



FOURTH & WASHINGTON PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW - 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

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FOR:

CITY OF ANN ARBOR DDA



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EXECUTIVE SUMMARY

The Fourth & Washington parking structure was built in 1999 and is in good condition. There has been some normal maintenance performed since the previous review in 2005, including the application of a new grit coat to the deck coating at the top and bottom of the ramps and concrete sealer in 2007.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in 2009 and that a follow-up review be completed in 2010.

Summary of Concrete, Waterproofing, Mechanical, Electrical and Miscellaneous Repairs

- **General Concrete Repair** – There is a small quantity of concrete deterioration. It is recommended that these items be repaired.
- **Waterproofing Systems** – All joint and cove sealants at the roof level should be replaced and all failed sealants at the lower levels should be repaired. There are cracks that need to be routed and sealed. There are a few locations of worn and failed deck coating that need to be repaired. It is also recommended that a deck coating be applied to the treads, risers and landings of the South Stair to protect against further corrosion.
- **Clean and Paint South Stair** – There is some minor corrosion on the steel in the South Stair. In addition to deck coating the South Stair, we recommend cleaning to remove corrosion and repainting the underside to protect against further corrosion.
- **Slab Washdown** – A slab washdown is recommended twice a year.

Optional items

- **Upgrade Lighting** – To improve lighting and energy efficiency we recommend upgrading the lighting system. (\$140,000)

Total Probable Construction Budget (excluding Optional Items)

Total	\$86,000
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I. STRUCTURE SUMMARY

STRUCTURE NAME: Fourth & Washington Parking Structure

LOCATION: Ann Arbor, MI
CROSS STREETS: 100 Block of S. Fourth Ave. and
100 Block of E. Washington St.

YEAR BUILT: 1999
YEAR(S) REPAIRED: No major repairs since construction

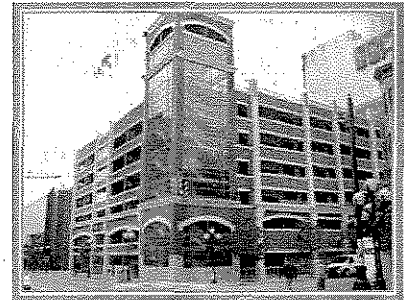
CONSTRUCTION TYPE: Precast, Field topped.
CONCRETE TYPE: Precast: 4500 psi @ 28 days
REINFORCING STEEL: Prestressed Double Tees
CORROSION INHIBITOR: None

OF LEVELS: 7 above grade / 1.5 below grade
OF STAIRS: 2
OF ELEVATORS: 1
AREA (SOG): 16,400 ft²
AREA (Supported): 123,000 ft²
AREA (Total): 139,000 ft²

STRUCTURE TYPE: Split Level
OF SPACES: 277
EFFICIENCY (sf/space): 503
TRAFFIC DIRECTION: 1-Way

SPACE ANGLE: 90 Degrees
OCCUPIED SPACE: None

DECKCOATING: Over Inverted Tee Beams at Supported Levels.
SEALERS: Silane – Applied over supported slab (1999 & 2007)
SEALANTS: Silicone and Urethane
WATERPROOFING: Stair/Elevator Roofs



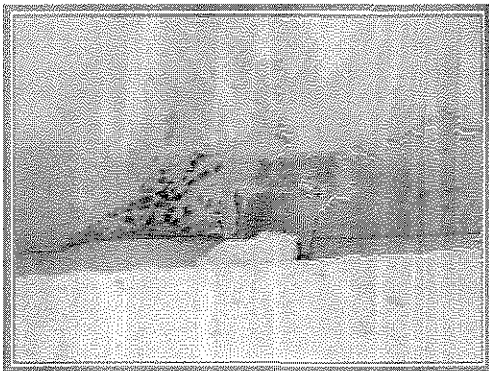
II. GENERAL CONDITION REVIEW

The following are pictures and observations of key items within the parking structure.

CONCRETE ITEMS



C1 - Topping Delaminations: A few delaminations were noted in the precast topping. The delaminations were small in size ranging from 1 square foot up to 10 square feet. Some of the delaminations noted were previous patches that have failed. The top of slab delaminations should be repaired to prevent further deterioration.

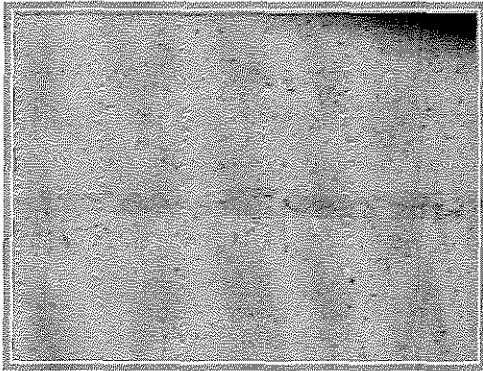


C2 - Ceiling Delaminations: Approximately 20 square feet of ceiling delaminations were noted at random locations throughout the structure. All loose concrete should be removed to prevent it from falling on pedestrians or vehicles, and the concrete should be patched back to the original surface.

C3 - Wall Delaminations: Approximately 20 square feet of wall delaminations were noted. Most of the wall delaminations were located on the roof level. Wall delaminations should be repaired to prevent the deterioration from growing and to improve aesthetics.

C4 - Curb Delaminations: A small amount of curb delaminations were noted at the roof level. These areas should be repaired to eliminate potential trip hazards.

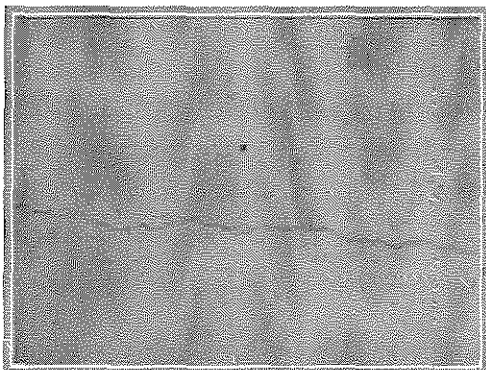
WATERPROOFING ITEMS



W1 – Joint Sealants: All of the joint sealants on the Roof Level (Level 7) are showing signs of deterioration due to UV exposure. Joint sealant failure was noted at random locations throughout the rest of the structure. We recommend replacing all joint sealants on the Roof Level and repairing failed sealants at all other levels to protect the structural members from deterioration caused by moisture and chlorides.

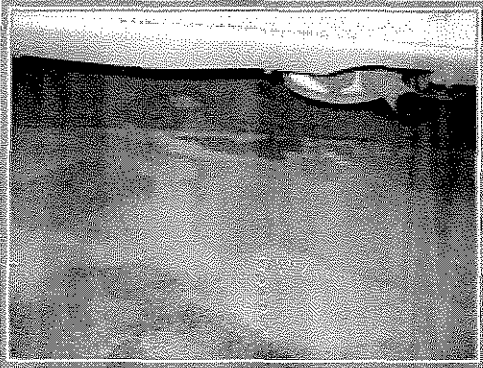


W2 – Cove Sealants: All of the cove sealants at the roof level are showing signs of deterioration due to UV exposure. Cove sealant failure was noted at a few random locations throughout the rest of the structure. We recommend replacing all of the cove sealants on the roof level and repairing all failed cove sealants to protect against moisture and chloride related deterioration.



W3 – Rout and Seal Cracks: Cracks were noted at random locations throughout the structure. Cracks allow moisture and chlorides to easily penetrate the concrete. The cracks should be routed and sealed.

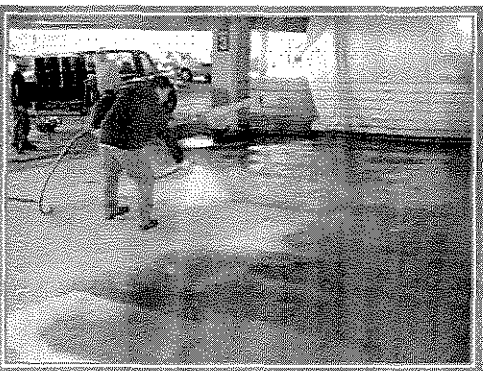
W4 – Deck Coating Recoat: Worn deck coating was noted at random locations throughout the structure. These areas should be recoated to provide protection against moisture and chlorides.



W5 – Deck Coating Repair: A small amount of deck coating failures were noted at Levels 2 and 7. Deck coating failure consists of areas where the deck coating has debonded from the concrete or the base membrane has been damaged. A full deck coating system should be applied at these locations.

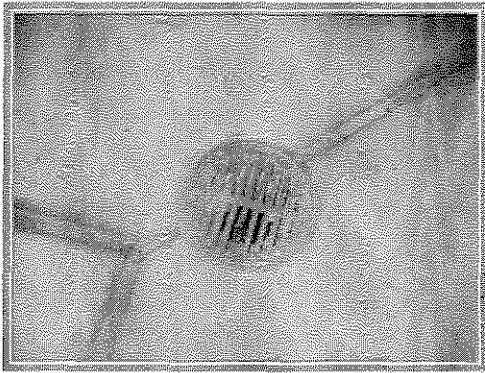


W6 – Deck Coating (at South Stair): Surface corrosion was noted on the steel in the South Stair. The corrosion is minor and has not created significant section loss. However, if no protective action is taken, the corrosion will become more severe and will eventually result in costly repairs. We recommend cleaning the steel to remove corrosion and deck coating the treads, risers and landings at the South Stair to protect the steel from further corrosion.



W7 – Sealer: A silane sealer was applied to all supported concrete areas during original construction in 1999 and then in 2007. Silane sealers help to reduce water and chloride intrusion into the concrete that may lead to corrosion of the embedded reinforcing steel and embedded connector plate steel over time.

MECHANICAL ITEMS



ME1 – Broken Floor Drain Grates: Floor drain grates throughout the structure appear to be in good condition. One broken floor drain grate was noted on Level 2. The broken grate creates a potential trip hazard and should be replaced.

ELECTRICAL ITEMS



E1 – Lighting: The lighting system consists of 175W metal halide light fixtures. The light levels at the below grade levels appeared to be low during our review. There have been significant advancements in fluorescent lighting recently which provide energy efficient lighting. We recommend upgrading the lights to provide improved light levels and energy efficiency.

MISCELLANEOUS ITEMS



M1 – Clean & Paint Steel (at South Stair): As stated in Item W6, corrosion was noted on the steel in the South Stair. Corrosion was also noted on the handrails in the South Stair. In addition to deck coating the South Stair, as recommended in Item W6, we recommend cleaning the steel to remove corrosion and repainting the underside to protect against further corrosion. The handrails should also be repainted.

III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

Some specific items that are important to enhance the longevity of this type of precast structure include:

- **Maintain Existing Structural Concrete Members** – It is critical to maintain structural concrete members (slab, beams, columns, etc.). Maintaining these elements, including reinforcement, will help maintain the structural integrity of the structure.
- **Maintain Waterproofing Systems** – Deck coatings, cove & joint sealants and routing & sealing all cracks, prevent moisture and chlorides from leaking to the underlying structural members. Protecting the concrete and reinforcing steel from moisture and chlorides helps avoid costly repairs and extends the service life of the structure.
- **Reapplication of Sealers** – The silane sealer applied in 2007 reduces the amount of water and chloride infiltration into the concrete. The effectiveness of this sealer decreases over time with wear and abrasion.
- **Maintain Painted Steel Surfaces** – Maintaining existing painted steel surfaces helps protect the steel from corrosion and improves aesthetics.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section II. All Items are broken into the following categories:

- Concrete Repairs and Maintenance – "C" Items
- Waterproofing Repairs and Maintenance – "W" Items
- Mechanical Repairs and Maintenance – "ME" Items
- Miscellaneous Repairs and Maintenance – "M" Items
- Optional Items – "O" Items

Soft Costs - Soft Costs are included as an estimated percentage and may vary. Soft costs include engineering planning and oversight, testing and other Owner costs related to oversight and planning. These costs do not include loss of parking revenue.

Optional Items – Below the base cost estimate there is a section for Optional Items. In many cases the items listed are general improvement items that we recommend as added value items that could be considered today but we have not included in our base cost estimate. Some items listed may be an added cost to upgrade an existing cost item to a better or more long-lasting repair.

TABLE 1 - FOURTH & WASHINGTON
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WASHINGTON PARKING STRUCTURE
December 2008
Construction Completed in 1999; WP Warranty Expiration in 2004 (EXPIRED)

Plan Year Year Age of Structure	<u>2</u> <u>2010</u> 11	<u>7</u> <u>2015</u> 16	<u>12</u> <u>2020</u> 21	<u>17</u> <u>2025</u> 26	<u>22</u> <u>2030</u> 31
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$3,000	\$4,000	\$6,000	\$9,000	\$11,000
Column & Wall	\$2,000	\$3,000	\$5,000	\$7,000	\$8,000
PC Concrete	\$2,000	\$4,000	\$5,000	\$7,000	\$8,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$3,000	\$5,000	\$7,000	\$10,000
DIVISION 7 - WATERPROOFING					
Sealants	\$27,000	\$100,000	\$4,000	\$100,000	\$6,000
Expansion Joints	\$0	\$0	\$0	\$0	\$0
Sealer (Silane)	\$0	\$0	\$62,000	\$0	\$62,000
Deck Coating	\$3,000	\$57,000	\$3,000	\$57,000	\$3,000
Epoxy Coating @ Stairs	\$18,000	\$3,000	\$17,500	\$3,000	\$17,500
Stair/Elev Roofs	\$0	\$0	\$20,000	\$0	\$0
Brick Sealer	\$0	\$40,000	\$0	\$40,000	\$0
Stair/Elevator Sealants	\$0	\$3,000	\$3,000	\$3,000	\$3,000
DIVISION 8					
Doors & Frames (25-30 years) Alum.	\$0	\$0	\$0	\$0	\$0
Stair Glass & Frame (at 30 years) Alum.	\$0	\$0	\$0	\$0	\$0
DIVISION 9 - FINISHES					
Restriping	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Steel					
Misc - bollards, rails, etc	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Exterior Handrails	\$0	\$25,000	\$4,000	\$25,000	\$4,000
Stairs - Paint Touchup	\$0	\$0	\$0	\$0	\$0
Stairs & Handrails - Paint	\$8,000	\$5,000	\$5,000	\$5,000	\$5,000
Concrete					
Stairs	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Interior Walls	\$0	\$10,000	\$10,000	\$10,000	\$10,000
Exterior Spandrels NA					
DIVISION 10					
Signage					
(replace at 10 years) Electric	\$0	\$20,000	\$0	\$20,000	\$0
(replace at 20-25 years) Standard	\$0	\$0	\$0	\$40,000	\$0
DIVISION 11					
Parking Equipment (replace at 10 yrs)	\$0	\$0	\$200,000	\$0	\$200,000
Fee Computers	\$0	\$10,000	\$10,000	\$10,000	\$10,000

TABLE 1 - FOURTH & WASHINGTON
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WASHINGTON PARKING STRUCTURE
December 2008
Construction Completed in 1999; WP Warranty Expiration in 2004 (EXPIRED)

Plan Year Year Age of Structure	2 <u>2010</u> 11	7 <u>2015</u> 16	12 <u>2020</u> 21	17 <u>2025</u> 26	22 <u>2030</u> 31
DIVISION 14					
Elevators Upgrades (<i>upgrade at 15 yrs</i>)	\$0	\$0	\$20,000	\$0	\$0
Elevator Replacement (<i>25 to 30 yrs</i>)	\$0	\$0	\$0	\$0	\$130,000
DIVISION 15 - MECHANICAL					
Plumbing					
(<i>replace at 30 years, 2032</i>) Drain Lines	\$0	\$1,000	\$1,000	\$1,000	\$1,000
(<i>replace at 30 years, 2032</i>) Floor Drains	\$500	\$1,000	\$1,000	\$1,000	\$1,000
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
HVAC - Lower Levels (<i>20 to 25 years</i>)	\$0	\$0	\$0	\$20,000	\$0
Restroom Fixtures	\$0	\$5,000	\$0	\$5,000	\$0
Fire Protection System	\$0	\$0	\$0	\$0	\$0
DIVISION 16 - ELECTRICAL					
Lighting (<i>replace fixtures at 20 yrs</i>)	\$0	\$140,000	\$0	\$0	\$0
Emergency Power - UPS (<i>at 15 yrs</i>)			\$40,000	\$0	\$0
Switchgear and Panels				\$0	\$0
TOTALS IN 2008 DOLLARS	\$63,500	\$447,000	\$442,500	\$483,000	\$540,500
Soft Costs (35%)	35% \$22,225	\$156,450	\$154,875	\$169,050	\$189,175
TOTALS IN 2008 DOLLARS	\$85,725	\$603,450	\$597,375	\$652,050	\$729,675

Notes:



LIBERTY SQUARE PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW - 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

CARL WALKER, INC.

5136 LOVERS LANE, STE 200
KALAMAZOO, MI 49002

FOR:

CITY OF ANN ARBOR DDA



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Tab IV Cost Estimate

EXECUTIVE SUMMARY

The Liberty Square parking structure built in 1984 and restored in 1998 is in very good condition. The repair work in 1998 included some concrete repairs, total sealant replacement, complete deck coating and a significant amount of painting. Minor repairs have been performed yearly, some of which include staining white all of the walls, columns and ceilings in 2007-08. Also completed was the replacement of all of the interior light fixtures with new high output fluorescent light fixtures. All repairs are done very well.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in 2009 and that a follow-up review be completed in 2010.

Summary of Concrete, Waterproofing and Miscellaneous Repairs

- **General Concrete Repair** – Some isolated ongoing corrosion related deterioration was noted and should be repaired.
- **Expansion Joint Repair** – The expansion joint at the entrance requires replacement and upgrade to a more durable expansion joint. Some minor repairs to the expansion joints between the stair and the main parking structure are needed.
- **Deck Coating Recoating** – The deck coating installed in 1998 is performing well. At this time we are recommending recoating an area that has experienced wear on a high traffic area at Level 2.
- **Painting** – Some minor touchup of painting has been recommended.
- **Stair Towers** – Structural steel framing repair is required at isolated locations in the stair towers. In addition to this, cleaning of corrosion and installation of a cove sealant at the horizontal to vertical intersections on the stair risers is recommended along with painting.
- **Slab Washdowns** – A slab washdown is recommended twice a year.

Optional items

- **Steel Stair Replacement** – In light of past repairs, current repair needs, and anticipated future deterioration of the steel pan type stair systems it may be wise to consider a complete stair element replacement. - \$200,000

Total Probable Construction Budget (excluding Optional Items)

Total	\$52,000
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I. STRUCTURE SUMMARY

STRUCTURE NAME: Liberty Square Parking Structure

LOCATION: Ann Arbor, MI
CROSS STREETS: 400 block E. Washington
100 block S. Division St.

YEAR BUILT: 1984
YEAR(S) REPAIRED: Major repairs in 1998

CONSTRUCTION TYPE: Cast-in-Place Post Tensioned Concrete

CONCRETE TYPE: Cast-in-Place: @ 28 days – 4500psi for Levels 1-4 and 4000psi for Level 5.

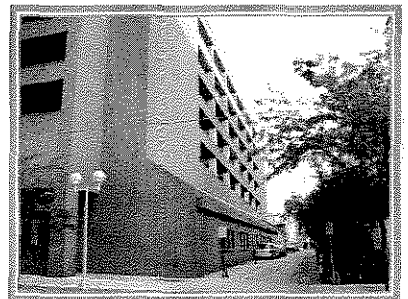
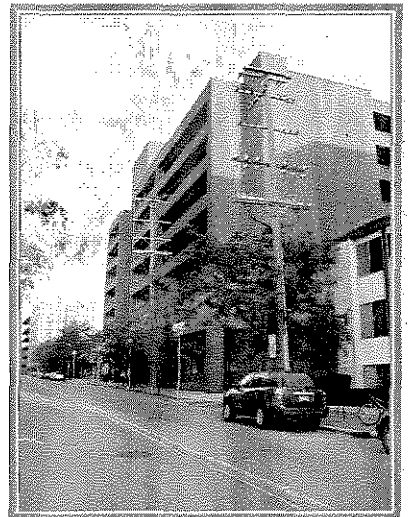
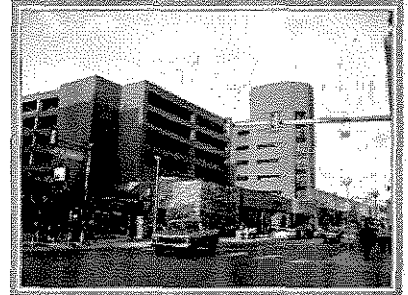
REINFORCING STEEL: Mild steel and Post-Tensioning.
CORROSION INHIBITOR: None

OF LEVELS: 7
OF STAIRS: 2
OF ELEVATORS: 4
AREA (SOG): n/a
AREA (Supported): 192,000 ft²
AREA (Total): 192,000 ft²

STRUCTURE TYPE: Single Helix
OF SPACES: 598
EFFICIENCY (sf/space): 321
TRAFFIC DIRECTION: 2-Way on the two full bays and 1-way traffic on the partial (east) bay.

