KELLER ENGINEERING

RESERVE FUND STUDY UPDATE WITH SITE VISIT
OTTAWA-CARLETON STANDARD CONDOMINIUM CORPORATION No. 769
OTTAWA, ONTARIO

File # 18377
March 12, 2019

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STUDY SUMMARY

A site inspection was performed on August 27, 2018 by:

- Luke CoDyre, M.A.Sc.Civ.Eng., Keller Engineering (Structural & Architectural)
- Miguel Plano, P.Eng., Keller Engineering (Electrical & Mechanical)

Based on our visual examination of the property, it is our opinion that Ottawa-Carleton Standard Condominium Corporation No. 769 is in satisfactory condition. A number of common elements will, however, require repairs or replacement over the 30-year horizon of this reserve fund study.

Based on our fiscal analysis and best current estimate, it is recommended that annual reserve fund contributions be increased by **13% above inflation to $338,292** in fiscal year **2019**. Increases in the annual contributions in fiscal year **2020 and 2021** are budgeted at **13% above inflation per year**. Increases in the annual contributions in fiscal year **2020** and all years thereafter are budgeted at **2.0% per year**, which is our assumed yearly construction cost increase. This funding plan, in our opinion, will provide adequate funds to carry out necessary repair work and will provide a surplus which will be required in later years to pay for major capital expenditures anticipated beyond the time period examined in this Reserve Fund Study.

Repair / Replacement Work

The following repair/replacement work will be required from the reserve fund over the next few years:

- Traffic Bearing Membrane Replacement - Turning Radiuses & Ramps
- Curtain Wall Glazing Replacement Allowance
- Emergency Generator & Fuel Systems Code Compliance Updates
- Condensing Heating Boiler Replacement
- Heating Boiler Refractory Panels Replacement
- Domestic Cold Water Expansion Tank Replacement
- Caulking Replacement
- Garage CO Sensor Replacement Allowance
- Glycol Loop Expansion Tank Replacement
- Hydronic Loop Expansion Tank Replacement
- Domestic Hot Water Tank Heaters Replacement
- Elevator Machine Guarding Installation
- Elevator Rope Brake Replacement
- Steam Generator Replacement

Future Work

The following items are not expected to require repair or replacement within the 30-year scope of this study; however, it is likely that work will be required in the future. Budgeting for these items will commence as they approach the 30-year scope of the Reserve Fund Study:

- Glass Panel Balcony Railing Replacement
- Subsequent Balcony Structure Repair Allowance
- Subsequent Masonry Repair Allowance
- Punched Window and Balcony Door Replacement (Continued)

Recommended Further Investigations:

The following investigations are recommended to further evaluate the condition of common elements showing distress. The findings of these investigations should be provided to your reserve fund planner in order to provide greater insight into existing conditions.

- Parking Garage Condition Assessment

- Podium Waterproofing Membrane Condition Assessment
- Brick Veneer Condition Assessment
- Masonry Efflorescence Investigation

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1.0 INTRODUCTION

1.1 Scope

The Board of Directors of Ottawa-Carleton Standard Condominium Corporation No. 769 (OCSCC 769) commissioned Keller Engineering to inspect the common elements of its condominium corporation in order to prepare the following Reserve Fund Study. The work included the review of civil, structural, architectural, mechanical, and electrical common elements.

In accordance with 'The Condominium Act, 1998', the purpose of this study is to determine whether the amount of money in the reserve fund and the amount of contributions collected by the Corporation are adequate to provide for the expected costs of major repairs and replacement of the common elements and assets of the Corporation. The Reserve Fund Study contains findings about the current conditions of the common elements and it tabulates major capital expenditure predictions over the next 30 years.

This Reserve Fund Study satisfies the requirements of a Reserve Fund Study Update with Site Visit as outlined in Part IV of the Ontario Regulation 48/01, s. 28.

1.2 Description of Property

Ottawa-Carleton Standard Condominium Corporation No. 769 is a 12-year old, 19-storey high-rise containing 140 residential units. The property, also known as Rivergate Phase 2 is located at 3580 Rivergate Way, in Ottawa, Ontario.

The condominium complex structure consists of cast-in-place reinforced concrete columns, floor slabs and shear walls. The exterior is primarily clad with masonry brick veneer as well as an exterior insulation and finishing system at the parking garage entrance. The aluminum framed punched and curtain wall windows provide the primary fenestration for the building.

The two-level parking garage is located beneath the building and the adjacent landscaped podium. The parking garage is comprised of reinforced concrete floor slabs, columns and walls. Level P1 is an intermediate concrete slab and level P2 is a concrete slab on grade. Concrete block masonry walls separate mechanical and storage rooms throughout the parking garage.

The flat roofs of the condominium complex are protected with inverted roofing systems. The sloped roofs on the main building are protected with aluminum siding while the main entrance canopy is comprised of glass panels.

The adjacent pool structure, tennis courts, entrance gatehouse and all of the surrounding landscaping elements are shared equally between OCSCC 769 and OCSCC 667. These shared elements are included in a separate Reserve Fund Study.

Electrical feed to the building is provided by a pad mount transformer owned by Hydro Ottawa with a 1200A 600V main service. A series of fused disconnect switches, dry core transformers and motor starters, and breaker panels provide electrical distribution throughout the building. Suites are individually metered with meter centers located in the basement and penthouse electrical rooms.

Emergency power is provided by a diesel fueled generator located in the parking garage.

Security systems consist of a phone-based door entry system, key fob system and security cameras.

The HVAC system consist of a hydronic packaged make-up air with electric cooling and multiple exhaust fans throughout the building. Heating is provided by four heating boilers feeding a hydronic heating system for the common areas and parking garage, and a heat pump loop for amenity rooms and suites. Electric

baseboard heaters provide supplemental heating to common area rooms and suites. A cooling tower serves the heat pump loop heat rejection in the summer months.

Plumbing systems consist of a domestic cold-water booster pump, two hot water heating boilers, 2 electric instantaneous hot water heaters and a storage tank provide domestic hot water to the building. A electric steam generator provides steam to the sauna.

The four traction elevators provide access to floors P to 19.

Fire protection systems are comprised of a fire alarm panel with voice annunciator, listed fire pump set, fire hose cabinets and fire extinguishers installed throughout the building and fire sprinklers located in the basement and parking garage.

Fig.1: Location of OCSCC 769

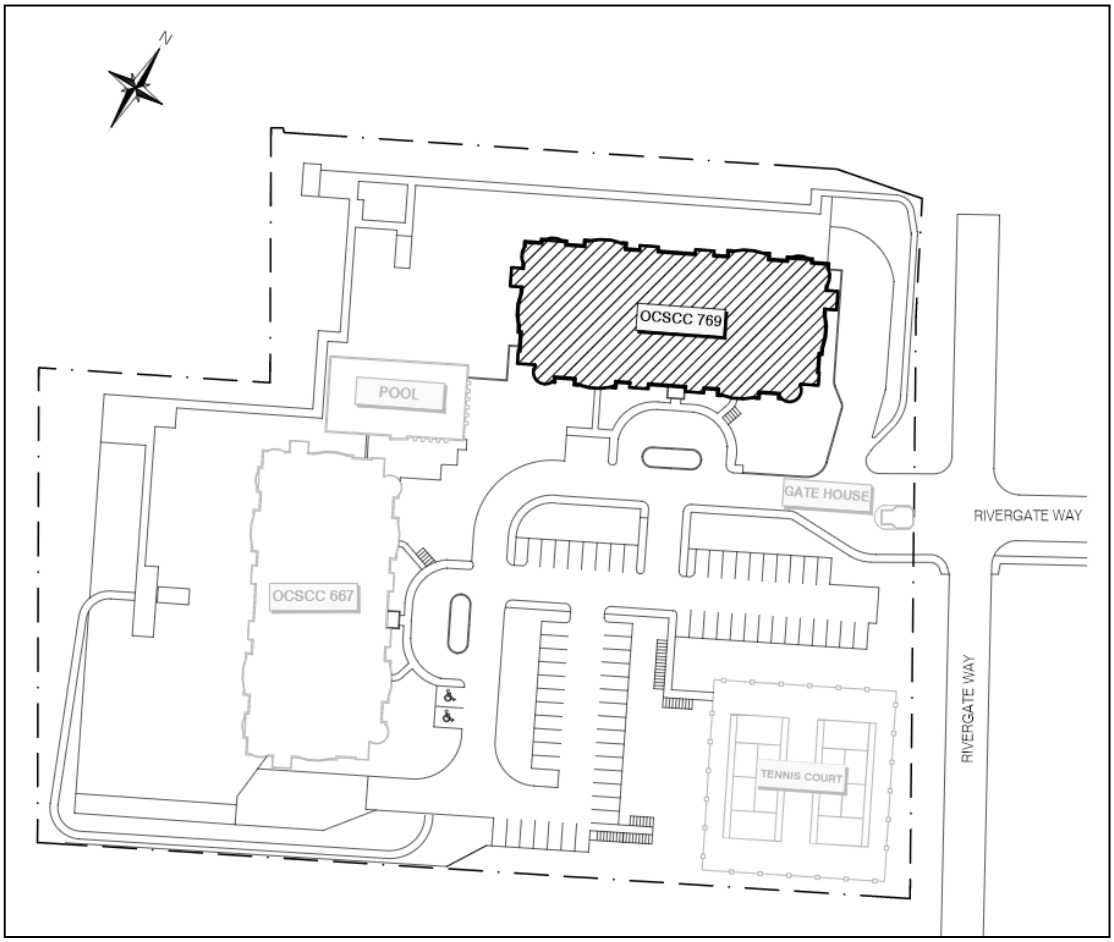

Fig. 2: Key Plan

1.3 References

Reference Materials were provided by Ms. Kimberly Renwick, of Condominium Management Group, Property Manager for OCSCC 769.

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

- Previous Reserve Fund Studies:
  - Reserve Fund Study Update with Site Visit, dated January 18, 2016; Buchan, Lawton, Parent Ltd.
- 2018 Budget; dated December 15, 2017
- Auditor's Statements
  - Fiscal Year 2017; dated May 23, 2018
- Drawings
  - Architectural; A1-A18; For Construction; dated August 8, 2003
  - Structural; S1-16; As-built; dated November 6, 2007
- Declaration; dated February 15, 2007
  - By-Law No.1; dated October 31, 2007
  - By-Law No.2; dated October 31, 2007
  - By-Law No.3; dated October 31, 2007
  - By-Law No.4; dated May 27, 2010
  - By-Law No.5; dated October 5, 2011
  - By-Law No.6; dated July 20, 2012
- Elevator Report; dated June 18, 2018; Solucore Inc.
- Share Services Agreement; dated October 15, 2003

2.0 GENERAL INFORMATION

2.1 Determination of Repair/Replacement Costs

The procedures for determining repair/replacement costs of the common elements involve site inspections, quantity take-offs from drawings, cost estimations and a spreadsheet layout which are described in detail in this report.

TECHNICAL AUDIT

A Technical Audit is performed to assess the general condition of the common elements. This site work also provides the opportunity to determine the type of repair or replacement work that will be required for each common element as well as the time period when such work will likely be required.

COST ESTIMATION

Once the type and quantity of repair or replacement work are known, the costs associated with such work are estimated. Keller Engineering has developed an extensive listing of unit costs for a wide variety of repair and replacement work involving all civil, structural, architectural, and exterior electrical elements that are typically included in Reserve Fund Studies. This listing was compiled using prices obtained from repair and replacement contracts in which Keller Engineering has been involved as well as from cost estimates provided by manufacturers, suppliers and contractors. For unique repair or replacement items, advice is generally obtained from a contractor with experience in the work of concern. In such cases, the contractor examines the work and prepares an estimate for our use in the Reserve Fund Study.

FORECASTING COSTS

Capital expenditures for repair and replacement of building components have been forecasted in current dollars and the most probable fiscal years when these expenditures will be required have been set out in this report. Adjustments for construction cost increases as well as earned interest are automatically made to the spreadsheet and, since the annual fees are to be revised in the current year, the recommended contributions are also determined in current dollars. Beyond the current year, it is the Board's responsibility to ensure that the reserve fund contributions are in line with those outlined in the spreadsheet.

When an expense will be incurred depends on a number of factors, such as:

i) The urgency of repair or replacement: Some building components, such as water supply, sanitary sewers or electricity distribution mains, must operate flawlessly at all times. Interruptions in their working condition cannot be tolerated and repair costs for these items cannot be deferred.

ii) The perceived importance of a repair or replacement: For example, caulking, paving or painting need not be addressed when the first blemishes appear. The Board of Directors has considerable freedom to delay or advance the time when funds will be spent on these non-essential types of repairs to suit the demand from owners and the financial constraints of the Corporation's budget.

In most cases, expenses for each common element have been budgeted for the specific fiscal year in which the repair or replacement will likely be required. If possible, repair or replacement of the common elements will usually be performed throughout the corporation during one year rather than spreading the repairs out over a few years as this is generally the most cost effective solution. For cases where repair or replacement of a building component is not required throughout the corporation at the same time, it may be more cost effective to phase the work over two or more years. Phasing the work may also be necessary due to a lack of reserve funds. A prudent manager would be expected to determine whether phasing the work is cost effective and have the work performed accordingly. Some of the expenses outlined in this Reserve Fund Study will occur early in the predicted time period, other expenses will be incurred later however the accumulated reserve fund should be sufficient to pay for all of these expenses as they come due.

It is within the Board's mandate to advance or defer non-essential repair contracts based on sound technical advice at the time of the scheduled repair.

ENGINEERING FEES

To ensure that major repair and replacement work at the condominium corporation is properly specified and performed, it is strongly recommended, that an experienced engineer be hired to provide professional assistance. Engaging the services of a professional engineer would ensure that the work is properly specified, tendered, and executed. Engineering fees related to the common element repairs will be paid out of the reserve fund. Accordingly, a suitable allowance for engineering fees has been included in the spreadsheet where it is likely that the Board will require professional assistance in implementing the work. Depending on the extent and complexity of the work, engineering fees can range between 5% and 15% of the value of the construction project.

2.2 Financial Plan

SPREADSHEET

The main purpose of the spreadsheet is to determine the annual reserve fund contributions required to ensure that there will be sufficient funds to pay for all foreseeable expenditures over the 30-year plan. To determine the total expenditures to be incurred in each fiscal year, the projected expenditures are entered into the spreadsheet, summed and adjusted for yearly construction cost increases.

INFLATION RATES

Over the past few years, the rate at which construction costs increase has varied significantly between -0.7% and 4.4%. An annual inflation rate of **2.0%** has been used in this report. This rate is based on annually published data by Statistics Canada relating to the construction price index for apartment buildings in the local region.

While the increase in construction costs will fluctuate from year to year, an annual rate of **2.0%** will likely provide a reasonable representation of how prices will increase over the next few years.

INTEREST RATES

For this Reserve Fund Study, a **2.5%** interest rate was assumed in calculating the annual contributions from interest earned on the reserve fund balance.

While actual inflation and interest rates may differ from those assumed for this report, the above rates, in combination, should be representative over the next few years.

DETERMINING CONTRIBUTION AMOUNTS

Trial values for the annual reserve fund contributions are entered into the spreadsheet and through an iterative process the most appropriate annual contributions are determined and used to establish the 30-year funding plan. The iterations account for annual expenditures, annual contributions from owners' monthly fees as well as contributions from investment interest earned on the unused balance of the reserve fund. As noted previously, these figures are adjusted to account for yearly construction cost increases prior to determining the recommended funding plan and the annual contributions are shown in the actual dollar values for each respective year.

The most appropriate contribution ensures that sufficient funds are accumulated in the reserve fund to cover all anticipated expenditures as they come due while leaving a surplus at the end of the study period. The size of the surplus depends greatly on the individual condominium and on the expenses that are to be incurred beyond the study period. Condominiums which are expected to incur large expenditures shortly beyond the study period should have a large surplus.

At the end of the spreadsheet, the remaining reserve fund is shown in current dollars to provide a better perspective of the fund balance at the end of the study period.

In accordance with the Condominium Act and the associated Regulations, Reserve Fund Study Updates must be conducted every 3 years. These updates will allow for adjustments to interest rates, construction cost increases, and/or the funding plan, due to any unforeseen costs incurred over the 3-year period. Prices for future reserve fund studies are for budgeting purposes only and do not constitute a fee proposal for future services.

3.0 ASSUMPTIONS AND LIMITATIONS

The accuracy of the discussions, conclusions and cost information contained in this study is limited to the extent of information available at this time. The condition assessment of the common elements is based upon visual examination only. Neither destructive testing nor performance monitoring were conducted.

Life expectancy projections for the common elements assume that the corporation will provide satisfactory and timely periodic maintenance. The study does not make allowances for the effects of rare events such as flood, fire, lightning, explosions, earthquakes etc.

Future cost projections for the repair or replacement of common element items is based on a set inflation rate taken as an average of past years' construction price index, which is provided by Statistics Canada. As market value increases may vary annually, it is difficult to determine the percentage increase on an item by item basis. Therefore, the most accurate projection is provided by reviewing the previous year's average of the entire construction industry and extrapolated over the life span of the study.

It is assumed that the expected performance standards and appearance correspond to the current norm. Furthermore, housing industry averages and manufacturers' published data on component life expectancy apply to this condominium corporation.

4.0 APPENDICES

4.1 Spreadsheet for Major Repair and Replacement

As described in Section 2: General Information, the purpose of the spreadsheet is to determine the annual reserve fund contributions required to ensure that there will be sufficient funds to pay for all foreseeable expenditures over the next thirty years.

4.2 Photo Review

A visual summary of our findings is included in Appendix B: Photo Review.

4.3 Management Planning Table

The Management Planning Table included in Appendix C provides managers and Board members with a list of expected major expenses and their likely occurrence. The information contained in this table is presented elsewhere in the text of this study and is summarized here for convenience.

4.4 Notice of Future Funding (Formerly Form 15)

The Notice of Future Funding of the Reserve Fund is included in Appendix E. This notice contains a summary of the Reserve Fund Study as well as the proposed plan for future funding. Copies of this notice are to be sent to each of the unit owners to give notice and make them aware of the proposed plan.

Within 120 days of receiving the study, it is the responsibility of the Board of Directors in consort with the Corporation's property management and financial advisors, to review the Reserve Fund Study and propose a plan for future funding of the reserve fund which the Board determines will ensure that the fund will be adequate for the purpose for which it was established.

5.0 TECHNICAL AUDIT AND COSTING

The following sections include a brief technical discussion of the major building components common to the condominium corporation, approximate quantities involved, life expectancy, repair and replacement costs as well as the fiscal years in which work is anticipated.

All items have been ranked on a scale from poor to satisfactory. The rankings are as follows:

- Satisfactory – The condominium complex component exhibits little to no deterioration and is expected to last or exceed its estimated full life cycle assuming regular maintenance and no change to its general environment.
- Fair – The condominium complex component is serviceable although there is evidence of collective degradation or deficient operation. Repairs may be required within the next 5 years.
- Poor – The condominium complex component is either at the end of its life cycle or there is the potential for immanent failure. In the circumstance, the condominium complex component may be inoperative or exhibit total failure and immediate repairs or replacement may be required.

5.1 Architectural/Structural/Civil

5.1.1 Parking Garage

The 2-level reinforced concrete below grade parking garage is located beneath the condominium and the adjacent landscaped podium.

PARKING GARAGE STRUCTURE

The parking garage structure is constructed of reinforced concrete slabs, beams, and columns and concrete block masonry walls. The parking garage structure will typically last the life of the complex; however, significant repairs usually required after 30 years of service.

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Parking Garage Structure Repair Allowance	
. Qty	Allowance
. Cost	$25,000
. Year(s)	2026, 2036, 2046

The parking garage structure was installed as part of the original construction; as such it is 12 years old. The parking garage structure is in satisfactory condition with isolated minor cracking observed on the cast-in-place concrete walls and structural cracking on the concrete block masonry walls. Soffit water infiltration and corrosion staining was observed at two locations adjacent to parking spots P2-36 and P2-82. Water infiltration and corrosion staining is also present on the cast-in-place concrete foundation wall at spot P2-15. Localized coating and concrete cracking was also noted at the base of the concrete columns on the ground level of the garage podium exit. We estimate that repairs will be required over the 30-year planning period of this study.

Significant concrete repairs are generally required in concrete parking structures after the structure has obtained 30-years of service; therefore, we recommend a survey of the structure be performed prior to the any significant repairs to determine the scope of this project.

We recommend the following work be anticipated and funded:

.A In order to ensure funds are available to perform repairs to the parking garage structure when required, an allowance of **$25,000** has been budgeted in **2026 and every 10 years thereafter**

.B Although costs are not included in this study, as it does not constitute a major repair or replacement, we recommend that a comprehensive investigation of the parking garage be

performed in the next 5-10 years using funds from the operating budget

PODIUM SLAB COVERED WITH LANDSCAPING

The landscaped covered podium is located on the south end of the property and is protected by a waterproofing membrane. The waterproofing under the landscaping has a typical service life of 20-35 years.

The waterproofing under the landscaping was installed as part of the original construction; as such it is 12 years old. Based on its current age, we expect the waterproofing is in satisfactory condition. We estimate replacement will be required in the next 10-15 years.

Replacement of the waterproofing membrane can occur as early as 20 years; however, under ideal conditions, these membranes can last almost twice this service life. Due to the large variance in service life of these membranes, we recommend a cut test investigation be performed after 25 years of service to determine whether the service life of the membrane can be extended.

At the request of the Board, the costs associated with the removal and reinstatement of the landscaping elements to provide access for podium membrane repairs and replacements have included in this study.

Generally minor concrete repairs will be required upon replacement of the waterproofing membrane and an allowance for these repairs have been included in the costs for replacement.

We recommend the following work be anticipated and funded:

.C Replacement of the podium waterproofing not including landscaping is estimated to cost **$550,000** and this work has been budgeted **equally over 2 years beginning in 2036**. This work includes an allowance for concrete repairs

.D The removal and reinstatement of the landscaping required to perform the podium waterproofing replacement is estimated to cost **$310,000** and this work has been budgeted **equally over 2 years beginning in 2036**

.E Although costs are not included in this study, as it does not constitute a major repair or replacement, we recommend that a comprehensive investigation of the waterproofing under the landscaping be performed in **2026**, using funds from the operating budget

■

Podium Waterproofing Replacement	
. Qty	2,415 m^2
. Cost	$550,000
. Year(s)	2036 - 2037

■

Podium Landscaping Replacement	
. Qty	2,415 m^2
. Cost	$310,000
. Year(s)	2036 - 2037

INTERMEDIATE SLABS

The intermediate suspended slabs on Level P1 in the parking structure are protected with an elastomeric traffic bearing membrane. The traffic bearing membrane has a typical service life of 15-20 years; however, areas of high traffic can have a reduced service life.

The traffic bearing membrane in the drive lanes and parking areas on Level P1 was installed as part of the original construction; as such it is 12 years old. The traffic bearing membrane is in satisfactory condition with isolated areas of damage at the column curbs throughout and minor membrane deterioration in the designated car washing area. We estimate replacement will be required in the next 5-10 years.

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Traffic Bearing Membrane Waterproofing - Turning Radiuses and Ramps Replacement	
. Qty	360 m^2
. Cost	$40,000
. Year(s)	2018

The traffic bearing membrane at the turning radiuses, ramp and garage entrance on Level P1 is suspected to have been patched over the life of the condominium. The traffic bearing membrane is in fair-to-poor condition with areas of membrane delamination observed at the garage entrance, the base of the ramp and intermediate slab drains. The traffic bearing membrane at the turning radiuses, garage entrance and ramp has reached the end of its useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.F Replacement of the traffic bearing membrane at the drive lanes and parking areas on level P1 is estimated to cost **$260,000** and this work has been budgeted in **2026 and every 20 years** thereafter

.G According to the information provided, replacement of the traffic bearing membrane at the turning radiuses and ramps has been scheduled in the fall of 2018. This work is estimated to cost **$40,000**

.H In order to ensure funds are available to perform isolated repairs to the intermediate slab and traffic bearing membranes when required, an allowance of **$10,000** has been budgeted in fiscal year **2021 and every 5 years** thereafter

.I Minor repairs of the traffic bearing membrane should be performed, as required, using funds from the operating budget

Intermediate Slab Repair Allowance	
. Qty	2,550 m^2
. Cost	$10,000
. Year(s)	2021, 2026, 2031 2036, 2041, 2046

Traffic Bearing Membrane Waterproofing - Drive Lanes and Parking Areas Replacement	
. Qty	2,550 m^2
. Cost	$260,000
. Year(s)	2026, 2046

CONCRETE SLAB-ON-GRADE

A concrete slab-on-grade has been installed in level 1 of the parking garage. The concrete slab-on-grade will typically last the life of the complex.

