



To The Owners, Strata Plan LMS 3990  
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Site Visits: July 19, 2019 and  
October 17, 2019  
Submitted: February 28, 2020  
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# 1 Introduction

RDH Building Science Inc. (RDH) was retained by the Owners, Strata Plan LMS3990 (the Owners) to prepare a Depreciation Report Update (the Report) for the residential complex known as The Crystal Residences, which is located at 6028 and 6088 Willingdon Avenue, Burnaby, BC. Strata Corporation LMS3990 is a residential strata property, which has an air space parcel agreement with the six adjacent air space parcels including the retail, office, hotel, community, cultural center, and parking. The Report only considers the common property and limited common property components (the Assets) that Strata Corporation LMS3990 (the residential strata corporation) is responsible to maintain, repair and replace.

The Report is intended to help the Owners, the Strata Council, and the Management team make informed decisions about the allocation of resources to the common property Assets (such as roofs, windows, boilers, and carpets).

This Report meets the requirements stipulated in the current Strata Property Act and Regulations. The Report includes a physical inventory of the common property assets; estimated costs for capital expenditures over a 30-year horizon; and three funding models. Refer to the appendices for RDH's qualifications and information on errors and omissions insurance. In accordance with the requirements of the Act, RDH declares that there is no relationship between the employees of RDH and the Owners.

This report is an update to the original Depreciation Report, which was issued on February 28, 2014. The Depreciation Report Update site visits were completed on July 19 and October 17, 2019, and the financial data is based on the 2019/2020 fiscal year. A draft report was distributed to the Strata Council and Strata Management on October 28, 2019. The report was subsequently finalized with the Strata Council's feedback and issued on February 28, 2020.

Depreciation Reports and Updates are a synopsis of a significant volume of data and has two parts: the summary and the appendices. The summary is intended to provide an overview of the Depreciation Report Update. The appendices provide detailed information to support the summary report. The appendices include a glossary of terms. Words that are *italicized* are defined in the glossary.

In addition to the Report, the supporting data are available to authorized users through RDH's interactive Building Asset Management Software (BAMS), posted on a secure website. The data is owned by the Strata Corporation and can be printed and/or exported on request. RDH has developed the interactive software tool to enable Owners to proactively manage their funding requirements and maintenance obligations, and a variety of other services in addition to Depreciation Reports and Updates are available.


As the physical and financial status of the Assets change over time, the Report will require updating. The Strata Property Act requires updates to the Report every three years; however, the Owners can choose to update portions of the Report more frequently, at their discretion, to reflect changes to their financial status and completed work.

## 2 The Crystal Residences

The Crystal Residences is the residential strata portion of the Crystal Mall complex comprised of a low-rise and a high-rise building. The buildings were originally constructed in approximately 1999; as of the date of this report, the complex is approximately 21 years old. The buildings are constructed of cast-in-place concrete with steel stud infill walls and situated above a four-level below-grade, concrete parkade.

The principal systems in the building include the building enclosure (the separation of the interior from exterior space), electrical (the electrical distribution, communications, and security equipment), mechanical (heating, cooling, and plumbing), elevators, fire safety (sprinklers, fire detection, and egress equipment), interior finishes, amenities, and site work. The Assets within each system are described in detail in Appendix B.

Key physical parameters of The Crystal Residences are summarized in Table 2.1, Figure 2.1, and Figure 2.2 below.

TABLE 2.1 KEY PHYSICAL PARAMETERS		
	Date of first occupancy (approximate)	1999
	Approximate gross floor area, including the parkade (ft <sup>2</sup> )	378,600
	Total area of Unit Entitlement	207,197
	Stories above grade	28
	Total number of strata lots	218

*Figure 2.1 Partial north elevation of the low-rise building at The Crystal Residences.*

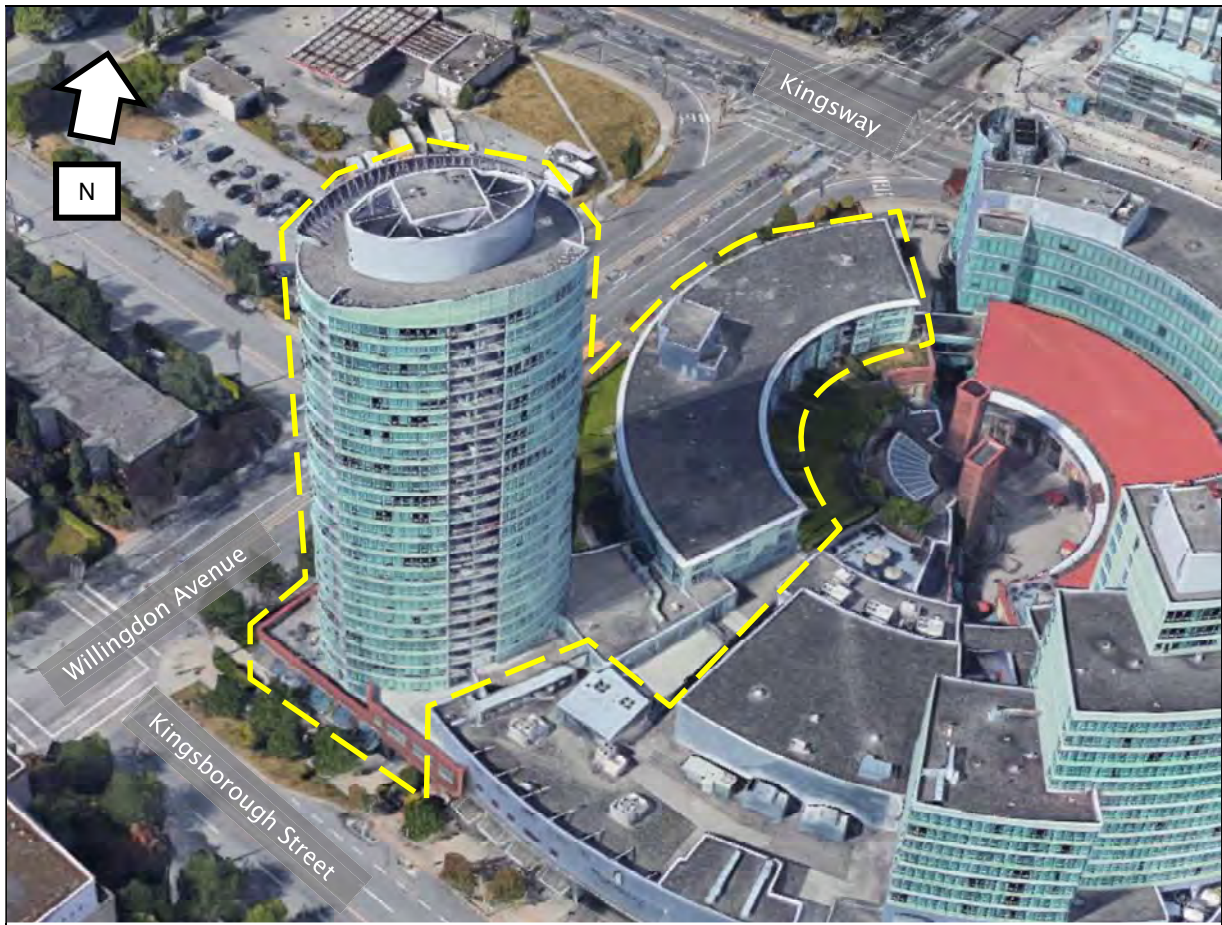
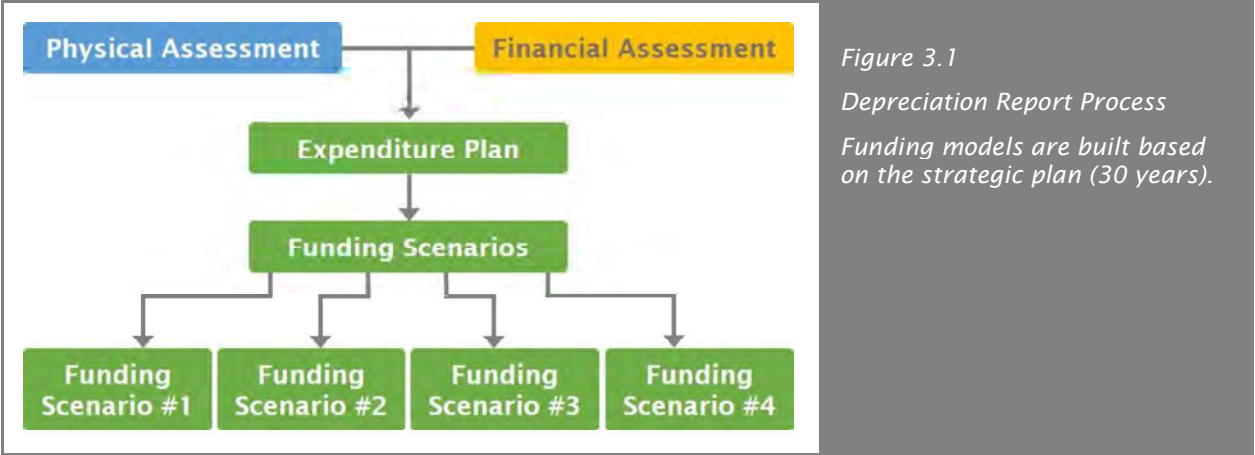


Figure 2.2 Aerial photograph of The Crystal Residences (Map Data Google © 2019).

# 3 Assessments

Depreciation Reports and Updates combine two distinct types of analysis: a *physical assessment*, and a *financial assessment*. The assessments are used to determine what the Strata Corporation owns, what condition the Assets are in, what the Strata is responsible for, and the *capital costs* associated with the Assets.

The process of preparing a Depreciation Report is summarized in Figure 3.1 below:



The following sections provide a brief overview of the physical assessment and financial assessment including a summary of key information.

## 3.1 Physical Assessment

The physical assessment has two parts: an inventory and an evaluation.

The *Asset Inventory* identifies “the common property, the common assets and those parts of a strata lot or limited common property, or both, that the Strata Corporation is responsible to maintain or repair under the Act, the Strata Corporation’s bylaws or an agreement with an owner” (*Strata Property Act Regulation*, BC Reg 43/2000, Ch. 6.2). In other words, it identifies what the Strata Corporation owns and must repair and maintain. The Asset Inventory is included as an appendix to this report.

The evaluation is used to forecast common repairs, replacements, and maintenance activities that “usually occur less often than once a year or that do not usually occur” (*Strata Property Act Regulation*, BC Reg 43/2000, Ch.6.2). In other words, the evaluation predicts only events that occur at intervals greater than one year.

The evaluation is typically based on:

- A review of historical documentation such as minutes, invoices, and the general ledger,
- Discussions with Strata Corporation representatives,
- A visual review of the complex, limited to a sample of readily accessible Assets, and
- A review of other technical information such as construction drawings, previous investigations or reports, and maintenance manuals.

Destructive testing, disassembly, and performance testing are not included in the physical evaluation; this report does not replace a Warranty Review or Condition Assessment. Please visit [www.rdh.com](http://www.rdh.com) for additional information on Warranty Reviews and Condition Assessments.

The condition of some Assets may be concealed, for example, buried infrastructure such as sanitary drainage lines or building enclosure assets such as the roof membrane. For Assets with the potential for concealed failure, a number of tools are used to assign a reasonable expected service life including the typical performance of the asset in other, similar properties; the performance history reported by the Strata Corporation; the original drawings; and any previous investigation reports commissioned by the Strata Corporation. It is expected that the Strata Corporation will need more detailed reviews as Assets approach the end of their service lives. Allowances for additional reviews or investigations are included as appropriate. Recommendations taken from any additional reviews should be incorporated into future Depreciation Report updates.

As part of the physical assessment, RDH compiled a history of completed projects by reviewing the documents provided by the Strata and interviewing Strata Corporation representatives. The history is summarized in Table 3.1 below. The history of renewals establishes the chronological age of the Assets while the history of major maintenance may affect the effective age of the Assets.

TABLE 3.1 MAINTENANCE AND RENEWALS HISTORY
<p><b>Building Enclosure</b></p> <ul style="list-style-type: none"> <li>→ 2019 - Caulking repairs for high-rise windows</li> <li>→ 2017 - Completed targeted membrane recoating at Parkade P1</li> <li>→ 2016 - Completed parkade P1 ceiling grouting</li> <li>→ 2012 - Completed partial renewal of the parking garage membrane</li> </ul>
<p><b>Electrical</b></p> <ul style="list-style-type: none"> <li>→ 2017 - Cleaned and inspected unit substation</li> <li>→ 2016 - Completed electrical vault maintenance</li> <li>→ 2013 - Completed various security upgrades</li> </ul>
<p><b>Mechanical</b></p> <ul style="list-style-type: none"> <li>→ 2019 - Replaced high-rise make up air unit</li> <li>→ 2019 - Replaced high-rise booster pumps</li> <li>→ 2005, 2012, 2018 &amp; 2019 - Replaced gas fired water heaters in the high-rise and low-rise buildings</li> <li>→ 2018 - Replaced high-rise hot water heater tank</li> <li>→ 2017 - Repaired exhaust fan in parkade</li> <li>→ 2017 - Replaced low-rise booster pump</li> <li>→ 2016 - Completed drain pipe cleaning for low-rise</li> <li>→ 2013 - Replaced the pool circulation, filtration, and heating equipment</li> </ul>

<p>Elevator</p> <ul style="list-style-type: none"> <li>→ 2019 - Completed an elevator assessment by Canadian Elevator Quality Assurance Inc.</li> <li>→ 2018 - Completed installation of elevator surveillance cameras</li> <li>→ 2017 - Completed repair for elevator #2</li> <li>→ 2016 - Completed elevator rope replacement</li> <li>→ As required - Replacement of miscellaneous pumps, valves, sensors, fans, and motors</li> </ul>
<p>Fire Safety</p> <ul style="list-style-type: none"> <li>→ 2019 - Fire detection and alarms were replaced on an as-needed basis</li> </ul>
<p>Interior Finishes</p> <ul style="list-style-type: none"> <li>→ 2017 - Replaced Men's Shower Room wall tile</li> </ul>
<p>Amenities</p> <ul style="list-style-type: none"> <li>→ 2017 - Completed swimming pool repairs</li> <li>→ 2016 - Re-plastered swimming pool for crack repair and stain removal</li> <li>→ 2015/2016 - Replaced pool/spa pumps and heaters</li> </ul>

On July 19 and October 17, 2019, representatives of RDH Building Science Inc. visited the site to visually review the Assets. In addition, sub consultants reviewed the elevators. While the Depreciation Report Update does not constitute a maintenance review or condition assessment, some observations regarding the general condition, design and construction of the Assets were made as part of the visual review. These observations were used to determine a reasonable estimated remaining service life of various assets. Table 3.2 includes examples of some observations made during the review.

TABLE 3.2 OBSERVATIONS BY SYSTEM	
SYSTEM	OBSERVATION
Building Enclosure	<ul style="list-style-type: none"> <li>→ Localized delamination of concrete coatings and localized concrete spalling (with exposed rebar) at various balcony slab edges.</li> <li>→ Localized deterioration of the balcony waterproofing membranes.</li> <li>→ Localized delamination of guardrail paint coatings.</li> <li>→ Localized cracking and efflorescence at the underside of balcony slabs.</li> <li>→ Localized cracking and staining at underside of the parkade suspended slabs.</li> <li>→ Localized damage of the urethane waterproofing membrane that protects the parkade suspended slabs, particularly at high-traffic areas.</li> </ul>
Structural	<ul style="list-style-type: none"> <li>→ Missing balcony guardrail baseplate anchor at one reviewed location.</li> <li>→ Localized corrosion of steel guardrails at the low-rise roof.</li> </ul>



## 3.2 Financial Assessment

The financial assessment estimates the future costs associated with the Assets, and examines how future funding requirements will be affected by current financial practises. More specifically, the financial assessment identifies:

- The opening balance in the *Contingency Reserve Fund* (CRF).
- The estimated value of capital expenditures, expressed in *Current Year Dollars* (CYD).
- The estimated future value of capital expenditures, expressed in *Future Year Dollars* (FYD). These costs are calculated by applying an inflation rate (2% per year) to the current costs.

The future value of major maintenance and renewals costs can be compared against the building reproduction cost. The building reproduction cost is the cost to reproduce the buildings in similar materials, in accordance with current market prices, and is obtained from the most recent insurance appraisal.

The financial assessment begins with a review of the current financial situation of the Strata Corporation. Table 3.3 below summarizes the key financial parameters reviewed as part of the financial assessment.

TABLE 3.3 KEY FINANCIAL PARAMETERS		
PARAMETER	INITIAL STUDY (2014/2015)	UPDATE STUDY (2019/2020)
Fiscal year end	August 31	
Building reproduction cost	\$72,959,000	\$92,800,000
Operating budget (excluding CRF contribution)	\$742,155	\$880,807
Annual CRF contribution	\$25,000	\$95,000
Opening CRF Balance*	\$436,558	\$387,291

*\*The balance in the CRF varies each month as contributions are made and funds are withdrawn for capital renewal projects and major maintenance activities.*

Depreciation Reports and Updates include capital costs only: the costs for activities that occur at intervals greater than one year. Activities that occur annually or more frequently than once a year are considered operating expenses and are not included in the Depreciation Report Update funding models and calculations.

Capital costs can be distributed into three general categories:

- *Catch-up costs*. The cost to complete any deferred maintenance and renewals.
- *Keep-up costs*. The cost to complete planned cyclical maintenance and renewals.
- *Get-ahead costs*. The cost to adapt, upgrade and improve.

The Report is based on keep-up costs. Get-ahead costs (improvements) may also be included, but only if they are required to meet changing codes or standards.

Costs are considered *Class D* estimates ( $\pm 50\%$ ), as defined by the Engineers and Geoscientists of British Columbia, unless noted otherwise. Unless otherwise noted, soft costs, such as consulting fees and contingency allowances are not included, because these costs are highly dependent on the scope of work for a particular project. Scopes of work for specific projects should be developed well in advance so that project budgets, including soft costs, can be refined.

The current value of many major maintenance and renewal activities is calculated by multiplying the quantity of an Asset by standard unit rates (for example, the cost per square foot or cost per linear foot). Quantities are measured from original construction documents and visual observations on site. The unit rates are based on historical information, construction trends, information from contractors, and other sources as appropriate. Unit rates will fluctuate over time. Basic unit rates are adjusted for the relative complexity of the property. A detailed list of activities and their associated costs are available online through BAMS. Please contact the strata council or strata manager for additional information on how to access and view this information.

### *Costing Caveats*

The capital costs given in the depreciation report update provide a basic estimate for long term planning. They are intended to help guide priority setting and provide a clearer sense of timing. They are not suitable for planning specific projects as they cannot account for project soft costs such as taxes, grants, engineering or design, municipal permits, etc., or for project specific construction costs such as access to the work (e.g. scaffold), contingencies, hazardous materials, disposal, project management, etc. Such costs cannot be estimated without more information, including a project scope and preliminary design work. Once a project reaches the planning stages, a reasonable assumption of soft costs should be made based on the actual needs of the project. It is recommended that this happen well in advance of predicted work to allow time to plan for the funding of the soft costs.



## 4 Expenditures

*Maintenance* refers to activities that preserve the Assets, to ensure the Assets will last their predicted service lives and perform as expected. *Renewal* refers to the replacement or refurbishment of an Asset at the end of its useful service life.

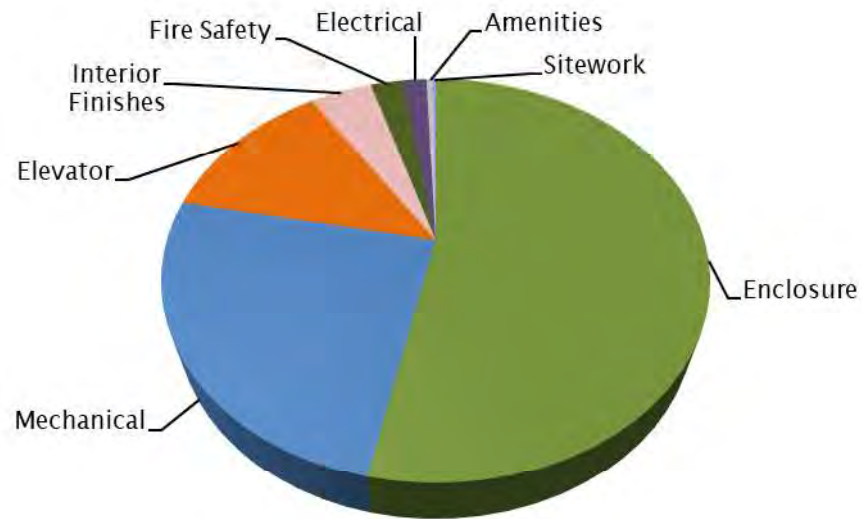
*Major maintenance* refers to maintenance that occurs at intervals greater than one year, for example, every 18 months, two years, five years, etc. (less frequently than once a year). Major maintenance typically includes activities such as testing and inspecting, and is considered a capital expense. Minor maintenance includes maintenance activities that occur once a year or more frequently such as quarterly or monthly. The costs associated with *major maintenance and renewals* are included in the Depreciation Report funding models as required by the Strata Property Act. Costs associated with minor maintenance are included in the Strata Corporation's operating budget.

### 4.1 Major Maintenance and Renewals Expenditures

Table 4.1 below summarizes all major maintenance and renewal costs by system, including costs forecasted for the next 30 years. The values are rounded.

TABLE 4.1 CAPITAL EXPENDITURES SUMMARY BY SYSTEM				
SYSTEM	10 YEAR CAPITAL COSTS (WITHOUT INFLATION)	10 YEAR CAPITAL COSTS (WITH INFLATION)	30 YEAR CAPITAL COSTS (WITHOUT INFLATION)	30 YEAR CAPITAL COSTS (WITH INFLATION)
Building Enclosure	\$4,900,000	\$5,800,000	\$15,000,000	\$20,000,000
Electrical	\$170,000	\$180,000	\$770,000	\$1,100,000
Mechanical	\$2,500,000	\$2,700,000	\$3,300,000	\$3,900,000
Elevator	\$1,100,000	\$1,400,000	\$1,300,000	\$1,600,000
Fire Safety	\$230,000	\$260,000	\$640,000	\$910,000
Interior Finishes	\$430,000	\$480,000	\$820,000	\$1,100,000
Amenities	\$45,000	\$51,000	\$130,000	\$190,000
Sitework	\$19,000	\$22,000	\$91,000	\$130,000
<b>Building Total</b>	<b>\$9,394,000</b>	<b>\$10,893,000</b>	<b>\$22,051,000</b>	<b>\$28,930,000</b>

Approximately 40% of the Strata Corporation's capital expenditures may occur in the next 10 years. The distribution of estimated capital expenditures over the next 10 years is shown in Figure 4.1 below.



*Figure 4.1 Distribution of estimated capital expenditures over 10 years by system.*

Section 5 discusses the timing and size of renewals projects forecast for the next 30 years. A detailed list of each major maintenance and renewals activity, including the frequency, costs expressed in current year dollars (CYD), and costs including inflation rates, expressed in future year dollars (FYD) are available to Strata Corporation owners.



# 5 Major Maintenance and Renewal Planning Horizons

There are three common planning horizons, used for making different types of capital planning decisions:

- **Strategic** (30 years): The average service life of many of Assets is approximately 25 years (such as roofs) so a long-range view captures most renewal projects. In some cases, an asset may be replaced more than once in the 30-year horizon.
- **Tactical** (5-10 years): Many residential Owners will own their strata lot for less than 10 years; the tactical plan captures projects that may occur while current Owners still have an interest in the Strata Corporation.
- **Operational** (1 year): The annual operating period encompasses one fiscal cycle (12 months). Typically, the budget is presented and approved at the annual general meeting (AGM) and will include any capital expenditures paid from the CRF, as well as the CRF contributions for the year. As a minimum, the decision on the CRF contribution should consider projects forecast for the next five to ten years.

## 5.1 Strategic Planning Horizon

Estimated major maintenance and renewal costs over the next 30 years are shown on the graph below (Figure 5.1). The blue bars represent the estimated value of capital costs.

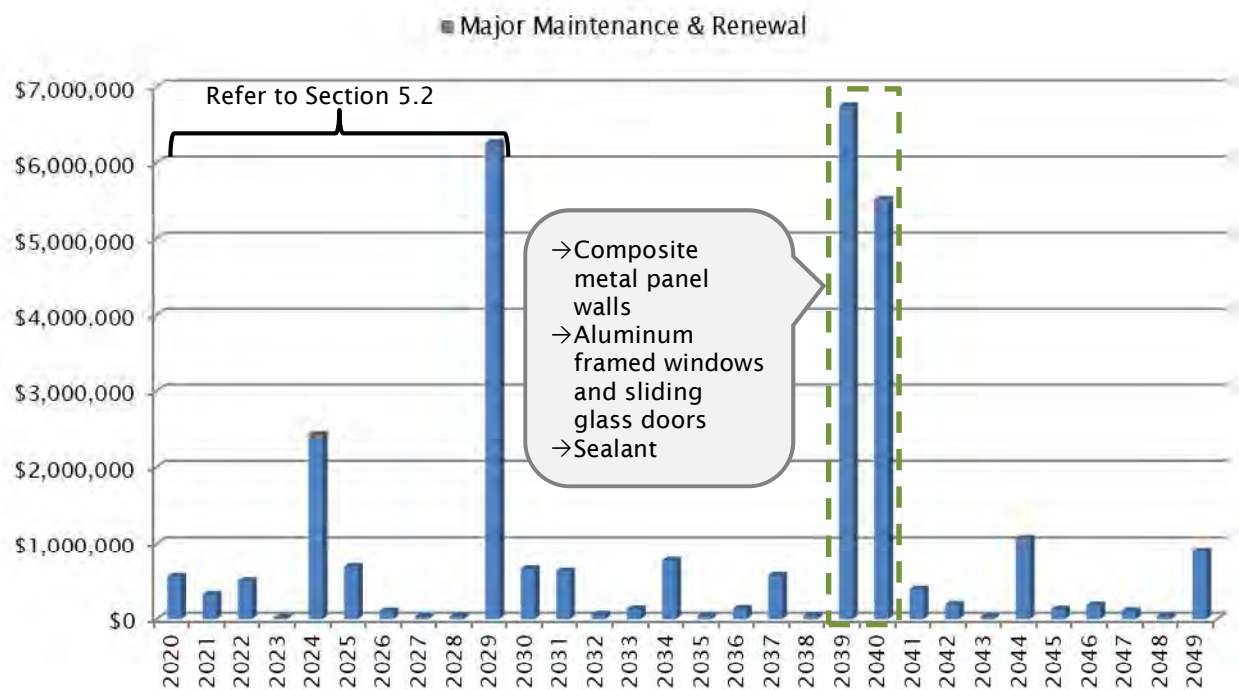


Figure 5.1 Strategic Forecast (30 Years), showing the approximate timing and value of some key capital expenditures.