SPACE ANGLE: 90 Degrees
OCCUPIED SPACE: Commercial Offices

DECKCOATING: Supported Levels (1998)
SEALERS: Brick Masonry (2006)
SEALANTS: Urethane
WATERPROOFING: Stair/Elevator Roofs
LIGHT FIXTURES: New Fluorescent Fixtures (2008)
CEILING: Painted (2008)



II. GENERAL CONDITION REVIEW

The following are pictures and observations of key items within the parking structure. Each item is listed in the cost estimate.



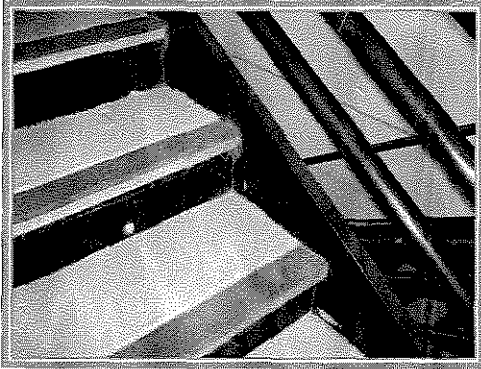
CONCRETE ITEMS

C1 – Top of Slab Delaminations: Throughout the structure, there are areas of the concrete floor slab that are delaminated. These delaminations typically occur in the slab above cast-in-place concrete beams where the embedded reinforcing steel is at the highest point in the slab, and the most vulnerable. The total area of deterioration is less than 300 square feet. Some additional deterioration can be expected from chloride contaminated concrete even though protected by deck coating. These areas should be repaired followed by reapplication of the deck coating at these repair areas.

C2 – Underside of Slab – Ceiling: At a few various locations throughout the parking structure, there are areas of corrosion related concrete deterioration on the underside of the floor slab. The majority of these areas are located along construction joints and may be caused by corrosion of post-tensioning anchors or bursting bars. The total quantity is less than 150 square feet. This minor amount of deterioration is not unexpected from ongoing corrosion activity, and should be repaired to maintain the integrity of the post tensioning system.

C3 – Column Delaminations: There are some limited corrosion induced deterioration of the concrete columns in this structure. The deterioration is a result of ongoing corrosion, particularly of column areas near the floor surface that are exposed to splash effect of chloride laden water on the floor surface.

WATERPROOFING ITEMS



W1 – Joint Sealants: All joint sealants on the floor slabs are covered by the deck coating. No failures through the deck coating were noted.

W2 – Cove Sealants at Stairs: In 1998 the stair treads were coated with a urethane deckcoating. The deckcoating is wearing very well but it was noted that water is leaking to the underside at the edges of each tread. This is causing staining, mild and heavy corrosion damage to the underside of the steel risers. We recommend installing a cove sealant at the horizontal to vertical intersections on the stair treads.

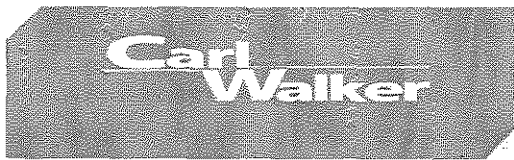


W3 – Flashing Sealant: At the exposed perimeter walls of portions of Levels 6 and 7, there is a metal flashing that covers the top of the wall. This flashing protects the opening between the concrete spandrel wall and the brick façade. Each butt joint sealant along the entire length has failed. These joints should be replaced with a UV stable sealant to maintain the integrity of the flashing system and to prevent damage to the structures façade components.

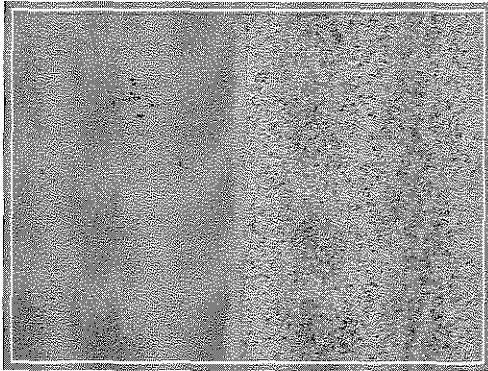
W4 – Rout and Seal Cracks: Throughout the structure cracking of the floor slabs was minimal. However, visible cracking through the existing deck coating should be repaired to prevent chloride intrusion into the slab.



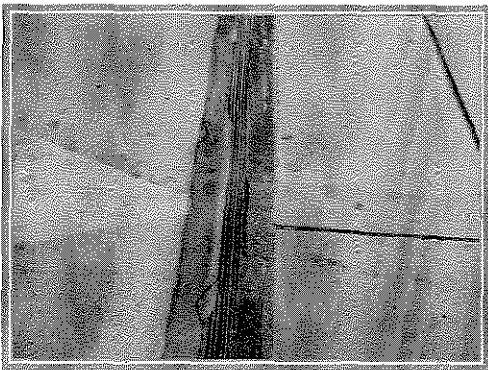
W5 – Deck Coating: All supported slab areas are deck coated. Overall, the deck coating is performing well. There was one location on Level 2 in a high traffic area that is showing wear, totaling around 220 square feet. This area should be recoated to maintain the integrity of the waterproofing system. A portion of this worn area is located above the lower level occupied space and could lead to future problems if not repaired soon.



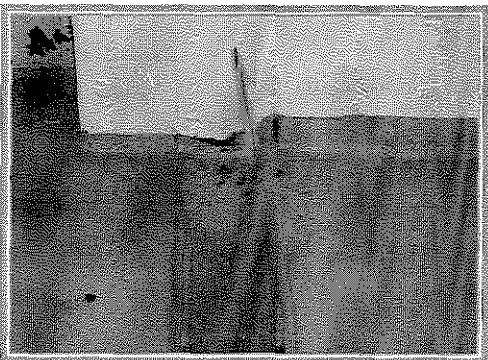
LIBERTY SQUARE PARKING STRUCTURE MAINTENANCE REVIEW - 2008



W6 – Epoxy Coatings: Portions of the supported slabs appear to have been recently coated with an epoxy and aggregate coating system. These areas are typically located in drive lanes that previously shown some wear. This system appears to have been applied well and should resist wear better than the existing urethane coating.



W7 – Expansion Joint – Strip Seal: The expansion joint at the entrance ramp has failed at the nosing material. Although there is no occupied space below this area where leaking would be a concern, we recommend replacing this joint at this time. As this is a high traffic area and this type of expansion joint has failed over time like the original joint we would recommend that a reinforced nosing bolt down expansion joint be installed at this time. This will require some concrete work to create a deeper blockout for this new joint.



W8 – Expansion Joint – Ribbon Seal: In 1998 the expansion joints between the parking structure and the main stair/elevator tower were replaced. Portions of the urethane nosing on these expansion joints have failed and lost bond to the concrete. In addition to nosing failures, one location was noted where the gland itself was damaged. These items should be repaired to prevent water and chloride damage to the structure below. These items may also become possible trip hazards in these high pedestrian traffic areas if not repaired.



LIBERTY SQUARE PARKING STRUCTURE MAINTENANCE REVIEW - 2008

MISCELLANEOUS ITEMS



M1 – Stair Repair & Paint Touchup: Water has been an ongoing problem for both the north and south stair in this structure. Leaking into the concrete treads and landings has caused wide spread corrosion of the steel framing members. In some cases, 100% section loss of the steel framing was noted. Any members that are replaced or cleaned of corrosion should be repainted to match the existing framing.

M2 – Painting: At isolated locations throughout the structure there are painted concrete walls that are in need of some touchup. This is mainly an aesthetic item, but should be repaired to maintain the overall appearance of the structure.

OPTIONAL ITEMS

O1 – Steel Stair Replacement: The steel framed stair towers have undergone deterioration over time and on a repeated basis. The concrete infilled steel pan type stair system is not a durable stair system to use in the northern climates exposed to deicing salts and high humidity. As future ongoing deterioration is anticipated it may be desirable to replace at this time and to replace with a more durable stair element.

In 2006, Carl Walker Inc. teamed with Lukenbach Ziegelman Architects to provide the Ann Arbor DDA with conceptual drawings for replacement and reconfiguration of the south stairwell. The outline for these changes were presented to the DDA in October of 2006, no decision were made at that time.

III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

The Liberty Square Parking Structure, built with post-tensioned concrete slabs, is a very durable structure. With the additional applied deckcoating there is little to no infiltration of chlorides and water into the concrete and no leaking through to the underside. It is anticipated that repair costs for this structure will remain low for years to come.

Some specific items that are important to enhance the longevity of this cast-in-place post-tensioned parking structure include:

- **Maintaining Deck Coatings** – A urethane deck coating has been applied to the entire supported surface of this parking structure. It is important to recoat the deck coating over time as it wears to prevent water and chloride intrusion.
- **Maintaining the Stair System** - One of the key items in this structure to review and maintain over time is the steel framing in the stair towers. The framing is currently showing signs of mild to heavy corrosion, and in some case full section loss. This could become a pedestrian hazard. Annual maintenance and repair of the stair system will ensure long-term durability.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



LIBERTY SQUARE PARKING STRUCTURE MAINTENANCE REVIEW - 2008

IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section II. All Items are broken into the following categories:

- Concrete Repairs and Maintenance - "C" Items
- Waterproofing Repairs and Maintenance - "W" Items
- Miscellaneous Repairs and Maintenance - "M" Items
- Optional Items - "O" Items

Soft Costs - Soft costs such as engineering planning and oversight, testing, other Owner costs related to oversight and planning, and loss of parking revenue are not included in this cost estimate.

Optional Items - Below the base cost estimate there is a section for Optional Items. In many cases the items listed are general improvement items that we recommend as added value items that could be considered today but we have not included in our base cost estimate. Some items listed may be an added cost to upgrade an existing cost item to a better or more long-lasting repair.

TABLE 2 - LIBERTY SQUARE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - LIBERTY SQUARE PARKING STRUCTURE
December 2008

Repairs Completed in 1998; WP Warranty Expiration in July 2003 (EXPIRED)

Plan Year	1	5	10	15	19
Year	<u>2009</u>	<u>2013</u>	<u>2018</u>	<u>2023</u>	<u>2027</u>
Age of Structure	25	29	34	39	43
Age Since 1998 Repairs	11	15	20	25	29
DIVISION 3 - CONCRETE REPAIRS					
Slab	\$16,000	\$20,000	\$20,000	\$40,000	\$50,000
Column & Wall	\$2,000	\$7,000	\$8,000	\$10,000	\$13,000
PC Concrete	N/A	\$0	\$0	\$0	\$0
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$10,000	\$10,000	\$10,000	\$40,000
DIVISION 5 - STEEL					
Replace South Stair	\$200,000	\$0	\$0	\$0	\$0
Replace North Stair	\$0	\$0	\$0	\$150,000	\$0
Steel Stair Repairs	\$10,000	\$0	\$12,000	\$0	\$0
DIVISION 7 - WATERPROOFING					
Sealants	\$2,500	\$50,000	\$5,000	\$50,000	\$3,000
Expansion Joints	\$3,000	\$12,000	\$3,000	\$12,000	\$3,000
Cap Flashing	\$2,000	\$3,000	\$20,000	\$3,000	\$3,000
Sealer (Silane) - 24" Vertical	\$0	\$0	\$0	\$0	\$0
Deck Coating	\$1,000	\$580,000	\$32,000	\$580,000	\$32,000
Epoxy Coating @ Stairs	\$0	\$24,000	\$2,400	\$24,000	\$2,400
Stair/Elev Roofs (20 to 25 yrs)	\$0	\$20,000	\$0	\$0	\$20,000
Brick Sealer	\$0	\$0	\$80,000	\$0	\$80,000
Stair/Elevator Sealants	\$0	\$2,000	\$15,000	\$2,000	\$15,000
DIVISION 8					
Doors & Frames (at 15 years)	\$0	\$2,500	\$2,500	\$2,500	\$5,000
Stair Glass Frame (at 30 yrs)	Alum.	\$0	\$6,000	\$80,000	\$6,000
DIVISION 9 - FINISHES					
Restriping	\$0	\$6,000	\$6,000	\$6,000	\$6,000
Steel					
Misc - bollards, rails, etc	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Stairs - Handrails	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Doors / Frames	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Exterior Frame					
Exterior Handrails	\$0	\$0	\$15,000	\$0	\$15,000
Interior Rails NA					
Stairs - Paint Touchup	\$0	\$0	\$0	\$0	\$0
Stairs - Paint	\$0	\$10,000	\$0	\$10,000	\$0
Concrete					
Stairs	\$0	\$20,000	\$20,000	\$10,000	\$20,000
Interior Walls	\$600	\$30,000	\$0	\$30,000	\$0

TABLE 2 - LIBERTY SQUARE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - LIBERTY SQUARE PARKING STRUCTURE
December 2008

Repairs Completed in 1998; WP Warranty Expiration in July 2003 (EXPIRED)

<i>Plan Year</i>	1	5	10	15	19
<i>Year</i>	<u>2009</u>	<u>2013</u>	<u>2018</u>	<u>2023</u>	<u>2027</u>
<i>Age of Structure</i>	25	29	34	39	43
<i>Age Since 1998 Repairs</i>	11	15	20	25	29
<i>Exterior Spandrels NA</i>					
DIVISION 10					
Signage					
<i>Electric</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>(replace at 20-25 yrs) Standard</i>	\$0	\$70,000	\$0	\$0	\$0
DIVISION 11					
Parking Equipment <i>(replace 10yrs)</i>	\$0	\$0	\$125,000	\$0	\$125,000
Fee Computers	\$0	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 14					
Elevators Upgrades <i>(at 15 years)</i>	\$60,000	\$0	\$0	\$0	\$0
Elevator Replacement <i>(25 to 30 yrs)</i>	\$0	\$0	\$500,000	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 years)</i>	\$0	\$1,000	\$10,000	\$0	\$1,000
<i>Floor Drains (replace at 30 yrs)</i>	\$0	\$2,000	\$2,000	\$5,000	\$2,000
<i>Sump Pump Replacement NA</i>					
HVAC - Lower Levels <i>NA</i>	\$0	\$0	\$0	\$0	\$0
Restroom Fixtures <i>NA</i>	\$0	\$0	\$0	\$0	\$0
Fire Protection System	\$0	\$5,000	\$0	\$30,000	\$0
DIVISION 16 - ELECTRICAL					
Lighting <i>(replace at 20yrs)(Done in 2008)</i>	\$0	\$5,000	\$5,000	\$5,000	\$180,000
Emergency Generator <i>NA</i>					
Switchgear and Panels <i>(30 yrs)</i>	\$0	\$0	\$30,000	\$0	\$0
TOTALS IN 2008 DOLLARS	\$297,100	\$914,500	\$1,016,900	\$1,014,500	\$635,400
Soft Costs (35%) <i>35%</i>	\$103,985	\$320,075	\$355,915	\$355,075	\$222,390
TOTALS IN 2008 DOLLARS	\$401,085	\$1,234,575	\$1,372,815	\$1,369,575	\$857,790

Notes:



FOREST AVENUE PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW – 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

CARL WALKER, INC.

5136 LOVERS LANE, STE 200

KALAMAZOO, MI 49002

FOR:

CITY OF ANN ARBOR DDA



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EXECUTIVE SUMMARY

The Forest Avenue Parking Structure was built in 2001. There has been some normal maintenance performed since the previous review in 2005, including the application of a concrete sealer in 2007.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in 2009 and that a follow-up review be completed in 2010.

Summary of Concrete, Waterproofing and Miscellaneous Repairs

- **General Concrete Repair** – There are a number of corrosion related concrete delaminations throughout the structure. These locations should be repaired.
- **Sealant Joint Repair** – There are a number of joint sealants that have failed throughout the structure. These joints should be replaced to prevent future concrete damage.
- **Deck Coating Repairs** – Isolated locations of deck coating repairs are needed to maintain the waterproofing system.
- **Canopy Repairs** – The canopies over the main entrance/exit on Forest Ave. and also the canopy at the (south side) Willard St. Entrance have some locations at the supporting arms that are exhibiting signs of corrosion and should be cleaned and re-galvanized.
- **Slab Washdown** – A slab washdown is recommended twice a year.

Optional items

- **Energy Usage Study** – This item is to have a energy study performed to determine the cost savings of turning stair lights on and off with a photocell, \$5,000.
- **Circuifing Changes** – This item is to implement any changes that might be recommended by the above stated study, \$20,000.

Total Probable Construction Budget (excluding Optional Items)

Total	\$113,000
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I. STRUCTURE SUMMARY

STRUCTURE NAME: Forest Avenue Parking Structure

LOCATION: Ann Arbor, MI
CROSS STREETS: S. University Ave, S. Forest Ave., Willard St.

YEAR BUILT: 2001
YEAR(S) REPAIRED: No major repairs

CONSTRUCTION TYPE: Precast Pretopped Double Tees
CONCRETE TYPE: Precast: 5500 psi @ 28 days
REINFORCING STEEL: Prestressed tendons, Mild Steel
CORROSION INHIBITOR: Calcium Nitrite at 3 gal/cu yd.

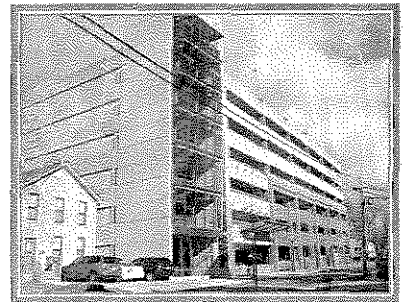
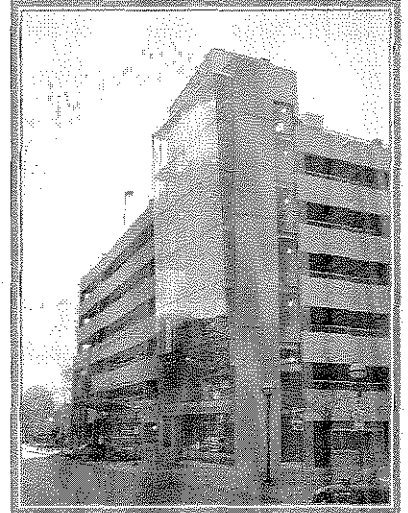
OF LEVELS: 7 at or above grade
OF STAIRS: 3
OF ELEVATORS: 2
AREA (SOG): 36,230 ft²
AREA (Supported): 226,890 ft²
AREA (Total): 263,120 ft²

STRUCTURE TYPE: Single Helix
OF SPACES: 863
EFFICIENCY (sf/space): 305
TRAFFIC DIRECTION: 2-Way

SPACE ANGLE: 90 Degrees
OCCUPIED SPACE: Parking Office

DECK COATING: All of Level 7 and over top of the inverted 'T' beams at Levels 2-6.

SEALERS: 40% Silane in 2001 & Silane in 2007
SEALANTS: Silicone & Urethane
WATERPROOFING: Stair/Elevator Roofs

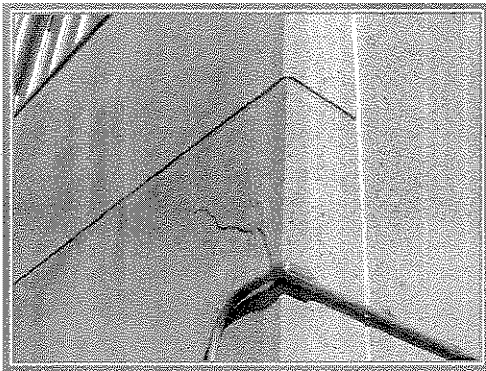


II. GENERAL CONDITION REVIEW

The following are pictures and observations of key items within the parking structure.

CONCRETE ITEMS

C1 – Topping Delaminations: Throughout the structure, there are areas of concrete topping that are delaminated or debonded. Level 2 appears to have the largest quantity of this type of deterioration. The total area of deterioration is less than 900 square feet. These areas should be repaired followed by reapplication of the deckcoating where applicable.



C2 – Wall Delaminations: In isolated locations of the structure small concrete wall delaminations were noted. These few delaminations do not appear to be caused by chloride induced corrosion and are simply cosmetic. Repairing these spalls is recommended to protect any exposed steel reinforcement that may be present.



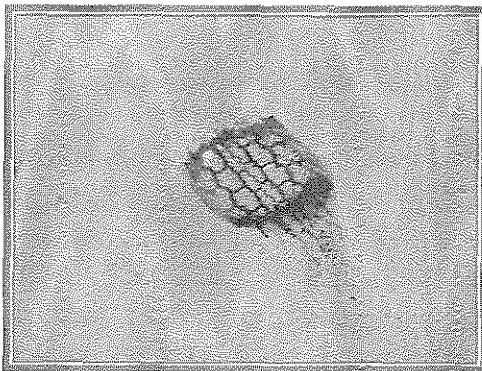
C3 – Column Delaminations: Columns and shear walls throughout the structure are in good shape overall. A majority of the column delaminations are located on Level 4 and consist mostly of failed patches. These locations should be repaired to prevent damage to the structural steel reinforcement in the columns.

WATERPROOFING ITEMS

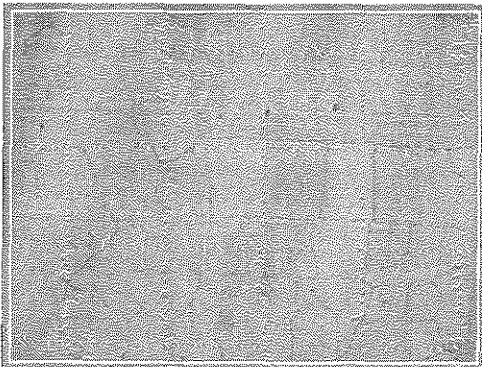


W1 – Joint Sealants: Throughout the structure, a large amount of joint sealants were noted that are in need of repair. The total amount of deterioration includes approximately 6,000 linear feet. At many locations, leaking is occurring causing staining of the ceiling below. The sealants are original to the structure, which was constructed in 2001 and are getting close to their estimated service life of 8 years. A majority of the failed sealants are located at the exposed roof level, where the harsh environment tends to take a heavier toll on urethane materials. Joint sealants should be replaced to prevent leaking and damage to the precast tees.