The concrete slab-on-grade was installed as part of the original construction; as such it is 12 years old. The concrete slab-on-grade is in satisfactory condition with isolated transverse cracking observed throughout and minor surface scaling observed in front of parking spots P2-66 and P2-87. We do not anticipate replacement will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.J In order to ensure funds are available to perform isolated repairs to the parking garage concrete slab-on-grade when required, an allowance of **$30,000** has been budgeted in **2031** and **every 10 years thereafter**

.K Minor repairs of the concrete slab-on-grade should be performed, as required, using funds from the operating budget

Concrete Slab-on-Grade Repair Allowance	
. Qty	Allowance
. Cost	$30,000
. Year(s)	2031, 2041

5.1.2 Gazebo

WOOD GAZEBO

A wood gazebo is located at the northwest corner of the landscaped podium. The wood gazebo has a typical service life of 15-30 years but can vary depending on maintenance.

According to the information provided, the wood gazebo was installed in 2010; as such it is 8 years old. The gazebo is in satisfactory condition with no major deficiencies observed. We estimate isolated repairs and replacements will be required in the next 15-20 years.

Gazebo Repair & Replacement	
. Qty	Allowance
. Cost	$5,000
. Year(s)	2040

We recommend the following work be anticipated and funded:

.A In order to ensure funds are available to perform isolated repairs and replacements to the gazebo when required, an allowance of **$5,000** has been budgeted in **2040** and **every 30 years** thereafter
.B Costs for staining the gazebo have been included in the Exterior Painting Section

5.1.3 Fencing

WOOD FENCING

Wood fencing is located on the northeast elevation of the building. Wood fencing has a typical service life of 20-25 years.

Wood Fencing Replacement	
. Qty	20 m
. Cost	$6,000
. Year(s)	2035

The fencing was reportedly repaired in fiscal year 2015; as such it is 3 years old. The fencing is in satisfactory condition with minor overturning and localized deterioration observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.C Replacement of the wood fencing is estimated to cost **$6,000** and this work has been budgeted in **2035** and **every 20 years** thereafter
.D Minor repairs of the fencing should be performed using funds from the operating budget
.E Costs for repainting of the fencing have been included in the Exterior Painting Section

5.1.4 Foundation Walls

CONCRETE FOUNDATION WALLS

The cast-in-place concrete foundation walls support the high-rise building structure. The foundation walls will typically last the life of the complex.

The foundation walls were installed as part of the original construction; as such they are 12 years old. The foundation walls are in satisfactory condition with no major deficiencies observed. We do not anticipate major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.A Minor concrete repairs of the foundation walls should be performed as required using funds from the operating budget

5.1.5 Balconies

BALCONY STRUCTURE

The balcony structures are constructed of cantilevered reinforced concrete slabs. The balcony slabs will typically last the life of the complex; however, significant repairs usually required after 30 years of service.

Balcony Structure Repair	
. Qty	Allowance
. Cost	$150,000
. Year(s)	2033

The balcony slabs were installed as part of the original construction; as

such they are 12 years old. The balcony slabs are in satisfactory condition with no major deficiencies observed. We estimate significant concrete repairs will be required in the next 20-25 years. Subsequent concrete repairs will be required in 15 years, following the initial repair program.

Significant concrete repairs are generally required in concrete balconies after the structure has obtained 30-years of service; therefore, we recommend a survey of the balconies be performed prior to the any significant repairs to determine the scope of this project.

We recommend the following work be anticipated and funded:

.A In order to ensure funds are available to perform repairs to the balcony slabs when required, an allowance of **$150,000** has been budgeted in **2033 and every 15 years** thereafter

BALCONY RAILINGS

The precast concrete and glass panel railings are located at the balcony edges. The aluminum and glass panel railings have a typical service life of 30-40 years. The precast concrete railings will typically last the life of the complex.

Glass Panel Balcony Railings	
. Qty	1,270 m
. Cost	$175,000
. Year(s)	Beyond 2047

The aluminum railings were installed as part of the original construction; as such they are 12 years old. The railings are in satisfactory condition with localized paint deterioration and peeling observed. We estimate replacement will be required in the next 20-25 years.

The precast concrete railings were installed as part of the original construction; as such they are 12 years old. The precast railings are in satisfactory condition with no major deficiencies observed. We estimate repairs will be required in the next 20-25 years. This work has been scheduled to coincide with the concrete balcony slab repairs.

We recommend the following work be anticipated and funded:

.B Replacement of the balcony railings is estimated to cost **$175,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.C Costs for the repair of the precast concrete railings have been included in the concrete balcony repair allowance

5.1.6 Masonry

MASONRY VENEER

A masonry brick veneer is installed as the primary cladding of the building. The masonry veneer will typically last the life of the complex; however, significant repairs usually required after 30 years of service.

Masonry Veneer Repairs	
. Qty	Allowance
. Cost	$100,000
. Year(s)	2033

The masonry veneer was installed as part of the original construction; as such it is 12 years old. The masonry veneer is in satisfactory condition with localized mortar erosion, structural step cracking and brick delamination observed on the lower levels. We do not anticipate replacement of the masonry veneer will be required during the 30-year planning period of this study; however, we expect repairs including isolated repointing and unit replacement, will be required within the scope of this study.

It should be noted that minor efflorescence staining of the brick veneer was observed at the main entrance columns. Efflorescence is usually an indication of moisture seepage through the brick which will cause premature deterioration of the brick veneer. Further investigation into the cause of the efflorescence should be performed in the near future to prevent future masonry problems from occurring.

Significant masonry veneer repairs are generally required after the masonry veneer has obtained 30-years of service; therefore, we recommend a survey of the masonry veneer be carried out prior to any major work to determine the correct scope of work.

In general, regular masonry veneer repairs and maintenance, such as mortar repointing and isolated brick replacements, should be performed at approximately 10 to 12 year intervals to prolong the service life of the brick.

We recommend the following work be anticipated and funded:

.A In order to ensure funds are available to perform isolated repairs when required, an allowance of **$100,000** has been made in **2033 and every 15 years** thereafter
.B Minor repairs of the masonry should be performed, as required, using funds from the operating budget.
.C Although costs are not included in this study, as it does not constitute a major repair or replacement, we recommend that a comprehensive survey of the masonry veneer be performed in 2029 using funds from the operating budget
.D Although costs are not included in this study, as it does not constitute a major repair or replacement, we recommend that an investigation into the masonry veneer efflorescence be performed in 2029 in the next, using funds from the operating budget

CONCRETE BLOCK MASONRY

The concrete block masonry is located throughout the parking garage, and the below-grade rooms and corridors. The concrete block masonry will typically last the life of the complex.

The concrete block masonry was installed as part of the original construction; as such it is 12 years old. The concrete block masonry is in satisfactory condition with localized step cracking observed in the parking garage.

We expect minor patch repairs will be required within the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.E Minor repairs of the concrete block masonry should be performed, as required, using funds from the operating budget.

5.1.7 Exterior Insulation & Finish System (EIFS)

EXTERIOR INSULATION & FINISH SYSTEM

The EIFS is installed at the parking garage entrance. This system typically consists of a cementitious basecoat and acrylic granular finish

coating applied over a rigid insulation-type panel of various thicknesses, which is either mechanically fastened or adhered to the wall. The EIFS has a typical service life of 50-60 years; however, significant repairs are usually required after 25-30 years of service.

The EIFS was installed as part of the original construction; as such it is 12 years old. The EIFS is in satisfactory condition with localized cracking due and corrosion staining observed adjacent to the garage door. We estimate replacement will not be required in the near future; however, we recommend that the EIFS receive an acrylic coating in the next 10-15 years. A subsequent replacement will be required in 20-30 years, following the initial recoating.

We recommend the following work be anticipated and funded:

.A Recoating and repair of the EIFS is estimated to cost **$5,000** and this work has been budgeted in **2031**.
.B Replacement of the EIFS is estimated to cost **$30,000** and this work has been budgeted **beyond the 30-year planning period** of this study
.C Minor repairs of the EIFS should be performed, as required, using funds from the operating budget

EIFS Recoating & Repair	
. Qty	50 m^2
. Cost	$5,000
. Year(s)	2031

EIFS Replacement	
. Qty	50 m^2
. Cost	$30,000
. Year(s)	Beyond 2047

5.1.8 Fascia

ALUMINIUM FASCIA

The aluminium fascia is located at the front entrance canopy and the parking garage podium exit. Aluminium fasica has a typical service life of 30-40 years.

The aluminium fascia was installed as part of the original construction; as such it is 12 years old. The aluminium fascia is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 20-25 years.

We recommend the following work be anticipated and funded:

.A Replacement of the aluminium fascia is estimated to cost **$5,000** and this work has been budgeted **2046** in conjunction with the canopy and garage exit window replacements
.B Minor repairs of the aluminium soffits and fascias should be performed, as required, using funds from the operating budget

Aluminium Fascia	
. Qty(fascia)	80 m
. Cost	$5,000
. Year(s)	2046

5.1.9 Exterior Coatings

EXTERIOR PAINTING

Exterior painting and staining has been performed on the penthouse roof ladder and the gazebo. Exterior painting has a typical service life of 5-6 years.

The exterior painting and staining is suspected to have been installed as part of the original construction as such it is 12 years old. The exterior paint and staining is in fair condition with isolated paint flaking and corrosion observed on the roof access ladder. We estimate replacement will be required in the next 3-5 years. Subsequent painting and staining will be required in 6 years intervals, following the initial replacement.

According to the information provided, exterior painting and staining is treated as an operating expense.

Exterior painting serves an important function in preserving exposed materials and enhancing the appearance of the property. Therefore, painting should be inspected regularly, and minor touch-ups carried out as required.

We recommend the following work be anticipated and funded:

.A As requested by the Board, repainting and staining should be performed, as required, using funds from the operating budget

5.1.10 Caulking

CAULKING

The caulking is located at the window and door openings, the masonry control joints, roof flashings, and parking garage columns. The caulking has a typical service life of 10-12 years.

The caulking is suspected to have been installed as part of the original construction; as such it is 12 years old. The caulking varies from poor to fair condition with areas of cracked, inflexible or split caulking present at the inspected ground floor window and door perimeters and roof flashings. Based on the condition of the caulking it is suspected that the replacements scheduled in 2016 and 2017 were not completed. The caulking has reached the end of its useful service life and should be replaced in the near future. A subsequent caulking replacement will be required in 10-12 years, following the initial replacement.

When caulking is replaced only high-quality materials should be used and all old caulking should be removed before applying the new caulking. Caulking should be inspected regularly, and the necessary repair work carried out by a qualified contractor. Minor repairs should be paid for out of the operating budget

We recommend the following work be anticipated and funded:

.A Replacement of the caulking is estimated to cost **$240,000** and this work has been budgeted equally over two years beginning in **2019** and **every 12 years** thereafter until **2043** when the allowance is reduced to **$50,000** due to the caulking replacements included in the window replacement costs at that time

.B Minor repairs of the caulking should be performed, as required, using funds from the operating budget.

Caulking	
. Qty	Allowance
. Cost	$240,000
. Year(s)	2019-2020 2031-2032

Caulking – Excluding Windows	
. Qty	Allowance
. Cost	$50,000
. Year(s)	2043

5.1.11 Windows & Balcony Doors

WINDOWS

The aluminium framed punched windows and curtain walls provide the primary fenestration for the building. The windows have a typical service life of 30-40 years.

The punched windows were installed as part of the original construction; as such they 12 years old. The windows are in satisfactory condition with no major deficiencies observed. We estimate replacement will be

required in the next 25-30 years.

The curtain wall windows were installed as part of the original construction; as such they are 12 years old with annual sealant repairs completed over the past 3 years to address leak issues. We do not expect replacement of the structural framing of the curtain wall will be required within the 30-year planning period of this study, but replacement of the glazing and caps will be required in the next 20-30 years.

Although the structure of aluminium frame windows can be maintained for periods exceeding 40 years, generally the window system will require replacement within 30 to 40 years as the aluminium frame finishes will degrade over time and become aesthetically unpleasing, the maintenance costs of the window system will begin to increase, and replacement hardware will become more difficult to source.

We recommend the following work be anticipated and funded:

.A Replacement of the punched windows is estimated to cost **$2,100,000** and this work has been budgeted **equally over four years beginning in 2046**, with two years beyond the 30-year scope of this study

.B As requested by the Board, an **annual allowance** of **$40,000** has been budgeted beginning in **2018** for the replacement of the curtain wall glazing and caps when required

.C Minor repairs including replacement of hardware, screens, weatherstripping and isolated thermopanes should be performed, as required, using funds from the operating budget

■ Punched Window Replacement	
. Qty	1,800 m^2
. Cost	$2,100,000
. Year(s)	2046 – 2049

■ Curtain Wall Glazing Replacement	
. Qty	5,300 m^2
. Cost	$40,000
. Year(s)	Annually

ENTRANCE CANOPY WINDOWS

The aluminium framed laminated windows make up the central portion of the front entrance canopy. The windows have a typical service life of 30-40 years.

The windows were installed as part of the original construction; as such they 12 years old. The windows are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

Although the structure of aluminium frame windows can be maintained for periods exceeding 40 years, generally the window system will require replacement within 30 to 40 years as the aluminium frame finishes will degrade over time and become aesthetically unpleasing, the maintenance costs of the window system will begin to increase, and replacement hardware will become more difficult to source.

We recommend the following work be anticipated and funded:

.D Replacement of the windows is estimated to cost **$70,000** and this work has been budgeted **equally over four years beginning in 2046** in conjunction with the punched and curtain wall window replacements

.E Minor repairs including replacement of hardware, screens, weatherstripping and isolated thermopanes should be performed, as required, using funds from the operating budget

■ Entrance Canopy Window Replacement	
. Qty	65 m^2
. Cost	$70,000
. Year(s)	2046 - 2049

GARAGE EXIT WINDOWS

The aluminium framed windows make up the above-grade walls of the

podium garage exit. The windows have a typical service life of 30-40 years.

Garage Exit Window Replacement	
. Qty	32 m^2
. Cost	$34,000
. Year(s)	2046 - 2049

The windows were installed as part of the original construction; as such they 12 years old. The windows are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

Although the structure of aluminium frame windows can be maintained for periods exceeding 40 years, generally the window system will require replacement within 30 to 40 years as the aluminium frame finishes will degrade over time and become aesthetically unpleasing, the maintenance costs of the window system will begin to increase, and replacement hardware will become more difficult to source.

We recommend the following work be anticipated and funded:

.F Replacement of the windows is estimated to cost **$34,000** and this work has been budgeted **equally over four years beginning in 2046** in conjunction with the punched and curtain wall window replacements

.G Minor repairs including replacement of hardware, screens, weatherstripping and isolated thermopanes should be performed, as required, using funds from the operating budget

BALCONY DOORS

The aluminium sliding doors are located at the unit balconies. The balcony doors have a typical service life of 30-40 years.

Balcony Door Replacement	
. Qty	144
. Cost	$400,000
. Year(s)	2046 - 2049

The balcony doors were installed as part of the original construction; as such they are 12 years old. The balcony doors are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

Although the structure of aluminium frame doors can be maintained for periods exceeding 40 years, generally the door system will require replacement within 30 to 40 years as the aluminium frame finishes will degrade over time and become aesthetically unpleasing, the maintenance costs of the door system will begin to increase and replacement hardware will become more difficult to source.

We recommend the following work be anticipated and funded:

.H Replacement of the balcony doors is estimated to cost **$400,000** and this work has been budgeted **equally over four years beginning in 2046** in conjunction with the punched and curtain wall window replacements

.I Minor repairs including replacement of hardware, screens, weatherstripping and isolated thermopanes should be performed, as required, using funds from the operating budget

5.1.12 Doors

MAIN ENTRANCE

The main exterior entrance doors are located on the ground floor at the front of the building. The main entrance doors have a typical service life of 25 to 30 years.

The main entrance doors were installed as part of the original construction; as such they are 12 years old. The main entrance doors are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

Generally main entrance doors have a shorter service than other doors due to their exterior exposure and high traffic use.

We recommend the following work be anticipated and funded:

.A Replacement of the main entrance doors is estimated to cost **$10,000** and this work has been budgeted in **2036**
.B Minor repairs of the main entrance doors should be performed, as required, using funds from the operating budget

Main Entrance Door Replacement	
. Qty.	2
. Cost	$10,000
. Year(s)	2036

COMMON AREA MAN DOORS

The common area man doors are located at entrances of stairwells, in common rooms and corridors, at emergency exits, in the garage and at entrances to mechanical rooms and other common areas. The common area man doors have a varying service life depending on usage and exposure.

The common area man doors were installed as part of the original construction; as such they are 12 years old. The man doors are in satisfactory condition with no major deficiencies observed. We do not anticipate full replacement will be required during the 30-year planning period of this study; however, isolated major repairs or replacements will be required periodically.

We recommend the following work be anticipated and funded:

.C In order to ensure funds are available to perform isolated repairs and replacements when required, an allowance of **$5,000** has been made in **2026** and **every 10 years** thereafter
.D Minor repairs of the unit suite doors should be performed, as required, using funds from the operating budget

Common Area Man Door Replacement	
. Qty.	Allowance
. Cost	$5,000
. Year(s)	2026, 2036, 2046

UNIT SUITE DOOR

The unit suite doors have a typical service life of 40-50 years.

The unit suite doors were installed as part of the original construction; as such they are 12 years old. The unit suite doors are in satisfactory condition with no major deficiencies observed. We do not anticipate full replacement will be required during the 30-year planning period of this study; however, isolated major repairs or replacements will be required periodically.
We recommend the following work be anticipated and funded:

.E In order to ensure funds are available to perform isolated repairs and replacements when required, an allowance of **$25,000** has been made in **2041 and every 5 years** thereafter
.F Minor repairs of the unit suite doors should be performed, as required, using funds from the operating budget

Unit Suite Door Replacement	
. Qty.	Allowance
. Cost	$25,000
. Year(s)	2041, 2046

GARAGE DOOR

The garage door is located at the garage entrance on the east side of the building. The garage door has a typical service life of 15-20 years but can vary depending on usage.

The garage door was installed as part of the original construction as such it is 12 years old. The garage door is in satisfactory condition, however localized corrosion was observed on the exterior frame. We estimate replacement will be required in the next 5-10 years.

Garage Door Replacement	
. Qty.	1
. Cost	$5,000
. Year(s)	2026, 2046

We recommend the following work be anticipated and funded:

.G Replacement of the garage door is estimated to cost **$2,000** and this work has been budgeted in **2026 and every 20 years** thereafter
.H Minor repairs of the garage doors should be performed, as required, using funds from the operating budget

5.1.13 Roofing Systems

INVERTED ROOFING SYSTEM

An inverted roofing membrane system protects the main roof, penthouse roof, entrance canopy, and the podium access stairwell. Inverted roofs typically consists of a hot-applied rubberized asphalt membrane covered by rigid insulation, filter fabric and gravel ballast. An inverted roofing system has a typical service life of 20-25 years.

Inverted Roofing System Replacement – Main Roof	
. Qty	1,800 m^2
. Cost	$480,000
. Year(s)	2031

The inverted roofing membranes were installed as part of the original construction; as such they are 12 years old. Based on their current age, we expect the inverted roofing systems are in satisfactory condition. We estimate replacement will be required in the next 10-15 years. A subsequent roof replacement will be required in 20-25 years, following the initial replacement.

Inverted Roofing System Replacement – Podium Stairs & Entrance Canopy	
. Qty	70 m^2
. Cost	$20,000
. Year(s)	2031

We recommend the following work be anticipated and funded:

.A Replacement of the inverted roofing membrane system on the main roof is estimated to cost **$480,000** and this work has been budgeted in **2031 and every 25 years** thereafter
.B Replacement of the inverted roofing membrane system at the podium stairs and entrance canopy is estimated to cost **$20,000** and this work has been budgeted in **2031 and every 25 years** thereafter
.C Minor repairs of the inverted roofing membrane system should be performed, as required, using funds from the operating budget

METAL ROOFING

The metal roofing is located on the mechanical penthouse and is comprised of aluminum siding. The aluminium siding has a typical service life of 40-50 years.

Aluminium Siding	
. Qty	560 m^2
. Cost	$200,000
. Year(s)	Beyond 2047

The aluminium siding was installed as part of the original construction; as such it is 12 years old. The aluminium siding is in satisfactory condition with no major deficiencies observed. We estimate that major repairs will not be required within the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.A Replacement of the aluminium siding is estimated to cost **$200,000** and this work has been budgeted **beyond the 30-**

year planning period of this study

.B Minor repairs of the aluminium siding should be performed, as required, using funds from the operating budget

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5.1.14 Common Corridors

The interior finishes of the corridors on levels 1-19 consist of painted, and decorative panel walls, stone, ceramic tile, and painted concrete flooring, and painted and acoustical tile ceilings.

The interior finishes of the corridors on levels P-P2 consist of painted walls, ceramic tile and painted concrete flooring, and painted ceilings.

As requested by the Board, all interior refinishing and refurnishing is to be completed using funds from the operating budget.

PAINTED WALLS

The walls are painted in the main corridors of the building. Painted walls have a typical service life of 10-15 years prior to becoming aesthetically unpleasing.

The painted walls are suspected to have been last painted as part of the original construction; as such they are 12 years old. The painting is in satisfactory condition with no major deficiencies observed. We estimate repainting will be required in the next 5 years. Subsequent repainting will be required in 10-15 years, following the initial replacement.

We recommend the following work be anticipated and funded:

.A Repainting should be performed, as required, using funds from the operating budget

DECORATIVE WALL PANELS

The walls are cladded with decorative panels in the main corridors of the building. Wall panels have a typical service life of 40 years prior to becoming aesthetically unpleasing.

The wall panels on levels 1-19 were installed as part of the original construction; as such they are 12 years old. The wall panels are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

We recommend the following work be anticipated and funded:

.B Repair and replacement of the decorative wall panels should be performed, as required, using funds from the operating budget.

STONE FLOORING

Stone flooring is installed on levels 1-19. The stone flooring will typically last the life of the complex.

The stone flooring on levels 1-19 was installed as part of the original construction; as such it is 12 years old. The stone flooring is in satisfactory condition with no major deficiencies observed. We do not anticipate major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.C Minor repairs should be performed, as required, using funds from the operating budget

CERAMIC TILE FLOORING

Ceramic tile flooring is installed on levels P2-19. Ceramic tile flooring has a typical service life of 40-50 years prior to requiring replacement.

The ceramic tile flooring on levels was installed as part of the original construction; as such it is 12 years old. The ceramic tile flooring is in satisfactory condition with no major deficiencies observed. We do not anticipate major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.D Repair and replacement of the ceramic tile flooring should be performed, as required, using funds from the operating budget

PAINTED CONCRETE FLOORS

Painted concrete floors are located throughout the building. The painted concrete floors have a typical service life of 15-20 years prior to becoming aesthetically unpleasing.

The painted concrete floors are suspected to have been last painted as part of the original construction; as such they are 12 years old. The painted concrete is in satisfactory condition with isolated areas of coating damage observed throughout the building. We estimate repainting will be required in the next 5 years. Subsequent repainting will be required in 15-20 years, following the initial replacement.

We recommend the following work be anticipated and funded:

.E Minor repairs of the exposed concrete ceiling should be performed, as required, using funds from the operating budget

ACOUSTICAL TILE

Acoustical tile ceilings are located on levels 2-19. The acoustical tile ceilings will have a typical service life of 40-50 years.

The acoustical tile ceilings on levels 2-19 were installed as part of the original construction; as such they are 12 years old. The acoustical tile ceilings are in satisfactory condition with no major deficiencies observed. We do not anticipate replacement will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.F Minor repairs of the acoustical tile ceiling should be performed, as required, using funds from the operating budget

PAINTED CEILINGS

The ceilings are painted in the main corridors of the building. Painted ceilings have a typical service life of 15-20 years prior to becoming aesthetically unpleasing.