Each bar on the graph represents a collection of different major maintenance and renewals activities, each with different values. Detailed information about each year, including a description of the maintenance and renewal activities and estimated costs, is also available through the appendices or the online version

of the Depreciation Report Update, available through BAMS (please contact the strata council for additional information).

The strategic plan represents an estimate of future projects. The actual timing of projects will likely vary. Assets may be replaced earlier or later, depending on the quality of maintenance, in-service conditions, and other factors. The Strata Corporation can anticipate changes to the strategic plan with each update of the Depreciation Report.

## 5.2 Tactical Planning Horizon

The graph below shows the projected major maintenance and renewal costs for the next ten years (Figure 5.2). Commonly, building managers refer to a five-year tactical plan; however, a ten-year plan allows the Strata Corporation to see a wider range of projects.

The bars indicate the years in which an event (or bundle of events) is most likely to occur as well as the total magnitude of major maintenance and renewal costs for that year and the costs broken down by system. The soft costs associated with project implementation, such as site access, design, contract administration, are not included.

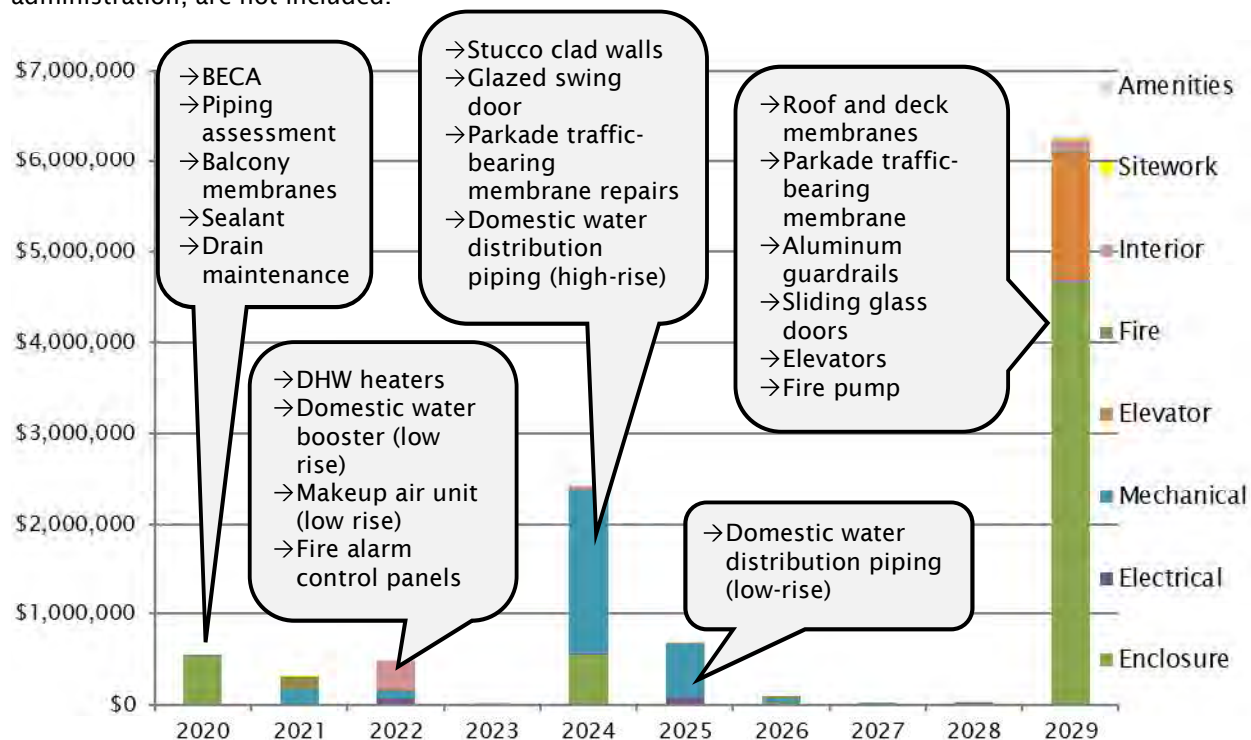


Figure 5.2 Tactical Forecast (10 years), showing the approximate timing and value of some key capital expenditures.

The tactical plan above represents one of many possible approaches to planning major maintenance and renewals activities. The Strata Corporation can use this initial plan as a tool, a starting point to identify probable projects, priorities, and strategies. The actual cost, timing, and scope of projects will be determined by the Strata Corporation and may be reflected in updates to the Depreciation Report.

To help the Strata Corporation start the project planning process, some of the activities forecast for the next 10 years are listed below. Because the timing is somewhat uncertain, renewals and major maintenance activities are grouped into three and four-year planning periods. The list below is not comprehensive; all renewals and major maintenance activities are available online through BAMS. The list

below focuses on renewals likely to cost more than \$10,000 in current year dollars, but also includes maintenance events, assessments, and repairs that are needed to ensure the assets achieve their full service life. A complete list of maintenance and renewals is also included in the appendices.

## **2020 to 2022**

### **Building Enclosure**

- Encl 23 General & Inspections - Commission a Building Enclosure Condition Assessment (BECA) Report. The BECA would provide the Owners with detailed information on the current condition, including concealed conditions, of the building enclosure Assets such as the roof membranes, balcony waterproofing membranes, podium waterproofing membrane, and exterior sealant. The BECA Report will help refine the actual timing and scope of work for potential upcoming maintenance and renewals.
- Encl 11 Aluminum Framed Window - Allowance to replace failed insulated glazing units (IGUs) with condensation or misting between panes of glass. Shown on a two-year cycle.
- Encl 18 Exposed Urethane Balcony/Eyebrow Membrane - Depending on the findings of the BECA Report, the Strata should begin planning for the recoating of balcony membranes, including localized repairs to damaged concrete.
- Encl 24 Sealant - Plan for the replacement of the exterior sealant at penetrations and interfaces in the exterior cladding, in coordination with balcony renewals.

### **Electrical**

- Elec 01, 04, and 05 Electrical Distribution Equipment - Conduct infrared thermography, ultrasonic scanning, and cleaning of the main components of the electrical distribution equipment to detect hidden hazards (every three years).
- Elec 02 Emergency Generator - Plan for the rebuilding of the emergency generator, as required.

### **Mechanical**

- Mech 12 Piping - Domestic Water Distribution - Commission comprehensive third-party testing and inspection of the domestic water distribution system to confirm the existing conditions and remaining service life. Refine the renewal forecast accordingly.
- Plan for cyclical replacement of valves as required, including:
  - Mech 14 Cross Connection & Backflow Prevention Valves
  - Mech 15 Plumbing Flow Control and Directional Valves
- Plan for replacement of the domestic hot water (DHW) water heaters/ tanks for high-rise and low-rise, including:
  - Mech 03 Tank - DHW - Packaged Combo Unit (Tower)
  - Mech 04 Tank - DHW - Packaged Combo Unit (Low rise)
- Mech 14 Pump - Domestic Water Booster (Low-rise) - Consider replacement of the domestic booster pumps and motor control panel for the low-rise building, as required.
- Mech 17, 18 & 19 Sanitary and Storm Drainage - Camera scoping and jet-flushing of sanitary and storm water drainage lines throughout the complex.
- Mech 21, 22, & 23 Sump Pumps - Plan for replacement of storm and sanitary sump pump lift and control panels.

- Mech 34 Packaged Dehumidification Unit (Pool) – Consider replacement of the pool dehumidification unit.
- Mech 32 Indoor Air Handler – Gas Fired (Low-rise) – Plan for cyclical rebuild or replacement of the indoor make-up air unit, as required.
- Mech 37 Indoor Air Handler – Fan Coil Unit – Replace split system AC units for common areas such as the amenity room.

#### Fire Safety

- Fire 01, 02, 03, & 12 – Fire Alarm Panel, Devices, and Emergency Egress Equipment – Anticipate replacing or modernizing the fire alarm panels, field devices, and emergency egress equipment, as required due to technological obsolescence. The Owners could contact their fire safety maintenance contractor to confirm the age and dependability of the equipment, and confirm upcoming renewal

#### Interior Finishes

- Interior common area renovations. Interior renovations are completed to refurbish the interior common areas and are typically renewed at the Ownership group's discretion. The following assets are anticipated to be included in the interior common area renovations:
  - Finish 03 Carpet flooring
  - Finish 02 Resilient sheet flooring
  - Finish 06 Interior paint
  - Finish 08 Wallpaper
  - Amen 07 Caretaker's Suite finishes
  - Elec 07 Interior lighting
  - Fire 12 Emergency egress equipment

### **2023 to 2025**

#### Building Enclosure

- Plan for replacement of common area doors as necessary, including the following:
  - Encl 13 Steel Swing Doors
  - Encl 14 Aluminum Frame Lobby Door
  - Encl 16 Metal Clad Glazed Swing Door
- Encl 20 Parking Slab with Traffic-bearing Membrane – Repair and re-apply damage/delaminated membrane, particularly in high-traffic areas such as ramps and driveways.

#### Electrical

- Elec 08 Enterphone System – Plan for replacement of enterphone system as required due to technological obsolescence.
- Elec 09 Proximity Access Control - Modernize components of the proximity access control system, excluding field wiring, as required by technological obsolescence.
- Elec 10 Security Surveillance - Modernize components of the security surveillance system, excluding field wiring, as required by technological obsolescence.



## Mechanical

- Mech 08 Boiler - DWH Heating - Gas Fired - Condensing (Pool) – Consider replacement of condensing gas fired pool boiler.
- Mech 12 Piping – Domestic Water Distribution – Phased renewal of the domestic water distribution lines throughout the complex. The initial renewal phase of the high-rise building has been forecasted for 2024 and the subsequent phase for the low-rise has been forecasted for 2025. The exact timing for the replacement should be based on a third-party review of the system prior to the replacement year provided in this Depreciation Report Update.

## **2026 to 2029**

### Building Enclosure

- Encl 01, 02 and 03 – Protected Membrane Roofs & Decks – Depending on the findings of the BECA report, the Owners should anticipate planning for the renewal of the roof and deck membranes throughout the complex.
- Encl 05, 06 and 07 – Aluminum Framed Guardrails and Dividers – Replacement of aluminum framed guardrails and privacy screens in coordination with roof and deck renewals, depending on the findings of the BECA report.
- Encl 15 – Aluminum Framed Sliding Glass Doors – Replacement of various sliding glass doors throughout the complex, depending on the findings of the BECA report.
- Encl 20 – Parkade Traffic Bearing Membrane – Anticipate the replacement of the parkade traffic bearing membrane throughout the high-traffic areas.

### Mechanical

- Mech 05 & 06 DHW Heaters – Replace the domestic hot water heaters within the high-rise and low-rise buildings, as required.
- Mech 07 Pool Boiler – Consider the replacement of the pool condensing boiler, as required.

### Fire Safety

- Fire 01 Smoke Control Dampers – Replace remaining damper operators and seals.
- Fire 04 Sprinkler & Standpipe – Wet - Renew compromised portions of piping, gaskets, connections, valves, devices and trim to maintain required function.
- Fire 09 Fire Pump – Consider the replacement of the fire pump and controls.

### Elevator

- Elev 01 – Geared Traction Elevators – Consider replacing the elevator machines, controls and drive systems. In general, renewal projects associated with the elevators tend to be completed on a preventative basis, to reduce the risk of break downs, and unreliable operation. A second comprehensive review by the elevator maintenance contractor or elevator consultant may help to confirm any new conditions and refine the potential renewal year.

## 5.3 Project Implementation

The projects identified in the previous section represent a preliminary step that is only intended to help the Strata Corporation identify, prioritize, and plan projects. Most significant renewal projects identified in the Depreciation Report Update will subsequently go through four basic steps before implementing the work: Assessment, Design, Documentation, and Quotation.

- **Assessment** – Determines what work must be done, what should be done and what could be done in general terms. The evaluation will help the Strata Corporation understand the risks and opportunities associated with deferring or implementing renewals work.
- **Design** – Refines the recommendations from the evaluation, and defines what work will be done in a specific project. The Design may include recommendations for different project strategies such as phasing or bundling projects, or may include recommendations for upgrades.
- **Documentation** – Describes the project in enough technical detail to get competitive pricing.
- **Quotation** – Obtains competitive pricing from different contractors or service providers to perform the work described in the documents, including alternate prices for optional work.

The time period for each step can range from a few days to a few months or more, depending on the scale of the project under consideration. The budget and scope of work will be refined in each step. Most estimates currently included in the Depreciation Report Update are considered Class D ( $\pm 50\%$ ) due to the lack of information regarding specific projects and are based on a number of general assumptions regarding scopes of work.

The Owners can implement projects in a variety of ways, including:

- *Targeted Projects*. These projects are localized to particular portions of the building. Different exposure conditions and wear patterns may require that only some sections of the building require renewal at one point in time.
- *Phased Projects*. These projects are carried out in multiple stages rather than as a single coordinated project. Phased projects can reduce the financial burden by spreading the costs over a longer time period.
- *Comprehensive Projects*. These projects are implemented as one coordinated undertaking. Comprehensive projects may allow the Strata Corporation to leverage the best economies of scale, shorten the overall duration, and lower the overall costs.
- *Bundled Projects*. These projects bundle or combine various related renewals activities (e.g. renewals that are located in close physical proximity, or that require the same type of trade workers). Bundled projects may allow the Strata Corporation to leverage economies of scale and lower the overall costs, improve the quality of the work, and incorporate upgrades.

The scope of the Depreciation Report Update does not compare different implementation methods.

## 6 Funding Scenarios

The physical assessment and financial assessment were used to create a tentative schedule and budget for forecasted major maintenance and renewal projects. Within this section, hypothetical *funding scenarios*, also known as *funding models*, based on different annual contributions to the contingency reserve fund (CRF) are presented.

The Strata Corporation can use the funding scenarios to choose an appropriate funding strategy, based on their tolerance for risk and desired standard of care for the property. RDH provides the tools so the Owners can determine a CRF contribution that suits their needs.

### 6.1 Minimum Funding Requirements

The Strata Property Act Regulations dictates that if the CRF closing balance is less than 25% of the operating fund, then the Strata Corporation must contribute either the difference between the balance and 25% of the operating fund, or up to 10% of the operating fund (*Strata Property Act Regulation*, BC Reg 43/2000, Ch. 6.1). Table 6.1 below shows the calculation to confirm the Strata Corporation meets the minimum requirements set out in the Strata Property Act Regulation.

TABLE 6.1 MINIMUM FUNDING REQUIREMENT CALCULATION	
PARAMETER	VALUE
2019/2020 Operating Budget (excluding CRF contribution)	\$ 880,807
→ 25% of the operating budget	\$ 220,202
→ 10% of the operating budget	\$ 88,081
2019/2020 Opening CRF Balance	\$ 387,291
2019/2020 CRF Contribution	\$ 95,000
Does the CRF closing balance exceed 25% of the operating budget at the end of the fiscal year?	Yes
Does the CRF contribution exceed 10% of the operating budget?	Yes

Although the Strata Corporation meets the statutory minimum contribution to the CRF, it is important to note that the statutory guideline is not a good measure of the financial preparedness of the corporation.

### 6.2 Alternative Funding Scenarios

The funding scenarios below compare the financial impact of different funding levels over the next 30 years. The scenarios serve as a sensitivity analysis that allow the Strata Corporation to evaluate how changes to the contingency reserve fund impact the number and size of special levies. The actual size and timing of special levies will be affected by how the Strata Corporation chooses to implement the renewal projects.

While there are many different scenarios that can be generated, Table 6.2 below compares the following alternatives:

- **Current (2019/2020)**. The CRF allocation that was approved by the Owners at the 2018 Annual General Meeting. The current allocation is also known as the status quo.

- **Alternative #1.** An increase from the status quo. This alternative starts with an increased contribution of \$125,000.
- **Alternative #2.** A non-linear funding scenario that begins with an increase in contribution to \$150,000 with a 5% annual increase in subsequent years. The alternatives are just two of many possible scenarios for a new funding level in the next fiscal year.
- **Alternative #3.** An increase from the status quo. This alternative starts with an increased contribution of \$400,000.
- **Progressive Reserve.** (not summarized) If the strata corporation wishes to offset the majority of forecasted capital expenditures over the next 30 years, an average CRF contribution of approximately \$842,000 per year (or an average of approximately \$322 per suite, per month) would be required.

TABLE 6.2 COMPARISON OF DIFFERENT FUNDING SCENARIOS				
	CURRENT 2019/2020	ALTERNATIVE #1	ALTERNATIVE #2	ALTERNATIVE #3
Annual CRF allocation	\$95,000	\$125,000	Starting at \$150,000	\$400,000
Annual CRF increase	-	-	5%	-
Percent of progressive reserve	11%	15%	18%	48%
CRF contribution per unit of unit entitlement			Starting at	
Per month	\$0.04	\$0.05	\$0.06	\$0.16
Per year	\$0.46	\$0.60	\$0.72	\$1.93
CRF contribution per average strata lot			Starting at	
Per month	\$37	\$48	\$58	\$153
Per year	\$444	\$576	\$696	\$1,836
Approximate number of special levies (over 30 years)	21	18	11	8
Approximate value of special levies (over 30 years)	\$26.1M	\$25.2M	\$20.5M	\$17.5M
Minimum Closing Balance	\$80,000			
Assumed Inflation Rate	2%			
Assumed Interest Rate	1%			

The following sections of the report provide more detailed information about each funding scenario, including a graph showing the closing balance of the CRF, annual CRF contributions, and the approximate value of special levies. Tables with ten years of cash flow data are also provided.

Appendix E includes 30 years of cash flow data for each funding scenario.

### 6.3 Current (2019/2020) Funding Scenario

The current funding scenario is based on the CRF contribution approved by the Owners at the last annual general meeting. The scenario is based on a fixed annual CRF contribution (no increases).

TABLE 6.3 CURRENT (2019/2020) FUNDING SCENARIO: CASH FLOW TABLE							
FISCAL YEAR	OPENING BALANCE	RESERVE CONTRIBUTION	SPECIAL LEVY	RESERVE INCOME	RENEWAL COSTS	CONTINGENCY COSTS	CLOSING BALANCE
2020	\$387,291	\$95,000	\$151,136	\$3,873	\$556,300	\$1,000	\$80,000
2021	\$80,000	\$95,000	\$225,910	\$800	\$320,710	\$1,000	\$80,000
2022	\$80,000	\$95,000	\$402,500	\$800	\$497,300	\$1,000	\$80,000
2023	\$80,000	\$95,000	\$0	\$800	\$18,300	\$1,000	\$156,500
2024	\$156,500	\$95,000	\$2,262,435	\$1,565	\$2,434,500	\$1,000	\$80,000
2025	\$80,000	\$95,000	\$588,400	\$800	\$683,200	\$1,000	\$80,000
2026	\$80,000	\$95,000	\$7,340	\$800	\$102,140	\$1,000	\$80,000
2027	\$80,000	\$95,000	\$0	\$800	\$32,000	\$1,000	\$142,800
2028	\$142,800	\$95,000	\$0	\$1,428	\$37,800	\$1,000	\$200,428
2029	\$200,428	\$95,000	\$6,044,768	\$2,004	\$6,261,200	\$1,000	\$80,000

The graph below shows the annual contribution to the CRF, the closing balance of the CRF, and the size of the special levies forecast for the next 30 years.

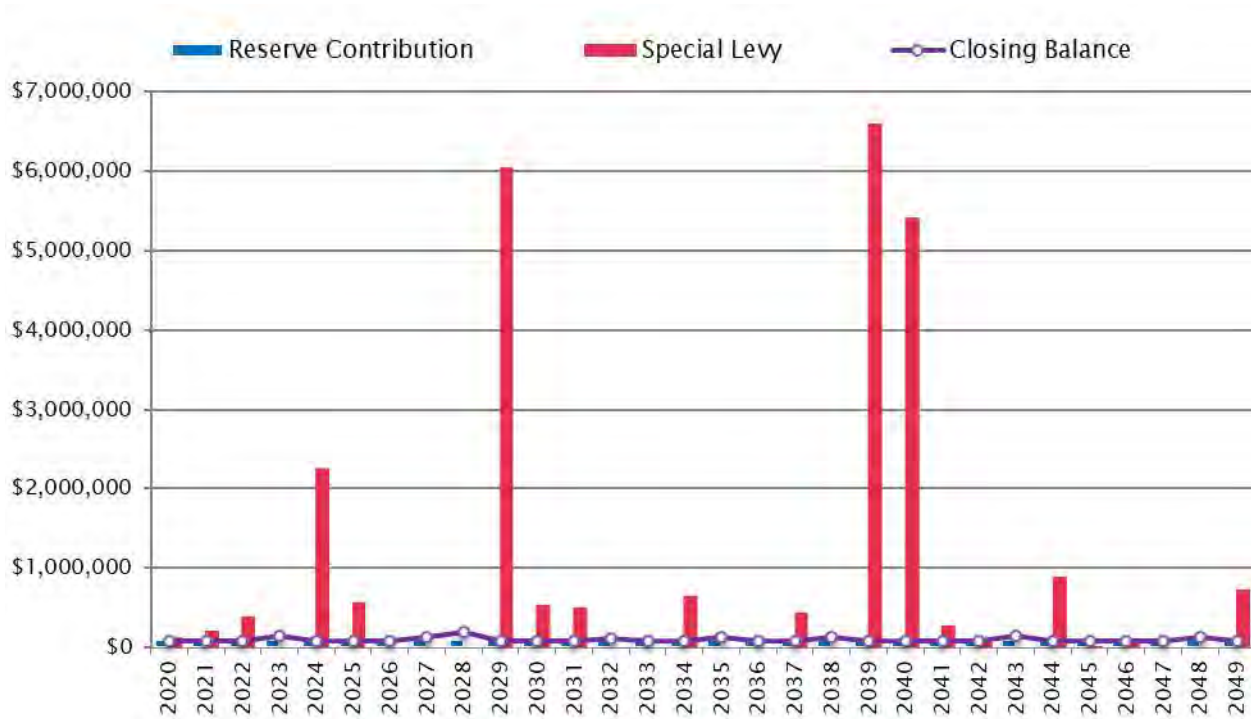


Figure 6.1 CRF balance, contribution and special levies based on the current funding.

If the Strata Corporation wishes to reduce the number and size of special levies, then increases will need to be made over the upcoming years.

## 6.4 Alternative Funding Scenario #1

Alternative funding scenario #1 is based on a fixed annual CRF contribution. The contribution is approximately five times the current funding level.

TABLE 6.4 ALTERNATIVE FUNDING SCENARIO #1: CASH FLOW TABLE							
FISCAL YEAR	OPENING BALANCE	RESERVE CONTRIBUTION	SPECIAL LEVY	RESERVE INCOME	RENEWAL COSTS	CONTINGENCY COSTS	CLOSING BALANCE
2020	\$387,291	\$125,000	\$121,136	\$3,873	\$556,300	\$1,000	\$80,000
2021	\$80,000	\$125,000	\$195,910	\$800	\$320,710	\$1,000	\$80,000
2022	\$80,000	\$125,000	\$372,500	\$800	\$497,300	\$1,000	\$80,000
2023	\$80,000	\$125,000	\$0	\$800	\$18,300	\$1,000	\$186,500
2024	\$186,500	\$125,000	\$2,202,135	\$1,865	\$2,434,500	\$1,000	\$80,000
2025	\$80,000	\$125,000	\$558,400	\$800	\$683,200	\$1,000	\$80,000
2026	\$80,000	\$125,000	\$0	\$800	\$102,140	\$1,000	\$102,660
2027	\$102,660	\$125,000	\$0	\$1,027	\$32,000	\$1,000	\$195,687
2028	\$195,687	\$125,000	\$0	\$1,957	\$37,800	\$1,000	\$283,843
2029	\$283,843	\$125,000	\$5,930,518	\$2,838	\$6,261,200	\$1,000	\$80,000

Alternative funding scenario #1 eliminates some of the smaller levies, but it is not adequate to offset all the special levies over the 30-year planning horizon. The graph below shows the annual contribution to the CRF, the closing balance of the CRF, and the size of the special levies forecast for the next 30 years.

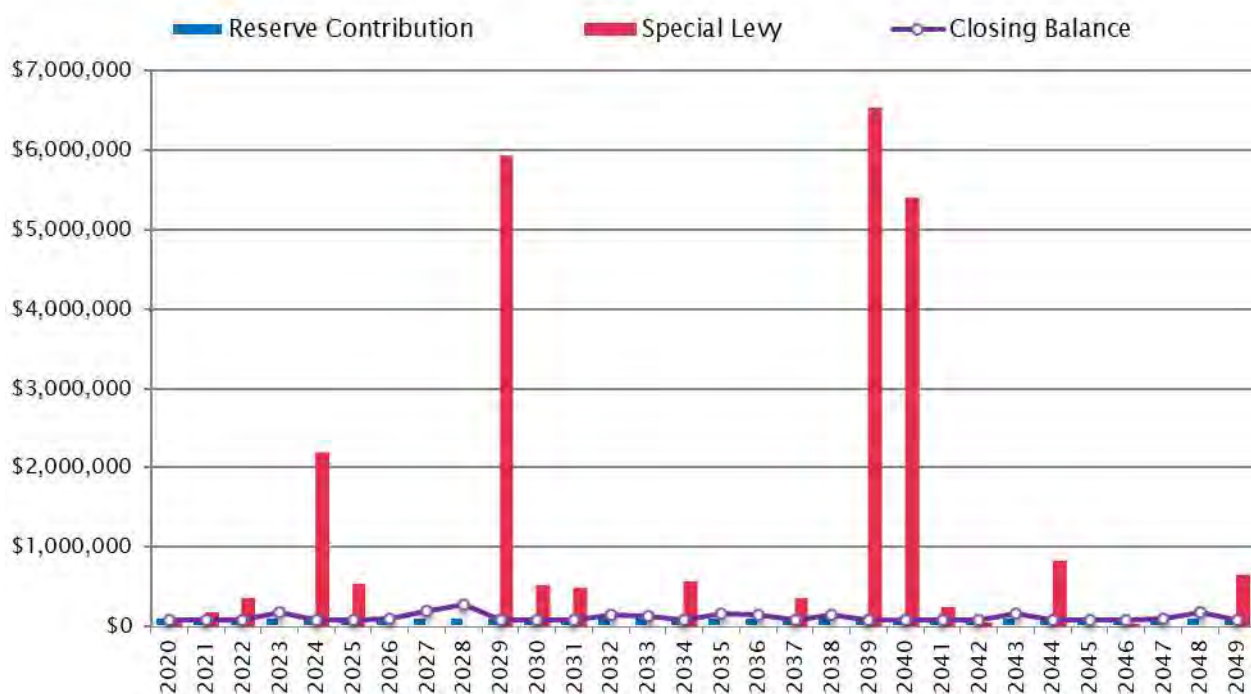


Figure 6.2 CRF balance, contribution and special levies based on Alternative #1.