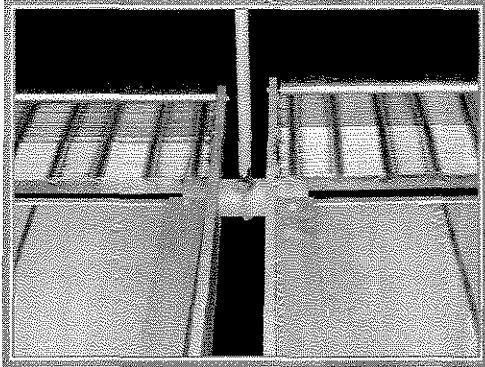
W2 - Rout & Seal Cracks: A small quantity of cracks exists in the parking structure and should be routed and filled with a urethane sealant. Routing and sealing helps to prevent moisture and chlorides from easily reaching the embedded reinforcement and causing it to corrode.



W3 – Deck Coating: Throughout the structure there are existing deck coatings at the exposed roof level, beam crossovers and over storage/occupied areas. The coating appears to be in good condition with less than 1,500 square feet of repair needed. These repairs include recoating worn crossovers, and applying a full system at small areas of debonded or damaged coating and areas in need of concrete repairs. Maintaining the membrane system is critical in the long-term durability of the structure.



W4 – Sealer: In 2001, a 40% silane sealer was applied to all supported concrete areas that were not deck coated. A silane sealer was also applied in 2007. Silane sealers help to reduce water and chloride intrusion into the concrete that may lead to embedded reinforcing steel. The estimated life of a 40% silane sealer is 5 years. Also there are many hairline “spider” cracks in the surface of the concrete topping. A sealer will help prevent water penetration in these cracks.

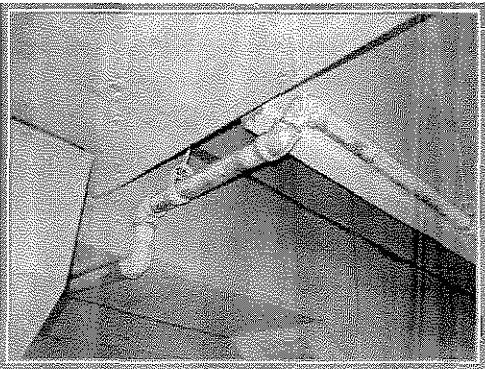


MISCELLANEOUS ITEMS

M1 – Repair Canopy Connections: Corrosion of the welded connections were noted at the canopies over the entry/exit lanes. Continued deterioration to these welds may lead to failure of the canopy supports. These areas should be cleaned and re-galvanized.



M2 – Handrail Repair: A hand rail in the North stair tower at Level 7 has been rotated out of place. This hand rail should be repaired to prevent possible pedestrian injury. Placement of an additional support at the right hand corner after the pipe railing has been reset will prevent this rotation from reoccurring.

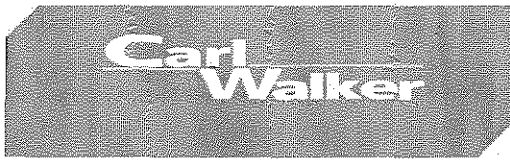


M3 – Mechanical Piping: Minor surface corrosion and peeling paint was noted on the mechanical piping throughout the structure. These areas of deterioration should be cleaned and repainted to help prevent further deterioration and for aesthetics.

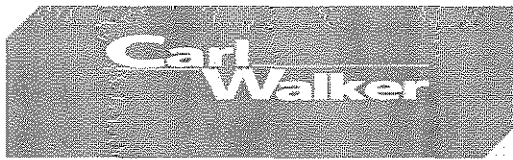
OPTIONAL ITEMS

O1 – Energy Usage Study: Perform a study of cost savings if stair tower lighting was converted to a photocell on/off. Currently, the lights are on 24 hours a day, 7 days a week.

O2 – Electrical Circuiting Changes: Change the circuiting so stair towers are on a separate circuit and then photocell system installed to turn lights on/off.



**FOREST AVENUE PARKING STRUCTURE
MAINTENANCE REVIEW - 2008**



III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

Some specific items that are important to enhance the longevity of this type of parking structure include:

- **Maintain Existing Structural Concrete** – It is critical to maintain structural concrete elements (slab, joist, beams columns, etc.). Maintaining these elements including reinforcement will help keep the facility structurally sound.
- **Maintain Existing Sealants** – Cove and joint sealants prevent water and chlorides from leaking to the underlying structural elements and causing costly repairs.
- **Maintaining Deck Coatings** – A urethane deck coating has been applied to critical areas in the parking structure. It is important to recoat the deck coating over time as it wears to prevent water and chloride intrusion.
- **Reapplication of Sealers** – The silane sealer applied in 2001 and in 2007 reduces the amount of water and chloride infiltration into the concrete. The effectiveness of this sealer decreases over time with wear and abrasion.
- **Maintain Galvanized Coatings** – Galvanized coatings help to protect the integrity of the structural steel elements beneath the coatings. Cleaning all surface corrosion and recoating with new galvanized coating will help maintain the appearance and the integrity of this protection system.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section II. All Items are broken into the following categories:

- Concrete Repairs and Maintenance - "C" Items
- Waterproofing Repairs and Maintenance - "W" Items
- Miscellaneous Repairs and Maintenance - "M" Items
- Optional Items - "O" Items

Soft Costs - Soft Costs are included as an estimated percentage and may vary. Soft costs include engineering planning and oversight, testing and other Owner costs related to oversight and planning. These costs do not include loss of parking revenue.

Optional Items - Below the base cost estimate there is a section for Optional Items. In many cases the items listed are general improvement items that we recommend as added value items that could be considered today but we have not included in our base cost estimate. Some items listed may be an added cost to upgrade an existing cost item to a better or more long-lasting repair.

TABLE 6 - FOREST AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOREST AVENUE PARKING STRUCTURE
December 2008
Construction Completed in 2001; WP Warranty Expiration in July 2006

Plan Year Year Age of Structure	2 <u>2010</u> 9	7 <u>2015</u> 14	12 <u>2020</u> 19	17 <u>2025</u> 24	22 <u>2030</u> 29
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$25,000	\$7,000	\$9,000	\$14,000	\$12,000
Column & Wall	\$3,000	\$1,000	\$1,000	\$3,000	\$13,000
PC Concrete	\$0	\$3,000	\$7,000	\$10,000	\$10,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$0	\$5,000	\$10,000	\$15,000
DIVISION 7 - WATERPROOFING					
Sealants	\$40,000	\$200,000	\$10,000	\$200,000	\$10,000
Expansion Joints	\$1,000	\$30,000	\$1,000	\$1,000	\$30,000
Sealer (Silane)	\$0	\$0	\$96,000	\$0	\$96,000
Deck Coating	\$4,000	\$150,000	\$4,000	\$150,000	\$4,000
Epoxy Coating @ Stairs	\$0	\$0	\$18,000	\$0	\$18,000
Stair/Elev Roofs (at 20 to 25 yrs)	\$0	\$1,000	\$0	\$30,000	\$0
Brick Sealer	\$0	\$10,000	\$0	\$10,000	\$0
Stair/Elevator Sealants	\$0	\$5,000	\$2,500	\$15,000	\$0
DIVISION 8					
Doors & Frames	S.S.				
Stair Glass & Frame	Alum.	\$3,000	\$3,000	\$3,000	\$3,000
Office Insulated Glass		\$0	\$0	\$15,000	\$0
DIVISION 9 - FINISHES					
Restriping		\$9,000	\$0	\$0	\$9,000
Steel					
Misc - bollards, rails, canopy, etc	\$6,000	\$5,000	\$5,000	\$5,000	\$5,000
Stairs - Handrails (stainless)	\$1,000				
Doors / Frames (stainless)					
Exterior Frame	NA				
Exterior Handrails	NA				
Interior Rails (stainless)					
Stairs - Galv Touchup	\$0	\$5,000	\$10,000	\$15,000	\$20,000
Stairs - Paint	\$0	\$0	\$0	\$0	\$0
Concrete					
Ceiling Stain		\$0	\$300,000	\$0	\$0
Stairs	\$0	\$45,000	\$0	\$45,000	\$0
Interior Walls	NA				
Exterior Spandrels	NA				
Office /Police Office		\$2,000	\$2,000	\$2,000	\$2,000
Office Finishes	\$0	\$10,000	\$0	\$10,000	\$0
DIVISION 10					

TABLE 6 - FOREST AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOREST AVENUE PARKING STRUCTURE
December 2008

Construction Completed in 2001; WP Warranty Expiration in July 2006

	<i>Plan Year</i>	2	7	12	17	22
	<i>Year</i>	2010	2015	2020	2025	2030
	<i>Age of Structure</i>	9	14	19	24	29
Signage						
<i>Electric</i>			\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20-25 yrs)</i>					\$60,000	\$0
DIVISION 11						
Parking Equipment	<i>Replace at 10 years.</i>		\$150,000		\$0	\$150,000
Fee Computers			\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14						
Elevators Upgrades <i>(at 15 yrs)</i>				\$60,000	\$0	\$0
Elevator Replacement <i>(25 to 30 yrs)</i>				\$0	\$0	\$0
DIVISION 15 - MECHANICAL						
Plumbing						
<i>Drain Lines (replace at 30 yrs)</i>		\$4,000	\$2,000	\$0	\$0	\$0
<i>Floor Drains (replace at 30 yrs)</i>		\$0	\$2,000	\$0	\$0	\$0
<i>Restroom Fixtures</i>		\$0	\$0	\$8,000	\$0	\$8,000
HVAC						
<i>Office / Police Office</i>			\$10,000	\$0	\$10,000	\$0
<i>Elevator Heat Units (20 yrs)</i>				\$0	\$30,000	\$0
<i>Restroom Fixtures</i>			\$2,000	\$0	\$2,000	\$0
Sump Pump Replacement		\$0	\$2,000	\$0	\$2,000	\$0
DIVISION 16 - ELECTRICAL						
Lighting <i>(at 20 yrs)</i>		\$2,000	\$5,000	\$10,000	\$260,000	\$5,000
Emergency Generator <i>(30 yrs)</i>						
Switchgear and Panels <i>(30 yrs)</i>						
Energy Use Study						
Electrical Circuiting Changes						
TOTALS IN 2008 DOLLARS		\$89,000	\$689,000	\$566,500	\$932,000	\$425,000
Soft Costs (35%)	35%	\$31,150	\$241,150	\$198,275	\$326,200	\$148,750
TOTALS IN 2008 DOLLARS		\$120,150	\$930,150	\$764,775	\$1,258,200	\$573,750

Notes:



ANN ASHLEY PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW - 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

CARL WALKER, INC.

5136 LOVERS LANE, STE 200

KALAMAZOO, MI 49002

FOR:

CITY OF ANN ARBOR DDA



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EXECUTIVE SUMMARY

The Ann Ashley parking structure built in 1986 and restored in 1998 is in good condition. The repair work in 1998 included some concrete repairs, total sealant replacement, strip deck coating and complete silane sealer application. Minor repairs have been performed yearly, some of which include staining white all of the walls, columns and ceilings in 2007-08. Also completed was the replacement of all of the interior light fixtures with new high output fluorescent light fixtures and roof level fixtures with new HID lighting system. All repairs are performing very well.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in 2009 and that a follow-up review be completed in 2010.

Summary of Concrete, Waterproofing and Miscellaneous Repairs

- **General Concrete Repair** – Some ongoing corrosion related deterioration was noted and should be repaired.
- **Sealant and Expansion Joint Repair** – There are a number of isolated leak locations at sealants and expansion joints that require spot repair to keep water and chlorides from infiltrating to the structural elements below. The expansion joint systems that were replaced in 1998 still has useful life remaining and spot repair, not system replacement, is recommended at this time. The sealants that were installed at the same time (1998) are nearing the end of their useful life and should have spot repairs completed as a minimum. Full replacement of sealants is recommended at the roof level.
- **Deck Coating Recoating** – The deck coating installed in 1998 is performing well. At this time we are recommending a re-coat all of the roof level deck coating.
- **Concrete Sealer** – Concrete sealer should be installed on all supported slabs which have no deck coating.
- **Painting** – Some minor touchup of painting has been recommended.
- **Slab Washdown** – A slab washdown is recommended twice a year.

Optional items

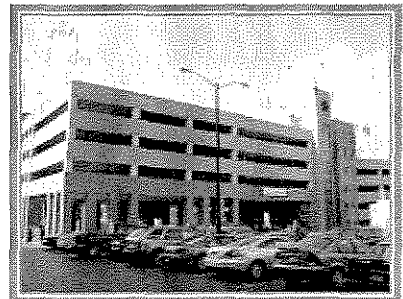
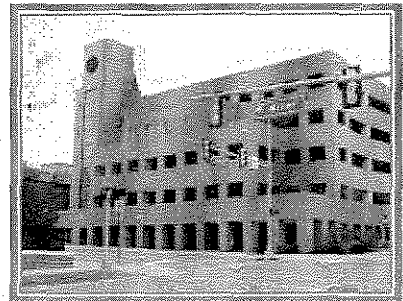
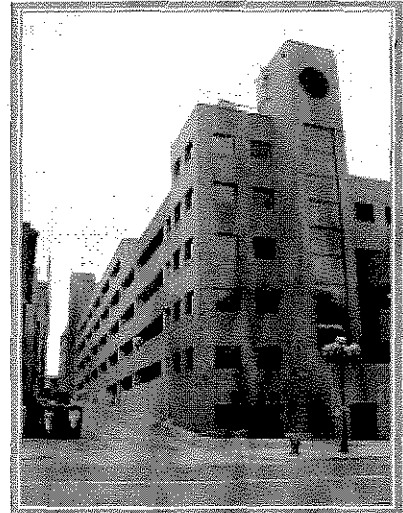
- **Restaining Precast Façade** – Due to fading and discoloration restaining or sealing to bring out color is an optional recommended item - \$90,000
- **North Area Resurfacing** – It is recommended to study alterations to the area north of the structure to provide a more useful and aesthetic area. Currently there is a bicycle storage unit in this area. If there is an increase in demand for these units, this location would be a good location to add more units - \$25,000

Total Probable Construction Budget (excluding Optional Items)

Total	\$196,000
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I. STRUCTURE SUMMARY

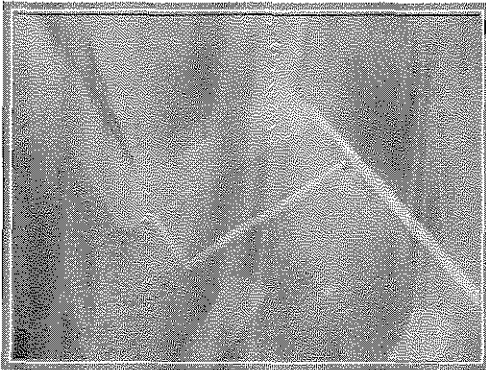
STRUCTURE NAME:	Ann Ashley Parking Structure
LOCATION:	Ann Arbor, MI
CROSS STREETS:	Ann Ashley, First, Ann
YEAR BUILT:	1986
YEAR(S) REPAIRED:	1998
CONSTRUCTION TYPE:	Precast, Cast-in-place Topping
CONCRETE TYPE:	Precast: Conventional Topping: Microsilica
REINFORCING STEEL:	Epoxy Mesh
CORROSION INHIBITOR:	None
# OF LEVELS:	6 Above, 2 Below
# OF STAIRS:	3
# OF ELEVATORS:	2
AREA (SOG):	28,500 ft ²
AREA (Supported):	246,000 ft ²
AREA (Total):	274,500 ft ²
STRUCTURE TYPE:	Double Helix
# OF SPACES:	839
EFFICIENCY (sf/space):	327
TRAFFIC DIRECTION:	1-Way
SPACE ANGLE:	70 Degrees
OCCUPIED SPACE:	Parking Office
DECKCOATING:	Strip Locations (1998)
SEALERS:	100% Silane (1998)
SEALANTS:	Silicone & Urethane
WATERPROOFING:	Stair/Elevator Roofs
CEILING:	Painted (2007)
LIGHTING:	Levels B thru 6 - New Fluorescent Fixtures (2008). Roof Level - New Metal Halide Fixtures (2008)



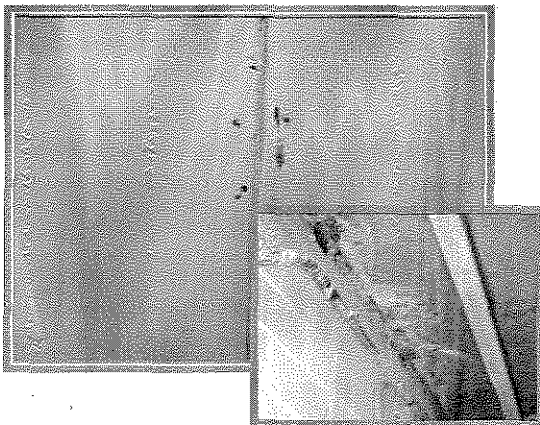
II. GENERAL CONDITION REVIEW

The following are pictures and observations of key items within the parking structure. Each item is listed in the cost estimate.

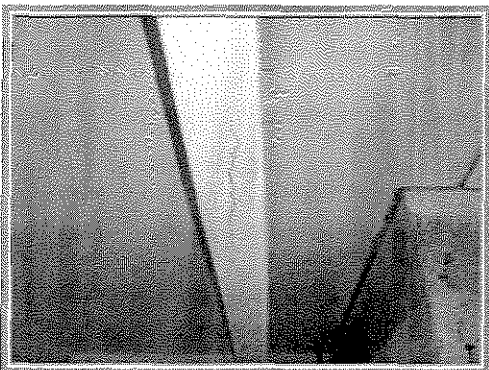
CONCRETE ITEMS



C1 – Topping Delaminations: Areas of the concrete topping were noted to have delaminations due to corrosion of embedded plates. Topping replacement at these areas is recommended. There are some other areas where the topping is debonded at these plates but no real concrete deterioration has occurred. At these locations it is recommended to deckcoat over the areas to prevent moisture from infiltrating leading to steel plate corrosion.



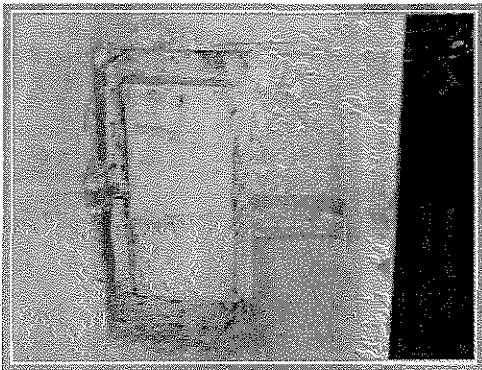
C2 – Precast Tee Flange Delaminations – Ceiling: At various locations throughout the parking structure there is corrosion related concrete deterioration of the tee flange. These locations are primarily at locations where leaks in the sealants above have led to corrosion of embedded steel at these locations and will require repair of the concrete and sealant.



C3 – Precast Tee Stem Delaminations – Ceiling: Various locations throughout the parking structure, most of which is at the grade or below, there are cracks in the tee stems. This may indicate corrosion of the post-tensioning strands. These locations will require concrete repair to maintain the structural integrity of the tee and possibly structural strengthening depending on the damage to the strands.



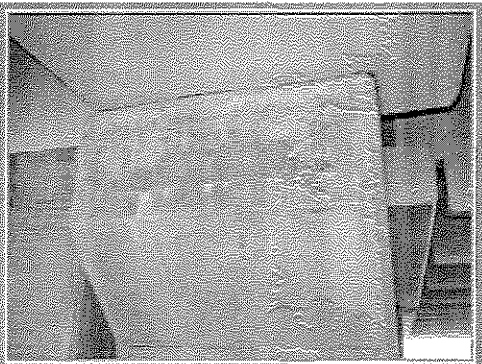
C4 – Column Delaminations: There were several locations in the structure where column or shear wall corrosion related concrete deterioration has occurred. These areas should be repaired with conventional concrete patching techniques.



C5 – Wall Delaminations: Several locations throughout the structure where the grout pockets installed over the embedded connector plates for the shear walls has spalled off leaving the plates exposed. In the past, these areas have been painted for protection from corrosion. We recommend painting these plates and patching the concrete cover back with mechanical connection to prevent future spalling.