The painted ceilings are suspected to have been last painted as part of

the original construction; as such are 12 years old. The painting is in satisfactory condition with no major deficiencies observed. We estimate repainting will be required in the next 5 years. Subsequent repainting will be required in 15-20 years, following the initial replacement.

We recommend the following work be anticipated and funded:

.G Minor repainting should be performed, as required, using funds from the operating budget

5.1.15 Common Rooms

The interior common rooms of the building include a lobby, stairwells, a condominium office, an exercise room, a steam room, change rooms, a library, bike rooms, a party room, a games room, a hobby room and a janitor's laundry room.

As requested by the Board, all interior refinishing and refurnishing is to be completed using funds from the operating budget.

LOBBY

The lobby consists of stone tile floors, painted drywall and decorative wall paneling, and painted drywall coffered ceilings. Furnishings include a security guard desk, couches, chairs, tables, mailboxes and artwork. Generally major renovations of the lobby occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The lobby finishes were installed as part of the original construction; as such they are 12 years old. The lobby finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The lobby furniture was last updated as part of the original construction; as such it is 12 years old. The lobby furniture is in satisfactory condition with no major deficiencies observed. We estimate replacement of the lobby furniture will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.A Replacement of the lobby furniture or finishes should be performed, as required, using funds from the operating budget

STAIRWELLS

The stairwells consist of painted concrete walls, floors and ceilings.

The stairwell painted is suspected to have been last updated as part of the original construction; as such it is 12 years old. stairwell finishes are in satisfactory condition with isolated areas of damaged and peeling paint observed. We estimate isolated repainting will be required over the 30-year planning period of this study.
We recommend the following work be anticipated and funded:

.B Repairs to the stairwell finishes should be performed, as required, using funds from the operating budget

CONDOMINIUM OFFICE

The condominium office consists of carpeted floors, painted drywall

walls, and a painted drywall ceiling. Furnishings include chairs, a desk, tables and storage. Generally major renovations of the condominium office occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 15 years.

The condominium office finishes were last updated as part of the original construction; as such they are 12 years old. The office finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The office furniture is suspected to have last been updated as part of the original construction; as such it is 12 years old. The office furniture is in satisfactory condition with no major deficiencies observed. We estimate isolated furniture replacements will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.C Replacement of the condominium office furniture or finishes should be performed, as required, using funds from the operating budget

LIBRARY

The library consists of carpeted floors and painted drywall walls and ceilings. Furnishings include tables, chairs, shelving, lighting and artwork. Generally major renovations of the library occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The library finishes were last updated as part of the original construction; as such they are 12 years old. The library finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The library furniture was last updated as part of the original construction; as such it is 12 years old. The library furniture is in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.D Replacement of the library furniture or finishes should be performed, as required, using funds from the operating budget

EXERCISE ROOM

The exercise room consists of a carpeted floor with painted drywall walls and a painted drywall ceiling. Furnishings include exercise equipment. Generally major renovations of the exercise room occur after 30-40 years of service as the original finishes appear dated. The service life of the exercise equipment varies based on usage and maintenance.

■ Exercise Room Equipment Allowance

. Qty	Allowance
. Cost	$4,000
. Year(s)	2021, 2026, 2031 2036, 2041, 2046

The exercise room finishes were last updated as part of the original construction; as such they are 12 years old. The exercise room finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The exercise room equipment is suspected to have been installed as part of the original construction; as such it is 12 years old. The exercise

room equipment is in satisfactory condition with no major deficiencies observed. We estimate isolated replacements will be required over the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.E At the request of the Board, in order to ensure funds are available to replace exercise room equipment when required, an allowance of **$4,000** has been made in **2021 and every 5 years** thereafter

.F Refinishing of the exercise room should be performed, as required, using funds from the operating budget

STEAM ROOMS

The steam rooms are located within the swimming pool change rooms. The steam room finishes consist of ceramic tile walls, flooring and seating. The finishes of the steam room have a typical service life of 20-30 years.

The finishes of the steam rooms were installed as part of the original construction; as such they are 12 years old. The steam rooms are in satisfactory condition with no major deficiencies observed. We estimate repairs will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.G Refinishing of the steam room should be performed, as required, using funds from the operating budget

CHANGE ROOMS

The change rooms consist of ceramic tile floors, painted drywall and ceramic tile walls, and painted drywall ceilings. Furnishings include showers, lockers, benches and washrooms. Generally major renovations of the change rooms occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The change room finishes were installed as part of the original construction; as such they are 15 years old. The change room finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required over the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.H Replacement of the change room furniture or finishes should be performed, as required, using funds from the operating budget

HOBBY ROOM

The hobby room consists of painted concrete walls, floors and ceilings. Furnishings include work benches, chairs, tool cabinets, carpentry equipment; and storage lockers. Generally major renovations of the theatre room occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The hobby room finishes were last updated as part of the original construction; as such they are 12 years old. The hobby room finishes

are in satisfactory condition with no major deficiencies observed. We estimate isolated repainting will be required over the 30-year planning period of this study.

The hobby room equipment and furniture are suspected to have been last updated as part of the original construction; as such it is 12 years old. The hobby room furniture and equipment are in satisfactory condition with no major deficiencies observed. We estimate isolated replacements will be required over the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.I Replacement of the hobby room furniture or finishes should be performed, as required, using funds from the operating budget

BIKE ROOMS

The bike room consists of painted concrete walls and ceilings and exposed concrete floors. Furnishings include steel bike racks.

The bike room finishes were installed as part of the original construction; as such they are 12 years old. The bike room finishes are in satisfactory condition with no major deficiencies observed. We estimate isolated repainting will be required over the life of the condominium.
We recommend the following work be anticipated and funded:

.J Repairs to the furniture or finishes should be performed, as required, using funds from the operating budget

LOCKERS

The locker rooms consist of painted concrete walls and ceilings and exposed concrete floors. Furnishings include steel lockers. Typically, the lockers require replacement every 30-40 years, depending on usage.

The locker room finishes were installed as part of the original construction; as such they are 12 years old. The locker room finishes are in satisfactory condition with no major deficiencies observed. We estimate isolated repainting will be required over the life of the condominium.

The lockers were installed as part of the original construction; as such they are 12 years old. The lockers are in satisfactory condition with no major deficiencies observed. We estimate isolated repairs and replacements will be required in 20-25 years.

We recommend the following work be anticipated and funded:

.K Minor repairs to the furniture or finishes should be performed, as required, using funds from the operating budget

PARTY ROOM

The party room consists of carpeted and ceramic tile floors, painted walls, acoustic ceiling tiles and painted drywall ceilings. Furnishings include a stove, microwave, dishwasher, refrigerator, cabinets, couches, chairs, tables, AV equipment and three single washrooms. Generally major renovations of the party rooms occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires

replacement every 10 years.

The party room finishes were last updated as part of the original construction; as such they are 12 years old. The party room finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The party room furniture is suspected to have been last updated as part of the original construction; as such it is 12 years old. The party room furniture is in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.L Replacement of the party room furniture or finishes should be performed, as required, using funds from the operating budget

JANITOR LAUNDRY ROOM

The janitor laundry room consists of ceramic tile floors and painted concrete walls and ceilings. Furnishings include a washer and a dryer. Generally major renovations of the laundry rooms occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The laundry room finishes were last updated as part of the original construction; as such they are 12 years old. The laundry room finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The laundry room equipment is suspected to have been last updated as part of the original construction; as such it is 12 years old. The laundry room equipment is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.M Refinishing and replacement of the janitor laundry room equipment should be performed, as required, using funds from the operating budget

GAMES ROOM

The games room consists of carpeted floors, painted drywall walls and painted concrete walls and ceilings. Furnishings include a pool table, a ping pong table, a dart board, tables, chairs, lighting and artwork. Generally major renovations of the billiards rooms occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The games room finishes were last updated as part of the original construction; as such they are 12 years old. The games room finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The games room furniture was last updated as part of the original construction; as such it is 12 years old. The games room furniture is in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.N Replacement of the games room furniture or finishes should be performed, as required, using funds from the operating budget

GUEST SUITE

The gust suite consists of carpeted and ceramic tile floors, painted drywall walls and painted ceilings. Furnishings includes two beds, tables, chairs, storage, decorative paintings and lighting, a television and a bathroom. Generally major renovations of guest suites occur after 30-40 years of service as the original finishes appear dated. Typically, the furniture requires replacement every 10 years.

The guest suite finishes were last updated as part of the original construction; as such they are 12 years old. The guest suite finishes are in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 20-25 years.

The guest suite furniture was last updated as part of the original construction; as such it is 12 years old. The guest suite furniture is in satisfactory condition with no major deficiencies observed. We estimate refinishing will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.O Replacement of the guest suite furniture or finishes should be performed, as required, using funds from the operating budget

5.2 Electrical

5.2.1 Electrical Distribution

MAIN DISCONNECT SWITCHGEAR

The 1200A, 600V main disconnect switchgear located in the main electrical room within the parking garage protects and isolates the main electrical feed into the building. Main disconnect switchgear has a typical service life of 40-45 years.

Main Disconnect Switchgear	
. Qty	1
. Cost	$320,000
. Year(s)	Beyond 2047

The main disconnect switchgear was installed as part of the original construction; as such is 12 years old. The main disconnect switchgear is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

We recommend that a company skilled in electrical distribution equipment maintenance be hired to open, inspect, test, clean and torque the boards, and that infrared thermography be performed on switches, panels, disconnects, transformers, and starters to determine “hot spots” on a regular basis. A qualified electrician should be employed to open and close panels and to correct immediate concerns during this inspection. The results of this inspection and testing will provide a much more accurate estimate of when the electric equipment will have to be repaired and/or replaced. This will require that the power to the building be shut off for 8 to 12 hours.

Note: The Electrical Room is being used as a storage space and access to panels and switches is being blocked by the stored items. Materials, supplies and trash left in electrical rooms often block access, are a

source for accidents, and pose potential fire hazards. Allowing any objects to be left near electrical panels violates the Ontario Electrical Safety Code:

> RULE 2-308 states “a minimum working space of 1 metre with secure footing shall be provided and maintained about electrical equipment… enclosed in metal.”
>
> RULE 2-312 further requires “working space around electrical equipment shall not be used for storage and shall be kept clear of obstruction.”

In order to comply with the Ontario Electrical Safety code, all items not related to the electrical maintenance (parts and tools) of the equipment in the electrical room should be removed.

We recommend the following work be anticipated and funded:

.A Replacement of the main disconnect switchgear is estimated to cost **$320,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.B Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend periodic maintenance and infrared thermography be performed on the electrical system every 5 years, using funds from the operating budget

METERING SOCKETS

The metering sockets located in the electrical rooms within the building provide individual electrical metering to the suites. Metering sockets have a typical service life of 45-50 years.

Metering Sockets	
. Qty	144
. Cost	$230,000
. Year(s)	Beyond 2047

The metering sockets were installed as part of the original construction; as such are 12 years old. The metering sockets are in satisfactory condition with no major deficiencies observed. We do not anticipate replacement will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.C Replacement of the metering sockets is estimated to cost **$230,000** and this work has been budgeted **beyond the 30-year planning period** of this study

DISTRIBUTION BREAKER PANELS

The 120/240V and 600V distribution breaker panels installed in electrical rooms and mechanical rooms divide electrical power feed into subsidiary circuits. Moulded case circuit breakers contained within provide circuit overload protection. Breaker panels have a typical service life of 40-45 years.

Electrical Distribution Breaker Panels	
. Qty	6
. Cost	$100,000
. Year(s)	Beyond 2047

The breaker panels and circuit breakers were installed as part of the original construction; as such are 12 years old. The distribution breaker panels and moulded case breakers are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

We recommend the following work be anticipated and funded:

.D Replacement of the breaker panels and moulded case breakers is estimated to cost **$100,000** and this work has been budgeted **beyond the 30-year planning period** of this study

FUSED DISCONNECT SWITCHES

The 600V fused disconnect switches of amperages ranging from 30A to 400A installed in electrical rooms, mechanical rooms, and electrical provide electrical power feed and overload protection to individual pieces of equipment. Fused disconnect switches have a typical service life of 40-45 years.

Fused Disconnect Switches	
. Qty	40
. Cost	$115,000
. Year(s)	Beyond 2047

The fused disconnect were installed as part of the original construction; as such are 12 years old The fused disconnect switches are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

We recommend the following work be anticipated and funded:

.E Replacement of the fused disconnect switches is estimated to cost **$115,000** and this work has been budgeted **beyond the 30-year planning period** of this study

DRY CORE TRANSFORMERS

The dry core transformers ranging from 27 kVA to 250 kVA located in the electrical and mechanical rooms reduce the voltage of the electrical feed. Dry core transformers have a typical service life of 35-40 years.

Dry Core Transformers	
. Qty	13
. Cost	$415,000
. Year(s)	2046

The dry core transformers were installed as part of the original construction; as such are 12 years old. The dry core transformers are in satisfactory condition with no major deficiencies observed. We estimate overhaul or replacement will be required in the next 20-25 years.

We recommend the following work be anticipated and funded:

.F Replacement or overhaul of the dry core transformers is estimated to cost **$415,000** and this work has been budgeted in **2046**

MECHANICAL LOAD STARTERS

The 600V motor starters installed in the electrical and mechanical rooms provide a safe method for starting an electric motor with a large load, under-voltage and overload protection, and an automatic cut-off in the event of a power failure. Motor starters have a typical service life of 20-25 years which can vary depending on usage.

Motor Starters	
. Qty	Allowance
. Cost	$18,000
. Year(s)	2021, 2026, 2031 2036, 2041, 2046

The motor starters were installed as part of the original construction; as such are 12 years old. The motor starters are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.G Due to the varying service life of the motor starters, replacement need only be completed as required. For budgeting purposes, an allowance of **$18,000** has been made in **2021 and every 5 years thereafter** to ensure funds are available when the work is

required

5.2.2 Lighting

LIGHT FIXTURES

The common area light fixtures are located throughout the common areas of the building and inside the parking garage. Common area light fixtures have a varying service life depending on usage and environmental conditions.

The common area light fixtures have been replaced as required over the life of the condominium. According to the information provided, the majority of the light fixtures have been upgraded to LED bulbs. The common area light fixtures are in satisfactory condition with no major deficiencies observed. We expect isolated light fixture replacement will be required within the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.A Full scale replacement of the light fixtures should not be required during the span of this study, and consequently, no funds have been allocated for fixture replacement. When individual fixtures and light bulbs/tubes require replacement, the costs should be paid for out of the operating budget

5.2.3 Fire Alarm System

FIRE ALARM PANEL

The Siemens fire alarm panel with voice annunciator installed in the fire alarm closet adjacent to the lobby and the remote annunciator installed in the main entrance vestibule provide monitoring of the fire alarm sensors. Fire alarm panels have a typical service life of 25-30 years.

Fire Alarm Panel	
. Qty	1
. Cost	$300,000
. Year(s)	2042

The fire alarm panel was installed as part of the original construction; as such is 12 years old. The fire alarm panel is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 20-25 years.

We recommend the following work be anticipated and funded:

.A Replacement of the fire alarm panel and partial rewiring of the fire alarm system is estimated to cost **$300,000** and this work has been budgeted in **2042**

.B Although costs are not included in this study, as they do not constitute a major repair or replacement, the ULC 536 test of the fire alarm system is required on an annual basis, using funds from the operating budget

FIRE ALARM SENSORS

The smoke detectors and heat sensors located in the common areas throughout the building provide monitoring for the fire alarm system. Smoke detectors and heat sensors have a typical service life of 5-10 years.

According to the information provided, the smoke detectors and heat sensors are suspected to have been replaced in 2018 using funds from the operating budget. The smoke detectors and heat sensors are in

satisfactory condition with no major deficiencies observed. We estimate isolated replacement will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.C As requested by the Board, replacement of the smoke detectors and heat sensors is to be completed using funds from the operating budget

5.2.4 Emergency Power System

EMERGENCY POWER SYSTEM

The Kholer 600V, 300kW emergency power generator consisting of a Volvo diesel fueled engine, located in the generator room within the parking garage provides emergency power to the elevators, emergency lights, and life and safety equipment. Emergency power generators have a typical service life of 30-35 years.

Emergency Power Generator	
. Qty	1
. Cost	$325,000
. Year(s)	2036

The emergency power generator was installed as part of the original construction; as such is 12 years old. The emergency power generator is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

Emergency Power Generator & Fuel Systems Code Compliance Updates	
. Qty	1
. Cost	$29,000
. Year(s)	2018

We recommend the following work be anticipated and funded:

.A Replacement of the emergency power generator is estimated to cost **$325,000** and this work has been budgeted in **2036**

.B A quotation of **$29,000** has been provided by GAL Power for the TSSA code compliance updates of the emergency generator and fuel system and this work has been budgeted in **2018**

TRANSFER SWITCH

The Cutler-Hammer 400A transfer switch located in the generator room within the parking garage automatically transfers power between the main hydro power and emergency power. Transfer switches have a typical service life of 30-35 years.

Emergency Transfer Switch	
. Qty	1
. Cost	$20,000
. Year(s)	2036

The transfer was installed as part of the original construction; as such is 12 years old. The transfer switch is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.C Replacement of the transfer switch is estimated to cost **$20,000** and this work has been budgeted in **2036**, in conjunction with the emergency generator replacement

FUEL STORAGE TANKS

The 1,500 litres double wall main fuel tank located in the parking garage generator room provides diesel fuel storage for the generator. TSSA requires fuel storage tanks to be replaced every 10 years.

Fuel Storage Main Tank	
. Qty	1
. Cost	$15,000
. Year(s)	2028, 2038

The main fuel tank was installed as part of the original construction; as such is 12 years old. Based on its current age, the main fuel tank is required to be replaced. The main fuel tank has exceeded the end of their useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.D Replacement of the main fuel tank is estimated to cost **$15,000,** the costs for the 2018 replacement have been included with the Emergency Power Generator & Fuel Systems Code Compliance Updates. Subsequent fuel tank replacement has been budgeted in **2028 and every 10 years thereafter**

5.2.5 Electrical Heating Systems

BASEBOARD ELECTRIC HEATERS

The baseboard electric heaters located in ground floor common areas provide supplemental heating to these areas. Baseboard electric heaters have a typical service life of 40-45 years.

The baseboard electric heaters were installed as part of the original construction; as such are 12 years old. Based on their current age, we expect the baseboard electric heaters are satisfactory condition. We expect isolated replacement will be required within the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.A As requested by the Board, repairs and replacements of the electric baseboard heaters are to be completed as required using funds from the operating budget

FORCED FLOW ELECTRIC HEATERS

The forced flow electric heaters located in emergency exits, provide primary heating to these areas. Forced flow electric heaters have a typical service life of 25-30 years.

Forced Flow Electric Heaters	
. Qty	4
. Cost	$6,000
. Year(s)	2031

The forced flow electric heaters were installed as part of the original construction; as such are 12 years old. The forced flow electric heaters are in satisfactory condition with no major deficiencies observed. We expect isolated replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.B Replacement of the forced flow electric heaters is estimated to cost **$6,000** and this work has been budgeted in **2031**

5.2.6 Security Systems

DOOR ENTRY SYSTEM

The Kantech phone based door entry system consists of an access panel located in the main entrance vestibule to provide visitor access to the building. Door entry systems have a typical service life of 25-30 years.

Door Entry System	
. Qty	1
. Cost	$8,000
. Year(s)	2031

The door entry system was installed as part of the original construction; as such is 12 years old. The door entry system is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.A Replacement of the door entry system is estimated to cost **$8,000** and this work has been budgeted in **2031**

KEY FOB SYSTEM

The key fob system consists of a main controller and fob readers. Key fob systems have a typical service life of 15-20 years.

Key Fob System	
. Qty	1
. Cost	$20,000
. Year(s)	2030, 2045

According to the information provided, the key fob system was replaced in 2016; as such it is 2 years old. The key fob system is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.B Replacement of the key fob system is estimated to cost **$20,000** and this work has been budgeted in **2030 and every 15 years thereafter**

CCTV SYSTEM

The CCTV system consists of a DVR and screen located in the pool security room and monitors 11 B&W cameras located inside the building and parking garage. CCTV DVR monitoring stations have a typical service life of 15-20 years. CCTV cameras have a typical service life of 10-15 years.

CCTV Monitoring Station	
. Qty	1
. Cost	$12,000
. Year(s)	2021, 2036

The CCTV monitoring station was installed as part of the original construction; as such is 12 years old. The CCTV monitoring station is in fair condition with no major deficiencies observed. We estimate replacement will be required in the next 5 years.

CCTV Cameras	
. Qty	15
. Cost	$6,000
. Year(s)	2021, 2031, 2041

The CCTV cameras are suspected to have been installed as part of the original construction; as such are 12 years old. Based on their current age, we expect the CCTV cameras are in fair condition. The CCTV cameras have reached the end of their useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.C Replacement of the CCTV monitoring station is estimated to cost **$12,000** and this work has been budgeted in **2021 and every 15 years thereafter**

.D Replacement of the CCTV cameras is estimated to cost **$6,000** and this work has been budgeted in **2021 and every 10 years thereafter**

BUILDING AUTOMATION SYSTEM

The building automation system consists of a computer and screen located in the mechanical room and monitors the building's HVAC equipment. Building automation systems have a typical service life of 15-20 years.

Building Automation System	
. Qty	1
. Cost	$10,000
. Year(s)	2027, 2037, 2047

The building automation system monitoring station was replaced in 2017; as such is 1 year old. The building automation system is in satisfactory condition with no major deficiencies observed. We estimate updates and upgrades of to the building automation system will be required in the 30-year planning of this study.

We recommend the following work be anticipated and funded:

.E Due to the varying service life of the building automation system, isolated repairs, updates or upgrades need only be completed as required. For budgeting purposes, an allowance of **$10,000** has been made in fiscal year **2027 and every 10 years thereafter** to ensure funds are available when the work is required

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5.3 Mechanical

5.3.1 Ventilation System

MAKE-UP AIR UNIT

The packaged indoor Engineered Air 27,000CFM make-up air unit with glycol heating and built in cooling coils and compressors located in the penthouse mechanical room provides fresh air to the building, pressurises the building and prevents odour transfer between units. Make-up air units have a typical service life of 30-35 years.

Make-up Air Unit	
. Qty	1
. Cost	$300,000
. Year(s)	2036

The make-up air unit was installed as part of the original construction; as such is 12 years old. The make-up air unit is in satisfactory condition with no major deficiencies observed. We estimate replacement or major overhaul will be required in the next 20-25 years.

We recommend the following work be anticipated and funded:

.A Replacement of the make-up air unit is estimated to cost **$300,000** and this work has been budgeted in **2036**

EXHAUST FANS

The multiple exhaust fans located in the electrical rooms, electrical vault, mechanical room, locker rooms, garbage room, laundry exhaust and other common areas provide ventilation and temperature control. Exhaust fans have a typical service life of 30-35 years which can vary greatly depending on usage and environmental conditions.

Exhaust Fans	
. Qty	Allowance
. Cost	$25,000
. Year(s)	2026, 2036, 2046

The exhaust fans were installed as part of the original construction; as such are 12 years old. The exhaust fans are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.B Due to the varying service life of the exhaust fans, isolated replacement need only be completed as required. For budgeting purposes, an allowance of **$25,000** has been made in **2026 and every 10 years thereafter** to ensure funds are available when the work is required

GARAGE VENTILATION

The axial exhaust fans, and motorized dampers for the parking garage ventilation are set to run in conjunction with the gas detection system. Axial exhaust fans and motorized dampers have a typical service life of 30-35 years.

Garage Exhaust Fans	
. Qty	5
. Cost	$30,000
. Year(s)	2036

The axial exhaust fans were installed as part of the original construction;

as such are 12 years old. The axial exhaust fans are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

Motorized Dampers	
. Qty	Allowance
. Cost	$20,000
. Year(s)	2036

The motorized were installed as part of the original construction; as such are 12 years old. The motorized dampers are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.C Replacement of the axial exhaust fans is estimated to cost **$30,000** and this work has been budgeted in **2036**

.D Due to the varying expected wear of the motorized dampers, replacement need only be completed as required. For budgeting purposes, an allowance of **$20,000** has been made in **2036**

GARAGE GAS MONITORING SYSTEM

The Armstrong gas monitoring controller monitors CO sensors located in the parking garage controlling the operation of the parking garage ventilation equipment. Gas monitoring controllers have a typical service life of 15-20 years. CO sensors have a typical service life of 5-7 years.

