KELLER
ENGINEERING

OCSCC 976 – PARKING GARAGE ASSESSMENT REPORT

300 Lett Street, Ottawa, Ontario

FILE # 1250638
2025-10-20

PROTECTING PEOPLE'S BUILDINGS

OCSCC 976 – PARKING GARAGE ASSESSMENT REPORT
300 LETT STREET, OTTAWA, ONTARIO

1.0 TERMS OF REFERENCE

Keller engineering was engaged to perform a condition assessment of the multi-storey parking garage at Ottawa Carleton Standard Condominium Corporation No.976 (OCSCC 976) on Thursday, October 2nd, 2025, located at 300 LETT STREET, OTTAWA, ONTARIO. Our mandate was to review the general condition of the parking garage and to prepare the following:

- Submit a written report that includes details of the inspection, findings, and key deficiencies. A summary of the key defects will be illustrated by means of photographs. Written report to include:
  - Summary of concrete and drainage conditions.
  - Summary of traffic bearing membrane condition.
  - Summary of podium membrane condition.
  - Repair requirements in both short term (immediate to 6 months) and longer term (12 months
  - plus).
  - Recommendations on options for remedial actions, materials, design approaches and sequencing, based on a multi-year or single repair program.
  - Provide survey drawings of delaminated concrete/membrane areas and detailed photo review.
  - Provide class ‘D’ repair estimate for each provided repair option.

2.0 PROPERTY BACKGROUND INFORMATION

OCSCC 976 is a 10-year old, 8-storey, multi-block, residential building. This property is located at 300 Lett Street, Ottawa, Ontario. The building structure consists of conventional concrete slabs, shear walls, and columns. Fenestration incorporates floor-to-ceilings windows, and private balconies. The exterior is clad with brick masonry veneer, and the flat roofs are protected by an eco-friendly green roof design and two-ply modified bitumen roofing. The parking garage has three (3) levels with a small half level between level 2 and 3. Above the parking garage are the buildings, large landscaped areas, and an outdoor community pool.

Fig 1: OCSCC 976 - 300 Lett Street Blocks A - C

3.0 TECHNICAL BACKGROUND INFORMATION

The following information was provided to us by the property manager and building maintenance supervisor:

- Water from vehicles pool in an area on Level P2. Water leaks through the slab and efflorescence is present on the soffit below.
- The soffit at the ramp between Levels P2 and P2.5 leaks.
- Other localized areas of water leaks were noted during the recent garage cleaning.

4.0 METHODOLOGY

Our Parking Garage Condition Assessment consisted of the following procedure:

- Review of architectural/structural drawings, past consultant report and documentation as required.
- Field review to evaluate existing condition of the underside of the drains, expansion joints, concrete walls, soffits, columns and slabs in the parking garage.
- Field review to evaluate the existing condition of the traffic bearing membrane systems currently installed to protect the suspended concrete slabs.
- Complete a concrete delamination survey on suspended slabs.
- Review of podium slab soffit (if present) for any signs of water infiltration through the podium membrane. No Exploratory tests openings within the landscaping have been included as part of the assessment. The condition of the podium membrane will be based off of visual observations of the podium slab soffit.
- Provide a report including the findings of the visual assessment and recommendations for future repairs or replacement.

5.0 DOCUMENTS REVIEWED

The following documents were available for review for the purpose of completing this study:

- As Built Drawings, Lebreton Flats Block 2 (Phase 3), Revision 4 by Claridge Homes and dated September 18, 2015.

6.0 FINDINGS

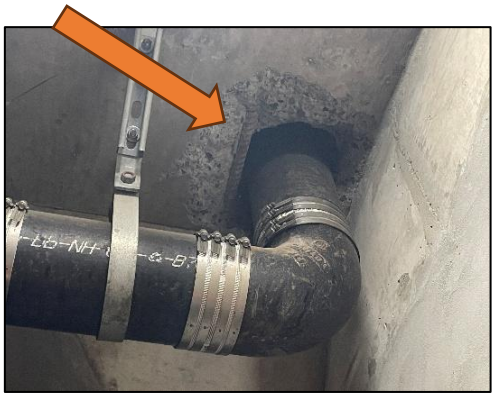
Keller Engineering attended site on Thursday, October 2nd, 2025, to conduct our investigation. The following observations were found throughout the parking garage:

6.1 Soffit concrete delaminations were generally present at locations where leaks were occurring or where efflorescence was present.

6.2 Wall concrete delaminations were observed at a vertically mounted bicycle rack. A leak was noted to be directly above this area.