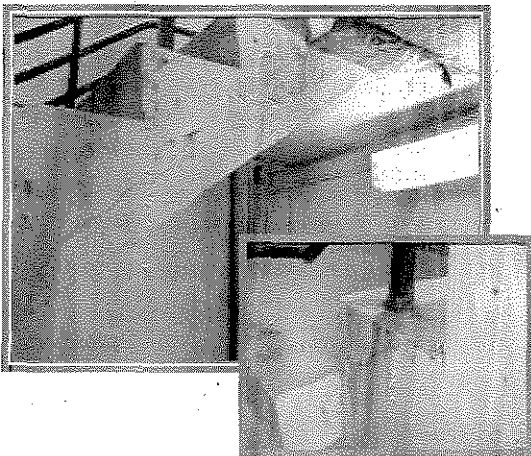
C6 – Beam Delaminations: There were a few locations with corrosion induced concrete deterioration. Delaminations at or near the bearing areas should be considered a priority repair and can be repaired with conventional patching techniques.



C7 – Haunch Delaminations: Throughout the structure there is continued deterioration of concrete haunches that supports the inverted tee beams. Delaminations at or near the bearing areas should be considered a priority repair and can be repaired with conventional patching techniques.

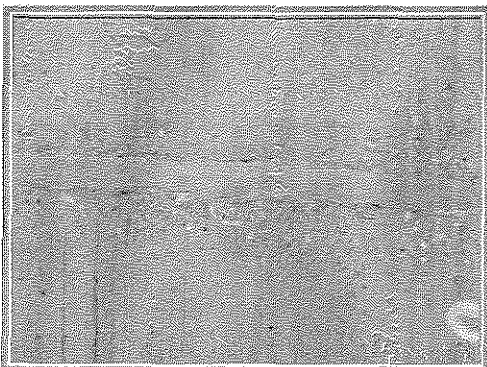


C8 – Haunch Repairs: At the below grade levels of the structure there is continued deterioration of concrete/steel haunches on the foundation wall that supports the double tees. The concrete cover is fire protection for the steel supports. Some of these were repaired in 1998. Additional deterioration was noted and requires repair.



C9 – Concrete Stair Delaminations: Large concrete delaminations at the east stair tower were noted during our review. These delaminations include the underside of the stair, primarily at or below grade. Other areas of deterioration were noted at handrail supports where they are embedded in the concrete. Repairs to the concrete stairs should be considered a priority.

WATERPROOFING

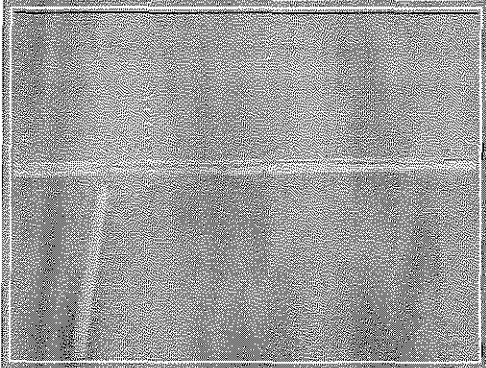


W1 – Joint Sealants: The Roof Level sealants are showing signs of weather checking and bond failure. These sealants were replaced in 1998 and spot repaired over the years. Joint sealants at other levels throughout the parking structure had failures at random locations. The sealants at the Ann Ashley parking are 10 years old and are considered to be at the end of their useful life.



**ANN-ASHLEY PARKING STRUCTURE
MAINTENANCE REVIEW - 2008**

As a minimum, complete sealant replacement should be performed at the Roof Level next year and at the other levels in the next few years.

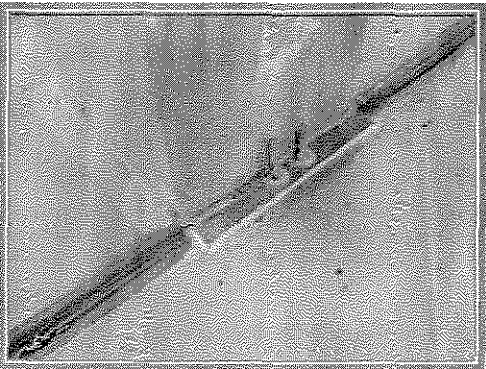


W2 – Cove Sealants: Cove sealants at the Roof Level appear to have plow damage. These sealants should have spot repairs completed or a full replacement completed at the same time as the joint sealants.

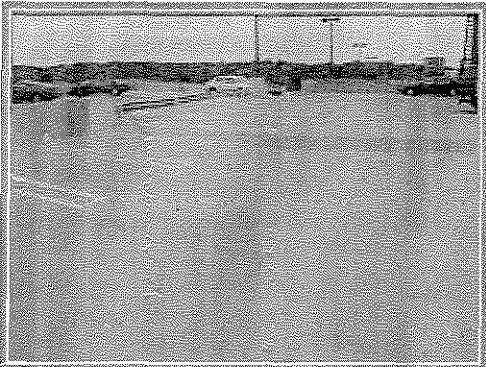


W3 – Rout & Seal Cracks: Some random cracks in the topping, walls and columns at the Roof Level were noted. A few cracks were sealed during recent repair, but more exist and should be sealed to prevent water infiltration.

W4 – Wall Sealant at Gaps in East Elevation at Grade: Along the alley on the east side of the structure there are gaps in the precast façade at the pavement surface level that are allowing water to leak down into the below grade portion of the structure. Some of these critical areas should be sealed.



W5 – Expansion Joint: Two types of expansion joints exist in this structure. Ribbon seals (premolded urethane), which are typically located at elevator towers and strip seals (winged expansion joint) typically located where joints are exposed to vehicle traffic. There are several areas where a failure of the nosing materials on both types of joints has occurred. These areas need to be repaired to prevent water infiltration to structural elements below.

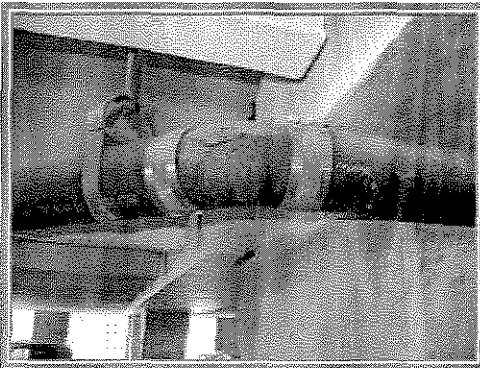


W6 – Roof Level Deck Coating Topcoat: The Roof Level deck coating system is in fair condition. Crossovers were recoated recently with an epoxy deck coating. It is recommended to topcoat the remaining deck coated areas at the Roof Level.



W7 – Sealer: In 1998 a 100% silane sealer was applied to all supported concrete areas that were not deck coated. Silane sealers help to reduce water and chloride intrusion into the concrete that may lead to embedded reinforcing steel and embedded connector plate steel over time. By 2009 this sealer will have been in service for 11 years and it is anticipated that its effectiveness in reducing water and chloride infiltration will be significantly diminished due to wear and abrasion. It is recommended that a 100% silane sealer be installed.

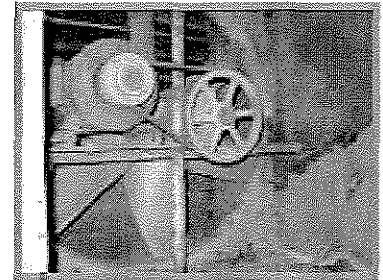
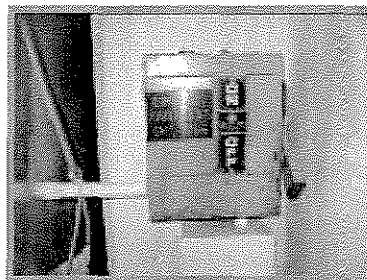
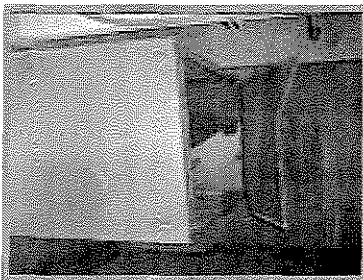
MECHANICAL ITEMS



ME1 – Broken Storm Piping: Storm piping appears to be in good condition throughout the parking structure. Only one broken pipe was noted at Level 2. Storm piping should be flushed on a yearly basis during wash downs. This keeps sediment from building up in the piping, which can lead to blocked, frozen and broken pipes.



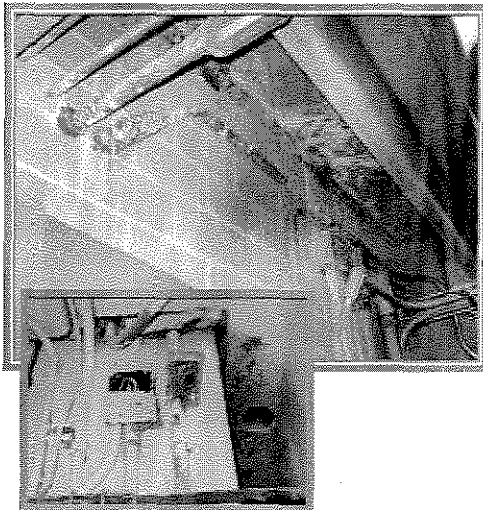
ME2 – Ventilation Fan: Existing mechanical ventilation fans are in disrepair and not functional during our review. Carbon monoxide is a poisonous gas that can build up rapidly at the lower (enclosed, underground) levels of a parking garage. It is required by code that an enclosed structure (such as the lower levels A & B) must have fans that operate continuously or operate by a gas monitoring system. Repair of these fans should be considered a priority.





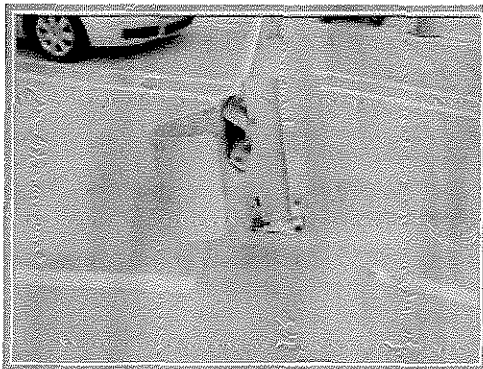
ME3 – CO2 System: The existing carbon monoxide detection system does not appear to be functioning at this time. There is only one unit located at the lowest area of Level B. This unit should be updated with a newer system and integrated with the existing fan system. Newer systems allow remote monitoring of the system via a computer and software.

ELECTRICAL ITEMS



E1 – Conduits: Electrical conduits located at random locations throughout the parking structure have corroded. Also noted were open and corroded junction boxes with exposed wires. Both of the conditions noted above were caused by failed sealants at the level above, allowing water and salt through to the conduits, causing corrosion. To keep the electrical system in good repair, these sections of conduit should be repaired as part of a comprehensive repair program.

MISCELLANEOUS ITEMS

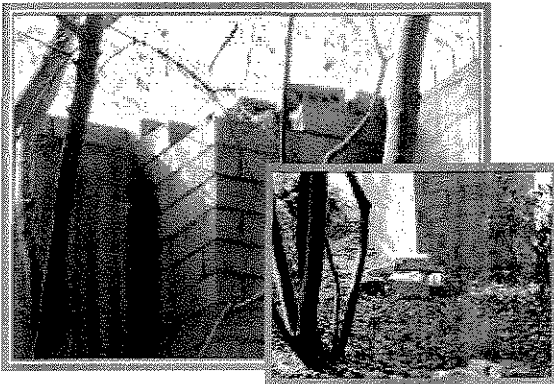


M1 – Bumper Rail: The bumper rail located at the south end of the Roof Level has been hit. The anchors at the rail support have been pulled out of the concrete. The anchors at the support should be re-anchored and the bumper rail bent back into shape.



M2 – CMU Block Repair: There is 20 square feet of concrete block located at Level A that should be replaced. (Not Pictured)

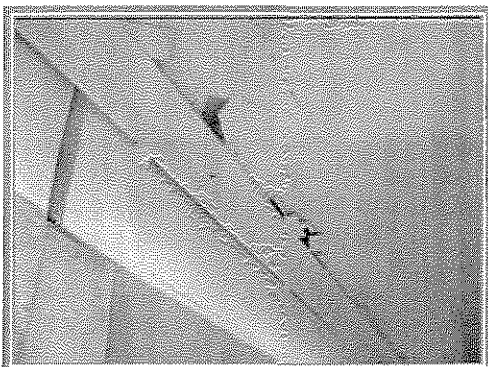
M3 – Masonry Tuckpointing: Some mortar joints in the masonry facade on the east stair were noted to have failed and are a point of water infiltration. Tuck pointing and mortar repair is recommended at these locations.



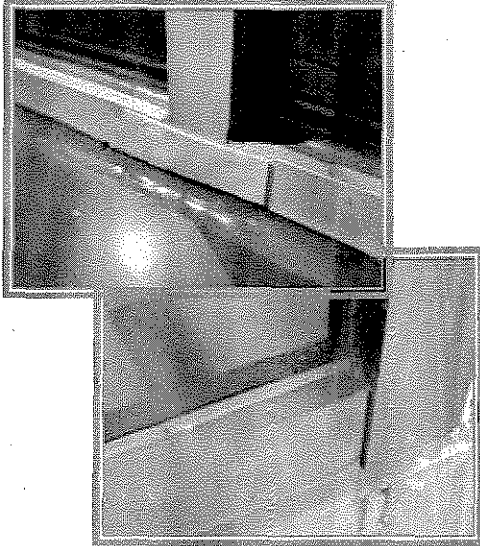
M4 – Brick Repair: Several bricks at Column A/17 at the northeast corner of the parking structure have fallen from the top of the column. Brick in this area should be repaired as part of a comprehensive repair project. These bricks are a fall hazard to pedestrians.



M5 – Steel Connector Plates: Some of the exposed steel plate connectors are experiencing some minor corrosion. Surface preparation and painting repair is recommended at these areas.



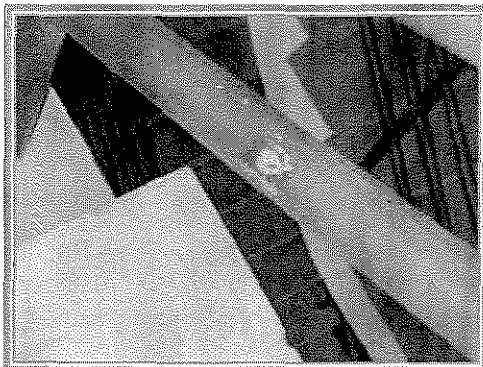
M6 –Shim Plates at Expansion Joints: There are several locations along the expansion joint where the plastic shims are loose and have moved outward. These shim plates need to be reset and perhaps affixed to the appropriate surfaces with epoxy.



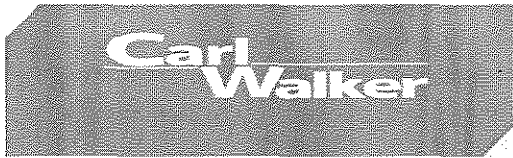
M7 – Mullion Sealant: We observed open metal-to-metal joints at mullion joinery. We recommend installation of new sealant at these locations with silicone bridge sealant or 123 tape (shown in far left photo) to comprehensively create a barrier against water penetration into the window system.



M8 – Pavement Markings: After the sealer reapplication and the recoating of the deck coating at the Roof Level it is recommended to restripe the entire parking structure.



M9 – Handrails: Handrails in all three stair towers were noted to have spots that require touchup of the painting system. Rust was also noted at the vertical supports where they enter the concrete step. These locations should be prepped, cleaned and repainted as needed.

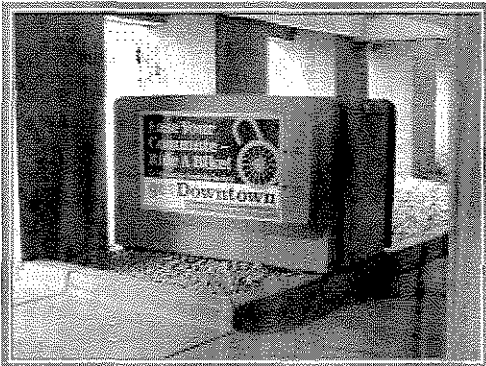


ANN-ASHLEY PARKING STRUCTURE MAINTENANCE REVIEW - 2008

OPTIONAL ITEMS



O1 – Restaining Precast Facade: The precast facade on this structure was stained during the original construction in 1986. The color of the facade has faded considerably. This item would include staining all of the precast elements on this structure to brighten up the exterior. It is believed that these concrete elements were stained and that pigmented cement was not used. It may also be possible to seal these areas to bring out the color of the existing better.



O2 – North Area Resurfacing : On the north end of the structure there is an area with stones and other surface treatments that could be modified and improved to create a more useful and aesthetic area. This item would require some study and then resurfacing based on study recommendations.



III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

Some specific items that are important to enhance the longevity of this type of precast structure include:

- **Maintain Existing Sealant Joints** – There are many sealant joints in this structure. Preventing water and chlorides from leaking to the underlying structural precast elements is critical in preventing future costly repairs.
- **Maintain Existing Expansion Joints** – As with the sealants leaking at expansion joints can lead to costly deterioration.
- **Maintain Deck Coatings** – Deck coatings have been applied at key areas in this parking structure. It is important to recoat these over time as they wear to prevent water and chloride intrusion into this concrete that already has high chlorides.
- **Reapplication of Sealers** – The 100% silane sealer applied in 1998 reduces the amount of water and chloride infiltration into the concrete. The effectiveness of this sealer decreases over time with wear and abrasion.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section 2.0. All Items are broken into the following categories:

- Concrete Repairs and Maintenance - "C" Items
- Waterproofing Repairs and Maintenance - "W" Items
- Miscellaneous Repairs and Maintenance - "M" Items
- Optional Items - "O" Items

Soft Costs - Soft Costs are included as an estimated percentage and may vary. Soft costs include engineering planning and oversight, testing and other Owner costs related to oversight and planning. These costs do not include loss of parking revenue.

Optional Items - Below the base cost estimate there is a section for Optional Items. In many cases the items listed are general improvement items that we recommend as added value items that could be considered today but we have not included in our base cost estimate. Some items listed may be an added cost to upgrade an existing cost item to a better or more long-lasting repair, for example, applying a deck coating on the entire deck surface instead of a sealer.

TABLE 3 - ANN ASHLEY
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - ANN ASHLEY PARKING STRUCTURE
December 2008

Repairs Completed in 1998; WP Warranty Expiration in 2003

<i>Plan Year</i>	1	3	8	13	18
<i>Year</i>	<u>2009</u>	<u>2011</u>	<u>2016</u>	<u>2021</u>	<u>2026</u>
<i>Age of Structure</i>	23	25	30	35	40
<i>Years Since Last Major Repair</i>	11	13	18	23	28
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$2,000	\$4,000	\$9,000	\$20,000	\$40,000
Column, Wall & Haunch	\$12,000	\$16,000	\$20,000	\$23,000	\$26,000
PC Concrete	\$18,000	\$20,000	\$26,000	\$36,000	\$50,000
Concrete Stair Repairs	\$5,000	\$10,000	\$5,000	\$100,000	\$5,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$5,000	\$4,500	\$15,000	\$30,000	\$12,000
DIVISION 7 - WATERPROOFING					
Sealants	\$41,000	\$229,000	\$23,000	\$229,000	\$23,000
Expansion Joints	\$3,000	\$5,000	\$80,000	\$5,000	\$8,000
Sealer (Silane) - + 24" Vert	\$22,500	\$104,000	\$0	\$130,000	\$0
Deck Coating	\$300	\$30,000	\$140,000	\$14,000	\$140,000
Epoxy Coating @ Stairs	\$0	\$0	\$0	\$0	\$0
Stair/Elev Roofs	\$0	\$20,000	\$0	\$0	\$0
Brick Sealer	\$0	\$30,000	\$0	\$30,000	\$0
Stair/Elevator Sealants	\$2,500	\$5,000	\$20,000	\$5,000	\$20,000
DIVISION 8					
Doors & Frames	<i>Alum.</i>		\$30,000	\$0	\$0
Stair Glass & Frame	<i>Alum.</i>	\$0	\$5,000	\$150,000	\$5,000
Office Insulated Glass		\$0	\$20,000	\$0	\$0
DIVISION 9 - FINISHES					
Restriping		\$8,000	\$8,000	\$8,000	\$8,000
Steel					
<i>Misc - bollards, rails, plates, etc</i>		\$3,000	\$5,000	\$10,000	\$5,000
<i>Doors / Frames</i>	<i>Aluminum</i>				
<i>Exterior Frame</i>	<i>NA</i>				
<i>Exterior Handrails</i>	<i>NA</i>				
<i>Interior Rails</i>	<i>NA</i>				
<i>Stairs Handrail- Paint Touchup</i>		\$2,000	\$5,000	\$0	\$5,000
<i>Stairs Handrails- Paint</i>		\$0	\$0	\$30,000	\$0
<i>Exterior Spandrels</i>		\$0	\$0	\$0	\$0
Concrete					
<i>Stairs</i>			\$20,000	\$0	\$20,000
<i>Interior Walls</i>	<i>NA</i>				
<i>Exterior Spandrels (stain)</i>		\$0	\$80,000	\$0	\$0
<i>Office</i>		\$0	\$2,000	\$2,000	\$2,000
Office Finishes		\$0	\$12,000	\$0	\$12,000

TABLE 3 - ANN ASHLEY
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - ANN ASHLEY PARKING STRUCTURE
December 2008
Repairs Completed in 1998; WP Warranty Expiration in 2003