Gas Monitoring Controller	
. Qty	1
. Cost	$10,000
. Year(s)	2021, 2036

The gas monitoring controller was installed as part of the original construction; as such is 12 years old. The gas monitoring controller is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5 years.

CO Sensors	
. Qty	Allowance (16)
. Cost	$8,000
. Year(s)	2019, 2024, 2029 2034, 2039, 2044

The CO sensors are tested and calibrated annually and are replaced on an as-needed basis. Based on their current age, we expect the CO sensors are in satisfactory condition. We estimate isolated replacement will be required in the next 5 years.

Calibration and testing of the CO sensors should occur every 12 months by a qualified service technician.

We recommend the following work be anticipated and funded:

.E Replacement of the gas monitoring controller is estimated to cost **$10,000** and this work has been budgeted in **2021 and every 15 years thereafter**

.F Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend that testing and calibration of the gas monitoring system be performed every year, using funds from the operating budget

.G Due to the varying condition of the CO sensors, replacement need only be completed as required. For budgeting purposes, an allowance of **$8,000** has been made in **2019 and every 5 years thereafter** to ensure funds are available when the work is required

5.3.2 Heating & A/C Systems

HEATING BOILERS

The Laars 2,501MBH output gas fueled atmospheric heating boilers located in the penthouse mechanical room provide heated water to the fan coil loop hot water heater loop and make-up air unit. Atmospheric

heating boilers have a typical service life of 25-30 years.

The heating boilers were installed as part of the original construction; as such are 12 years old. The heating boilers are in fair condition as three of the boilers were down for maintenance due to cracked refractories. We estimate replacement will be required in the next 10-15 years.

Atmospheric Heating Boilers	
. Qty	3
. Cost	$445,000
. Year(s)	2031

One of the atmospheric heating boilers is going to be replaced with a condensing HydroTherm KN-30 boiler in 2018-2019. Condensing boilers have a service life of 20-25 years, as such a subsequent replacement will be required in the next 20-25 years.

Condensing Heating Boiler	
. Qty	1
. Cost	$147,000
. Year(s)	2018, 2038

We recommend the following work be anticipated and funded:

.A Replacement of the 3 remaining atmospheric heating boilers is estimated to cost **$445,000** and this work has been budgeted in **2031**

.B A quotation of **$147,000** has been provided by Baxtec Mechanical Services for the replacement of one of the atmospheric heating boiler for a condensing boiler and this work has been budgeted in **2018 and every 20 years thereafter**

.C A quotation of **$20,000** has been provided by Baxtec Mechanical Services for the replacement of the refractory panels for 3 boilers and this work has been budgeted in the **current year**

Refractory Panels of Heating Boilers	
. Qty	3
. Cost	$20,000
. Year(s)	2018

PRIMARY LOOP PUMPS

The Bell & Gossett 900USGPM, 10HP primary loop pumps in the penthouse mechanical room hot water circulation between the boiler and the secondary heating loops. Primary loop pumps have a typical service life of 25-30 years.

Primary Loop Pumps	
. Qty	2
. Cost	$30,000
. Year(s)	2031

The primary loop pumps were installed as part of the original construction; as such are 12 years old. The primary loop pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.D Replacement of the primary loop pumps is estimated to cost **$30,000** and this work has been budgeted in **2031**

PRIMARY HEAT PUMP LOOP PUMPS

The Bell & Gossett 1,100USGPM, 40HP primary heat pump loop pumps, located in the penthouse mechanical room distribute the tempered water throughout the building to the primary heat pumps inside the units and common areas. Primary heat pump loop pumps have a typical service life of 25-30 years.

Primary Heat Pump Loop Pumps	
. Qty	2
. Cost	$120,000
. Year(s)	2031

The primary heat pump loop pumps were installed as part of the original construction; as such are 12 years old. The primary heat pump loop pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.E Replacement of the primary heat pump loop pumps is estimated to cost **$120,000** and this work has been budgeted in **2031**

HEATING HEAT PUMP LOOP PUMPS

The Bell & Gossett 100USGPM, 1HP heating heat pump loop pumps, located in the penthouse mechanical room distribute the tempered water throughout the building to the heating heat pumps inside the units and common areas. Heating heat pump loop pumps have a typical service life of 25-30 years.

Heating Heat Pump Loop Pumps	
. Qty	2
. Cost	$9,000
. Year(s)	2031

The heating heat pump loop pumps were installed as part of the original construction; as such are 12 years old. The heating heat pump loop pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.F Replacement of the heating heat pump loop pumps is estimated to cost **$9,000** and this work has been budgeted in **2031**

GARAGE HEATING LOOP PUMPS

The Bell & Gossett 225USGPM, 5HP garage heating loop pumps, located in the penthouse mechanical room distribute the water to the garage heating loop. Garage heating loop pumps have a typical service life of 25-30 years.

Garage Heating Loop Pumps	
. Qty	2
. Cost	$36,000
. Year(s)	2031

The garage heating loop pumps were installed as part of the original construction; as such are 12 years old. The garage heating loop pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-25 years.

We recommend the following work be anticipated and funded:

.G Replacement of the garage heating loop pumps is estimated to cost **$36,000** and this work has been budgeted in **2031**

MAKE-UP AIR CIRCULATING PUMPS

The Bell & Gossett 275USGPM and 300USGPM, 5HP and 7.5HP make-up air circulating pumps located in the penthouse mechanical room circulate water and glycol between the make-up air, the heat exchanger, and the main heating loop. Make-up air circulating pumps have a typical service life of 25-30 years.

Make-up Air Circulating Pumps	
. Qty	2
. Cost	$18,000
. Year(s)	2031

The make-up air circulating pumps were installed as part of the original construction; as such are 12 years old. The hydronic loop pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.

We recommend the following work be anticipated and funded:

.H Replacement of the make-up air circulating pumps is estimated to cost **$18,000** and this work has been budgeted in **2031**

COOLING TOWER

The BAC 482-Ton capacity cooling tower installed in the penthouse mechanical room cools down the water in the heat pump loop. Cooling towers have a typical service life of 20-25 years with proper preventive maintenance and water treatment.

Cooling Tower	
. Qty	1
. Cost	$150,000
. Year(s)	2026, 2046

The cooling tower was installed as part of the original construction; as such is 12 years old. The cooling tower is in satisfactory condition with

no major deficiencies observed. We estimate replacement or a major overhaul will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.I Replacement or overhaul of the cooling tower is estimated to cost **$150,000** and this work has been budgeted in **2026 and every 20 years thereafter**

GLYCOL MAKE-UP UNIT

The glycol make-up unit installed in the penthouse mechanical room automatically provides glycol make-up to the make-up air heating loop. Glycol make-up units have a typical service life of 30-35 years.

Glycol Make-up Unit	
. Qty	1
. Cost	$4,000
. Year(s)	2036

The glycol make-up was installed as part of the original construction; as such is 12 years old. The glycol make-up unit is in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.J Repairs and overhaul of the glycol make-up unit is estimated to cost **$4,000** and this work has been budgeted in **2036**

GLYCOL LOOP EXPANSION TANK

The Amtrol SX-60V expansion tank for the glycol loop located in the mechanical room handles the expansion and contraction for the glycol in the closed loop system. Expansion tanks have a typical service life of 10-15 years.

Glycol Loop Expansion Tank	
. Qty	1
. Cost	$1,000
. Year(s)	2019, 2029, 2039

The expansion tank was installed as part of the original construction; as such is 12 years old. Based on its current age, we expect the expansion tank is in fair condition. The expansion tank has reached the end of its useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.K Replacement of the expansion tank is estimated to cost **$1,000** and this work has been budgeted in **2019 and every 10 years thereafter**

HYDRONIC LOOP EXPANSION TANK

The Elbi expansion tank for the heating loop located in the mechanical room handles the expansion and contraction for the water in the closed loop system. Expansion tanks have a typical service life of 10-15 years.

Hydronic Loop Expansion Tank	
. Qty	1
. Cost	$2,000
. Year(s)	2019, 2029, 2039

The expansion was installed as part of the original construction; as such is 12 years old. Based on its current age, we expect the expansion tank is in fair condition. The expansion tank has reached the end of its useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.L Replacement of the expansion tank is estimated to cost **$2,000** and this work has been budgeted in **2019 and every 10 years thereafter**

HEAT EXCHANGER

The plate and frame heat exchanger for the make-up air unit is located in the penthouse mechanical room and provides heat transfer between the secondary heating loop and the make-up air glycol loop. Plate and frame heat exchangers have a typical service life of 20-25 years, this can vary greatly depending on the water treatment.

Heat Exchanger	
. Qty	1
. Cost	$40,000
. Year(s)	2026, 2046

The heat exchanger was installed as part of the original construction; as such is 12 years old. Based on its current age, we expect the heat exchanger is in satisfactory condition. We estimate replacement will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.M Replacement of the heat exchanger is estimated to cost **$40,000** and this work has been budgeted in **2026 and every 20 years thereafter**

.N Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend that flushing and cleaning of the heat exchangers be performed ever 5 years, using funds from the operating budget

HYDRONIC CABINET UNIT HEATERS

The hydronic cabinet unit heaters located in the vestibule and mechanical penthouse provide primary heating to these building areas. Cabinet unit heaters have a typical service life of 40-45 years, which can vary greatly depending on usage and environmental conditions.

Hydronic Cabinet Unit Heaters	
. Qty	3
. Cost	$7,000
. Year(s)	2046

The cabinet unit heaters were installed as part of the original construction; as such are 12 years old. The cabinet unit heaters are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 25-30 years.

We recommend the following work be anticipated and funded:

.O Replacement of the cabinet unit heaters is estimated to cost **$7,000** and this work has been budgeted in **2046**

SPACE HEATERS

The Rosemex hydronic space heaters located in the mechanical room and parking garage provide primary heating to these building areas. The space heaters have a typical service life of 30-35 years which can vary greatly depending on environmental conditions.

Space Heaters	
. Qty	3
. Cost	$4,000
. Year(s)	2036

The space heaters in the mechanical room were installed as part of the original construction; as such are 12 years old. The space heaters are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

Parking Garage Space Heaters	
. Qty	18
. Cost	$35,000
. Year(s)	2036

The space heaters in the parking garage were installed as part of the original construction; as such are 12 years old. The space heaters in the parking garage are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.P Replacement of the space heaters in the mechanical room is

estimated to cost **$4,000** and this work has been budgeted in **2036**

.Q Replacement of the space heaters in the parking garage is estimated to cost **$35,000** and this work has been budgeted in **2036**

HEAT PUMPS

The Trane water source heat pumps located in the elevator rooms, common areas and individual suites provide air conditioning and primary heating to these building areas. According to the declaration, ownership and maintenance of the heat pumps in the suites are the responsibility of the condominium. Heat pumps have a typical service life of 15-20 years.

Common Area Heat Pumps	
. Qty	9
. Cost	$65,000
. Year(s)	2021, 2036

The common area heat pumps were installed as part of the original construction with isolated replacements reportedly completed as required using funds from the operating budget; as such are 12 years old. Based on their current age, we expect the heat pumps are in fair condition. We estimate replacement will be required in the next 5 years.

Suite Heat Pumps	
. Qty	144
. Cost	$850,000
. Year(s)	2021-2025 2036-2040

The suite heat pumps were installed as part of the original construction with isolated replacements reportedly completed as required using funds from the operating budget; as such are 12 years old. Based on their current age, we expect the heat pumps are in fair condition. We estimate replacement will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.R Replacement of the common area heat pumps is estimated to cost **$65,000** and this work has been budgeted in **2021 and every 15 years thereafter**

.S Total replacement of the suite heat pumps is estimated to cost **$850,000**. This work has been budgeted **equally over 5 years beginning in 2021**. Subsequent replacements have been scheduled **every 15 years** thereafter

HYDRONIC PIPING

The hydronic piping and risers installed throughout the building distribute heating water to the fain coil loop and tempered water to the heat pump loop. Hydronic piping systems have a typical service life of 50-70 years with proper maintenance and water treatment. However, it is our experience that the life experience of systems with poor maintenance or water treatment can be reduced by 10-20 years.

Hydronic Piping and Risers	
. Cost	$1,000,000
. Year(s)	Beyond 2047

The hydronic piping and risers were installed as part of the original construction; as such are 12 years old Based on their current age, we expect the hydronic piping and risers are in satisfactory condition. We do not anticipate replacement will be required during the 30-year planning period of this study.

Ultrasonic thickness testing should be performed on the piping in periodic intervals to better assess their condition and plan their replacement.

We recommend the following work be anticipated and funded:

.T A rough order of magnitude for the replacement of the hydronic

piping and risers is estimated to cost **$1,000,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.U Minor repairs to the hydronic piping and risers should be performed, as required, using funds from the operating budget

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5.3.3 Plumbing Systems

DOMESTIC COLD WATER BOOSTER PUMPS

The duplex Bell & Gossett 200USGPM, 30HP cold water booster pumps, located in the pump room within the parking garage, increase the incoming water pressure to deliver cold water to the high-rise section of the building. Cold water booster pumps have a typical service life of 20-25 years.

Domestic Cold Water Booster Pumps	
. Qty	2
. Cost	$60,000
. Year(s)	2026, 2046

The cold water booster pumps were installed as part of the original construction; as such are 12 years old. The cold water booster pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.A Replacement of the cold water booster pumps is estimated to cost **$60,000** and this work has been budgeted in **2026 and every 20 years thereafter**

DOMESTIC HOT WATER HEATERS

The Laars 688.5MBH output gas fueled atmospheric hot water heaters located in the penthouse mechanical room provide domestic hot water to the suites. Atmospheric domestic hot water heaters have a typical service life of 25-30 years.

Domestic Hot Water Heaters	
. Qty	2
. Cost	$65,000
. Year(s)	2031

The domestic hot water heaters were installed as part of the original construction; as such are 12 years old. The domestic hot water heaters are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 10-15 years.
We recommend the following work be anticipated and funded:

.B Replacement of the domestic hot water heaters is estimated to cost **$65,000** and this work has been budgeted in **2031**

DOMESTIC HOT WATER TANK HEATERS

The Rheem 10USgal 12kW electric glass lined hot water tank heaters located in the 7 and 13 floor garbage chute rooms provide boosting of the domestic hot water to the recirculation loop. Glass lined domestic hot water tank heaters have a typical service life of 5-10 years.

Domestic Hot Water Tank Heaters	
. Qty	2
. Cost	$8,000
. Year(s)	2019, 2024, 2029 2034, 2039, 2044

According to their serial number, the domestic hot water tank heaters were replaced in 2012 and 2013; as such are 5 to 6 years old. Based on their current age, we expect the domestic hot water tank heaters are in fair condition. We estimate replacement will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.C Replacement of the domestic hot water tank heaters is estimated to cost **$8,000** and this work has been budgeted in **2019 and every 5 years thereafter**

DOMESTIC HOT WATER HEATER CIRCULATION PUMPS

The Bell & Gossett 140USGPM, 2HP domestic hot water heater circulation pumps located in the penthouse mechanical room provide hot water circulation between the water heaters and the storage tanks. The domestic hot water heater circulation pumps have a typical service life of 20-25 years.

Domestic Hot Water Heater Circulation Pumps	
. Qty	2
. Cost	$12,000
. Year(s)	2026, 2046

The domestic hot water heater circulation pumps were installed as part of the original construction; as such are 12 years old. The domestic hot water heater circulation pumps are satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.D Replacement of the domestic hot water heater circulation pumps is estimated to cost **$12,000** and this work has been budgeted in **2026 and every 20 years thereafter**

DOMESTIC HOT WATER RECIRCULATION PUMPS

The Bell & Gossett 30USGPM, ½HP domestic hot water recirculation pumps in the penthouse mechanical room provide hot water recirculation throughout the building to ensure hot water is readily available at all times. Domestic hot water recirculation pumps have a typical service life of 20-25 years.

Domestic Hot Water Recirculation Pumps	
. Qty	2
. Cost	$6,000
. Year(s)	2026, 2046

The domestic hot water recirculation pumps were installed as part of the original construction; as such is 12 years old. The domestic hot water recirculation pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5-10 years.

We recommend the following work be anticipated and funded:

.E Replacement of the domestic hot water recirculation pumps is estimated to cost **$6,000** and this work has been budgeted in **2026 and every 20 years thereafter**

DOMESTIC HOT WATER RECIRCULATION PUMPS

The Armstrong Astro 14USGPM, fractional domestic hot water recirculation pumps in the 7 and 13 floor garbage chute rooms provide hot water recirculation for the mid and low rise sections of the building. Fractional domestic hot water recirculation pumps have a typical service life of 10-15 years.

Domestic Hot Water Recirculation Pumps	
. Qty	2
. Cost	$1,000
. Year(s)	2023, 2033, 2043

The domestic hot water recirculation pumps are suspected to have been replaced in 2013; as such are 5 years old. The domestic hot water recirculation pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 5 years.

We recommend the following work be anticipated and funded:

.F Replacement of the domestic hot water recirculation pumps is estimated to cost **$1,000** and this work has been budgeted in **2023 and every 10 years thereafter**

DOMESTIC HOT WATER STORAGE TANK

The Flo Fab 1,400USGal concrete lined domestic hot water storage tank installed in the penthouse mechanical room provides domestic hot water storage for the building. Concrete lined domestic hot water storage tanks have a typical service life of 60+ years and could potentially last the life of the complex, providing scheduled maintenance including anode replacement and periodic relining is performed. Tank relining is typically required every 10 years.

Domestic Hot Water Storage Tank Relining	
. Qty	1
. Cost	$10,000
. Year(s)	2024, 2034, 2044

The domestic hot water storage tank was installed as part of the original construction; as such is 12 years old, and reportedly underwent relining in 2014. The domestic hot water storage tank is in fair condition with sings of water leakage observed from its manhole cover. We do not anticipate replacement will be required during the 30-year planning period of this study. Glass lining will be required in the next 5 years.

Domestic Hot Water Storage Tank Replacement	
. Qty	1
. Cost	$70,000
. Year(s)	Beyond 2047

We recommend the following work be anticipated and funded:

.G Relining of the domestic hot water storage tanks is estimated to cost **$10,000** and this work has been budgeted in **2024 and every 10 years thereafter**

.H Replacement of the domestic hot water storage tanks is estimated to cost **$70,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.I Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend periodic inspection and anode replacement be performed on storage tanks every 1-3 years, using funds from the operating budget

DOMESTIC WATER EXPANSION TANK

The Elbi expansion tank for the domestic cold water located in the penthouse mechanical room handles the expansion and contraction for the incoming water as warms up. Expansion tanks have a typical service life of 10-15 years.

Domestic Cold Water Expansion Tank	
. Qty	1
. Cost	$3,000
. Year(s)	2018, 2028, 2038

The expansion tank was installed as part of the original construction; as such is 12 years old. Based on its current age, we expect the expansion tank is in fair condition. The expansion tank has reached the end of its useful service life and should be replaced in the near future.

We recommend the following work be anticipated and funded:

.J Replacement of the expansion tank is estimated to cost **$3,000** and this work has been budgeted in **2018 and every 10 years thereafter**

STEAM GENERATOR

The Relax-A-Mist 13.5kW electric steam generator located in the parking garage storage room provides low pressure steam to the steam sauna. Electric steam generators have a typical service life of 10-15 years.

Steam Generator	
. Qty	1
. Cost	$14,000
. Year(s)	2020, 2030, 2040

The steam generator was reportedly installed as part of the original construction; as such is 12 years old. Based on its current age, we expect the steam generator is in fair condition. The steam generator has reached the end of their useful service life and should be replaced in the

near future.

We recommend the following work be anticipated and funded:

.K Replacement of the steam generator is estimated to cost **$14,000** and this work has been budgeted in fiscal year **2020 and every 10 years thereafter**

PLUMBING SYSTEMS

The plumbing systems are comprised of domestic cold and hot water distribution pipes and risers, and sanitary and storm pipes and stacks installed throughout the building. The plumbing systems have a typical service life of 60-80 years.

Domestic Cold & Hot Water Distribution and Risers	
. Cost	$3,500,000
. Year(s)	Beyond 2047

The domestic cold and hot water distribution pipes and risers were installed as part of the original construction; as such are 12 years old. Based on their current age, we expect the domestic cold and hot water distribution pipes and risers are in satisfactory condition. We do not anticipate replacement will be required during the 30-year planning period of this study.

Sanitary and Storm Pipes & Stacks	
. Cost	$3,000,000
. Year(s)	Beyond 2047

The sanitary and storm pipes were installed as part of the original construction; as such are 12 years old. Based on their current age, we expect the sanitary and storm pipes are in satisfactory condition. We do not anticipate replacement or major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.L A rough order of magnitude for the replacement of the domestic cold and hot water distribution pipes and risers is estimated to cost **$3,500,000** and this work has been budgeted in **20 beyond the 30-year planning period** of this study

.M Minor repairs of the domestic cold & hot water distribution pipes and risers should be performed, as required, using funds from the operating budget

.N A rough order of magnitude for the replacement of the sanitary and storm pipes is estimated to cost **$3,000,000** and this work has been budgeted in **beyond the 30-year planning period** of this study

.O Minor repairs of the sanitary and storm pipes should be performed, as required, using funds from the operating budget

.P Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend that flushing and camera inspection of the sanitary pipes and stacks be performed every 10 years, using funds from the operating budget

5.3.4 Sump Pumps

SUMP PUMPS

The sump pumps and pump controllers are located in their respective pit in the basement pumping water from the lower levels of the building to the city sewer. Sump pumps have a typical service life of 10-15 years which can vary greatly depending on usage.

The sump pumps were recently replaced. It is reported that the pumps

operate continuously due to ground water flow and they require replacement every 2-3 years. Based on this information, we expect the sump pumps are in fair condition. The sump pumps could not be visually inspected. We estimate replacement will be required in the next 1-3 years.

We recommend the following work be anticipated and funded:

.A According to the information provided, repair and replacement of the sump pumps is to be completed when required using funds from the operating budget

5.3.5 Elevators

ELEVATORS

The ThyssenKrupp traction elevators installed in the building provide access to floors P to 19. The elevator mechanical rooms are located in two penthouse mechanical rooms. Traction elevators have a typical service life of 25-30 years. Elevator cab interiors have a typical service life of 25-30 years and are renewed for aesthetic purposes.

The elevators were installed as part of the original construction; as such are 12 years old. In the 2018 elevator report provided by Solucore, it was reported that the elevators are in satisfactory condition with a list of deficiencies outlined in their report. We estimate an elevator modernization will be required in the next 10-15 years.

Periodically, the Technical Standards and Safety Authority dictates remedial work that must be carried out on various types of elevators, and is mandatory.

We recommend the following work be anticipated and funded:

.A Replacement of the elevator control systems is estimated to cost **$812,000** and this work has been budgeted in **2031**

.B Replacement of the elevator cab interiors is estimated to cost **$68,000** and this work has been budgeted in **2031**, in conjunction with the elevator control modernization

.C Installation of the MOL compliant machine guarding is estimated to cost **$32,000** and this work has been budgeted in **2019**

.D Replacement of the rope breaks is estimated to cost **$45,500** and this work has been budgeted in **2019**

.E At the request of the Board**,** funds required to perform potential mandatory TSSA upgrades shall be taken from the operating budget

.F At the request of the Board, rust repairs and painting to the equipment in the elevator pits shall be completed using funds from the operating budget

■ Elevator Control Modernization

. Qty	4
. Cost	$812,000
. Year(s)	2031

■ Elevator Cab Interior Modernization

. Qty	4
. Cost	$68,000
. Year(s)	2031

■ Elevator Machine Guarding

. Qty	2
. Cost	$32,000
. Year(s)	2019

■ Elevator Rope Brake

. Qty	4
. Cost	$45,500
. Year(s)	2019

5.3.6 Fire Protection Systems

FIRE PROTECTION SYSTEMS

The fire protection system consists of fire extinguishers and fire hose cabinets installed throughout the building. Fire protection systems have a varying service life.