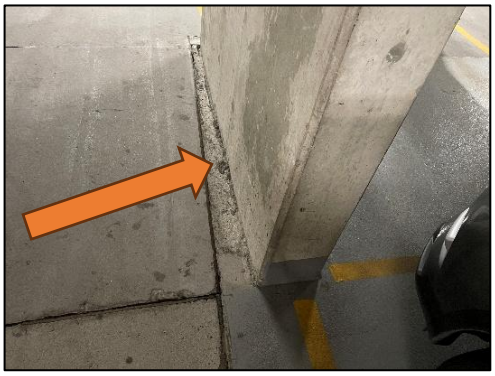
6.3 Localized concrete delaminations were evident at localized shear walls and columns throughout the garage.

6.4 Steel reinforcing was exposed at localized drain locations.



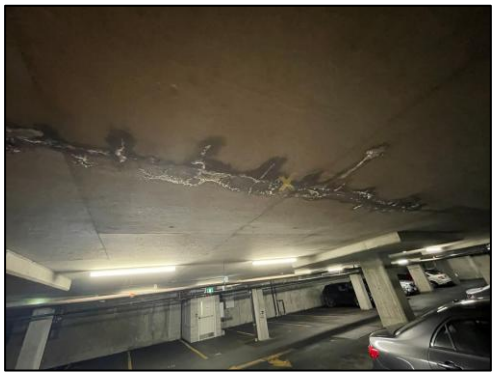
6.5 Surface cracks were observed at various locations throughout the garage with varying widths.

6.6 A section of concrete next to the ramp access was exposed and the abutting shear wall was also missing a waterproofing upturn.



6.7 An abandoned concrete core location through the suspended slab was noted to be filled. However, no waterproofing membrane had been applied over the area.

6.8 At most soffit delamination locations, efflorescence is present. This is consistent for walls, columns, and soffits.



6.9 Soffit delamination and mineral deposits were noted above a fire suppression sprinkler. A section of the fire suppression pipe directly below the leak is beginning to corrode.

6.10 Efflorescence staining was evident on the soffit of the suspended slab below the area where water pools on the level above.

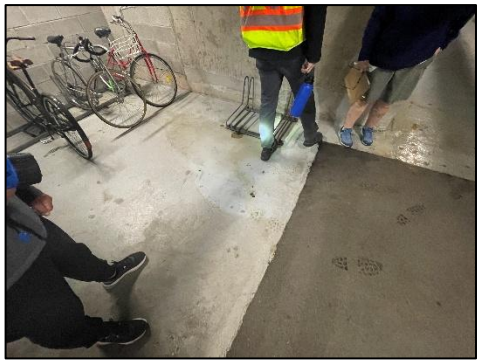
6.11 An abandoned concrete core location through the suspended slab was noted to be filled. The underside of the repair was noted to be significantly wet and was presenting efflorescence staining at the surrounding surfaces.

6.12 A concrete soffit delamination was found along a cold joint of the suspended slab.

6.13 Many localized wall leaks were noted throughout the parking garage utility rooms.

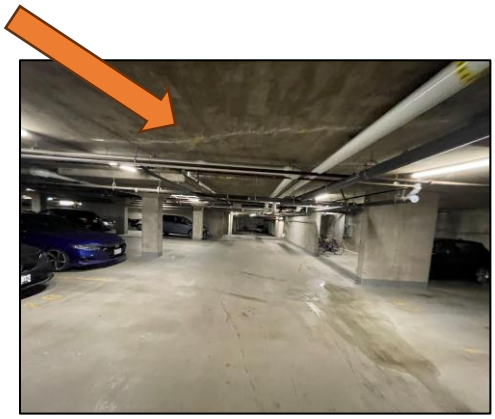
6.14 Localized concrete slab surface cracks were evident at an intersection between the membrane and non-membraned concrete.

6.15 Water pooling was noted near the bike racks on level P2. The concrete may be sloped toward this area. No reglet or termination bar was present at the joint between the membrane and the non membraned concrete.