<i>Plan Year</i>	1	3	8	13	18
<i>Year</i>	<u>2009</u>	<u>2011</u>	<u>2016</u>	<u>2021</u>	<u>2026</u>
<i>Age of Structure</i>	23	25	30	35	40
<i>Years Since Last Major Repair</i>	11	13	18	23	28
DIVISION 10					
Signage					
<i>Electric (replace at 10 years)</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20 to 25 yrs)</i>	\$0	\$0	\$70,000	\$0	\$70,000
DIVISION 11					
Parking Equipment (<i>every 10 yrs</i>)	\$0	\$0	\$250,000	\$0	\$250,000
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (<i>every 15 yrs</i>)	\$0	\$10,000	\$0	\$0	\$0
Elevator Replacement (<i>25 to 30 yrs</i>)	\$0	\$250,000	\$0	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$500	\$2,000	\$15,000	\$2,000	\$0
<i>Floor Drains (replace at 30 yrs)</i>	\$0	\$2,500	\$15,000	\$5,000	\$5,000
<i>Restroom Fixtures</i>	\$0	\$8,000	\$0	\$0	\$10,000
HVAC					
<i>Office</i>		\$10,000	\$0	\$10,000	\$0
<i>Sump Pump Replacement</i>	\$0	\$3,000	\$0	\$3,000	\$0
HVAC - Lower Levels (<i>20 to 25 yrs</i>)	\$13,000	\$0	\$20,000	\$0	\$0
Standpipe System	\$0	\$2,000	\$0	\$0	\$0
DIVISION 16 - ELECTRICAL					
Lighting (<i>replace at 20 yrs</i>) (<i>Done in 2008</i>)	\$0	\$1,000	\$2,500	\$2,500	\$275,000
Emergency Generator	NA				
Switchgear and Panels (<i>30 years</i>)	<i>Replace at 30 y</i>	\$0	\$25,000	\$0	\$0
Conduit Repairs	\$5,000	\$0	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS	\$142,800	\$953,000	\$980,500	\$731,500	\$999,000
Soft Costs (35%)	35%	\$49,980	\$333,550	\$256,025	\$349,650
TOTALS IN 2008 DOLLARS	\$192,780	\$1,286,550	\$1,323,675	\$987,525	\$1,348,650

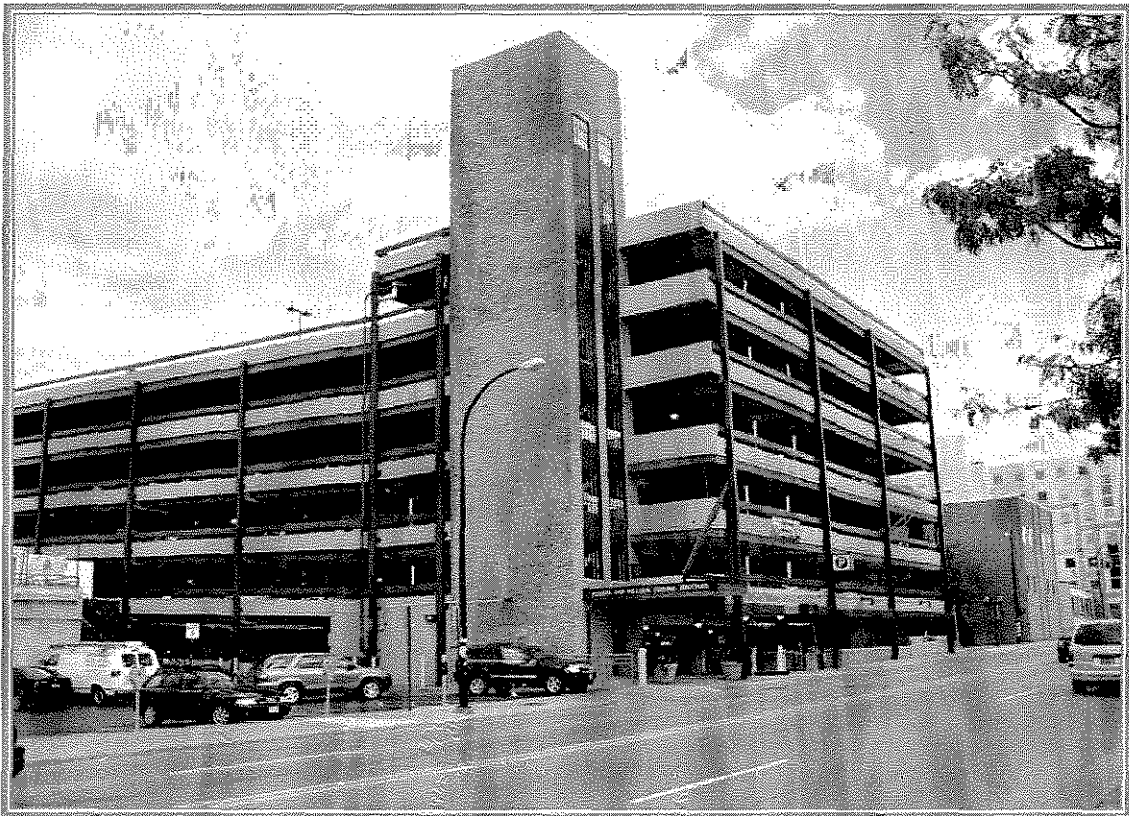
Notes:



FOURTH & WILLIAM PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW - 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

CARL WALKER, INC.

5136 LOVERS LANE, STE 200
KALAMAZOO, MI 49002

FOR:

CITY OF ANN ARBOR DDA

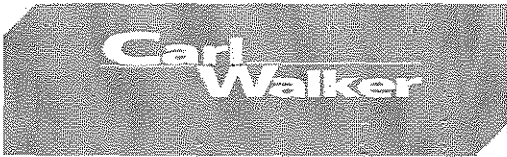


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Tab II General Condition Review

Tab III Repair and Maintenance Recommendations

Tab IV Cost Estimate

EXECUTIVE SUMMARY

The Fourth & William parking structure built in 1966, was expanded in 1981 and 2006, repaired in 1991-1993 and again in 2001-2003. The repair work done during the years of 1991-1993 included the addition of overlays to the supported levels along with a deck coating at select areas. In 2001-2003, there were some concrete repairs, sealant replacement, deck coating full system and/or recoat performed to all supported levels. Most repairs are doing well. The 2006 expansion included the addition of 1 level vertically and a speed ramp to direct traffic to the Fourth Street exit. Improvements made in 2007 and 2008 include new fluorescent light fixtures and painted columns beams and ceilings at Levels 1-4, ceilings only painted at Levels 4-6, and Level 7 has columns beams and ceilings painted. The structure is in very good condition.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in the near future.

Summary of Concrete, Waterproofing and Miscellaneous Repairs

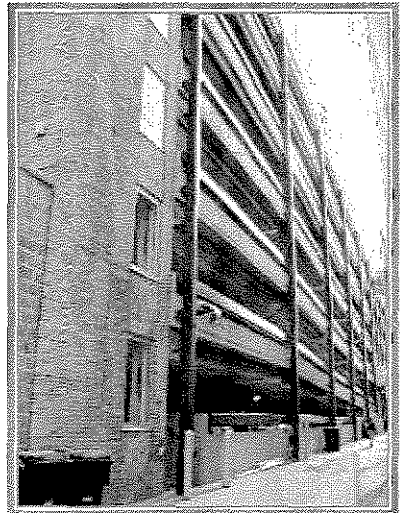
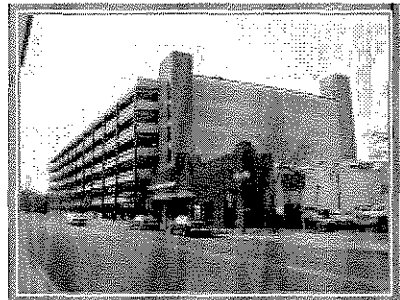
- **General Concrete Repair** – Some ongoing corrosion related deterioration was noted and should be repaired.
- **Sealant and Expansion Joint Repair** – There are a few isolated leak locations at sealants and expansion joints that require spot repair to keep water and chlorides from infiltrating to the structural elements below. The sealant and expansion joint systems that were replaced in 1991-93 still have useful life remaining and spot repair, not system replacement, is recommended at this time.
- **Deck Coating Recoating** – The deck coating installed in 2002-2003 is performing well with the exception of Level 7 where there are areas of debonding. At this time we would recommend contacting the installing contractor and advising them of these warranty repairs. All other levels appear to be performing well and may only need spot repairs.
- **Painting** – Some minor touchup painting has been recommended.
- **Slab Wash down** – A slab wash down is recommended twice a year.

Total Probable Construction Budget

Total	\$164,000
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I. STRUCTURE SUMMARY

STRUCTURE NAME:	Fourth & William Parking Structure
LOCATION:	Ann Arbor, MI
CROSS STREETS:	S. Main, E. William, S. Fourth
YEAR BUILT:	1966 (Original)/ 1981 (Expansion)
YEAR(S) REPAIRED:	Dates prior to 1981 unknown, 1991-93, 2001-03
CONSTRUCTION TYPE:	(1966) Cast-in-Place Pan Joist, (1981) One-way Slab over Steel Beams
CONCRETE TYPE:	Cast-in-Place: 4000 psi @ 28 days Overlay: (91-93 levels 4-7)
REINFORCING STEEL:	Mild Steel
CORROSION INHIBITOR:	None
# OF LEVELS:	8 at or above grade
# OF STAIRS:	3
# OF ELEVATORS:	2
AREA (SOG):	40,150 ft ²
AREA (Supported):	278,600 ft ²
AREA (Total):	318,750 ft ²
STRUCTURE TYPE:	Single Helix
# OF SPACES:	950
EFFICIENCY (sf/space):	336
TRAFFIC DIRECTION:	2-Way
SPACE ANGLE:	90 Degrees
OCCUPIED SPACE:	Parking Office
DECK COATING:	Supported Levels (2002-03)
SEALERS:	None
SEALANTS:	Silicone & Urethane
WATERPROOFING:	Stair/Elevator Roofs



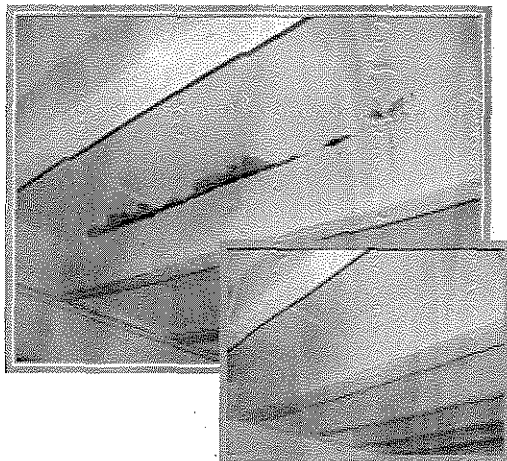
II. GENERAL CONDITION REVIEW

The following are pictures and observations of key items within the parking structure.

CONCRETE ITEMS

C1 -Top of Slab Delaminations: Top of slab delaminations were noted at random locations throughout the parking structure. The majority of the delaminations were concentrated on Levels 2 and 3. Slabs on Level 2 and 3 are supported by a structural concrete pan joist system. Slab repairs are recommended in these areas along with the reapplication of the deck coating to seal the repair areas.

C2 - Delamination at Underside (ceiling): At various locations throughout the parking structure there is corrosion related concrete deterioration at the underside of the concrete slab. The majority of the deterioration noted is located at Levels 2-4 in the pan joist system. At the Levels 5-7 (steel framed) corrosion induced spalling was observed at the ceiling along the steel beams and at locations where the steel support chairs are deteriorating. All of these areas are shallow in nature. It is recommended that these areas be repaired to prevent further deterioration.



C3 - Slab Jacking: Several areas of slab jacking at the underside of level two were noticed during our walk thru. Slab Jacking is caused by the corrosion of the embedded steel at the top of the joist, forcing the concrete slab to separate or split from the pan joist. Most of the deterioration is located north of grid line 10 as indicated on the review drawings in Appendix E; drawing R1.1. These areas will require full depth removal/replacement of the concrete slab to expose and repair the reinforcement in the joist.

C4 - Column Delaminations: Column delaminations were noted at a few locations on Levels 1-3. These delaminations are typically located at or near the slab column intersection and are a result of corrosion of embedded steel. These areas should be repaired with conventional concrete patching techniques.



C5 - Beam Delaminations: There were a few locations on the beams with corrosion induced concrete deterioration. Delaminations at or near the bearing areas should be considered a priority repair and can be repaired with conventional patching techniques.

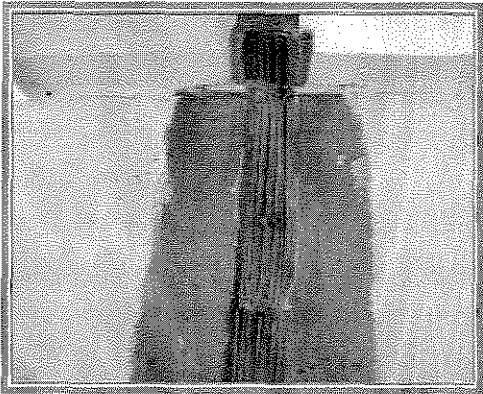
C6 - Concrete Delaminations at Stair: One delamination was noted at the southeast stair tower.

WATERPROOFING ITEMS

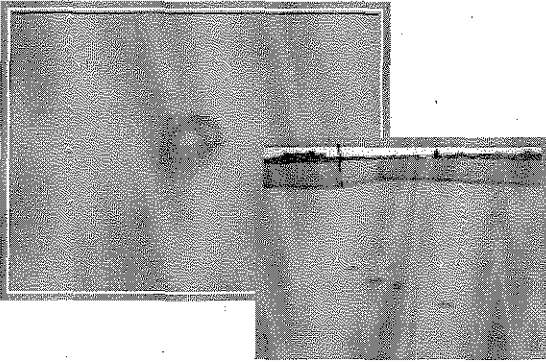
W1 -Cove Sealants: Failed cove sealants were noted at the northwest and southwest stair towers. These areas are exposed to rain from the north and west. Repairs should be made to these areas to reduce the amount of moisture leaking onto structural elements below.



W2 - Rout & Seal Cracks: Cracks in slabs were noted at a few locations at random areas throughout the parking structure. These cracks should be routed and sealed to prevent moisture and chlorides from penetrating through to the embedded reinforcement and structural elements below.



W3 – Expansion Joint Nosing (Strip Seal): Expansion joints throughout the parking structure in general are in good condition. A few of these expansion joints were noted to have damaged nosings. This condition should be repaired to prevent continued deterioration of the nosing.

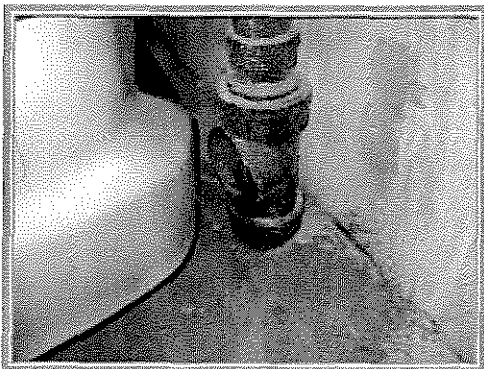


W4 – Expansion Joint Gland (Strip Seal): New expansion joints located at the Roof Level have splices that have failed/separated. These failed splices are allowing water to leak to the level below. This expansion joint is still under warranty, the installing contractor should be contacted to perform repairs to this joint.

W5 – Deck Coating: Several locations located at the new Roof Level were noted to have small spots worn or burned through to the concrete surface. These locations should have the coating repaired with a full deck coating system to maintain the integrity of the waterproofing system.

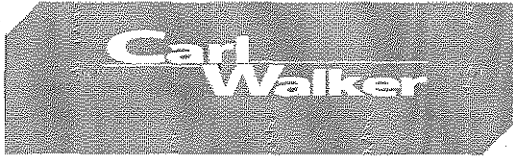
MECHANICAL ITEMS

ME1 – Damaged Storm Piping: One horizontal section of piping was noted at Level 2 to be split and leaking. Broken piping typically occurs when horizontal sections of pipe become filled with sediment and trap water. In the winter, water in the pipe freezes, expands, splitting the pipe. Flushing the piping system during yearly wash downs is one way to avoid unnecessary repairs.

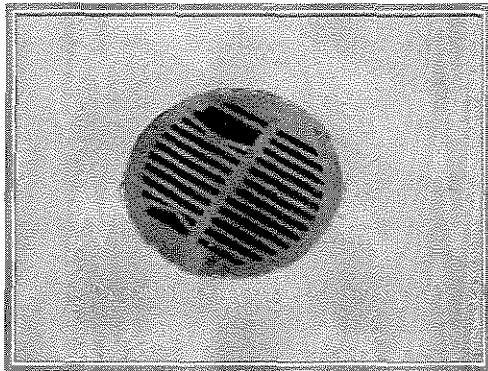


ME2 – Cleanout Cover: A cleanout cover at Level 1 was noted missing. Water was pouring out onto the adjacent concrete surface. This condition can create a slip hazard during the winter when the water freezes.

ME3 – Missing Floor Drain Grate: One was noted to be missing at Level 2. This condition is a possible trip hazard to pedestrians and should be corrected.

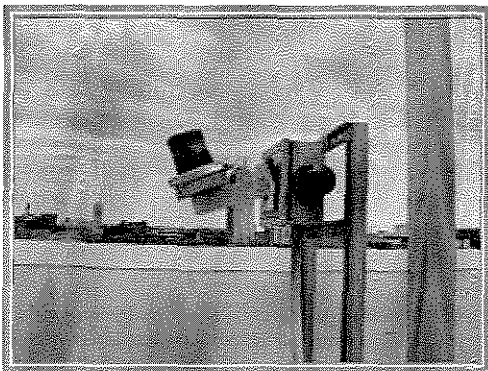


FOURTH & WILLIAM PARKING STRUCTURE MAINTENANCE REVIEW - 2008



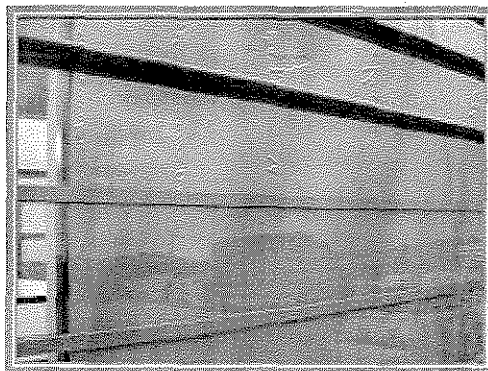
ME4 – Damaged Floor Drain Grate: A new floor drain grate at the new Level 8 has damaged ribs in the grate. This condition creates a trip hazard and should be corrected by installing a new grate.

ELECTRICAL ITEMS

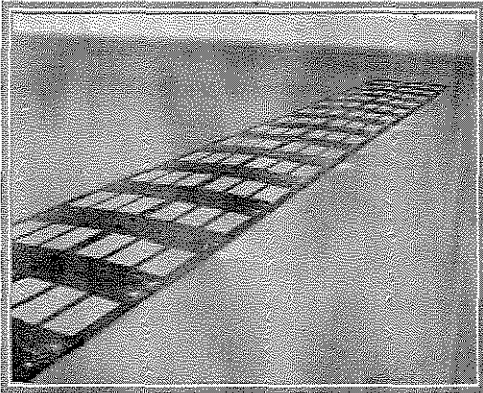


E1 – Emergency Call Box Light: The light fixture at an emergency call box located at the Roof Level has been bent. This allows moisture to enter the fixture.

MISCELLANEOUS ITEMS



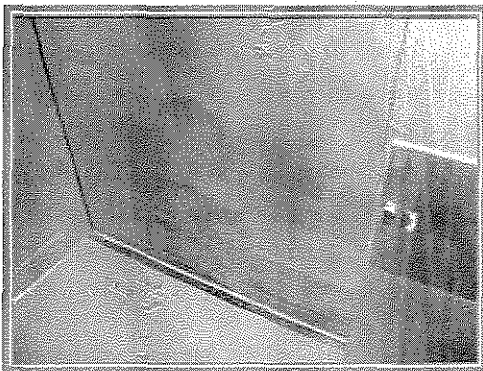
M1 – Leaking Stair Tower: During the review of the northeast stair tower, water staining of the backup panels to the glass were noted. It is believed that this staining was not present after the original construction. Possible areas of water entry could be at the glass glazing & joints and at the roof. All of these items should be covered by the warranty by the installing contractor. We recommend contacting the responsible contractor to evaluate and make any necessary repairs.



M2 – Speed Bumps: New speed bumps have been added to select locations throughout the parking structure to limit the speed of the vehicles in long. The new speed bumps were anchored using anchor bolts. Although this is a good method of anchoring, it requires a hole to be drilled into the concrete, breaching the waterproofing membrane. We were not able to determine what steps were taken to seal these penetrations. These penetrations can allow water and chlorides into the concrete.



M3 – Painting: Paint in this structure is in very good condition. A few areas were noted to need some touch up to maintain the condition of the paint system.



M4 – Elevators: In general, the elevators at this structure are in good condition. The elevator door at the southwest stair/elevator tower opens and closes poorly, rubbing and scraping as it operates. The door should be adjusted.