The fire protection systems are inspected annually and are replaced on an as-needed basis. Based on their current age, we expect the fire

protection systems are in satisfactory condition. We anticipate isolated repairs and replacement of individual components will be required during the 30-year planning period of this study.

Annual inspection and maintenance has been performed and should be continued to ensure that the fire protection system remains in active working condition at all times.
We recommend the following work be anticipated and funded:

.A Repairs and maintenance of the fire protection system should be performed, as required, using funds from the operating budget
.B Although costs are not included in this study, as they do not constitute a major repair or replacement, we recommend that annual inspection and testing be performed, using funds from the operating budget

FIRE PUMPS

The ITT 750USGPM, 78HP listed fire pump , jockey pump and pump controller, located in the pump room within the parking garage provide water to the standpipe, fire hose cabinets in the building. Fire pumps have a typical service life of 30-35 years.

Fire Pumps	
. Qty	1
. Cost	$100,000
. Year(s)	2036

The fire pump and jockey pump were installed as part of the original construction; as such are 12 years old. The fire pumps are in satisfactory condition with no major deficiencies observed. We estimate replacement will be required in the next 15-20 years.

We recommend the following work be anticipated and funded:

.C Replacement of the fire pumps is estimated to cost **$100,000** and this work has been budgeted in **2036**

SPRINKLER HEADS

The automatic sprinkler heads installed in the parking garage and basement provide fire protection to the building. The sprinkler heads need to be replaced or tested and re-certified every 50 years.

Sprinkler Heads	
. Cost	$220,000
. Year(s)	Beyond 2047

The sprinklers were installed as part of the original construction; as such are 12 years old. The sprinkler heads are in satisfactory condition with no major deficiencies observed. We do not anticipate replacement or major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.D A rough order of magnitude for the replacement of the sprinkler heads is estimated to cost **$220,000** and this work has been budgeted **beyond the 30-year planning period** of this study

STANDPIPES AND SPRINKLER PIPES

The standpipes and sprinkler pipes are comprised of steel pipes installed throughout the condominium. The standpipes and sprinkler systems have a typical service life of 60-80 years which can vary greatly depending on environmental conditions.

Standpipes	
. Cost	$250,000
. Year(s)	Beyond 2047

The standpipes were installed as part of the original construction; as such are 12 years old. Based on their current age, we expect the

standpipes are in satisfactory condition. We do not anticipate replacement or major repairs will be required during the 30-year planning period of this study.

The sprinkler pipes were installed as part of the original construction; as such are 12 years old. The sprinkler pipes are in satisfactory condition with no major deficiencies observed. We do not anticipate replacement or major repairs will be required during the 30-year planning period of this study.

We recommend the following work be anticipated and funded:

.E A rough order of magnitude for the replacement of the standpipes is estimated to cost **$250,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.F Minor repairs of the standpipes should be performed, as required, using funds from the operating budget

.G A rough order of magnitude for the replacement of the sprinkler pipes is estimated to cost **$350,000** and this work has been budgeted **beyond the 30-year planning period** of this study

.H Minor repairs of the sprinkler pipes and sprinkler heads should be performed, as required, using funds from the operating budget

■

Sprinkler Pipes	
· Cost	$350,000
· Year(s)	Beyond 2047

APPENDIX A: SPREADSHEET FOR MAJOR REPAIR AND REPLACEMENT COSTS

OCSCC 769: Spreadsheet For Major Repair & Replacement Costs, Fiscal Years 2018 to 2047

AGE OF COMPLEX		12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years	21 Years	22 Years	23 Years	24 Years	25 Years	26 Years
REPAIR/REPLACEMENT ITEMS		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
5.1	**CIVIL, ARCHITECTURAL**															
5.1.1	**Parking Garage**	$40,000			$10,000					$295,000					$40,000	
5.1.2	**Gazebo**															
5.1.3	**Fencing**															
5.1.4	**Foundation Walls**															
5.1.5	**Balconies**															
5.1.6	**Masonry**															
5.1.7	**Exterior Insulation & Finish System**														$5,000	
5.1.8	**Soffits & Fascias**															
5.1.9	**Exterior Coatings**															
5.1.10	**Caulking**		$120,000	$120,000											$120,000	$120,000
5.1.11	**Windows & Balcony Doors**	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000
5.1.12	**Doors**									$10,000						
5.1.13	**Roofing Systems**														$500,000	
5.1.14	**Common Corridors**															
5.1.15	**Common Rooms**				$4,000					$4,000					$4,000	
5.2	**ELECTRICAL SYSTEMS**															
5.2.1	**Electrical Distribution**				$18,000					$18,000					$18,000	
5.2.2	**Lighting**															
5.2.3	**Fire Alarm System**															
5.2.4	**Emergency Power System**	$29,000										$15,000				
5.2.5	**Electrical Heating System**														$6,000	
5.2.6	**Security System**				$18,000						$10,000			$20,000	$14,000	
5.3	**MECHANICAL SYSTEMS**															
5.3.1	**Ventilation System**		$8,000		$10,000			$8,000		$25,000			$8,000			
5.3.2	**Heating & A/C System**	$167,000	$3,000		$235,000	$170,000	$170,000	$170,000	$170,000	$190,000			$3,000		$658,000	
5.3.3	**Plumbing System**	$3,000	$8,000	$14,000			$1,000	$18,000		$78,000		$3,000	$8,000	$14,000	$65,000	
5.3.4	**Pool Mechanical Systems**															
5.3.5	**Sump Pumps**															
5.3.6	**Elevators**		$77,500												$880,000	
5.3.7	**Fire Protection System**															
	Reserve Fund Study Update	$6,670			$4,630			$6,670			$4,630			$6,670		
YEARLY EXPENDITURE TOTALS		$285,670	$256,500	$174,000	$339,630	$210,000	$211,000	$242,670	$210,000	$660,000	$54,630	$58,000	$59,000	$80,670	$2,350,000	$160,000
EXPENDITURES INCL. INFLATION		$285,670	$261,630	$181,030	$360,418	$227,311	$232,961	$273,286	$241,224	$773,295	$65,288	$70,702	$73,359	$102,309	$3,039,976	$211,117
CONTRIBUTIONS FROM FEES		$294,167	$338,292	$389,036	$447,391	$456,339	$465,466	$474,775	$484,271	$493,956	$503,835	$513,912	$524,190	$534,674	$545,367	$556,275
ADDITIONAL CONTRIBUTIONS																
INTEREST CONTRIBUTIONS		$32,951	$35,140	$40,584	$43,043	$49,733	$56,675	$63,013	$70,546	$65,205	$77,675	$90,571	$103,978	$117,256	$57,688	$67,623
REMAINING RESERVE FUND		$1,498,070	$1,609,872	$1,858,462	$1,988,478	$2,267,240	$2,556,420	$2,820,923	$3,134,515	$2,920,381	$3,436,604	$3,970,385	$4,525,194	$5,074,815	$2,637,895	$3,050,676

ESTIMATED RESERVE FUND = $1,456,622 December 31, 2017
CURRENT ANNUAL CONTRIBUTIONS = $294,167 January 1, 2018
FUTURE ANNUAL CONTRIBUTIONS = $338,292 January 1, 2019
ANN. INCREASE IN CONTRIBUTIONS = 13.0 % ABOVE INFLATION PER YEAR FOR 3 YEARS, STARTING IN THE FISCAL YEAR 2019

NOTES:

1) Interest contributions for each year are calculated at the midpoint of the fiscal year and assume that all expenditures have occurred and 50% of contributions have been collected. A fixed interest rate of 2.5% is used in the calculation

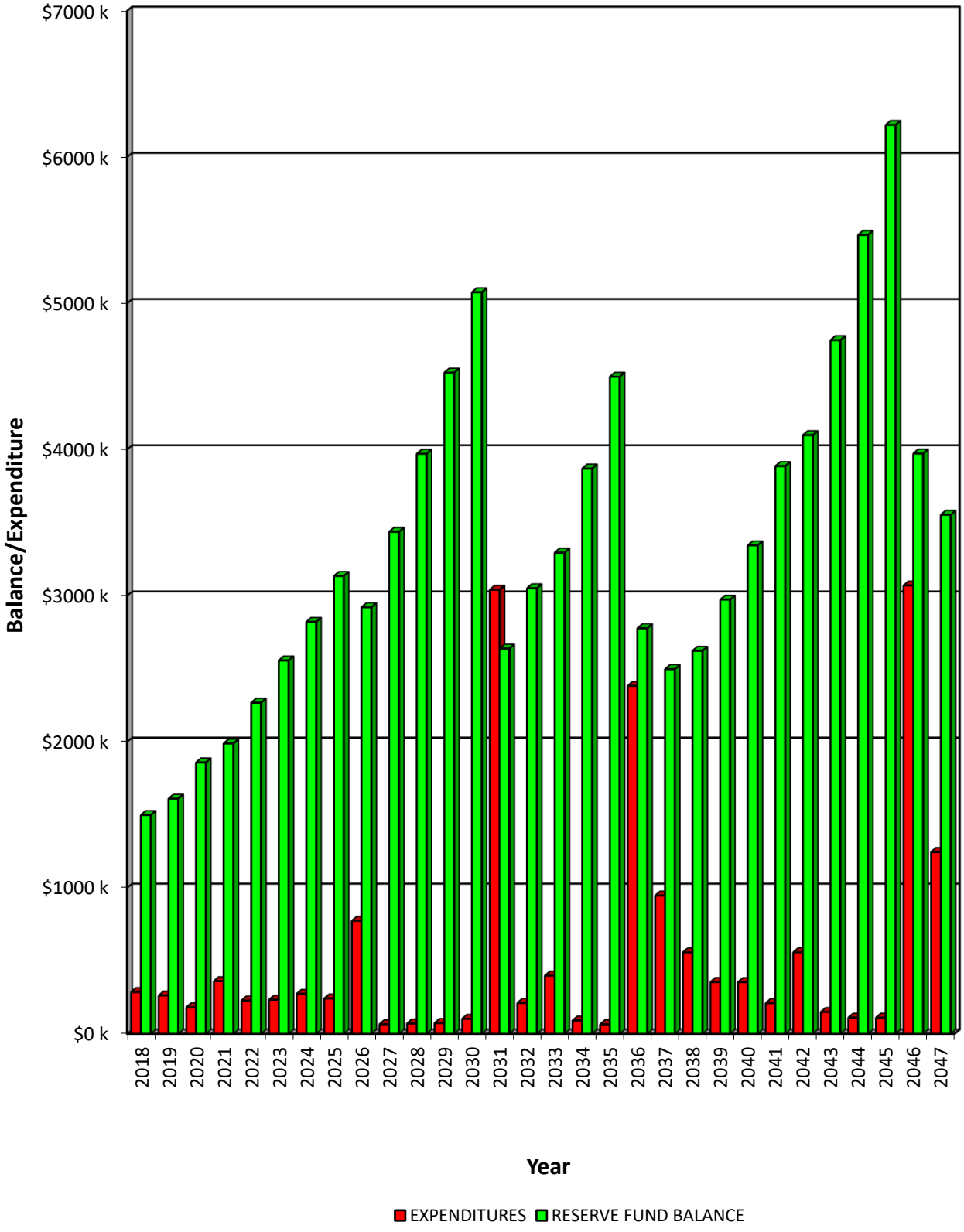
2) Estimates for expenditures include HST and, where appropriate, engineering fees.

27 Years	28 Years	29 Years	30 Years	31 Years	32 Years	33 Years	34 Years	35 Years	36 Years	37 Years	38 Years	39 Years	40 Years	41 Years		AGE OF COMPLEX	
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	TOTALS		REPAIR/REPLACEMENT ITEMS
																5.1	CIVIL, ARCHITECTURAL
			$465,000	$430,000				$40,000					$295,000		$1,615,000	5.1.1	Parking Garage
							$5,000								$5,000	5.1.2	Gazebo
		$6,000													$6,000	5.1.3	Fencing
															$0	5.1.4	Foundation Walls
$150,000															$150,000	5.1.5	Balconies
$100,000															$100,000	5.1.6	Masonry
															$5,000	5.1.7	Exterior Insulation & Finish System
													$5,000		$5,000	5.1.8	Soffits & Fascias
															$0	5.1.9	Exterior Coatings
										$50,000					$530,000	5.1.10	Caulking
$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,000	$691,000	$691,000	$2,502,000	5.1.11	Windows & Balcony Doors
			$15,000					$25,000					$35,000		$85,000	5.1.12	Doors
															$500,000	5.1.13	Roofing Systems
															$0	5.1.14	Common Corridors
			$4,000					$4,000					$4,000		$24,000	5.1.15	Common Rooms
																5.2	ELECTRICAL SYSTEMS
			$18,000					$18,000					$433,000		$523,000	5.2.1	Electrical Distribution
															$0	5.2.2	Lighting
									$300,000						$300,000	5.2.3	Fire Alarm System
			$345,000		$15,000										$404,000	5.2.4	Emergency Power System
															$6,000	5.2.5	Electrical Heating System
			$12,000	$10,000				$6,000				$20,000		$10,000	$120,000	5.2.6	Security System
																5.3	MECHANICAL SYSTEMS
	$8,000		$385,000			$8,000					$8,000		$25,000		$493,000	5.3.1	Ventilation System
			$278,000	$170,000	$317,000	$173,000	$170,000						$197,000		$3,241,000	5.3.2	Heating & A/C System
$1,000	$18,000				$3,000	$8,000	$14,000			$1,000	$18,000		$78,000		$353,000	5.3.3	Plumbing System
															$0	5.3.4	Pool Mechanical Systems
															$0	5.3.5	Sump Pumps
															$957,500	5.3.6	Elevators
			$100,000												$100,000	5.3.7	Fire Protection System
$4,630			$6,670				$4,630			$6,670			$4,630		$56,500		Reserve Fund Study Update
$295,630	$66,000	$46,000	$1,668,670	$650,000	$375,000	$233,630	$229,000	$133,000	$346,670	$91,000	$66,000	$64,630	$1,763,000	$701,000	$12,081,000	YEARLY EXPENDITURE TOTALS	
$397,879	$90,604	$64,411	$2,383,272	$946,927	$557,230	$354,105	$354,029	$209,728	$557,597	$149,295	$110,446	$110,316	$3,069,426	$1,244,867	$16,999,706	EXPENDITURES INCL. INFLATION	
$567,400	$578,748	$590,323	$602,130	$614,172	$626,456	$638,985	$651,765	$664,800	$678,096	$691,658	$705,491	$719,601	$733,993	$748,673	$16,834,236	CONTRIBUTIONS FROM FEES	
															$0	ADDITIONAL CONTRIBUTIONS	
$73,412	$87,309	$102,495	$60,382	$53,422	$56,334	$64,708	$73,609	$86,664	$91,676	$107,358	$124,745	$142,919	$87,927	$77,536	$2,262,180	INTEREST CONTRIBUTIONS	
$3,293,609	$3,869,063	$4,497,471	$2,776,710	$2,497,377	$2,622,937	$2,972,525	$3,343,869	$3,885,605	$4,097,781	$4,747,501	$5,467,291	$6,219,495	$3,971,989	$3,553,331	$3,553,331	REMAINING RESERVE FUND	
											REMAINING RESERVE FUND IN 2018 DOLLARS				$2,000,924		

3) Inflation assumed to be at an average rate of 2.0% over the time frame examined above.

KELLER ENGINEERING

OCSCC 769 - Reserve Fund Annual Expenditures/Closing Balance



APPENDIX B:
PHOTO REVIEW

1. Partial front elevation of OCSCC 769

2. General view of the landscaped podium.

3. General view of inverted roofing system and the mechanical penthouse aluminium siding

4. Showing traffic bearing membrane delamination and previous repairs within the parking garage

5. Showing localized garage door frame corrosion and cracking of the garage entrance EIFS

6. General view of the parking garage

7. Showing localized masonry efflorescence at the entrance canopy columns

8. Showing localized concrete block masonry step cracking within the parking garage

9. Showing punched widow frame silicone sealant repairs and localized masonry veneer delamination

10. Showing condition of podium stairs with localized concrete column delamination

APPENDIX C:
MANAGEMENT
PLANNING TABLE

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
12	2018	5.1.1 Traffic Bearing Membrane Replacement - Turning Radiuses & Ramps	$40,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.4 Emergency Generator & Fuel Systems Code Compliance Updates	$29,000		
		5.3.2 Condensing Heating Boiler Replacement	$147,000		
		5.3.2 Heating Boiler Refractory Panels Replacement	$20,000		
		5.3.3 Domestic Cold Water Expansion Tank Replacment	$3,000		
		Reserve Fund Study With Site Visit	$6,670		
				$285,670	$285,670
13	2019	5.1.10 Caulking Replacement	$120,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.2 Glycol Loop Expansion Tank Replacement	$1,000		
		5.3.2 Hydronic Loop Expansion Tank Replacement	$2,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
		5.3.5 Elevator Machine Guarding Installation	$32,000		
		5.3.5 Elevator Rope Brake Replacement	$45,500		
				$256,500	$261,630
14	2020	5.1.10 Caulking Replacement	$120,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.3 Steam Generator Replacement	$14,000		
				$174,000	$181,030
15	2021	5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.2.6 CCTV Monitoring Station Replacement	$12,000		
		5.2.6 CCTV Camera Replacement	$6,000		
		5.3.1 Garage Gas Monitoring Controller Replacement	$10,000		
		5.3.2 Common Area Heat Pump Replacement	$65,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		Reserve Fund Study Without Site Visit	$4,630		
				$339,630	$360,418
16	2022	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
				$210,000	$227,311
17	2023	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.3 Armstrong Domestic Hot Water Recirculation Pump Replacement	$1,000		
				$211,000	$232,961

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
18	2024	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
		5.3.3 Domestic Hot Water Storage Tank Relining	$10,000		
		Reserve Fund Study With Site Visit	$6,670		
				$242,670	$273,286
19	2025	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
				$210,000	$241,224
20	2026	5.1.1 Parking Garage Structure Repair Allowance	$25,000		
		5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.1 Traffic Bearing Membrane Replacement - Drive Lanes & Parking	$260,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.12 Common Area Man Door Replacement Allowance	$5,000		
		5.1.12 Garage Door Replacement	$5,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.3.1 Exhaust Fan Replacement Allowance	$25,000		
		5.3.2 Cooling Tower Replacement	$150,000		
		5.2.3 Heat Exchanger Replacement	$40,000		
		5.3.3 Domestic Cold Water Booster Pump Replacement	$60,000		
		5.3.3 Domestic Hot Water Heater Circulation Pumps Replacement	$12,000		
		5.3.3 Bell & Gossett Domestic Hot Water Recirculation Pumps Replacement	$6,000		
				$660,000	$773,295
21	2027	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.6 Building Automation System Replacement	$10,000		
		Reserve Fund Study Without Site Visit	$4,630		
				$54,630	$65,288
22	2028	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.4 Fuel Storage Main Tank Replacement	$15,000		
		5.3.3 Domestic Cold Water Expansion Tank Replacment	$3,000		
				$58,000	$70,702
23	2029	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.2 Glycol Loop Expansion Tank Replacement	$1,000		
		5.3.2 Hydronic Loop Expansion Tank Replacement	$2,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
				$59,000	$73,359

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
24	2030	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.6 Key Fob System Replacement	$20,000		
		5.3.3 Steam Generator Replacement	$14,000		
		Reserve Fund Study With Site Visit	$6,670		
				$80,670	$102,309
25	2031	5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.1 Concrete Slab-on-Grade Repair Allowance	$30,000		
		5.1.7 EIFS Recoating & Repair	$5,000		
		5.1.10 Caulking Replacement	$120,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.13 Inverted Roofing System Replacement - Main Roof	$480,000		
		5.1.13 Inverted Roofing System Replacement - Podium Stairs & Canopy	$20,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.2.5 Forced Flow Electric Heater Replacement	$6,000		
		5.2.6 Door Entry System Replacement	$8,000		
		5.2.6 CCTV Camera Replacement	$6,000		
		5.3.2 Atmospheric Heating Boiler Replacement	$445,000		
		5.3.2 Primary Loop Pumps Replacement	$30,000		
		5.3.2 Primary Heat Pump Loop Pumps Replacement	$120,000		
		5.3.2 Heating Heat Pump Loop Pump	$9,000		
		5.3.2 Garage Heating Loop Pumps	$36,000		
		5.3.2 Make-Up Air Circulating Pumps Replacement	$18,000		
		5.3.3 Domestic Hot Water Heaters Replacement	$65,000		
		5.3.5 Elevator Control Modernization	$812,000		
		5.3.5 Elevator Cab Interior Modernization	$68,000		
				$2,350,000	$3,039,976
26	2032	5.1.10 Caulking Replacement	$120,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
				$160,000	$211,117
27	2033	5.1.5 Balcony Structure Repair	$150,000		
		5.1.6 Masonry Veneer Repairs	$100,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.3 Armstrong Domestic Hot Water Recirculation Pump Replacement	$1,000		
		Reserve Fund Study Without Site Visit	$4,630		
				$295,630	$397,879
28	2034	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
		5.3.3 Domestic Hot Water Storage Tank Relining	$10,000		
				$66,000	$90,604

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
29	2035	5.1.3 Wood Fencing Replacement	$6,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
				$46,000	$64,411
30	2036	5.1.1 Parking Garage Structure Repair Allowance	$25,000		
		5.1.1 Podium Waterproofing Replacement	$275,000		
		5.1.1 Podium Landscaping Replacement	$155,000		
		5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.12 Main Entrance Door Replacement	$10,000		
		5.1.12 Common Area Man Door Replacement Allowance	$5,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.2.4 Emergency Power Generator Replacement	$325,000		
		5.2.4 Emergency Transfer Switch	$20,000		
		5.2.6 CCTV Monitoring Station Replacement	$12,000		
		5.3.1 Make-Up Air Unit Replacement	$300,000		
		5.3.1 Exhaust Fan Replacement Allowance	$25,000		
		5.3.1 Garage Exhaust Fan Replacement	$30,000		
		5.3.1 Motorized Damper Replacement Allowance	$20,000		
		5.3.1 Garage Gas Monitoring Controller Replacement	$10,000		
		5.3.2 Glycol Make-Up Unit Replacement	$4,000		
		5.3.2 Space Heater Replacement	$4,000		
		5.3.2 Parking Garage Space Heater Replacement	$35,000		
		5.3.2 Common Area Heat Pump Replacement	$65,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.6 Fire Pumps Replacement	$100,000		
		Reserve Fund Study With Site Visit	$6,670		
				$1,668,670	$2,383,272
31	2037	5.1.1 Podium Waterproofing Replacement	$275,000		
		5.1.1 Podium Landscaping Replacement	$155,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.6 Building Automation System Replacement	$10,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
				$650,000	$946,927
32	2038	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.4 Fuel Storage Main Tank Replacement	$15,000		
		5.3.2 Condensing Heating Boiler Replacement	$147,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.3 Domestic Cold Water Expansion Tank Replacment	$3,000		
				$375,000	$557,230

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
33	2039	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.2 Glycol Loop Expansion Tank Replacement	$1,000		
		5.3.2 Hydronic Loop Expansion Tank Replacement	$2,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
		Reserve Fund Study Without Site Visit	$4,630		
				$233,630	$354,105
34	2040	5.1.2 Gazebo Repair & Replacement	$5,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.2 Suite Heat Pump Replacement	$170,000		
		5.3.3 Steam Generator Replacement	$14,000		
				$229,000	$354,029
35	2041	5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.1 Concrete Slab-on-Grade Repair Allowance	$30,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.12 Unit Suite Door Replacement	$25,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.2.6 CCTV Camera Replacement	$6,000		
				$133,000	$209,728
36	2042	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.3 Fire Alarm Panel Replacement	$300,000		
		Reserve Fund Study With Site Visit	$6,670		
				$346,670	$557,597
37	2043	5.1.10 Caulking Replacement - Excluding Windows	$50,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.3 Armstrong Domestic Hot Water Recirculation Pump Replacement	$1,000		
				$91,000	$149,295
38	2044	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.3.1 Garage CO Sensor Replacement Allowance	$8,000		
		5.3.3 Domestic Hot Water Tank Heaters Replacement	$8,000		
		5.3.3 Domestic Hot Water Storage Tank Relining	$10,000		
				$66,000	$110,446

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

OCSCC 769 : Annual Major Repair & Replacement Work, Fiscal Years 2018 to 2047

Year		Description of Work	Cost	Yearly Total	Inflated Yearly Total
39	2045	5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.2.6 Key Fob System Replacement	$20,000		
		Reserve Fund Study Without Site Visit	$4,630		
				$64,630	$110,316
40	2046	5.1.1 Parking Garage Structure Repair Allowance	$25,000		
		5.1.1 Intermediate Slab Repair Allowance	$10,000		
		5.1.1 Traffic Bearing Membrane Replacement - Drive Lanes & Parking	$260,000		
		5.1.8 Aluminium Fascia Replacement	$5,000		
		5.1.11 Punched Window Replacement	$525,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.11 Entrance Canopy Window Replacement	$17,500		
		5.1.11 Garage Exit Window Replacement	$8,500		
		5.1.11 Balcony Door Replacement	$100,000		
		5.1.12 Common Area Man Door Replacement Allowance	$5,000		
		5.1.12 Unit Suite Door Replacement	$25,000		
		5.1.12 Garage Door Replacement	$5,000		
		5.1.15 Exercise Room Equipment Replacement Allowance	$4,000		
		5.2.1 Dry Core Transformers Replacement	$415,000		
		5.2.1 Mechanical Load Starter Replacement Allowance	$18,000		
		5.3.1 Exhaust Fan Replacement Allowance	$25,000		
		5.3.2 Cooling Tower Replacement	$150,000		
		5.3.2 Heat Exchanger Replacement	$40,000		
		5.3.2 Hydronic Cabinet Unit Heaters Replacement	$7,000		
		5.3.3 Domestic Cold Water Booster Pump Replacement	$60,000		
		5.3.3 Domestic Hot Water Heater Circulation Pumps Replacement	$12,000		
		5.3.3 Bell & Gossett Domestic Hot Water Recirculation Pumps Replacement	$6,000		
				$1,763,000	$3,069,426
41	2047	5.1.11 Punched Window Replacement	$525,000		
		5.1.11 Curtain Wall Glazing Replacement Allowance	$40,000		
		5.1.11 Entrance Canopy Window Replacement	$17,500		
		5.1.11 Garage Exit Window Replacement	$8,500		
		5.1.11 Balcony Door Replacement	$100,000		
		5.2.6 Building Automation System Replacement	$10,000		
				$701,000	$1,244,867

Notes:
1) Estimates for expenditures include HST and, where applicable, engineering fees.
2) Inflation assumed to be at an average of 2.0 % over the time frame examined above.