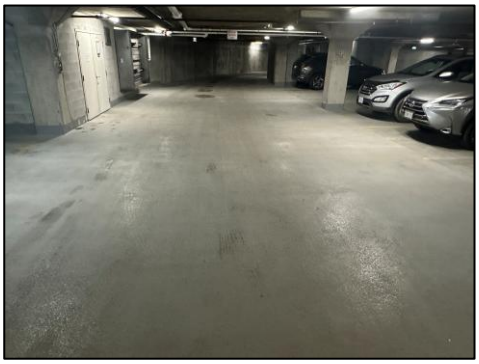


6.16 Water pooling was observed at the base of the P1 garage entrance ramp.

6.17 Efflorescence staining was noted at areas of cracking on the soffit of the podium level.



6.18 The membrane on the level P1 and P2 was significantly worn down at areas of high traffic, i.e. turn radii, drivelanes and ramps.



6.19 Overview of typical condition of cast iron through slab drain. Through slab drains are significantly corroded.

6.20 Efflorescence and corrosion staining along with concrete pitting was noted on the slab on grade concrete surface on P2 at an entrance door to one of the building blocks.

7.0 DISCUSSION/CONCLUSION

Concrete delamination is the separation of concrete from the internal reinforcing steel due to corrosion of the steel bars. Corrosion occurs as a result of penetrating mineral-laden water into the concrete, primarily from de-icing salts used in the winter. The formation of rust on the steel bars will enlarge their cross-sections, creating internal stresses in the slab which are only relieved by the eventual separation of the concrete and reinforcing steel.

Concrete delaminations are not typically visible until their later stages. At this point, the weight of the loose concrete may cause portions of the slab to bubble or blister and can appear visibly loose. The loose concrete blisters, known as spalls, can become serious safety concerns as minor vibrations or differential movements of the building elements can dislodge the spalls causing them to fall unexpectedly onto vehicles or pedestrians below. Concrete delaminations represent a reduction in the overall structural integrity of the reinforced concrete surface or elements. Concrete delaminations and the corrosion of the steel reinforcement represent a loss of composite action between the concrete surface and the embedded reinforcing steel which work in conjunction

with each other to support the imposed building loads. At OCSCC 976, the parking garage suspended slabs are in generally fair condition, with noticeable localized active leaks, and efflorescence staining and concrete spall on the soffits.

Repairing concrete delaminations involves the destructive removal of the unsound concrete surface from around the embedded reinforcing steel, thereby exposing the corroded steel reinforcement. The corrosion on the steel reinforcement is removed by abrasive sand-blast operations. If there is significant section loss of the steel reinforcement or missing steel reinforcement, new sections of steel reinforcement are installed by dowelling. Once the steel reinforcement is cleaned and the installation of the new steel reinforcement is complete, the structural element/repair area is formed to its original dimensions. New concrete is then placed to match the original thickness of the slab.

Cracking of reinforced concrete elements is unavoidable. It is inherent to the nature of concrete materials and reinforced concrete construction to crack. Cracking occurs for a variety of reasons, the majority of which are normal and uncontrollable. These would include drying/shrinkage cracks from the original casting process, expansion/contraction cracks from temperature fluctuations, and cracks due to minor building movements (associated with wind loading, minor earthquakes and normal use/occupancy). These however do not represent a deficiency in the structural element.

Generally, cracking observed during our limited inspection was noted to be categorized as hairline cracking. In instances due to under-design, construction practise errors, overloading and/or deep creep, more significant than hairline cracking may be observed that represents an inadequacy in the structural member in some regard. However, this was not apparent during our review. When cracking of concrete is of concern, a crack survey is performed, and the crack sizes are noted and monitored over an extended period to ensure elements are not further degrading. Areas noted by the engineering professional may be deemed unsafe and require emergency shoring, and further investigation, followed by remediation. At OCSCC 976, cracking and efflorescence staining was noted on the soffits of the suspended slabs. The efflorescence staining that was noted on the podium soffit, may be evident of failure in the waterproofing membrane above. We recommend a condition assessment and cut tests be performed on the podium level waterproofing to determine its conditions and the reasoning for the efflorescence staining below.

The best method to prevent moisture infiltration into a concrete slab, and subsequent concrete delamination is to apply a waterproofing membrane to the top surface. In general, lightweight waterproofing membrane systems have a typical service life of 10-20 years, depending on the type of system, and the level of traffic and wear that it is exposed to. Towards the end of its lifespan, the membrane typically shows signs of physical damage, wear in high traffic areas, and debonding from the concrete substrate. Once the membrane has begun to debond, it provides a gap between the waterproofing and the concrete surface, where water can spread to create further debonding and infiltrate into areas of the slab.