## 6.5 Alternative Funding Scenario #2

Alternative funding scenario #2 is based on an initial annual CRF contribution of \$150,000, with a 5% annual increase. The initial annual contribution is approximately six times the current contribution.

TABLE 6.5 ALTERNATIVE FUNDING SCENARIO #2: CASH FLOW TABLE							
FISCAL YEAR	OPENING BALANCE	RESERVE CONTRIBUTION	SPECIAL LEVY	RESERVE INCOME	RENEWAL COSTS	CONTINGENCY COSTS	CLOSING BALANCE
2020	\$387,291	\$150,000	\$96,136	\$3,873	\$556,300	\$1,000	\$80,000
2021	\$80,000	\$157,500	\$163,410	\$800	\$320,710	\$1,000	\$80,000
2022	\$80,000	\$165,375	\$332,125	\$800	\$497,300	\$1,000	\$80,000
2023	\$80,000	\$173,644	\$0	\$800	\$18,300	\$1,000	\$235,144
2024	\$235,144	\$182,326	\$2,095,679	\$2,351	\$2,434,500	\$1,000	\$80,000
2025	\$80,000	\$191,442	\$491,958	\$800	\$683,200	\$1,000	\$80,000
2026	\$80,000	\$201,014	\$0	\$800	\$102,140	\$1,000	\$178,674
2027	\$178,674	\$211,065	\$0	\$1,787	\$32,000	\$1,000	\$358,526
2028	\$358,526	\$221,618	\$0	\$3,585	\$37,800	\$1,000	\$544,930
2029	\$544,930	\$232,699	\$5,559,122	\$5,449	\$6,261,200	\$1,000	\$80,000

Alternative funding scenario #2 eliminates some of the smaller levies, but it is not adequate to offset all the special levies over the 30-year planning horizon. The graph below shows the annual contribution to the CRF, the closing balance of the CRF, and the size of the special levies forecast for the next 30 years.

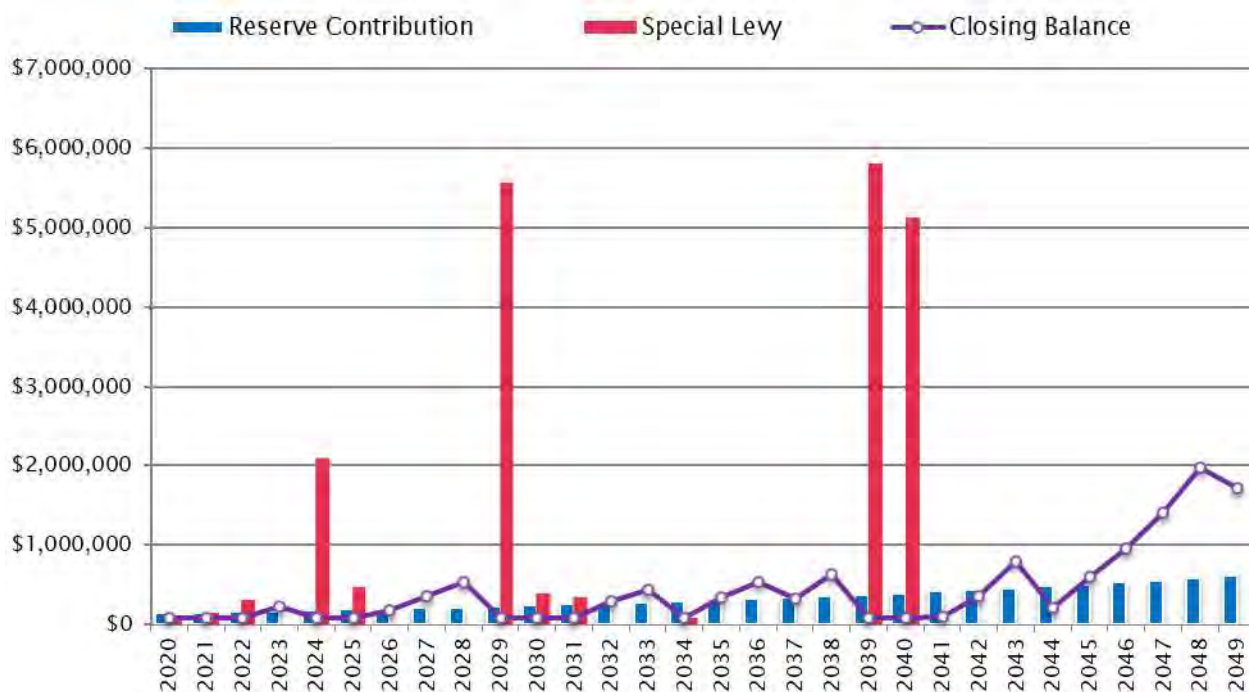


Figure 6.3 CRF balance, contribution and special levies based on Alternative #2.

## 6.6 Alternative Funding Scenario #3

Alternative funding scenario #3 is based on a fixed annual CRF contribution. The increased contribution is \$400,000.

TABLE 6.6 ALTERNATIVE FUNDING SCENARIO #3: CASH FLOW TABLE							
FISCAL YEAR	OPENING BALANCE	RESERVE CONTRIBUTION	SPECIAL LEVY	RESERVE INCOME	RENEWAL COSTS	CONTINGENCY COSTS	CLOSING BALANCE
2020	\$387,291	\$400,000	\$0	\$3,873	\$556,300	\$1,000	\$233,864
2021	\$233,864	\$400,000	\$0	\$2,339	\$320,710	\$1,000	\$314,493
2022	\$314,493	\$400,000	\$0	\$3,145	\$497,300	\$1,000	\$219,338
2023	\$219,338	\$400,000	\$0	\$2,193	\$18,300	\$1,000	\$602,231
2024	\$602,231	\$400,000	\$1,507,247	\$6,022	\$2,434,500	\$1,000	\$80,000
2025	\$80,000	\$400,000	\$283,400	\$800	\$683,200	\$1,000	\$80,000
2026	\$80,000	\$400,000	\$0	\$800	\$102,140	\$1,000	\$377,660
2027	\$377,660	\$400,000	\$0	\$3,777	\$32,000	\$1,000	\$748,437
2028	\$748,437	\$400,000	\$0	\$7,484	\$37,800	\$1,000	\$1,117,121
2029	\$1,117,121	\$400,000	\$4,813,908	\$11,171	\$6,261,200	\$1,000	\$80,000

Alternative funding scenario #3 eliminates some of the smaller levies, but it is not adequate to offset all the special levies over the 30-year planning horizon. The graph below shows the annual contribution to the CRF, the closing balance of the CRF, and the size of the special levies forecast for the next 30 years.

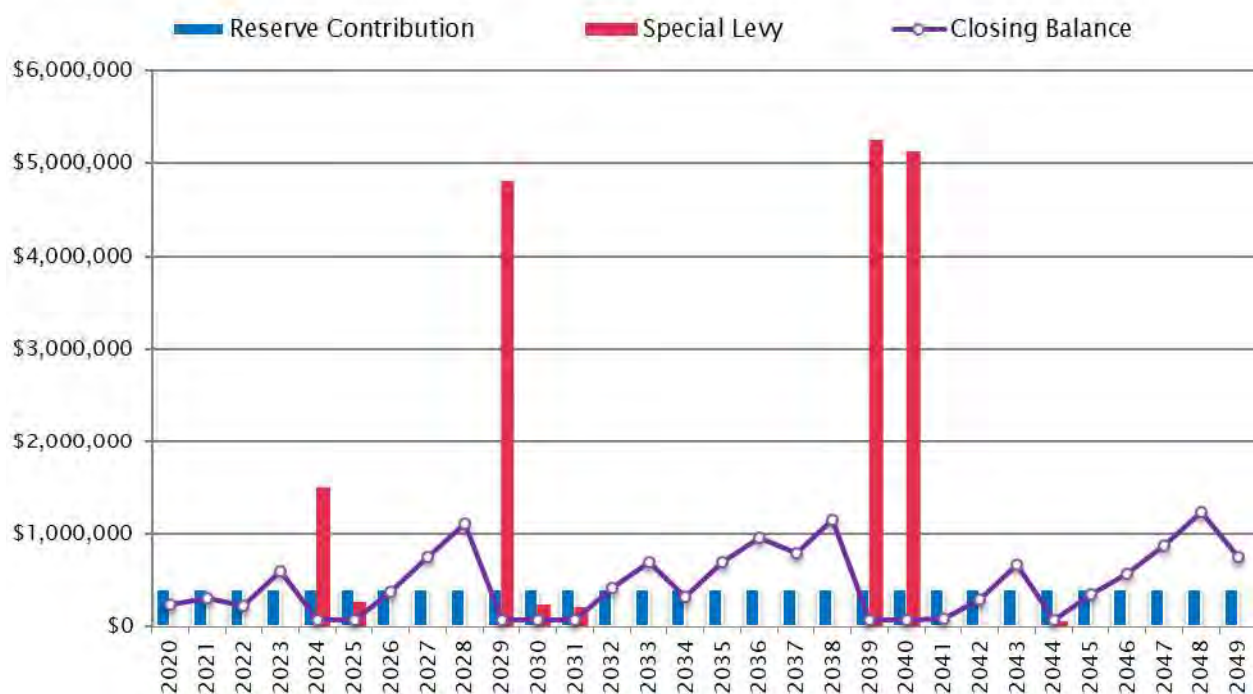


Figure 6.4 CRF balance, contribution and special levies based on Alternative #3.



# 7 Next Steps

The Depreciation Report Update identifies the possible major maintenance and renewals expenditures that The Crystal Residences may encounter over the next 30 years. Estimated timelines have been provided to assist the Strata Corporation with the planning process; however, the Depreciation Report Update should be considered a first step when planning for renewals. Funding scenarios have been developed to provide the Strata Corporation with an objective basis for determining appropriate CRF contributions.

The Crystal Residences is a 21 year old complex (as of 2020), and some assets, such as the domestic water distribution piping and fire alarm systems may need to be renewed in the next five years, and roofing membranes towards the end of the 10-year tactical plan. In addition, some major maintenance and renewal events such as repair and recoating of the balcony membranes, renewal of exterior sealant, and replacement of various mechanical and electrical assets may be required over the next 10 years. This is a fairly typical renewal pattern for middle-aged Strata Corporations such as The Crystal Residences. The Strata should continue to be diligent in performing maintenance tasks so assets may achieve their full service life. It is unlikely that the Strata Corporation can avoid special levies in this time period; however, there may be opportunities to reduce the scope of work needed or otherwise manage projects to alleviate the financial impact on individual owners.

The recommendations below are intended to aid the Strata Corporation in the next steps of the renewals planning process.

## *Recommendations*

- **Project Planning:** Review the information in Section 5.2, and begin planning for significant projects, including commissioning assessments, requesting information, and preparing construction budgets, well in advance of the forecasted date of renewal. The planning process will assist the strata corporation in refining the actual timing, scope of work, and project budget.
- **Major Maintenance Planning:** Review Appendix H for a detailed checklist of forecasted major maintenance activities and renewals on an annual basis.
- **Record keeping:** Continue to record significant renewals, repairs, and maintenance activities. These records will be used to improve the forecast at the time of the next Depreciation Report Update.
- **CRF Planning:** On a yearly basis, review and update the CRF funding strategy based on the estimated forecasts presented in this Report and update information obtained from assessments, investigations and quotations.
- **Updates:** Plan for an update to the Depreciation Report in three years' time.
- **Building Enclosure Condition Assessment.** Conduct a Condition Assessment of the building enclosure prior to the update to the Depreciation Report in three years' time. The condition assessment should inform the renewal timing of roof and deck membranes, balcony membranes, sealant, parkade traffic-bearing membrane, and etc. Update the Report with these findings and recommendations as may be required.
- **Piping Condition Assessment or Evaluation.** Conduct a Condition Assessment of the piping prior to the Depreciation Report in three years' time. The condition assessment will confirm the estimated remaining service lives of piping. Update the Report with these findings and recommendations as may be required.

Yours truly,



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# **Appendix A**

## **Glossary of Terms**

## Glossary

**Annual Contribution** – Funds allocated to the Reserve Fund each fiscal year. Sometimes referred to as the Annual Allocation. Determining the appropriate size of the Annual Allocation is aided with a Reserve Study (a Depreciation Report in B.C.).

**Asset** – An integrated assembly of multiple physical components, which requires periodic maintenance, repair and eventual renewal. Typical examples of assets are: roofs, boilers and hallway carpets.

**Catch-up Costs** – The costs associated with the accumulated backlog of deferred maintenance associated with the assets.

**Chronological Age** – The age of an asset relative to its date of installation (current year minus year of installation).

**Classes of Cost Estimates** – Until a project is actually constructed, a cost estimate represents the best judgement of the professional according to their experience and knowledge and the information available at the time. Its completeness and accuracy is influenced by many factors, including the project status and development stage. Estimates have a limited life and are subject to inflation and fluctuating market conditions. The precision of cost estimating is categorized into the following four classes and are as defined in guidelines prepared by the Association of Professional Engineers and Geoscientists of B.C. The percentage figures in parentheses refer to the level of precision or reliability of the cost estimates.

- **Class A Estimate** ( $\pm 10-15\%$ ): A detailed estimate based on quantity take-offs from final drawings and specifications. It is used to evaluate tenders or as a basis of cost control during day-labour construction.
- **Class B Estimate** ( $\pm 15-25\%$ ): An estimate prepared after site investigations and studies have been completed, and the major systems defined. It is based on a project brief and preliminary design. It is used for obtaining effective project approval and for budgetary control.
- **Class C Estimate** ( $\pm 25-40\%$ ): An estimate prepared with limited site information and based on probable conditions affecting the project. It represents the summation of all identifiable project elemental costs and is used for program planning, to establish a more specific definition of client needs and to obtain preliminary project approval.
- **Class D Estimate** ( $\pm 50\%$ ): A preliminary estimate which, due to little or no site information, indicates the approximate magnitude of cost of the proposed project, based on the client's broad requirements. This overall cost estimate may be derived from lump sum or unit costs for a similar project. It may be used in developing long term capital plans and for preliminary discussion of proposed capital projects.

**Closing Balance** – Alternatively referred to as the Starting Balance. The balance of funds remaining in the reserve account at the end of a fiscal period (Fiscal year end, calendar year or study period). The Closing Balance becomes the Opening Balance for the subsequent fiscal period.

**Contingency Costs** – An allowance for unexpected or unforeseen costs that may impact monies required for projects to maintain or replace assets. (Not to be confused with costs of Renewal or Major Maintenance projects which are paid for out of the Reserve Fund (otherwise known the Contingency Reserve Fund.)

**Contribution Threshold** - A dollar value which dictates the size of the Contingency Reserve Fund (CRF) contribution based on whether the accumulated CRF balance is greater than or less than the specified dollar value. For example, the Strata Property Act indicates that if the closing balance of the CRF at the end of the fiscal year is less than 25% of the operating budget for the next fiscal year, then the CRF contribution for the next fiscal year should be a minimum of 10% of the operating budget. In this case, the threshold is 25% of the operating budget.

**Current Dollars** – Dollars in the year they were actually received or paid, unadjusted for price changes.

**Effective Age** – An assessment of the age of an asset relative to its condition and how that condition may have accelerated or decelerated the chronological age of the asset (service life minus remaining service life).

**Funding Model** – A mathematical model used to establish an appropriate funding level for sustaining the assets in a building. Running a number of scenarios out of the funding model using different parameters (such as inflation rates and interest rates) can serve as a sensitivity analysis to determine the financial impact of different funding levels.

**Future Dollars** – The projected cost of future asset renewal projects, which accounts for inflation and escalation factors.

**Get Ahead Costs** – These are costs associated with adaptation of the building to counter the forces of retirement associated with different forms of obsolescence, such as:

- Functional obsolescence
- Legal obsolescence
- Style obsolescence

Some of the costs in this category are discretionary spending that result in either a change or an improvement to the existing strata building. This category includes projects to alter the physical plant for changes in use, codes and standards. Some typical examples include:

- Energy retrofits
- Code retrofits
- Hazardous material abatement
- Barrier free access retrofits
- Seismic Upgrades

**Keep-up Costs** – The monies required for renewal projects as each asset reaches the end of its useful service life. If an asset is not replaced at the end of its useful service life

and is kept in operation, through targeted repairs, then these costs get reclassified into the “catch-up” category.

**Major Maintenance** – Any maintenance work for common expenses that usually occurs less often than once a year or that do not usually occur. Major maintenance provides for the preservation of assets to ensure that they achieve their full intended service life.

**Next Renewal Year** - The forecasted date of asset replacement or renewal.

**Opening Balance** – Alternatively referred to as the Starting Balance. The amount of money in an account at the beginning of a fiscal period. Opening balances are derived from the balance sheet and are used in cash flow calculations in the Funding Model.

**Operating Costs** – Frequently recurring expenses that arise during the course of a single fiscal year and are paid from the operating budget as opposed to the Reserve Fund.

**Operational Plan/Horizon (1 year)** – The annual operating period encompasses one fiscal cycle (12 months). The Reserve Contribution in the operating budget should reflect the majority of the projects in the Tactical Plan (5 years) and ideally should also contemplate elements of the Strategic Plan (30 years).

**Percent Funded** – The ratio, at a particular point of time (typically the beginning of the fiscal year), of the actual or projected Reserve Fund balance to the accrued Reserve Fund balance, expressed as a percentage. For example: If the 100% funded balance is \$100,000 and there is \$76,000 in the Reserve Fund, the Reserve Fund is 76% funded.

Since funds can typically be allocated from one asset to another with ease, this parameter has no real meaning on an individual reserve component basis. The purpose of this parameter is to identify the relative strength or weakness of the entire Reserve Fund at a particular point in time. The value of this parameter is to provide a more stable measure of Reserve Fund strength, since cash in reserve may mean very different things to different governing bodies or Owner groups.

- **Poor Level.** When the Percent Funded falls to 0% - 30%, the current reserves may be considered to be at a ‘poor’ level. At this funding level, Special Levies are common. This is also commonly known as the Unfunded or Special Levy Model. The Owner Group does not have a Reserve Fund balance that will cover expected renewal costs and the only recourse is to raise funds by Special Levies to cover those costs when they become due.
- **Fair Level.** If the Percent Funded level is 31 to 70% then the current reserve may be considered to be in a mid-range level.
- **Good Level.** If the Percent Funded level is 70% or higher this is likely to be considered ‘strong’ because cash flow problems are rare.

**Renewal** – The replacement of an Asset as it reaches the end of its useful service life.

**Renewal Cost** – The cost required to replace an Asset, which is paid from the Reserve Fund, Special Levy or combination thereof.

**Reserve Contribution** – See Annual Contribution.

**Reserve Fund** – Also known as the Contingency Reserve Fund (CRF). The account in which the accumulated Annual Contributions are deposited and from which costs are withdrawn for Renewal projects and Major Maintenance projects.

**Reserve Income** – The interest earned from investing the money deposited in the Reserve Fund.

**Reserve Study** – Also referred to as a Reserve Fund Study or Depreciation Report in BC.

- A long-range financial planning tool that identifies the current status of the Owners' Reserve Fund and recommends a stable and equitable funding plan to offset the costs of anticipated future major expenditures associated with replacement of the assets and major maintenance.
- The purpose of the Reserve Study is to provide a plan for appropriate funding for renewal and major maintenance work.
- While Reserve Studies provide analysis of the timing, costs and funding for renewal projects, they should ideally be supported by a maintenance plan that assists the Owners to plan for maintenance activities so that assets achieve their predicted service lives.

**Service Life** - The estimated period of time over which an asset (and its components or assembly) provides adequate performance and function.

**Special Levy** – Also referred to as a "Special Assessment". A financial levy to be paid by the Owner group to finance large-scale projects for major maintenance, repairs, renewal and rehabilitation of an asset, which occur as result of a shortfall in available funds and requires special decision making and approval procedures. A Reserve Study contains funding scenarios that assist the Owners in long-range financial planning.

**Statutory Funding Model** - A funding model which uses the Strata Property Act and Regulations to determine the minimum amount of money to contribute to the Contingency Reserve Fund on an annual basis.

**Strategic Horizon** – The longest of the three planning horizons, which typically covers the full study period of 30 years and identifies the long-term needs of the assets.

**Style Obsolescence** – When an asset is no longer desirable because it has fallen out of popular fashion, its style is obsolete. Some assets, particularly interior furnishings, reflect fashion cycles and can become out-dated.

**Tactical Plan/Horizon** – A period of planning for asset Renewal projects and Major Maintenance projects, which typically extends five years from the current year.

# **Appendix B**

## **Asset Inventory**



**Crystal Residences**  
Asset Inventory

**Enclosure**

**Roofs & Decks**

**Encl 01 - Protected Membrane Roof with Ballast**



**Location**

Main tower roof and lowrise roof.

**Description**

Waterproof membrane overlaid with insulation and stone ballast.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Encl 02 - Protected Membrane Deck (Conventional Assembly) with Landscaping**



**Location**

Low rise landscaping areas.

**Description**

Waterproofing membrane overlaid with soft and hard landscaping overburden.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Encl 03 - Protected Membrane Deck (Conventional Assembly) with Traffic-Bearing Surface**



**Location**

Tower and lowrise decks.

**Description**

Membrane overlaid with pavers as traffic-bearing surface.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Fall Protection**

**Encl 04 - Anchor Fall Protection Equipment**



**Location**

Tower and low rise roofs and at edge of terraces.

**Description**

Safety anchoring system for work on exterior walls and roofs.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Crystal Residences**  
**Asset Inventory**

**Encl 05 - Guardrail Glazed Aluminum**



**Location**

Balconies and surrounding low rise landscaping perimeter.

**Description**

Aluminum Posts and glass infill panels functioning as a protective barrier at the open sides of stairs, landings, balconies, decks, raised walkways or other locations to prevent accidental falls from one level to another.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Encl 06 - Guardrail Aluminum**



**Location**

At tower juliet balconies and other guard locations at elevation changes.

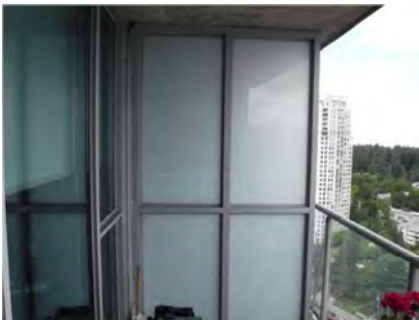
**Description**

Aluminum posts and pickets functioning as a protective barrier at the open sides of balconies and other locations to prevent accidental falls from one level to another.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Encl 07 - Glazed Aluminum Frame Divider**



**Location**

Tower and low rise balconies.

**Description**

Aluminum frame and glass infill panels functioning as a 6' high privacy barrier between balconies and decks.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Walls**

**Encl 08 - Stucco Clad Wall - Undrained**



**Location**

Tower roof top elevator and mechanical penthouse cladding. Rooftop perimeter wall cladding.

**Description**

Acrylic coated stucco applied directly over concrete walls.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 16  
Next Renewal Year: 2024

## Crystal Residences Asset Inventory

### Encl 09 - Clay Masonry Veneer Wall



**Location**

Lower levels of complex at multiple elevations.

**Description**

Clay masonry units applied as a veneer with a drained and vented cavity over exterior sheathing membrane.

**Information**

Service Life: 50  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2049

### Encl 10 - Composite Metal Panel Wall



**Location**

Lowrise mechanical/elevator penthouse and section of south exterior cladding of tower terrace.

**Description**

Metal panel system with integral framing and anchorage to create drainage cavity over sheathing membrane. Joints are either dry and wet.

**Information**

Service Life: 50  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 31  
Next Renewal Year: 2039

## Glazing Systems

### Encl 11 - Aluminum Framed Window



**Location**

Tower and low rise glazing systems.

**Description**

Aluminum framed, windows with double insulating glazing units and awning operators. Windows are arranged in window-wall. The renewal of this asset is phased.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

### Encl 12 - Aluminum Storefront



**Location**

Low-rise building lobby.

**Description**

Aluminum framed storefront system with insulating glazing units and lobby swing doors.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Crystal Residences**  
**Asset Inventory**

**Doors**

**Encl 13 - Steel Swing Door**



**Location**

Parking garage service doors, roof top service and access doors and exit doors at ground level.

**Description**

Hollow steel slab swing door.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Encl 14 - Aluminum Frame Lobby Door**



**Location**

Tower and low rise lobby entrances.

**Description**

Outswing aluminum-framed doors with glazing and low-profile thresholds with electric strike and hardware.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 16  
Next Renewal Year: 2024

**Encl 15 - Aluminum Framed Sliding Glass Door**



**Location**

Tower and lowrise; deck and balcony access.

**Description**

Sliding glass doors, double insulating glazing units, aluminum framing.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Encl 16 - Metal Clad Glazed Swing Door**



**Location**

Tower terraces and lowrise east elevation balconies/patios.

**Description**

Metal clad wood swing door with insulating glazing units.