APPENDIX D:
OTHER CONSULTANT REPORTS

SOLUCORE
343 Preston Street, 11th Floor
Ottawa, ON K1S 1N4
Tel: 613.569.0555
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Offices: Calgary ▪ Edmonton ▪ Halifax ▪ Kitchener ▪ Mississauga ▪ New York ▪ Ottawa ▪ Toronto ▪ Vancouver ▪ Winnipeg

3580 RIVERGATE WAY
OTTAWA, EASTERN ONTARIO

Vertical Transportation Inspection Report

Performed by:	Ian Richardson
	Roger Zink
For:	Condominium Management Group
Date of Inspection:	June 12, 2018
	June 14, 2018
Job Number:	1860024M001
File Number:	1860024001

TABLE OF CONTENTS

EXECUTIVE SUMMARY

We recently inspected 4 traction Passenger elevators at 3580 Rivergate Way in Ottawa, Eastern Ontario.

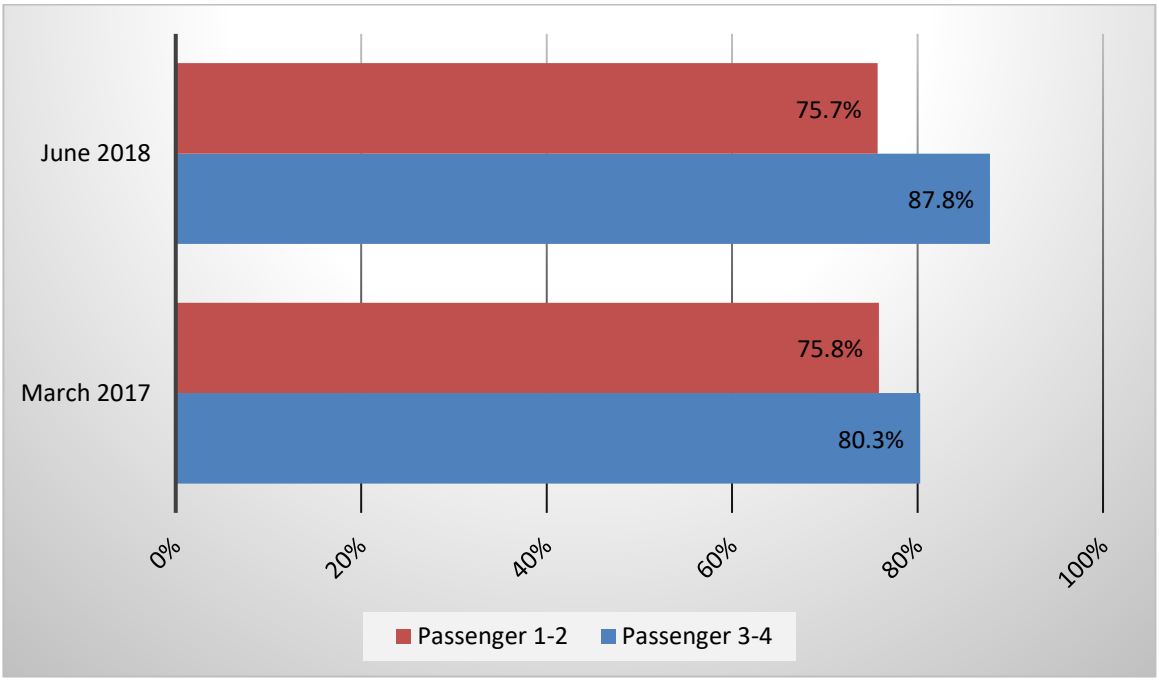
The purpose of this inspection was to measure the equipment performance and evaluate the quality of operation and maintenance. The inspection did not include a comprehensive review of the safety aspects of the installation as this falls under the jurisdiction of the safety authorities.

Overall the condition of the elevator equipment and the quality of the maintenance being performed at 3580 Rivergate Way are excellent.

The overall Soludex rating for the elevators in this inspection is 81.8% compared to the previous inspection which scored 78.1%. The overall Soludex score is computed for passenger elevators and escalators only. Devices such as freight elevators, dumbwaiters, handicap lifts or platform/material lifts are excluded as well as any device that was shut down during the inspection.

Date	Soludex Rating for Elevators	Safety	Performance	Logbook	Major Work	Housekeeping
June 2018	81.8%	92.9%	79.6%	62.5%	89.3%	81.2%
March 2017	78.1%	96.4%	61.4%	50.0%	98.2%	90.6%

A comparison of the overall Soludex rating for each of the elevator banks over the last few inspections is displayed in the bar chart below.



The contractor should dispatch an adjuster to tweak the performance of the equipment. A service crew should be dispatched as well to address the major work outlined under the aforementioned section in this report. The mechanic should dedicate sufficient time at this site to complete the maintenance and also address the minor items as well as cleanliness of the equipment.

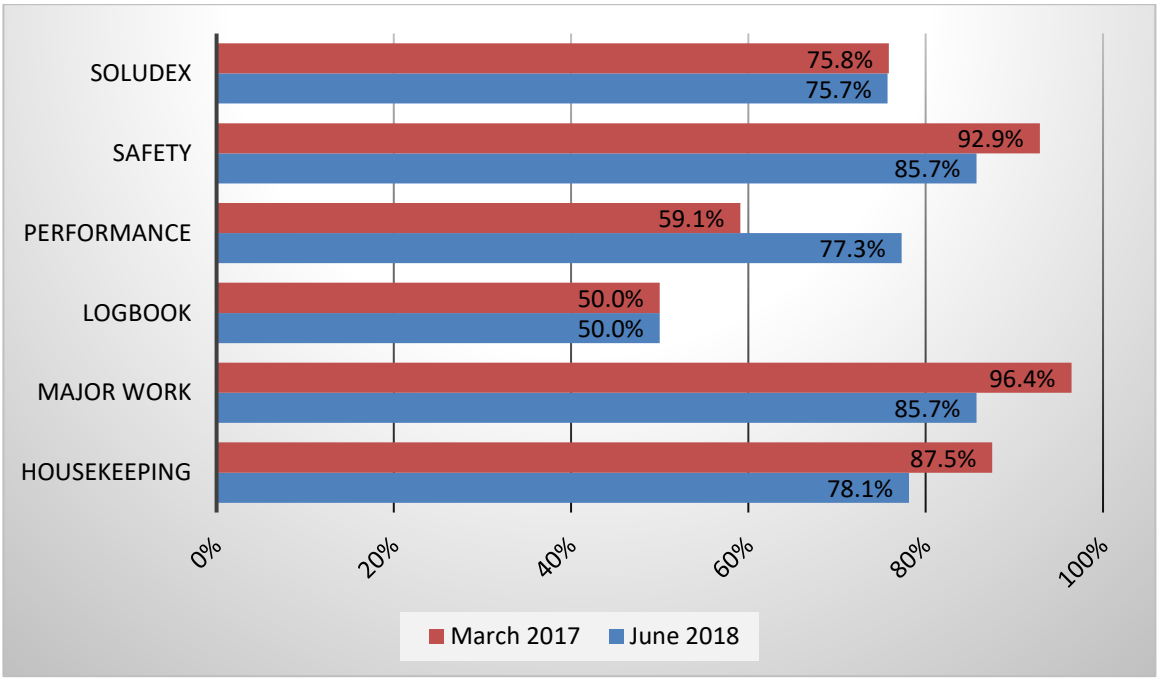
Detailed observations can be found in the Deficiencies section of the report. The Owner should request from the contractor to address these items. Priority should be given to items highlighted in red, then to items identified as safety related, followed by performance and major deficiencies. In order to improve the quality of service, the performance settings should be adjusted to meet the suggested values listed in the Performance Data section.

The contractor should advise the Owner, in writing, when the required work has been completed, in order to schedule a follow-up inspection.

All items in red are considered priority items that in our opinion should be reviewed by the contractor as soon as possible and within 15 days at the latest. The contractor should respond in writing to the items noted in red within 30 days at the latest to ensure that the elevator equipment is operating according to code requirements and the contractor's maintenance control program. Following this, Performance and Major deficiencies should be addressed. In order to improve the quality of service of the elevators, the performance settings should be adjusted to meet the suggested values listed in the Performance Data section. All items in the report should be addressed and completed within 90 days from the date of receipt. Where ropes or other major items identified in the report are not replaced within 90 days, the contractor should provide a scheduled date for the replacement of the deficient equipment. Where there is a disagreement between the contractor and consultant report, the contractor should provide an explanation and supporting evidence for not implementing the repair or adjustment as noted in the report.

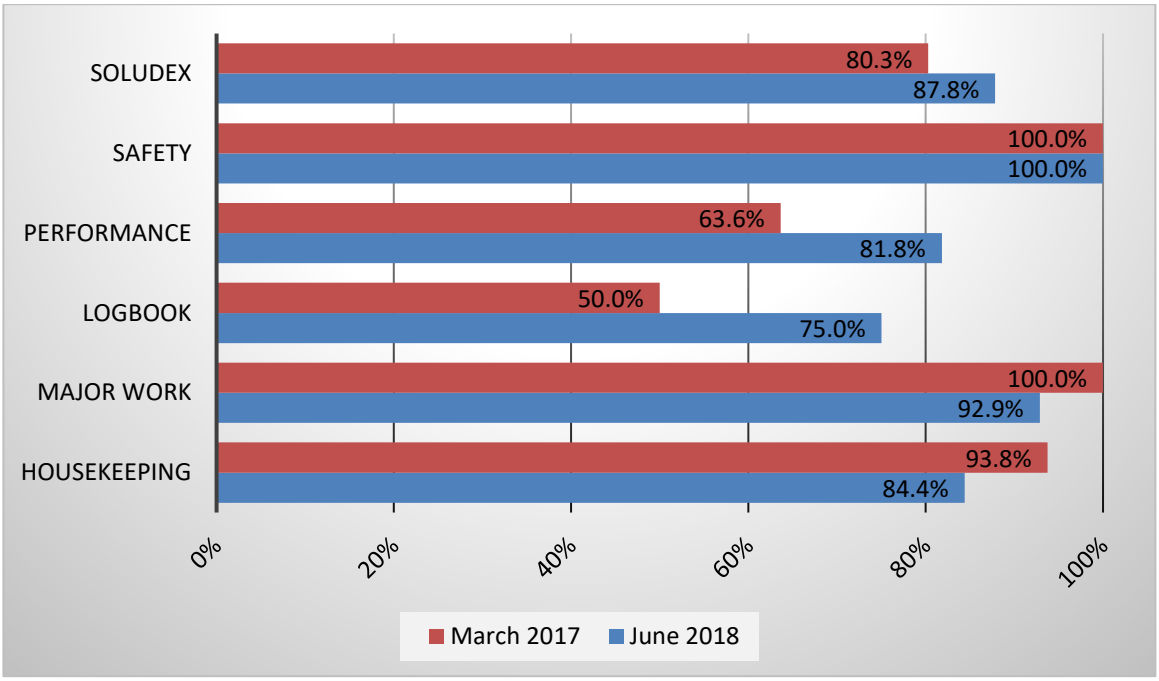
Passenger 1-2

The Soludex™ elevator rating of the maintenance for the Passenger 1-2 is 75.7% indicating that the maintenance is very good. This index is designed to benchmark the performance of the equipment so that annual improvements can be charted to achieve maximum performance.



Passenger 3-4

The Soludex™ elevator rating of the maintenance for the Passenger 3-4 is 87.8% indicating that the maintenance is excellent. This index is designed to benchmark the performance of the equipment so that annual improvements can be charted to achieve maximum performance.



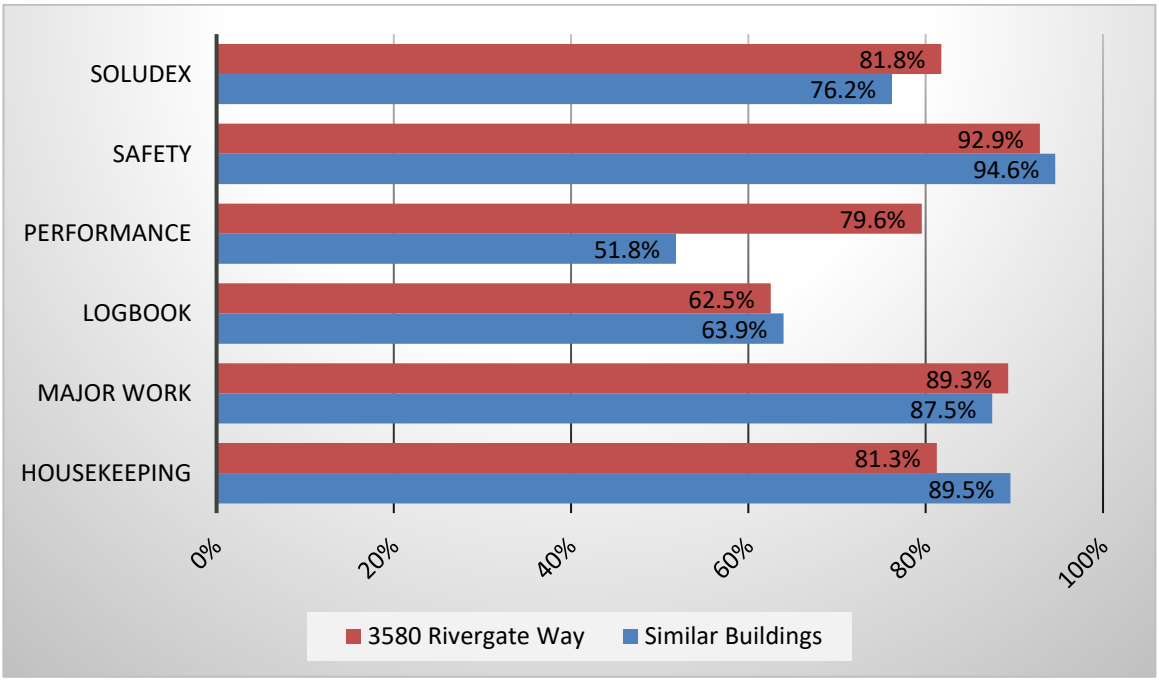
Building Comparison

In order to determine how the elevating devices at this site compare to other buildings the devices were compared to the mean and ranked. The Soludex rating was compared to data obtained by Solucore from inspections conducted over the last three years in the same city and for the same building classification. Where insufficient data was available in the city where the inspection occurred, the Soludex data for similar inspections conducted in similar cities were used.

The devices were ranked according to whether the overall elevator maintenance was in the top decile (top 10%), top 4th quartile (top 25%), 3rd quartile (middle 25% to 50%), 2nd quartile (lower 50% to 75%), bottom 1st quartile (lowest 75% to 100%) or bottom decile (lowest 10%).

Based on similar building types in similar markets, the overall Soludex rating of the elevators at 3580 Rivergate Way scores in the top fourth quartile.

The graph below compares the elevator Soludex rating for this building to the mean for similar building types in similar markets.



NOTES ON SOLUDEX™ RATING

Soludex is a weighted scale designed by Solucore to track annual elevator maintenance changes. The scale gives different weightings to different components such as safety, performance, logbook (mandated maintenance), major work and housekeeping, based on importance. Since safety, performance and logbook, are critical liability components to Owners, they impact **Soludex™** significantly.

These five critical components are evaluated when assessing the overall rating of a site. Each deficiency (except minor deficiencies) impacts the rating by one point or more depending on the number of deficiencies. For example, if the bearing is leaking on two out of three devices, you will see a "2" under the "Deducted column" and "3" under the "Available column" in the Bearings row in the **Soludex Rating™** page. This calculation is performed internally and results are displayed in the **Soludex Rating™** page.

NOTES ON PERFORMANCE DATA

1. The Operating Time is measured from the time the doors begin to close until they are three quarters open at the next floor.

2. The Door Open Time is measured from the time the doors begin to open until they are fully open.

3. The Door Close Time is measured from the time the doors begin to close until completely closed.

4. The Door Dwell times are measured from the time the doors are fully open until they start to close after answering a hall or car call.

5. Hall Advance Time is measured in seconds from the time the hall directional lantern chimes until the door begins to open.

6. Noise levels are measured with an ANSI type 2 sound level meter on the "A" scale, set for an "F" response. For elevators the running (fan) noise level is measured inside the cab with the doors closed; the door operation noise level is measured during a full door open and close cycle. For escalators the ambient noise level is measured at the respective landing with the meter at eye level; escalator noise level is measured with the meter pointed to the respective deck plate.

7. Unless otherwise stated, all times are in seconds, all distances are in inches (in) or millimeters (mm), all speeds are in feet per minute (fpm) or meter per second (mps), all capacities are in pounds (lbs) or kilograms (kg), all sound levels are in decibels, all temperatures are in degrees Fahrenheit (F) or Celsius (C) and all forces are in pound-force (lbf) or Newton (N).

8. Unless otherwise stated, for elevators the terms "left" and "right" are used viewing the elevator from the hall lobby. For escalators the terms "left" and "right" are used viewing the escalator from the bottom landing looking up.

9. Acceleration is the change in velocity and is measured in feet per second squared (ft/sec^2) or meter per second squared (m/sec^2) and is measured from peak-to-peak.

10. Jerk is the rate of change in acceleration and is measured in feet per second cubed (ft/sec^3) or meter per second cubed (m/sec^3).

Soludex™ Rating 81.8%

Soludex Rating		81.8%
Rear Door(s)	0	
Traction	4	
Hydraulic	0	
Total Elevators	4	

Excellent	80% – 100%
Very Good	70% – 79.99%
Good	60% – 69.99%
Below Average	50% – 59.99%
Poor	40% – 49.99%
Unacceptable	0% – 39.99%

	Available	Deducted
Safety (Multiple 30%)		**92.9%**
Brakes (Safety)	4	0
Levelling (Safety)	4	0
Door Force	4	0
Self Closing	4	1
Jumpers/Fuse	4	0
Door Edge (Safety)	4	1
Safeties/Seals	4	0
Total Points	**28**	**26**
Performance (Multiple 25%)		**79.5%**
Nudging	4	0
Speed	8	0
Flight Times	8	1
Dwell Times	8	0
Door Time	8	4
Cab Noise	4	0
Ride Quality	4	4
Total Points	**44**	**35**
Logbook (Multiple 20%)		**62.5%**
Monthly/Quarterly	4	2
Oil Logbook	0	0
Annual	4	4
Two/Five year	4	0
Callbacks	4	0
Total Points	**16**	**10**

	Available	Deducted
Major Work (Multiple 15%)		**89.3%**
Leaks (Major)	4	0
Sheaves	4	0
Machine	4	0
Door Operation	4	0
Ropes/Cables	4	1
Governor	4	1
Brakes (Major)	4	1
Motor	4	0
Rollers/Guides/Stabilizer	4	2
Drive/Generator/Pump	4	0
Control/Selector/Electrical	4	0
Compensation/Pit	4	1
Cylinder	0	0
Buffers/Springs	4	0
Bearings	4	0
Valves	0	0
Total Points	**56**	**50**
Housekeeping (Multiple 10%)		**81.2%**
Machines & Room	8	1
Motors/Generators	8	0
Controls & Governor	12	3
Pit & Equipment	12	1
Car Tops & Equipment	12	7
Hoistway Cleaning	8	0
Hoistway Doors	4	0
Total Points	**64**	**52**

EQUIPMENT INVENTORY - PASSENGER 1-2

Designation:	1	2
Installation Number:	83978	83979
OEM Manufacturer:	ThyssenKrupp	ThyssenKrupp
OEM Installer:	ThyssenKrupp	ThyssenKrupp
Current Contractor:	ThyssenKrupp	ThyssenKrupp
Year Installed:	Circa 2006	Circa 2006
Sales Number:	CU4462	CU4463
Control Manufacturer:	ThyssenKrupp	ThyssenKrupp
Control Type:	TAC 50	TAC 50
Elevator Classification:	Passenger	Passenger
Capacity (lbs):	2500	2500
Contract Speed (fpm):	500	500
Governor Trip Speed:	625	625
Motor Manufacturer:	ThyssenKrupp	ThyssenKrupp
Motor Type:	286TCZ	286TCZ
Motor Serial Number:	Z0511140105	Z0511140110
Motor Output:	30 HP	30 HP
Machine Type:	Geared	Geared
Machine Manufacturer:	ThyssenKrupp	ThyssenKrupp
Machine Model:	GD-1	GD-1
Drive Manufacturer:	ThyssenKrupp	ThyssenKrupp
Drive Type:	VVVF	VVVF
Drive Model:	TKE 207 BJ1	TKE 207 BJ1
Drive Output:	30	30
Drive Configuration:	Overhead	Overhead
Rope Ratio:	1:1	1:1
# of Ropes/Belts:	6	6
Rope Diameter:	.625	.625
Auxiliary Brake:	Sheave jammer	Sheave jammer
Entrance Type:	SSSO	SSSO
Door Operator Type:	Thyssenkrupp HD-03	Thyssenkrupp HD-03
Door Locks:	ThyssenKrupp	ThyssenKrupp
Entrance Protection:	Infrared	Infrared
Entrance Width (inches):	42	42

Designation:	1	2
Entrance Height (inches):	84	84
Arrival Signal:	Car lantern	Car lantern
Cab Width (inches):	74	74
Cab Depth (inches):	48	48
Cab Height (inches):	104	104
Car Operating Panels:	Main	Main
Floors Served:	P, G, 2-19	P, G, 2-19
Fire Service:	Phase 2	Phase 2
Communication:	Hands-free	Hands-free
Security:	Not provided	Not provided

EQUIPMENT INVENTORY - PASSENGER 3-4

Designation:	3	4
Installation Number:	83980	83981
OEM Manufacturer:	ThyssenKrupp	ThyssenKrupp
OEM Installer:	ThyssenKrupp	ThyssenKrupp
Current Contractor:	ThyssenKrupp	ThyssenKrupp
Year Installed:	Circa 2006	Circa 2006
Sales Number:	CU4460	CU4461
Control Manufacturer:	ThyssenKrupp	ThyssenKrupp
Control Type:	TAC 50	TAC 50
Elevator Classification:	Passenger	Passenger
Capacity (lbs):	2500	2500
Contract Speed (fpm):	500	500
Governor Trip Speed:	625	625
Motor Manufacturer:	Imperial	Imperial
Motor Type:	286TSC	286TSC
Motor Serial Number:	M600039	M601247@'
Motor Output:	30 HP	30 HP
Machine Type:	Geared	Geared
Machine Manufacturer:	ThyssenKrupp	ThyssenKrupp
Machine Model:	GD-1	GD-1
Drive Manufacturer:	ThyssenKrupp	ThyssenKrupp
Drive Type:	VVVF	VVVF
Drive Model:	TKE 207 BJ1	TKE 207 BJ1
Drive Output:	30	30
Drive Configuration:	Overhead	Overhead
Rope Ratio:	1:1	1:1
# of Ropes/Belts:	6	6
Rope Diameter:	.625	.625
Auxiliary Brake:	Sheave jammer	Sheave jammer
Entrance Type:	SSSO	SSSO
Door Operator Type:	Thyssenkrupp HD-03	Thyssenkrupp HD-03
Door Locks:	ThyssenKrupp	ThyssenKrupp
Entrance Protection:	Infrared	Infrared
Entrance Width (inches):	42	42

Designation:	3	4
Entrance Height (inches):	84	84
Arrival Signal:	Car lantern	Car lantern
Cab Width (inches):	74	74
Cab Depth (inches):	48	48
Cab Height (inches):	104	104
Car Operating Panels:	Main	Main
Floors Served:	P, G, 2-19	P, G, 2-19
Fire Service:	Phase 2	Phase 2
Communication:	Hands-free	Hands-free
Security:	Not provided	Not provided

PERFORMANCE DATA - PASSENGER 1-2

Designation:	1	2	
Parameters	**Measured Values**	**Measured Values**	**Suggested Values$^{\Psi}$**
Installation Number:	83978	83979	-
Speed Up (fpm):	501.7	500.7	490.0 - 510.0
Speed Down (fpm):	502.0	501.4	490.0 - 510.0
Operating Time Up (s):	12.82	12.69	≤ 13.20
Operating Time Down (s):	12.86	13.66	≤ 13.20
Door Open Time (s):	3.21	4.79	≤ 2.90
Door Close Time (s):	4.01	3.98	≤ 4.50
Car Call Dwell Time (s):	4.54	4.41	≤ 5.00
Nudging Time (s):	20.00	20.00	≤ 20.00
Running (Fan) Noise Level (db):	62.0	54.0	≤ 55.0
Door Open Noise Level (db):	57.0	61.0	≤ 62.0
Door Close Noise Level (db):	58.0	58.0	≤ 62.0
Max: X (mg):	33.1	49.8	≤ 10.0
Max: Y (mg):	69.0	40.4	≤ 10.0
Max: Z (mg):	69.4	75.9	≤ 10.0
A95: X (mg):	20.0	20.4	≤ 6.0
A95: Y (mg):	49.4	26.9	≤ 6.0
A95: Z (mg):	45.3	55.3	≤ 6.0
Levelling Accuracy (inches):	0.250	0.250	≤ 0.250
Door Closing Force (N):	12	12	≤ 133
Jerk (ft/s3):	3.6	3.7	≤ 9.0
A95 Acceleration (ft/s2):	2.1	2.1	≤ 4.5

Ψ- Operating times and door times should be discussed with building management.
s/d - Elevator shutdown.

DEFICIENCIES - PASSENGER 1-2

Safety Related Deficiencies

#	Elevator	Description	Photo
1	1	**The gap between car door and return is large. Adjust the elevator door and reduce gap to prevent any passenger injuries or pinching hazards. Return /swing panel is loose. Can be moved to enlarge door gap.**	1
2	2	**The hall door is not self-closing in the absence of an elevator. Adjust or replace the door close equipment to allow the door to close under its own force. At P level, when fully open door does not self close.**	

Performance Deficiencies

#	Elevator	Description
3	1	The Fan Running Noise is louder than the recommended value. If this noise is considered objectionable, consideration should be given to operating the fan at a lower speed or replacing it with a less noisy one.
4	1	The maximum horizontal vibration in the X-axis or front to back is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
5	1	The maximum horizontal vibration in the Y-axis or side to side is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
6	1	The maximum vertical vibration in the Z-axis or up and down direction is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
7	1	The horizontal vibration in the X-axis or front to back direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
8	1	The horizontal vibration in the Y-axis or side to side direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
9	1	The maximum vertical vibration in the Z-axis or up and down direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
10	1	The door open time is too slow and should be improved. Refer to the "Performance Data" for suggested value.

#	Elevator	Description
11	2	The maximum horizontal vibration in the X-axis or front to back is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
12	2	The maximum horizontal vibration in the Y-axis or side to side is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
13	2	The maximum vertical vibration in the Z-axis or up and down direction is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
14	2	The horizontal vibration in the X-axis or front to back direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
15	2	The horizontal vibration in the Y-axis or side to side direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
16	2	The maximum vertical vibration in the Z-axis or up and down direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
17	2	The operating time down is too slow and should be improved. Refer to the "Performance Data" for suggested value.
18	2	The door open time is too slow and should be improved. Refer to the "Performance Data" for suggested value.

Logbook Deficiencies

#	Elevator	Description
19	1	**Some or all annual tests are six or more months overdue. The contractor should perform the missed annual tests to maintain the elevators in accordance with required code. Firefighters Emergency Operation and Standby or Emergency Power Operation testing still overdue.**
20	1	One of the quarters of maintenance was missed. Inspection must be completed evenly thought the year. No more than three months apart May then Sept inspection in 2017
21	2	**Some or all annual tests are six or more months overdue. The contractor should perform the missed annual tests to maintain the elevators in accordance with required code. Firefighters Emergency Operation and Standby or Emergency Power Operation testing still overdue.**
22	2	One of the quarters of maintenance was missed. Inspection must be completed evenly thought the year. No more than three months apart May then Sept inspection in 2017

Major Deficiencies

#	Elevator	Description
23	1	The counterweight governor rope is rouged. The contractor should replace the governor ropes immediately to ensure the ropes are in compliance with safety code requirements and operate as designed in the event of safety activation.
24	1	The compensating sheave shakes when operating and is noisy. The compensating sheave should be adjusted and repaired as required to eliminate the noise and vibration. Appears to not be tracking correctly.
25	2	One or more hoist ropes have unequal rope tension. The contractor should test, review, and adjust the ropes to ensure the rope tension is equalized.
26	2	The counterweight guide shoes/roller guides are noisy. The contractor should adjust or replace the noisy guide shoes or roller guides.

Housekeeping Deficiencies

#	Elevator	Description	Photo
27	1	The car top is dirty and dusty. The contractor should clean the car tops including door operators. Also, remove all discretionary components from the car top. Remove parts and boxes	
28	1	The roller guides / guide shoes require cleaning. The contractor should ensure the roller guides / guide shoes are cleaned on a regular basis.	2
29	1	The clutch and slave arm is dusty and fluffy. The contractor should clean the components.	3
30	2	The controller is dusty and requires cleaning. The contractor should clean the controller. Debris in the bottom of controller	
31	2	The car top is dirty and dusty. The contractor should clean the car tops including door operators. Also, remove all discretionary components from the car top. Remove parts and boxes	
32	2	The clutch and slave arm is dusty and fluffy. The contractor should clean the components.	
33	2	The pit is slightly dusty and dirty. The pit should be cleaned.	4

Minor Deficiencies

#	Elevator	Description
34	1	The alteration data tag is missing from the car top or controller. The tag should be provided to reflect any major alterations or changes to cab weight as required by code. Provide tag for the car top railing installation.
35	1	The car top railings are installed but some of the components are missing or are not in compliance with the code requirements. The contractor should replace or retrofit the required components. No mid rail on divider beam side of elevator
36	1	**The car top inspection box is not working properly. The inspection box should be reviewed and repaired to ensure safe operation of the elevator from the car top. The inspection button can be pushed down and it feels like it has been activated but does not put car on inspection. Safety Concern.**
37	1	The spirator is noisy. The spirator should be lubricated where possible or replaced. Floors G, 2 and 3.
38	2	One or more hall door rollers are worn or noisy. The contractor should replace the rollers. Ground floor
39	2	The alteration data tag is missing from the car top or controller. The tag should be provided to reflect any major alterations or changes to cab weight as required by code. Provide tag for the car top railing installation. Rope tag missing
40	2	The fuse is not properly inserted in the fuse holder. The fuse should be inserted properly in the fuse holder. Fuses FLA and FLB . Cannot read label on fuse
41	2	The car top railings are installed but some of the components are missing or are not in compliance with the code requirements. The contractor should replace or retrofit the required components. No mid rail on divider beam side of elevator
42	2	The spirator is noisy. The spirator should be lubricated where possible or replaced. Multiple floors

Owner Deficiencies

#	Elevator	Description
43	1	Device certificate displayed is incorrect or expired. Owner should provide the correct and valid license. Capacity rating is inconsistent on multiple tags. Certificate is expired

PHOTO REFERENCE PASSENGER 1-2

Photo - 1

Photo - 2

Photo - 3

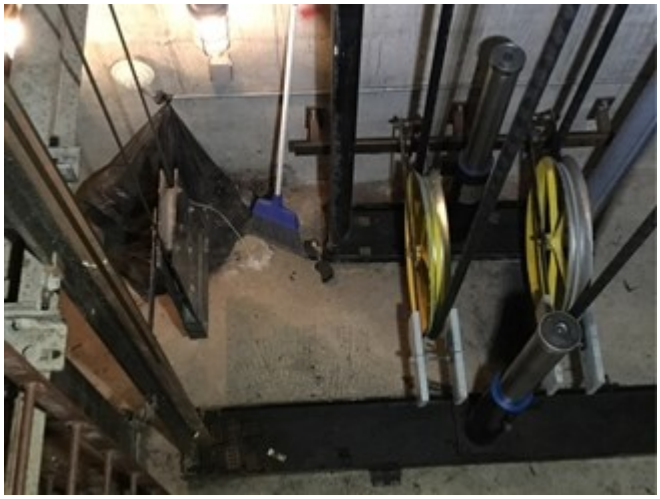


Photo - 4

PERFORMANCE DATA - PASSENGER 3-4

Designation:	3	4	
Parameters	**Measured Values**	**Measured Values**	**Suggested Values$^{\Psi}$**
Installation Number:	83980	83981	-
Speed Up (fpm):	498.8	502.3	490.0 - 510.0
Speed Down (fpm):	505.9	508.1	490.0 - 510.0
Operating Time Up (s):	12.67	12.66	≤ 13.20
Operating Time Down (s):	12.67	12.63	≤ 13.20
Door Open Time (s):	**4.04**	**4.01**	≤ 2.90
Door Close Time (s):	4.04	3.73	≤ 4.50
Car Call Dwell Time (s):	4.36	4.30	≤ 5.00
Nudging Time (s):	20.00	20.00	≤ 20.00
Running (Fan) Noise Level (db):	**56.0**	**58.0**	≤ 55.0
Door Open Noise Level (db):	58.0	60.0	≤ 62.0
Door Close Noise Level (db):	57.0	59.0	≤ 62.0
Max: X (mg):	**19.6**	**27.8**	≤ 10.0
Max: Y (mg):	**13.5**	**33.1**	≤ 10.0
Max: Z (mg):	**60.0**	**79.2**	≤ 10.0
A95: X (mg):	**6.1**	**19.2**	≤ 6.0
A95: Y (mg):	5.3	**16.7**	≤ 6.0
A95: Z (mg):	**44.1**	**56.3**	≤ 6.0
Levelling Accuracy (mm):	0.250	0.250	≤ 6.350
Door Closing Force (N):	12	12	≤ 133
Jerk (ft/s3):	4.1	4.8	≤ 9.0
A95 Acceleration (ft/s2):	2.1	2.1	≤ 4.5

Ψ- Operating times and door times should be discussed with building management.
s/d - Elevator shutdown.

DEFICIENCIES - PASSENGER 3-4

Safety Related Deficiencies

#	Elevator	Description
		None

Performance Deficiencies

#	Elevator	Description
1	3	The Fan Running Noise is louder than the recommended value. If this noise is considered objectionable, consideration should be given to operating the fan at a lower speed or replacing it with a less noisy one.
2	3	The maximum horizontal vibration in the X-axis or front to back is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
3	3	The maximum horizontal vibration in the Y-axis or side to side is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
4	3	The maximum vertical vibration in the Z-axis or up and down direction is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
5	3	The horizontal vibration in the X-axis or front to back direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
6	3	The maximum vertical vibration in the Z-axis or up and down direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
7	3	The door open time is too slow and should be improved. Refer to the "Performance Data" for suggested value.
8	4	The Fan Running Noise is louder than the recommended value. If this noise is considered objectionable, consideration should be given to operating the fan at a lower speed or replacing it with a less noisy one.
9	4	The maximum horizontal vibration in the X-axis or front to back is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
10	4	The maximum horizontal vibration in the Y-axis or side to side is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for

#	Elevator	Description
		more details.
11	4	The maximum vertical vibration in the Z-axis or up and down direction is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
12	4	The horizontal vibration in the X-axis or front to back direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
13	4	The horizontal vibration in the Y-axis or side to side direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
14	4	The maximum vertical vibration in the Z-axis or up and down direction for 95% of the ride is greater than the suggested limit. Refer to the Performance Data for suggested value and to the ride analysis portion of our report for more details.
15	4	The door open time is too slow and should be improved. Refer to the "Performance Data" for suggested value.

Logbook Deficiencies

#	Elevator	Description
16	3	**Some or all annual tests are six or more months overdue. The contractor should perform the missed annual tests to maintain the elevators in accordance with required code. Emergency power testing.**
17	4	**Some or all annual tests are six or more months overdue. The contractor should perform the missed annual tests to maintain the elevators in accordance with required code. Emergency power testing.**

Major Deficiencies

#	Elevator	Description
18	3	The counterweight guide shoes/roller guides are noisy. The contractor should adjust or replace the noisy guide shoes or roller guides.
19	3	The car governor rope is rouging slightly. The rope should be monitored.
20	4	The brakes operate with a clapping noise. The contractor should adjust the brakes to eliminate the noise. Proper gaskets should be installed as required.

Housekeeping Deficiencies

#	Elevator	Description	Photo
21	3	The controller is dusty and requires cleaning. The contractor should clean the controller.	
22	3	The car top is dirty and dusty. The contractor should clean the car tops including door operators. Also, remove all discretionary components from the car top. Remove parts from cartop	1, 2
23	3	The machine room has an accumulation of items such as cardboard boxes, spare parts, plastic containers, garbage etc. The machine room should be organized. Provide explanation why 4 worm gear assemblies are in machine room. Machine housing.	
24	4	The controller is dusty and requires cleaning. The contractor should clean the controller.	
25	4	The car top is dirty and dusty. The contractor should clean the car tops including door operators. Also, remove all discretionary components from the car top.	

Minor Deficiencies

#	Elevator	Description	Photo
26	3	One or more controller door panels have been removed. The contractor should reinstall the panels to reduce the amount of dust and debris accumulation.	
27	3	The car top railings are installed but some of the components are missing or are not in compliance with the code requirements. The contractor should replace or retrofit the required components. Mid rail on deflector beam side	3
28	3	The spirator is noisy. The spirator should be lubricated where possible or replaced. Numerous floors	
29	3	One or more door restrictor assembly components are loose. The components should be review and adjusted. Sometimes releases between floors	
30	4	One or more door operator drive belts are damaged. The contractor should replace the belt. Also loose.	
31	4	One or more hall door rollers are worn or noisy. The contractor should replace the rollers. 12 th floor	
32	4	The car top railings are installed but some of the components are missing or are not in compliance with the code requirements. The contractor should replace or retrofit the required components. Mid rail on deflector beam side	
33	4	The spirator is noisy. The spirator should be lubricated where possible or replaced. Numerous floors	

#	Elevator	Description	Photo
34	4	One or more door restrictor assembly components are loose. The components should be review and adjusted. Sometimes releases between floors	

Owner Deficiencies

#	Elevator	Description	Photo
35	3	**The pit steel is rusty. Owner should have the pit and pit equipment sanded and painted to prevent any further damage.**	
36	3	There is an accumulation of water in the pit. The water should be removed from the pit to prevent damage and corrosion to pit equipment. The pit equipment should be treated as required.	4
37	4	**The pit steel is rusty. Owner should have the pit and pit equipment sanded and painted to prevent any further damage.**	

PHOTO REFERENCE PASSENGER 3-4

Photo - 1

Photo - 2

Photo - 3

Photo - 4

FOR BUILDING OWNERS

The Government of Ontario, under the direction of the Ministry of Consumer and Commercial Relations and the Technical Standards and Safety Authority, Elevating Devices Branch, through its Elevating Devices Act and the Ontario Regulation 209/01 and specifically Section 32, 34 and 38, requires that every Owner of an elevating device ensures that the elevating device is never used or operated, unless it is maintained by a qualified elevator maintenance contractor. Also the Owner is responsible for clear access to and egress from every elevating device. All elevator contractors and elevator interior contractors (anyone performing work on an elevator), must be qualified for their specific work and registered as a contractor with the TSSA (formerly the MCCR).

The elevating devices act also requires the Owner to be responsible and liable for the minimum maintenance requirements, performance and compliance of each elevator as directed in CSA B44.2-07. The Owner must assure that such required tests and tasks as applicable are completed and that the maintenance contractor updates the logbook near each elevating device, on a monthly, annual, 2 and 5 year term basis and as per the schedule Table 1 for elevators and dumbwaiters, Table 2 for escalators. The CSA B44.2-07 is a schedule of minimal maintenance requirements, where safety components must be inspected and tested at a regular interval. These requirements are not nearly enough to properly maintain an Elevating Device and to preserve the value of the equipment.

The Owner of an elevating device is also required under Ontario Regulation 209/01 Section 37 to assure that access to elevating devices are clear and there is safe, properly illuminated and convenient access to a machine room, regardless of weather conditions and that machine rooms and any part of elevating devices that may be hazardous, is locked or otherwise made inaccessible to the public.

The purpose of this equipment audit, performance and maintenance evaluation is to assist the owners or property managers to provide safe and reliable vertical transportation in this building. Further we check to verify that the owner's equity is being protected, by proper preventive maintenance.

The building manager should address Owner related deficiencies outlined in this report under "Owner Deficiencies" where applicable. Based on our inspection, the contractor should be asked to respond to the deficiencies as soon as possible and to notify the Owner when the work is completed.

SUGGESTED UPGRADES

The following is a list of recommended or suggested upgrades that should be considered in the next five years for competitive and liability reasons and to ensure reliable and dependable elevator service. Some of the upgrades are recommended due to age, obsolescence, safety or reliability while others may be required due to code requirements and must be addressed by the indicated deadline. Any upgrades required due to code changes are identified with 'CODE REQUIREMENT' preceding the upgrade description.

Passenger 1-2

CODE REQUIREMENT - Machine Guarding (1, 2)
Machine guarding under the Ministry of Labour (MOL) mandate but not presently required by the elevating devices code are now required on all elevating devices irrespective of the year of installation. The guarding installations are designed to protect elevator mechanics against accidental contact with hoist machine drive sheaves. This issue is being pursued and enforced by the MOL but not by the TSSA (elevating devices regulating authority in the Province of Ontario). The TSSA issued a guideline to assist employers, supervisors and workers on recognizing hazards and determining the best way to comply with their obligations under the Occupational Health and Safety Act (OHSA) which is enforced by the MOL. While there is no compliance deadline or implementation date, according to the guideline there is a requirement for compliance now. The guideline does not define how to design or install elevator machine room equipment guarding since each installation is unique. However, it provides background details, along with specific equipment requirements that the designers and implementers of such guarding need to consider. All guarding will be provided to cover all moving parts including but not limited to: machines, sheaves, governors and exposed ropes while still allowing for proper maintenance.

Total cost of upgrade: $14,000

Rope Brake (1, 2)
The existing rope brake should be replaced with newer rope brake design for obsolescence reasons as well as reliability issues. The existing ThyssenKrupp Elevator sheave jammer has been mandated for replacement in some jurisdictions due to the device not performing the intended safety function as required by code. Since replacement is not mandated in this jurisdiction we anticipate that the contractor will charge for the replacement of the rope brake. The cost associated with replacing these rope brakes is not a sunk cost since they can be retained if a modernization is performed. We recommend replacement in short term.

Total cost of upgrade: $20,000

Passenger 3-4

CODE REQUIREMENT - Machine Guarding (3, 4)
Machine guarding under the Ministry of Labour (MOL) mandate but not presently required by the elevating devices code are now required on all elevating devices irrespective of the year of installation. The guarding installations are designed to protect elevator mechanics against accidental contact with hoist machine drive sheaves. This issue is being pursued and enforced by the MOL but not by the TSSA (elevating devices regulating authority in the Province of Ontario). The TSSA issued a guideline to assist employers, supervisors and workers on recognizing hazards and determining the best way to comply with their obligations under the Occupational Health and Safety Act (OHSA) which is enforced by the MOL. While there is no compliance deadline or implementation date, according to the guideline there is a requirement for compliance now. The guideline does not define how to design or install elevator machine room equipment guarding since each installation is unique. However, it provides background details, along with specific equipment requirements that the designers and implementers of such guarding need to consider. All guarding will be provided to cover all moving parts including but not limited to: machines, sheaves, governors and exposed ropes while still allowing for proper maintenance.

Total cost of upgrade: $14,000

Rope Brake (3, 4)
The existing rope brake should be replaced with newer rope brake design for obsolescence reasons as well as reliability issues. The existing ThyssenKrupp Elevator sheave jammer has been mandated for replacement in some jurisdictions due to the device not performing the intended safety function as required by code. Since replacement is not mandated in this jurisdiction we anticipate that the contractor will charge for the replacement of the rope brake. The cost associated with replacing these rope brakes is not a sunk cost since they can be retained if a modernization is performed. We recommend replacement in short term.

Total cost of upgrade: $20,000

Rust Proofing (3, 4)
The pit steel or equipment is rusting and the presence of rust on the pit equipment will eventually damage the equipment. To prevent this from happening, the pit equipment should be sanded and painted so that damage does not occur. The scope of work includes cleaning and treating the pit steel, sanding the pit equipment, priming and painting the pit steel, buffer stands, rail support, and fascia brackets. Steel may have to be provided to support existing steel channel.

Total cost of upgrade: $6,000

Please note that all capital costs are in today's local currency rates and these costs are estimates for budgetary purpose only. These costs can change without notice due to fluctuation in currency exchanges, changes in the collective agreement, inflation, war, and strikes.

RIDE QUALITY ANALYSIS

Qualitative approach to ride quality depends entirely on an undefined individual human response to external stimulus. To address this problem a committee was organized in 1995 by the Lift Manufacturers Association of Australia (LMAA) to address the lack of standards. The committee consisted of lift industry individuals (Manufacturers, consultants, academics and instrumentation manufacturers) from the US, Finland and Australia.

The committee adopted generally accepted ISO8041 standards, which measure the human response to vibration.The following are the general measurement methodologies set by LMAA and adopted by Solucore:

Measurement Methodologies:

1. Place instrument in centre of elevator, Microphone at 3 to 3.5 feet above the floor;
2. X-axis perpendicular to the guide rails or across from the door;
3. One operator in the elevator, maximum two persons;
4. Record full run from the lowest landing to the top floor;
5. Recording starts prior to car door(s) closing and ends after they are fully open; and
6. Ride quality measurements shall be reported to include: maximum peak-to-peak and typical vibration levels for each axis, sound levels, jerk, acceleration and velocity.