III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

Some specific items that are important to enhance the longevity of this parking structure include:

- **Maintain Existing Structural Concrete** – It is critical to maintain structural concrete elements (slab, joist, beams columns, etc.). Maintaining these elements will help keep the facility structurally sound.
- **Maintain Existing Sealants** – Cove and joint sealants prevent water and chlorides from leaking to the underlying structural elements and causing costly repairs.
- **Maintain Deck Coatings** – Deck Coatings have been applied to all supported level of this parking structure. It is important to recoat these over time as they wear to prevent water and chloride intrusion into this concrete.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



FOURTH & WILLIAM PARKING STRUCTURE MAINTENANCE REVIEW - 2008

IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section II. All Items are broken into the following categories:

- Concrete Repairs and Maintenance – "C" Items
- Waterproofing Repairs and Maintenance – "W" Items
- Miscellaneous Repairs and Maintenance – "M" Items
- Optional Items – "O" Items

Soft Costs - Soft Costs are included as an estimated percentage and may vary. Soft costs include engineering planning and oversight, testing and other Owner costs related to oversight and planning. These costs do not include loss of parking revenue.

TABLE 5 - FOURTH & WILLIAM
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WILLIAM PARKING STRUCTURE
December 2008

Repairs Completed in 2002; WP Warranty Expiration in 2007(Expired); 2006 Expansion Warranty Expires (2011)

Plan Year	2	7	12	17	22
Year	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Age of Original Structure	44	49	54	59	64
Years Since Last Major Repairs	8	13	18	23	28
DIVISION 3 - CONCRETE REPAIRS					
Floor Repairs	\$5,000	\$12,000	\$24,000	\$42,000	\$70,000
Column & Wall Repairs	\$4,000	\$10,000	\$13,000	\$20,000	\$33,000
Beams & Joist Repairs	\$98,000	\$117,000	\$150,000	\$189,000	\$228,000
Concrete Overlay Replacement	\$0	\$0	\$0	\$0	\$0
Concrete Overlay Repair	\$0	\$3,000	\$12,000	\$30,000	\$50,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$3,000	\$3,000	\$3,000	\$3,000
DIVISION 7 - WATERPROOFING					
Sealants	\$2,500	\$50,000	\$100,000	\$50,000	\$100,000
Expansion Joints	\$2,400	\$58,000	\$10,000	\$58,000	\$10,000
Sealer (Silane) - SOG + 24" Vert	\$0	\$0	\$0	\$0	\$0
Deck Coating	\$300	\$290,000	\$590,000	\$290,000	\$590,000
Epoxy Coating @ Stairs	\$0	\$10,000	\$0	\$10,000	\$0
Stair/Elev Roofs	\$0	\$0	\$0	\$0	\$45,000
Brick Sealer	\$0	\$14,000	\$0	\$14,000	\$0
Stair/Elevator Sealants	\$0	\$7,000	\$2,000	\$7,000	\$2,000
DIVISION 8					
Doors & Frames (35 to 30 yrs) S.S.	\$0	\$0	\$0	\$0	\$0
Stair Curtain Wall System (30 yrs) Alum.	\$0	\$0	\$0	\$0	\$0
Insulated Glass-NW Stair & Office	\$0	\$20,000	\$0	\$15,000	\$0
DIVISION 9 - FINISHES					
Restriping		\$10,000	\$10,000	\$10,000	\$10,000
Steel					
Misc - bollards, rails, etc	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Stairs - Handrails	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Weathering Steel	\$0	\$0	\$0	\$0	\$0
Doors / Frames					
Exterior Frame	\$0	\$0	\$90,000	\$0	\$0
Exterior Guardrails	\$0	\$0	\$60,000	\$0	\$0
Interior Rails	\$0	\$0	\$25,000	\$0	\$0
Concrete					
Ceiling Stain	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Stairs	\$0	\$20,000	\$0	\$20,000	\$0
Interior Walls, Columns, Beams	\$2,000	\$2,000	\$2,000	\$2,000	\$45,000
Exterior Spandrels	\$0	\$0	\$110,000	\$0	\$0
Office	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Office Finishes	\$0	\$10,000	\$0	\$10,000	\$0

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Ann Arbor Parking Structures Maintenance & Repair Plan
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December 2008

Repairs Completed in 2002; WP Warranty Expiration in 2007(Expired); 2006 Expansion Warranty Expires (2011)

<i>Plan Year</i>	2	7	12	17	22
<i>Year</i>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
<i>Age of Original Structure</i>	44	49	54	59	64
<i>Years Since Last Major Repairs</i>	8	13	18	23	28
DIVISION 10					
Signage					
<i>Electric</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20 to 25 years)</i>	\$0	\$0	\$0	\$50,000	\$0
DIVISION 11					
Parking Equipment	\$0	\$200,000	\$0	\$200,000	\$0
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (15 years)	\$1,000	\$0	\$0	\$0	\$30,000
Elevator Replacement (25-30 years)	\$0	\$250,000	\$0	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Floor Drains (replace at 30 years)</i>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Restroom Fixtures</i>	\$0	\$0	\$8,000	\$0	\$8,000
HVAC					
<i>Office</i>		\$10,000	\$0	\$10,000	\$0
<i>Restroom Fixtures</i>		\$3,000	\$0	\$3,000	\$0
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
Fire Protection System					
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20 years)	\$300	\$5,000	\$5,000	\$5,000	\$319,300
Emergency Generator (at 30 yrs)					
Switchgear and Panels (at 30 yrs)					
TOTALS IN 2008 DOLLARS	\$117,500	\$1,162,000	\$1,270,000	\$1,131,000	\$1,619,300
Soft Costs (35%) 35%	\$41,125	\$406,700	\$444,500	\$395,850	\$566,755
TOTALS IN 2008 DOLLARS	\$158,625	\$1,568,700	\$1,714,500	\$1,526,850	\$2,186,055



MAYNARD STREET PARKING STRUCTURE

Ann Arbor, Michigan

MAINTENANCE REVIEW - 2008



Carl Walker, Inc. Project No. R1-2008-246

December 2008

BY:

CARL WALKER, INC.

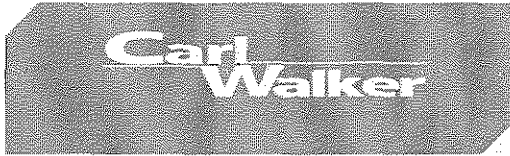
DDA

5136 LOVERS LANE, STE 200

KALAMAZOO, MI 49002

FOR:

CITY OF ANN ARBOR



**MAYNARD STREET PARKING STRUCTURE
MAINTENANCE REVIEW - 2008**

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Tab I Structure Summary

Tab II General Condition Review

Tab III Repair and Maintenance Recommendations

Tab IV Cost Estimate



MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008

EXECUTIVE SUMMARY

The Maynard Street Parking Structure was built in 1954, expanded in 1956 and 1967. Major repair work was completed in 1991/1992 and then a full restoration in 2000. The 2000 restoration included full slab replacement, concrete repairs, sealant replacement, deck coating, and a significant amount of painting. A new stair tower and internal speed ramp was added and the central elevator enlarged and modernized. Minor repairs have been performed yearly. All repairs are done very well.

Section II outlines the deterioration noted in the structure at this time. These items are listed as line items in the cost estimate in Section IV. We recommend that these repair and maintenance items be implemented in 2009 and that a follow-up review be completed in 2010.

Summary of Concrete, Waterproofing and Miscellaneous Repairs

- **General Concrete Repair** – Some isolated ongoing corrosion related deterioration of columns, beams, walls and floor slabs was noted and should be repaired.
- **Beam Cracks** – Shear cracks in some of the beams were noted to be widening and should be repaired.
- **Expansion Joint Repair** – Some minor expansion joint repairs are needed outside the main stair tower.
- **Deck Coating Recoating** – The deck coating installed in 2000 is performing well. At this time we are recommending top coating around 800 square feet of coating that has experienced deterioration in a few areas.
- **Painting** – Some minor touchup of painting has been recommended.
- **Slab Washdowns** – A slab washdown is recommended twice a year.

Total Probable Construction Budget

Total Repair	\$107,000
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MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008

I. STRUCTURE SUMMARY

STRUCTURE NAME: Maynard Street Parking Structure

LOCATION: Ann Arbor, MI

CROSS STREETS: Thompson, Maynard St., E. William St.

YEAR BUILT: 1954 (Original)/ 1956 (Expansion above existing parking structure) / 1967 (Expansion over Maynard and above existing building to the east of Maynard)

YEAR(S) REPAIRED: Major Repairs in 1991/1992/2000

CONSTRUCTION TYPE: 1954, 1956 Expansion are Cast-in-Place Conventionally Reinforced One-way Slab over Concrete Beams; 1967 Expansion is Two-Way Slab

CONCRETE TYPE: 4000 psi @ 28 days Overlay: (91-92 supported levels), 5,000 replacement slabs

REINFORCING STEEL: Mild Steel – no epoxy coating

CORROSION INHIBITOR: Calcium Nitrite in Replaced Slabs

OF LEVELS: 8 at or above grade

OF STAIRS: 3

OF ELEVATORS: 2

AREA (SOG): 36,000 ft²

AREA (Supported): 272,000 ft²

AREA (Total): 308,000 ft²

STRUCTURE TYPE: Single Helix

OF SPACES: 811

EFFICIENCY (sf/space): 380

TRAFFIC DIRECTION: 2-Way

SPACE ANGLE: 90 Degrees

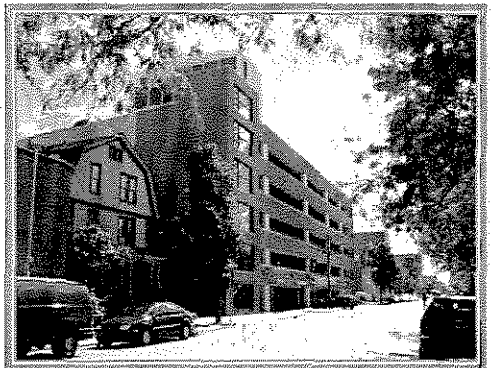
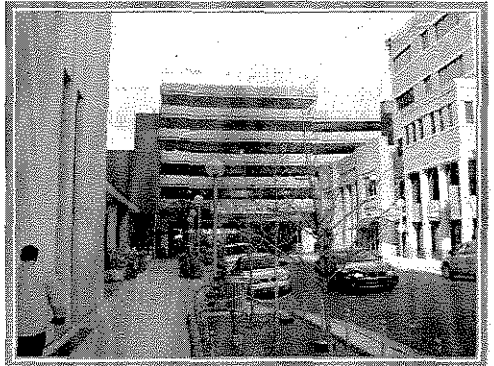
OCCUPIED SPACE: Parking Offices

DECKCOATING: Supported Levels (2000)

SEALERS: None

EXPANSION JOINTS: Strip seals replaced in 2005

SEALANTS: Silicone & Urethane





**MAYNARD STREET PARKING STRUCTURE
MAINTENANCE REVIEW - 2008**

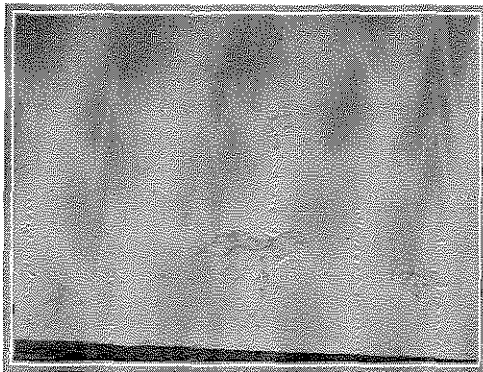
WATERPROOFING: Stair/Elevator Roofs

II. GENERAL CONDITION REVIEW

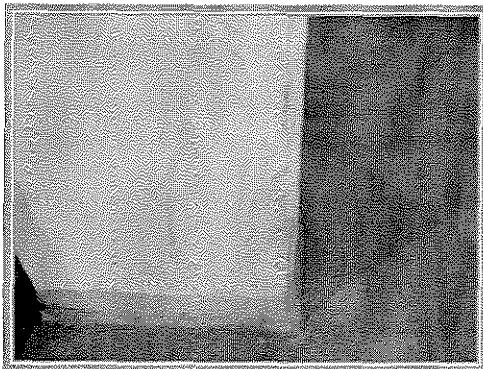
The following are pictures and observations of key items within the parking structure.

CONCRETE ITEMS

C1 – Top of Slab Delaminations: There are areas of the concrete floor slab that are delaminated due to corrosion of embedded reinforcing steel. Some additional deterioration can be expected from chloride contaminated concrete even though protected by a deck coating membrane. These areas should be repaired followed by reapplication of the deck coating at these repair areas. The majority of the deterioration noted in the top of slab is located at Levels 7 & 8, where the concrete overlay installed in 1992 has debonded. These areas are slowly growing in size and although repairs are not required at this time, the slabs should be reviewed on a regular basis.

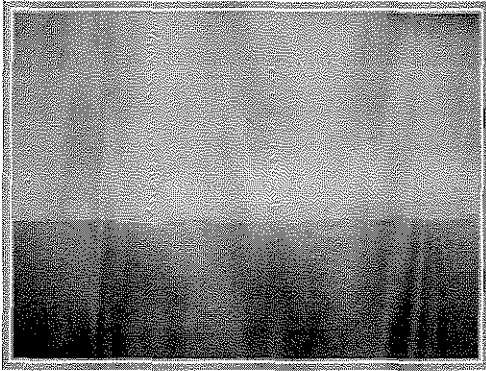


C2 – Underside of Slab – Ceiling: At various locations throughout the parking structure there is corrosion related concrete deterioration of the underside of the floor slab. The total quantity is less than 50 square feet. This minor amount of deterioration is not unexpected from ongoing corrosion activity.



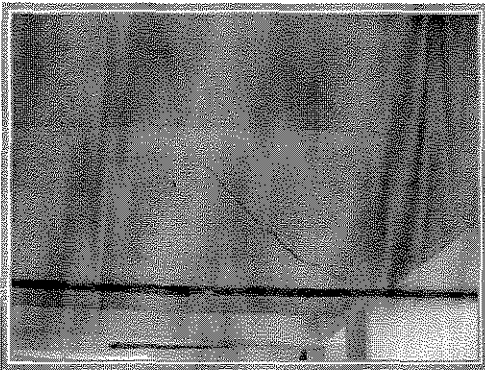
C3 – Column Delaminations: There are some limited corrosion induced deterioration of the concrete columns in this structure. The deterioration is a result of ongoing corrosion, particularly of column areas near the floor surface that are exposed to splash effect of chloride laden water on the floor surface.

C4 – Wall Delaminations: There are some limited corrosion induced deterioration of the concrete walls in this structure. The deterioration is a result of ongoing corrosion.



C5 – Beam Delaminations: There is some corrosion induced deterioration of the concrete beams in this structure. The deterioration is a result of ongoing corrosion.

C6 – Curb Delaminations: There is approximately 5 square feet of curb delaminations located at Level 4.



C7 – Stair Tread Nosing: In both of the older stairs, the middle stair and the east stair there is some corrosion induced deterioration of the stair tread nosing.

C8 – Beam Cracks: Diagonal shear cracks in several of the beams along column line P/Q, Level 3-5 appear to be getting wider. We recommend epoxy injecting the cracks and installing carbon fiber around the beams at these ends.

WATERPROOFING ITEMS

W1 – Joint Sealants: There were a few isolated areas of failed sealants. All of joint sealants on the floor slabs are covered by the deck coating and no failure through the deck coating was noted.

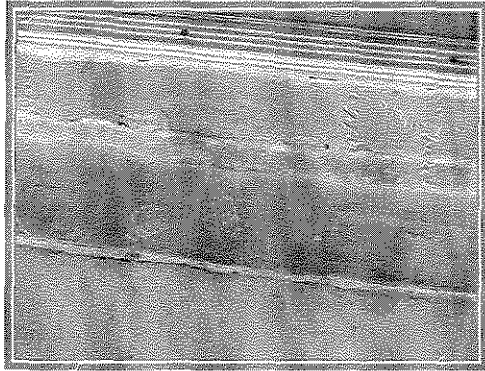
W2 – Cove Sealants: There were a few isolated areas of failed cove sealants, the sealants installed at the intersection of a horizontal to vertical surface.

W3 – Rout & Seal Cracks: Some random cracks in the topping, walls and columns at the Roof Level were noted. A few cracks were sealed during recent repair, but more exist and should be sealed to prevent water infiltration.





MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008



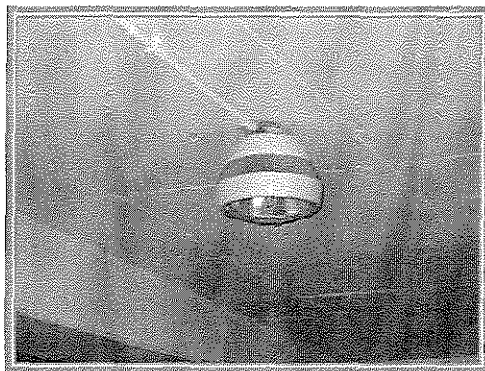
W4 –Expansion Joint –Ribbon Seal: There are a couple of areas located at the stair towers (at Levels 7 & 8) where failure of the urethane nosing material on the urethane ribbon seal has occurred. These areas need to be repaired to prevent water infiltration and deterioration of underlying concrete.



W5 – Deck Coating: Several areas of deck coating throughout the parking structure are beginning to wear. A majority of these areas are in high traffic or turning areas. These areas should be repaired and top coated. The speed ramp down from the far east end of the structure has experienced some wear and should be re-coated.

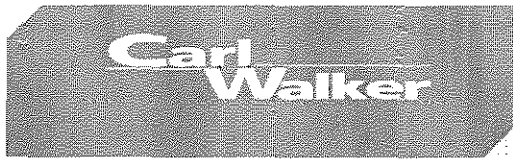
MECHANICAL ITEMS

ME1 – Floor Drains/Storm Piping: Floor drains and storm piping throughout the parking structure appear to be in good condition. One floor drain at Level 2 was noted to be plugged. Floor drains and related storm piping should be flushed on an annual basis during wash downs. This will greatly reduce broken storm piping and hazards created by standing water that freezes, which is a slip hazard in the winter.



ELECTRICAL ITEMS

E1 – Lighting: The electrical conduits and lighting system appear to be in good condition. There were a few light fixtures noted that were not operational at the time of our review. Light fixtures should be reviewed on a regular basis as part of an ongoing maintenance program to identify burnt out bulbs and/or bad ballast.



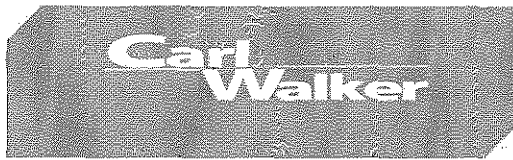
MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008

MISCELLANEOUS ITEMS

M1 –Paint Touch Up: The entire central stair was painting in the 2000 restoration. This painting is performing well but needs to be touched up in several areas.



M2 – Speed Bumps: New speed bumps have been added to select locations throughout the parking structure to limit the speed of the vehicles in long. The new speed bumps were anchored using anchor bolts. Although this is a good method of anchoring, it requires a hole to be drilled into the concrete, breeching the waterproofing membrane. We were not able to determine what steps were taken to seal these penetrations. These penetrations can allow water and chlorides into the concrete at locations of lower cover (over beams) similar to what is shown in the photo at the left.



MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008

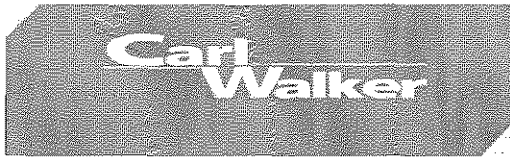
III. REPAIR AND MAINTENANCE RECOMMENDATIONS

We recommend implementing the repair and maintenance items listed in the cost tables at this time.

This structure is old but has been fully restored in two stages in 1991/1992 and 2000. With the applied deck coating there is little to no infiltration of chlorides and water into the concrete and no leaking through to the underside.

Some specific items that are important to enhance the longevity of this structure include:

- **Maintain Deck Coatings** – A urethane deck coating has been applied to the entire supported surface of this parking structure. It is important to recoat the deck coating over time as it wears to prevent water and chloride intrusion.
- **Concrete Overlay** - In 1991/1992 a cast-in-place concrete overlay was installed on the two-way slab area on the East Side of Maynard Street above the occupied space. In 2000 some concrete repairs were completed on this overlay and the entire area was deck coated. The overlay continues to perform well with limited additional topping delamination or concrete corrosion deterioration. It is anticipated that at some point in the next 10 years that additional areas of the overlay will debond and some corrosion deterioration may occur. It is important to continue to monitor this overlay to be proactive and help minimizing future repair costs.
- **Ceiling Deterioration** - As this structure is old it is important to monitor the underside of the beams and slabs, except in the full depth replacement areas. Concrete overtime becomes carbonated to the depth of the reinforcing steel from diffusion of carbon dioxide gases. When the carbonation front reaches the embedded reinforcing steel, corrosion can occur in a similar way as chloride induced deterioration on the top of floor slabs. Paint was applied to the underside of the majority of older remaining beams and walls that will hopefully reduce the probability of this type of deterioration.
- **Slab Washdown** – Not only will washdowns enhance the appearance of the structures interior, they remove chemicals and debris that over time may be harmful to the slabs or coatings.



MAYNARD STREET PARKING STRUCTURE MAINTENANCE REVIEW - 2008

IV. COST ESTIMATE

This section includes a cost estimate for repair and maintenance work that we recommend be completed on this structure at this time.