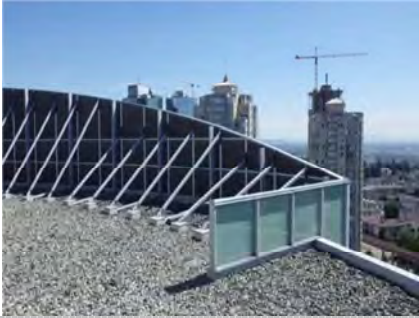
**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Crystal Residences**  
Asset Inventory

**Balconies**

**Encl 17 - Metal Panel Screen**



**Location**

Tower roof top wind/visual screen.

**Description**

Metal panel screen and lateral structural supports.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Encl 18 - Exposed Urethane Balcony/Eyebrow Membrane - Concrete Substrate**



**Location**

Tower and lowrise; balconies and eyebrows.

**Description**

Liquid applied urethane membrane applied over concrete balcony.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 14  
Next Renewal Year: 2031

**Canopies**

**Encl 19 - Metal Frame and Glass Canopy**



**Location**

Lobby entrances.

**Description**

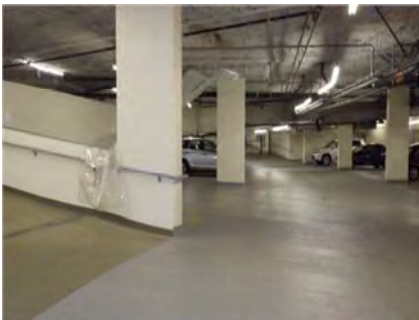
Canopy constructed with metal framing and single glazing.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Parking Garage**

**Encl 20 - Parking Slab with Traffic-bearing Membrane**



**Location**

Throughout the residential parking garage at all levels above P4.

**Description**

Traffic-bearing membrane on concrete parking garage floor slab. Crack injection repairs completed in P1 in 2016. Locally re-coated membrane in 2017 (lower P1).

**Information**

Service Life: 75  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2074

## Crystal Residences Asset Inventory

### Encl 21 - Open-grid Overhead Parkade Gate



**Location**

At residential/commercial separations in the parking garage.

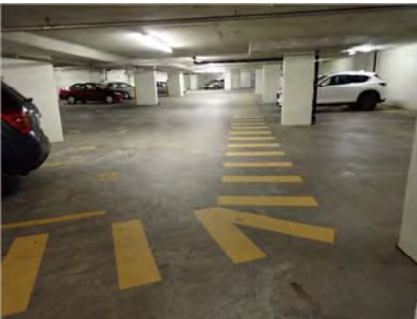
**Description**

Pre-finished metal grid overhead gate for underground parkade. Motor and lifting mechanism included separately.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

### Encl 22 - Slab-on-Grade



**Location**

Level P4 of parking Garage.

**Description**

Concrete slab on grade.

**Information**

Service Life: 75  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2074

## General & Inspections

### Encl 23 - General & Inspections



**Location**

Throughout the property.

**Description**

Miscellaneous interior and exterior components, such as service penetrations and interface details, not related to any particular assembly. Warranty and general reviews.

**Information**

Service Life: 75  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2074

### Encl 24 - Sealant



**Location**

Throughout the building enclosure.

**Description**

Sealant of various types located at joints between building enclosure assemblies, as well as around components and penetrations within building enclosure assemblies.

**Information**

Service Life: 10  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 10  
Next Renewal Year: 2020

**Crystal Residences**  
**Asset Inventory**

**Electrical**

**Power Supply**

**Elec 01 - Distribution Transformer - Interior**



**Location**

Electrical room.

**Description**

150 KVA, 3 phase, dry-type, with Nema enclosure, coil and vibration isolators that provide power to receptacles and low voltage loads.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Elec 02 - Emergency Generator**



**Location**

Generator room.

**Description**

Simpower ,400 KW, 500 KVA, 3 phase, generator with fuel tank to provide standby/emergency power.

**Information**

Service Life: 35  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2034

**Elec 03 - Tank - Fuel Oil Storage**



**Location**

Generator room.

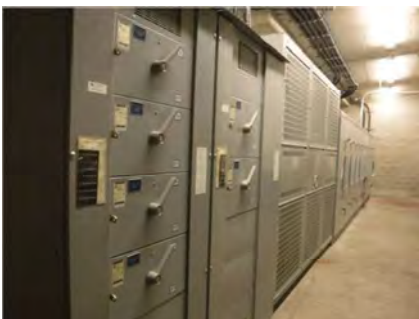
**Description**

Tidy Tank, 1140 L steel single wall fuel storage tank in enclosure, connected to genset.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Elec 04 - Unit Substation**



**Location**

Electrical Vault.

**Description**

Cutler-Hammer, 12.47KV, 95KV, 208/120V, 3 phase, dry type transformer; main breaker, load break switches and metering compartments contained within unit substation to provide primary electrical service. Cleaned and inspected in 2017.

**Information**

Service Life: 35  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2034

**Crystal Residences**  
**Asset Inventory**

**Distribution**

**Elec 05 - Electrical Distribution**



**Location**

Throughout the property.

**Description**

3 phase switchgear units; downstream switchboards, panelboards, breakers, switches, disconnects and wiring to mechanical, lighting and power loads throughout the building and to individual suites through BC Hydro owned metering devices.

**Information**

Service Life:	40
Installed Year:	1999
Chronological Age:	21
Effective Age:	21
Next Renewal Year:	2039

**Light Fixtures**

**Elec 06 - Exterior Light Fixtures**



**Location**

Mounted to various elevations.

**Description**

A variety of fixture types, including wall, pole and post mounted, street, pathway and recessed soffit pot lighting. A variety of lamp types, including fluorescent, compact fluorescent, halogen, incandescent, LED, etc. for exterior direct, indirect and accent lighting applications. A variety of light fixture controls, including switches, motion sensors, timers and photocells.

**Information**

Service Life:	20
Installed Year:	1999
Chronological Age:	21
Effective Age:	18
Next Renewal Year:	2022

**Elec 07 - Interior Light Fixtures**



**Location**

Throughout all interior common hallways, parking garage, lobbies, and service rooms

**Description**

A variety of fixture types, including fixed surface (pendant, track and sconce) and recessed (pot, troffer and cove). A variety of lamp types, including fluorescent, compact fluorescent, halogen, incandescent, LED, etc. for interior direct, indirect and accent lighting applications. A variety of light fixture controls, including switches, motion sensors, timers, dimmers and photocells.

**Information**

Service Life:	20
Installed Year:	1999
Chronological Age:	21
Effective Age:	18
Next Renewal Year:	2022



**Crystal Residences**  
**Asset Inventory**

**Security**

**Elec 08 - Enterphone System**



**Location**

Each main lobby.

**Description**

Sentex. Enterphone panels with associated key pads and display panels.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Elec 09 - Proximity Access Control**



**Location**

At access points to common areas throughout the building.

**Description**

Local proximity access control system components include fob devices for building occupants, fob readers, RTE sensors/buttons, electric strikes and door controllers. Network level components include door control panel, communication boards, backup batteries, RTE board, conduit, cable and connectors.

**Information**

Service Life: 12  
Installed Year: 2013  
Chronological Age: 7  
Effective Age: 7  
Next Renewal Year: 2025

**Elec 10 - Security Surveillance**



**Location**

Mounted in strategic location in building and parking garage.

**Description**

Cameras, multiplexer, monitors and storage media to deter and track activity on and within building premises. Additional cameras were installed in 2018.

**Information**

Service Life: 14  
Installed Year: 2013  
Chronological Age: 7  
Effective Age: 9  
Next Renewal Year: 2025

**Crystal Residences**  
**Asset Inventory**

**Mechanical**

**Controls and End Devices**

**Mech 01 - Controls - Electronic Actuators**



**Location**

Throughout the building.

**Description**

Electronic motor-driven control devices on valves, dampers etc to control heating, air-conditioning, domestic hot water system and boilers etc.

**Information**

Service Life: 10  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 8  
Next Renewal Year: 2022

**Mech 02 - Gas Detection - Parking Garage**



**Location**

Throughout the parking garage.

**Description**

Critical environment technologies, electronic sensing devices for detection of dangerous gases, carbon monoxide (CO), produced by vehicles and to activate the exhaust fans accordingly.

**Information**

Service Life: 10  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 8  
Next Renewal Year: 2022

**Plumbing & Drainage**

**Mech 03 - Tank - DHW - Packaged Combo Unit (Tower)**



**Location**

Roof mechanical room of the tower.

**Description**

Lochinvar, max input 360,000 BTU natural gas fired, stacked on heavy duty lock-temp 100L tanks, for domestic hot water for plumbing fixtures in the suites.

**Information**

Service Life: 12  
Installed Year: 2005  
Chronological Age: 15  
Effective Age: 11  
Next Renewal Year: 2021

**Mech 04 - Tank - DHW - Packaged Combo Unit (Low rise)**



**Location**

Roof mechanical room of low rise.

**Description**

Lochinvar, max input 200,000 BTU natural gas fired, stacked on heavy duty lock-temp 100L tanks, for domestic hot water for plumbing fixtures in the suites.

**Information**

Service Life: 12  
Installed Year: 2008  
Chronological Age: 12  
Effective Age: 11  
Next Renewal Year: 2021

**Crystal Residences**  
**Asset Inventory**

**Mech 05 - Tank - DHW - Heating - Gas Fired (Tower)**



**Location**

Mechanical penthouse of tower.

**Description**

A.O. Smith, 390,000 BTU input, natural gas fired domestic water heaters, model for domestic hot water for plumbing fixtures in the suites. Installed in 2014 and 2018; age is averaged.

**Information**

Service Life: 10  
Installed Year: 2016  
Chronological Age: 4  
Effective Age: 4  
Next Renewal Year: 2026

**Mech 06 - Tank - DHW - Heating - Gas Fired (Low rise)**



**Location**

Mechanical penthouse of low rise.

**Description**

A.O. Smith, 199,000 BTU input, natural gas fired domestic water heaters, model for domestic hot water for plumbing fixtures in the suites. Renewal in progress at the time of the Depreciation Report Update, therefore a photo of the old equipment is shown.

**Information**

Service Life: 10  
Installed Year: 2019  
Chronological Age: 1  
Effective Age: 1  
Next Renewal Year: 2029

**Mech 07 - Boiler - DWH Heating - Gas Fired - Condensing (Pool)**



**Location**

Pool mechanical room.

**Description**

High efficiency condensing boiler for pool and spa.

**Information**

Service Life: 12  
Installed Year: 2015  
Chronological Age: 5  
Effective Age: 5  
Next Renewal Year: 2027

**Mech 08 - Tank - Expansion - DHW - Diaphragm (Low rise)**



**Location**

Mechanical room in low rise.

**Description**

Floor mounted diaphragm expansion tank for domestic water system.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Crystal Residences**  
**Asset Inventory**

**Mech 09 - Tank - Expansion -DHW - Diaphragm (Tower)**



**Location**

Roof mechanical rooms of the tower

**Description**

Amtrol Thermxtrol floor mounted diaphragm expansion tank for domestic water system.

**Information**

Service Life: 20  
Installed Year: 2019  
Chronological Age: 1  
Effective Age: 1  
Next Renewal Year: 2039

**Mech 10 - Tank - DHW - Booster/Heater**



**Location**

Reheat stations on mechanical floors in the tower.

**Description**

Rheem Ruud electric booster water heater, 9.0KW, electric water heater with 10 gallon tank.

**Information**

Service Life: 10  
Installed Year: 2011  
Chronological Age: 9  
Effective Age: 9  
Next Renewal Year: 2021

**Mech 11 - Pump - DHW - Circulation and Recirculation**



**Location**

Mechanical rooms and through floor service spaces.

**Description**

Various power ratings, pipe-mounted domestic hot water circulation pumps. Circulating hot water from boilers to tanks and recirculating hot water from system. Two pumps replaced in 2018.

**Information**

Service Life: 10  
Installed Year: 2010  
Chronological Age: 10  
Effective Age: 9  
Next Renewal Year: 2021

**Mech 12 - Piping - Domestic Water Distribution**



**Location**

Throughout the building to each strata lot and common facilities.

**Description**

Mixture of K and L copper for vertical/horizontal mains system. The renewal of this asset is phased.

**Information**

Service Life: 28  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 24  
Next Renewal Year: 2024

**Crystal Residences**  
**Asset Inventory**

**Mech 13 - Pump - Domestic Water Booster - Tower**



**Location**

Water entry room.

**Description**

Triplex system with 10 & 20 HP pumps, packaged motor control system, to supply constant boosted pressure to fixtures and equipment to the tower.

**Information**

Service Life: 14  
Installed Year: 2019  
Chronological Age: 1  
Effective Age: 1  
Next Renewal Year: 2033

**Mech 14 - Pump - Domestic Water Booster - (Low rise)**



**Location**

Water entry room.

**Description**

Duplex system with 5 & 10 HP pumps, packaged motor control system, to supply constant boosted pressure to fixtures and equipment to the low-rise building. One pump replaced in 2017.

**Information**

Service Life: 14  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2021

**Mech 15 - Valves - Cross Connection & Backflow Prevention**



**Location**

Water entry room.

**Description**

Various types and sizes of backflow prevention valves, including vacuum breakers, double check, reduced pressure valves on systems.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Mech 16 - Valves - Plumbing Flow Control and Directional**



**Location**

Throughout the building in service spaces and rooms.

**Description**

Various types and sizes of valves, including pressure reducing valves, isolation valves, two-way and three way valves, circuit flow control valves and check valves to regulate the flow of water through domestic plumbing systems. Inspected and replaced two PRV's in 2016.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Crystal Residences**  
**Asset Inventory**

**Mech 17 - Drainage - Sanitary**



**Location**

Throughout the building to city connection.

**Description**

PVC DWV piping with glued joints cast iron and copper risers in building. P-traps, and fittings.

**Information**

Service Life: 50  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2049

**Mech 18 - Drainage - Storm - Internal**



**Location**

Throughout the buildings and property.

**Description**

Trench drains, catch basins and associated piping systems for rainwater runoff. Roof drains may be included with the roof assets.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Mech 19 - Drainage - Perimeter and Foundation**



**Location**

Residential portion of P4 level.

**Description**

Perforated PVC piping forming part of a sub-surface foundation drainage system at underground structures.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Mech 20 - Interceptor - Oil**



**Location**

Parking garage level 4.

**Description**

Multi-chamber flow-through interceptor with hatches to grade.

**Information**

Service Life: 50  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2049

**Crystal Residences**  
**Asset Inventory**

**Mech 21 - Pumps - Sanitary Lift and Control Panel**



**Location**

Near stall 46 parking garage.

**Description**

Northwest tech-con systems (Manuf), duplex, sanitary lift station sump pump and control panel for sanitary lift/drainage.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Mech 22 - Pumps - Storm Lift and Control Panel**



**Location**

Parking garage near stall #1.

**Description**

Northwest tech-con systems (Manuf), simplex, sump pump and control panel for oil interceptor.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Mech 23 - Pumps - Triplex Storm Lift and Control Panel**



**Location**

Parking garage level 3 near stall #72.

**Description**

Northwest tech-con systems (Manuf), triplex storm sump pumps and control panel for water runoff and sub-surface drainage.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Mech 24 - Piping - Gas Distribution**



**Location**

Throughout the building to appliances such as water heaters.

**Description**

Gas distribution system consisting of piping from meter to appliances.

**Information**

Service Life: 50  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2049

**Crystal Residences**  
**Asset Inventory**

**Heating & Cooling**

**Mech 25 - Condensing Unit - Outdoor Section - AC Cooling only**



**Location**

Parkade.

**Description**

Lennox condensing units, 6 ton, and associated ceiling mounted indoor fan coil units for air conditioning (cooling only).

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Mech 26 - Condensing Unit - Outdoor Section - Heat Pump (Amenity)**



**Location**

Amenity roof.

**Description**

Trane heat pump outdoor unit, 3.5 tons and associated indoor unit for forced air conditioning and heating.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 14  
Next Renewal Year: 2021

**Mech 27 - Condensing Unit - Split System A/C**



**Location**

Provides A/C to electrical vault and other service rooms throughout the building.

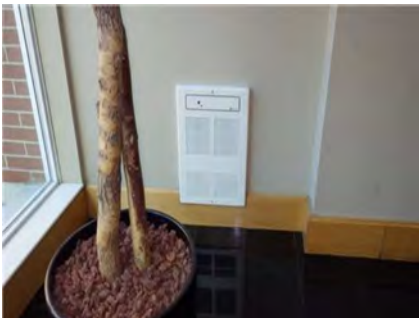
**Description**

Condensing units serving ductless split system for air conditioning to service rooms. Wall mounted indoor units, with remote and wall mounted controllers.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 14  
Next Renewal Year: 2021

**Mech 28 - Unit Heater - Electric**



**Location**

Main lobbies and mechanical rooms.

**Description**

Ouellet, electric unit heater, wall mounted with fan and directional louver.

**Information**

Service Life: 17  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 15  
Next Renewal Year: 2022



**Crystal Residences**  
**Asset Inventory**

**Mech 29 - Baseboard - Electric**



**Location**

Throughout service rooms and spaces needing additional heating.

**Description**

Standard grade, wall mounted, electric convector baseboard heaters with electrical fins for localized space heating and integral thermostat control.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Mech 30 - Acid Neutralizer (Pool)**



**Location**

Pool mechanical room.

**Description**

Plastic acid neutralization tank for neutralization of pool heater condensate before running to drain.

**Information**

Service Life: 8  
Installed Year: 2015  
Chronological Age: 5  
Effective Age: 5  
Next Renewal Year: 2023

**Ventilation and Air-conditioning**

**Mech 31 - Outdoor Air Handler - Makeup Air - Gas (Tower)**



**Location**

Tower roof.

**Description**

I.C.E. outdoor rooftop unit, belt-driven, centrifugal fan with natural gas fired heating (600,000 BTU max input) to supply tempered make-up air to the interior spaces (8,750 CFM). Renewal in progress at the time of the Depreciation Report Update, therefore a photo of the old equipment is shown.

**Information**

Service Life: 20  
Installed Year: 2019  
Chronological Age: 1  
Effective Age: 1  
Next Renewal Year: 2039

**Mech 32 - Indoor Air Handler - Gas Fired (Low rise)**



**Location**

Roof mechanical room of low rise.

**Description**

Trane, 2,750 CFM indoor unit, belt-driven, centrifugal fan with natural gas fired heating to supply tempered make-up air to the low rise interior spaces. Replaced burner in circa 2015.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Crystal Residences**  
**Asset Inventory**

**Mech 33 - Outdoor Air Handler - Air Conditioning - Gas Heat (Amenity)**



**Location**

Amenity roof.

**Description**

American Standard, outdoor packaged rooftop gas-fired air-conditioning unit, nominal 3 tons. Centrifugal fan with direct expansion cooling to supply conditioned ventilation up air to the interior spaces of amenity area, and natural gas heating.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Mech 34 - Packaged Dehumidification Unit (Pool)**



**Location**

Pool mechanical room.

**Description**

Packaged dehumidification unit for circulating and drying air to the interior of pool room.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 18  
Next Renewal Year: 2022

**Mech 35 - Coil - Electric - Duct Heater**



**Location**

Throughout the building HVAC system.

**Description**

Electric duct heaters, duct-mounted elements and controllers.

**Information**

Service Life: 17  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 15  
Next Renewal Year: 2022

**Mech 36 - Exhaust & Supply Fans - Small Service**



**Location**

Throughout the building.

**Description**

Direct drive fans, ceiling and cabinet fans, and centrifugal inline blower fans.

**Information**

Service Life: 12  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 9  
Next Renewal Year: 2023

**Crystal Residences**  
**Asset Inventory**

**Mech 37 - Indoor Air handler - Fan Coil Unit**



**Location**

Throughout the property.

**Description**

Direct expansion air-conditioning ceiling suspended fan coil unit with ducted system for air conditioning.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Mech 38 - Exhaust Fan Parkade**



**Location**

Throughout the parking garage.

**Description**

Leeson (Manuf.) 7.5hp belt driven axial fan utility set on spring isolated base frame.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 19  
Next Renewal Year: 2021

**Other**

**Mech 39 - Overhead Gate Motor**



**Location**

Entrance to residential portion of parking garage.

**Description**

AC motor and commercial-grade overhead sectional door controlled by an electric operator.

**Information**

Service Life: 15  
Installed Year: 2001  
Chronological Age: 19  
Effective Age: 14  
Next Renewal Year: 2021

**Elevator**

**Traction**

**Elev 01 - Traction Elevators, Overhead Geared (6088 Willingdon Ave.)**



**Location**

Elevator machine room at roof level.

**Description**

Geared overhead traction elevators with Dover T-IV Relay/Microprocessor controls; Quantum variable voltage, variable frequency drives; 2500 lbs; 450 fpm rated speed.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Crystal Residences**  
**Asset Inventory**

**Elev 02 - Traction Elevators, Overhead Geared (6028 Willingdon Ave.)**



**Location**

Elevator machine room at roof level.

**Description**

Geared overhead traction elevators; Dover T-IV Relay / Microprocessor controls; Quantum variable voltage, variable frequency drive systems; 2500 lbs capacity; 450 fpm rated speed.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Car Interiors**

**Elev 03 - Elevator Cabs & Hoistway (6088 Willingdon Ave.)**



**Location**

Elevator cab and travelling hoistway.

**Description**

Single speed side opening doors; plastic car and hall push-buttons; one (1) car operating panel; Dover door operators; infrared light curtain door protection; stainless steel doors and front return, stainless steel reveals on walls, plastic laminated ear wall and ceiling; tile flooring; tubular handrails on all non-access walls; firefighter's emergency operation; standby power provisions; hand-held voice communication device in cabinet; no seismic provisions.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Elev 04 - Elevator Cabs & Hoistway (6028 Willingdon Ave.)**



**Location**

Elevator cab and travelling hoistway.

**Description**

Single speed side opening doors; plastic car and hall push-buttons; one (1) stainless steel car operating panel; Dover door operators; infrared light curtain door protection; stainless steel doors and return, stainless steel reveals on walls, plastic laminated rear wall and ceiling; tile flooring; tubular handrails on all non-access walls; no firefighter's emergency operation; no standby power provisions; hand-held voice communication device in cabinet; no seismic provisions.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Crystal Residences**  
**Asset Inventory**

**Fire Safety**

**Fire Safety**

**Fire 01 - Smoke Control Dampers**



**Location**

Throughout the building at every floor.

**Description**

Motorized smoke dampers for control of building pressure and smoke in a building

**Information**

Service Life:	20
Installed Year:	1999
Chronological Age:	21
Effective Age:	19
Next Renewal Year:	2021

**Controls**

**Fire 02 - Fire Alarm Panel - Addressable**



**Location**

Display panels in lobbies and controller in electrical room.

**Description**

Edwards systems technology microprocessor and supervised unit with annunciator and LCD display.

**Information**

Service Life:	20
Installed Year:	1999
Chronological Age:	21
Effective Age:	19
Next Renewal Year:	2021

**Detection**

**Fire 03 - Fire Detection & Alarm**



**Location**

Throughout the property.

**Description**

Smoke detectors, heat detectors, flow switches, tamper switches, horns, pull stations and other fixed apparatus field devices to detect fire and smoke conditions and initiate timely response. Replaced as required.

**Information**

Service Life:	10
Installed Year:	2010
Chronological Age:	10
Effective Age:	9
Next Renewal Year:	2021

**Crystal Residences**  
**Asset Inventory**

**Suppression**

**Fire 04 - Sprinkler & Standpipe - Wet**



**Location**

Throughout the tower and low rise.

**Description**

Upright, pendent and sidewall sprinkler heads, flow switches and indicating devices, gauges, steel distribution lines.

**Information**

Service Life: 100  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2099

**Fire 05 - Dry Sprinklers - Wet System**



**Location**

Tower and low rise balconies.

**Description**

Dry sidewall sprinklers on a wet distribution system, extending from a heated space to unheated coverage area.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Fire 06 - Sprinkler System - Dry**



**Location**

Throughout parkade (residential only).

**Description**

Exposed dry sprinklers, upright and sidewall sprinkler heads, steel piping.

**Information**

Service Life: 100  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2099

**Fire 07 - Sprinkler Valve Assembly - Dry**



**Location**

Fire pump room.

**Description**

Viking, dry sprinkler valve, trim and gauges, steel piping.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Crystal Residences**  
**Asset Inventory**

**Fire 08 - Dry Sprinkler Compressor**



**Location**

Fire pump room.

**Description**

Swan compressor with 1/2 HP motor and to maintain the pressure of air in the dry fire sprinkler lines.

**Information**

Service Life: 14  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2021

**Fire 09 - Fire Pump**



**Location**

Fire suppression room.

**Description**

Motor control centre connected to 100 HP fire pump, which work in tandem to supply water flow and pressure to the sprinkler system and standpipe system.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Fire 10 - Smoke Control Fan**



**Location**

Tower roof.

**Description**

Smoke exhaust fan; with motorized intake dampers on fan inlets and interconnected motorized smoke dampers on each floor.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Fire 11 - Portable Fire Extinguisher**



**Location**

Throughout the building.

**Description**

Wall mounted, manually operated, ABC type, pressurized vessels for controlled discharge of chemicals to extinguish small fires.

**Information**

Service Life: 12  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 9  
Next Renewal Year: 2023

**Crystal Residences**  
Asset Inventory

**Egress**

**Fire 12 - Emergency Egress Equipment**



**Location**

Throughout the building.

**Description**

Unit battery packs; exit signs.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 18  
Next Renewal Year: 2022

**Interior Finishes**

**Floors**

**Finish 01 - Amenity - Floor Tile**



**Location**

Amenity washrooms, showers, spa and pool deck.

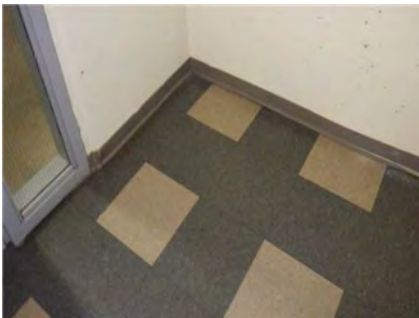
**Description**

Floor tile on thin set mortar with grout.  
Mens change room re-tiled in 2017

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Finish 02 - Resilient Sheet Flooring**



**Location**

Parking Garage elevator lobbies.

**Description**

Vinyl tile adhered to the substrate.

**Information**

Service Life: 20  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 18  
Next Renewal Year: 2022

**Finish 03 - Sheet Carpet**



**Location**

Throughout the common hallways.

**Description**

Synthetic, low level loop, textile sheet floor covering floor substrate.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022



**Crystal Residences**  
**Asset Inventory**

**Finish 04 - Lobby Floor Tile**



**Location**

Main entry lobbies.

**Description**

Cut stone floor tile on thin set mortar with grout.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Walls**

**Finish 05 - Wall Tile**



**Location**

Pool area wall finish and portion washroom wall finish.

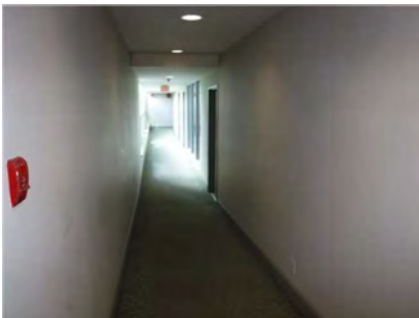
**Description**

Ceramic tile on mortar bed and substrate with grout and sealant at interfaces. Mens change room re-tiled in 2017

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Finish 06 - Paint**



**Location**

Hallways, amenity area, and elevator vestibules in the parkade.

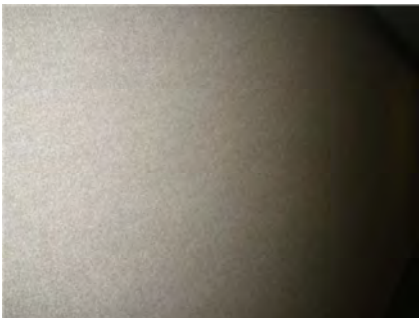
**Description**

Primers and multiple pigmented coating finishes applied to interior gypsum wallboard.

**Information**

Service Life: 10  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 8  
Next Renewal Year: 2022

**Finish 07 - Wallpaper Covering**



**Location**

Throughout the common hallways and lobbies.

**Description**

Decorative wallpaper sheet covering adhered to substrate sheathing.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 22  
Next Renewal Year: 2023

**Crystal Residences**  
**Asset Inventory**

**Finish 08 - Wallpaper Covering**



**Location**

Hallways and common areas throughout the building.

**Description**

Decorative wallpaper sheet covering adhered to substrate sheathing.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Ceilings**

**Finish 09 - Painted Ceiling**



**Location**

Throughout the common interior spaces.

**Description**

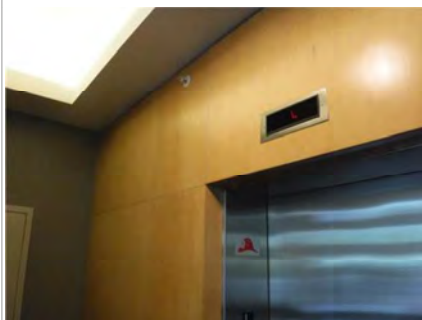
Primer and multiple pigmented finish coat applied to interior exposed concrete or gypsum wallboard.

**Information**

Service Life: 10  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 8  
Next Renewal Year: 2022

**Architectural Woodwork**

**Finish 10 - Wood Panels**



**Location**

Lobbies.

**Description**

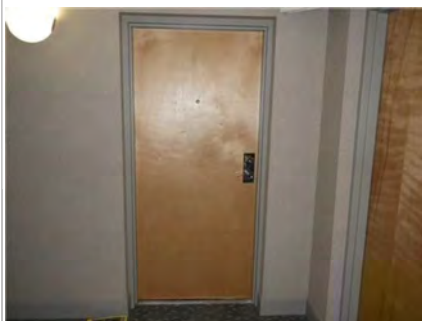
Laminated veneer panel walls.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Doors**

**Finish 11 - Interior Swing Door - General**



**Location**

Suite doors, electrical closet doors, stairwell doors and amenity room access doors.

**Description**

Swing doors of varying construction hung in framed openings including hardware.

**Information**

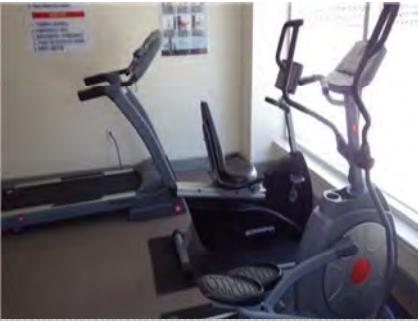
Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Crystal Residences**  
**Asset Inventory**

**Amenities**

**Equipment**

**Amen 01 - Fitness Equipments**



**Location**

Amenity room gym.

**Description**

Various fitness machines and equipment.

**Information**

Service Life: 10  
Installed Year: 2010  
Chronological Age: 10  
Effective Age: 8  
Next Renewal Year: 2022

**Specialties**

**Amen 02 - Washroom Partition**



**Location**

Common washrooms.

**Description**

Privacy panels and miscellaneous hardware fittings such as pilaster, panel, door, anchors, hinges, latches and brackets.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Amen 03 - Wood Storage Locker**



**Location**

Storage rooms.

**Description**

Wood framed general purpose storage locker with swing door and hardware.

**Information**

Service Life: 30  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2029

**Crystal Residences**  
**Asset Inventory**

**Furnishings**

**Amen 04 - Exterior Furniture & Accessories**



**Location**

Throughout the property.

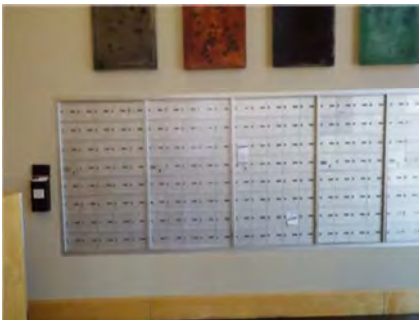
**Description**

Wood and metal furniture and other miscellaneous accessories.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 13  
Next Renewal Year: 2022

**Amen 05 - Central Mailboxes**



**Location**

Main lobbies.

**Description**

Flush mounted in tower lobby. Surface mounted with mill work trim in low-rise lobby. Front loading, brushed aluminum finish, extruded aluminum trim.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Amen 06 - Public Signage**



**Location**

Mounted to doors and walls throughout the building.

**Description**

Variety of permanently displayed information placards in the common areas of the building.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 20  
Next Renewal Year: 2025

**Suite**

**Amen 07 - Caretaker Suite**



**Location**

Suite 509 in low rise.

**Description**

Kitchen with stove, microwave, fridge and dishwasher, fixtures, flooring, wall and ceiling finishes, Millwork and permanent accessories such as mirrors.

**Information**

Service Life: 25  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2024

**Crystal Residences**  
**Asset Inventory**

**Pool, Spa & Sauna**

**Amen 08 - Pool/Spa Circulation & Sanitation**



**Location**

Pool mechanical room.

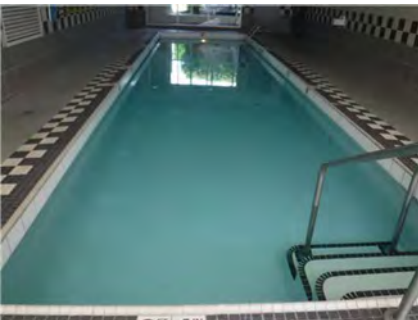
**Description**

Sand filters, circulation, pumps, cpvc piping, chemical feeders and other components to distribute sanitized water to the pool and spas.

**Information**

Service Life: 15  
Installed Year: 2013  
Chronological Age: 7  
Effective Age: 7  
Next Renewal Year: 2028

**Amen 09 - Pool/Spa Tank**



**Location**

Pool room in amenity area of low rise.

**Description**

Reinforced concrete for tank lined with marcite and ceramic tile and grout trim. Hot tub included.

**Information**

Service Life: 30  
Installed Year: 2016  
Chronological Age: 4  
Effective Age: 4  
Next Renewal Year: 2046

**Sitework**

**Hard Landscaping**

**Site 01 - Interlocking Unit Paving**



**Location**

Entry walkway to residential lobbies.

**Description**

Precast concrete unit pavers, combination of chip seal joint filler and jointing sand, bedding sand, and onto compacted gravel base.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Site 02 - Metal Fencing**



**Location**

Parking garage commercial/residential separation.

**Description**

Chainlink metal fencing separating residential parking from public parking garage.

**Information**

Service Life: 40  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 21  
Next Renewal Year: 2039

**Crystal Residences**  
**Asset Inventory**

**Site 03 - Wood Fencing**



**Location**

Common area decks.

**Description**

6 feet high wood fence with posts and lattice.

**Information**

Service Life: 15  
Installed Year: 2010  
Chronological Age: 10  
Effective Age: 6  
Next Renewal Year: 2029

**Soft Landscaping**

**Site 04 - Irrigation System**



**Location**

Throughout the soft landscaping.

**Description**

Controller with time clock, network of pipes, valves, and irrigation heads distributed around the soft landscaping.

**Information**

Service Life: 15  
Installed Year: 1999  
Chronological Age: 21  
Effective Age: 14  
Next Renewal Year: 2021

**Site 05 - Soft Landscaping**



**Location**

Level 5 podium and localized sections at ground level.

**Description**

Lawn, ground cover, shrubs, perennials and small trees(up to 30').

**Information**

Service Life: 15  
Installed Year: 2013  
Chronological Age: 7  
Effective Age: 6  
Next Renewal Year: 2029

# **Appendix C**

## **Asset Service Life Summary**

## Crystal Residences Asset Service Life Summary

ASSET ID	ASSET NAME	CHRONOLOGICAL AGE	ESTIMATED REMAINING SERVICE LIFE
<b>ENCLOSURE</b>			
Encl 01	Protected Membrane Roof with Ballast	21 <input type="text"/>	9 <input type="text"/>
Encl 02	Protected Membrane Deck (Conventional Assembly) with Landscaping	21 <input type="text"/>	9 <input type="text"/>
Encl 03	Protected Membrane Deck (Conventional Assembly) with Traffic-Bearing Surface	21 <input type="text"/>	9 <input type="text"/>
Encl 04	Anchor Fall Protection Equipment	21 <input type="text"/>	19 <input type="text"/>
Encl 05	Guardrail Glazed Aluminum	21 <input type="text"/>	9 <input type="text"/>
Encl 06	Guardrail Aluminum	21 <input type="text"/>	9 <input type="text"/>
Encl 07	Glazed Aluminum Frame Divider	21 <input type="text"/>	9 <input type="text"/>
Encl 08	Stucco Clad Wall - Undrained	21 <input type="text"/>	4 <input type="text"/>
Encl 09	Clay Masonry Veneer Wall	21 <input type="text"/>	29 <input type="text"/>
Encl 10	Composite Metal Panel Wall	21 <input type="text"/>	19 <input type="text"/>
Encl 11	Aluminum Framed Window	21 <input type="text"/>	19 <input type="text"/>
Encl 12	Aluminum Storefront	21 <input type="text"/>	19 <input type="text"/>
Encl 13	Steel Swing Door	21 <input type="text"/>	4 <input type="text"/>
Encl 14	Aluminum Frame Lobby Door	21 <input type="text"/>	4 <input type="text"/>
Encl 15	Aluminum Framed Sliding Glass Door	21 <input type="text"/>	9 <input type="text"/>
Encl 16	Metal Clad Glazed Swing Door	21 <input type="text"/>	4 <input type="text"/>
Encl 17	Metal Panel Screen	21 <input type="text"/>	19 <input type="text"/>
Encl 18	Exposed Urethane Balcony/Eyebrow Membrane - Concrete Substrate	21 <input type="text"/>	11 <input type="text"/>
Encl 19	Metal Frame and Glass Canopy	21 <input type="text"/>	19 <input type="text"/>
Encl 20	Parking Slab with Traffic-bearing Membrane	21 <input type="text"/>	54 <input type="text"/>
Encl 21	Open-grid Overhead Parkade Gate	21 <input type="text"/>	4 <input type="text"/>
Encl 22	Slab-on-Grade	21 <input type="text"/>	54 <input type="text"/>
Encl 23	General & Inspections	21 <input type="text"/>	54 <input type="text"/>
Encl 24	Sealant	21 <input type="text"/>	0 <input type="text"/>
<b>ELECTRICAL</b>			
Elec 01	Distribution Transformer - Interior	21 <input type="text"/>	19 <input type="text"/>
Elec 02	Emergency Generator	21 <input type="text"/>	14 <input type="text"/>
Elec 03	Tank - Fuel Oil Storage	21 <input type="text"/>	2 <input type="text"/>
Elec 04	Unit Substation	21 <input type="text"/>	14 <input type="text"/>
Elec 05	Electrical Distribution	21 <input type="text"/>	19 <input type="text"/>
Elec 06	Exterior Light Fixtures	21 <input type="text"/>	2 <input type="text"/>
Elec 07	Interior Light Fixtures	21 <input type="text"/>	2 <input type="text"/>
Elec 08	Enterphone System	21 <input type="text"/>	4 <input type="text"/>



## Crystal Residences Asset Service Life Summary

ASSET ID	ASSET NAME	CHRONOLOGICAL AGE	ESTIMATED REMAINING SERVICE LIFE
Elec 09	Proximity Access Control	7	5
Elec 10	Security Surveillance	7	5
<b>MECHANICAL</b>			
Mech 01	Controls - Electronic Actuators	21	2
Mech 02	Gas Detection - Parking Garage	21	2
Mech 03	Tank - DHW - Packaged Combo Unit (Tower)	15	1
Mech 04	Tank - DHW - Packaged Combo Unit (Low rise)	12	1
Mech 05	Tank - DHW - Heating - Gas Fired (Tower)	4	6
Mech 06	Tank - DHW - Heating - Gas Fired (Low rise)	1	9
Mech 07	Boiler - DWH Heating - Gas Fired - Condensing (Pool)	5	7
Mech 08	Tank - Expansion - DHW - Diaphragm (Low rise)	21	1
Mech 09	Tank - Expansion -DHW - Diaphragm (Tower)	1	19
Mech 10	Tank - DHW - Booster/Heater	9	1
Mech 11	Pump - DHW - Circulation and Recirculation	10	1
Mech 12	Piping - Domestic Water Distribution	21	4
Mech 13	Pump - Domestic Water Booster - Tower	1	13
Mech 14	Pump - Domestic Water Booster - (Low rise)	21	1
Mech 15	Valves - Cross Connection & Backflow Prevention	21	1
Mech 16	Valves - Plumbing Flow Control and Directional	21	1
Mech 17	Drainage - Sanitary	21	29
Mech 18	Drainage - Storm - Internal	21	19
Mech 19	Drainage - Perimeter and Foundation	21	19
Mech 20	Interceptor - Oil	21	29
Mech 21	Pumps - Sanitary Lift and Control Panel	21	2
Mech 22	Pumps - Storm Lift and Control Panel	21	2
Mech 23	Pumps - Triplex Storm Lift and Control Panel	21	2
Mech 24	Piping - Gas Distribution	21	29
Mech 25	Condensing Unit - Outdoor Section - AC Cooling only	21	2
Mech 26	Condensing Unit - Outdoor Section - Heat Pump (Amenity)	21	1
Mech 27	Condensing Unit - Split System A/C	21	1
Mech 28	Unit Heater - Electric	21	2
Mech 29	Baseboard - Electric	21	19
Mech 30	Acid Neutralizer (Pool)	5	3
Mech 31	Outdoor Air Handler - Makeup Air - Gas (Tower)	1	19
Mech 32	Indoor Air Handler - Gas Fired (Low rise)	21	1

## Crystal Residences Asset Service Life Summary

ASSET ID	ASSET NAME	CHRONOLOGICAL AGE	ESTIMATED REMAINING SERVICE LIFE
Mech 33	Outdoor Air Handler - Air Conditioning - Gas Heat (Amenity)	21 <input type="text"/>	1 <input type="text"/>
Mech 34	Packaged Dehumidification Unit (Pool)	21 <input type="text"/>	2 <input type="text"/>
Mech 35	Coil - Electric - Duct Heater	21 <input type="text"/>	2 <input type="text"/>
Mech 36	Exhaust & Supply Fans - Small Service	21 <input type="text"/>	3 <input type="text"/>
Mech 37	Indoor Air handler - Fan Coil Unit	21 <input type="text"/>	2 <input type="text"/>
Mech 38	Exhaust Fan Parkade	21 <input type="text"/>	1 <input type="text"/>
Mech 39	Overhead Gate Motor	19 <input type="text"/>	1 <input type="text"/>

### ELEVATOR

Elev 01	Traction Elevators, Overhead Geared (6088 Willingdon Ave.)	21 <input type="text"/>	9 <input type="text"/>
Elev 02	Traction Elevators, Overhead Geared (6028 Willingdon Ave.)	21 <input type="text"/>	9 <input type="text"/>
Elev 03	Elevator Cabs & Hoistway (6088 Willingdon Ave.)	21 <input type="text"/>	9 <input type="text"/>
Elev 04	Elevator Cabs & Hoistway (6028 Willingdon Ave.)	21 <input type="text"/>	9 <input type="text"/>

### FIRE SAFETY

Fire 01	Smoke Control Dampers	21 <input type="text"/>	1 <input type="text"/>
Fire 02	Fire Alarm Panel - Addressable	21 <input type="text"/>	1 <input type="text"/>
Fire 03	Fire Detection & Alarm	10 <input type="text"/>	1 <input type="text"/>
Fire 04	Sprinkler & Standpipe - Wet	21 <input type="text"/>	79 <input type="text"/>
Fire 05	Dry Sprinklers - Wet System	21 <input type="text"/>	9 <input type="text"/>
Fire 06	Sprinkler System - Dry	21 <input type="text"/>	79 <input type="text"/>
Fire 07	Sprinkler Valve Assembly - Dry	21 <input type="text"/>	19 <input type="text"/>
Fire 08	Dry Sprinkler Compressor	21 <input type="text"/>	1 <input type="text"/>
Fire 09	Fire Pump	21 <input type="text"/>	9 <input type="text"/>
Fire 10	Smoke Control Fan	21 <input type="text"/>	4 <input type="text"/>
Fire 11	Portable Fire Extinguisher	21 <input type="text"/>	3 <input type="text"/>
Fire 12	Emergency Egress Equipment	21 <input type="text"/>	2 <input type="text"/>

### INTERIOR FINISHES

Finish 01	Amenity - Floor Tile	21 <input type="text"/>	19 <input type="text"/>
Finish 02	Resilient Sheet Flooring	21 <input type="text"/>	2 <input type="text"/>
Finish 03	Sheet Carpet	21 <input type="text"/>	2 <input type="text"/>
Finish 04	Lobby Floor Tile	21 <input type="text"/>	19 <input type="text"/>
Finish 05	Wall Tile	21 <input type="text"/>	4 <input type="text"/>
Finish 06	Paint	21 <input type="text"/>	2 <input type="text"/>
Finish 07	Wallpaper Covering	21 <input type="text"/>	3 <input type="text"/>

**Crystal Residences**  
**Asset Service Life Summary**

ASSET ID	ASSET NAME	CHRONOLOGICAL AGE	ESTIMATED REMAINING SERVICE LIFE
Finish 08	Wallpaper Covering	21 <input type="text"/>	2 <input type="text"/>
Finish 09	Painted Ceiling	21 <input type="text"/>	2 <input type="text"/>
Finish 10	Wood Panels	21 <input type="text"/>	9 <input type="text"/>
Finish 11	Interior Swing Door - General	21 <input type="text"/>	9 <input type="text"/>

**AMENITIES**

Amen 01	Fitness Equipments	10 <input type="text"/>	2 <input type="text"/>
Amen 02	Washroom Partition	21 <input type="text"/>	9 <input type="text"/>
Amen 03	Wood Storage Locker	21 <input type="text"/>	9 <input type="text"/>
Amen 04	Exterior Furniture & Accessories	21 <input type="text"/>	2 <input type="text"/>
Amen 05	Central Mailboxes	21 <input type="text"/>	19 <input type="text"/>
Amen 06	Public Signage	21 <input type="text"/>	5 <input type="text"/>
Amen 07	Caretaker Suite	21 <input type="text"/>	4 <input type="text"/>
Amen 08	Pool/Spa Circulation & Sanitation	7 <input type="text"/>	8 <input type="text"/>
Amen 09	Pool/Spa Tank	4 <input type="text"/>	26 <input type="text"/>

**SITework**

Site 01	Interlocking Unit Paving	21 <input type="text"/>	19 <input type="text"/>
Site 02	Metal Fencing	21 <input type="text"/>	19 <input type="text"/>
Site 03	Wood Fencing	10 <input type="text"/>	9 <input type="text"/>
Site 04	Irrigation System	21 <input type="text"/>	1 <input type="text"/>
Site 05	Soft Landscaping	7 <input type="text"/>	9 <input type="text"/>

# **Appendix D**

## **Disclosures and Disclaimers**

## Disclosures and Disclaimers

### Condition of the Assets

The method of determining the physical condition of the assets is based on a visual review of a representative sampling of the assets in readily accessible locations, discussions with facility representatives, and review of readily available reference documents. No destructive testing or exploratory openings are carried out on any of the assets and the equipment is not disassembled, operated, or subject to re-commissioning tests. The physical review is not a full “condition assessment” since operating, testing, or exploratory openings are excluded from the scope of services.

### Cost Estimating for Assets

- All estimates of costs are provided in future year dollars.
- All estimates of costs are Class D estimates intended for planning purposes and not for accounting or tender use. See Glossary of Terms for definition of Class D estimates.
- Actual costs will vary depending on several factors. The estimates assume economies of scale will be achieved by bundling work tasks together into larger renewal, repair, or rehabilitation projects. Small tasks performed individually may exceed the estimates presented.
- Soft costs, such as consulting services and contingency allowances are not included in the budget estimates. When developing cost estimates for projects in greater detail for budgeting, each project should include appropriate soft costs - such as Owner contingency, permit fees, engineering fees, etc. Depending on the sizes, scope and timing of individual projects, the magnitude of the soft costs will vary.
- Construction costs are subject to the vagaries of the marketplace. At the time of tender, costs may vary depending on the time of the year, contractor availability, and other factors.
- The estimates must be updated over time, further developed for scope of work and confirmed by competitive tender before any contracts are awarded.
- Detailed repair specifications are required to be prepared in order to confirm scopes of work and costs.
- The estimates do not include allowances for site specific access requirements or environmental concerns, which should be addressed on a project-by-project basis.
- Consideration may sometimes need to be given to costs arising from the impact of projects on occupancy use and facility operations.
- Replacement costs are typically based on like-for-like with a similar asset unless code or other circumstances require the replacement cost to include an upgrade.

## **Maintenance of the Assets:**

The maintenance checklists are not exhaustive and are intended as a framework for the ongoing refinement of the maintenance program.

- Work must only be carried out by appropriately qualified personnel who have the necessary and sufficient knowledge about the maintenance tasks and maintenance intervals.
- The manufacturers' latest printed instructions should take precedence in the event of any conflict with the maintenance checklists.
- The Owners' maintenance staff and/or service contractors are responsible to verify what is contained in the manufacturers' documentation regarding recommended maintenance procedures and intervals.
- The maintenance checklists and maintenance intervals should be reviewed annually and adjusted, as required, to reflect the service environment, feedback from contractors, etc.

## **Specialist and Non-Specialist Reviews**

Our personnel collect the asset inventory data for all the different systems, including mechanical, plumbing, fire safety, elevator, electrical, interior finishes, and sitework. Our scope of services is to identify the assets within each system, determine their age and report on their reasonable service life-cycles according to accepted industry standards. RDH personnel do not make observations with regard to specialty building system conditions unless specifically addressed in our proposal.

## **Forecasting the Useful Service Life of Assets**

The service life of assets can be affected by a variety of circumstances, including the following:

- The quality of the maintenance conducted on an asset will affect the service life of the asset. Poor maintenance can lead to a reduced service life and may result in the premature failure of an asset.
- Insurable losses (force majeure), such as earthquakes, fires, and floods can shorten the life of an asset. These events are not considered in a Depreciation Report.
- Asset service life in a Depreciation Report is determined according to accepted industry standards.

## **Funding Models**

The funding models for Depreciation Reports are based on a 30-year horizon and use "future year dollars termed" methodology. This methodology projects the costs (in future year dollars) over the planning horizon and not beyond the terminus year of the planning horizon. The current year is the starting year of the planning horizon. The term,

therefore, matches the initial horizon and does not respect a shifting horizon. This means that in year 1 the funding scenarios will look forward for 30 years.

For example, in 2012 the model looks forward to 2042. In year two, it will be accurate for 29 years, as it is only looking forward to year 2042. When an update study is performed in three years, the revised funding scenarios will look forward 30 years from 2015 to 2045. Renewal and major maintenance projects that occur beyond the 30-year planning horizon are not considered in the scenarios; that is, those projects that occur beyond 30 years are unfunded in the funding scenarios.

# **Appendix E**

## **Funding Scenario Cash Flow Tables**



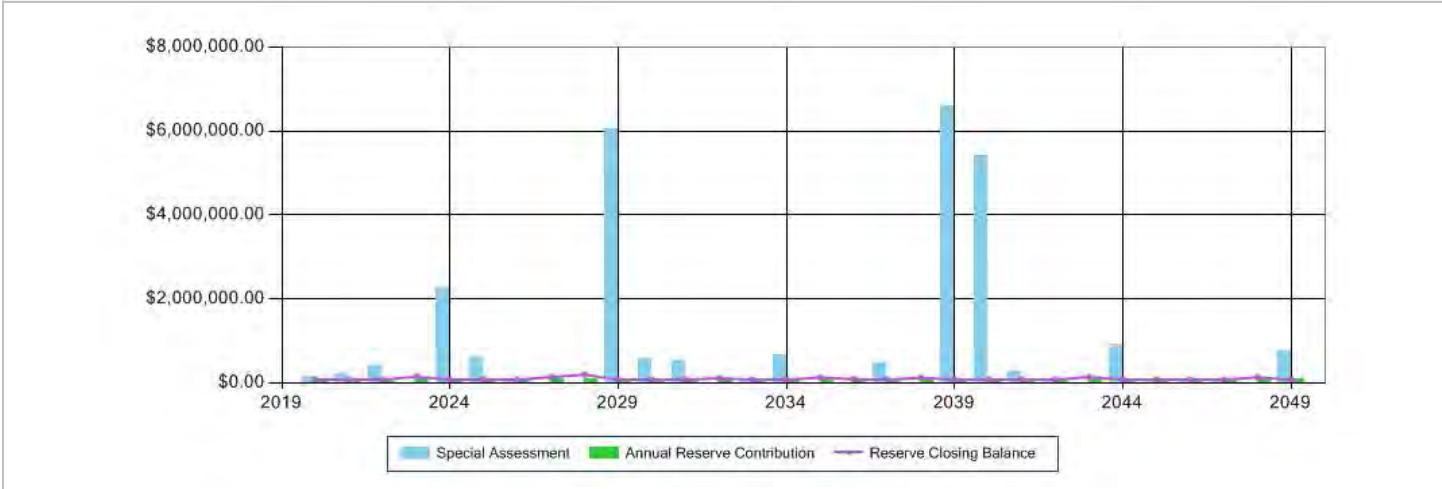
### Funding Model - 2019/2020 Fixed Annual Funding of \$ 95,000 (Current)

Funding Model Name	2019/2020 Fixed Annual Funding of \$ 95,000 (Current)	Initial Catch-Up Cost	\$0
Building	Crystal Residences	Operating Budget	\$880,807
Start Year	2020	Starting Reserve Balance	\$387,291
Interest/Investment Rate	1.0 %	Contribution Threshold	\$500,000
Estimated Contingency Allowance	\$1,000	Contribution Below Threshold	\$95,000
Tax Rate	0.0 %	Contribution Above Threshold	\$95,000
Planning Horizon (Years)	30	Reserve Contribution Increase	0.00 %
Number of Units	218	Monthly Avg. Unit Contribution	\$36

Year	Opening Balance	Reserve Contribution	Additional Funding	Reserve Income	Keep-Up	Contingency Costs	Tax Liability	Closing Balance	Percent Funded
2020	\$387,291	\$95,000	\$151,136	\$3,873	\$556,300	\$1,000	\$0	\$80,000	0.81 %
2021	\$80,000	\$95,000	\$225,910	\$800	\$320,710	\$1,000	\$0	\$80,000	0.76 %
2022	\$80,000	\$95,000	\$402,500	\$800	\$497,300	\$1,000	\$0	\$80,000	0.73 %
2023	\$80,000	\$95,000	\$0	\$800	\$18,300	\$1,000	\$0	\$156,500	1.31 %
2024	\$156,500	\$95,000	\$2,262,435	\$1,565	\$2,434,500	\$1,000	\$0	\$80,000	0.76 %
2025	\$80,000	\$95,000	\$588,400	\$800	\$683,200	\$1,000	\$0	\$80,000	0.74 %
2026	\$80,000	\$95,000	\$7,340	\$800	\$102,140	\$1,000	\$0	\$80,000	0.69 %
2027	\$80,000	\$95,000	\$0	\$800	\$32,000	\$1,000	\$0	\$142,800	1.14 %
2028	\$142,800	\$95,000	\$0	\$1,428	\$37,800	\$1,000	\$0	\$200,428	1.48 %
2029	\$200,428	\$95,000	\$6,044,768	\$2,004	\$6,261,200	\$1,000	\$0	\$80,000	0.96 %
2030	\$80,000	\$95,000	\$560,500	\$800	\$655,300	\$1,000	\$0	\$80,000	0.95 %
2031	\$80,000	\$95,000	\$528,350	\$800	\$623,150	\$1,000	\$0	\$80,000	0.93 %
2032	\$80,000	\$95,000	\$0	\$800	\$60,100	\$1,000	\$0	\$114,700	1.24 %
2033	\$114,700	\$95,000	\$1,753	\$1,147	\$131,600	\$1,000	\$0	\$80,000	0.80 %
2034	\$80,000	\$95,000	\$672,700	\$800	\$767,500	\$1,000	\$0	\$80,000	0.80 %
2035	\$80,000	\$95,000	\$0	\$800	\$42,700	\$1,000	\$0	\$132,100	1.23 %
2036	\$132,100	\$95,000	\$0	\$1,321	\$136,800	\$1,000	\$0	\$90,621	0.79 %
2037	\$90,621	\$95,000	\$463,473	\$906	\$569,000	\$1,000	\$0	\$80,000	0.68 %
2038	\$80,000	\$95,000	\$0	\$800	\$47,100	\$1,000	\$0	\$127,700	1.02 %
2039	\$127,700	\$95,000	\$6,600,023	\$1,277	\$6,743,000	\$1,000	\$0	\$80,000	1.21 %
2040	\$80,000	\$95,000	\$5,428,800	\$800	\$5,523,600	\$1,000	\$0	\$80,000	4.87 %
2041	\$80,000	\$95,000	\$294,450	\$800	\$389,250	\$1,000	\$0	\$80,000	5.36 %
2042	\$80,000	\$95,000	\$94,300	\$800	\$189,100	\$1,000	\$0	\$80,000	5.25 %
2043	\$80,000	\$95,000	\$0	\$800	\$29,800	\$1,000	\$0	\$145,000	8.52 %
2044	\$145,000	\$95,000	\$907,150	\$1,450	\$1,067,600	\$1,000	\$0	\$80,000	9.51 %
2045	\$80,000	\$95,000	\$34,200	\$800	\$129,000	\$1,000	\$0	\$80,000	9.54 %
2046	\$80,000	\$95,000	\$85,710	\$800	\$180,510	\$1,000	\$0	\$80,000	10.26 %
2047	\$80,000	\$95,000	\$12,700	\$800	\$107,500	\$1,000	\$0	\$80,000	10.37 %
2048	\$80,000	\$95,000	\$0	\$800	\$40,100	\$1,000	\$0	\$134,700	16.34 %
2049	\$134,700	\$95,000	\$750,253	\$1,347	\$900,300	\$1,000	\$0	\$80,000	100.00 %

**Funding Model - 2019/2020 Fixed Annual Funding of \$ 95,000 (Current)**

GRAPHIC REPRESENTATION



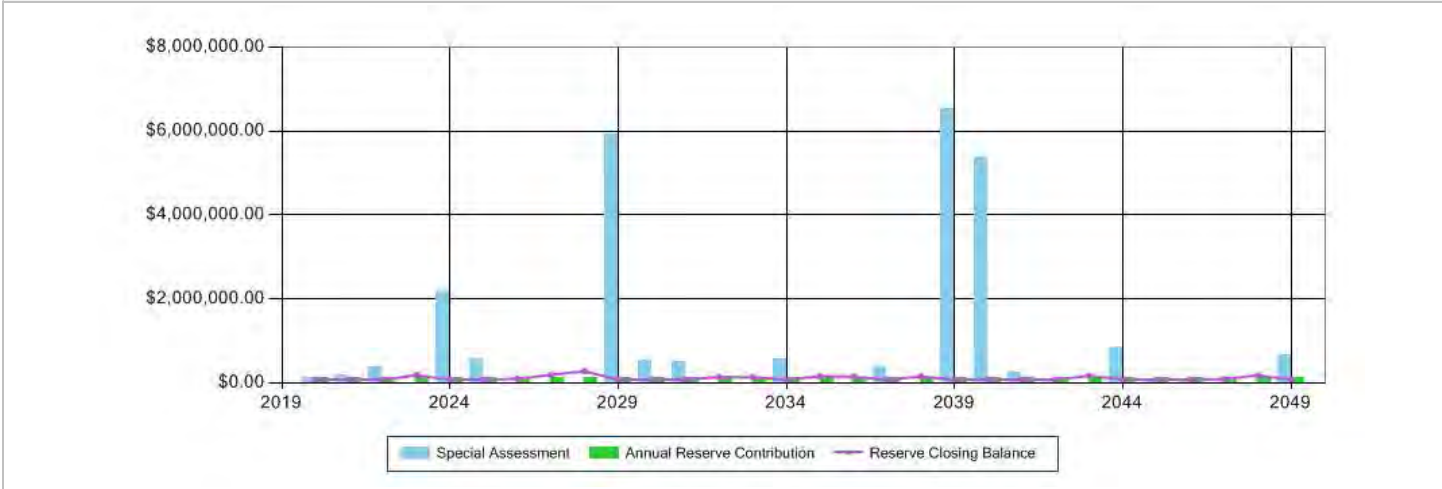
### Funding Model - 2019/2020 Fixed Annual Funding of \$125,000 (Alternative #1)

Funding Model Name	2019/2020 Fixed Annual Funding of \$125,000 (Alternative #1)	Initial Catch-Up Cost	\$0
Building	Crystal Residences	Operating Budget	\$880,807
Start Year	2020	Starting Reserve Balance	\$387,291
Interest/Investment Rate	1.0 %	Contribution Threshold	\$500,000
Estimated Contingency Allowance	\$1,000	Contribution Below Threshold	\$125,000
Tax Rate	0.0 %	Contribution Above Threshold	\$125,000
Planning Horizon (Years)	30	Reserve Contribution Increase	0.00 %
Number of Units	218	Monthly Avg. Unit Contribution	\$48

Year	Opening Balance	Reserve Contribution	Additional Funding	Reserve Income	Keep-Up	Contingency Costs	Tax Liability	Closing Balance	Percent Funded
2020	\$387,291	\$125,000	\$121,136	\$3,873	\$556,300	\$1,000	\$0	\$80,000	0.81 %
2021	\$80,000	\$125,000	\$195,910	\$800	\$320,710	\$1,000	\$0	\$80,000	0.76 %
2022	\$80,000	\$125,000	\$372,500	\$800	\$497,300	\$1,000	\$0	\$80,000	0.73 %
2023	\$80,000	\$125,000	\$0	\$800	\$18,300	\$1,000	\$0	\$186,500	1.57 %
2024	\$186,500	\$125,000	\$2,202,135	\$1,865	\$2,434,500	\$1,000	\$0	\$80,000	0.76 %
2025	\$80,000	\$125,000	\$558,400	\$800	\$683,200	\$1,000	\$0	\$80,000	0.74 %
2026	\$80,000	\$125,000	\$0	\$800	\$102,140	\$1,000	\$0	\$102,660	0.88 %
2027	\$102,660	\$125,000	\$0	\$1,027	\$32,000	\$1,000	\$0	\$195,687	1.56 %
2028	\$195,687	\$125,000	\$0	\$1,957	\$37,800	\$1,000	\$0	\$283,843	2.10 %
2029	\$283,843	\$125,000	\$5,930,518	\$2,838	\$6,261,200	\$1,000	\$0	\$80,000	0.96 %
2030	\$80,000	\$125,000	\$530,500	\$800	\$655,300	\$1,000	\$0	\$80,000	0.95 %
2031	\$80,000	\$125,000	\$498,350	\$800	\$623,150	\$1,000	\$0	\$80,000	0.93 %
2032	\$80,000	\$125,000	\$0	\$800	\$60,100	\$1,000	\$0	\$144,700	1.56 %
2033	\$144,700	\$125,000	\$0	\$1,447	\$131,600	\$1,000	\$0	\$138,547	1.40 %
2034	\$138,547	\$125,000	\$583,568	\$1,385	\$767,500	\$1,000	\$0	\$80,000	0.80 %
2035	\$80,000	\$125,000	\$0	\$800	\$42,700	\$1,000	\$0	\$162,100	1.51 %
2036	\$162,100	\$125,000	\$0	\$1,621	\$136,800	\$1,000	\$0	\$150,921	1.32 %
2037	\$150,921	\$125,000	\$372,570	\$1,509	\$569,000	\$1,000	\$0	\$80,000	0.68 %
2038	\$80,000	\$125,000	\$0	\$800	\$47,100	\$1,000	\$0	\$157,700	1.26 %
2039	\$157,700	\$125,000	\$6,539,723	\$1,577	\$6,743,000	\$1,000	\$0	\$80,000	1.21 %
2040	\$80,000	\$125,000	\$5,398,800	\$800	\$5,523,600	\$1,000	\$0	\$80,000	4.87 %
2041	\$80,000	\$125,000	\$264,450	\$800	\$389,250	\$1,000	\$0	\$80,000	5.36 %
2042	\$80,000	\$125,000	\$64,300	\$800	\$189,100	\$1,000	\$0	\$80,000	5.25 %
2043	\$80,000	\$125,000	\$0	\$800	\$29,800	\$1,000	\$0	\$175,000	10.28 %
2044	\$175,000	\$125,000	\$846,850	\$1,750	\$1,067,600	\$1,000	\$0	\$80,000	9.51 %
2045	\$80,000	\$125,000	\$4,200	\$800	\$129,000	\$1,000	\$0	\$80,000	9.54 %
2046	\$80,000	\$125,000	\$55,710	\$800	\$180,510	\$1,000	\$0	\$80,000	10.26 %
2047	\$80,000	\$125,000	\$0	\$800	\$107,500	\$1,000	\$0	\$97,300	12.61 %
2048	\$97,300	\$125,000	\$0	\$973	\$40,100	\$1,000	\$0	\$182,173	22.10 %
2049	\$182,173	\$125,000	\$672,305	\$1,822	\$900,300	\$1,000	\$0	\$80,000	100.00 %

**Funding Model - 2019/2020 Fixed Annual Funding of \$125,000 (Alternative #1)**

GRAPHIC REPRESENTATION



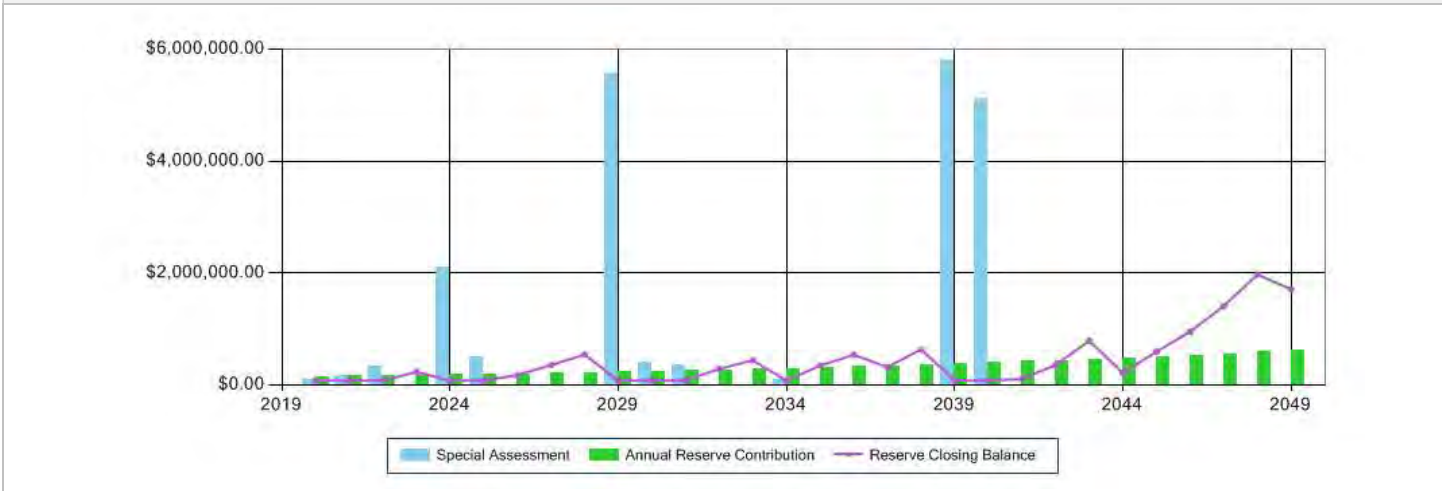
### Funding Model - 2019/2020 Fixed Annual Funding of \$150,000 + 5% (Alternative #2)

Funding Model Name	2019/2020 Fixed Annual Funding of \$150,000 + 5% (Alternative #2)	Initial Catch-Up Cost	\$0
Building	Crystal Residences	Operating Budget	\$880,807
Start Year	2020	Starting Reserve Balance	\$387,291
Interest/Investment Rate	1.0 %	Contribution Threshold	\$500,000
Estimated Contingency Allowance	\$1,000	Contribution Below Threshold	\$150,000
Tax Rate	0.0 %	Contribution Above Threshold	\$150,000
Planning Horizon (Years)	30	Reserve Contribution Increase	5.00 %
Number of Units	218	Monthly Avg. Unit Contribution	\$57

Year	Opening Balance	Reserve Contribution	Additional Funding	Reserve Income	Keep-Up	Contingency Costs	Tax Liability	Closing Balance	Percent Funded
2020	\$387,291	\$150,000	\$96,136	\$3,873	\$556,300	\$1,000	\$0	\$80,000	0.81 %
2021	\$80,000	\$157,500	\$163,410	\$800	\$320,710	\$1,000	\$0	\$80,000	0.76 %
2022	\$80,000	\$165,375	\$332,125	\$800	\$497,300	\$1,000	\$0	\$80,000	0.73 %
2023	\$80,000	\$173,644	\$0	\$800	\$18,300	\$1,000	\$0	\$235,144	1.98 %
2024	\$235,144	\$182,326	\$2,095,679	\$2,351	\$2,434,500	\$1,000	\$0	\$80,000	0.76 %
2025	\$80,000	\$191,442	\$491,958	\$800	\$683,200	\$1,000	\$0	\$80,000	0.74 %
2026	\$80,000	\$201,014	\$0	\$800	\$102,140	\$1,000	\$0	\$178,674	1.54 %
2027	\$178,674	\$211,065	\$0	\$1,787	\$32,000	\$1,000	\$0	\$358,526	2.86 %
2028	\$358,526	\$221,618	\$0	\$3,585	\$37,800	\$1,000	\$0	\$544,930	4.04 %
2029	\$544,930	\$232,699	\$5,559,122	\$5,449	\$6,261,200	\$1,000	\$0	\$80,000	0.96 %
2030	\$80,000	\$244,334	\$411,166	\$800	\$655,300	\$1,000	\$0	\$80,000	0.95 %
2031	\$80,000	\$256,551	\$366,799	\$800	\$623,150	\$1,000	\$0	\$80,000	0.93 %
2032	\$80,000	\$269,378	\$0	\$800	\$60,100	\$1,000	\$0	\$289,078	3.12 %
2033	\$289,078	\$282,847	\$0	\$2,891	\$131,600	\$1,000	\$0	\$442,216	4.46 %
2034	\$442,216	\$296,990	\$104,872	\$4,422	\$767,500	\$1,000	\$0	\$80,000	0.80 %
2035	\$80,000	\$311,839	\$0	\$800	\$42,700	\$1,000	\$0	\$348,939	3.26 %
2036	\$348,939	\$327,431	\$0	\$3,489	\$136,800	\$1,000	\$0	\$542,059	4.76 %
2037	\$542,059	\$343,802	\$0	\$5,421	\$569,000	\$1,000	\$0	\$321,282	2.75 %
2038	\$321,282	\$360,993	\$0	\$3,213	\$47,100	\$1,000	\$0	\$637,388	5.11 %
2039	\$637,388	\$379,042	\$5,801,196	\$6,374	\$6,743,000	\$1,000	\$0	\$80,000	1.21 %
2040	\$80,000	\$397,994	\$5,125,806	\$800	\$5,523,600	\$1,000	\$0	\$80,000	4.87 %
2041	\$80,000	\$417,894	\$0	\$800	\$389,250	\$1,000	\$0	\$108,444	7.26 %
2042	\$108,444	\$438,789	\$0	\$1,084	\$189,100	\$1,000	\$0	\$358,217	23.53 %
2043	\$358,217	\$460,728	\$0	\$3,582	\$29,800	\$1,000	\$0	\$791,727	46.54 %
2044	\$791,727	\$483,764	\$0	\$7,917	\$1,067,600	\$1,000	\$0	\$214,809	25.54 %
2045	\$214,809	\$507,953	\$0	\$2,148	\$129,000	\$1,000	\$0	\$594,910	70.99 %
2046	\$594,910	\$533,350	\$0	\$5,949	\$180,510	\$1,000	\$0	\$952,699	122.29 %
2047	\$952,699	\$560,018	\$0	\$9,527	\$107,500	\$1,000	\$0	\$1,413,744	183.36 %
2048	\$1,413,744	\$588,019	\$0	\$14,137	\$40,100	\$1,000	\$0	\$1,974,800	239.66 %
2049	\$1,974,800	\$617,420	\$0	\$19,748	\$900,300	\$1,000	\$0	\$1,710,668	100.00 %

**Funding Model - 2019/2020 Fixed Annual Funding of \$150,000 + 5% (Alternative #2)**

GRAPHIC REPRESENTATION



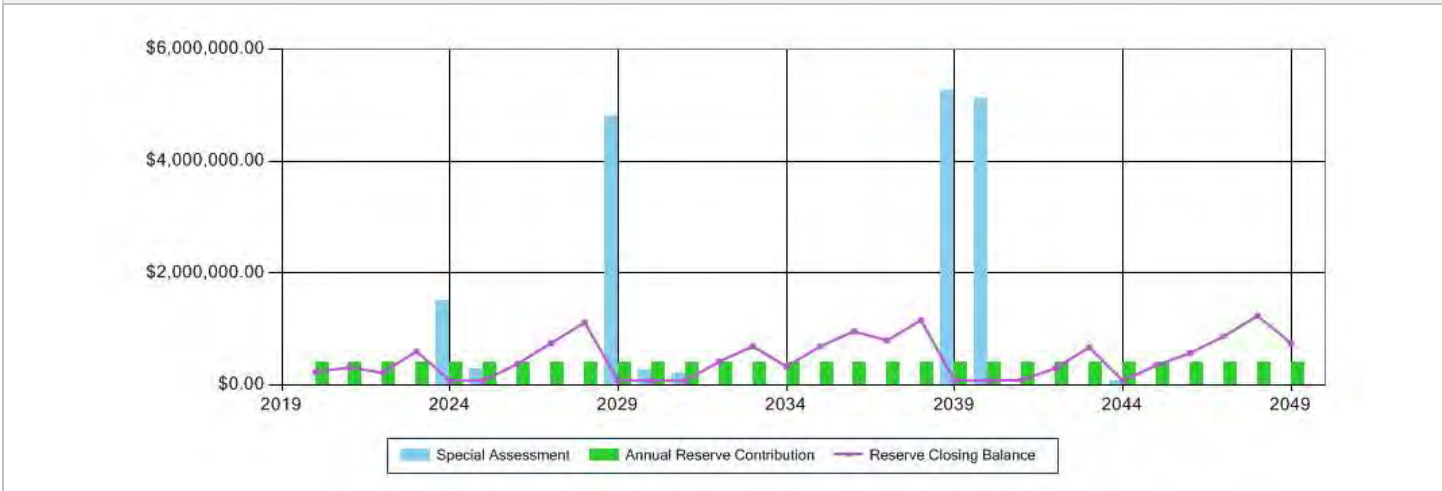
### Funding Model - 2019/2020 Fixed Annual Funding of \$400,000 (Alternative #3)

Funding Model Name	2019/2020 Fixed Annual Funding of \$400,000 (Alternative #3)	Initial Catch-Up Cost	\$0
Building	Crystal Residences	Operating Budget	\$880,807
Start Year	2020	Starting Reserve Balance	\$387,291
Interest/Investment Rate	1.0 %	Contribution Threshold	\$500,000
Estimated Contingency Allowance	\$1,000	Contribution Below Threshold	\$400,000
Tax Rate	0.0 %	Contribution Above Threshold	\$400,000
Planning Horizon (Years)	30	Reserve Contribution Increase	0.00 %
Number of Units	218	Monthly Avg. Unit Contribution	\$153

Year	Opening Balance	Reserve Contribution	Additional Funding	Reserve Income	Keep-Up	Contingency Costs	Tax Liability	Closing Balance	Percent Funded
2020	\$387,291	\$400,000	\$0	\$3,873	\$556,300	\$1,000	\$0	\$233,864	2.38 %
2021	\$233,864	\$400,000	\$0	\$2,339	\$320,710	\$1,000	\$0	\$314,493	3.01 %
2022	\$314,493	\$400,000	\$0	\$3,145	\$497,300	\$1,000	\$0	\$219,338	2.01 %
2023	\$219,338	\$400,000	\$0	\$2,193	\$18,300	\$1,000	\$0	\$602,231	5.07 %
2024	\$602,231	\$400,000	\$1,507,247	\$6,022	\$2,434,500	\$1,000	\$0	\$80,000	0.76 %
2025	\$80,000	\$400,000	\$283,400	\$800	\$683,200	\$1,000	\$0	\$80,000	0.74 %
2026	\$80,000	\$400,000	\$0	\$800	\$102,140	\$1,000	\$0	\$377,660	3.27 %
2027	\$377,660	\$400,000	\$0	\$3,777	\$32,000	\$1,000	\$0	\$748,437	5.99 %
2028	\$748,437	\$400,000	\$0	\$7,484	\$37,800	\$1,000	\$0	\$1,117,121	8.28 %
2029	\$1,117,121	\$400,000	\$4,813,908	\$11,171	\$6,261,200	\$1,000	\$0	\$80,000	0.96 %
2030	\$80,000	\$400,000	\$255,500	\$800	\$655,300	\$1,000	\$0	\$80,000	0.95 %
2031	\$80,000	\$400,000	\$223,350	\$800	\$623,150	\$1,000	\$0	\$80,000	0.93 %
2032	\$80,000	\$400,000	\$0	\$800	\$60,100	\$1,000	\$0	\$419,700	4.53 %
2033	\$419,700	\$400,000	\$0	\$4,197	\$131,600	\$1,000	\$0	\$691,297	6.98 %
2034	\$691,297	\$400,000	\$0	\$6,913	\$767,500	\$1,000	\$0	\$329,710	3.32 %
2035	\$329,710	\$400,000	\$0	\$3,297	\$42,700	\$1,000	\$0	\$689,307	6.45 %
2036	\$689,307	\$400,000	\$0	\$6,893	\$136,800	\$1,000	\$0	\$958,400	8.42 %
2037	\$958,400	\$400,000	\$0	\$9,584	\$569,000	\$1,000	\$0	\$797,984	6.84 %
2038	\$797,984	\$400,000	\$0	\$7,980	\$47,100	\$1,000	\$0	\$1,157,864	9.29 %
2039	\$1,157,864	\$400,000	\$5,254,557	\$11,579	\$6,743,000	\$1,000	\$0	\$80,000	1.21 %
2040	\$80,000	\$400,000	\$5,123,800	\$800	\$5,523,600	\$1,000	\$0	\$80,000	4.87 %
2041	\$80,000	\$400,000	\$0	\$800	\$389,250	\$1,000	\$0	\$90,550	6.06 %
2042	\$90,550	\$400,000	\$0	\$906	\$189,100	\$1,000	\$0	\$301,356	19.79 %
2043	\$301,356	\$400,000	\$0	\$3,014	\$29,800	\$1,000	\$0	\$673,569	39.59 %
2044	\$673,569	\$400,000	\$68,295	\$6,736	\$1,067,600	\$1,000	\$0	\$80,000	9.51 %
2045	\$80,000	\$400,000	\$0	\$800	\$129,000	\$1,000	\$0	\$350,800	41.86 %
2046	\$350,800	\$400,000	\$0	\$3,508	\$180,510	\$1,000	\$0	\$572,798	73.52 %
2047	\$572,798	\$400,000	\$0	\$5,728	\$107,500	\$1,000	\$0	\$870,026	112.84 %
2048	\$870,026	\$400,000	\$0	\$8,700	\$40,100	\$1,000	\$0	\$1,237,626	150.19 %
2049	\$1,237,626	\$400,000	\$0	\$12,376	\$900,300	\$1,000	\$0	\$748,703	100.00 %

**Funding Model - 2019/2020 Fixed Annual Funding of \$400,000 (Alternative #3)**

GRAPHIC REPRESENTATION





# **Appendix F**

## **RDH Qualifications**



## Maintenance and Planning (MaP)

Our Maintenance and Planning (MaP) group works with your owner group to plan and develop strategies for the long- and short-term needs of your building—everything from roof maintenance to boiler replacement. As the acronym suggests, our services are designed so that we can provide you with a comprehensive roadMaP for the management of your assets.

RDH staff have broad practical experience assisting building owners with all aspects of planning for the long term stewardship of their building(s). Our reserve fund analysts, engineers, architects, and technologists have a wide variety of formal training—including building science, structural engineering, and mechanical engineering. We believe that by using a team approach, we can ensure an appropriate level of thoroughness and quality. We have prepared hundreds of Depreciation Reports and are recognized as industry leaders.

## Depreciation Reports

A Depreciation Report is a long-range financial planning tool. It's used to identify funding requirements for costs associated with future repair, renewal, and replacement projects. The report establishes where you need to focus resources and is a good place to start developing your roadMaP.

The first step in preparing the report is to compile an inventory of all of your building's assets (roofs, boilers, carpets, etc.). Using the inventory as a foundation, we estimate the remaining life of each asset, forecast the replacement costs in future-year dollars, and display the financial analysis with graphs and cash flow tables.

## Building Asset Management Software (BAMS)

All of this information is accessible through our propriety online BAM Software—we do the groundwork and provide the critical information so that you can leverage the Software to track and report on maintenance, repair, and renewal activities. Alternatively, we can follow up and manage the activities on your behalf.

The Software tool also empowers you to create your own funding scenarios so you can evaluate different funding levels and find a solution that works specifically for your building. Where a Depreciation Report identifies what items you need to spend money on and when you need to spend it, this tool helps you optimize the way you spend your money. Ultimately, we can help you track what work is completed versus what is outstanding so that you are better able to produce reports and make informed decisions.



## About Us



**Mark Will** | B.A. Econ.

**Managing Principal, Vancouver Regional Manager**

- B.A., Economics
- Has worked in project management since 1997
- Member of the Board of Directors, Condominium Home Owner's Association (CHOA)
- Member of Professional Association of Managing Agents (PAMA)



**Jason Dunn** | B.Arch.Sc., CCCA

**Principal, Senior Project Manager**

- B.Arch.Sc., Building Science Option
- Certified Construction Contract Administrator, CSC
- Has worked in building science consulting since 2004



**Jesse Listoen** | Dipl.T.

**Associate, Project Manager**

- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- 5+ years' experience in maintenance and planning consulting and has been involved in the preparation 70+ depreciation reports



**Brandon Carreira** | Dipl.T.

**Project Manager**

- MaP Service Area Leader
- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- Has worked in maintenance and planning consulting since 2011
- Prepared 150+ Depreciation Reports and has been involved with 200+ MaP projects



**David Taguchi** | Eng.L., RRO

**Associate, Building Science Specialist**

- Eng.L., Engineers & Geoscientists of British Columbia
- RRO, Roofing Consultants Institute Inc.
- Member of Applied Science Technologists and Technicians of British Columbia
- Has 19 years of Building Science Experience



**Alex Seto** | Dipl.T.

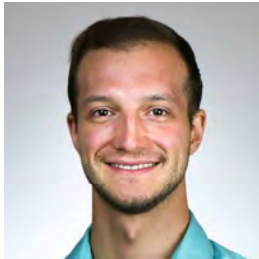
**Building Science Technologist**

- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- Has worked in maintenance and planning consulting since 2012



**Jackie Wong** | Dipl.T.  
**Building Science Technologist**

- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- Has worked in maintenance and planning consulting since 2016



**Talen Springer** | EIT  
**Building Science Engineer (EIT)**

- B.A.Sc., Civil Engineering
- Has worked in maintenance and planning consulting since 2016



**Preston Wu** | Dipl.T.  
**Maintenance and Planning Technologist**

- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- Has worked in maintenance and planning consulting since 2016



**Cameron Skoglund** | GradTech.  
**Maintenance and Planning Technologist**

- GradTech., ASTTBC
- Has worked in maintenance and planning consulting since 2017



**Torrance Beamish** | B.F.A., Dipl.T.  
**Building Science Technologist**

- Dipl.T., Architectural & Building Engineering Technology (Building Science Option)
- Has worked in maintenance and planning consulting since 2017



**Yan Marineau-Brachmann** | B.A.Sc.  
**Building Science Engineer (EIT)**

- B.A.Sc., Civil Engineering
- Has worked in maintenance and planning consulting since 2018

## Administrators and Client Support



### **Vanessa Jumawan**

#### **Maintenance and Planning Coordinator**

- Has worked in administration within engineering/architecture since 2008
- Preparation of Depreciation Report estimates and proposals



### **Anna Qiu**

#### **Maintenance and Planning Project Assistant**

- Certificate, Business Administration
- Has worked in administration within engineering/architecture firms since 2004
- BAMS user account setup and maintenance

## Software Support and Programmer



### **Matthew Branch | P.Eng.**

#### **Software Developer**

- B.Sc., Civil Engineering
- Registered professional engineer, APEGBC
- Has worked in engineering data analysis since 2000

## Acknowledgements



### **Serge Desmarais | B.Arch. Architect AIBC, CP**

#### **Principal (In Memoriam), Senior Building Science Specialist**

RDH gratefully acknowledges the contributions of Serge Desmarais as the building science technical lead for the MaP group.

- Registered Architect AIBC, Certified Professional
- 30+ years' experience in building design and construction capital renewal projects
- RDH 2004 - 2017

# **Appendix G**

## **Insurance Certificate**

**Ref. No. 320008109489**

**CERTIFICATE OF INSURANCE**

Aon Reed Stenhouse Inc.  
401 West Georgia Street, Suite 1200  
PO Box 3228 STN. TERMINAL  
Vancouver BC V6B 3X8  
tel 604-688-4442 fax 604-682-4026

Re: Evidence of Insurance:

**To Whom It May Concern**  
**Suite 400, 4333 Still Creek Drive**  
**Burnaby, BC V5C 6S6**

Insurance as described herein has been arranged on behalf of the Insured named herein under the following policy(ies) and as more fully described by the terms, conditions, exclusions and provisions contained in the said policy(ies) and any endorsements attached thereto.

**Insured**

RDH Building Science Inc.  
Suite 400, 4333 Still Creek Drive  
Burnaby, BC V5C 6S6

**Coverage**

<b>Commercial General Liability</b>	<b>Insurer</b>	Zurich Insurance Company Ltd	
<b>Policy #</b>	8850746		
<b>Effective</b>	02-May-2019	<b>Expiry</b>	02-May-2020
<b>Limits of Liability</b>	Bodily Injury & Property Damage, Each Occurrence \$1,000,000 Products and Completed Operations, Aggregate \$1,000,000 Non-Owned Automobile Liability \$1,000,000 Tenant's Legal Liability - All Risks \$1,000,000 Legal Liability for Damage to Hired Automobiles \$100,000 Policy may be subject to a general aggregate and other aggregates where applicable		

<b>Architects &amp; Engineers Professional Liability</b>	<b>Insurer</b>	Lloyd's Underwriters	
<b>Policy #</b>	PSDEF1900249		
<b>Effective</b>	02-May-2019	<b>Expiry</b>	02-May-2020
<b>Limits of Liability</b>	Subject to aggregate where applicable		

**Terms and / or Additional Coverage**

Professional Liability  
Limit: \$1,000,000 Per Claim Limit / \$2,000,000 Aggregate Limit

**THE POLICY CONTAINS A CLAUSE THAT MAY LIMIT THE AMOUNT PAYABLE**  
**OR, IN THE CASE OF AUTOMOBILE INSURANCE,**  
**THE POLICY CONTAINS A PARTIAL PAYMENT OF LOSS CLAUSE**



**Ref. No. 320008109489**

**CERTIFICATE OF INSURANCE**

**Commercial General Liability**

Products and Completed Operations  
Broad Form Property Damage  
Cross Liability  
Contractual Liability  
Owners and Contractors Protective  
Contractual Liability included

THIS CERTIFICATE CONSTITUTES A STATEMENT OF THE FACTS AS OF THE DATE OF ISSUANCE AND ARE SO REPRESENTED AND WARRANTED ONLY TO THE INSURED. OTHER PERSONS RELYING ON THIS CERTIFICATE DO SO AT THEIR OWN RISK.

**Aon Reed Stenhouse Inc.**



Dated : 10-May-2019  
Issued By : McLean,Chris J.  
Tel : 1-604-688-4442

**THE POLICY CONTAINS A CLAUSE THAT MAY LIMIT THE AMOUNT PAYABLE  
OR, IN THE CASE OF AUTOMOBILE INSURANCE,  
THE POLICY CONTAINS A PARTIAL PAYMENT OF LOSS CLAUSE**



# Appendix H

## Strategic Plan

## Crystal Residences Major Maintenance and Renewals Schedule

### Accuracy of Budget Cost Estimates:

- Budget costs in this report are provided in both current year dollars(without inflation or escalation factors) and future year dollars(with inflation or escalation factors).
- All budget costs are preliminary estimates intended for planning purposes and not for accounting use.
- Actual costs will vary depending on several factors. The budget estimates assume economies of scale will be achieved by bundling work items together into larger projects. Small projects done individually may exceed the budget estimates.
- Each project should include appropriate cost line-items when developing an overall project budget.
- Labour and material costs are subject to the vagaries of the marketplace. At the time of tender, costs may vary depending on the time of the year and/or contractor availability.
- The budget estimates must be updated over time and confirmed by competitive tender before any contracts are awarded.
- Detailed repair specifications are required to be prepared in order to confirm scopes of work and costs.
- Soft costs, such as consulting services and contingency allowances are not included in the budget estimates. Depending on the sizes, scope and timing of individual projects, the magnitude of the soft costs will vary.
- Cost savings may be realized depending on the use of in-house labor or 3rd party-contractors.
- The estimates do not include allowances for site specific access requirements and environmental concerns, which should be addressed on a project-by-project basis.
- Consideration may sometimes need to be given to costs arising from the impact of projects on occupancy use and facility operations.

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049			
<b>ENCLOSURE</b>																																							
<b>ROOFS &amp; DECKS</b>																																							
Encl 01	J01	Locally remove ballast to visually review the surface of the underlying membrane, paying close attention to all penetration locations for signs of distress, such as ridges, cracks, and delamination. Review to include sealants and flashings.	2 Yrs	\$0	2020	\$0	•	•	•	•	•	•	•	•	•						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
Encl 01	R01	Replace roof membrane assembly and associated components, such as drains and flashing. Ballast may be salvagable.	30 Yrs	\$714,300	2029	\$870,000									•																								
Encl 02	J01	Review traffic surface for signs of distress. Replace damaged pavers as required.	2 Yrs	\$0	2020	\$0	•	•	•	•	•	•	•	•	•						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Encl 02	R01	Replace roof membrane assembly and associated components. Some of the pavers and overburden may be salvagable.	30 Yrs	\$1,790,000	2029	\$2,200,000									•																								
Encl 03	J01	Review traffic surface for signs of distress. Replace damaged pavers, as required.	2 Yrs	\$0	2020	\$0	•	•	•	•	•	•	•	•	•						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Encl 03	J02	Locally remove pavers to visually review the surface of the underlying membrane, paying close attention to all penetration locations for signs of distress, such as ridges, cracks, and delamination. Review to include sealants and flashings.	2 Yrs	\$0	2020	\$0	•	•	•	•	•	•	•	•	•						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Encl 03	R01	Replace roof membrane assembly and associated components. Some of the pavers may be salvageable.	30 Yrs	\$259,000	2029	\$320,000									•																								
<b>FALL PROTECTION</b>																																							
Encl 04	R01	Replace components of fall protection system, as required.	20 Yrs	\$64,500	2039	\$96,000																				•													
Encl 05	J01	Review guardrails for structural adequacy including attachments.	10 Yrs	\$0	2020	\$0	•																			•													•
Encl 05	R01	Replace exterior guardrails.	30 Yrs	\$156,000	2029	\$190,000										•																							
Encl 06	J01	Review metal finishes. Touch up paint as required.	5 Yrs	\$1,420	2020	\$1,400	•				•										•					•													•
Encl 06	J02	Review guardrails for structural adequacy including attachments.	10 Yrs	\$0	2020	\$0	•																			•													•
Encl 06	R01	Replace exterior guardrails.	30 Yrs	\$42,600	2029	\$52,000										•																							

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	
<b>ENCLOSURE</b>																																					
Encl 07	J01	Review divider for structural adequacy including attachments.	10 Yrs	\$0	2020	\$0	•																		•										•		
Encl 07	R01	Replace glazed aluminum frame dividers.	30 Yrs	\$36,480	2029	\$44,000										•																					
<b>WALLS</b>																																					
Encl 08	J01	Clean exterior stucco surfaces to remove atmospheric dirt, vegetative growth and other stains. Extent of work and frequency depends on environmental exposure conditions.	2 Yrs	\$4,275	2020	\$4,300	•	•					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Encl 08	J02	Re-paint stucco surface as required.	10 Yrs	\$22,800	2034	\$31,000														•																	
Encl 08	R02	Replace stucco cladding along with associated flashing and sealants. Consideration should be given to replacement of vent hoods and other accessories that penetrated the cladding at the time of cladding replacement.	20 Yrs	\$228,000	2024	\$250,000					•																										
Encl 09	J01	Clean exterior surfaces of masonry veneer cladding to remove vegetation growth and other atmospheric staining.	2 Yrs	\$0	2020	\$0	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Encl 09	J02	Locally repoint mortar joints in clay masonry veneer wall, as required.	10 Yrs	\$4,240	2020	\$4,400	•									•									•												
Encl 09	J03	Re-apply sealer over masonry as required.	10 Yrs	\$2,120	2020	\$0										•									•												
Encl 09	R01	Replace sections of clay masonry veneer cladding along with associated flashing and sealants as required.	10 Yrs	\$10,335	2049	\$19,000																															•
Encl 10	J01	Clean all exterior surfaces of metal panels, as required, to remove atmospheric dirt and other surface staining.	2 Yrs	\$2,625	2020	\$2,600	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 10	J02	Review all metal finishes. Touch up paint as required.	5 Yrs	\$0	2021	\$0		•					•				•																				•
Encl 10	J03	Review exterior surfaces of the metal panels for signs of distress, such as corrosion, misalignment, discolouration.	2 Yrs	\$0	2021	\$0		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 10	R01	Replace metal panels along with associated flashing and sealants. Consideration should be given to replacement of vent hoods and other accessories that penetrated the cladding at the time of cladding replacement.	50 Yrs	\$210,000	2039	\$310,000																				•											
<b>GLAZING SYSTEMS</b>																																					
Encl 11	J01	Replace or repair gasket and weatherstripping, as required.	2 Yrs	\$0	2020	\$0	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 11	J02	Replace insulating glazing units (IGUs) with condensation or misting between panes of glass.	2 Yrs	\$10,247	2020	\$12,000	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 11	R01	Replace aluminum framed windows and associated components.	40 Yrs	\$3,277,500	2040	\$5,000,000																				•											
Encl 11	R02	Replace aluminum framed windows and associated components.	40 Yrs	\$3,277,500	2039	\$4,900,000																				•											
Encl 12	J01	Replace or repair gasket and weatherstripping, as required.	2 Yrs	\$0	2020	\$0	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 12	R01	Replace insulating glazing units (IGUs) with condensation or misting between panes of glass. [Refer to manufacturer's warranty if applicable.]	2 Yrs	\$1,000	2020	\$1,000	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Encl 12	R02	Replace storefront window system.	40 Yrs	\$54,400	2039	\$81,000																				•											
<b>DOORS</b>																																					
Encl 13	R01	Repaint steel door finish.	8 Yrs	\$4,800	2032	\$6,200																															•
Encl 13	R02	Replace steel swing doors.	10 Yrs	\$12,800	2024	\$14,000					•																										•
Encl 14	R01	Replace/upgrade door hardware, as required.	10 Yrs	\$2,200	2034	\$3,000																															•

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049			
<b>ENCLOSURE</b>																																							
Encl 14	R02	Replace aluminum frame lobby doors.	20 Yrs	\$16,000	2024	\$18,000					•																												
Encl 15	R01	Phased replacement of sliding glass doors and associated components.	30 Yrs	\$271,400	2039	\$400,000																			•														
Encl 15	R02	Phased replacement of sliding glass doors and associated components.	30 Yrs	\$271,400	2029	\$330,000										•																							
Encl 16	R01	Replace metal clad swing doors.	25 Yrs	\$146,000	2024	\$160,000					•																										•		
<b>BALCONIES</b>																																							
Encl 17	J02	Touch up coating to architectural steel, as required.	10 Yrs	\$20,000	2020	\$21,000	•										•																					•	
Encl 17	R01	Replace metal panel screen.	40 Yrs	\$189,000	2039	\$280,000																				•													
Encl 18	J01	Locally damaged and delaminated repair balcony membrane prior to re-application of top coat.	10 Yrs	\$18,000	2020	\$18,000	•										•										•												
Encl 18	R01	Prepare and re-apply membrane top coat.	10 Yrs	\$144,000	2020	\$150,000	•										•				•																		
Encl 18	R02	Replace exposed urethane balcony membrane and associated components.	25 Yrs	\$432,000	2031	\$550,000												•																					
<b>CANOPIES</b>																																							
Encl 19	J01	Review exposed metal finishes. Touch up paint as required.	2 Yrs	\$0	2020	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•
Encl 19	R01	Repaint exposed metal frame of canopy assemblies.	20 Yrs	\$1,500	2020	\$1,500	•																																
Encl 19	R02	Replace metal and glass canopy assemblies.	40 Yrs	\$22,400	2039	\$33,000																				•													
<b>PARKING GARAGE</b>																																							
Encl 20	J01	Re-apply traffic demarcation striping and directional signage as required. Frequency will depend on traffic volume and other factors.	5 Yrs	\$0	2020	\$0	•					•					•								•														
Encl 20	J02	Review traffic-bearing membrane for signs of distress, such as tears, peeling, delamination, and discoloration, particularly at high traffic areas.	5 Yrs	\$0	2020	\$0	•					•					•								•														
Encl 20	J03	Repair damaged and delaminated membrane prior to re-application of top coat.	10 Yrs	\$30,400	2024	\$34,000					•										•																		
Encl 20	R01	Locally re-apply membrane top coat in high traffic areas (e.g. drive aisles).	10 Yrs	\$57,000	2024	\$63,000					•										•																		
Encl 20	R02	Prepare concrete surface and re-apply traffic-bearing membrane. [Frequency will depend on traffic volume and other factors.]	25 Yrs	\$532,000	2029	\$650,000											•																						
Encl 20	R03	Concrete slab is durable and not deemed a renewable asset. Maintenance of the concrete substrate is required for the asset to achieve longevity.	75 Yrs	\$0	2074	\$0																																	
Encl 21	R01	Replacement of sectional overhead door and associated hardware.	25 Yrs	\$2,500	2024	\$2,800																																	•
Encl 22	J01	Re-apply traffic demarcation striping and directional signage. Frequency will depend on traffic volume and other factors.	5 Yrs	\$1,000	2021	\$1,000	•						•														•												
Encl 22	J02	Heavy duty cleaning on slab surface to remove oil stains, etc.	5 Yrs	\$355	2021	\$370	•						•														•												
Encl 22	R01	Prepare surface and re-apply concrete sealer as required.	5 Yrs	\$3,905	2021	\$4,100	•						•														•												
Encl 22	R02	Concrete slab is durable and not deemed a renewable asset. Maintenance of the concrete substrate is required for the asset to achieve longevity.	75 Yrs	\$0	2074	\$0																																	

**Crystal Residences**  
**Major Maintenance and Renewals Schedule**

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
<b>ENCLOSURE</b>																																				
<b>GENERAL &amp; INSPECTIONS</b>																																				
Encl 23	J01	Review metal flashing at all location and touch-up paint as required.	3 Yrs	\$0	2020	\$0	•			•			•			•		•			•			•			•			•						
Encl 23	J02	Repaint dryer, kitchen and bathroom exhaust vents as required.	3 Yrs	\$0	2020	\$0	•			•			•			•		•			•			•			•			•						
Encl 23	J03	Update depreciation report.	3 Yrs	\$0	2022	\$0			•			•			•					•			•				•									
Encl 23	J04	Perform full condition assessment of all enclosure systems.	10 Yrs	\$10,000	2020	\$10,000	•										•									•										
Encl 23	R01	This is not a renewable asset.	75 Yrs	\$0	2074	\$0																														
Encl 24	R01	Replace sealants at interfaces between building enclosure assemblies, and at penetrations through assemblies in accordance with sealant renewals plan.	10 Yrs	\$300,000	2020	\$310,000	•										•									•										

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
<b>ELECTRICAL</b>																																				
<b>POWER SUPPLY</b>																																				
Elec 01	J01	Clean and maintain all unit substation equipment (reference subsequent maintenance tasks). Vacuum to remove accumulated dust. Check oil levels of oil filled equipment.	5 Yrs	\$0	2021	\$0	•						•										•					•								
Elec 01	J02	Conduct infrared thermography and ultrasonic scanning tests on unit substation equipment. Results may diagnose hidden hazards; contractor should provide certificate for insurance purposes. To be coordinated with maintenance activities.	5 Yrs	\$0	2021	\$0	•						•										•					•								
Elec 01	J03	Check for tightness of electrical connections.	5 Yrs	\$0	2021	\$0	•						•										•					•								
Elec 01	J04	Tighten bolted connections.	5 Yrs	\$0	2021	\$0	•						•										•					•								
Elec 01	R01	Cyclical replacement of distribution transformers, as required.	20 Yrs	\$2,000	2021	\$2,000	•																				•									
Elec 01	R02	Cyclical replacement of distribution transformers, as required.	40 Yrs	\$20,000	2039	\$30,000																				•										
Elec 02	R01	Rebuild emergency generator.	17 Yrs	\$15,000	2022	\$16,000			•																	•										
Elec 02	R02	Replace generator hoses.	10 Yrs	\$0	2021	\$0	•																				•									
Elec 02	R03	Replace generator battery packs.	4 Yrs	\$0	2021	\$0	•					•				•					•			•				•								
Elec 02	R04	Replace emergency generator and transfer switch.	35 Yrs	\$120,000	2034	\$160,000																														
Elec 03	R01	Replacement of oil storage tank and enclosure.	15 Yrs	\$6,500	2022	\$6,500			•																•											
Elec 04	J01	Lubricate all moving contacts.	5 Yrs	\$0	2021	\$0	•						•										•					•								
Elec 04	J02	Perform mechanical tests in accordance with manufacturer guidelines to verify mechanical integrity of unit substation equipment and main secondary disconnects (e.g. check switches for correct operation and alignment; megger and verify equipment phase colours; inspect candles for damage or cracking, oil leakage and oil level for oil circuit breakers).	5 Yrs	\$0	2021	\$0	•						•										•					•								

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	
<b>ELECTRICAL</b>																																					
Elec 04	J03	Calibrate electrical relays to match documented (or utility company) settings.	5 Yrs	\$0	2021	\$0		•					•					•									•										
Elec 04	J04	Prior to cleaning verify nameplate information; check insulator chips, cracks and tracking; inspect lightning arrestors and visually inspect contacts and bus.	5 Yrs	\$0	2021	\$0		•					•					•									•										
Elec 04	J05	Verify that unit substation grounding network is adequate to ensure safety during work and while equipment is in operation.	5 Yrs	\$0	2021	\$0		•					•					•									•										
Elec 04	J06	Check tightness and torque all electrical connections. To be coordinated with 5-year system shutdown and cleaning.	5 Yrs	\$0	2021	\$0		•					•					•									•										
Elec 04	R01	Clean and maintain all unit substation equipment (reference subsequent maintenance tasks). Vacuum to remove accumulated dust. Check oil levels of oil filled equipment. Conduct infrared thermography and ultrasonic scanning tests on unit substation equipment. Results may diagnose hidden hazards; contractor should provide certificate for insurance purposes. To be coordinated with maintenance activities.	3 Yrs	\$3,000	2020	\$3,000	•			•									•								•										
Elec 04	R03	Replace unit substation equipment.	35 Yrs	\$160,000	2034	\$220,000															•																
<b>DISTRIBUTION</b>																																					
Elec 05	J01	Check for any exposed wiring and visually inspect wiring, where accessible, for signs of distress. Repair as required.	2 Yrs	\$0	2022	\$0			•		•			•			•		•		•			•		•		•		•		•		•		•	
Elec 05	J02	Check raceways and cables for proper mechanical support, check insulation for abrasion or cracks at support points, examine raceway joints for clean and tight connections. Check busducts connections for proper tightness and evidence of overheating, corrosion, arcing or other deterioration. Clean and torque dirty and loose connections.	2 Yrs	\$0	2022	\$0			•		•			•			•		•		•			•		•		•		•		•		•		•	
Elec 05	R01	Cyclical replacement of components of the electrical distribution equipment, as required.	40 Yrs	\$60,000	2039	\$89,000																					•										
<b>LIGHT FIXTURES</b>																																					
Elec 06	J01	Perform survey of actual lighting use and lighting levels to determine lighting needs. Consider updating fixtures or lighting controls to optimize light levels and energy costs.	3 Yrs	\$0	2022	\$0			•			•			•			•			•			•		•		•		•		•		•		•	
Elec 06	R01	Replace exterior light fixtures, as required, for aesthetic purposes, to match ballast replacement cycles, or technological obsolescence.	20 Yrs	\$3,000	2022	\$3,200			•																			•									
Elec 07	J01	Perform survey of actual lighting use and lighting levels to determine lighting needs. Consider updating fixtures, lighting controls or interior finishes (e.g. painting) to optimize light levels and energy costs.	3 Yrs	\$0	2022	\$0			•			•			•			•			•			•		•		•		•		•		•		•	
Elec 07	R01	Replace interior light fixtures, as required, for aesthetic purposes, to match ballast replacement cycles, or technological obsolescence.	20 Yrs	\$30,000	2022	\$32,000			•																			•									
<b>SECURITY</b>																																					
Elec 08	R01	Replace enterphone panels, excluding field wiring.	25 Yrs	\$12,000	2024	\$13,000						•																									•
Elec 09	R01	Replace media in recording device to maintain continuous records from proximity access control devices. Retain records in secure archive for period determined by policy.	6 Yrs	\$0	2025	\$0							•					•							•				•								•
Elec 09	R02	Modernize components of the proximity access control system, excluding field wiring, as required by technological obsolescence.	12 Yrs	\$65,400	2025	\$74,000							•												•												•

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049			
<b>ELECTRICAL</b>																																							
Elec 10	R01	Service the multiplex unit, update software as required.	5 Yrs	\$2,000	2023	\$2,200				•					•					•																			
Elec 10	R02	Modernize components of the security surveillance system, excluding field wiring, as required by technological obsolescence.	14 Yrs	\$16,000	2025	\$18,000						•														•													
<b>MECHANICAL</b>																																							
<b>CONTROLS AND END DEVICES</b>																																							
Mech 01	R01	Cyclical replacement of electronic actuator controls, as required.	10 Yrs	\$2,000	2022	\$2,100			•											•																			
Mech 02	R01	Cyclical replacement of gas detection sensors.	5 Yrs	\$7,650	2022	\$8,100			•																														
<b>PLUMBING &amp; DRAINAGE</b>																																							
Mech 03	R01	Cyclical replacement of various components of domestic hot water storage tanks, such as burners, controls, etc.	5 Yrs	\$0	2021	\$0		•																															
Mech 03	R02	Replace domestic hot water heater.	12 Yrs	\$30,000	2021	\$31,000		•													•																		
Mech 04	R01	Cyclical replacement of various components of domestic hot water storage tanks, such as burners, controls, etc.	5 Yrs	\$0	2021	\$0		•																															
Mech 04	R02	Replace domestic hot water heater.	12 Yrs	\$24,000	2021	\$25,000		•														•																	
Mech 05	R01	Cyclical replacement of various components of domestic hot water storage tanks, such as burners, controls, etc.	5 Yrs	\$0	2021	\$0		•																															
Mech 05	R02	Replace domestic hot water heater.	10 Yrs	\$24,000	2026	\$28,000								•																									
Mech 06	R01	Cyclical replacement of various components of domestic hot water storage tanks, such as burners, controls, etc.	5 Yrs	\$0	2021	\$0		•																															
Mech 06	R02	Replace domestic hot water heater.	10 Yrs	\$8,000	2029	\$8,000																																	
Mech 07	R01	Replacement of condensing gas fired pool boiler.	12 Yrs	\$20,000	2027	\$23,000																																	
Mech 08	R01	Cyclical replacement of hot water expansion tanks, as required.	20 Yrs	\$1,500	2021	\$1,600		•																															
Mech 09	R01	Cyclical replacement of buffer tanks, as required.	20 Yrs	\$1,500	2039	\$2,200																																	
Mech 10	R01	Replace electric hot water heater.	10 Yrs	\$2,400	2021	\$2,500		•																															
Mech 11	J01	Inspect brushes and remove brush dust from motor.	2 Yrs	\$0	2024	\$0					•		•		•		•		•		•		•		•		•		•		•		•		•		•		
Mech 11	R01	Cyclical replacement of recirculating pumps, as required.	5 Yrs	\$4,500	2021	\$5,300		•																															
Mech 12	J01	Check that pipe hangars are properly fastened.	5 Yrs	\$0	2021	\$0		•																															
Mech 12	J02	Check piping and supports for mechanical damage, proper clearance, adequate insulation, and labeling.	5 Yrs	\$0	2021	\$0		•																															
Mech 12	J03	Check integrity of all soldered pipe connections and couplings.	5 Yrs	\$0	2021	\$0		•																															
Mech 12	J04	Perform copper piping condition assesment.	10 Yrs	\$10,000	2020	\$10,000	•																																

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049			
<b>MECHANICAL</b>																																							
Mech 12	R01	Replace components of domestic plumbing distribution system, including domestic valves. Extent and timing of renewal will be dependent on the third-party testing of the domestic water distribution piping recommended in tactical plan. Phase 2 of 2.	28 Yrs	\$510,000	2025	\$560,000						*																											
Mech 12	R02	Replace components of domestic plumbing distribution system, including domestic valves. Extent and timing of renewal will be dependent on the third-party testing of the domestic water distribution piping recommended in tactical plan. Phase 1 of 2.	28 Yrs	\$1,670,000	2024	\$1,800,000					*																												
Mech 13	J01	Inspect brushes and remove brush dust from motor.	2 Yrs	\$0	2021	\$0	*		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*		
Mech 13	R01	Replace motor bearings, pump bearings and seals. Inspect mounts and housing, repair as required.	7 Yrs	\$9,900	2026	\$11,000							*						*							*								*					
Mech 13	R02	Replace domestic booster pumps and motor control panel.	14 Yrs	\$30,000	2033	\$40,000													*															*					
Mech 14	J01	Inspect brushes and remove brush dust from motor.	2 Yrs	\$0	2022	\$0		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*	
Mech 14	R01	Replace booster pumps, as required.	7 Yrs	\$4,000	2029	\$4,400										*						*						*											
Mech 14	R02	Replace motor bearings, pump bearings and seals. Inspect mounts and housing, repair as required. [Allowance of 33% of assembly renewal].	7 Yrs	\$0	2020	\$0	*						*							*						*								*					
Mech 14	R03	Replace domestic booster pumps and motor control panel.	14 Yrs	\$10,000	2021	\$10,000		*													*															*			
Mech 15	R01	Cyclical replacement of cross connection & back flow prevention valves, as required.	20 Yrs	\$10,000	2021	\$10,000		*																		*													
Mech 16	R01	Cyclical replacement of valves, as required.	20 Yrs	\$10,000	2021	\$10,000		*																		*													
Mech 17	J01	Insert video cameras into main lines to conduct pipe inspection. Auger lateral drain lines (storm and sanitary) as required.	5 Yrs	\$3,000	2020	\$3,100	*					*				*					*				*														
Mech 17	R01	Repair components of sanitary drainage distribution system, as required.	50 Yrs	\$30,000	2049	\$54,000																														*			
Mech 18	R01	Repair and/replace components of storm water drainage distribution system, as required.	40 Yrs	\$40,000	2039	\$59,000																			*														
Mech 19	J01	By means of pipe camera service, visually inspect underground piping runs. Look for build up of silts and dirt fines and other obstructions. Look for standing water indicating saturated soil conditions or impermeable conditions. Cost included with sanitary drainage asset.	5 Yrs	\$2,000	2020	\$2,000	*					*				*					*				*														
Mech 19	J02	Jetflush or auger drains to remove buildup and blockages. Cost included with sanitary drainage asset.	5 Yrs	\$2,000	2020	\$2,000	*					*				*					*				*														
Mech 19	R01	Repair and/replace components of perimeter drainage system, as required.	40 Yrs	\$40,000	2039	\$59,000																			*														
Mech 20	R01	Replacement of oil interceptor, as required.	50 Yrs	\$10,000	2049	\$18,000																															*		
Mech 21	J01	Coat exposed shaft of impeller with anti-seize compound.	2 Yrs	\$0	2022	\$0		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*	
Mech 21	R01	Overhaul sanitary sump pumps.	5 Yrs	\$0	2021	\$0		*				*						*				*				*								*					
Mech 21	R02	Cyclical replacement of sump pumps.	15 Yrs	\$8,000	2022	\$8,500			*														*																
Mech 22	J01	Coat exposed shaft of impeller with anti-seize compound.	2 Yrs	\$0	2022	\$0		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*		*	
Mech 22	R01	Overhaul storm sump pumps.	5 Yrs	\$0	2021	\$0		*				*						*				*			*			*						*					
Mech 22	R02	Cyclic replacement of sump pump storm lift and control panels.	15 Yrs	\$4,000	2022	\$4,200			*														*																



## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049		
<b>MECHANICAL</b>																																						
Mech 23	J01	Coat exposed shaft of impeller with anti-seize compound.	2 Yrs	\$0	2022	\$0		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		
Mech 23	R01	Overhaul storm sump pumps.	5 Yrs	\$0	2021	\$0	•					•					•					•				•						•						
Mech 23	R02	Cyclical replacement of sump pump storm lift and control panels.	15 Yrs	\$15,000	2022	\$16,000		•															•															
Mech 24	R01	Cyclical replacement of fittings and valves, as required.	25 Yrs	\$10,000	2049	\$18,000																														•		
<b>HEATING &amp; COOLING</b>																																						
Mech 25	R01	Cyclical replacement of components of condensing units and fan coil units on split system AC.	15 Yrs	\$6,000	2022	\$6,400		•															•															
Mech 26	R01	Cyclical replacement of components of condensing units and fan coil units on split system AC.	15 Yrs	\$4,000	2021	\$4,200	•																•															
Mech 27	R01	Replacement of components of split system AC for individual suites.	15 Yrs	\$4,000	2021	\$4,200	•																•															
Mech 28	R01	Replacement of electric unit heaters.	17 Yrs	\$1,500	2022	\$1,500		•																	•													
Mech 29	J01	Check that circuit breakers for electric baseboard heaters are properly labeled for maintenance and servicing.	3 Yrs	\$0	2020	\$0	•		•			•		•		•		•		•		•		•		•		•		•		•		•		•		
Mech 29	J02	Inspect baseboard heaters for signs of distress, such as detachment from the wall substrate, impact damage, loose connections and potential hazards.	2 Yrs	\$0	2020	\$0	•	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		
Mech 29	R01	Cyclical replacement of electric baseboard heaters in common areas, as required.	40 Yrs	\$2,500	2039	\$3,700																				•												
Mech 30	R01	Cyclical replacement of components of acid waste equipment.	8 Yrs	\$0	2023	\$0				•								•								•									•			
<b>VENTILATION AND AIR-CONDITIONING</b>																																						
Mech 31	J01	Motor mount - Inspect for damage, cracks or corrosion.	2 Yrs	\$0	2022	\$0		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•
Mech 31	J02	Conduct measurements and assessment of indoor air quality (IAQ) to ensure that desirable levels are being attained.	5 Yrs	\$0	2024	\$0				•					•					•						•											•	
Mech 31	R01	Cyclical replacement of pulleys and motors and vibration isolation, as required.	8 Yrs	\$0	2025	\$0					•									•						•											•	
Mech 31	R02	Cyclical rebuild or replacement of the make-up air unit.	20 Yrs	\$60,000	2039	\$89,000																				•												
Mech 32	J01	Motor mount - Inspect for damage, cracks, or corrosion.	2 Yrs	\$0	2021	\$0	•	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•
Mech 32	J02	Conduct measurements and assessment of indoor air quality (IAQ) to ensure that desirable levels are being attained.	5 Yrs	\$0	2021	\$0	•					•											•				•										•	
Mech 32	R01	Cyclical replacement of pulleys and motors and vibration isolation, as required.	8 Yrs	\$0	2023	\$0			•																	•											•	
Mech 32	R02	Cyclical rebuild or replacement of make-up air units.	20 Yrs	\$20,000	2021	\$21,000	•																			•												
Mech 33	R01	Cyclical rebuild or replacement of rooftop units.	20 Yrs	\$6,000	2021	\$6,200	•																			•												
Mech 34	R01	Cyclical rebuild or replacement of dehumidification unit.	20 Yrs	\$25,000	2022	\$27,000		•																				•										
Mech 35	R01	Cyclical replacement of electric duct heaters.	17 Yrs	\$3,000	2022	\$3,000		•																		•												
Mech 36	R01	Cyclical replacement of failed or damaged general purpose exhaust fans, as required.	12 Yrs	\$5,000	2023	\$5,400			•																		•										•	
Mech 37	R01	Replace split system AC units.	15 Yrs	\$9,000	2022	\$9,600		•																														
Mech 38	R01	Rebuild of supply and exhaust fans, as required.	20 Yrs	\$30,000	2021	\$31,000	•																				•											

**Crystal Residences  
Major Maintenance and Renewals Schedule**

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049		
<b>MECHANICAL</b>																																						
<b>OTHER</b>																																						
Mech 39	R01	Replace overhead door motors and operators, as required.	15 Yrs	\$1,500	2021	\$1,500	•																															

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049		
<b>ELEVATOR</b>																																						
<b>TRACTION</b>																																						
Elev 01	J01	Check and test the overload devices.	2 Yrs	\$0	2021	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 01	J02	With test weights, load each elevator to contract capacity and operate the elevator in both directions, making single and two floor runs as well as runs for the full travel.	2 Yrs	\$0	2021	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 01	J03	Conduct full load performance test.	2 Yrs	\$0	2021	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 01	R01	Replace elevator hoist ropes, as required.	15 Yrs	\$0	2044	\$0																																
Elev 01	R02	Replace elevator geared machines, controls and drive systems. Include door operator, fixtures and cab interior upgrade.	30 Yrs	\$500,000	2029	\$610,000																																
Elev 02	J01	Check and test the overload devices.	2 Yrs	\$0	2021	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 02	J02	With test weights, load each elevator to contract capacity and operate the elevator in both directions, making single and two floor runs as well as runs for the full travel.	2 Yrs	\$0	2021	\$0	•		•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 02	J03	Conduct full load performance test.	2 Yrs	\$0	2022	\$0			•		•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Elev 02	R01	Replace elevator hoist ropes, as required.	15 Yrs	\$0	2044	\$0																																
Elev 02	R02	Replace elevator geared machines, controls and drive systems. Include door operator, fixture and cab interior upgrade.	30 Yrs	\$500,000	2029	\$610,000																																
<b>CAR INTERIORS</b>																																						
Elev 03	R01	Replace elevator door operators, operating and signal fixtures. Upgrade cab interior.	15 Yrs	\$70,000	2029	\$85,000																																
Elev 04	R01	Replace elevator operating and signal fixtures; replace door operator; upgrade cab interior. (to be completed with modernization of elevator machines, controls and drive)	15 Yrs	\$70,000	2029	\$85,000																																

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049		
<b>FIRE SAFETY</b>																																						
<b>FIRE SAFETY</b>																																						
Fire 01	R01	Replace remaining damper operators and seals.	20 Yrs	\$14,000	2025	\$16,000																																
Fire 01	R02	Replace damper operators and seals.	20 Yrs	\$14,000	2021	\$15,000	•																															

## Crystal Residences Major Maintenance and Renewals Schedule

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<b>FIRE SAFETY</b>																																								
<b>CONTROLS</b>																																								
Fire 02	J01	Replace battery packs for fire alarm control panels.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 02	R01	Replace battery packs.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 02	R02	Replace fire alarm annunciator panels and control panel, excluding field wiring and field devices.	20 Yrs	\$73,000	2021	\$73,000	•																				•													
<b>DETECTION</b>																																								
Fire 03	R01	Cyclical replacement of speakers, heat detectors, smoke detectors and related modules, excluding field wiring.	10 Yrs	\$21,740	2021	\$23,000	•																					•												
<b>SUPPRESSION</b>																																								
Fire 04	J01	Conduct flow test and pipe line condition (flushing) test to NFPA25.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 04	J02	Sprinkler Heads - Test extra high temperature on sprinkler heads.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 04	R01	Phased replacement of sprinkler zone control valves, as required.	20 Yrs	\$2,500	2021	\$2,600	•																					•												
Fire 04	R02	Renew compromised portions of piping, gaskets, connections, valves, devices and trim to maintain required function.	5 Yrs	\$21,740	2021	\$23,000	•						•										•																	
Fire 04	R03	Replace all heads, or submit representative sample of heads for testing by a recognized testing agency at the 50th anniversary, to the satisfaction of the authority having jurisdiction, in accordance with NFPA 25.	10 Yrs	\$65,220	2049	\$120,000																																	•	
Fire 04	R04	Replace entire system including risers, branch piping, valves, heads, swaybracing, and all related trim, back to Sprinkler Room.	100 Yrs	\$217,400	2099	\$0																																		
Fire 05	R02	Replace all heads, or submit a representative sample of heads for testing by a recognized testing agency, to the satisfaction of the authority having jurisdiction, in accordance with NFPA 25.	10 Yrs	\$3,270	2029	\$4,000										•																							•	
Fire 06	J01	Sprinkler Piping - Conduct flow test and pipe line condition (flushing) test to NFPA25.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 06	J02	Sprinkler Heads - Test extra high temperature on sprinkler heads.	5 Yrs	\$0	2021	\$0	•						•										•																	
Fire 06	R01	Replace all heads, or submit representative sample of heads for testing by recognized testing agency at the 50th anniversary, to the satisfaction of the authority having jurisdiction, in accordance with NFPA 25.	10 Yrs	\$48,360	2049	\$88,000																																		•
Fire 06	R02	Replace damaged sprinkler heads, hangers and leaking gaskets, cages, sway-braces, drains, etc. as required.	5 Yrs	\$806	2021	\$840	•						•										•																	•
Fire 06	R03	Replace entire system including risers, branch piping, valves, heads, swaybracing, and all related trim, back to Sprinkler Room.	100 Yrs	\$161,200	2099	\$0																																		
Fire 07	R01	Phased replacement of sprinkler zone control valves, as required.	20 Yrs	\$0	2021	\$0	•																																	•
Fire 07	R02	Replace gaskets in dry sprinkler valves.	20 Yrs	\$0	2021	\$0	•																																	•
Fire 07	R03	Rebuild dry sprinkler valves.	20 Yrs	\$4,000	2021	\$4,000	•																																	•
Fire 07	R04	Replace sprinkler valves, as required.	40 Yrs	\$15,000	2039	\$22,000																																		•
Fire 08	R01	Replace fire sprinkler compressor.	14 Yrs	\$2,000	2021	\$2,100	•																																	•

## Crystal Residences Major Maintenance and Renewals Schedule

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	
<b>FIRE SAFETY</b>																																					
Fire 09	J01	Conduct flow test.	5 Yrs	\$0	2021	\$0		•					•					•									•										
Fire 09	R01	Replace jockey pump.	12 Yrs	\$2,000	2024	\$2,200					•											•													•		
Fire 09	R02	Rebuild fire pump.	15 Yrs	\$5,000	2024	\$5,000					•															•											
Fire 09	R03	Replace fire pump and motor control centre.	30 Yrs	\$30,000	2029	\$37,000										•																					
Fire 10	R01	Replace smoke exhaust fans.	25 Yrs	\$5,000	2024	\$5,500					•																									•	
Fire 11	J01	Conduct hydrotest on fire extinguishers.	12 Yrs	\$0	2023	\$0				•																										•	
Fire 11	R01	Cyclical replacement of fire extinguishers.	12 Yrs	\$4,000	2023	\$4,300				•																										•	
<b>EGRESS</b>																																					
Fire 12	R01	Cyclical replacement of batteries and lamps in DC battery packs.	5 Yrs	\$0	2027	\$0																														•	
Fire 12	R02	Cyclical replacement of LED exit signs.	15 Yrs	\$11,250	2022	\$12,000			•																												•
<b>INTERIOR FINISHES</b>																																					
<b>FLOORS</b>																																					
Finish 01	J01	Recolour or replace tile grout as required.	12 Yrs	\$0	2022	\$0			•																												
Finish 01	R01	Renew porcelain tile floor.	40 Yrs	\$27,200	2039	\$40,000																															
Finish 02	R01	Replace resilient flooring.	20 Yrs	\$23,000	2022	\$24,000			•																												
Finish 03	R01	Renew carpet.	15 Yrs	\$119,200	2022	\$130,000			•																												
Finish 04	J01	Recolour or replace tile grout as required.	12 Yrs	\$0	2023	\$0				•																											
Finish 04	R01	Renew stone floor tile.	40 Yrs	\$30,000	2039	\$45,000																															
<b>WALLS</b>																																					
Finish 05	J01	Clean tile grout with medium bristle brush.	3 Yrs	\$0	2021	\$0		•																													
Finish 05	J02	Review wall tile for signs of distress, such as cracking, loose pieces, delamination, missing grout. Repair as required.	3 Yrs	\$0	2021	\$0		•																													
Finish 05	R01	Replace grout and sealant at wall tile, as required.	10 Yrs	\$0	2021	\$0		•																													
Finish 05	R02	Replace ceramic wall tiles.	25 Yrs	\$30,000	2024	\$33,000					•																										
Finish 06	R01	Repaint interior wall in high traffic area, as required.	5 Yrs	\$0	2020	\$0		•						•																							
Finish 06	R02	Repaint wall surface including preparation of substrate.	10 Yrs	\$2,500	2022	\$2,700			•																												
Finish 08	R01	Replace wall paper covering at affected walls.	15 Yrs	\$123,300	2022	\$130,000			•																												
<b>CEILINGS</b>																																					
Finish 09	R01	Renew all paint after preparing substrate.	15 Yrs	\$20,200	2022	\$21,000			•																												

**Crystal Residences**  
**Major Maintenance and Renewals Schedule**

Asset Ref ID	Maint. Ref ID	Maintenance Description	Frequency	Current Cost	Next Event	Future Cost	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049		
<b>INTERIOR FINISHES</b>																																						
<b>ARCHITECTURAL WOODWORK</b>																																						
Finish 10	R01	Replace wood panel walls.	30 Yrs	\$15,000	2029	\$18,000																																
<b>DOORS</b>																																						
Finish 11	J01	Lubricate and adjust doors and moving parts. Tighten mechanical parts and screws. Adjust door swing arms and hardware as required. Replace broken hardware.	3 Yrs	\$0	2020	\$0																																
Finish 11	J02	Repaint door and frame in high-traffic locations as required.	8 Yrs	\$4,725	2022	\$4,700																																
Finish 11	J03	Rekey master door cylinders and issue new master keys to facility staff.	10 Yrs	\$0	2020	\$0																																
Finish 11	R01	Replace interior swing door as required.	30 Yrs	\$94,500	2029	\$120,000																																
<b>AMENITIES</b>																																						
<b>EQUIPMENT</b>																																						
Amen 01	R01	Replace components of fitness equipment, as required.	10 Yrs	\$7,000	2022	\$7,400																																
<b>SPECIALTIES</b>																																						
Amen 02	R01	Replace washroom partitions and associated hardware.	30 Yrs	\$2,000	2029	\$2,400																																
Amen 03	R01	Reconstruct wood storage lockers, as required.	30 Yrs	\$2,000	2029	\$2,400																																
<b>FURNISHINGS</b>																																						
Amen 04	R01	Replace furnishings in common areas, as required.	15 Yrs	\$1,000	2022	\$1,000																																
Amen 05	J01	Lubricate locks and hinges.	2 Yrs	\$0	2021	\$0																																
Amen 05	J02	Rekey cylinder on master lock.	5 Yrs	\$0	2021	\$0																																
Amen 05	R01	Replace central mail boxes as required.	40 Yrs	\$10,000	2039	\$15,000																																
Amen 06	R01	Replace damaged and outdated signage, as required.	25 Yrs	\$5,000	2025	\$5,600																																
<b>SUITE</b>																																						
Amen 07	R01	Replace damaged finishes, appliances, fixtures and millwork as required.	25 Yrs	\$15,000	2024	\$17,000																																
<b>POOL, SPA &amp; SAUNA</b>																																						
Amen 08	R01	Cyclical replacement of components of water circulation and sanitation equipment for pool/spa, as required.	5 Yrs	\$3,000	2023	\$3,200																																
Amen 08	R02	Cyclical replacement of pool/spa circulation and sanitation equipment, as required.	15 Yrs	\$10,000	2028	\$12,000																																
Amen 09	J01	Replace bulbs and gaskets in pool and spa lights.	2 Yrs	\$0	2021	\$0																																
Amen 09	R02	Refinish interior surface of pool and spa tank.	30 Yrs	\$28,000	2046	\$48,000																																



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Burnaby, BC V5C 6S6

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<b>SITWORK</b>																																					
<b>HARD LANDSCAPING</b>																																					
Site 01	R01	Rebuild sections of interlocking paving, including sub-grade, as required.	40 Yrs	\$24,660	2039	\$37,000																															
Site 02	J01	Review metal fencing posts to ensure posts are adequately anchored in the ground.	5 Yrs	\$0	2021	\$0		•					•					•										•									
Site 02	R02	Replace metal fencing.	40 Yrs	\$29,150	2039	\$43,000																															
Site 03	R01	Recoat/repaint wood fencing.	6 Yrs	\$0	2022	\$0			•						•						•																
Site 03	R02	Replace wood fencing.	15 Yrs	\$4,500	2029	\$5,500										•																					
<b>SOFT LANDSCAPING</b>																																					
Site 04	J01	Replace the back-up battery in the timer/controller.	2 Yrs	\$0	2023	\$0				•		•		•		•		•		•		•		•		•		•		•		•		•		•	
Site 04	R01	Cylical replacement of components of irrigation sprinkler system, as required.	15 Yrs	\$6,000	2021	\$6,200		•																													
Site 05	R01	Renovate sections of the soft landscaping, as required.	15 Yrs	\$8,000	2029	\$9,800										•																					