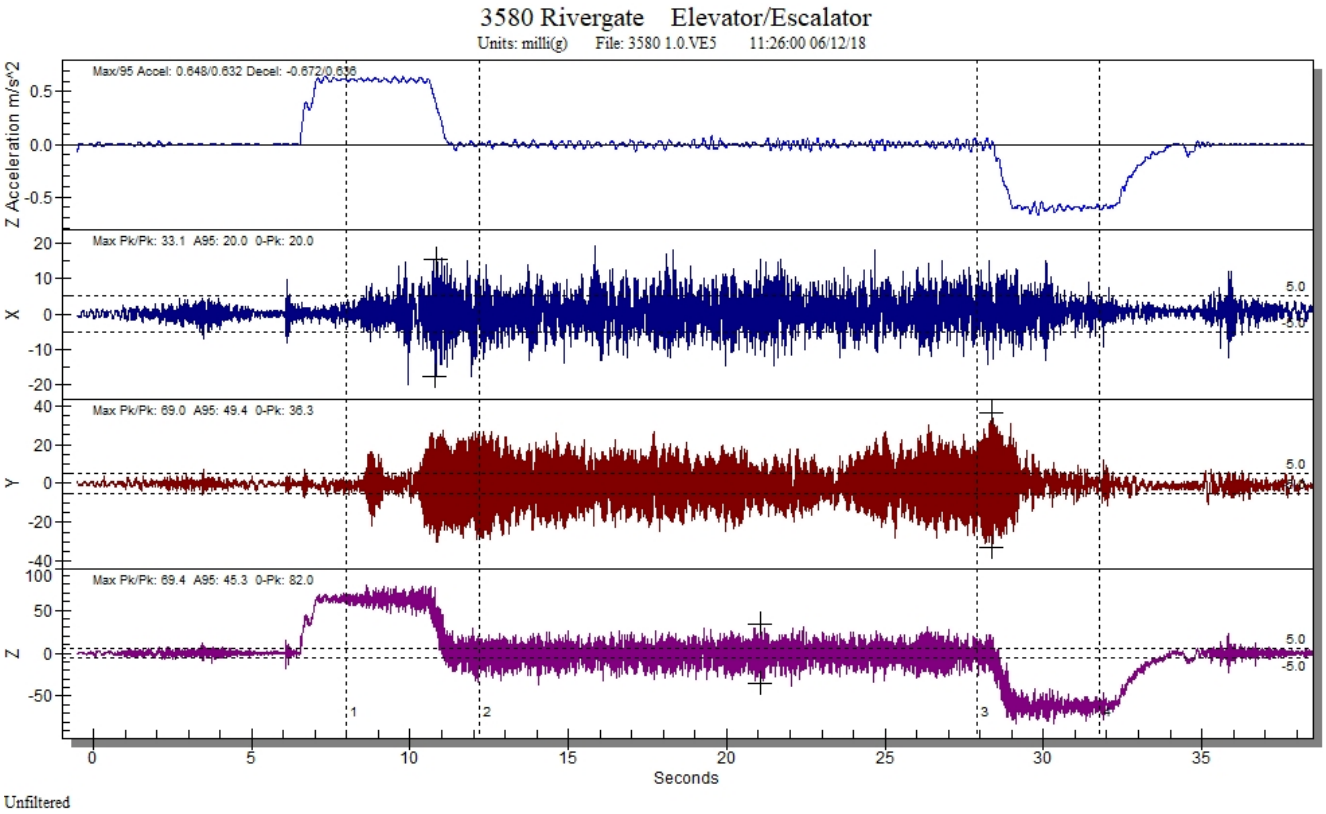
Ride Quality at 3580 Rivergate Way

The ride quality analysis was performed on the devices using the latest ride quality instrument. The device used was an EVA-625 designed and built by Physical Measurement Technologies Inc. (PMT). An ISO 1999 filter was used to “clean” the raw data.

The contract at 3580 Rivergate Way does not specify ride quality requirements. Based on the suggested values where the ride quality and the acceleration profiles are beyond the recommended limits, they should be investigated and repaired. The contractor should be asked to review the ride quality recording and take corrective actions to help keep the building perception competitive with other buildings.

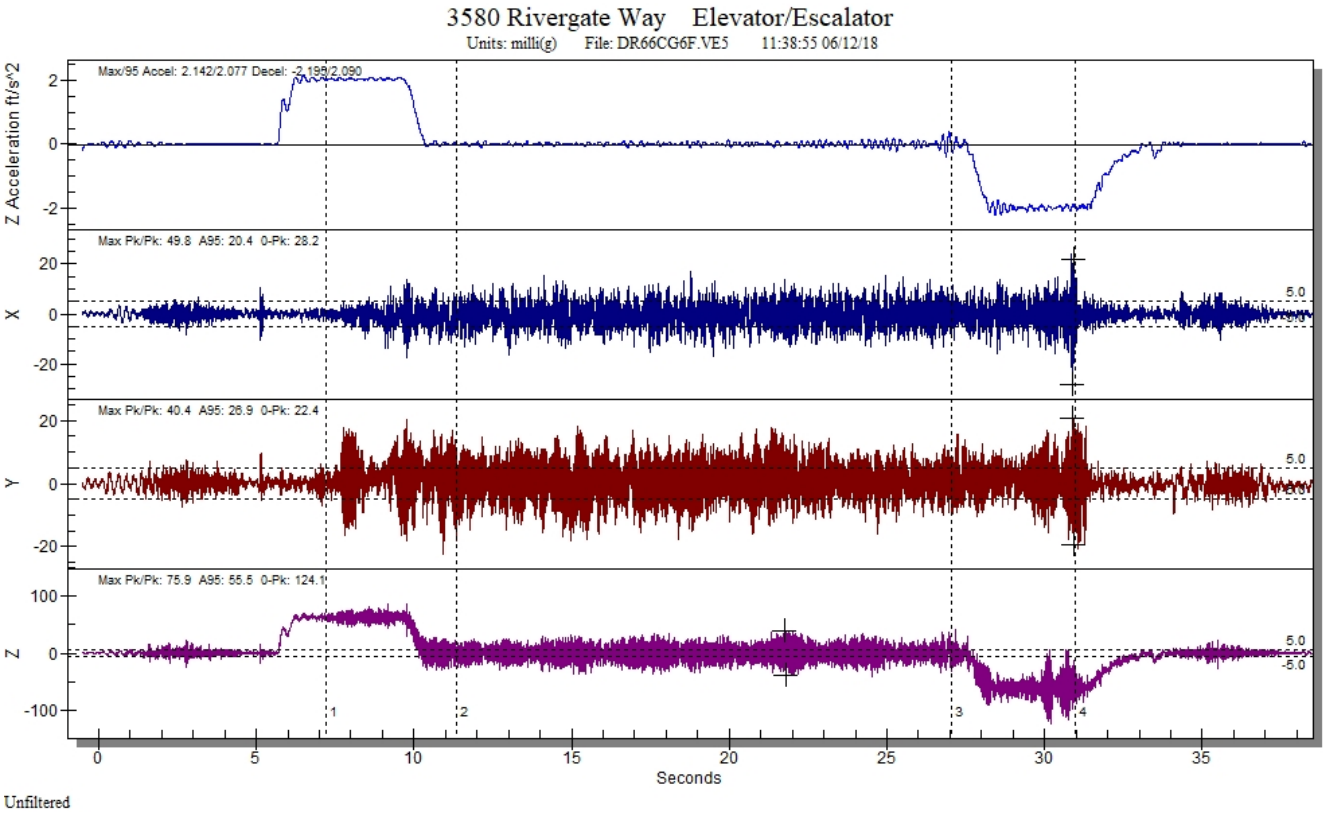
Passenger 1-2 - 1

The ride quality appears to be poor in the X, Y and Z axes. The readings are greater than the suggested value and should be improved. The contractor should review the ride quality in all axes and make the necessary adjustment or repairs to rollers, rails, stabilizers, etc. as required.



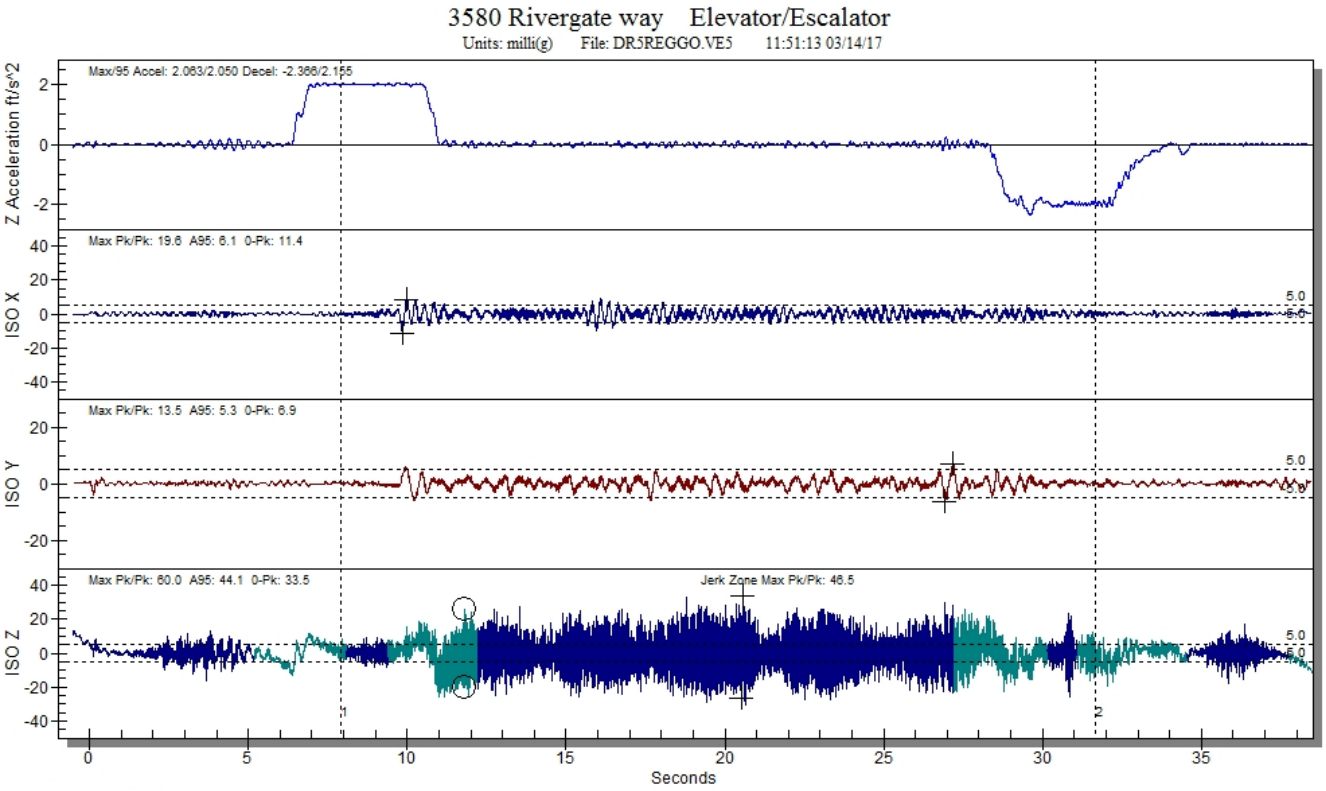
Passenger 1-2 - 2

The ride quality appears to be poor in the X, Y and Z axes. The readings are greater than the suggested value and should be improved. The contractor should review the ride quality in all axes and make the necessary adjustment or repairs to rollers, rails, stabilizers, etc. as required.



Passenger 3-4 - 3

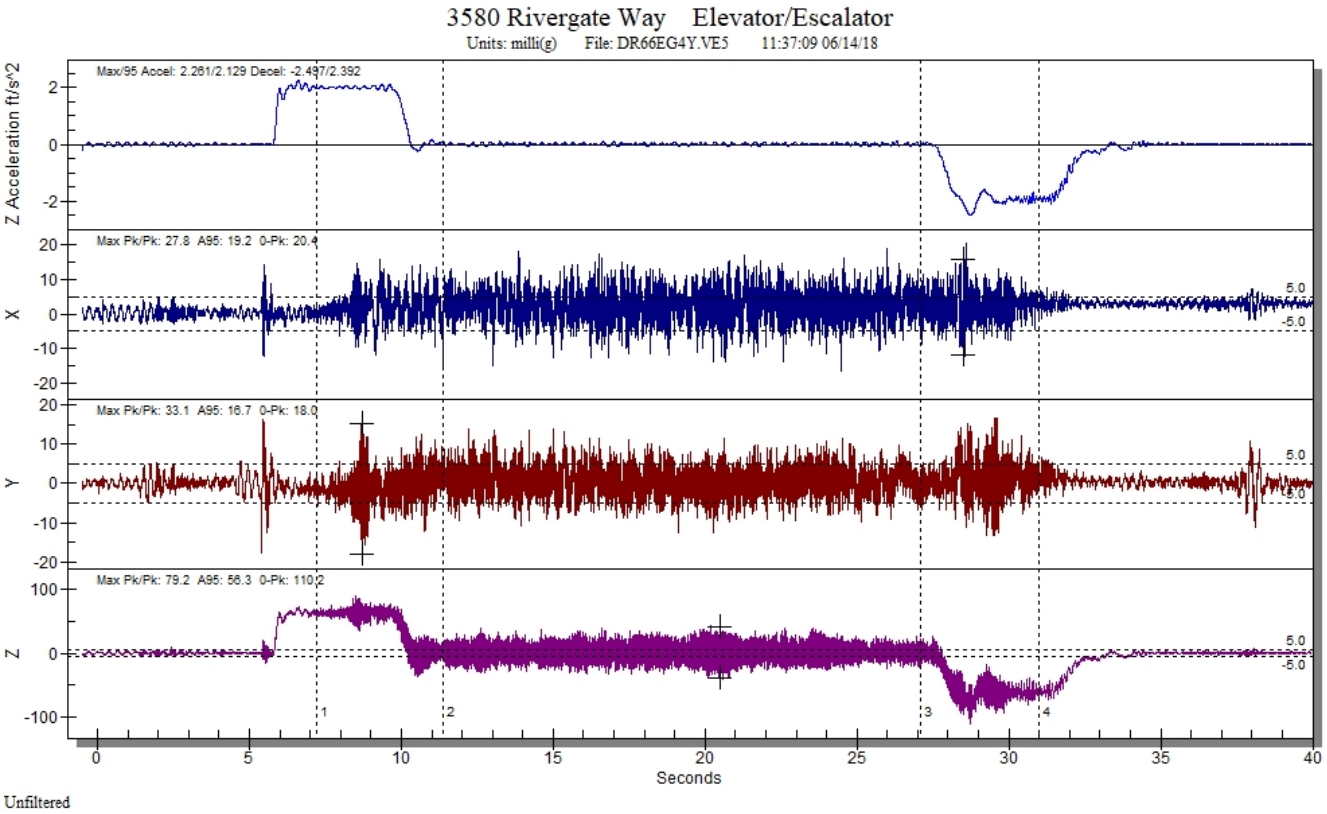
The ride quality appears to be poor in the X and Z axes. The readings are greater than the suggested value and should be improved. The contractor should review the ride quality in those axes and make the necessary adjustment or repairs to rollers, rails, stabilizers, etc. as required.



ISO Whole Body X,Y,Z 1999

Passenger 3-4 - 4

The ride quality appears to be poor in the X, Y and Z axes. The readings are greater than the suggested value and should be improved. The contractor should review the ride quality in all axes and make the necessary adjustment or repairs to rollers, rails, stabilizers, etc. as required.



APPENDIX E:
NOTICE OF FUTURE FUNDING OF RESERVE FUND

NOTICE OF FUTURE FUNDING OF THE RESERVE FUND

(under *subsection 94 (9)* of the *Condominium Act, 1998*)

TO: All Owners of Ottawa-Carleton Standard Condominium Corporation No. 769

The Board has received and reviewed a Class 2 - Update with Site Inspection Reserve Fund Study dated March 12, 2019, prepared by Keller Engineering, and has proposed a plan for the future funding of the reserve fund that the Board of Directors has determined will ensure that, in accordance with the regulations made under the Condominium Act, 1998, the reserve fund will be adequate for the major repair and replacement of the common elements and assets of the corporation.

This notice contains:

1. A summary of the reserve fund study.
2. A summary of the proposed funding plan.
3. A statement indicating the areas, if any, in which the proposed funding plan differs from the reserve fund study.

At the present time the average contribution per common interest per month to the reserve fund is $175.10. Based on the proposed funding plan, the average increase in contribution per common interest per month will be $26.26 in fiscal year 2019, $30.20 in fiscal year 2020, and $34.74 in fiscal year 2021.

The proposed funding plan, recommended by Keller Engineering, will be implemented on or before January 1, 2019.

Dated this _____ day of _____, 2019.

OTTAWA-CARLETON STANDARD CONDOMINIUM CORPORATION NO. 769

_____

, Director

_____

, Director

SUMMARY OF RESERVE FUND STUDY

The following is a summary of the Class 2 - Update with Site Inspection dated March 12, 2019, prepared by Keller Engineering for Ottawa-Carleton Standard Condominium Corporation No. 769 (known as the 'Reserve Fund Study').

Subsection 94 (1) of the *Condominium Act, 1998*, requires the corporation to conduct periodic studies to determine whether the amount of money in the reserve fund and the amount of contributions collected by the corporation are adequate to provide for the expected costs of major repair and replacement of the common elements and assets of the corporation. As a result, the corporation has obtained the Reserve Fund Study.

The estimated expenditures from the reserve fund for the next thirty (30) years are set out in the CASH FLOW TABLE. In this summary, the term 'annual contribution' means the total amount to be contributed each year to the reserve fund, exclusive of interest earned on the reserve fund. The recommended annual contribution for 2019 is $338,292, based on the estimated expenditures and the following:

Opening Balance of the Reserve Fund:	$ 1,456,622
Minimum Reserve Fund Balance during the projected period:	$ 1,498,070
Assumed Annual Inflation Rate for Reserve Fund Expenditures:	2.0%
Assumed Annual Interest Rate for interest earned on the Reserve Fund:	2.5%

The Reserve Fund Study can be examined by making a written request to the Board of Directors of Ottawa-Carleton Standard Condominium Corporation No. 769.

CASH FLOW TABLE

Opening Balance of the Reserve Fund:	$ 1,456,622
Current Annual Contributions:	$ 294,167
Minimum Reserve Fund Balance (as indicated in this table):	$ 1,498,070
Assumed Annual Inflation Rate for Reserve Fund Expenditures:	2.0%
Assumed Annual Interest Rate for interest on the Reserve Fund:	2.5%

Fiscal Year Ending	Opening Balance	Recommended Annual Total Contribution	Estimated Inflation Adjusted Expenditures	Estimated Interest Earned	Percentage Increase (Decrease) in Recommended Annual Total Contribution	Closing Balance
2018	$1,456,622	$294,167	$285,670	$32,951	2.5%	$1,498,070
2019	$1,498,070	$338,292	$261,630	$35,140	15.0%	$1,609,872
2020	$1,609,872	$389,036	$181,030	$40,584	15.0%	$1,858,462
2021	$1,858,462	$447,391	$360,418	$43,043	15.0%	$1,988,478
2022	$1,988,478	$456,339	$227,311	$49,733	2.0%	$2,267,240
2023	$2,267,240	$465,466	$232,961	$56,675	2.0%	$2,556,420
2024	$2,556,420	$474,775	$273,286	$63,013	2.0%	$2,820,923
2025	$2,820,923	$484,271	$241,224	$70,546	2.0%	$3,134,515
2026	$3,134,515	$493,956	$773,295	$65,205	2.0%	$2,920,381
2027	$2,920,381	$503,835	$65,288	$77,675	2.0%	$3,436,604
2028	$3,436,604	$513,912	$70,702	$90,571	2.0%	$3,970,385
2029	$3,970,385	$524,190	$73,359	$103,978	2.0%	$4,525,194
2030	$4,525,194	$534,674	$102,309	$117,256	2.0%	$5,074,815
2031	$5,074,815	$545,367	$3,039,976	$57,688	2.0%	$2,637,895
2032	$2,637,895	$556,275	$211,117	$67,623	2.0%	$3,050,676
2033	$3,050,676	$567,400	$397,879	$73,412	2.0%	$3,293,609
2034	$3,293,609	$578,748	$90,604	$87,309	2.0%	$3,869,063
2035	$3,869,063	$590,323	$64,411	$102,495	2.0%	$4,497,471
2036	$4,497,471	$602,130	$2,383,272	$60,382	2.0%	$2,776,710
2037	$2,776,710	$614,172	$946,927	$53,422	2.0%	$2,497,377
2038	$2,497,377	$626,456	$557,230	$56,334	2.0%	$2,622,937
2039	$2,622,937	$638,985	$354,105	$64,708	2.0%	$2,972,525
2040	$2,972,525	$651,765	$354,029	$73,609	2.0%	$3,343,869
2041	$3,343,869	$664,800	$209,728	$86,664	2.0%	$3,885,605
2042	$3,885,605	$678,096	$557,597	$91,676	2.0%	$4,097,781
2043	$4,097,781	$691,658	$149,295	$107,358	2.0%	$4,747,501
2044	$4,747,501	$705,491	$110,446	$124,745	2.0%	$5,467,291
2045	$5,467,291	$719,601	$110,316	$142,919	2.0%	$6,219,495
2046	$6,219,495	$733,993	$3,069,426	$87,927	2.0%	$3,971,989
2047	$3,971,989	$748,673	$1,244,867	$77,536	2.0%	$3,553,331

SUMMARY OF PROPOSED PLAN FOR FUTURE FUNDING OF THE RESERVE FUND

The following is a summary of the board's proposed plan for the future funding of the reserve fund.

The Board of Ottawa-Carleton Standard Condominium Corporation No. 769 has reviewed the Class 2 - Update with Site Inspection dated March 12, 2019 prepared by Keller Engineering for the corporation (known as the 'Reserve Fund Study') and has proposed a plan for the future funding of the reserve fund that the Board has determined will ensure that, in accordance with the regulations made under the Condominium Act, 1998, the reserve fund will be adequate for the major repair and replacement of the common elements and assests of the corporation.

The Board has adopted the funding recommendations of the Reserve Fund Study and will implement them as set out in the CONTRIBUTION TABLE.

The annual contribution recommended under the proposed funding plan for fiscal year 2019 is $338,292, which represents an increase of 15.0% over the amount already budgeted.

The Proposed Plan for Future Funding of the Reserve Fund can be examined by making a written request to the Board of Directors of Ottawa-Carleton Standard Condominium Corporation No. 769.

CONTRIBUTION TABLE

Fiscal Year Ending	A Annual Contribution*	% Increase Over Previous Year	B Other Contribution (e.g. special assessment, loan)	A + B Total Contribution Each Year to Reserve Fund
2018	$294,167	2.5%	$0	$294,167
2019	$338,292	15.0%	$0	$338,292
2020	$389,036	15.0%	$0	$389,036
2021	$447,391	15.0%	$0	$447,391
2022	$456,339	2.0%	$0	$456,339
2023	$465,466	2.0%	$0	$465,466
2024	$474,775	2.0%	$0	$474,775
2025	$484,271	2.0%	$0	$484,271
2026	$493,956	2.0%	$0	$493,956
2027	$503,835	2.0%	$0	$503,835
2028	$513,912	2.0%	$0	$513,912
2029	$524,190	2.0%	$0	$524,190
2030	$534,674	2.0%	$0	$534,674
2031	$545,367	2.0%	$0	$545,367
2032	$556,275	2.0%	$0	$556,275
2033	$567,400	2.0%	$0	$567,400
2034	$578,748	2.0%	$0	$578,748
2035	$590,323	2.0%	$0	$590,323
2036	$602,130	2.0%	$0	$602,130
2037	$614,172	2.0%	$0	$614,172
2038	$626,456	2.0%	$0	$626,456
2039	$638,985	2.0%	$0	$638,985
2040	$651,765	2.0%	$0	$651,765
2041	$664,800	2.0%	$0	$664,800
2042	$678,096	2.0%	$0	$678,096
2043	$691,658	2.0%	$0	$691,658
2044	$705,491	2.0%	$0	$705,491
2045	$719,601	2.0%	$0	$719,601
2046	$733,993	2.0%	$0	$733,993
2047	$748,673	2.0%	$0	$748,673

* The term 'annual contribution' means the amount to be contributed each year to the reserve fund from the monthly common expenses

DIFFERENCES BETWEEN THE RESERVE FUND STUDY AND THE PROPOSED PLAN FOR FUTURE FUNDING OF THE RESERVE FUND

The Plan for Future Funding of the Reserve Fund proposed by the Board differs from the Reserve Fund in the following respects:

NIL