Cost Items and Categories - Each Work Item is numbered. Matching text and pictures are found in Section II. All Items are broken into the following categories:

- Concrete Repairs and Maintenance – "C" Items
- Waterproofing Repairs and Maintenance – "W" Items
- Mechanical Repairs and Maintenance – "M" Items
- Electrical Repair and Maintenance – "E" Items
- Miscellaneous Repairs and Maintenance – "MI" Items

Soft Costs - Soft Costs are included as an estimated percentage and may vary. Soft costs include engineering planning and oversight, testing and other Owner costs related to oversight and planning. These costs do not include loss of parking revenue.

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SUMMARY SHEET																				
Ann Arbor Parking Structures Maintenance & Repair Plan																				
ANTICIPATED CAPITAL EXPENDITURES - SUMMARY SHEET FOR ALL STRUCTURES																				
December 2008																				
Plan Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Parking Structure	Total Cost (In 2008 dollars) per Plan Year																			
Ann Ashley Parking Structure	\$192,780	\$0	\$1,286,550	\$0	\$0	\$0	\$0	\$1,323,675	\$0	\$0	\$0	\$0	\$987,525	\$0	\$0	\$0	\$0	\$1,348,650	\$0	\$0
Liberty Square Parking Structure	\$401,085	\$0	\$0	\$0	\$1,234,675	\$0	\$0	\$0	\$0	\$1,372,815	\$0	\$0	\$0	\$0	\$1,369,575	\$0	\$0	\$0	\$857,790	\$0
Fourth & Washington Parking Structure	\$0	\$85,725	\$0	\$0	\$0	\$0	\$603,450	\$0	\$0	\$0	\$0	\$597,375	\$0	\$0	\$0	\$0	\$652,050	\$0	\$0	\$0
Maynard Street Parking Structure	\$105,030	\$0	\$0	\$2,121,525	\$0	\$0	\$0	\$0	\$858,600	\$0	\$0	\$0	\$0	\$2,373,300	\$0	\$0	\$0	\$0	\$1,818,450	\$0
Fourth & William Parking Structure	\$0	\$158,625	\$0	\$0	\$0	\$1,588,700	\$0	\$0	\$0	\$0	\$1,714,500	\$0	\$0	\$0	\$0	\$1,526,850	\$0	\$0	\$0	\$0
Forest Avenue Parking Structure	\$0	\$120,150	\$0	\$0	\$0	\$0	\$930,150	\$0	\$0	\$0	\$0	\$764,775	\$0	\$0	\$0	\$0	\$1,258,200	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS	\$698,895	\$364,500	\$1,286,550	\$2,121,525	\$1,234,675	\$1,588,700	\$1,533,600	\$1,323,675	\$858,600	\$1,372,815	\$1,714,500	\$1,382,150	\$987,525	\$2,373,300	\$1,369,575	\$1,526,850	\$1,010,250	\$1,348,650	\$2,676,240	\$0

Notes:

TABLE 4 - MAYNARD STREET
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - MAYNARD STREET PARKING STRUCTURE
December 2008
Construction Completed in 2000; WP Warranty Expiration in July 2005 (*Expired*)

<i>Plan Year</i> <i>Year</i> <i>Age of Structure (Apprx)</i> <i>Years Since Last Major Repair</i>	<u>1</u> <u>2009</u> 44 9	<u>4</u> <u>2012</u> 47 12	<u>9</u> <u>2017</u> 52 17	<u>14</u> <u>2022</u> 57 22	<u>19</u> <u>2027</u> 62 27
DIVISION 3 - CONCRETE REPAIRS					
Floor Repairs	\$17,000	\$24,000	\$40,000	\$70,000	\$100,000
Column & Wall Repairs	\$16,000	\$20,000	\$26,000	\$33,000	\$39,000
Beams & Joist Repairs	\$31,000	\$24,000	\$29,000	\$36,000	\$42,000
Concrete Overlay Replacement	\$0	\$0	\$0	\$0	\$540,000
Concrete Overlay Repair	\$2,000	\$10,000	\$20,000	\$60,000	\$0
Stair Delamination Repair	\$2,600	\$2,500	\$10,000	\$5,000	\$5,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 7 - WATERPROOFING					
Sealants	\$1,400	\$240,000	\$24,000	\$240,000	\$24,000
Expansion Joints	\$500	\$6,000	\$80,000	\$6,000	\$80,000
Sealer (Silane) - SOG + 24" Vert	\$0	\$0	\$0	\$0	\$0
Deck Coating & Epoxy	\$3,300	\$820,000	\$41,000	\$820,000	\$41,000
Stair/Elev Roofs (20 to 25 years)	\$0	\$20,000	\$0	\$10,000	\$0
Brick Sealer	\$0	\$20,000	\$0	\$20,000	\$0
Stair/Elevator Sealants	\$0	\$10,000	\$0	\$10,000	\$0
DIVISION 8					
Doors & Frames (25 to 30 years) S.S.	\$0	\$0	\$0	\$0	\$0
Stair Glass & Frame (at 30 years) Alum.	\$0	\$0	\$0	\$0	\$0
Office Insulated Glass	\$0	\$0	\$15,000	\$0	\$0
DIVISION 9 - FINISHES					
Restripping	\$0	\$8,000	\$8,000	\$8,000	\$8,000
Steel					
<i>Misc - bollards, rails, etc</i>	\$0	\$5,000	\$5,000	\$5,000	\$5,000
<i>Exterior Handrails</i>	\$0	\$10,000	\$0	\$10,000	\$0
<i>Interior Rails Stainless & Galvanized</i>					
<i>Stairs - Galv Touchup</i>	\$3,000	\$5,000	\$5,000	\$5,000	\$5,000
Concrete					
<i>Stairs</i>	\$0	\$5,000	\$5,000	\$5,000	\$5,000
<i>Interior Walls / Beams</i>	\$0	\$25,000	\$25,000	\$25,000	\$25,000
<i>Exterior Spandrels</i>	\$0	\$35,000	\$0	\$35,000	\$0
<i>Office /Police Office</i>	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Office Finishes	\$0	\$15,000	\$0	\$15,000	\$0
DIVISION 10					
Signage					

TABLE 4 - MAYNARD STREET
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - MAYNARD STREET PARKING STRUCTURE
December 2008
Construction Completed in 2000; WP Warranty Expiration in July 2005 (Expired)

<i>Plan Year</i>	1	4	9	14	19
<i>Year</i>	<u>2009</u>	<u>2012</u>	<u>2017</u>	<u>2022</u>	<u>2027</u>
<i>Age of Structure (Apprx)</i>	44	47	52	57	62
<i>Years Since Last Major Repair</i>	9	12	17	22	27
<i>Electric</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20 to 25 yrs)</i>	\$0	\$0	\$0	\$60,000	\$0
DIVISION 11					
Parking Equipment (every 10 yrs)	\$0	\$0	\$250,000	\$0	\$250,000
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (every 15 yrs)	\$0	\$0	\$15,000	\$0	\$15,000
Elevator Replacement (25-30 yrs)	\$0	\$125,000	\$0	\$0	\$125,000
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$0	\$1,000	\$1,000	\$1,000	\$1,000
<i>Floor Drains (replace at 30 yrs)</i>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Restroom Fixtures</i>	\$0	\$0	\$8,000	\$0	\$8,000
HVAC					
<i>Office / Police Office Replace.</i>		\$15,000	\$0	\$15,000	\$0
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
Fire Protection System					
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20 years)	\$0	\$85,000	\$5,000	\$223,000	\$5,000
Emergency Generator (20 yrs)	\$0	\$0	\$0	\$0	\$0
Switchgear and Panels (30 yrs)	\$0	\$0	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS	\$77,800	\$1,571,500	\$636,000	\$1,758,000	\$1,347,000
Soft Costs (35%) 35%	\$27,230	\$550,025	\$222,600	\$615,300	\$471,450
TOTALS IN 2008 DOLLARS	\$105,030	\$2,121,525	\$858,600	\$2,373,300	\$1,818,450

Notes:

TABLE 1 - FOURTH & WASHINGTON
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WASHINGTON PARKING STRUCTURE
December 2008
Construction Completed in 1999; WP Warranty Expiration in 2004 (EXPIRED)

Plan Year Year Age of Structure	2 <u>2010</u> 11	7 <u>2015</u> 16	12 <u>2020</u> 21	17 <u>2025</u> 26	22 <u>2030</u> 31
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$3,000	\$4,000	\$6,000	\$9,000	\$11,000
Column & Wall	\$2,000	\$3,000	\$5,000	\$7,000	\$8,000
PC Concrete	\$2,000	\$4,000	\$5,000	\$7,000	\$8,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$3,000	\$5,000	\$7,000	\$10,000
DIVISION 7 - WATERPROOFING					
Sealants	\$27,000	\$100,000	\$4,000	\$100,000	\$6,000
Expansion Joints	\$0	\$0	\$0	\$0	\$0
Sealer (Silane)	\$0	\$0	\$62,000	\$0	\$62,000
Deck Coating	\$3,000	\$57,000	\$3,000	\$57,000	\$3,000
Epoxy Coating @ Stairs	\$18,000	\$3,000	\$17,500	\$3,000	\$17,500
Stair/Elev Roofs	\$0	\$0	\$20,000	\$0	\$0
Brick Sealer	\$0	\$40,000	\$0	\$40,000	\$0
Stair/Elevator Sealants	\$0	\$3,000	\$3,000	\$3,000	\$3,000
DIVISION 8					
Doors & Frames (25-30 years) Alum.	\$0	\$0	\$0	\$0	\$0
Stair Glass & Frame (at 30 years) Alum.	\$0	\$0	\$0	\$0	\$0
DIVISION 9 - FINISHES					
Restriping	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Steel					
Misc - bollards, rails, etc	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Exterior Handrails	\$0	\$25,000	\$4,000	\$25,000	\$4,000
Stairs - Paint Touchup	\$0	\$0	\$0	\$0	\$0
Stairs & Handrails - Paint	\$8,000	\$5,000	\$5,000	\$5,000	\$5,000
Concrete					
Stairs	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Interior Walls	\$0	\$10,000	\$10,000	\$10,000	\$10,000
Exterior Spandrels NA					
DIVISION 10					
Signage					
(replace at 10 years) Electric	\$0	\$20,000	\$0	\$20,000	\$0
(replace at 20-25 years) Standard	\$0	\$0	\$0	\$40,000	\$0
DIVISION 11					
Parking Equipment (replace at 10 yrs)	\$0	\$0	\$200,000	\$0	\$200,000
Fee Computers	\$0	\$10,000	\$10,000	\$10,000	\$10,000

TABLE 1 - FOURTH & WASHINGTON
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WASHINGTON PARKING STRUCTURE
December 2008
Construction Completed in 1999; WP Warranty Expiration in 2004 (EXPIRED)

<i>Plan Year Year Age of Structure</i>	2 <u>2010</u> 11	7 <u>2015</u> 16	12 <u>2020</u> 21	17 <u>2025</u> 26	22 <u>2030</u> 31
DIVISION 14					
Elevators Upgrades (<i>upgrade at 15 yrs</i>)	\$0	\$0	\$20,000	\$0	\$0
Elevator Replacement (<i>25 to 30 yrs</i>)	\$0	\$0	\$0	\$0	\$130,000
DIVISION 15 - MECHANICAL					
Plumbing					
(<i>replace at 30 years, 2032</i>) Drain Lines	\$0	\$1,000	\$1,000	\$1,000	\$1,000
(<i>replace at 30 years, 2032</i>) Floor Drains	\$500	\$1,000	\$1,000	\$1,000	\$1,000
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
HVAC - Lower Levels (<i>20 to 25 years</i>)	\$0	\$0	\$0	\$20,000	\$0
Restroom Fixtures	\$0	\$5,000	\$0	\$5,000	\$0
Fire Protection System	\$0	\$0	\$0	\$0	\$0
DIVISION 16 - ELECTRICAL					
Lighting (<i>replace fixtures at 20 yrs</i>)	\$0	\$140,000	\$0	\$0	\$0
Emergency Power - UPS (<i>at 15 yrs</i>)			\$40,000	\$0	\$0
Switchgear and Panels				\$0	\$0
TOTALS IN 2008 DOLLARS	\$63,500	\$447,000	\$442,500	\$483,000	\$540,500
Soft Costs (35%)	35% \$22,225	\$156,450	\$154,875	\$169,050	\$189,175
TOTALS IN 2008 DOLLARS	\$85,725	\$603,450	\$597,375	\$652,050	\$729,675

Notes:

TABLE 2 - LIBERTY SQUARE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - LIBERTY SQUARE PARKING STRUCTURE
December 2008

Repairs Completed in 1998; WP Warranty Expiration in July 2003 (EXPIRED)

<i>Plan Year</i> <i>Year</i> <i>Age of Structure</i> <i>Age Since 1998 Repairs</i>	<u>1</u> <u>2009</u> 25 11	<u>5</u> <u>2013</u> 29 15	<u>10</u> <u>2018</u> 34 20	<u>15</u> <u>2023</u> 39 25	<u>19</u> <u>2027</u> 43 29
DIVISION 3 - CONCRETE REPAIRS					
Slab	\$16,000	\$20,000	\$20,000	\$40,000	\$50,000
Column & Wall	\$2,000	\$7,000	\$8,000	\$10,000	\$13,000
PC Concrete N/A	\$0	\$0	\$0	\$0	\$0
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$10,000	\$10,000	\$10,000	\$40,000
DIVISION 5 - STEEL					
Replace South Stair	\$200,000	\$0	\$0	\$0	\$0
Replace North Stair	\$0	\$0	\$0	\$150,000	\$0
Steel Stair Repairs	\$10,000	\$0	\$12,000	\$0	\$0
DIVISION 7 - WATERPROOFING					
Sealants	\$2,500	\$50,000	\$5,000	\$50,000	\$3,000
Expansion Joints	\$3,000	\$12,000	\$3,000	\$12,000	\$3,000
Cap Flashing	\$2,000	\$3,000	\$20,000	\$3,000	\$3,000
Sealer (Silane) - 24" Vertical	\$0	\$0	\$0	\$0	\$0
Deck Coating	\$1,000	\$580,000	\$32,000	\$580,000	\$32,000
Epoxy Coating @ Stairs	\$0	\$24,000	\$2,400	\$24,000	\$2,400
Stair/Elev Roofs (20 to 25 yrs)	\$0	\$20,000	\$0	\$0	\$20,000
Brick Sealer	\$0	\$0	\$80,000	\$0	\$80,000
Stair/Elevator Sealants	\$0	\$2,000	\$15,000	\$2,000	\$15,000
DIVISION 8					
Doors & Frames (at 15 years)	\$0	\$2,500	\$2,500	\$2,500	\$5,000
Stair Glass Frame (at 30 yrs) Alum.	\$0	\$6,000	\$80,000	\$6,000	\$6,000
DIVISION 9 - FINISHES					
Restriping	\$0	\$6,000	\$6,000	\$6,000	\$6,000
Steel					
Misc - bollards, rails, etc	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Stairs - Handrails	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Doors / Frames	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Exterior Frame					
Exterior Handrails	\$0	\$0	\$15,000	\$0	\$15,000
Interior Rails NA					
Stairs - Paint Touchup	\$0	\$0	\$0	\$0	\$0
Stairs - Paint	\$0	\$10,000	\$0	\$10,000	\$0
Concrete					
Stairs	\$0	\$20,000	\$20,000	\$10,000	\$20,000
Interior Walls	\$600	\$30,000	\$0	\$30,000	\$0

TABLE 2 - LIBERTY SQUARE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - LIBERTY SQUARE PARKING STRUCTURE
December 2008
Repairs Completed in 1998; WP Warranty Expiration in July 2003 (EXPIRED)

Plan Year	1	5	10	15	19
Year	<u>2009</u>	<u>2013</u>	<u>2018</u>	<u>2023</u>	<u>2027</u>
Age of Structure	25	29	34	39	43
Age Since 1998 Repairs	11	15	20	25	29
Exterior Spandrels	NA				
DIVISION 10					
Signage					
Electric	\$0	\$15,000	\$0	\$15,000	\$0
(replace at 20-25 yrs) Standard	\$0	\$70,000	\$0	\$0	\$0
DIVISION 11					
Parking Equipment(replace 10yrs)	\$0	\$0	\$125,000	\$0	\$125,000
Fee Computers	\$0	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 14					
Elevators Upgrades (at 15 years)	\$60,000	\$0	\$0	\$0	\$0
Elevator Replacement (25 to 30 yrs)	\$0	\$0	\$500,000	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
Drain Lines (replace at 30 years)	\$0	\$1,000	\$10,000	\$0	\$1,000
Floor Drains (replace at 30 yrs)	\$0	\$2,000	\$2,000	\$5,000	\$2,000
Sump Pump Replacement	NA				
HVAC - Lower Levels	NA	\$0	\$0	\$0	\$0
Restroom Fixtures	NA	\$0	\$0	\$0	\$0
Fire Protection System	\$0	\$5,000	\$0	\$30,000	\$0
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20yrs)(Done in 2008)	\$0	\$5,000	\$5,000	\$5,000	\$180,000
Emergency Generator	NA				
Switchgear and Panels (30 yrs)	\$0	\$0	\$30,000	\$0	\$0
TOTALS IN 2008 DOLLARS	\$297,100	\$914,500	\$1,016,900	\$1,014,500	\$635,400
Soft Costs (35%)	35%	\$103,985	\$320,075	\$355,075	\$222,390
TOTALS IN 2008 DOLLARS	\$401,085	\$1,234,575	\$1,372,815	\$1,369,575	\$857,790

Notes:

TABLE 3 - ANN ASHLEY
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - ANN ASHLEY PARKING STRUCTURE
December 2008
Repairs Completed in 1998; WP Warranty Expiration in 2003

<i>Plan Year</i> <i>Year</i> <i>Age of Structure</i> <i>Years Since Last Major Repair</i>	<u>1</u> <u>2009</u> 23 11	<u>3</u> <u>2011</u> 25 13	<u>8</u> <u>2016</u> 30 18	<u>13</u> <u>2021</u> 35 23	<u>18</u> <u>2026</u> 40 28
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$2,000	\$4,000	\$9,000	\$20,000	\$40,000
Column, Wall & Haunch	\$12,000	\$16,000	\$20,000	\$23,000	\$26,000
PC Concrete	\$18,000	\$20,000	\$26,000	\$36,000	\$50,000
Concrete Stair Repairs	\$5,000	\$10,000	\$5,000	\$100,000	\$5,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$5,000	\$4,500	\$15,000	\$30,000	\$12,000
DIVISION 7 - WATERPROOFING					
Sealants	\$41,000	\$229,000	\$23,000	\$229,000	\$23,000
Expansion Joints	\$3,000	\$5,000	\$80,000	\$5,000	\$8,000
Sealer (Silane) - + 24" Vert	\$22,500	\$104,000	\$0	\$130,000	\$0
Deck Coating	\$300	\$30,000	\$140,000	\$14,000	\$140,000
Epoxy Coating @ Stairs	\$0	\$0	\$0	\$0	\$0
Stair/Elev Roofs	\$0	\$20,000	\$0	\$0	\$0
Brick Sealer	\$0	\$30,000	\$0	\$30,000	\$0
Stair/Elevator Sealants	\$2,500	\$5,000	\$20,000	\$5,000	\$20,000
DIVISION 8					
Doors & Frames	<i>Alum.</i>		\$30,000	\$0	\$0
Stair Glass & Frame	<i>Alum.</i>	\$0	\$5,000	\$150,000	\$5,000
Office Insulated Glass		\$0	\$20,000	\$0	\$0
DIVISION 9 - FINISHES					
Restriping	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Steel					
<i>Misc - bollards, rails, plates, etc</i>	\$3,000	\$5,000	\$10,000	\$5,000	\$10,000
<i>Doors / Frames</i>	<i>Aluminum</i>				
<i>Exterior Frame</i>	<i>NA</i>				
<i>Exterior Handrails</i>	<i>NA</i>				
<i>Interior Rails</i>	<i>NA</i>				
<i>Stairs Handrail- Paint Touchup</i>	\$2,000	\$5,000	\$0	\$5,000	\$5,000
<i>Stairs Handrails- Paint</i>	\$0	\$0	\$30,000	\$0	\$0
<i>Exterior Spandrels</i>	\$0	\$0	\$0	\$0	\$0
Concrete					
<i>Stairs</i>		\$20,000	\$0	\$20,000	\$0
<i>Interior Walls</i>	<i>NA</i>				
<i>Exterior Spandrels (stain)</i>	\$0	\$80,000	\$0	\$0	\$20,000
<i>Office</i>	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Office Finishes	\$0	\$12,000	\$0	\$12,000	\$0

TABLE 3 - ANN ASHLEY
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - ANN ASHLEY PARKING STRUCTURE
December 2008
Repairs Completed in 1998; WP Warranty Expiration in 2003