At OCSCC 976, the debonding of the membrane is very apparent in localized areas, especially in areas where significant efflorescence staining was noted on the soffit below. Select high-traffic areas were also noted to have widespread physical damage and wear to the waterproofing membrane. Although the concrete delaminations at/below these areas is limited, it is recommended that repairs be completed in these areas to prevent excess water and chloride infiltration into the slab, leading to structural damages and the associated additional costs with concrete repair work. Although there have been some areas of premature wear in the drive lanes and parking spaces where the traffic membrane has debonded, the overall condition of the traffic membrane is on par for the age of the building (10 years).

A common failure point for waterproofing membranes is at areas where the membrane terminates, such as at a through slab drain or at a transition between surface types. Therefore, it is important to ensure that proper membrane tie in is completed around through-slab drains and reglets are cut into the concrete surface at transitions between surface types. By their nature, drains are exposed to an increased amount of chloride-containing water and are

more prone to develop shrinkage cracks through the concrete slab immediately around the drain opening. Shrinkage cracks are also more prone to develop around drains due to stress concentrations inherent with the design/placement of any opening through a building element.

At OCSCC 976, the through slab drains were in fair condition with moderate to significant surface corrosion. During concrete repair projects, it is recommended these through slab drains are removed and new drains with the proper membrane tie-in flange are installed. Areas of water ponding were also noted in the garage. At least three (3) new drains should be installed throughout the garage to allow water to drain at the areas of water pooling.

8.0 RECOMMENDATIONS

We recommend the following repairs to be completed:

Based on our observations, it is our opinion that the following remedial repairs be completed for the parking garage within the next 1-2 years:

- Perform localized concrete breakthrough, top surface, wall and column repairs
- Perform epoxy crack injections to wall sections
- Complete through slab drain replacements
- Complete new through slab drain placement at three (3) locations
- Apply new traffic bearing membrane on all suspended slab within drivelane areas and radii
- Apply new traffic bearing membrane at localized parking stall areas on suspended slabs
- Apply new heavy duty traffic bearing membrane on all ramps within garage
- Apply new heavy duty traffic bearing membrane within the recycling room on level P2
- Apply new heavy duty traffic bearing membrane along the garbage room ramp on level P1
- Complete a podium waterproofing condition assessment complete with test openings

Based on our observations, it is our opinion that the following remedial repairs be completed for the parking garage within the next 7-9 years:

- Complete a podium membrane replacement project based on the investigation previously completed
- Perform localized concrete breakthrough and top surface repairs on the podium level.

9.0 BUDGET COSTS

We anticipate the repair recommendations to take place within 1-2 years, outlined above should be budgeted at **740,000.00 + HST**. Costs do not include engineering fees or contingencies. Costs are reported in today's dollars and are based on a 1-year project starting January 2026.

We anticipate the repair recommendations to take place within 7-9 years, outlined above should be budgeted at **880,000.00 + HST** . This cost does not include engineering fees, contingencies and inflation costs. Note that this includes a waterproofing investigation which will more than likely necessitate specified repairs upon completion, therefore this budget does not include the unforeseen conditions uncovered during the investigation.

The above Class 'D' estimates are based on our quantity take-offs, our engineering judgement, and the conditions present at the time of our visit. A complete breakdown of estimated costs is available in Appendix B – Estimated Repair Budget.

Trusting this meets your present requirements, please feel free to contact the undersigned should you require further information.

Sincerely,

Keller Engineering

Written by: Chris Lachapelle, B.Sc

Reviewed by: Ryan Terpstra, P.Eng.

Chris Lachapelle, B.Sc

Ryan Terpstra, P.Eng.

APPENDIX A

GARAGE SURVEY PLANS

LEGEND

- SOFFIT REPAIRS
- DRAIN LOCATIONS
- EXPOXY CRACK INJECTION
- WALL, COLUMN/SHEAR WALL REPAIR AREA
- TRAFFIC TOPPING REPAIR AREA
- NEW HEAVY DUTY MEMBRANE AREA
- CONCRETE TOP SURFACE REPAIRS
- CRACKS WITH EFFLORESCENCE

LEVEL P3
40 RESIDENTIAL PARKING SPACES
21 BICYCLE SPACES

BICYCLES (7)
BICYCLES (6H+14V)
CISTERN
INTAKE
Fire Rated Bulkhead to be coordi with equipe (see detail 1 A-900_1)
STAIR 4
STAIR 3
P303
P302
P301
P380
P360
P3-01(R)
P3-02(R)
P3-03(R)
P3-04(R)
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EL. 48 625
8.5

LEGEND

- SOFFIT REPAIRS
- DRAIN LOCATIONS
- EXPOXY CRACK INJECTION
- WALL, COLUMN/SHEAR WALL REPAIR AREA
- TRAFFIC TOPPING REPAIR AREA
- NEW HEAVY DUTY MEMBRANE AREA
- CONCRETE TOP SURFACE REPAIRS
- CRACKS WITH EFFLORESCENCE

SECTION REQUIRES WATERPROOFING MEMBRANE

LEGEND

- SOFFIT REPAIRS
- DRAIN LOCATIONS
- EXPOXY CRACK INJECTION
- WALL, COLUMN/SHEAR WALL REPAIR AREA
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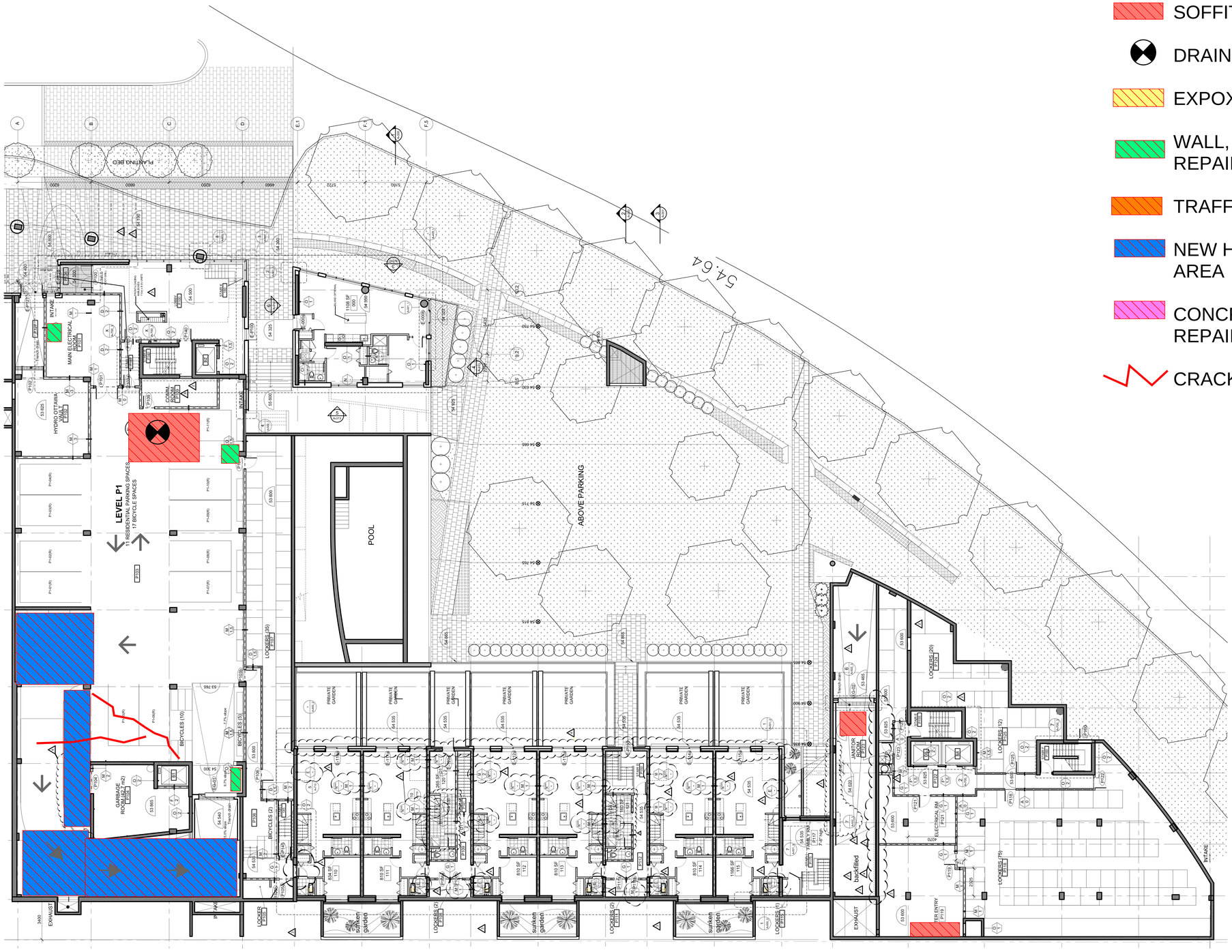

APPENDIX B

COST ANALYSIS

OCSCC 976 Parking Garage Condition Assessment 2025 Recommended Immediate Repairs Breakdown				
ITEM	**QTY**	**UNITS**	**RATE**	**COST**
Concrete & Membrane Repairs				
Concrete Breakthrough Repairs	450	ft^2	$ 125.00	$ 56,250.00
Concrete Top Surface Repairs	40	ft^2	$ 110.00	$ 4,400.00
Concrete Wall and Column Repairs	125	ft^2	$ 185.00	$ 23,125.00
Through Slab Drain Replacements	10	ea	$ 5,000.00	$ 50,000.00
Epoxy Crack Injection Repair	20	ft	$ 225.00	$ 4,500.00
Waterproofing Membrane in Drivelanes	6500	ft^2	$ 35.00	$ 227,500.00
Localized Waterproofing Membane in Parking Stalls	3000	ft^2	$ 22.00	$ 66,000.00
Heavy Duty Waterproofing Membrane on Ramps and Turn Radii	3800	ft^2	$ 35.00	$ 133,000.00
Heavy Dutry Waterproofing Membrane in Recycling Room	275	ft^2	$ 35.00	$ 9,625.00
Heavy Duty Waterproofing Membrane on Garage Room Ramp	700	ft^2	$ 35.00	$ 24,500.00
Allowances				
Concealed Conditions/Interior Repairs	1	Sum	$ 10,000.00	$ 10,000.00
New Reinforcing Steel, Dowels, etc.	1	Sum	$ 7,500.00	$ 7,500.00
Podium Waterproofing Condition Assessment	1	Sum	$ 3,500.00	$ 3,500.00
Contactor Allowance for Cut Tests on Podium	1	Sum	$ 4,000.00	$ 4,000.00
Shoring Allowance	1	Sum	$ 10,000.00	$ 10,000.00
Mechanical & Electical Allowance	1	Sum	$ 10,000.00	$ 10,000.00
Sum				$ 643,900.00
Contractors Fixed Costs (15%)				$ 96,585.00
Sum of Contractors Costs				$ 740,485.00
Add Engineering Design				$ 6,000.00
Add Engineering Tender				$ 2,500.00
Add Engineering Construction (~7%)				$ 51,833.95
Contractor and Engineering Costs				$ 800,818.95
Add 2.5% Inflation				$ 20,020.47
Add 10% Contingency				$ 80,081.90
Subtotal				$ 900,921.32
Add HST 13%				$ 117,119.77
Grand Total Including HST				$ 1,018,041.09

OCSCC 976 Parking Garage Condition Assessment 2025				
Recommended Intermediate Repairs Breakdown 7 - 9 Years				
ITEM	**QTY**	**UNITS**	**RATE**	**COST**
Podium Wateproofing Repalcement - Landscaping	9500	ft^2	$ 50.00	$ 475,000.00
Podium Waterproofing Replacement - Pavers, Concrete & Asphalt	4300	ft^2	$ 55.00	$ 236,500.00
Concrete Break Through Repairs	450	ft^2	$ 125.00	$ 56,250.00
Sum				$ 767,750.00
Contractors Fixed Costs (15%)				$ 115,162.50
Sum of Contractors Costs				$ 882,912.50

APPENDIX C

LIMITATIONS

LIMITATIONS

This report is based on, and limited to, verbal information supplied to Keller Engineering by the Board of Directors, and visual observations made during our inspections of the building. Only those items that can be observed and are reasonably obvious to Keller Engineering or have been otherwise identified by other parties and listed during this investigation are included in this report.

The work reflects Keller Engineering's best judgement in light of the information reviewed at the time of the inspection. There is no warranty expressed or implied by Keller Engineering that this assessment will uncover all potential deficiencies and risks of liabilities associated with the subject property. Keller Engineering believes, however, that the level of review carried out in this assessment is appropriate to meet the objectives as outlined in the Terms of Reference. We cannot guarantee the completeness or accuracy of information supplied by any third party.

This report has been prepared for the sole use of the Client and cannot be reproduced or otherwise used by any third party unless approval is obtained from Keller Engineering. No portion of this report may be used as a separate entity; it is written to be read in its entirety.

Detailed technical specifications and drawings should be prepared by a qualified professional for any work decided upon as a result of this report.

Keller Engineering is not a professional quantity surveyor, cost estimator, or construction contractor. Any Construction probable costs outlined in this report are budget figures only, based on the current market conditions, and are in present dollars. All estimated costs are before taxes. The actual costs of construction may vary considerably depending on the time of year when tendering is conducted, the actual detailed scope of work and the economic climate of the construction industry.