<i>Plan Year</i>	1	3	8	13	18
<i>Year</i>	<u>2009</u>	<u>2011</u>	<u>2016</u>	<u>2021</u>	<u>2026</u>
<i>Age of Structure</i>	23	25	30	35	40
<i>Years Since Last Major Repair</i>	11	13	18	23	28
DIVISION 10					
Signage					
<i>Electric (replace at 10 years)</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20 to 25 yrs)</i>	\$0	\$0	\$70,000	\$0	\$70,000
DIVISION 11					
Parking Equipment (every 10 yrs)	\$0	\$0	\$250,000	\$0	\$250,000
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (every 15 yrs)	\$0	\$10,000	\$0	\$0	\$0
Elevator Replacement(25 to 30 yrs)	\$0	\$250,000	\$0	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$500	\$2,000	\$15,000	\$2,000	\$0
<i>Floor Drains (replace at 30 yrs)</i>	\$0	\$2,500	\$15,000	\$5,000	\$5,000
<i>Restroom Fixtures</i>	\$0	\$8,000	\$0	\$0	\$10,000
HVAC					
<i>Office</i>		\$10,000	\$0	\$10,000	\$0
<i>Sump Pump Replacement</i>	\$0	\$3,000	\$0	\$3,000	\$0
HVAC - Lower Levels (20 to 25 yrs)	\$13,000	\$0	\$20,000	\$0	\$0
Standpipe System	\$0	\$2,000	\$0	\$0	\$0
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20 yrs)(Done in 2008)	\$0	\$1,000	\$2,500	\$2,500	\$275,000
Emergency Generator	NA				
Switchgear and Panels (30 years)	Replace at 30 y	\$0	\$25,000	\$0	\$0
Conduit Repairs	\$5,000	\$0	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS	\$142,800	\$953,000	\$980,500	\$731,500	\$999,000
Soft Costs (35%)	35%	\$49,980	\$333,550	\$343,175	\$256,025
TOTALS IN 2008 DOLLARS	\$192,780	\$1,286,550	\$1,323,675	\$987,525	\$1,348,650

Notes:

TABLE 4 - MAYNARD STREET
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - MAYNARD STREET PARKING STRUCTURE
December 2008
Construction Completed in 2000; WP Warranty Expiration in July 2005 (*Expired*)

Plan Year Year Age of Structure (Apprx) Years Since Last Major Repair	1 <u>2009</u> 44 9	4 <u>2012</u> 47 12	9 <u>2017</u> 52 17	14 <u>2022</u> 57 22	19 <u>2027</u> 62 27
DIVISION 3 - CONCRETE REPAIRS					
Floor Repairs	\$17,000	\$24,000	\$40,000	\$70,000	\$100,000
Column & Wall Repairs	\$16,000	\$20,000	\$26,000	\$33,000	\$39,000
Beams & Joist Repairs	\$31,000	\$24,000	\$29,000	\$36,000	\$42,000
Concrete Overlay Replacement	\$0	\$0	\$0	\$0	\$540,000
Concrete Overlay Repair	\$2,000	\$10,000	\$20,000	\$60,000	\$0
Stair Delamination Repair	\$2,600	\$2,500	\$10,000	\$5,000	\$5,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 7 - WATERPROOFING					
Sealants	\$1,400	\$240,000	\$24,000	\$240,000	\$24,000
Expansion Joints	\$500	\$6,000	\$80,000	\$6,000	\$80,000
Sealer (Silane) - SOG + 24" Vert	\$0	\$0	\$0	\$0	\$0
Deck Coating & Epoxy	\$3,300	\$820,000	\$41,000	\$820,000	\$41,000
Stair/Elev Roofs (20 to 25 years)	\$0	\$20,000	\$0	\$10,000	\$0
Brick Sealer	\$0	\$20,000	\$0	\$20,000	\$0
Stair/Elevator Sealants	\$0	\$10,000	\$0	\$10,000	\$0
DIVISION 8					
Doors & Frames (25 to 30 years) S.S.	\$0	\$0	\$0	\$0	\$0
Stair Glass & Frame (at 30 years) Alum.	\$0	\$0	\$0	\$0	\$0
Office Insulated Glass	\$0	\$0	\$15,000	\$0	\$0
DIVISION 9 - FINISHES					
Restriping	\$0	\$8,000	\$8,000	\$8,000	\$8,000
Steel					
Misc - bollards, rails, etc	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Exterior Handrails	\$0	\$10,000	\$0	\$10,000	\$0
Interior Rails Stainless & Galvanized					
Stairs - Galv Touchup	\$3,000	\$5,000	\$5,000	\$5,000	\$5,000
Concrete					
Stairs	\$0	\$5,000	\$5,000	\$5,000	\$5,000
Interior Walls / Beams	\$0	\$25,000	\$25,000	\$25,000	\$25,000
Exterior Spandrels	\$0	\$35,000	\$0	\$35,000	\$0
Office /Police Office	\$0	\$3,000	\$3,000	\$3,000	\$3,000
Office Finishes	\$0	\$15,000	\$0	\$15,000	\$0
DIVISION 10					
Signage					

TABLE 4 - MAYNARD STREET
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - MAYNARD STREET PARKING STRUCTURE
December 2008
Construction Completed in 2000; WP Warranty Expiration in July 2005 (*Expired*)

Plan Year	1	4	9	14	19
Year	2009	2012	2017	2022	2027
Age of Structure (Apprx)	44	47	52	57	62
Years Since Last Major Repair	9	12	17	22	27
Electric	\$0	\$15,000	\$0	\$15,000	\$0
Standard (replace at 20 to 25 yrs)	\$0	\$0	\$0	\$60,000	\$0
DIVISION 11					
Parking Equipment (every 10 yrs)	\$0	\$0	\$250,000	\$0	\$250,000
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (every 15 yrs)	\$0	\$0	\$15,000	\$0	\$15,000
Elevator Replacement (25-30 yrs)	\$0	\$125,000	\$0	\$0	\$125,000
DIVISION 15 - MECHANICAL					
Plumbing					
Drain Lines (replace at 30 yrs)	\$0	\$1,000	\$1,000	\$1,000	\$1,000
Floor Drains (replace at 30 yrs)	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Restroom Fixtures	\$0	\$0	\$8,000	\$0	\$8,000
HVAC					
Office / Police Office Replace.		\$15,000	\$0	\$15,000	\$0
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
Fire Protection System					
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20 years)	\$0	\$85,000	\$5,000	\$223,000	\$5,000
Emergency Generator (20 yrs)	\$0	\$0	\$0	\$0	\$0
Switchgear and Panels (30 yrs)	\$0	\$0	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS	\$77,800	\$1,571,500	\$636,000	\$1,758,000	\$1,347,000
Soft Costs (35%)	35%	\$27,230	\$550,025	\$615,300	\$471,450
TOTALS IN 2008 DOLLARS	\$105,030	\$2,121,525	\$858,600	\$2,373,300	\$1,818,450

Notes:

TABLE 5 - FOURTH & WILLIAM
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WILLIAM PARKING STRUCTURE
December 2008

Repairs Completed in 2002; WP Warranty Expiration in 2007(Expired);2006 Expansion Warranty Expires (2011)

<i>Plan Year</i>	2	7	12	17	22
<i>Year</i>	2010	2015	2020	2025	2030
<i>Age of Original Structure</i>	44	49	54	59	64
<i>Years Since Last Major Repairs</i>	8	13	18	23	28
DIVISION 3 - CONCRETE REPAIRS					
Floor Repairs	\$5,000	\$12,000	\$24,000	\$42,000	\$70,000
Column & Wall Repairs	\$4,000	\$10,000	\$13,000	\$20,000	\$33,000
Beams & Joist Repairs	\$98,000	\$117,000	\$150,000	\$189,000	\$228,000
Concrete Overlay Replacement	\$0	\$0	\$0	\$0	\$0
Concrete Overlay Repair	\$0	\$3,000	\$12,000	\$30,000	\$50,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$3,000	\$3,000	\$3,000	\$3,000
DIVISION 7 - WATERPROOFING					
Sealants	\$2,500	\$50,000	\$100,000	\$50,000	\$100,000
Expansion Joints	\$2,400	\$58,000	\$10,000	\$58,000	\$10,000
Sealer (Silane) - SOG + 24" Vert	\$0	\$0	\$0	\$0	\$0
Deck Coating	\$300	\$290,000	\$590,000	\$290,000	\$590,000
Epoxy Coating @ Stairs	\$0	\$10,000	\$0	\$10,000	\$0
Stair/Elev Roofs	\$0	\$0	\$0	\$0	\$45,000
Brick Sealer	\$0	\$14,000	\$0	\$14,000	\$0
Stair/Elevator Sealants	\$0	\$7,000	\$2,000	\$7,000	\$2,000
DIVISION 8					
Doors & Frames (35 to 30 yrs)	S.S.	\$0	\$0	\$0	\$0
Stair Curtain Wall System (30 yrs)	Alum.	\$0	\$0	\$0	\$0
Insulated Glass-NW Stair & Office		\$0	\$20,000	\$0	\$15,000
DIVISION 9 - FINISHES					
Restriping		\$10,000	\$10,000	\$10,000	\$10,000
Steel					
<i>Misc - bollards, rails, etc</i>	\$0	\$5,000	\$5,000	\$5,000	\$5,000
<i>Stairs - Handrails</i>	\$0	\$5,000	\$5,000	\$5,000	\$5,000
<i>Weathering Steel</i>	\$0	\$0	\$0	\$0	\$0
<i>Doors / Frames</i>					
<i>Exterior Frame</i>	\$0	\$0	\$90,000	\$0	\$0
<i>Exterior Guardrails</i>	\$0	\$0	\$60,000	\$0	\$0
<i>Interior Rails</i>	\$0	\$0	\$25,000	\$0	\$0
Concrete					
<i>Ceiling Stain</i>	\$0	\$2,000	\$2,000	\$2,000	\$2,000
<i>Stairs</i>	\$0	\$20,000	\$0	\$20,000	\$0
<i>Interior Walls, Columns, Beams</i>	\$2,000	\$2,000	\$2,000	\$2,000	\$45,000
<i>Exterior Spandrels</i>	\$0	\$0	\$110,000	\$0	\$0
<i>Office</i>	\$0	\$2,000	\$2,000	\$2,000	\$2,000
Office Finishes	\$0	\$10,000	\$0	\$10,000	\$0

TABLE 5 - FOURTH & WILLIAM
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOURTH & WILLIAM PARKING STRUCTURE
December 2008

Repairs Completed in 2002; WP Warranty Expiration in 2007(Expired); 2006 Expansion Warranty Expires (2011)

Plan Year	2	7	12	17	22
Year	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Age of Original Structure	44	49	54	59	64
Years Since Last Major Repairs	8	13	18	23	28
DIVISION 10					
Signage					
<i>Electric</i>	\$0	\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20 to 25 years)</i>	\$0	\$0	\$0	\$50,000	\$0
DIVISION 11					
Parking Equipment	\$0	\$200,000	\$0	\$200,000	\$0
Fee Computers	\$0	\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (15 years)	\$1,000	\$0	\$0	\$0	\$30,000
Elevator Replacement (25-30 years)	\$0	\$250,000	\$0	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Floor Drains (replace at 30 years)</i>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Restroom Fixtures</i>	\$0	\$0	\$8,000	\$0	\$8,000
HVAC					
<i>Office</i>		\$10,000	\$0	\$10,000	\$0
<i>Restroom Fixtures</i>		\$3,000	\$0	\$3,000	\$0
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
Fire Protection System					
DIVISION 16 - ELECTRICAL					
Lighting (replace at 20 years)	\$300	\$5,000	\$5,000	\$5,000	\$319,300
Emergency Generator (at 30 yrs)					
Switchgear and Panels (at 30 yrs)					
TOTALS IN 2008 DOLLARS	\$117,500	\$1,162,000	\$1,270,000	\$1,131,000	\$1,619,300
Soft Costs (35%)	35% \$41,125	\$406,700	\$444,500	\$395,850	\$566,755
TOTALS IN 2008 DOLLARS	\$158,625	\$1,568,700	\$1,714,500	\$1,526,850	\$2,186,055

TABLE 6 - FOREST AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOREST AVENUE PARKING STRUCTURE
December 2008
Construction Completed in 2001; WP Warranty Expiration in July 2006

Plan Year Year Age of Structure	2 <u>2010</u> 9	7 <u>2015</u> 14	12 <u>2020</u> 19	17 <u>2025</u> 24	22 <u>2030</u> 29
DIVISION 3 - CONCRETE REPAIRS					
Slab (Topping/SOG)	\$25,000	\$7,000	\$9,000	\$14,000	\$12,000
Column & Wall	\$3,000	\$1,000	\$1,000	\$3,000	\$13,000
PC Concrete	\$0	\$3,000	\$7,000	\$10,000	\$10,000
DIVISION 4 - MASONRY					
Masonry Repairs	\$0	\$0	\$5,000	\$10,000	\$15,000
DIVISION 7 - WATERPROOFING					
Sealants	\$40,000	\$200,000	\$10,000	\$200,000	\$10,000
Expansion Joints	\$1,000	\$30,000	\$1,000	\$1,000	\$30,000
Sealer (Silane)	\$0	\$0	\$96,000	\$0	\$96,000
Deck Coating	\$4,000	\$150,000	\$4,000	\$150,000	\$4,000
Epoxy Coating @ Stairs	\$0	\$0	\$18,000	\$0	\$18,000
Stair/Elev Roofs (at 20 to 25 yrs)	\$0	\$1,000	\$0	\$30,000	\$0
Brick Sealer	\$0	\$10,000	\$0	\$10,000	\$0
Stair/Elevator Sealants	\$0	\$5,000	\$2,500	\$15,000	\$0
DIVISION 8					
Doors & Frames	S.S.				
Stair Glass & Frame	Alum.	\$3,000	\$3,000	\$3,000	\$3,000
Office Insulated Glass		\$0	\$0	\$15,000	\$0
DIVISION 9 - FINISHES					
Restriping		\$9,000	\$0	\$0	\$9,000
Steel					
Misc - bollards, rails, canopy, etc	\$6,000	\$5,000	\$5,000	\$5,000	\$5,000
Stairs - Handrails (stainless)	\$1,000				
Doors / Frames (stainless)					
Exterior Frame	NA				
Exterior Handrails	NA				
Interior Rails (stainless)					
Stairs - Galv Touchup	\$0	\$5,000	\$10,000	\$15,000	\$20,000
Stairs - Paint	\$0	\$0	\$0	\$0	\$0
Concrete					
Ceiling Stain		\$0	\$300,000	\$0	\$0
Stairs	\$0	\$45,000	\$0	\$45,000	\$0
Interior Walls	NA				
Exterior Spandrels	NA				
Office /Police Office		\$2,000	\$2,000	\$2,000	\$2,000
Office Finishes	\$0	\$10,000	\$0	\$10,000	\$0
DIVISION 10					

TABLE 6 - FOREST AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - FOREST AVENUE PARKING STRUCTURE
December 2008
Construction Completed in 2001; WP Warranty Expiration in July 2006

Plan Year Year Age of Structure	2 <u>2010</u> 9	7 <u>2015</u> 14	12 <u>2020</u> 19	17 <u>2025</u> 24	22 <u>2030</u> 29
Signage					
<i>Electric</i>		\$15,000	\$0	\$15,000	\$0
<i>Standard (replace at 20-25 yrs)</i>				\$60,000	\$0
DIVISION 11					
Parking Equipment		\$150,000		\$0	\$150,000
Fee Computers		\$15,000	\$15,000	\$15,000	\$15,000
DIVISION 14					
Elevators Upgrades (at 15 yrs)			\$60,000	\$0	\$0
Elevator Replacement (25 to 30 yrs)			\$0	\$0	\$0
DIVISION 15 - MECHANICAL					
Plumbing					
<i>Drain Lines (replace at 30 yrs)</i>	\$4,000	\$2,000	\$0	\$0	\$0
<i>Floor Drains (replace at 30 yrs)</i>	\$0	\$2,000	\$0	\$0	\$0
<i>Restroom Fixtures</i>	\$0	\$0	\$8,000	\$0	\$8,000
HVAC					
<i>Office / Police Office</i>		\$10,000	\$0	\$10,000	\$0
<i>Elevator Heat Units (20 yrs)</i>			\$0	\$30,000	\$0
<i>Restroom Fixtures</i>		\$2,000	\$0	\$2,000	\$0
Sump Pump Replacement	\$0	\$2,000	\$0	\$2,000	\$0
DIVISION 16 - ELECTRICAL					
Lighting (at 20 yrs)	\$2,000	\$5,000	\$10,000	\$260,000	\$5,000
Emergency Generator (30 yrs)					
Switchgear and Panels (30 yrs)					
Energy Use Study					
Electrical Circuiting Changes					
TOTALS IN 2008 DOLLARS	\$89,000	\$689,000	\$566,500	\$932,000	\$425,000
Soft Costs (35%)	35% \$31,150	\$241,150	\$198,275	\$326,200	\$148,750
TOTALS IN 2008 DOLLARS	\$120,150	\$930,150	\$764,775	\$1,258,200	\$573,750

Notes:

TABLE 7 - SOUTH FIFTH AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - SOUTH FIFTH AVENUE UNDERGROUND PARKING STRUCTURE
December 2008
Scheduled Completion Date August 2011

Plan Year	9	14	19	24	29
Year	<u>2017</u>	<u>2022</u>	<u>2027</u>	<u>2032</u>	<u>2037</u>
Age of Structure	5	10	15	20	25
DIVISION 3 - CONCRETE REPAIRS					
Slab	\$3,000	\$6,000	\$9,000	\$12,000	\$15,000
Column & Wall	\$1,000	\$3,000	\$7,000	\$10,000	\$13,000
Beams	\$1,000	\$3,000	\$7,000	\$10,000	\$13,000
DIVISION 4 - MASONRY N/A					
DIVISION 5 - STEEL N/A					
DIVISION 7 - WATERPROOFING					
Sealants	\$0	\$60,000	\$6,000	\$60,000	\$6,000
Expansion Joints	\$0	\$60,000	\$0	\$60,000	\$0
Sealer (Silane) - 24" Vertical	\$0	\$100,000	\$0	\$100,000	\$0
Deck Coating	\$0	\$70,000	\$7,000	\$70,000	\$7,000
Epoxy Coating @ Stairs	N/A	\$0	\$0	\$0	\$0
Stair/Elev Roofs (20 to 25 yrs)	\$0	\$0	\$0	\$0	\$20,000
Plaza	\$10,000	\$20,000	\$40,000	\$60,000	\$80,000
DIVISION 8					
Doors & Frames (at 15 years)	\$0	\$3,000	\$30,000	\$0	\$3,000
Stair Glass Frame (at 30 yrs)	Alum.	\$0	\$2,000	\$2,000	\$2,000
DIVISION 9 - FINISHES					
Restriping	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Steel					
Misc - bollards, rails, etc	\$1,000	\$10,000	\$1,000	\$10,000	\$1,000
Stairs - Handrails	\$1,000	\$10,000	\$1,000	\$10,000	\$1,000
Doors / Frames	\$1,000	\$10,000	\$1,000	\$10,000	\$1,000
Concrete					
Stairs	\$3,000	\$3,000	\$3,000	\$20,000	\$3,000
Interior Walls	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 10					
Signage					
Electric	\$0	\$15,000	\$0	\$15,000	\$0
(replace at 20-25 yrs) Standard	\$0	\$0	\$0	\$70,000	\$0
DIVISION 11					
Parking Equipment(replace 10yrs)	\$0	\$200,000	\$0	\$200,000	\$0
Fee Computers	\$0	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 14					
Elevators Upgrades (at 15 years)	\$0	\$0	\$60,000	\$0	\$0
Elevator Replacement (25 to 30 yrs)	\$0	\$0	\$0	\$0	\$300,000
DIVISION 15 - MECHANICAL					

TABLE 7 - SOUTH FIFTH AVENUE
Ann Arbor Parking Structures Maintenance & Repair Plan
ANTICIPATED CAPITAL EXPENDITURES - SOUTH FIFTH AVENUE UNDERGROUND PARKING STRUCTURE
December 2008
Scheduled Completion Date August 2011

	<i>Plan Year</i>	9	14	19	24	29
	<i>Year</i>	<u>2017</u>	<u>2022</u>	<u>2027</u>	<u>2032</u>	<u>2037</u>
	<i>Age of Structure</i>	5	10	15	20	25
Plumbing						
<i>Drain Lines (replace at 30 years)</i>		\$1,000	\$3,000	\$3,000	\$3,000	\$3,000
<i>Floor Drains (replace at 30 yrs)</i>		\$0	\$1,000	\$1,000	\$1,000	\$1,000
<i>Sump Pump Replacement</i>		\$0	\$10,000	\$0	\$10,000	\$0
<i>Clean Tanks</i>		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
HVAC - Lower Levels		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Restroom Fixtures	N/A	\$0	\$0	\$0	\$0	\$0
Fire Protection System		\$1,000	\$5,000	\$5,000	\$5,000	\$5,000
DIVISION 16 - ELECTRICAL						
Lighting (<i>replace at 25 yrs</i>)		\$0	\$3,000	\$3,000	\$3,000	\$300,000
Emergency Generator		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Switchgear and Panels (<i>30 yrs</i>)		\$0	\$0	\$0	\$0	\$0
TOTALS IN 2008 DOLLARS		\$45,000	\$624,000	\$213,000	\$768,000	\$801,000
Soft Costs (35%)	35%	\$15,750	\$218,400	\$74,550	\$268,800	\$280,350
TOTALS IN 2008 DOLLARS		\$60,750	\$842,400	\$287,550	\$1,036,800	\$1,081,350

Notes: