

DISTRICT OF OAK BAY

BUILDING ASSET MANAGEMENT PLAN

MUNICIPAL BUILDINGS ANALYSIS

JULY 2016

EXECUTIVE SUMMARY

In September of 2015 the District of Oak Bay (“The District”) retained Moore Wilson Architects Inc., through proposal submission, to perform a Municipal Building Analysis (MBA) on 29 District-owned buildings. Moore Wilson Architects included WSP Canada Inc. as sub consultants on the MBA team to provide building envelope, structural, mechanical and electrical engineering services within the Building Asset Management Plan (BAMP) component.

District-owned buildings support several critical functions of local government, public works/services, community development and emergency operations. They serve as storage for records, historic documents, and specialized vehicles/equipment. Furthermore, they provide recreation, community-based activities and programmes, and a regional cultural identity. Collectively they represent a substantial portion of District capital assets. For these reasons, the District has commissioned a long-term building asset management plan spanning the next twenty years (2016-2035) to measure and monitor maintenance and renewal expenses. This report is intended to highlight overall expenses and therefore funding needs at a baseline case of investment. The District can then draw comparisons to other investment types such as full-scale renovation, addition, or replacement provided by the separate Moore Wilson Architects Inc. NEEDS assessment.

The management of District-owned buildings over the next twenty years is summarized in Table i, where the costs are combined into five-year increments.

Table i: Summary of Building Costs every 5 years

Building	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs	% Total
1a - Fire Station	\$716,800	\$120,260	\$40,100	\$57,000	\$934,000	6%
1b – Police Station	\$498,560	\$86,600	\$116,000	\$44,200	\$745,000	5%
1c – Garage	\$143,900	\$5,800	\$600	\$-	\$150,000	1%
2 - Municipal Hall	\$1,805,750	\$125,700	\$35,500	\$141,400	\$2,100,000	13%
3a – PW Office & Storage	\$533,400	\$95,900	\$18,000	\$27,000	\$675,000	4%
3b – PW Maintenance Shop	\$445,100	\$84,500	\$24,900	\$28,500	\$583,000	4%
4 & 5 – PW Shelters 1 & 2	\$10,000	\$-	\$4,000	\$59,000	\$73,000	0.4%
6 – PW Bulk Transfer Station	\$6,500	\$-	\$2,000	\$2,000	\$10,500	0.1%
7a – Monterey Centre	\$2,052,900	\$186,900	\$229,700	\$97,900	\$2,570,000	16%
7b - Oak Bay Library	\$602,600	\$110,300	\$33,700	\$91,600	\$840,000	5%
8 – Oak Bay Rec Centre	\$1,605,400	\$761,300	\$393,800	\$392,600	\$3,200,000	20%
9 – Tennis Facility	\$2,300	\$136,300	\$344,000	\$371,000	\$854,000	5%

Building	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs	% Total
10 – Henderson Rec Centre	\$262,300	\$56,800	\$54,100	\$113,800	\$487,000	3%
11 – Jack Groves Fieldhouse	\$35,200	\$5,700	\$4,000	\$7,400	\$52,300	0.3%
12 – Carnarvon Pavilion	\$128,300	\$14,600	\$22,700	\$13,800	\$179,400	1%
13 – Carnarvon Old Bowling Pavilion	\$9,800	\$16,300	\$12,800	\$1,500	\$40,400	0.2%
14 – Carnarvon Bowling Pavilion	\$7,400	\$18,800	\$17,600	\$5,100	\$48,900	0.3%
15 – Willows Park Pavilion	\$60,300	\$16,000	\$12,700	\$24,300	\$113,300	1%
16 – Willows Park Washroom	\$31,900	\$14,200	\$12,600	\$6,100	\$64,800	0.4%
17 – Quimper Park Washroom	\$7,400	\$5,000	\$3,800	\$9,800	\$26,000	0.2%
19 – Boy Scout Hall	\$79,100	\$33,900	\$3,800	\$7,200	\$124,000	1%
20 – Girl Guides Hall	\$108,200	\$13,200	\$9,700	\$34,600	\$166,000	1%
21 – Oak Bay Apartments	\$30,900	\$14,200	\$36,400	\$12,000	\$93,500	1%
22 – 1531 Hampshire Road	\$79,300	\$6,500	\$1,800	\$6,000	\$94,000	1%
23 – 2564 Heron Street (Tod House)	\$168,200	\$16,200	\$1,000	\$9,800	\$195,000	1%
24 – Marina Restaurant	\$615,700	\$347,600	\$292,400	\$89,700	\$1,345,400	8%
25 – Marina Offices	\$133,700	\$26,400	\$92,800	\$111,300	\$364,200	2%
26 – Marina Dockworks	\$27,600	\$63,400	\$4,300	\$12,400	\$107,700	1%
Total	\$10,210,000	\$2,385,000	\$1,825,000	\$1,800,000	\$16,200,000	100%

The contents of the full report identify the renovations needed for all buildings included in the study. We have provided the summary below of the most significant renovations needed within five year increments. We note that there are critical and recommended renovations provided, whereby 'recommended' renovations is required work, that may cause more significant renovation scope if they are deferred.

The Options Analysis - Recommended Building Replacement summary is provided within this Executive Summary. This recommendation brings together the analysis of the Asset Management Report and the Master Program Report. All buildings listed here have been determined to have extensive building deficiencies in regard to systems, envelope, functional and spatial. Please see the Options Analysis Report for further information.

Table ii: Priority of Recommendations Every 5 Years

Priority	Building	Scope
CRITICAL (1-5 YEARS)	8-Oak Bay Rec Centre	Replace east roofing membrane. Replace gravel-ballast roofing with roofing membrane.
	1b-Police Station	Replace main and secondary elec. distribution panels. Alternate option: Building Replacement
	2-Municipal Hall	Replace main and secondary elec. distribution panels.
	10-Henderson Rec Centre	Replace roofing membrane.
	23-Tod House	Raise house foundation, replace porch foundations, repair chimneys, and replace roof.
	24-Marina Restaurant	Repair priority marine concrete columns/beams.
RECOMMENDED (1-5 YEARS)	1c-Garage (Fire/Police)	Replace generators.
	2-Municipal Hall	Replace original windows. Replace boilers #1 & #2
	7a-Monterey Centre	Replace main and secondary elec. distribution panels. Replace electric furnaces.
	7b-Oak Bay Library	Replace roof-top air handler and gas furnaces.
	8-Oak Bay Rec Centre	Replace roof-top air handlers. Replace secondary elec. distribution panel.
	19 & 20 – Boy Scout & GG Halls	Replace stucco cladding.
	22-1531 Hampshire Road	Full interior renovation (flooring, wall finishes, doors, hardware). Replace electrical distribution, interior lighting fixtures and wiring devices. Replace original wood-framed windows and trim.
	24-Marina Restaurant	Replace original windows.
CRITICAL (5-10 YEARS)	1a-Fire Station	Replace roofing membrane and shingles.
	2-Municipal Hall	Replace lower roofing membrane.
	3b-PW Maintenance	Replace roofing membrane.
	7a-Monterey Centre	Replace roofing membrane.
	19-Boy Scout Hall	Replace roofing membrane and shingles.
	24-Marina Restaurant	Repair remaining marine concrete columns/beams.
RECOMMENDED (5-10 YEARS)	7b-Oak Bay Library	Elevator modernization.
	8-Oak Bay Rec Centre	Replace air handlers, HRV, compressors, and main elec. distribution panel.
	9-Tennis Facility	Replace standby inflation unit. Resurface courts.

Priority	Building	Scope
CRITICAL (10-15 YEARS)	8-Oak Bay Rec Centre	Replace north west roofing membrane.
	9-Tennis Facility	Replace three-court bubble.
	24-Marina Restaurant	Replace main elec. distribution panel.
	25-Marina Office	Replace roofing membrane.
RECOMMENDED (10-15 YEARS)	7a-Monterrey Centre	Replace original windows and communication system.
	8-Oak Bay Rec Centre	Replace 2003 renovation exhaust fans, and CCTV system.
	24-Marina Restaurant	Replace boilers.
	25-Marina Office	Replace fan coil units.
CRITICAL (15-20 YEARS)	4&5-PW Shelters	Replace roofing membranes.
	8-Oak Bay Rec Centre	Replace lounge & mechanical roofing membranes.
	9-Tennis Facility	Replace four-court bubble.
RECOMMENDED (15-20 YEARS)	2-Municipal Hall	Replace communication system.
	7b-Oak Bay Library	Replace roof-top air handler and communication system.
	8-Oak Bay Rec Centre	Replace heat pumps, pool dehumidifier, and paging and communication systems.
	10-Henderson Rec Centre	Replace exterior lighting and interior flooring.
	25-Marina Office	Replace skylight/canopy, split-system air conditioner, and communication system.

Table iii: Building Replacement Recommendations

OPTIONS ANALYSIS BUILDING REPLACEMENT RECOMMENDED (1-5 YEARS) (no priority indicated)	Police Station Building Replacement	Functionally deficient and seismically unrestrained.
	Public Works Building Replacement	Functionally deficient and seismically unrestrained.
	Fire Station Building Replacement	Functionally deficient and seismically unrestrained.
	Municipal Hall Building Replacement	Poor thermal performance (existing envelope and windows), and seismically unrestrained.
	Oak Bay Library Building Replacement	Spatially and functionally deficient and Seismically Unrestrained.

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1. GENERAL

1.1. INTRODUCTION

In September of 2015 the District of Oak Bay (“The District”) retained Moore Wilson Architects Inc., through proposal submission, to perform a Municipal Building Analysis (MBA) on 29 District-owned buildings. Moore Wilson Architects included WSP Canada Inc. as sub consultants on the MBA team to provide building envelope, structural, mechanical and electrical engineering services within the Building Asset Management Plan (BAMP) component.

This report is prepared solely for the use of the Client. Moore Wilson Architects Inc. and WSP Canada Inc. accept no responsibility for damages suffered by third parties as a result of decisions or actions based on this report. The report does not claim to have uncovered or identified all building system deficiencies during the course of this work.

1.2. TERMS OF REFERENCE

The project team consists of Moore Wilson Architects Inc. providing the coordination, building Code, interior commentary. As their sub-consultant, WSP Canada Inc. provided electrical, structural, mechanical, and building science/envelope consulting services for larger facilities and facilities scheduled to undergo a NEEDS assessment. Additional contractor services for other smaller buildings were provided by Houle Electric Ltd., and West Bay Mechanical.

All buildings were reviewed on site for their construction and condition. Staff were interviewed and provided occupational and historical commentary for each of the buildings and sue-specific building sites.

1.3. SCOPE OF WORK

The scope of work was conducted from the provided Moore Wilson Architects Inc. proposal dated September 1, 2015. This scope of work included:

- A start-up meeting with the District to confirm intentions, priorities, methodology, and district contacts for each building group.
- Condition surveys of each building (29 total), accompanied by District staff or external users, gathering information on each building system (interior finishes, building envelope, electrical, mechanical, and structural where appropriate) condition, apparent deficiencies, and further investigation.
- Structural review was included for NEEDS buildings only (Building No’s. 1-7).
- A progress meeting with the District to discuss preliminary findings and garner feedback.
- Development of a prioritized 20-year plan for each facility asset from estimated remaining service life, last renewal date and period of renewal.
- Draft report submittal.

- Meeting with the District to discuss the draft report, feedback, and alterations to be implemented into the final report.
- Final report submittal.

In all cases, an asset pertaining to a particular building was included if it was a part of the building’s construction secured to the structure of the building. A more detailed list of exclusions can be found in Section 1.7. For smaller select buildings. Electrical and mechanical Contractor services for smaller buildings were sub-contracted to Houle Electric Ltd. and West Bay Mechanical, respectively. The sub-contractors findings were incorporated into the reporting.

1.4. REPORT ORGANIZATION

The report presents all major District buildings in five groups:

- Essential Services (e.g., Municipal Hall, Fire Hall, Police Station),
 - Recreation Centres (Oak Bay Rec. Centre, Monterey Centre, Henderson Rec. Centre),
 - Parks and Pavilions (e.g., Carnavon, Windsor Park, Willows Beach (the Tea House) and associated washroom and field house buildings)
 - Specific-Use Buildings (e.g., Boy Scouts, Girl Guides, Heron St.(residential heritage rental), Hampshire (residential rental)
 - The Oak Bay Marina (restaurant, offices and retail, and dockworks buildings) leased long-term to The Oak Bay Marina Group
- *Table iv: Distribution.*

Municipal Building Analysis – Building Groups					
Group	Essential Services	Recreation Centres	Parks and Pavilions	Specific-Use Buildings	Oak Bay Marina
Building No.	1a Fire Station, 1b, 1c, 2, 3a, 3b, 4-6	7a-Monterey Centre, 7b, 8-10	11 – Jack Groves Fieldhouse, 12-17	18 – Boy Scout Hall, 20-23	24 – Marina Restaurant, 25, 26
Total (29)	9	5	7	5	3

We have capitalised building names, and where warranted, rooms within buildings that have specific titles such as the ‘Evidence Room’ in the police station, but have not capitalised other rooms that are descriptor-based such as male washroom or custodial room.

Section 2 defines each building and its building systems in terms of maintaining the ‘status quo’, i.e. the Building Asset Management Plan (BAMP) portion of this analysis. It includes the NEEDS assessed buildings in order to

develop their baseline case for comparison to other investment types such as renovation, addition, or replacement. This involves two commitments:

- 1) Upgrade the building (if necessary) so that it will comply with the minimum needs of its current occupants, and
- 2) Once upgraded, assign maintenance and renewal costs for the building's components for the next 20 years of operation (2016 to 2035 inclusive).

Buildings are reported with a description of building systems, visual review of condition, recommendations, and anticipated expenses. Near the end of each building section a summary table for financial investment every 5 years (i.e., 0-5, 6-10 etc.) is provided. The first 5 years would typically include all upgrade costing, subsequent years (6-20) would typically result from reoccurring maintenance and renewal costing under more steady-state operation.

Each building section then concludes with greater detailed information for the reader to refer to. This includes a building summary table and chart, and relevant system cut sheets. Building the systems are divided by the following tabs in order:

- Int. Finishes and Furnishings Components
- Building Envelope Components
- Mechanical Components
- Electrical Components
- Structural Components, if in scope

In the Appendices, Table A (11x17) presents a Municipal Buildings Overview Table highlighting information of the buildings themselves: images, past reports, desired future studies, age, and additions. Some of the buildings are conjoined such as the fire and police stations with the out-building 'Garage' servicing them directly. For these shared-use facilities we reference them as buildings 1a, 1b, and 1c respectively, treating them as 3 distinct buildings. Aerial photos of all buildings within the report were obtained from 2015 imagery provided by the Capital Regional Districts (CRD) Regional Web Map.

Table B1-Master Expense Forecasting (11x17) contains all the buildings in the building asset management plan without specific building detail, listing the financial demand proposed for each building from years 2016 to 2035 inclusive.

1.5. DISTRICT OF OAK BAY OBJECTIVES: POLICY AND LEADERSHIP OBJECTIVES

District-owned buildings support several critical functions of local government, public works/services, community development and emergency operations. They serve as storage for records, historic documents, and specialized vehicles/equipment. Furthermore, they provide recreation, community-based activities and programmes, and regional cultural identity. Collectively, they represent a substantial portion of District capital assets and operating expenses. For these reasons, the District has commissioned an asset management plan

spanning the next twenty years (2016-2035) to measure and monitor anticipated upcoming expenses in maintenance and renewal. Expenses included in this report represent reserve expenses. As a brief aside, reserve expenses differ from operating expenses (janitorial, annual servicing/inspection) in that they occur less frequently (upwards of 80-year renewal periods), are financially great enough to require advance planning and funding, and their condition is fundamental to the operation, performance, health and safety of the building.

The District has outlined the following objectives for the plan:

- Maximize useful life of each facility
- Protection of assets
- Cost savings over the long term
- Enhanced public safety and health
- Reduced disruption of services and greater efficiencies

Creating a 20-year plan for District building infrastructure engages a proactive roadmap to campaign and allocate funds with resultant purpose and intent. This reports is intended to assist decision makers with planning of capital and operational budgets toward future investment in District-owned buildings.

1.6. DISTRICT OF OAK BAY BUILDING ASSET MANAGEMENT PLAN (BAMP) AND NEEDS PREFERENCES

Within the request for proposal, and at start-up and progress meetings, the District described some preferences that were addressed within reporting. The general intention with the building components is maintenance in perpetuity over renewal, a common example being diligent maintenance of wood board siding (cleaning, substrate prep, and painting) instead of replacing the siding. When required, renewal is prioritized by building function and operation. Essential services such as fire, police, and government are given greatest priority.

Preference towards heritage buildings is to maintain indefinitely at steady state, and to prevent deterioration while preserving heritage character, advocating repair and stabilization more than replacement of components.

The following guiding documents are preferred by The District in building decision making:

- British Columbia Climate Action Plan / Carbon Footprint
- Oak Bay Emergency Response and Recovery Plan (ERRPlan)
- Oak Bay Urban Development and Planning
- Oak Bay Official Community Plan
- Oak Bay Strategic Energy Management Plan (2014)
- Oak Bay commitment to LEED-rated buildings

Phasing maintenance and renewal by elevation (varying exposures) was deemed too detailed for the District's intentions. Similarly, buildings with multiple roofs renewed at different times of different sizes would instead be modelled as being renewed for, say 5 years, an equal amount each year. Statistically the sensitivity of the overall model to this inaccuracy and approximation is expected to be low, and lower than the sensitivity to, say,

available funding or differences between bids at tender. In all cases, the intended future use(s) of the building was considered when determining the level of renewal required to serve out the building's remaining service life.

1.7. EXCLUSIONS

There are a number of items that would typically be excluded from the funding model. Exclusions were either due to their age, durability, user priority, renewal date beyond 20 years, low cost, or likelihood that they would be replaced promptly from an operating budget as they must remain functional and safe. As time passes, components can be added or deleted from this list based on changing conditions or rising repair costs; some of the items excluded are listed below:

General:

- Assets forming part of the ground-works or site infrastructure beyond the building footprint such as perimeter fencing, roadways, parking areas, picnic tables
- Sidewalks, roads, drive aisles, subsurface infrastructure

Arch/ Interior Finishes/ Furnishings:

- Kitchen assets such as cooking equipment (grill, fryer, exhaust).
- Wall fixtures
- Tables and furniture and other removable content/ chattel
- Fixtures or components not attached to the building

Building Envelope:

- Exhaust vents, plumbing stacks, and hose bibs penetrating exterior walls and roof
- Integral flashing within assemblies
- Fasteners and concealed envelope components

Structural:

- Structural assessment were included for NEEDS buildings only (No.'s 1-7)

Mechanical:

- Concealed piping
- Concealed ducting

Electrical:

- Low-voltage wiring
- Supplemental space heaters
- IT equipment

Unless specified explicitly for a particular building, such items are beyond the scope of this report.

A number of reasonable assumptions were necessary to simplify the reporting process. Where architectural drawings were not available to perform quantity takeoffs, a measuring-wheel, measuring-tape and photographs were used to estimate building dimensions. Where specific ages or previous maintenance of building components were unavailable, assumptions were made based on our visual review.

Assumptions regarding the age of mechanical and electrical equipment were made by sub-contractors where applicable. Where installation dates were not available from The District, the sub-contractor assigned an age to each respective component from assessment of physical condition, generation of technology, and technical knowledge. Estimates provided by WSP, Houle Electric, and West Bay Mechanical are of class 4/5 nature (screening to feasibility). At the time of replacement it is expected that The District will seek a quotation from specific contractors or tendering proponents.

For newer buildings or renewal events further away from the present, there is a need to acknowledge the inability to be accurate to say, the nearest year such that a 15, 20, 25-year service life approximation is applied. This creates a 'binning' effect at these years. In actuality, renewal can and would occur around these dates. An internal WSP asset-management research & development project applied a normal distribution curve to these dates where the likelihood changed randomly, and found that lower-funded scenarios were less able to weather unexpected earlier expenses.

2. BASELINE- MUNICIPAL BUILDING ANALYSIS

This section of the report addresses each building from the five identified groups on an individual basis. Each building is further broken down into four or five main systems: interior finishes, building envelope, structural, mechanical, and electrical.

A visual-only review was performed for this report and study. A general condition of good, average, fair, poor or concealed was used to describe the condition of each item as observed during the visual review. More substantial commentary on preventative maintenance is beyond the scope of this report. However, please refer to Table v for a description of the condition statements. Comment regarding seismic restraint of contents is important, but beyond the scope of this report.

Table v: Description of Condition Statement

	Condition	Description
No Action	Good	The condition of the element appears newer, may outlast its life expectancy and may potentially be replaced further into the future than anticipated.
	Average	The element is wearing evenly or as should be expected, based on the age and life expectancy of the material/ assembly.
Monitor	Fair	The element is generally “Average” and performing its intended function. However, its material integrity is no longer intact.
Action Required	Poor	Planning for the repair or replacement of the element should occur.
To be Confirmed	Concealed	Visual review was not possible due to access, concealment, or danger of putting the component’s performance at risk. It may require a separate follow up. The condition is therefore “Concealed” and is “To be Confirmed”. In most circumstances, we assume an “Average” condition unless we feel it appropriate to highlight an item. Often due to the cost of exposure, a reactive action may be taken whether the funds are proactively assigned or not.

Structural visual review of essential service buildings involved greater analysis than assigning a general condition statement. For each essential service building, the collection of structural elements that resist lateral seismic forces are assessed and assigned a capacity-to-demand ratio. The lowest capacity-to-demand ratio for the collection of structural elements in a building is the ratio assigned to the entire building. A capacity-to-demand ratio of 1.0 or greater indicates the building’s Seismic Force Resisting System meets the current Building Code. A ratio less than 1.0 indicates that its lateral system does not meet current Building Code. The Building Code recommends seismic upgrading if an existing building is found to have a capacity-to-demand ratio of less than the 0.6. This is generally accepted as the trigger value for seismic upgrades. It is considered to be the minimum level (life-safety level) for any seismic upgrades. At this level, the building is expected to survive a code level earthquake, possibly with irreparable structural damages and the building occupants would be able to exit the building safely. It is preferable to upgrade the building to a higher level if economically achievable. Details regarding the evaluation of this ratio value are discussed in the structural description and visual review, found below the visual review table, for each of the essential service buildings. The estimated costs for seismically upgrading essential service buildings are prioritized by year below.

Year	Buildings	Total Estimated Cost
2017	Police Station, Fire Station, Garage	\$800,000
2018	Municipal Hall, PW Office, PW Maintenance	\$1,650,000
2019	Monterey Centre and Library	\$1,740,000

A number of major expense projects (>\$50,000) within older buildings and known hazardous materials buildings were allocated a 10% contingency for asbestos abatement. Examples of such projects that have this contingency included are: electrical service replacement, interior lighting, seismic upgrades, stucco wall repairs, and replacing interior finishes.

2.1. ESSENTIAL SERVICES BUILDINGS

2.1.1. No. 1a – Fire Station



<p>1703 Monterey Avenue</p> <p>Peak Occupancy: 20 Persons</p> <p>Staffing (avg.): 8-10 Persons</p> <p>Built: 1938</p> <p>Addition(s): 1963, 2002 Seismic Upgrade</p> <p>Current Area: 8,400 sf</p> <p>HVAC: Electric baseboard and roof top units (RTU), Natural gas boiler</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, no wheelchair access</p>	 
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Figure 1 - No. 1a – Fire Station

2.1.1.1. Description

The fire and police department are both located at 1703 Monterey Avenue, the entry to Fireman’s Park. Both essential services share a coupled, heritage-designated, facility whose original three-storey structure was built in 1938 to serve as a new fire station. In 1963 an addition to the west brought two further apparatus bays as well as an adjoining second-level and basement. The ground floor entrance to the Fire Station is located on the original, east, side of the building, where staff offices and dispatch areas are currently located. The five apparatus bays take up the majority of the building’s floor area. Utilities, storage, and an exercise area are located in the basement below the bays while a staff kitchen, washroom, lounge, meeting room and dormitory are located on the second-level. Two second-level decks are located on the north elevation and another is located on the east elevation out the back of the kitchen with picnic table seating. This kitchen deck required a guardrail in order to comply with life safety requirements of the building code.

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists of carpeting, vinyl-sheet, ceramic tile, hardwood, and unfinished concrete at utility and storage rooms. Interior walls are finished with painted gypsum wall-board, plaster and concrete.

BUILDING ENVELOPE: The lower level of the building is constructed with multi-wythe bricks while the wood-framed upper-level is clad with Tudor-style, where painted stucco. Wood trim and fascia boards are set between and on stucco panels. Windows are original wood-framed (fixed, single-hung, and casement) on the lower level and recently replaced Pella wood-frames on the upper-level. Exterior doors and motorized roll-up bay doors are original wood. The wood-framed roof features steep-sloped (14/12) asphalt shingle and low-sloped SBS membrane roof and deck areas. Gutters and downspouts connected to perimeter drains run along the north and south lengths of the sloped roof.

STRUCTURAL: The original 1938 Fire Hall had three levels, two above grade and one partial floor in the basement. Walls on the first floor consist of multi-wythe bricks, while the roof structure, the upper floor framing, as well as the upper floor walls are all wood-framed. A 1963 addition added two apparatus bays to the west. This addition also included a basement level and a second floor above the apparatus bays. Exterior walls on the first floor of the addition consist of a single-wythe brick wall backed onto concrete block masonry walls. Upper floor framing is similar to the original construction and is built entirely from wood-frame. The Police Station was built in 1957 and constructed tight to the east side of the Fire Hall. There was a seismic upgrade of the Fire Hall carried out in 2002, the design of which was done to the 1995 National Building Code of Canada.

The 2002 seismic upgrade consists of the construction of new 100 mm thick concrete walls on one side of the existing masonry walls on the first floor; upper floor upgrades include new wood-framed shear walls, new floor diaphragm and connections to shear walls. The upgrade also added a steel braced frame on the lower floor. The concrete and structural steel design was based on the 1994 editions of the concrete and steel design standards, which lack a lot of the ductility and detailing requirements for post-disaster buildings that are in current editions. In its current condition, the Fire Hall with its stiffer lateral system has the tendency to attract lateral loads from the adjacent Police Station. The Fire Hall has a seismic capacity-to-demand ratio of about 0.2.

Seismic upgrade of the entire building which includes the Fire Hall and the Police Station is one option to consider. There are challenges associated with a seismic upgrade to the entire building. The Fire Hall side is much stiffer than the Police Station side. Any new lateral system to upgrade the combined building would have to be made as stiff as the existing masonry and concrete walls in the Fire Hall. The addition of such a lateral system would pose significant space challenges in the already tight spaces of the Police Station and the Fire Hall. Floor layout may have to be revised or external lateral supports added to minimize the impact on the use of the available floor space.

MECHANICAL:

Natural gas is supplied through a meter set on the Northwest side of the building and serves both the police and fire station. The gas supply runs through the basement and into the boiler room of the Fire Station. A central

hot water heating system is located in the Fire Station lower-level boiler room and services both the Fire Station and the Police Station. The heating system is composed of a single boiler with two secondary heating loops (Fire Station and Police Station). The heating water is distributed to perimeter convectors in the offices, cast iron radiators on the second level, and unit heaters in the garage and basement areas of the Fire Station. Both permanent and temporary electric baseboards and heaters are present as a back-up to the hot water heat. The Fire Chief and Inspections offices are served by the Police Station heating loop and ventilation system. It is recommended that the Fire Station HVAC system be separated from the Police Station.

The boiler room has one older type natural gas boiler which cannot be replaced with the same model as it is no longer made. The existing boiler is a high temperature boiler which if to be replaced today should be a low temperature boiler. Any change in boiler efficiency work would only be pursued if the existing HVAC system was also upgraded to take advantage of the efficiency of the newer boiler. The boiler area is shared with a gas fired hot water tank and laundry facility while it should be isolated from them. Both the boiler and the hot water tank flues run up and into an existing chimney to vent at the roof.

There is an existing fan coil unit in the west bay garage that supplies heated air through a hydronic coil to the bay and basement level. This system is controlled through a thermostat. There is no fresh air supply to the basement. An existing system, in the west bay, was used to supply air in a bunker area; however, it is not being used and is not a source of clean outdoor air. The basement area has a workout area and a small repair shop, each requires ventilation to meet current Code.

There is an existing site-made (non-proprietary) tail pipe exhaust system in the west bay servicing the garage bay's that exhausts tail pipe and general air fumes through a wall cap on the back south side of the building. This system is manually activated on a timer.

An existing 3 ton heat pump unit located on the roof over the first level fire station office is linked to a fan coil unit in the mezzanine attic space. This system provides conditioned air to the first level office area now located in the garage bay. Supply air is ducted from the fan coil in the attic space to supply diffusers and then returned back to the air handling unit through return grilles. A single programmable thermostat controls the operation of the unit for this area. Diffusers are installed in drop T-bar ceilings that were installed at the time of this area's renovation (approximately 1999). The users indicated that there were different thermal comfort requirements for each worker. The HVAC system does not appear to be flexible to their individual needs.

There is one unisex washroom with two showers on the mezzanine level of the Fire Station. There are operable windows yet no exhaust ventilation. Ventilation for this washroom is not to the current BC building Code. There should be a separate washroom and locker room to avoid the Uni-sex requirement. There is a dryer in the basement boiler room that is ducted to through an open window into a well at grade level.

A recent kitchen upgrade was done in 2008, as indicated by staff, on the 2nd level for the Fire Station crew. The area has an exhaust fan and range hood over the oven area.

Overall the heating and ventilation within this building is poor. It appears that there are three separate building conditions. The two storey Garage and 2nd level bay areas have been engineered under the older Codes and have not had any significant upgrades since then. The garage bay closest to the Police station has been reconfigured and recently renovated to accommodate offices and is outfitted with a split fan coil heating and cooling system. Finally the Fire Station shares HVAC with the Police station which is under performing and should be separate for each user. Observations noted throughout the HVAC systems include:

- There are portable and permanent heaters located in the shared Police and Fire Station building indicating that there is insufficient heat in this area.
- A single cooling and heating zone covers only the added office area (Garage Bay reclaimed space). The system should be expanded to cover the adjacent office area. A single zone for this size of building is not uncommon. However, the use and occupants of this building should govern the design of the system. There are professionals which are in full gear (vest, equipment belts, etc.) to office workers in light clothing. The single zone heating and cooling system cannot respond to this which creates an uncomfortable working environment.
- The occupants of the shared Police and Fire Station area do not have individual control of the central heating plant. Reports were given that this heating water has been adjusted (higher or lower) to suit the Fire Station which will in turn either overcool or overheat the shared area. These two systems should be isolated from each another. There are temperature zones within the Fire Station that are controlled by thermostats within the Police Station.
- The washroom requires ventilation. Ventilation for this washroom is not to the current BC building Code. Separate washrooms for men and women should be added to serve the needs of the Fire Station more completely.
- The basement does not have any ventilation air and is shared with the boiler room/laundry room. Ventilation should be added to each space according to its use (e.g. workshop, exercise etc.). This area is not to current BC building Code for its use.
- There is no ventilation in the lounge and sleeping quarters on the upper level. They are reliant on operable windows. This is not uncommon for the time; however it is not to the current BC building Code.
- Some areas on the second level are used as office space and should have proper ventilation.
- The existing vehicle exhaust system is not certified and is in use; however, it is not to today's standard for this type of facility. Low ceiling heights in this facility may present an issue when considering any upgrade.

- Plumbing:

There are two areas with plumbing fixtures: the upstairs kitchen and the mezzanine unisex washroom. The kitchen has a sink and a dishwasher that staff indicated were installed in 2008. The washroom has older single handle faucets, ceramic lavatory basins and two 2-piece acrylic or fiberglass shower stalls with shower

spout and handle. There is no janitor or laundry sink in the facility. The water closets are of the older high flow tank type which use twice the maximum water to today's Code.

There is a laundry area with two washing machines and one dryer next to the gas-fired boiler, hot water tank and electrical panels on the lower level. This area should be separated from the electrical panels and boiler equipment.

There is a 189L natural gas fired hot water tank that supplies domestic hot water to the Fire Station. Domestic cold water, 25 mm [1" dia.], is supplied from the Fire Station water entry in the Boiler Room and has proper backflow protection. Domestic cold water is supplied from the boiler room and then distributed to both the Fire and Police stations. The piping is copper and steel braided hose. There are hose bibs located in various parts of the station to service the bays.

The sanitary sewer system is comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. The storm system is comprised of aluminum rainwater leaders that collect roof runoff to concrete downspout shoes. Two storm sump pumps, located in the basement Recreation and Equipment Storage rooms, collect building storm water and pump it up to the building storm main. One sump collects perimeter water run-off along an older foundation that is now an interior wall. The other sump collects water from the exterior stair area drain and the garage pit above.

Observations noted throughout the plumbing system include:

- The plumbing systems appear to be older with fixtures (except the Kitchen fixtures) and piping systems approaching the end of their useful life expectancy.
- There is no janitor or laundry sink in the facility.
- A new washroom should be added to provide separate access for men and women, as well as staff/criminal separation.
- Fire Suppression:

The facility is not protected with a fire suppression system. Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The Fire Department shares an electrical service and generator with the Police Station (attached building). There is no Fire Alarm system or exit signs. The diesel generator is past its expected life serviceability and is overloaded; the computers and servers in the building are connected to individual UPS units that are not monitored. Much of the electrical system is beyond its estimated service life, including lighting equipment, wiring devices and the main distribution (panel and breakers).

The communication system and equipment are in good to excellent condition. The paging system is operational but needs replacement. There is a fibre optic server in the basement that acts as a backup server for the district of Oak Bay.

The recently renovated office and dispatch area is in excellent electrical condition, including new smoke alarms, lighting, and wiring devices.

2.1.1.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 1: Condition of Building Systems – No. 1a – Fire Station

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Paint				X	
Vinyl Sheet				X	
Carpet					X
Marmoleum			X ₁		
Hardwood Flooring				X	
Building Envelope					
Brick			X ₂		
Stucco			X		
Wood Trim & Fascia Board			X ₃		
Windows, Wood			X		
Exterior Wood Doors				X	
Bay Roll-Up Doors				X	
Gutters & Downspouts				X	
SBS Membrane-Roof				X	
SBS Membrane-Deck	X ₄				
Asphalt Shingles				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers				X	
Roof Top Unit HP AC unit				X	
Fan coil Units				X	
Fan assisted Heating Water Unit Heaters				X	
Heating Water Boiler			X		
Heating Water Pump			X		
Heating Water Radiators			X		
Storm Sump Pumps	X				
Garage Vehicle Exhaust Fan				X	
Natural Gas Hot Water Tank					X
Plumbing Fixtures – washroom		X			
Plumbing Fixtures – Kitchen					X
Domestic Water System			X		
Electrical					
Main Distribution Equipment		X ₅			
Secondary Distribution Equipment		X ₆			

	Concealed	Poor	Fair	Average	Good
Smoke Alarms				X ₇	
Lighting – Interior and Exterior			X	X	
Wiring Devices			X ₈		
Emergency Generator		X ₉			
Transfer Switch		X			
UPS Units			X		
Electric Heating			X		
Paging System		X			
Communications System					X ₁₀
Structural					
Seismic Restraint		X ₁₁			

Notes:

1. Marmoleum flooring at transitions to hardwood exhibiting cracking/flaking. Dormitory areas showing signs of wear.
2. Some deterioration at corners of brick and mortar. Efflorescence significant on rear of building. One instance observed where a piece of wood (1"x2") used to plug a hole between bricks.
3. Fascia board paint wearing near drip edge. Deterioration of board where low-sloped roofing meets sloped roofing. Board is tight to shingles and without diverter or step flashing. Black paint on Tudor trim is peeling.
4. SBS membrane on deck areas somewhat concealed by wood slate decking. Exposed areas appeared in fair condition.
5. Service Shared with Police Station.
6. Branch circuit wiring intermixed with Police station loads.
7. A fire alarm system is recommended.
8. Devices in new addition for firefighters are in excellent condition.
9. The generator is out of date and overloaded. Circuits shared with Police station. Replacement cost has been assigned to building No.1c Garage where both generators and transfer switch are located
10. A fibre server in the basement acts as a backup for Oak Bay.
11. Seismic capacity-to-demand ratio of 0.2.

STRUCTURAL: Significant structural distress was not observed. At a few door and window openings, hairline cracks are observed in the concrete walls that are constructed in the 2002 seismic upgrade. The cracks typically start at or near corners and extend away from the opening. They do not appear to be significant.

2.1.1.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Fire Station: Baseline Recommendations:

2016

- Cut back deteriorated fascia board at areas where low-sloped roof meets sloped roof. Install step and diverter flashing to remove water and protect wood.

2017

- Separate the Fire Station and the Police Station such that each has independent heating/cooling controls by adjusting existing systems.
- Seismic Upgrade

2018

- Design and installation of an application appropriate heating, ventilation, cooling and control system.
- Improve ventilation required in Washroom
- Improve ventilation in Basement area Repair and Exercise Rooms.
- Improve ventilation in the recreational space and sleeping quarters on the upper level.
- Improve ventilation in the second level office space.

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Code.
- Improve maintenance and add a janitor or laundry sink.
- Improve washroom accessibility and add a new washroom.
- Design and install a fire sprinkler system to NFPA 13.
- Design an up to date vehicle exhaust system that is certified and to today's standard for this type of facility.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 2: Summary of Present-Value Building Costs every 5 years – No. 1a – Fire Station

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$13,900	\$30,060	\$-	\$20,300	\$64,260
Building Envelope	\$24,600	\$45,200	\$12,600	\$12,900	\$95,300
Mechanical Summary	\$19,000	\$45,000	\$22,500	\$20,000	\$106,500
Electrical Summary	\$129,300	\$-	\$5,000	\$3,800	\$138,100
Structural Summary	\$530,000	\$-	\$-	\$-	\$530,000
Total	\$716,800	\$120,260	\$40,100	\$57,000	\$934,000

The Fire Station currently faces challenges with seismically upgrading, electrical systems are non-existent or beyond their estimated service life, and mechanical systems and controls are deficient. Significant investment in the building is required, this investment should be weighed against NEEDS assessment findings before renovating the building.

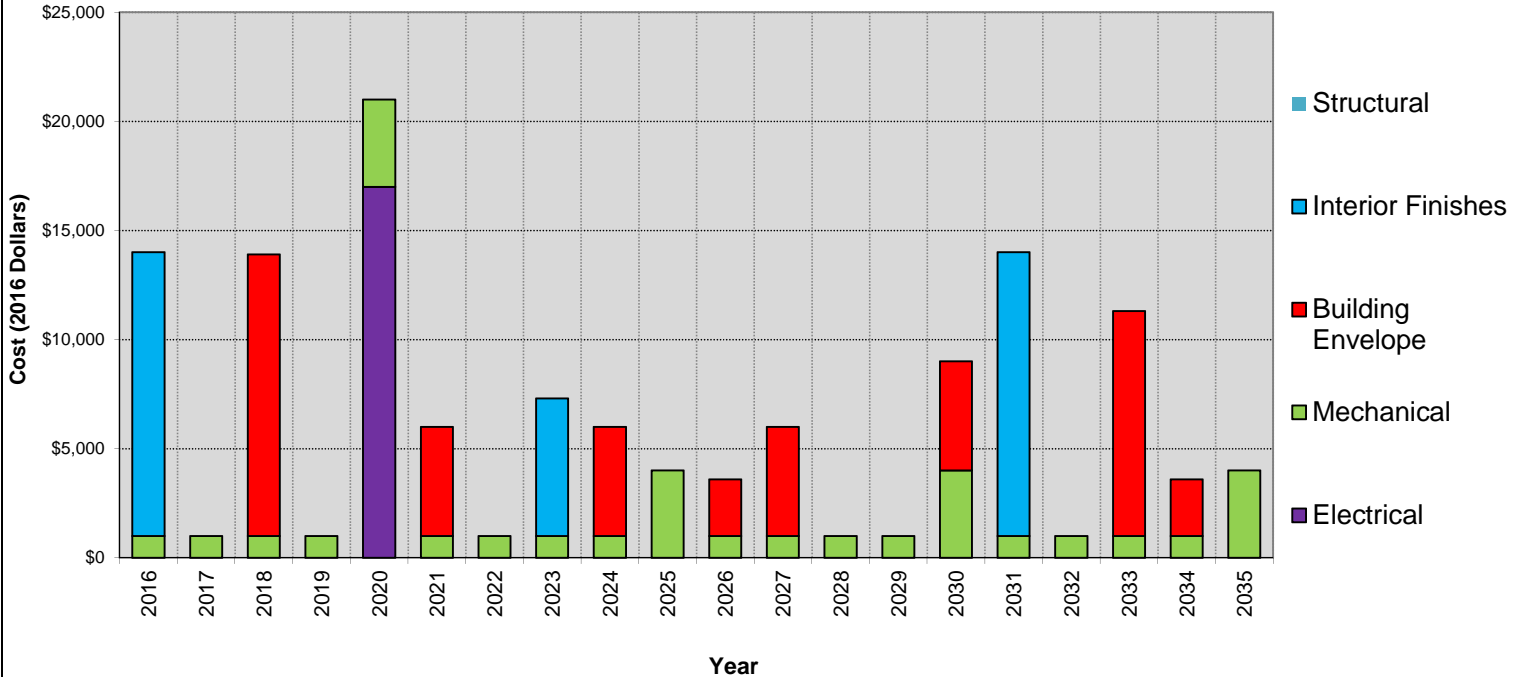
Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																								
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035					
Section 4 - ELECTRICAL COMPONENTS																															
Breaker Panel	Maintenance																														
Main	Replacement	28000	1967	35	15	2017		28,000																							
Breaker Panel	Maintenance																														
Secondary	Replacement	55000	1967	35	15	2017		55,000																							
Smoke	Maintenance																														
Alarms	Replacement	1000	2010	10		2020																			1,000						
Electric Heating	Maintenance	2000	1985	35		2020																									
	Replacement																														
Lighting	Maintenance																														
Exterior	Replacement	2500	1985	30	5	2020																									
Lighting	Maintenance																														
Interior	Replacement	11000	1985	35		2020																									
UPS Units	Maintenance																														
	Replacement	4000	2010	10		2020																									
Paging	Maintenance																														
System	Replacement	2000	1985	20	15	2020																									
Intrusion	Maintenance																														
System	Replacement	3800	1985	15	16	2016	3,800																								
Communication	Maintenance	32500	2010	30		2040																									
System	Replacement																														
Wiring Devices	Maintenance	15000	1985	35		2020																									
	Replacement																														
Door	Maintenance																														
Intercomm	Replacement	5000	1985	25	7	2017		5,000																							
Electrical	Maintenance																														
Summary	Replacement						3,800	88,000																	5,000	3,800					
Section 5 - STRUCTURAL COMPONENTS																															
Seismic	Maintenance																														
Upgrade	Replacement	530000				2017		530,000																							
Structural	Maintenance																														
Summary	Replacement							530,000																							
Building Summary																															
Maintenance	Replacement						14,000	1,000	13,900	1,000	21,000	6,000	1,000	7,300	6,000	4,000	3,600	6,000	1,000	1,000	9,000	14,000	1,000	11,300	3,600	4,000					
							14,800	618,000	900	32,200	2,000			23,760		70,200	11,500			2,000	5,000	15,800				7,300					
Yearly Totals							\$28,800	\$619,000	\$13,900	\$1,900	\$53,200	\$8,000	\$1,000	\$31,060	\$6,000	\$74,200	\$15,100	\$6,000	\$2,000	\$3,000	\$14,000	\$29,800	\$1,000	\$11,300	\$3,600	\$11,300					
Totals Inflated at 2% per Year							\$28,800	\$631,380	\$14,462	\$2,016	\$57,585	\$8,833	\$1,126	\$35,678	\$7,030	\$88,676	\$18,407	\$7,460	\$2,536	\$3,881	\$18,473	\$40,107	\$1,373	\$15,823	\$5,142	\$16,462					

No.1a Fire Station

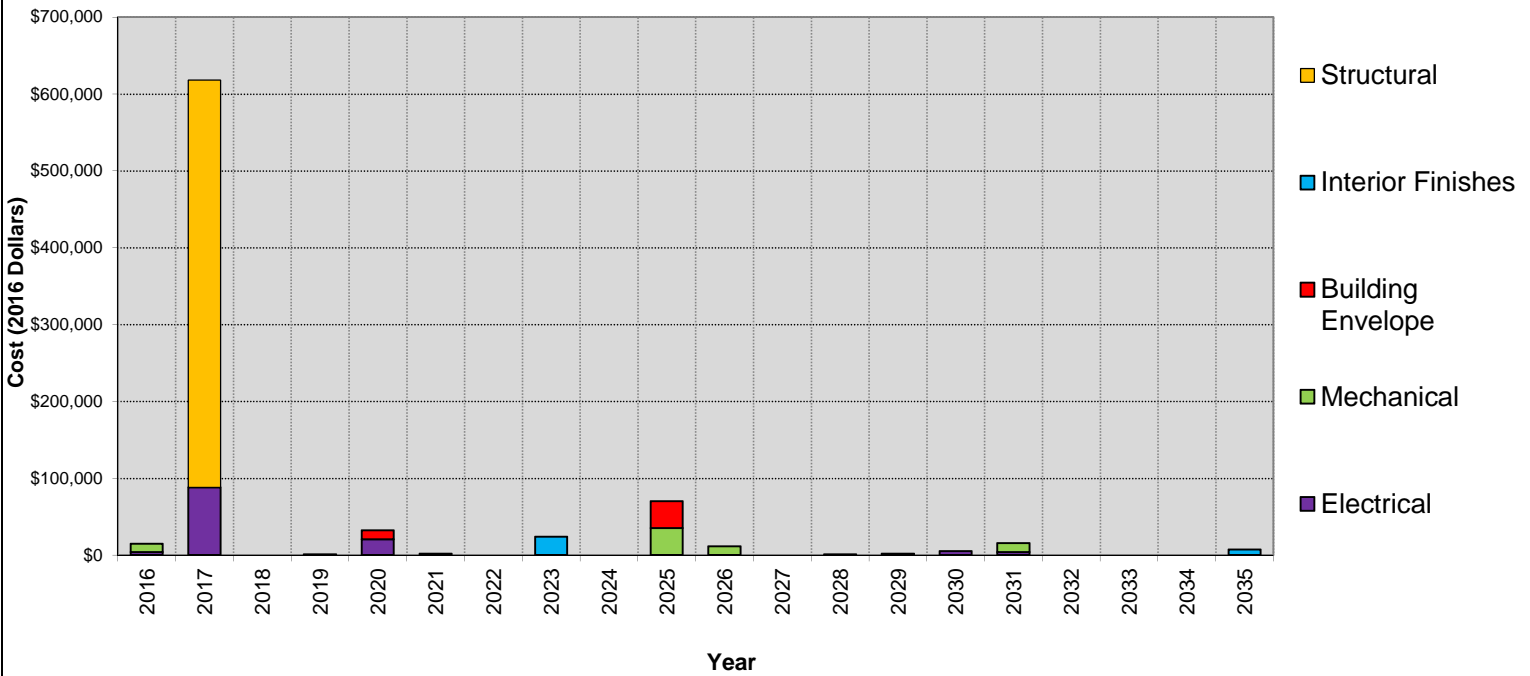
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.1a Fire Station

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Carpet	Maintenance					
	Replacement	\$ 7,300	2015	20		2035
Vinyl Sheet	Maintenance					
	Replacement	\$ 900	1994	25		2019
Marmoleum	Maintenance					
	Replacement	\$ 23,760	1955	50	18	2023
Hardwood Flooring	Maintenance	\$ 6,300	2008	15		2023
	Replacement					
Interior Paint	Maintenance	\$ 13,000	2003	15	-2	2016
	Replacement					

NOTES:

Maintenance:

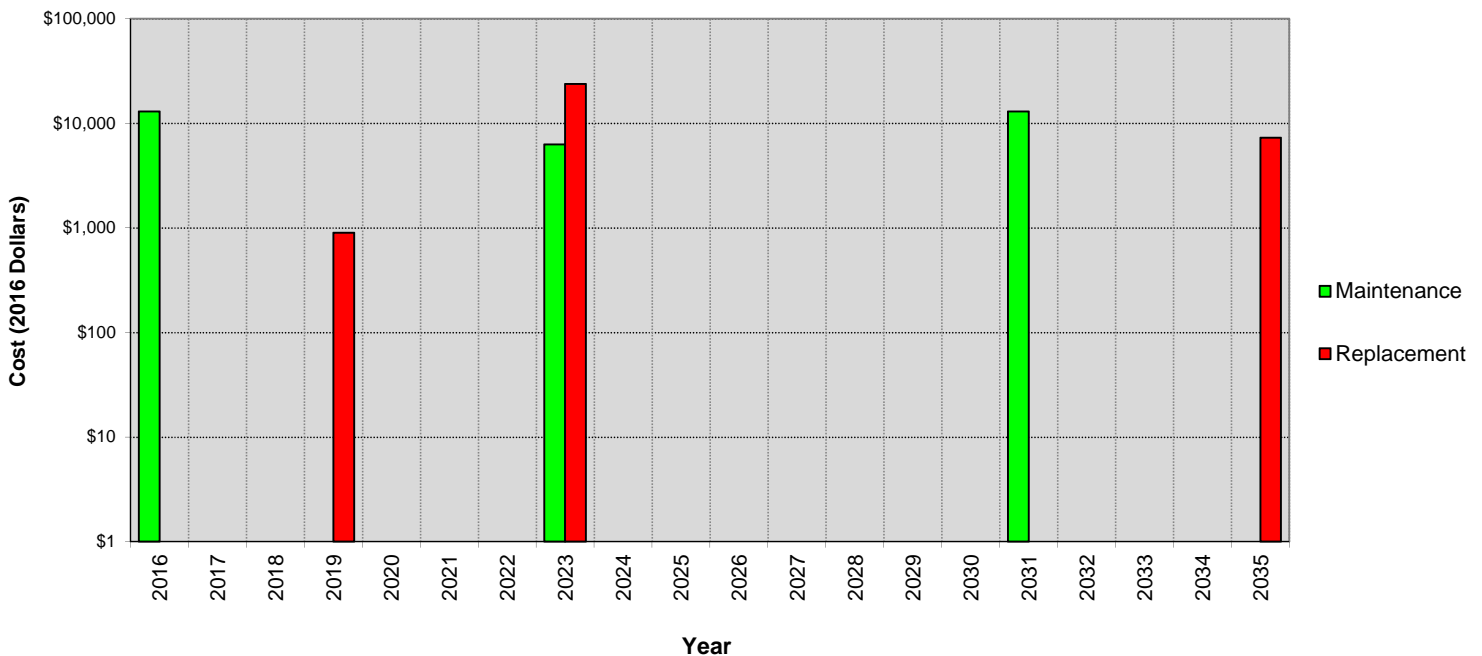
Office and upper level areas are painted with internal staff, expense is omitted. Painting of bays scheduled for 2016 with \$13,000 budgeted.

Hardwood floor maintenance includes sanding, filling and two coats of varnish.

Replacement:

Marmoleum flooring on upper level: stairs, washrooms, kitchen, dormitory and meeting room. Replacement scheduled with refinishing hardwood flooring.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1a Fire Station

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Brick	Maintenance Replacement	\$ 2,000	2005	15	-2	2018
Stucco	Maintenance Replacement	\$ 3,300	2005	15	-2	2018
Wood Trim & Fascia Board	Maintenance Replacement	\$ 2,600	2010	8		2018
		\$ 6,700	1965	40	20	2025
Wood Windows	Maintenance Replacement	\$ 11,700	1965	45	10	2020
Exterior Doors	Maintenance Replacement	\$ 4,800	1965	60		2025
Bay Doors	Maintenance Replacement	\$ 5,000	2015	3		2018
Gutters & Downspouts	Maintenance Replacement	\$ 1,300	2000	25		2025
SBS Membrane Roof	Maintenance Replacement	\$ 5,400	2000	25		2025
SBS Membrane Deck	Maintenance Replacement	\$ 4,200	2000	25		2025
Asphalt Shingles	Maintenance Replacement	\$ 12,800	2000	20	5	2025

NOTES:

Maintenance:

Brick maintenance includes cleaning growth and efflorescence.

Exterior cleaning and paint (brick, stucco and wood trim) scheduled together for economy of scale savings. Wood trim includes windows, doors, and fascia board. Downspouts should be removed when repainting for full coverage.

Bay door maintenance includes finishes and hardware so that operation remains uninterrupted for emergency services.

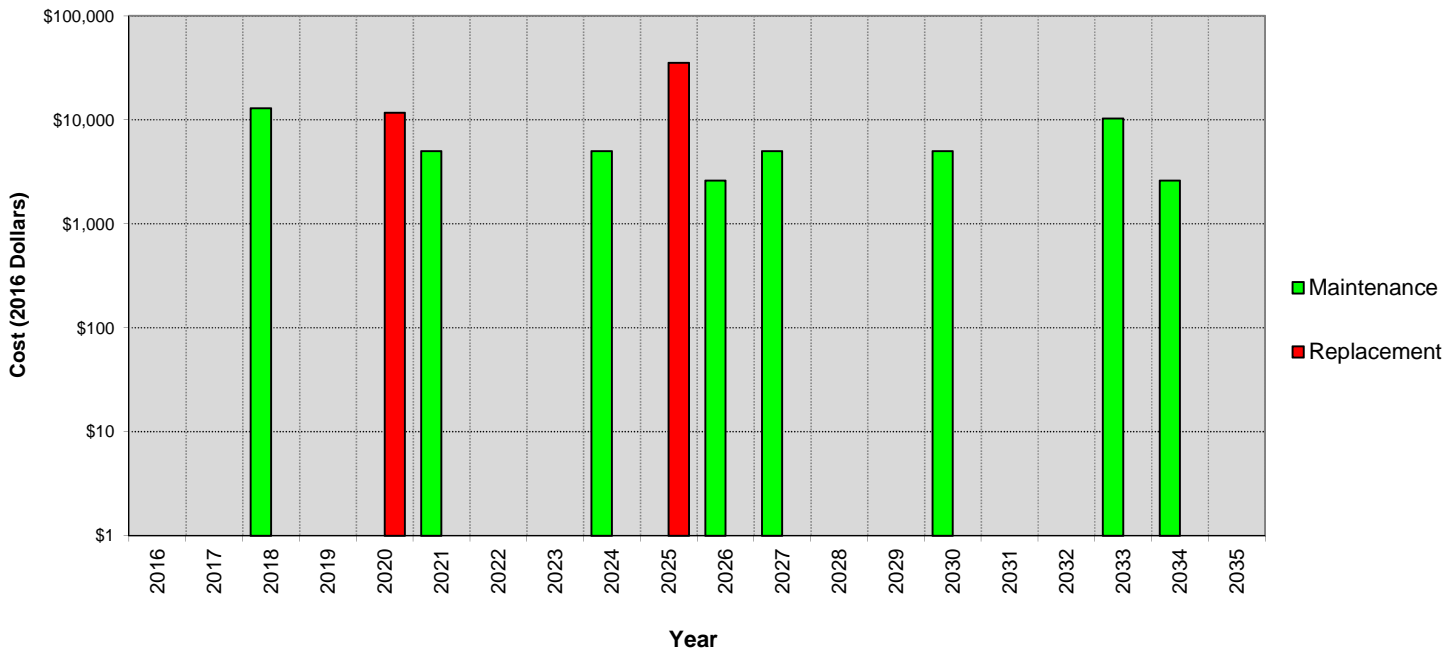
Replacement:

Wood window replacement for remaining, original, windows on lower level. Replacement with Pella 750 series to match 2012 window replacement on upper level.

SBS membrane replacement at low-sloped roof and north and south decks.

Asphalt shingles extended 5 years due to good condition and to coincide with SBS roofing replacement. Wood trim and fascia board also scheduled to coincide with replacement.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.1a Fire Station

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
RTU 3 ton HP	Maintenance Replacement	\$ 5,000	1999	15	2	2016
RTU 3 ton HP	Maintenance Replacement	\$ 5,000	1999	15	2	2016
Heating Water Pumps 1-1/2"	Maintenance Replacement	\$ 1,000	1994	10	12	2016
Storm Sump Pumps 1-1/2"&1"	Maintenance Replacement	\$ 2,000	2011	10		2021
Boiler High Temp	Maintenance Replacement	\$ 35,000	1990	35		2025
Exhaust Fans Range Hood	Maintenance Replacement	\$ 500	2006	20		2026
Exhaust Fans Vehicle	Maintenance Replacement	\$ 5,000	2006	20		2026
Fan Coil Area Heat West Garage Bay	Maintenance Replacement	\$ 5,000	2006	20		2026
Hot Water Tank 320L Nat. Gas	Maintenance Replacement	\$ 2,000	2014	15		2029
Plumbing Fixtures Washroom	Maintenance Replacement	\$ 3,000	2015	5		2020
Plumbing Fixtures Kitchen	Maintenance Replacement	\$ 1,000	2008	20		2028
Controls Electric	Maintenance Replacement	\$ 1,000	2015	1		2016

NOTES:

Maintenance:

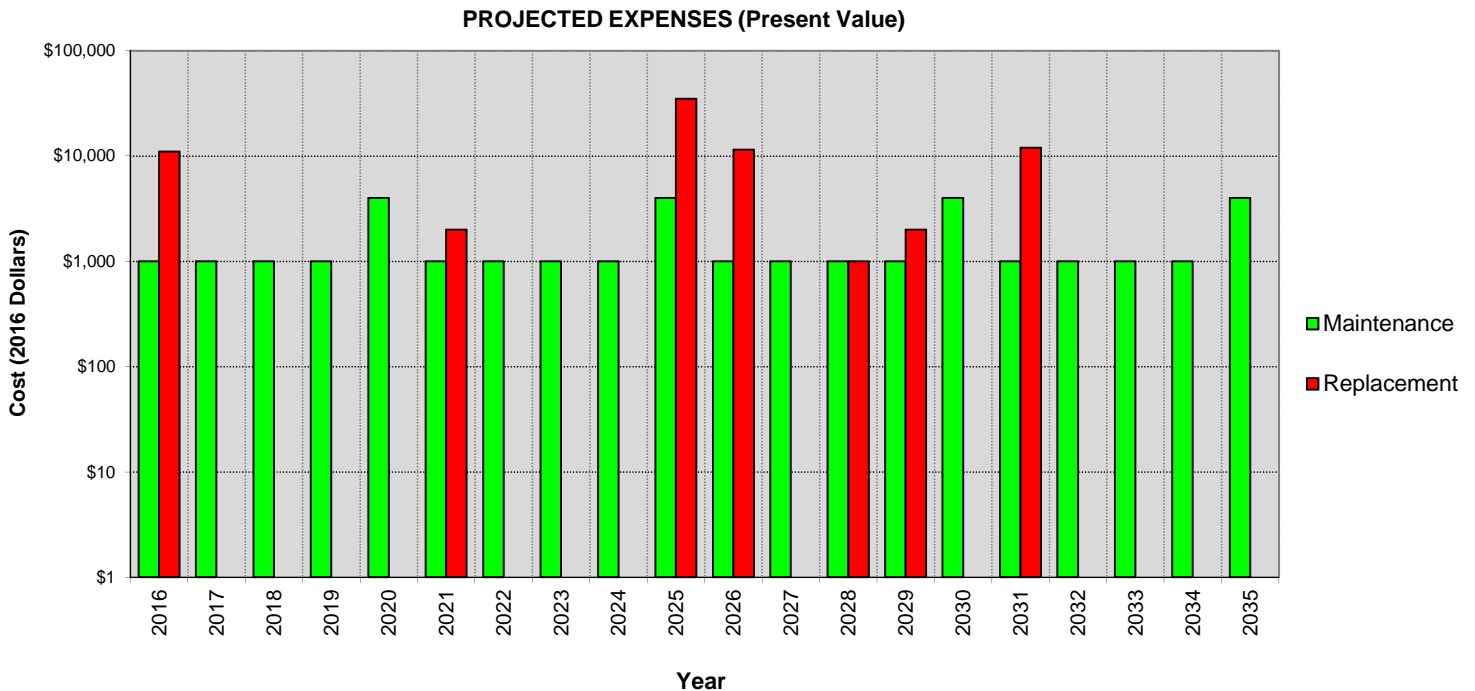
Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

Storm Sump Inaccessible.

Plumbing Fixtures variable age. Replace as required.

Exhaust fans inaccessible.

Replacement:



The dollar axis is in logarithmic scale for ease of presentation.

No.1a Fire Station

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 28,000	1967	35	15	2017
Breaker Panel Secondary	Maintenance Replacement	\$ 55,000	1967	35	15	2017
Smoke Alarms	Maintenance Replacement	\$ 1,000	2010	10		2020
Electric Heating	Maintenance Replacement	\$ 2,000	1985	35		2020
Lighting Exterior	Maintenance Replacement	\$ 2,500	1985	30	5	2020
Lighting Interior	Maintenance Replacement	\$ 11,000	1985	35		2020
UPS Units	Maintenance Replacement	\$ 4,000	2010	10		2020
Paging System	Maintenance Replacement	\$ 2,000	1985	20	15	2020
Intrusion System	Maintenance Replacement	\$ 3,800	1985	15	16	2016
Communication System	Maintenance Replacement	\$ 32,500	2010	30		2040
Wiring Devices	Maintenance Replacement	\$ 15,000	1985	35		2020
Door Intercomm	Maintenance Replacement	\$ 5,000	1985	25	7	2017

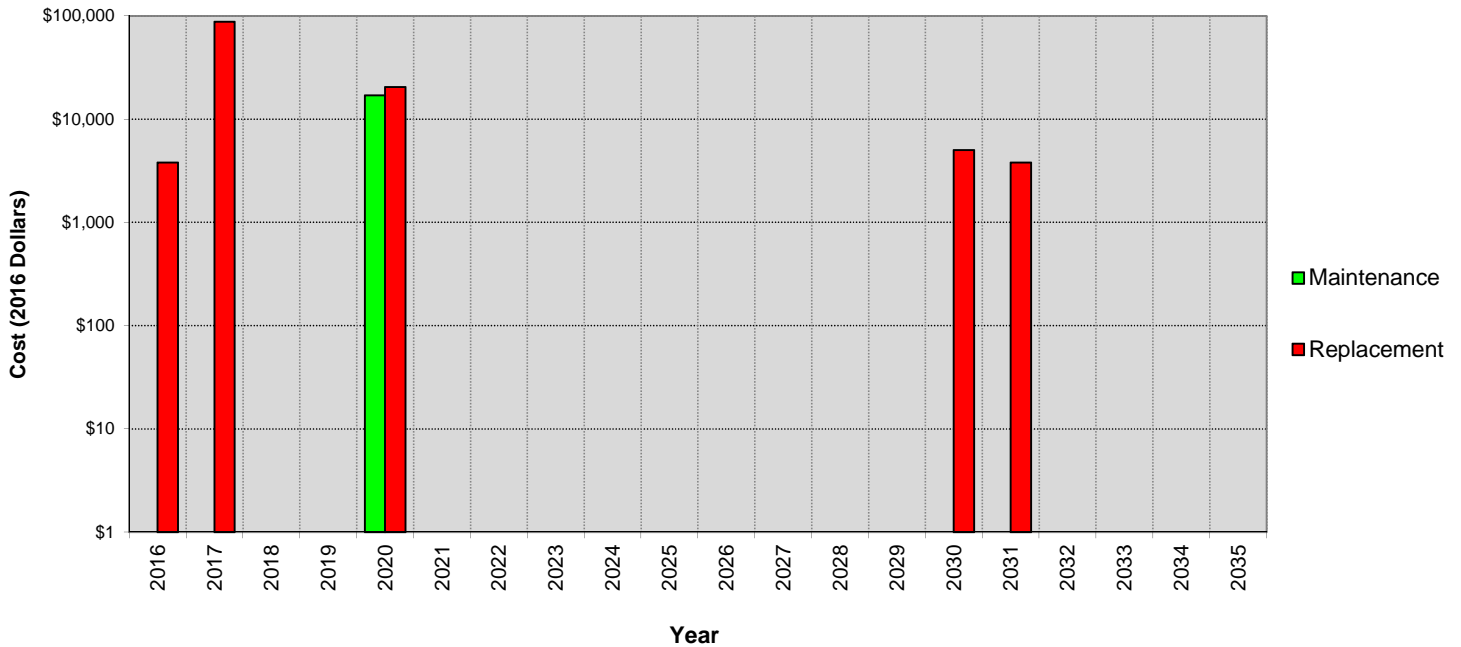
NOTES:

Maintenance:

Replacement:

Electrical Distribuion equipment is past expected life expectancy and is recommended for replacement.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1a Fire Station Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance					
	Replacement	\$ 530,000				2017

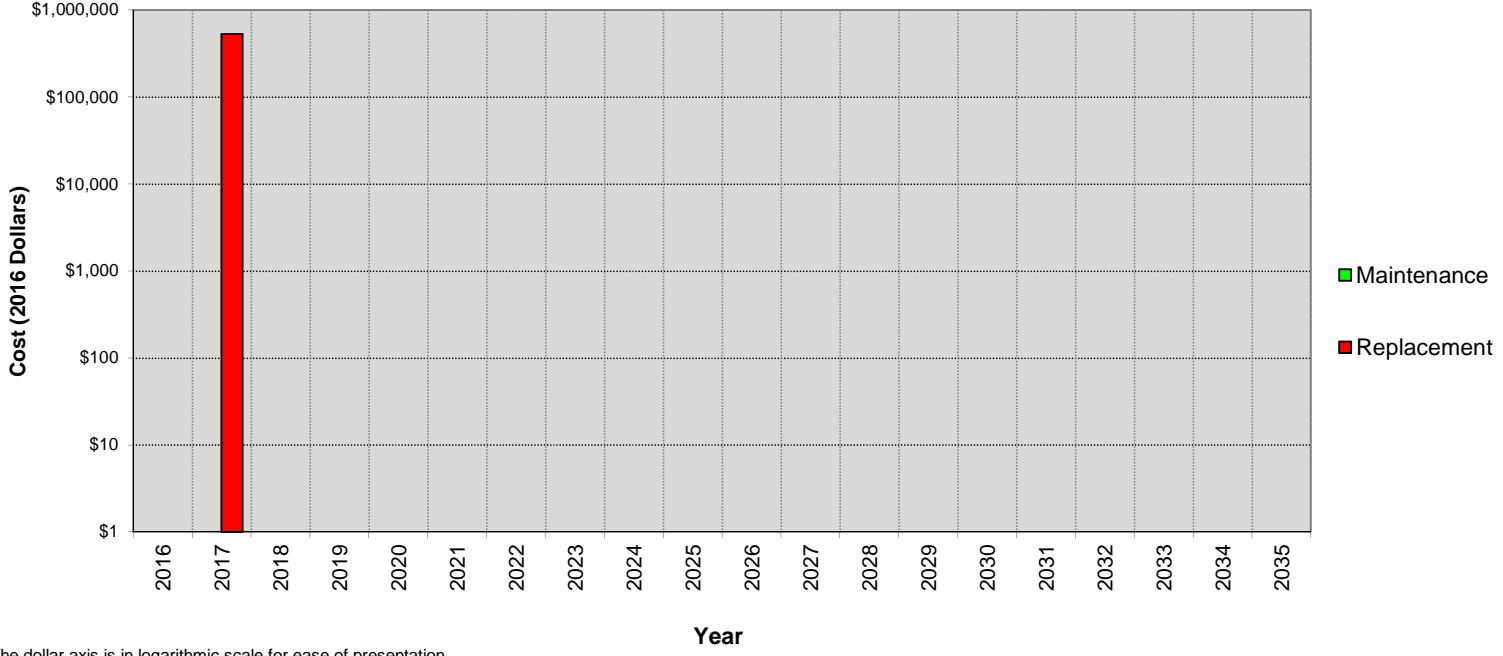
NOTES:

Maintenance:

Replacement:


Seismic upgrade of the entire building which includes the Fire Hall and the Police Station is one option to consider. There are challenges associated with a seismic upgrade to the entire building. Any new lateral system to upgrade the combined building would have to be made as stiff as the existing masonry and concrete walls in the Fire Hall. The addition of such a lateral system would pose significant space challenges in the already tight spaces of the Police Station and the Fire Hall. Floor layout may have to be revised or external lateral supports added to minimize the impact on the use of the available floor space.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.2. No. 1b – Police Station

<p>1703 Monterey Avenue</p> <p>Peak Occupancy: 30 persons</p> <p>Staffing (avg.): 23 persons</p> <p>Built: 1958</p> <p>Addition(s): 1978</p> <p>Current Area: 7,300 sf</p> <p>HVAC: Electric baseboard and Air handling unit (AHU), Natural gas boiler</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, no wheelchair access</p>	 <p><i>Figure 2 - No. 1b – Police Station</i></p>
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2.1.2.1. Description

The fire and police department are both located at 1703 Monterey Avenue, the entry to Fireman’s Park. Both essential services share a coupled facility whose original structure was built in 1938 to serve as a new fire station. In 1958 a 1,950 ft² police station was adjoined to the east, followed by a small addition (600 ft²) further to the east between 1958-1978, and a final 1,300 ft² addition in 1978 extending north of the 1958 building. The police station consists of staff offices and kitchen, interview rooms, a holding cell, records, evidence, lockers, storage, washrooms, change rooms, and a meeting area.

This Police building would be considered a Group D Classification without Detention Quarters. By current Code the building exceeds the allowable area for a building without sprinkler fire suppression. Additionally, the floor assembly and supporting structure are required to have a 45min fire resistance rating.

INTERIOR FINISHES & FURNISHINGS: Interior flooring is finished with carpeting, vinyl-sheet flooring, ceramic tile, and unfinished concrete at utility and storage rooms. Interior walls are finished with painted gypsum wall-board. To accommodate growing staff numbers and changing functional needs the Police Station has had minor interior renovations to meet their needs. The minimum maintenance to the interior finishes such as paint and

carpet have been provided periodically, however the interior appears dated, worn, technically and spatially inadequate. The general interior conditions of the Police Station are in fair to good condition, however, most significantly the interior walls throughout do not provide the acoustic separation that is required for this type of facility. High levels of privacy are needed throughout the facility. The renovation required to provide the walls with an adequate acoustic rating would be extensive, and considered as a band aid solution on a greater issue, that is, existing functional spaces and layout that inadequately service the inhabitant's needs. Some identified Code issues include: an emergency power generator located in an unrated room in the detached Garage (Building No.1c) that is shared with fuel storage, evidence storage and Emergency Response Storage. Also noted is the guardrail height at the internal stairs that doesn't meet current standards.

BUILDING ENVELOPE: The wood-framed structure is clad entirely with brick veneer and features wood-framed single pane windows with painted wood trim. The main portion of the roof is low-sloped SBS 2-ply membrane with roof-top drains. Further perimeter portions of the roof are steep-sloped (14/12) asphalt shingle with gutters and downspouts to perimeter drains.

STRUCTURAL: The original 1958 building was built adjacent to the 1938 Fire Hall without any physical separation. It is a two-storey structure with one level below grade. There was an addition to the east that was built sometime between 1958 and 1978. This addition also has a basement level. The third addition at the north end is a single storey addition that is above grade. All of the above grade structures are wood-framed and built tight to each other. Even though the entire structure for the police station was built at times prior to any seismic design, the wood-frame superstructure does have some inherent capacity to resist lateral seismic forces. Current building Codes have detailing and ductility requirements for post-disaster buildings. The police station can be categorized into the post-disaster category of buildings and must meet the relevant Code requirements for post-disaster buildings. Some of these details are likely lacking or not present at all. These include hold-down anchors at the end of shear walls and proper seismic load paths from the roof diaphragm to the foundations. In its current condition, the structure for the Police Station has a seismic capacity-to-demand ratio of about 0.3, under current Code load levels.

For post-disaster buildings, the intent of the current Building Code is that these buildings can remain fully operational even after a disaster, such as a Code level wind storm or a Code level seismic event. In such context, seismic upgrading of existing deficient post-disaster buildings would have to meet 100% of the building Code requirements, rather than upgrading to an improved level of performance that is less than 100% of the Code. The building has not been seismically upgraded, and it is not recommended given the significant functional, spatial, and physical inadequacies of the existing building.

MECHANICAL:

- Heating, Ventilation and Cooling (HVAC):

A central hot water heating system is located in the Fire Hall and services both the Fire Hall and the Police Station. The heating system is composed of a single boiler with two secondary heating loops (Fire Hall and Police Station). The heating water is distributed to convectors around the perimeter of the Police Station. Both permanent and temporary electric baseboards and heaters are present as a back-up to the hot water heat.

There is an existing 5 ton air handling unit located on the roof and provides conditioned air to the main work spaces. The supply air is ducted within the ceiling space to supply diffusers and then returned back to the air handling unit through return grilles. A single programmable thermostat controls the operation of the unit for all spaces. Diffusers protrude from the ceiling surface as the ceiling space is limited.

There are two split air conditioning systems installed with individual programmable controls within each space served. The AC unit's condensate is pumped up to drain. One unit is located in the Reception Office area and the other in the basement Server Room. The Server room has been provided with an over temperature exhaust fan in case the AC unit fails.

Public and staff washrooms, shower rooms and Detention Room have exhaust ventilation. The exhaust air is ducted from the room to exhaust fans, concealed within the ceiling, and then blown outside the building.

Overall the heating and ventilation within this building is poor. It appears that the building has been retrofitted several times without looking at the particular needs of the occupants or building controls. Observations noted throughout the HVAC systems include:

- Numerous portable heaters throughout the building indicating that there is insufficient heat.
- A single cooling zone covers the entire upper floor; for this size of building this is not uncommon. However, the use and occupants of this building should govern the design of the system. Occupant attire ranges from full gear (vest, equipment, belts, etc.) to light clothing. The single zone heating and cooling system cannot respond to this variation in clothing levels which creates an uncomfortable working environment.
- The occupants of the Police Station do not have control of the central heating plan (i.e., their side). Reports were given that this heating water has been adjusted (higher or lower) to suit the Fire Hall which will in turn either overcools or overheats the Police Station.
- It was reported that there are temperature zones within the Police Station that are controlled by thermostats within the Fire Hall.
- The ventilation within the Evidence Lock-up is insufficient. Whenever the drug storage is opened the strong odours migrate out of the room into the adjacent Media/Office area. These rooms are typically designed to be kept under negative pressure and possibly with an entrance vestibule to contain the odours.

- Plumbing:

Fixtures are in various states of condition and of various manufacturers. Flush tank water closets, one dual flush, flush valve urinal, enamel steel vanity mount lavatory sinks (rusting at the sides), stainless steel kitchen sink, ceramic mop sink, etc. Many of the water closets are of the older high flow tank type which uses twice the maximum water compared to today's Code. The locker rooms each have 3-piece acrylic showers. The Police Chief has his own washroom and an electric hot water tank is located within the adjacent closet to service this washroom. The Detention Room has heavy duty ceramic fixtures and a normal floor drain. Access to the Detention Room plumbing fixtures is through the desk of the adjacent Detective's Office. 25 mm [1"] domestic cold water is supplied from the Fire Hall water entry in the Boiler Room and has proper backflow protection. Domestic cold water is supplied from the Fire Hall system. The piping is copper and steel braided hose. Other than the Chief's Washroom, domestic hot water is provided to the Police Station from the electric hot water tank located in the sanitary pump room located in the basement. The domestic water service is undersized for the number and type of fixtures served.

The sanitary sewer system is comprised of cast iron piping with plastic pipe take-offs to fixtures under sinks. There are sanitary sump pumps, located in the basement Equipment Storage Room, that collect the building sanitary and pumps it into the building sanitary main. The storm system is comprised of aluminum rainwater leaders that collect roof gutter water and direct it to concrete downspout splash-guards. Lastly, there is a propane fired generator located in the back area providing emergency power. Observations noted throughout the plumbing system include:

- The plumbing systems appear to be older with fixtures and piping systems approaching the end of their useful life expectancy. There are signs of maintenance with replaced plumbing fixtures but there are also fixtures which are rusted and require replacement.
- The fixtures within the Detention Room do not meet any standard for a room of this use. Ceramic and accessible fixtures can be dismantled, broken and used as weapons or for self-harm.
- The domestic cold water service will need to be replaced with a larger service to accommodate current Code requirements for the number and type of fixtures served. This would be initiated in any significant renovation scenario.

- Fire Suppression:

The facility is not protected with a fire suppression sprinkler system. Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The Police Station shares an electrical service and generator with the Fire Department (attached building). The Access Control, CCTV and Security systems are either not present or provide insufficient coverage. There is no Fire Alarm system. The natural gas generator is past its expected life serviceability and is overloaded; the computers and servers in the building are connected to individual UPS units that are not monitored. Much

of the electrical system is beyond its estimated service life, including lighting equipment, wiring devices and the main distribution (panel and breakers).

2.1.2.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed. For the description of the condition statements refer to Table 3

Table 3: Condition of Building Systems – No. 1b – Police Station

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X ₁	
Vinyl Sheet					X
Carpet					X
Guardrail, Interior		X			
Interior Doors				X	
Building Envelope					
Foundation Wall			X ₂		
Brick Veneer			X ₃ , X ₇		
Wood Trim			X ₄		
SBS 2-Ply Roof Membrane			X ₅		
Asphalt Shingles			X ₆		
Cap Flashing (SBS-Asphalt)				X	
Gutters and Downspouts			X ₇		
Windows, Wood			X		
Exterior Metal Doors				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers				X	
Roof Top Unit HP AC unit				X	
Heating Water Boiler			X		
Heating Water Pump			X		
Heating Water Radiators			X		
Sanitary Sump Pump	X				
Ductless Split AC units					X
Exhaust Fans	X				
Electric Hot Water Tanks					X
Plumbing Fixtures – washrooms		X			
Plumbing Fixtures – Detention Room		X			
Plumbing Fixtures – Locker rooms			X		

	Concealed	Poor	Fair	Average	Good
Plumbing Fixtures – Lunch room			X		
Domestic Water System			X		
Electrical					
Main Distribution Equipment		X			
Secondary Distribution Equipment		X ₈			
Smoke Alarms				X ₉	
Lighting – Interior and Exterior			X ₁₀		
Wiring Devices				X	
Emergency Generator		X ₁₁			
Transfer Switch			X		
UPS Units				X ₁₂	
CCTV System					X ₁₃
Door Entry System					X
Intrusion Detection System				X	
Communications System					X
Structural					
Seismic Restraint		X ₁₄			

Notes:

- Interior wall finish condition is good, however, the acoustic performance is very poor/ requires improvement.
- Leak present at basement foundation wall in storage room on community services side. Leak may be occurring due to vertical crack descending below-grade observed on exterior of concrete wall.
- Brick veneer displayed efflorescence and some deterioration of mortar due to roof runoff missing gutter at front.
- Paint has peeled on much of the wood window trim. Roofline fascia board in poor condition.
- Mechanical equipment curb walls do not have flashing; waterproofing reliant on sealant only. Penetrations (wiring, plumbing stacks etc.) sealed poorly.
- Guy wires from radio tower anchor through shingles. On north portion of sloped roof, the anchor bolts appeared to be lifting through the plywood sheathing (Re-anchor).
- The steep sloped roof (12/12) is overtaxing the gutter system resulting in water overflowing the gutters on the north façade. Water spilling over, falling into the planter at base of wall, and splashing back onto the brick is resulting in heavy organic growth at this area and is disruptive to employees.
- Electrical circuits are intermixed with the Fire Hall.
- No centralized fire alarm system present.
- Lighting no longer meets current ASHRAE 90.1 requirements as mandated by the BC Building Code.
- Generator is undersized and only services the communication system. Replacement cost has been assigned to building No.1c Garage where both generators and transfer switch are located.
- USP units consist of localized-at-load units; unclear on conditional status of each unit.
- CCTV system new, however there are blind spots inside and outside the building.
- Seismic capacity-to-demand ratio of 0.3.

STRUCTURAL: Significant structural distress was not observed for the main building, or brought to our attention by the building users.

2.1.2.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Recommendations are assigned an opinion of cost and are recommended to be implemented to support the needs of the building and its occupants. Should the needs or use of the building change, the District could review specific recommendations and decide to implement them regardless. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow; in an ideal world, all recommendations would be implemented right away.

Police Station: Baseline Recommendations:

2017

- Convert the Police Chief's washroom to a public washroom. Currently the public must be escorted past security-related sensitive areas which is inappropriate as well as impractical.
- Replace Detention Room plumbing fixtures to penal-rated and replace the floor drain with a non-accessible type.
- Replace Detention Room wood-framed curb wall to a structurally-adequate penal-rated wall.
- Improve ventilation in Evidence Lock-Up Room.
- Excavate, repair, and seal crack at basement foundation wall.
- Anchor guy wires securely from the radio tower to low sloped roof.
- Separate the Fire Station and the Police Station such that each has independent heating/cooling controls.
- Seismic Upgrade

2018

- Design and installation of an application appropriate heating, ventilation, cooling and control systems.
- Provide a centralized uninterrupted power source (UPS) UPS system to ensure operation when needed.
- Install an improved access control system.
- Improve ventilation in showers and washrooms.
- Install larger or custom gutters recommended for whole building to accommodate steep sloped roofing runoff during storm events.

2019

- Ongoing replacement of plumbing fixtures with flow rates to meet present Code.
- Replace existing domestic cold water service with one sized to meet present Code.

- Design and installation of a fire sprinkler system to NFPA 13.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 4: Summary of Present-Value Building Costs every 5 years – No. 1b – Police Station

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$21,860	\$12,700	\$15,800	\$2,500	\$52,860
Building Envelope	\$71,400	\$5,900	\$7,700	\$17,900	\$102,900
Mechanical Summary	\$21,000	\$47,000	\$37,000	\$17,000	\$122,000
Electrical Summary	\$118,300	\$21,000	\$55,500	\$6,800	\$201,600
Structural Summary	\$266,000	\$-	\$-	\$-	\$266,000
Total	\$498,560	\$86,600	\$116,000	\$44,200	\$745,000

The existing building requires significant upgrades that are reflective of the buildings age, and we note that the cost of upgrading for current fire resistance ratings and seismic standards are significant. These important building life safety Code requirements are fundamental to a Public Service Building, however, the current Police Station area provides only 50% of the Police Station's spatial/functional needs. For this reason we do not recommend the Code upgrades unless the building was renovated and expanded. The cost of this is provided in the Optional Analysis Section of the Report.

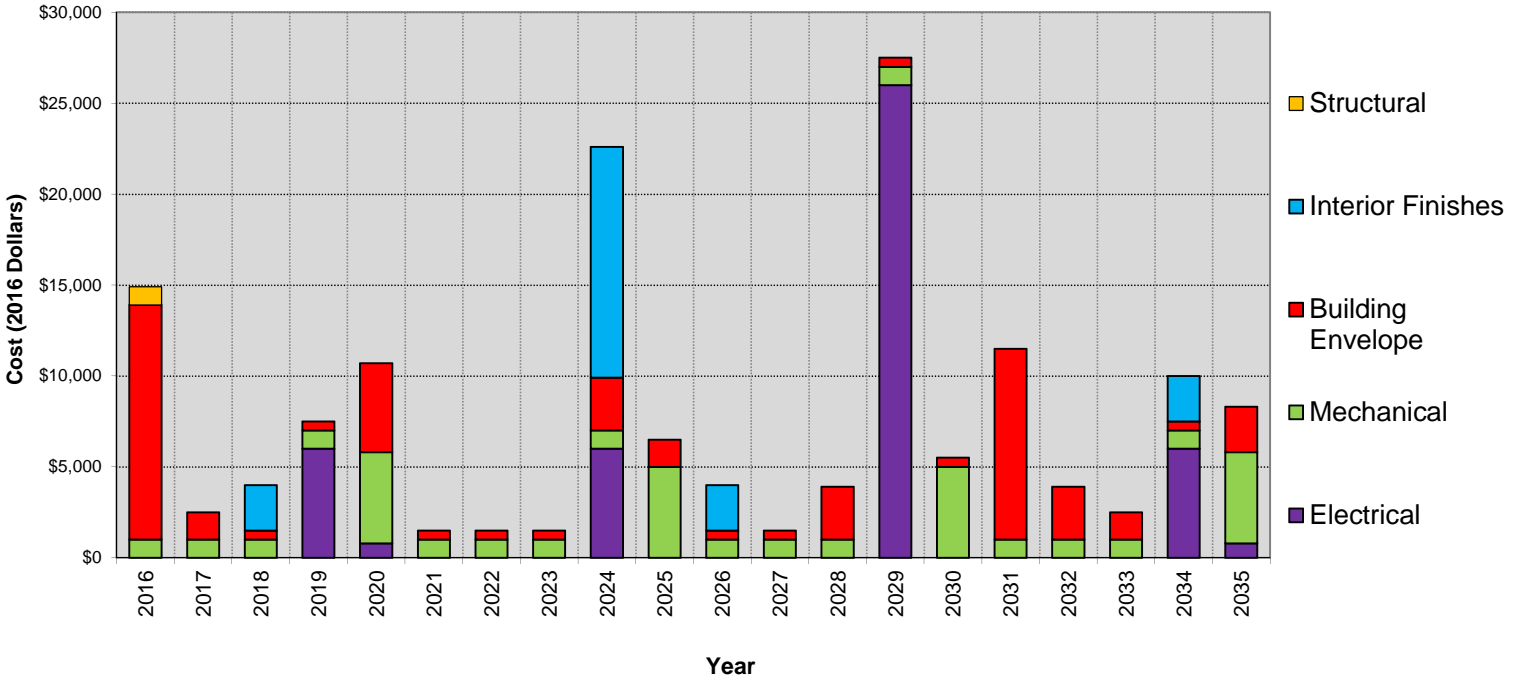
No.1b Police Station

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																			
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Section 4 - ELECTRICAL COMPONENTS																										
Breaker Panel	Maintenance																									
Main	Replacement	40000	1965	35	16	2016	40,000																			
Breaker Panel	Maintenance																									
Secondary	Replacement	15000	1965	35	16	2016	15,000																			
Fire Warning System	Maintenance	800	1985	15	20	2020				800															800	
Electric Heating	Replacement																									
	Maintenance	1500	1965	35	20	2020																				
Lighting	Replacement	15000	1985	25	8	2018																				
	Maintenance																									
Wiring Devices	Replacement	12500	1985	30	5	2020																				
	Maintenance																									
CCTV System	Replacement	15000	2009	10		2019																				
	Maintenance	6000	2009	5	5	2019																				
UPS Units	Replacement	12500	2009	10		2019																				
	Maintenance																									
Door Entry System	Replacement	2000	2009	20		2029																				
	Maintenance																									
Intrusion System	Replacement	15000	2009	15		2024																				
	Maintenance																									
Communication System	Replacement	20000	2009	20		2029																				
	Maintenance																									
Electrical Summary	Replacement						55,000			15,000																
	Maintenance																									
	Summary																									
Section 5 - STRUCTURAL COMPONENTS																										
Seismic Upgrade	Replacement	265000				2017																				
	Maintenance	1000				2016	1,000																			
Radio Tower	Replacement																									
	Maintenance						1,000																			
Structural Summary	Replacement																									
	Maintenance																									
	Summary																									
Building Summary	Replacement						14,900	2,500	4,000	7,500	10,700	1,500	1,500	1,500	22,600	6,500	4,000	1,500	3,900	27,500	5,500	11,500	3,900	2,500	10,000	8,300
	Maintenance						70,760	265,000	50,000	27,500	45,700	2,000			16,000	35,000	10,000	4,400	49,200	10,000	2,000		5,000	1,000		
Yearly Totals							\$85,660	\$267,500	\$54,000	\$35,000	\$56,400	\$3,500	\$1,500	\$1,500	\$38,600	\$41,500	\$14,000	\$1,500	\$8,300	\$76,700	\$15,500	\$13,500	\$3,900	\$7,500	\$11,000	\$8,300
Totals Inflated at 2% per Year							\$85,660	\$272,850	\$56,182	\$37,142	\$61,049	\$3,864	\$1,689	\$1,723	\$45,226	\$49,596	\$17,066	\$1,865	\$10,526	\$99,220	\$20,452	\$18,169	\$5,354	\$10,502	\$15,711	\$12,092

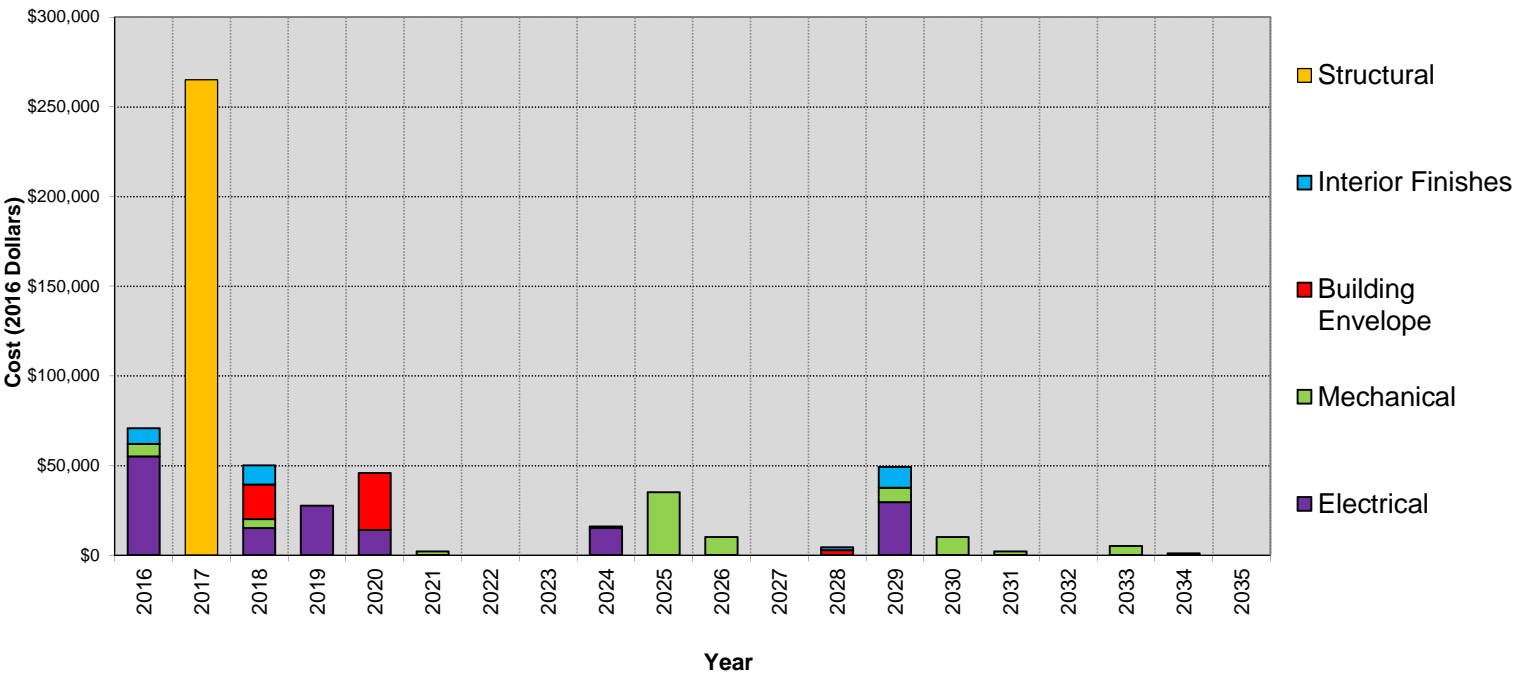
No.1b Police Station Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.1b Police Station

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 12,700	2009	15		2024
Vinyl Sheet	Maintenance Replacement	\$ 7,400	2008	30	15	2053
Vinyl Sheet Kitchen	Maintenance Replacement	\$ 1,600	2013	10	5	2028
Carpet	Maintenance Replacement	\$ 11,700	2009	20		2029
Int. Doors	Maintenance Replacement	\$ 2,500	2010	8		2018
	Maintenance Replacement	\$ 12,500	1978	60		2038
Stair Guard Rail	Maintenance Replacement	\$ 1,260	1973		43	2016
Acoustic Separations	Maintenance Replacement	\$ 7,500	1973		43	2016
Washroom Partitions	Maintenance Replacement	\$ 2,600	1973	30	15	2018
Washroom Fixtures	Maintenance Replacement	\$ 8,000	1973	30	15	2018

NOTES:

Maintenance:

Interior door maintenance includes hardware replacement, realignment, and painting as required on an 8 year period.

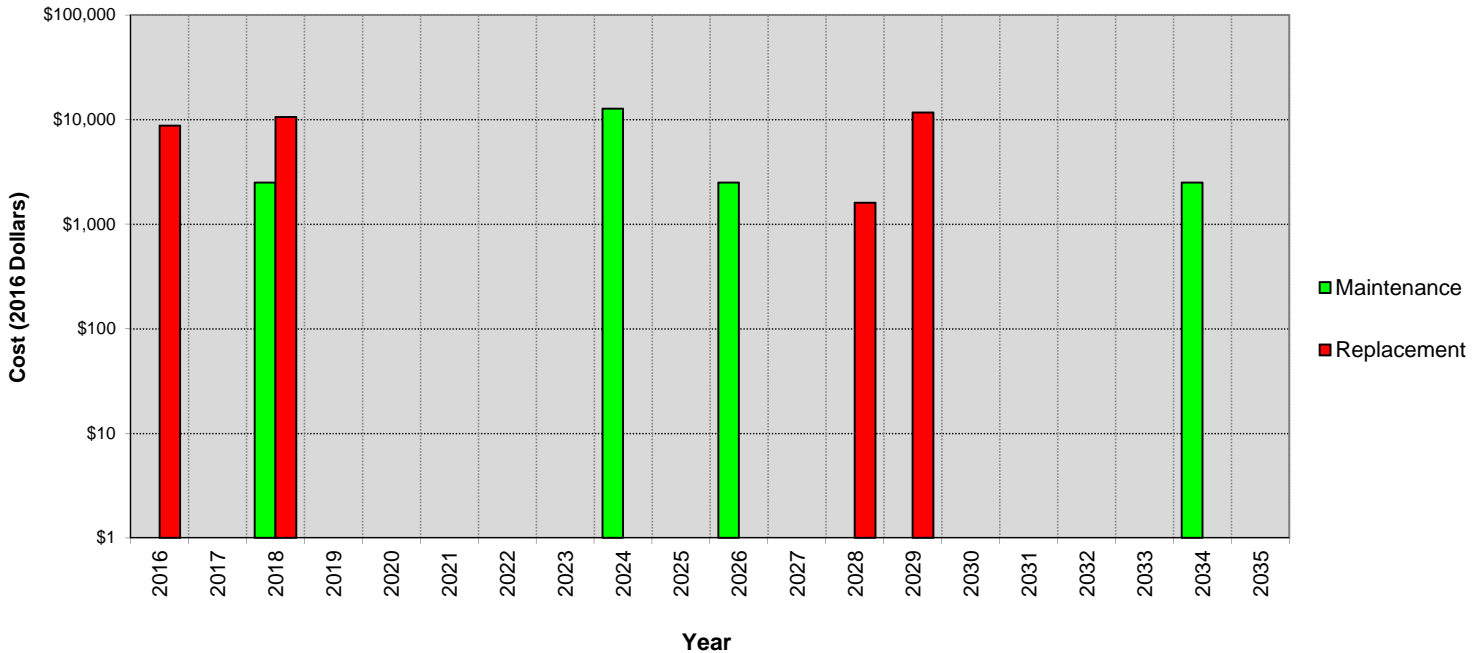
Interior wall maintenance includes repainting gypsum and trim. Storage areas and utility rooms are not included.

Replacement:

Interior walls acoustic replacement includes demolition and installing resilient channels, insulation, new drywall and repainting for a proper acoustic separation. The stair guardrail height should be increased to meet code. New female washrooms are being provided currently, however, existing male washrooms should be replaced within the next 5 years for improved water efficiency. Flooring replacements and interior painting are needed on a 8-10 year cycle.

Carpet replacement period set at 20 years, but may occur before or after depending on the amount of traffic.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1b Police Station

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Brick	Maintenance	\$ 2,000	2005	15		2020
	Replacement					
Wood Windows	Maintenance	\$ 2,400	2012	4		2016
	Replacement	\$ 19,400	1978	40		2018
Exterior Doors	Maintenance	\$ 1,000	2009	8		2017
	Replacement	\$ 2,800	1978	50		2028
Gutters & Downspouts	Maintenance	\$ 500	2015	1		2016
	Replacement	\$ 2,500	2000	20		2020
SBS Membrane Roof	Maintenance					
Asphalt Shingles	Replacement	\$ 20,500	2000	20		2020
	Maintenance	\$ 8,700	2000	20		2020
Concrete Foundation	Maintenance	\$ 10,000	1978	15	23	2016

NOTES:

Maintenance:

Brick maintenance includes cleaning growth and efflorescence every 15 years.

Concrete foundation crack repairs every 15 years beginning in 2016 to respond to an active leak.

Wood window maintenance includes repainting the frames and trim every 4 years

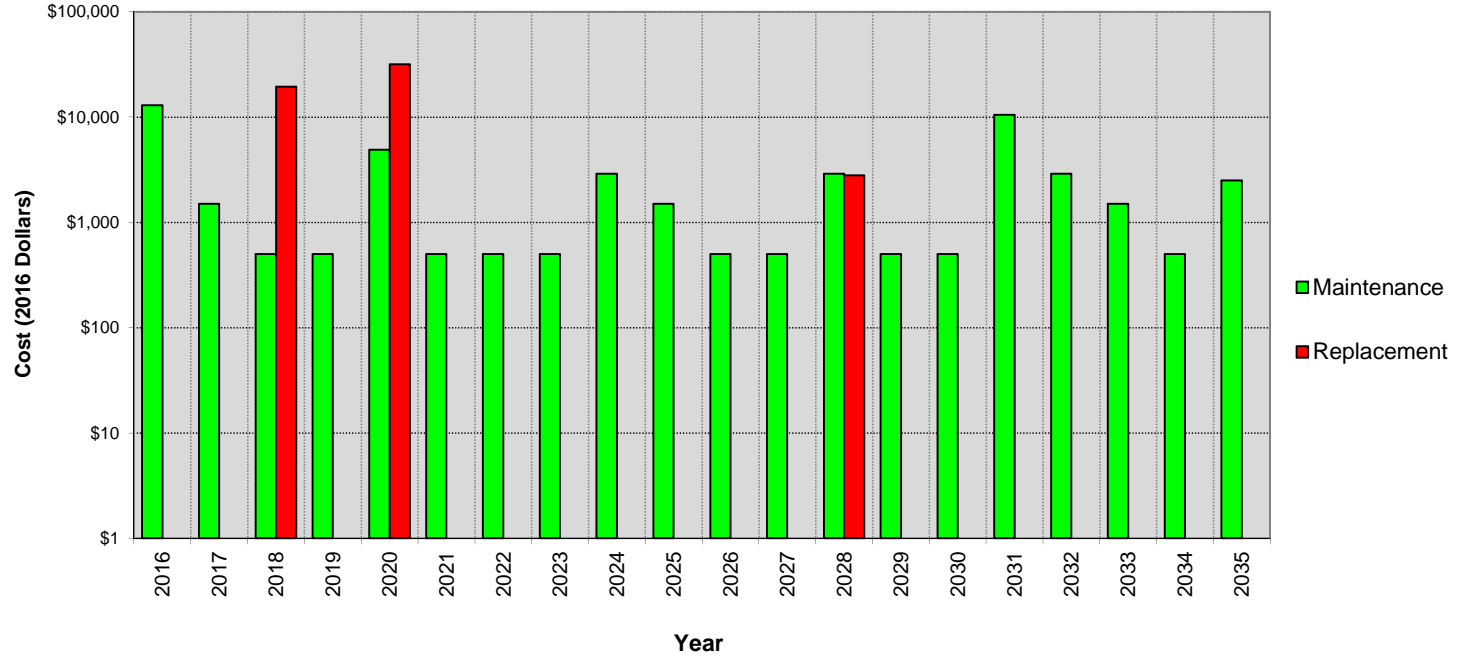
Exterior door maintenance includes painting, alignment, hardware, and weather stripping replacement as required every 8 years.

Replacement:

Wood-framed window estimate based on aluminum-frame, double-glazed replacement.

SBS roofing, asphalt shingles, gutters and downspouts have all been scheduled for replacement at the same time for economies of scale. SBS cost includes metal cap flashing from SBS to asphalt shingle transition, and sealing of all penetrations.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.1b Police Station

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
RTU	Maintenance					
5 ton AC unit	Replacement	\$ 10,000	2000	15		2015
Heating Water Pumps 1 -1/2"	Maintenance					
	Replacement	\$ 1,000	1994	10		2004
Sanitary Sump Pump	Maintenance					
	Replacement	\$ 2,000	2011	10		2021
Ductless Split 1ton A/C	Maintenance					
	Replacement	\$ 5,000	1999	15		2014
Ductless Split 1.5tonA/C	Maintenance					
	Replacement	\$ 5,000	2003	15		2018
Boiler Hight Temp	Maintenance					
	Replacement	\$ 35,000	1990	35		2025
Exhaust Fans	Maintenance					
	Replacement	\$ 10,000	2006	20		2026
Hot Water Tank (65L) Electric	Maintenance					
	Replacement	\$ 1,000	1999	15		2014
Hot Water Tank (240L) Electric	Maintenance					
	Replacement	\$ 2,000	2014	15		2029
Plumbing Fixtures	Maintenance					
	Replacement	\$ 4,000	2015	5		2020
Plumbing Fixtures Institutional	Maintenance					
	Replacement	\$ 7,000	2000	20	-4	2016
Controls Electric	Maintenance					
	Replacement	\$ 1,000	2015	1		2016

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

Sanitary Sump Inaccessible.

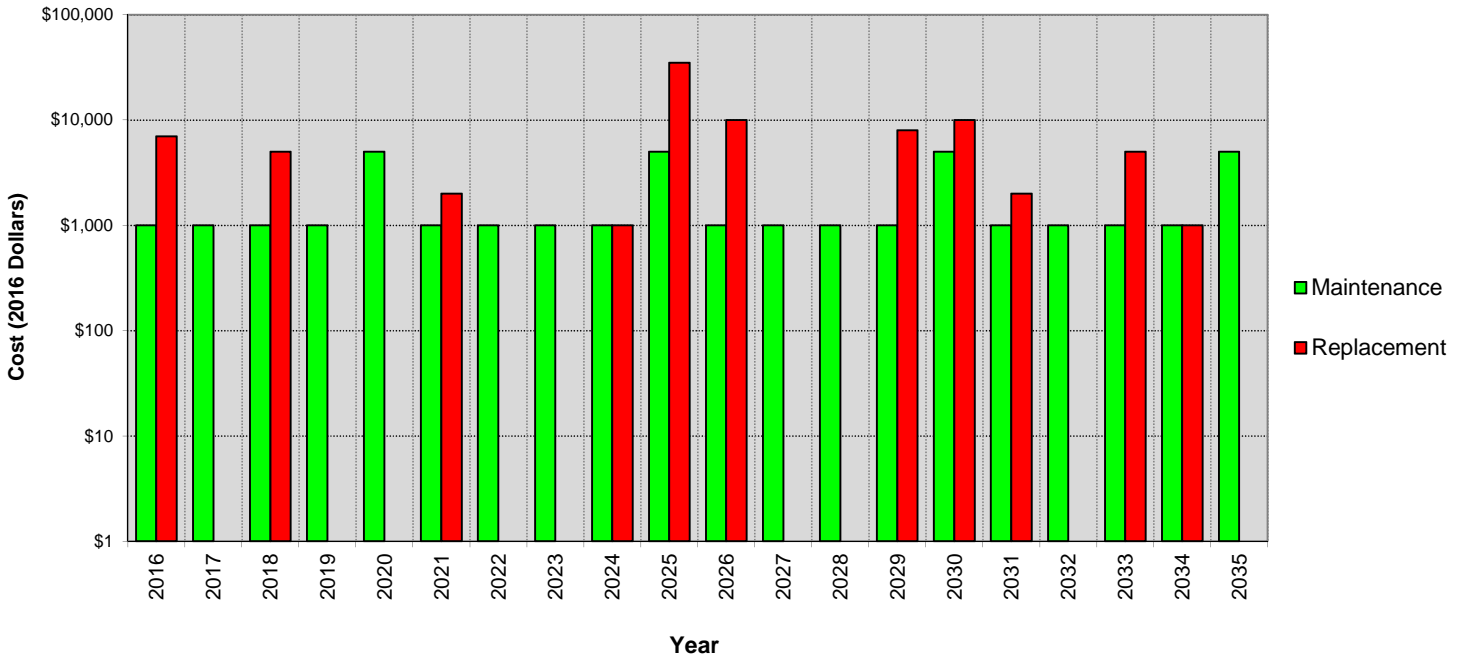
Plumbing Fixtures variable age. Replace as required.

Exhaust fans inaccessible.

Replacement:

Penal fixtures require replacement. WC and Lav.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1b Police Station Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 40,000	\$ 1,965	35	16	2016
Breaker Panel Secondary	Maintenance Replacement	\$ 15,000	1965	35	16	2016
Fire Warning System	Maintenance Replacement	\$ 800	1985	15	20	2020
Electric Heating	Maintenance Replacement	\$ 1,500	1965	35	20	2020
Lighting	Maintenance Replacement	\$ 15,000	1985	25	8	2018
Wiring Devices	Maintenance Replacement	\$ 12,500	1985	30	5	2020
CCTV System	Maintenance Replacement	\$ 15,000	2009	10		2019
UPS Units	Maintenance Replacement	\$ 6,000	2009	5	5	2019
		\$ 12,500	2009	10		2019
Door Entry System	Maintenance Replacement	\$ 2,000	2009	20		2029
Intrusion System	Maintenance Replacement	\$ 15,000	2009	15		2024
Communication System	Maintenance Replacement	\$ 20,000	2009	20		2029

NOTES:

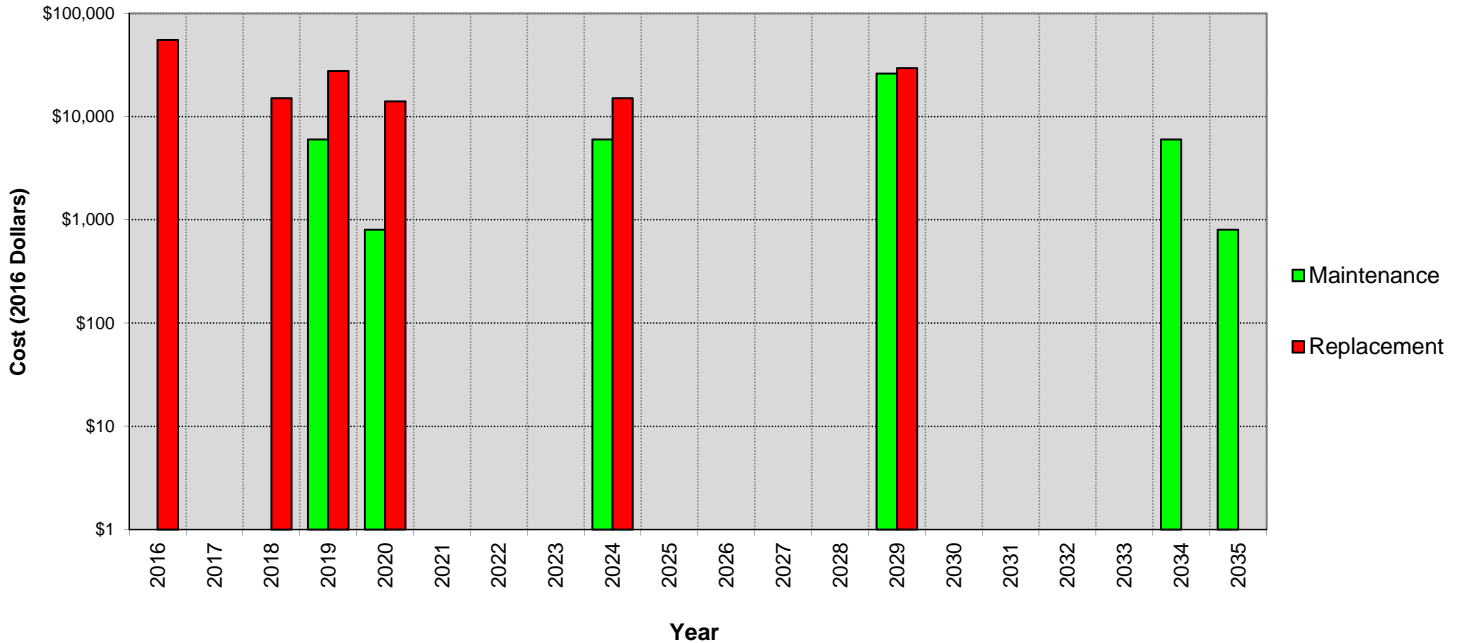
Maintenance:

UPS maintenance consists of battery replacements.
Lighting maintenance will trigger ASHRAE 90.1 upgrades as required by the BC Building Code.
Maintenance for the Communication system includes for new servers and cable upgrades as required.

Replacement:

Fire Warning System consists of 120V Smoke Alarms only. The Generator includes the transfer switch. The Intrusion Detection System needs some minor repairs and part replacements.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1b Police Station Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance Replacement	\$ 265,000				2017
Roof-Top Radio Tower	Maintenance Replacement	\$ 1,000				2016

NOTES:

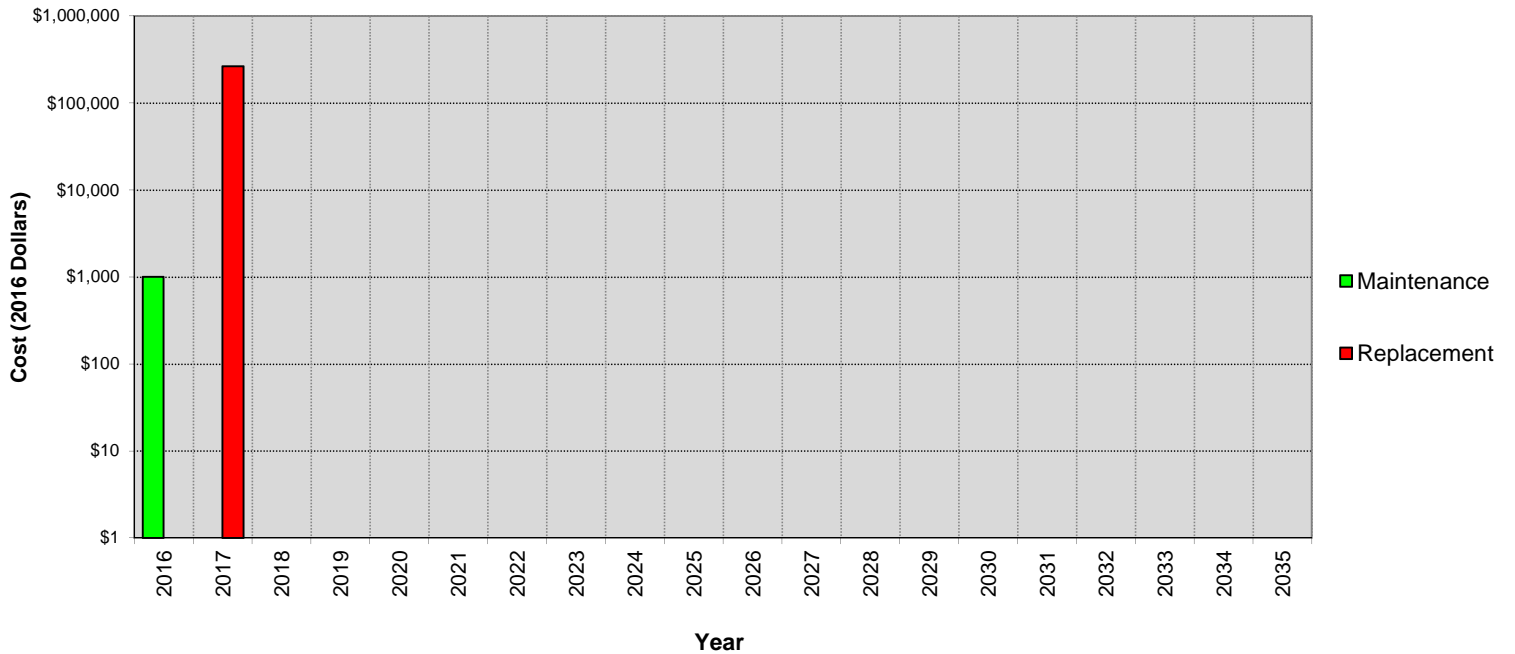
Maintenance:

Guy wires from radio tower anchor through shingles, not recommended. On north portion of sloped roof, the anchor bolts were lifting shingles off the roof and did not appear secure.

Replacement:

Hold-down anchors at the end of shear walls and proper seismic load paths from the roof diaphragm to the foundations are lacking. Current structure has a seismic capacity-to-demand ratio of about 0.3, which is under current code levels.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.3. No. 1c – Station Garage

<p>1703 Monterey Avenue</p> <p>Peak Occupancy: 5 persons</p> <p>Staffing (avg.): Not Applicable</p> <p>Built: 1958 Addition(s): Yes, date unknown Total current area: 600 sf</p> <p>HVAC: N/A</p> <p>Fire Suppression: None</p> <p>Access: Wheelchair access</p>	  
--	--

Figure 3 - No. 1c – Station Garage

2.1.3.1. Description

The single storey garage was constructed in 1958 along with the Police Station. The concrete masonry unit and wood-frame structure is situated to the south (rear) and is utilized by Police and Fire Station staff. The building serves primarily as storage for supplies and equipment and houses the emergency generator for both the Police and Fire Stations. The Garage contains several rooms that facilitate Evidence Storage, Bikes, Emergency Generators, Emergency Response Supplies, miscellaneous storage items and fuel storage. An addition was made to the building at an unknown date to accommodate the Fire Hall Emergency generator. This addition was properly fire separated from the rest of the building.

INTERIOR FINISHES & FURNISHINGS: As the garage building serves as a storage area for both police and fire staff, the interior is unfinished. We recommend that the area of the Police Station emergency generator be enclosed by a fire-rated assembly, and be properly mechanically ventilated.

BUILDING ENVELOPE: The building lies east-west and is clad entirely with stucco on concrete block and wood-framing (north wall). Fenestration includes: wood-framed windows, exterior wood doors and a roll-up garage

door on the east end. The asphalt shingle roof is steeply pitched to the north and low-sloped to the south where it meets the rear embankment. Wooden fascia board runs along the roofline with gutters hung on the north and south lengths connected to downspouts and perimeter drains.

STRUCTURAL: The single storey garage to the south of the police station was constructed in 1958. There was an addition to the west of the garage that does not have any existing documentation. This addition was built tight to the existing garage and is a wood-frame structure and is currently housing a generator that supplies power to emergency equipment and communications equipment. This addition is directly adjacent to a rock formed retaining wall. It is uncertain what capacity the wall has in resisting current Code seismic forces. There is a potential that the existing wall could become unstable in a Code level seismic event. A more detailed assessment of the wall is beyond the scope of this report. In that this addition is housing equipment that is intended to be operational after a disaster, the building structure should meet current Code post-disaster requirements. If the police station and fire hall is to remain on this site, it is recommended that the generator be relocated away from the existing retaining wall in a properly designed post-disaster structure, or the existing retaining wall assessed and upgraded if it is more appropriate.

The original 1958 garage had concrete walls on the east, west and south sides. The south wall of the garage is a full height retaining wall. The original building did not have any significant length of wall on the north side. However it was observed during our inspection that the north wall is now filled in with wood framing, with the exception of a couple of doors, windows and the original overhead door for the garage. In its current condition, the garage which houses equipment for emergency use, has a seismic capacity-to-demand ratio of about 0.3, under current Code load levels. Upgrading of the building would consist of stabilizing the retaining wall and seismically connecting the wood-frame roof to the existing concrete walls.

MECHANICAL: The storage garage is not heated or ventilated. The facility is not protected with a fire suppression sprinkler system. The air intake grille (5 x 5 ft.) for the generator in the addition has an after-market plywood over on it to dampen sound, reducing the intake to a perimeter strip vent.

ELECTRICAL: Electrical systems for the building are minimal, consisting of interior and exterior lighting, and a distribution panel. Two generators are installed in the garage; one is natural gas, the other is diesel. Both are at the end of their service life and are in need of replacement. The diesel generator also has the transfer switch in the garage which is also in need of replacement.

2.1.3.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 5: Condition of Building Systems – No. 1c – Station Garage

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls		X			
Interior Doors			X		
Building Envelope					
Stucco				X	
Wood Trim & Fascia Board			X ₁		
Asphalt Shingles					X
Windows, Wood			X		
Gutters & Downspouts				X	
Exterior Wood Doors				X	
Garage Door				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Electrical					
Distribution Equipment				X	
Lighting – Interior and Exterior				X	
Diesel Generator			X		
Natural Gas Generator		X			
Diesel Transfer Switch			X		
Structural					
Seismic Restraint		X ₂			

Notes:

1. Fascia board paint peeling. Wood did not appear compromised.
2. Seismic capacity-to-demand ratio of 0.3. Shifting of interior contents may block doors/ access to equipment.

STRUCTURAL: The existing wood framing of the building is mostly exposed on the inside. Significant structural distress was not observed. The concrete retaining wall that forms the back side (south side) of the garage has a significant vertical crack. This crack is wider at the top of the wall and diminishes to a hairline crack at the bottom. It appears that the crack is not new and has been there for quite some time. Structural design review of the wall indicates that the wall was not designed for superimposed live loads and previous superimposed loading(s) behind the wall may have initiated the crack. Further, the wall was not designed for seismic loads and may become unstable under a Code-level seismic event. Upgrade of this wall is recommended. The estimated cost of upgrading this wall is based on the concept of adding three new buttress walls to stabilize it.

2.1.3.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Station Garage: Baseline Recommendations:

2016

- Install a fire-rated interior separation for the emergency generator.

2017

- Seismic Upgrade of south retaining wall.
- Modify noise baffling/ relocate air intake to ensure min area is provided.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

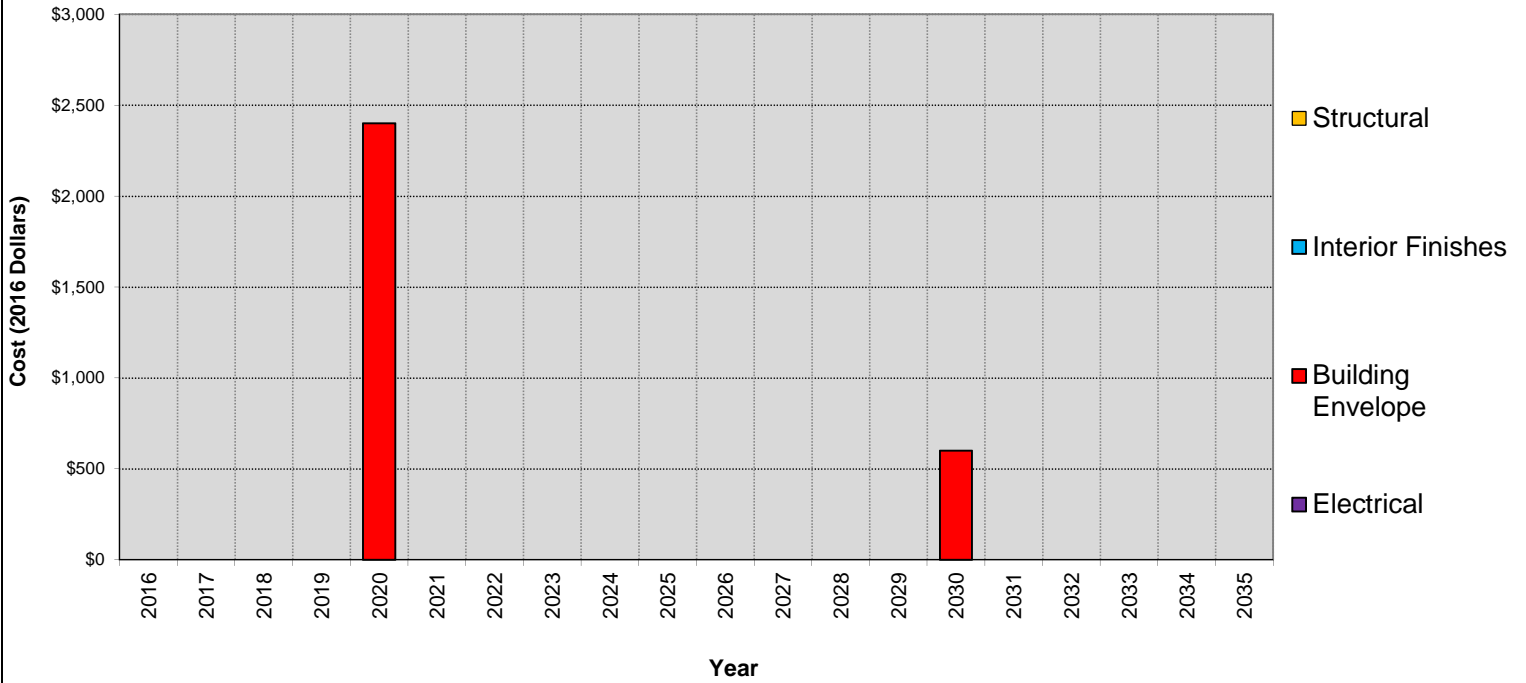
Table 6: Summary of Present-Value Building Costs every 5 years – No. 1c – Station Garage

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$23,000	\$-	\$-	\$-	\$23,000
Building Envelope	\$2,400	\$5,800	\$600	\$-	\$8,800
Mechanical Summary	\$-	\$-	\$-	\$-	\$-
Electrical Summary	\$92,500	\$-	\$-	\$-	\$92,500
Structural Summary	\$26,000	\$-	\$-	\$-	\$26,000
Total	\$143,900	\$5,800	\$600	\$-	\$150,000

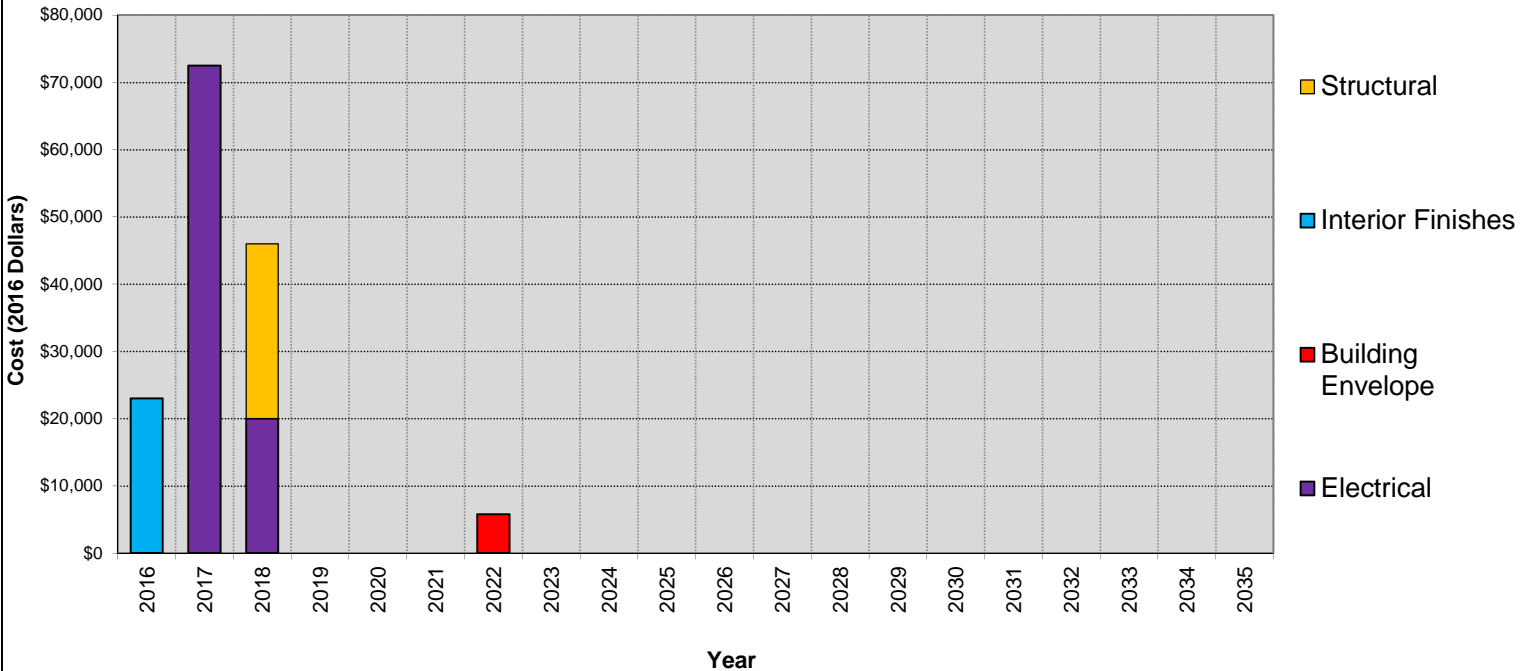
No.1c Garage Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.1c Garage

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Fire Separation	Maintenance					
	Replacement	\$ 23,000	1973		43	2016

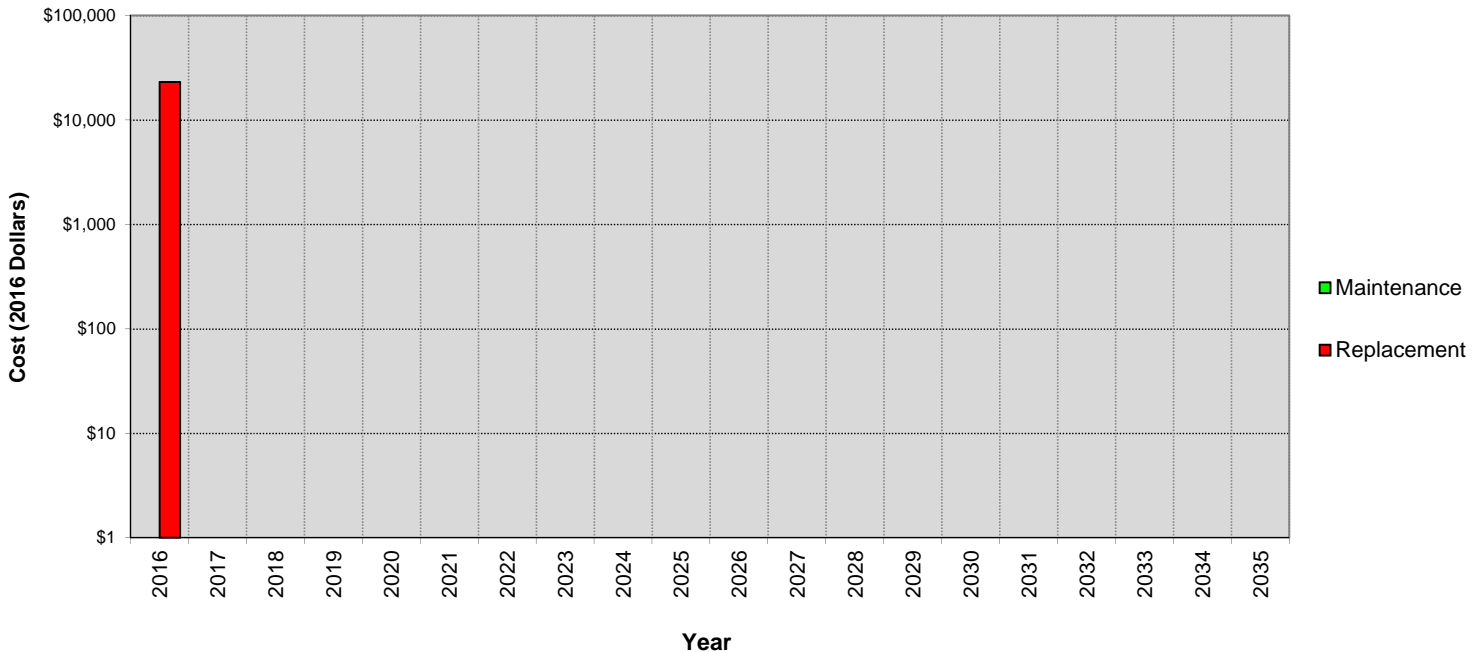
NOTES:

Maintenance:

Replacement:

We recommend that Emergency Generator be enclosed by a fire rated assembly, and be properly mechanically ventilated.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1c Garage Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 1,800	2000	20		2020
Wood Trim	Maintenance Replacement	\$ 600	2000	10	10	2020
Exterior Doors	Maintenance Replacement	\$ 2,800	1957	60	5	2022
Windows	Maintenance Replacement	\$ 1,500	1957	60	5	2022
Garage Door	Maintenance Replacement	\$ 1,500	1957	60	5	2022
Asphalt Shingles	Maintenance Replacement	\$ 4,500	2013	25		2038
Gutters & Downspouts	Maintenance Replacement	\$ 1,600	2013	25		2038

NOTES:

Maintenance:

Maintenance for doors, windows, and gutters assumed to be performed internally by staff as needed.

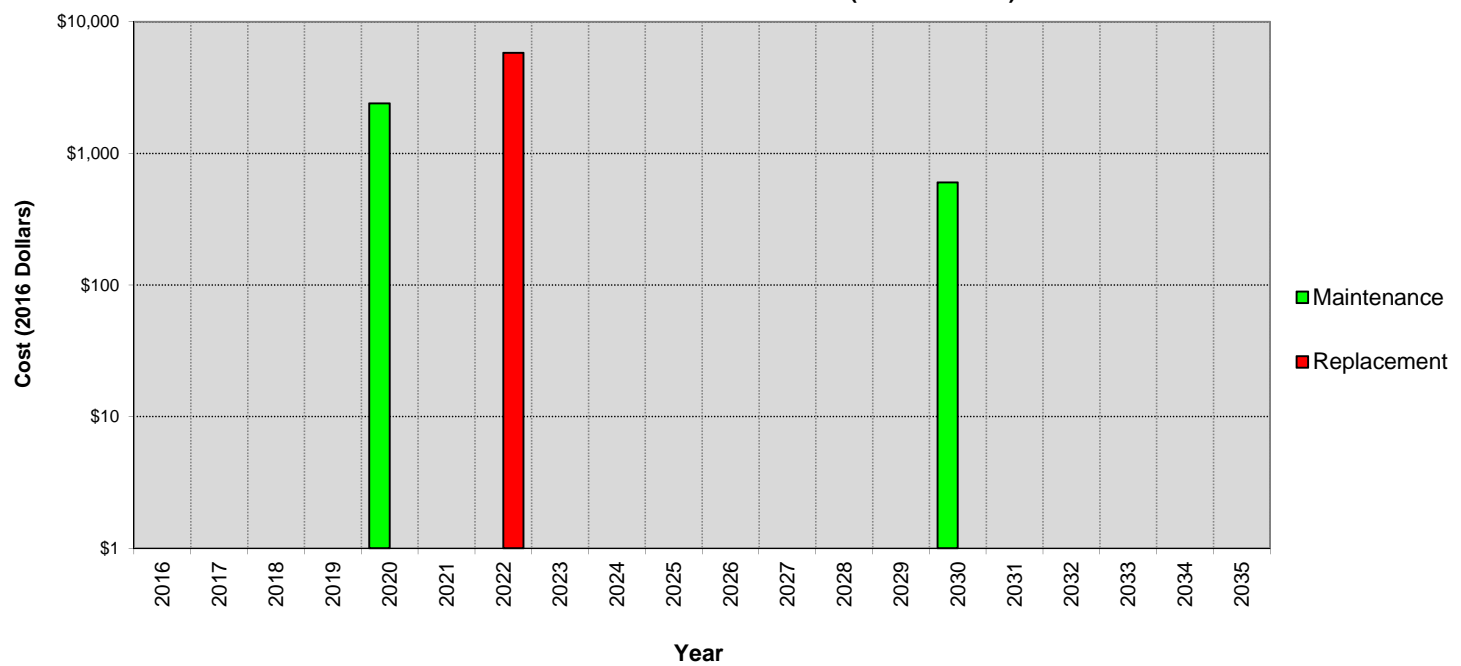
Stucco maintenance includes repainting every 20 years.

Replacement:

Replacement periods for garage generally extended due to being unoccupied and limited traffic.

Windows, doors and garage door scheduled together for replacement. Service life may be further extended if still performing and meeting needs of users.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.1c Garage Electrical



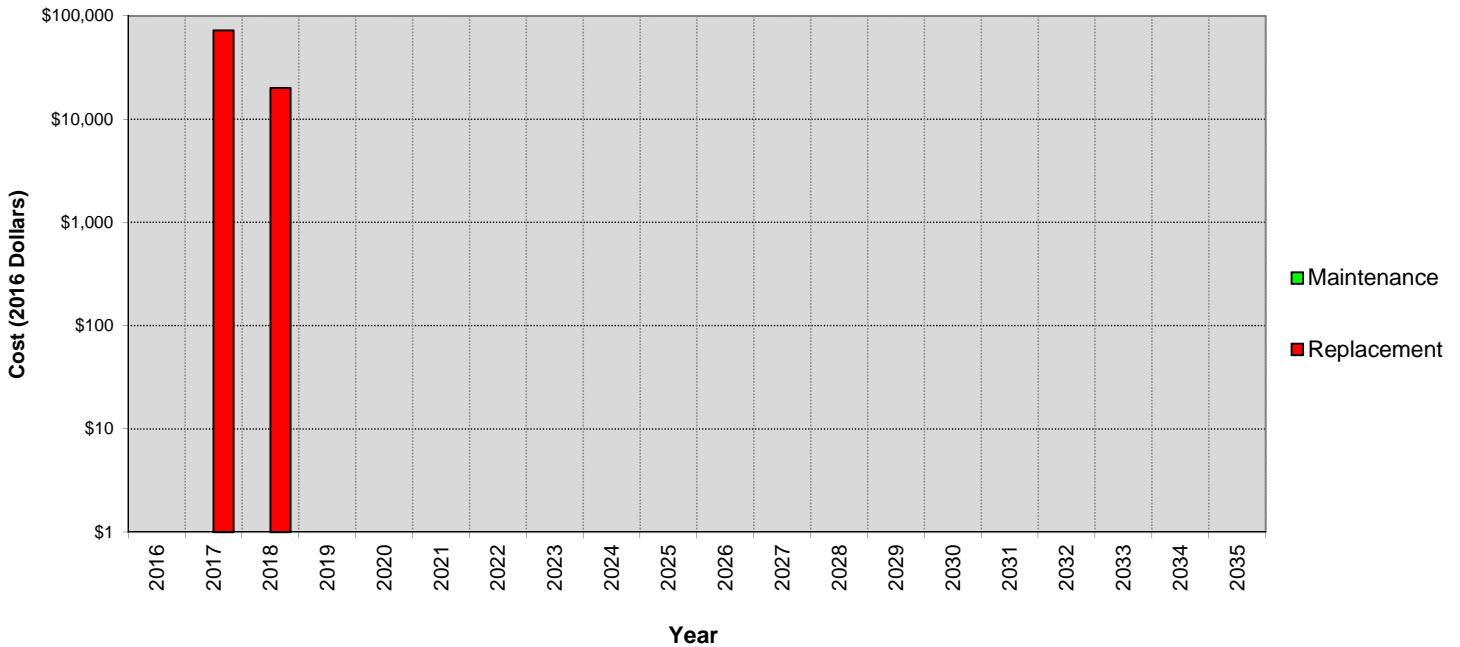
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Natural Gas Generator	Maintenance Replacement	\$ 20,000	1980	30	8	2018
Diesel Generator	Maintenance Replacement	\$ 65,000	1985	30	2	2017
Diesel Transfer Swtich	Maintenance Replacement	\$ 7,500	1985	30	2	2017

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.1c Garage Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance Replacement	\$ 26,000				2018

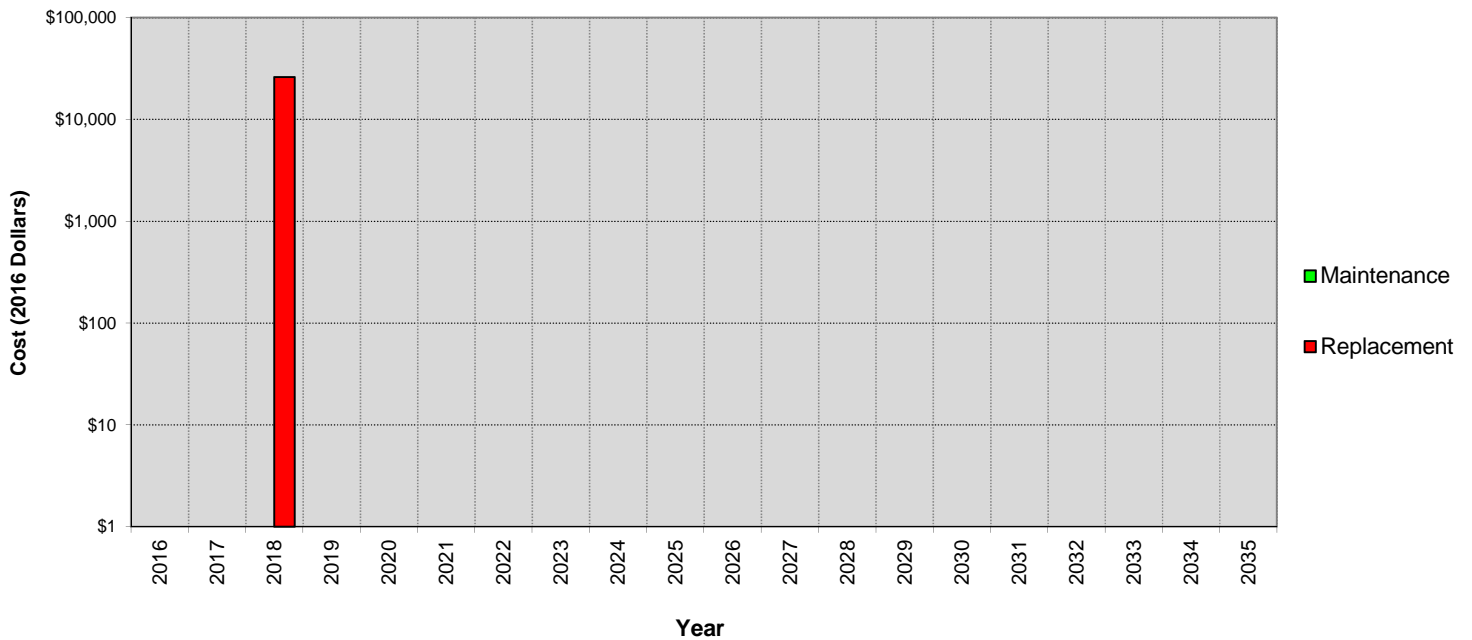
NOTES:

Maintenance:

Replacement:



Seismic upgrade includes stabilizing south retaining and connecting the wood frame roof to existing concrete walls.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.4. No. 2 – Municipal Administration Hall

<p>2167 Oak Bay Ave.</p> <p>Peak Occupancy: 100 persons</p> <p>Staffing (avg.): 26 persons</p> <p>Built: 1958</p> <p>Addition(s): None Current Area: 14,897 sf</p> <p>HVAC: Natural gas boilers, AHU, Ductless Split Cooling</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>		
		<p>Figure 4 - No. 2 – Municipal Administration Hall</p>

2.1.4.1. Description

The Municipal Administration Hall is located in the heart of Oak Bay Village. Set back Southward from Oak Bay Avenue with a northern aspect, the building is of two-storey concrete and concrete-block construction and is not seismically restrained. Additions to the 1958 building or significant upgrades to the building envelope and windows have not occurred. The mechanical systems have been upgraded but are now dated, resulting in an inefficient building in terms of energy consumption. Changes to interior partitions and rearrangements to the floor plan have occurred over time to accommodate changing needs. As a public building, it experiences 100-150 visitors a day, and can host events in the Council Chambers of up to 60 persons.

Open parking is situated at the south west corner of the building. Two main entrances on the upper level lead staff and public into the high-ceiling, lobby area. On opposite sides of the lobby are the Council Chambers to the West and the Administration Offices to the East. The upper level also contains meeting rooms, office storage, washrooms and a staff kitchen. Two sets of stairs connect the upper and lower levels. The lower level houses utility rooms, washrooms, further storage, and a Community Archives and Emergency Program Centre. Although an elevator is not present, both levels are wheelchair accessible.

This unsprinklered building is a Group D Classification for office space. By current code requirements the construction can be non-combustible construction, and if the building ‘faces 2 streets’ the building does not need to be sprinklered. The floor assembly and load bearing is required to have a 45min fire resistance rating to meet current code.

INTERIOR FINISHES & FURNISHINGS: The 1950's modernist building is very basic on materials, while offering natural daylight throughout and many open spaces. Interiors walls are constructed of wood-frame and painted gypsum wallboard. The flooring includes: carpet, vinyl-sheet, ceramic tile, marmoleum, and unfinished concrete. Interior finishes appear dated and worn, although they have been maintained with floor finishes, interior paint, wall coverings, and ceiling tiles over the years. The interior spaces have been modified periodically to accommodate the growing needs for space, although minimal investment into the quality of renovations has occurred over that same time; this includes the sub-division of office spaces, and the upgrade of the public washrooms and the staff room.

Many rooms contain original millwork that is in good condition. Further interior renovations will be recommended for the staff washrooms and stair guardrail heights to meet current Code. A re-planning of the open administration workstations and reception desks is recommended to create more efficient workspace and to accommodate future staffing. The building has not been seismically upgraded, and this renovation would be an extensive renovation that would reduce the current functional space into an unacceptable form. Also, given the poor thermal performance of the building envelope we would recommend a building replacement rather than a seismic upgrade.

BUILDING ENVELOPE: Exterior walls are of uninsulated, fully-or partially grouted, painted concrete masonry unit and cast-in-place concrete. Original, single-pane, metal-framed punched windows are abundant on both levels with continuous clerestory windows wrapping around the central open plan office area. Removal of warm stratified air is by hand-cranked original rods operating clerestory awning-style vents to provide natural ventilation. Exterior doors are hollow-metal and storefront-style assemblies. The low-sloped roof has two tiers, all of which is waterproofed with 2-ply SBS membrane. Roof-top drains are present, however overflow scuppers from the upper tier to lower are lacking. Roof slope is poor for both roofs, with significant ponding on the South side of the lower roof. We would assess this building as air-leaky and air sealing measures including window upgrades are recommended.

Several office ceilings having ceiling tile allow passage of conditioned air directly to the underside of the unvented roof assembly. Installing an air barrier in the perimeter offices and installing venting to the exterior to the underside of these lower roofs would constitute a major undertaking requiring the temporary relocation of staff in affected offices.

A review of the crawlspace revealed dry, concrete flooring with heated, low relative humidity environment. Floor joists appeared to be in good condition with little to no symptoms of water exposure. Around the perimeter, joist ends and blocking beaming on the concrete foundation were treated with green-coloured stain, likely wood preservative.

Doors of offices around the perimeter are closed overnight to compartmentalize against fire/ smoke risk. However, heat loss through windows/ walls and inability for central area heated air to enter offices results with space heater usage by staff during the morning half the year.

STRUCTURAL: The Municipal Hall was constructed in 1958. It is a two storey building constructed with concrete block masonry for the perimeter walls and wood-frame for the roof and floor structures. There are structural steel trusses spanning over the central, open-plan office area (administration hall) and the Council chamber. The building was constructed prior to seismic design standards and it is evident in its structural framing that it lacks a lateral system to resist seismic forces. The raised roof in the central office area has steel column supports and clerestory windows on all four sides, with the exception on the west side where there is a section of wall supporting the raised roof. Similarly the low roof over the central office area has windows all around and masonry columns in between large window openings. There are small sections of walls on the west and east side of the general office area but no structural wall at all on the north and south sides. The same windows, with masonry columns in between, are also found on the walls of the lower floor. The exterior walls in the lobby area are similar as well; they are filled with windows, lacking strength to resist lateral loads. The council chamber has concrete masonry walls on all four sides. In its current condition the municipal hall building as a whole would perform very poorly under a Code level seismic event. It has a capacity-to-demand ratio of less than 0.1 for current Code seismic loads. Seismic upgrading is recommended.

To upgrade the building to the minimum life-safety level, additional shear walls or steel braced frames with corresponding foundations will be required. These shear walls or braced frames will likely block several of the existing window openings. Additional anchorage of the walls to the roof and floor structures will also be required, in addition to roof and floor diaphragm strengthening. This will significantly alter the original appearance of the Building.

MECHANICAL:

- Heating, Ventilation and Cooling (HVAC):

A central hot water (hydronic) heating system is located in the basement Boiler Room. The heating system is composed of two natural gas hydronic boilers (1991) with four secondary heating loops or zones. The heating water is distributed to perimeter convectors throughout the building and to heating coils within the central air handling units. Natural gas is supplied through a meter set on the south side of the building and piped into the Boiler Room.

There is an air handling unit (AHU) located in the Attic Fan Room; this unit was not accessible at the time of this review. The air handling unit provides outdoor air ventilation and heated supply air (from a hydronic heating coil) to the single storey Council Chamber. Return air is ducted from wall grilles, located at the floor, through the crawlspace and up to the unit in the attic. The Council Chamber has had electric baseboard heaters added to supplement room heating. No mechanical cooling has been provided for this space. These systems are controlled by wall thermostats.

There is a second air handling unit located in the basement Boiler Room. This system provides heated ventilation air to the first floor central administration areas. Outdoor air is ducted from the exterior of the Boiler Room into the air handling unit, heated, and then the air is ducted to supply diffusers in the main

floor space. Return air is ducted back from the main space through a return air grille located in the Admin Area. A programmable thermostat controls the operation of the unit for this area. Diffusers are installed in drop T-bar ceilings that were installed at the time of this area's renovation.

The remaining spaces within this building, main floor and basement areas, do not have a mechanical ventilation system installed and rely on operable windows for ventilation and indoor air quality. There are repartitioned spaces within the basement which are not adjacent to an exterior wall and therefore do not have any outdoor air ventilation, and would benefit from an assessment for compliance to maximize distance to exits.

There are two refrigerant split systems providing mechanical cooling to the IT Office (1.5 tons) on the main floor and the basement Sever Room (2.5 ton). The outdoor condensing units are located on the roof above or adjacent the indoor units.

Overall the heating and ventilation equipment within this building is older, is approaching its useful life expectancy, but appears to be in good mechanical condition. The occupants did indicate that there are times when the building is cold and drafty which are most likely due to the single-glazed windows with poor air seals.

The main floor Washrooms and Janitor's room do not have any exhaust systems installed; depend on operable windows for ventilation.

The base building drawings show a washroom exhaust fan servicing the Men's and Women's staff washroom/showers and the exterior public washrooms. Grilles are located in each of these spaces and are ducted to the exhaust fan. The exhaust air is then ducted directed up through a shaft to the roof outlet. At the time of review this fan could not be located nor accessed – there are wall switches indicating that it should be there. The basement Janitor's room does not have an exhaust system installed.

The washroom in the more recently renovated basement area in which an exhaust fan has been installed ducted to the building's exterior.

Observations noted throughout the HVAC systems include:

- The existing boilers are at an age where they cannot be replaced with the same model as it is no longer made. An alternate manufacturer would be required.
- The existing boiler system is a high temperature system. If the boilers were to be replaced with a low temperature, high efficiency condensing boilers then the entire perimeter convector heating system and air handling unit coils would have to be replaced. Also, if the inefficient and drafty existing windows, were retained, a low temperature heating system is not recommended as the size of the perimeter heaters required would be large. Any change in boiler efficiency work would only be pursued if the existing HVAC system was also upgraded and the existing windows are replaced.

- There are many spaces within the building which do not have mechanical ventilation and would not meet the requirements of the Building Code. New ventilation systems should be installed to ensure adequate indoor air quality.
 - The main floor washrooms and Janitor's room and the basement Janitor's room do not have an exhaust system installed and would not meet the requirements of the Building Code. An exhaust system should be installed.
 - The exhaust system serving the basement Men's and Women's staff washroom/showers and the exterior public washrooms should be reviewed. Although it was looked for, the exhaust fan could not be located, and it should be readily accessible for servicing. Also, the fan's capacity should be reviewed as the conditions within the washrooms/showers were not typical.
- Plumbing: Both levels of the building have coffee/staff areas, Janitor's rooms and washrooms. The kitchens have a sink and a dishwasher. The main floor public washrooms have newer single handle sensor faucets, ceramic lavatory basins, water closets with sensors on flush valves and ceramic basins. The basement floor staff washrooms have older single handle faucets, ceramic lavatory basins, tank water closets and ceramic basins. The janitor sinks are above-floor older ceramic models. The shower is a two 2-piece acrylic or fiberglass shower stall with shower spout and handle. The water closets are of the older high flow tank type which uses twice the maximum water to today's Code.

There is a 300L 9KW electric hot water tank located in the basement Janitor's room which supplies domestic hot water to the building. Domestic cold water is distributed to the electric hot water tank and each building plumbing fixture. There are non-frost-free hose bibs located in various places on the building exterior.

The sanitary sewer system is comprised of cast iron piping piped from the building's plumbing fixtures. The storm system is comprised of cast iron rainwater leaders connected to roof drains. Both the sanitary and storm piping systems are piped to mains running either through the crawlspace or below grade, outside the building footprint, to municipal mains.

Observations noted throughout the plumbing system include:

- The plumbing systems appear to be older with fixtures (excepting the public washroom fixtures) and piping systems approaching the end of their useful life expectancy.
 - Due to Building Code revisions the domestic cold water service is most likely undersized and any renovations to the building will require a larger service size.
 - Building domestic cold water premise backflow prevention is required for all buildings.
- Fire Suppression:

This building is not protected with a fire suppression system.

Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The electrical system is outdated and needs replacement; both service and distribution. Lighting is beginning to be dated and energy savings could be realized by installation of newer fixtures and lighting controls. The emergency generator is in excellent condition. Receptacles and switches are aging in some areas, replacement is recommended.

The communications system is in good condition, however the fire alarm, intrusion detection system and paging system are outdated and will soon require replacement.

2.1.4.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 7: Condition of Building Systems – No. 2 – Municipal Administration Hall

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X ₁		
Vinyl Sheet		X			
Carpet		X ₂			
Marmoleum				X	
Wood Laminate				X	
Guardrail		X			
Interior Doors			X		
Building Envelope					
CMU				X	
Stucco				X	
Windows, Metal		X ₃			
Exterior Doors			X		
Curb-Mounted Skylights			X		
SBS 2-Ply Roof Membrane			X ₄		
Flashing				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers				X	
Split AC units				X	
Air Handling Units	X			X	
Exhaust Fans			X		
Heating Water Boiler			X		
Heating Water Pump			X		
Heating Water Radiators			X		
Storm Sump Pumps	X				
Electric Hot Water Tank					X
Plumbing Fixtures				X	

	Concealed	Poor	Fair	Average	Good
Domestic Water System			X		
Electrical					
Breaker Panel-Main			X ₅		
Breaker Panel-2ndry			X ₅		
Generator-Emergency					X
Transfer Switch					X
Receptacle-Duplex			X ₆		
Baseboard			X ₆		
Alarm Panel		X ₇			
Exit			X ₈		
Lighting-Exterior				X	
Lighting-Interior			X		
Communications System					X
Paging System			X ₇		
Intrusion Detection System			X ₇		
UPS				X	
Emergency Lighting			X		
Audio System				X	
Electric Car Charges					X
Structural					
Seismic Restraint		X ₉			

Notes:

1. Air sealing penetrations within boiler room is required. Fire rating on boiler room ceiling also requires upgrading.
2. Mould and water noted at engineering offices in north east corner from consist condensate dripping from an exposed, capped, domestic cold water line.
3. Windows are drafty and rattle during wind events, condensation is likely.
4. Upper level membrane in good condition with some areas of ponding. Lower level in fair condition with significant amounts of ponding and organic growth. Most concentrated on east portion. Some tenting (lifting) of membrane noted on east portion. Some drains are lacking covers to prevent debris blockages. Installation of scupper drains to the upper level is recommended. Lower roof is unvented with dropped ceiling exfiltrating conditioned air up through poly-filled paper-faced R12 Batt insulation directly to underside of roof.
5. Should be replaced.
6. Certain devices are aging and should be replaced.
7. Consideration should be given to replacement of this system.
8. New exit signs utilize the 'green running person'; existing exist signs should be replaced to meet Code.
9. Seismic capacity-to-demand ratio of less than 0.1.

STRUCTURAL: Significant structural distress was not observed for the building. Cracks in gypsum wall boards were pointed out at several locations - one at the stairs in the lobby accessing the basement, the others are mostly below the clerestory windows in the central office area. The crack in the stairs appears more severe than the others. It may be a result of building movement relative to the boiler exhaust stack to the roof. Original

structural drawings indicate the stack is built from concrete masonry block units but the stack is currently concealed and not visible for inspection. Further investigations requiring exploratory work will be required to determine the cause of the crack. The cracks in the central office area are hairline cracks that do not appear to be severe. They may have been caused by previous building movement.

2.1.4.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances for which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Municipal Administration Hall: Baseline Recommendations:

2016

- Replace carpet and paint interior as planned. Replace all existing sheet flooring.
- Provide building domestic cold water premise backflow prevention.
- Seal wall penetrations and upgrade fire rating of ceiling to current Code in boiler room.

2017

- Seismic Upgrade

2018

- Install upper level roof scupper drains, roof-top drain covers, and re-slope areas of significant ponding.
- Replace select damaged acoustic ceiling tiles (ACT) tiles in offices.
- Create air seal above ACT tiles, introduce a vented sub-roof or install to the underside of the new sloped roof sheathing on unvented polyurethane spray foam air/vapour seal system.
- Design and installation of an application appropriate heating, ventilation, cooling and control systems.
- Provide and/or improve ventilation in showers and washrooms.
- Replace Staff Washrooms and Washrooms with outdoor access, flooring, millwork, partitions and fixtures
- Replace interior guardrails and handrails to meet Code.

2019

- Ongoing replacement of plumbing fixtures with flow rates to meet present Code.
- Replace existing domestic cold water service with one sized to meet the current BC Building Code.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 8: Summary of Present-Value Building Costs every 5 years No. 2 – Municipal Administration Hall

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$115,500	\$500	\$-	\$20,500	\$136,500
Building Envelope	\$161,800	\$38,000	\$-	\$64,500	\$264,300
Mechanical Summary	\$142,400	\$27,200	\$9,200	\$6,400	\$185,200
Electrical Summary	\$436,050	\$60,000	\$26,300	\$50,000	\$572,350
Structural Summary	\$950,000	\$-	\$-	\$-	\$950,000
Total	\$1,805,750	\$125,700	\$35,500	\$141,400	\$2,100,000

The Municipal Hall Building has reached its maximum capacity for accommodating staff and will not be able to house growing staff and community needs. Given the fundamental Life Safety deficiencies and thermal inefficiencies caused by the building envelope and mechanical systems, we recommend careful consideration be given to consider building replacement rather than investing significant funds into the building.

No.2 Municipal Hall

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																						
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035			
Section 1 - INTERIOR FINISHES COMPONENTS																													
Interior Walls	Maintenance	33000	2000	20		2020					33,000																		
	Replacement																												
Carpet	Maintenance	38900	2000	20		2020				38,900																			
	Replacement																												
Vinyl Sheet	Maintenance	14300	1990	25	1	2016	14,300																						
	Replacement																												
Marmoleum	Maintenance	16500	1990	50		2040																							
	Replacement	500	2010	15		2025									500														
Wood Laminate	Maintenance																												
Basement	Maintenance																												
Washroom	Maintenance																												
Partitions	Maintenance	10500	1957	15		1972		10,500																					
	Replacement																												
Washroom	Maintenance																												
Fixtures	Maintenance	10000	1989	15		2004																							
	Replacement																												
Fire Separations	Maintenance									10,000																			
	Replacement	5000				2016	5,000																						
Stair Guard Rail	Maintenance																												
Handrails	Maintenance	3800	1957	50	9	2016	3,800																						
	Replacement																												
Interior Summary	Maintenance																												
	Replacement																												
Section 2 - BUILDING ENVELOPE COMPONENTS							23,100	10,500		10,000	71,900					500											10,500		10,000
CMU	Maintenance	10200	2004	15		2019				10,200																			
	Replacement																												
Stucco	Maintenance	500	2004	15		2019				500																			
	Replacement																												
Aluminum	Maintenance																												
Windows	Maintenance	137500	1957	45	15	2017	137,500																						
	Replacement																												
Exterior Doors	Maintenance	9600	1957	60		2017	9,600																						
	Replacement																												
SBS Membrane	Maintenance	52000	2007	25		2032																							
	Replacement																												
Roof - Upper	Maintenance	38000	2000	25		2025																							
	Replacement																												
Roof - Lower	Maintenance																												
	Replacement																												
Roof Scuppers	Maintenance	4000				2017	4,000																						
	Replacement																												
Skylights	Maintenance	1800	2000	30	2	2032																							
	Replacement																												
Curb Mounted	Maintenance																												
	Replacement																												
Building Envelope Summary	Maintenance																												
	Replacement																												
Section 3 - MECHANICAL COMPONENTS																													
Boiler #1 & #2	Maintenance																												
	Replacement	20000	1992	25		2017		20,000																					
AHU #1	Maintenance																												
	Replacement	36000	1957	20	39	2016	36,000																						
Council Chamber	Maintenance																												
	Replacement	70000	1957	20	39	2016	70,000																						
Admin Area	Maintenance																												
	Replacement	4000	1957	10	49	2016	4,000																						
Heating Water	Maintenance																												
	Replacement	6000	1957	20	39	2016	6,000																						
Pumps 1-1/2"	Maintenance																												
	Replacement																												
Exhaust Fans	Maintenance																												
	Replacement																												
Hot Water Tank	Maintenance	1200	2002	15		2017		1,200																					
	Replacement																												
Electric	Maintenance	5200	2015	5		2020				5,200																			
	Replacement																												
Plumbing Fixtures	Maintenance																												
	Replacement																												
Washroom	Maintenance																												
	Replacement																												
Ductless	Maintenance																												
	Replacement																												
Split 2.5 ton A/C	Maintenance	12000	2010	15		2025																							
	Replacement																												
Ductless	Maintenance																												
	Replacement																												
Split 1.5 ton A/C	Maintenance	10000	2010	15		2025																							
	Replacement																												
Mechanical Summary	Maintenance																												
	Replacement																												
Section 3 - MECHANICAL COMPONENTS Summary							116,000	21,200																					

No.2 Municipal Hall

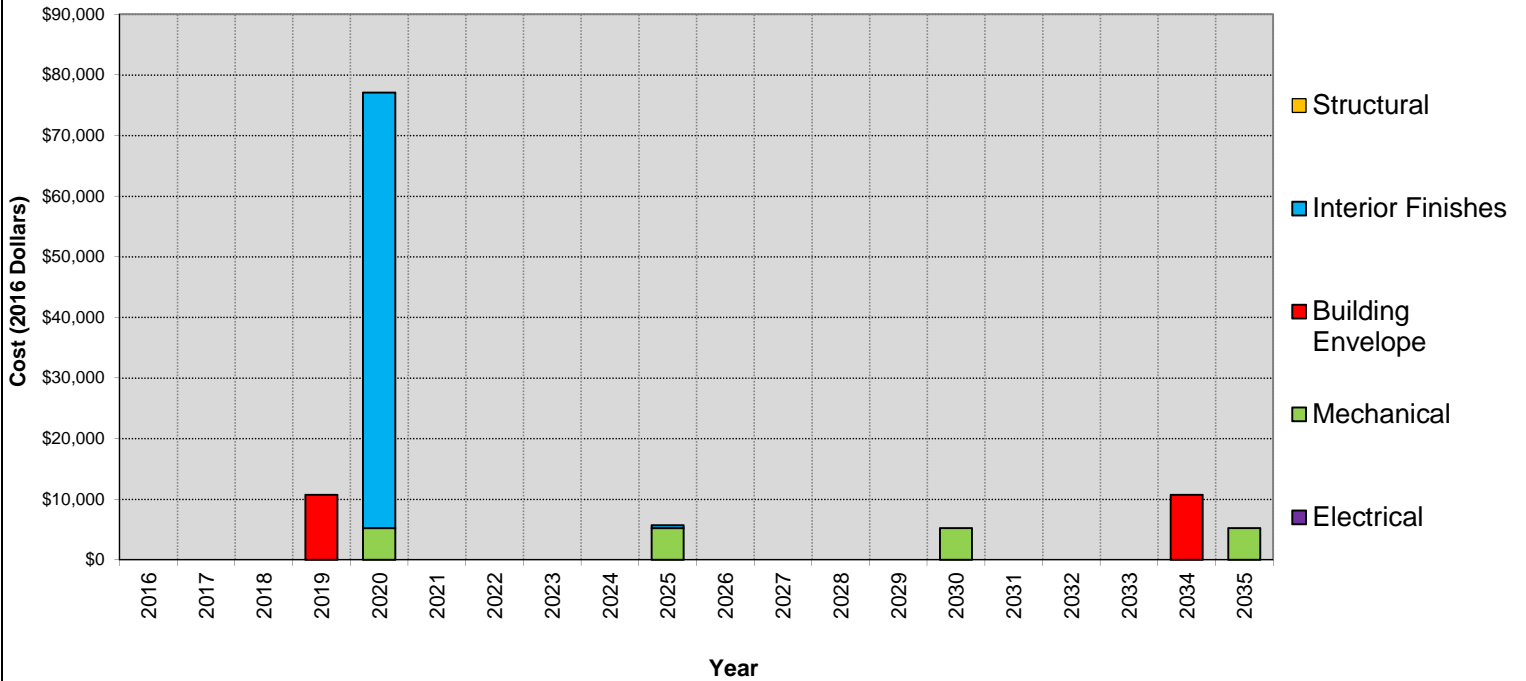
Component Name	Task	Cost (\$)	Instal Date	Period (years)	Adjusted (years)	Next Year	Expenses																				
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Section 4 - ELECTRICAL COMPONENTS																											
Break Panel	Maintenance																										
Main	Replacement	60000	1978	35	3	2016	60,000																				
Breaker Panel	Maintenance																										
Secondary	Replacement	310000	1978	30	8	2016	310,000																				
Generator	Maintenance																										
Emergency	Replacement	65000	2013	25		2038																					
Transfer Switch	Maintenance																										
	Replacement	15000	2013	25		2038																					
Receptacle	Maintenance																										
Duplex	Replacement	30000	1978	35	8	2021					30,000																
Baseboard	Maintenance																										
	Replacement	6300	1978	30	9	2017		6,300																			
Alarm Panels	Maintenance																										
	Replacement	15000	1978	20	20	2018			15,000																		
Lighting Exit	Maintenance																										
	Replacement	8750	1978	25	15	2018			8,750																		
Lighting Exterior	Maintenance																										
	Replacement	5300	2000	30		2030																		5,300			
Lighting Interior	Maintenance																										
	Replacement	21000	2000	30		2030																		21,000			
Communication	Maintenance																										
System	Replacement	50000	2010	25		2035																				50,000	
Paging System	Maintenance																										
	Replacement	22500	1978	25	15	2018			22,500																		
Intrusion	Maintenance																										
Detection System	Replacement	8500	1978	20	21	2019			8,500																		
UPS	Maintenance																										
	Replacement	15000	2010	15		2025																		15,000			
Lighting	Maintenance																										
Emergency	Replacement	5000	1978	25	15	2018			5,000																		
Audio System	Maintenance																										
	Replacement	15000	2000	25		2025																		15,000			
Electric Car	Maintenance																										
Charges	Replacement	20000	2010	30		2040																					
Electrical	Maintenance																										
Summary	Replacement						370,000	6,300	51,250	8,500		30,000					30,000							26,300		50,000	
Section 5 - STRUCTURAL COMPONENTS																											
Seismic	Maintenance																										
Upgrade	Replacement	950000				2018			950,000																		
Structural	Maintenance																										
Summary	Replacement								950,000																		
Building Summary	Maintenance																										
	Replacement						509,100	189,100	1,001,250	10,700	77,100		30,000				5,700							5,200		10,700	5,200
Yearly Totals							\$509,100	\$189,100	\$1,001,250	\$29,200	\$77,100	\$30,000				\$95,700	\$4,000						\$31,500		\$65,500	\$20,700	\$55,200
Totals Inflated at 2% per Year							\$509,100	\$192,882	\$1,041,701	\$30,987	\$83,456	\$33,122				\$114,370	\$4,876						\$41,564		\$89,917	\$29,565	\$80,416

No.2 Municipal Hall

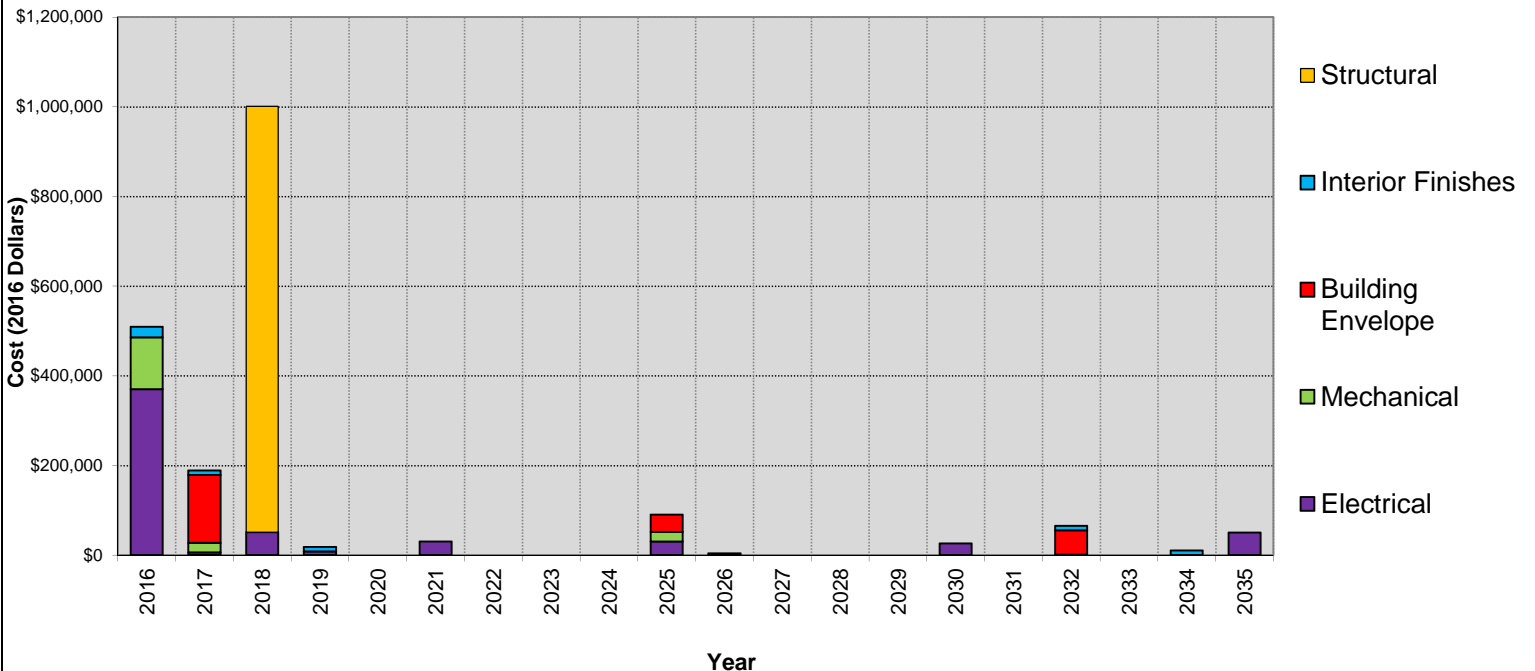
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.2 Municipal Hall

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 33,000	2000	20		2020
Carpet	Maintenance Replacement	\$ 38,900	2000	20		2020
Vinyl Sheet	Maintenance Replacement	\$ 14,300	1990	25	1	2016
Marmoleum	Maintenance Replacement	\$ 16,500	1990	50		2040
Wood Laminate Basement	Maintenance Replacement	\$ 500	2010	15		2025
Washroom Partitions	Maintenance Replacement	\$ 10,500	1957	15		1972
Washroom Fixtures	Maintenance Replacement	\$ 10,000	1989	15		2004
Fire Separations	Maintenance Replacement	\$ 5,000				2016
Stair Guard Rail Handrails	Maintenance Replacement	\$ 3,800	1957	50	9	2016

NOTES:

Maintenance:

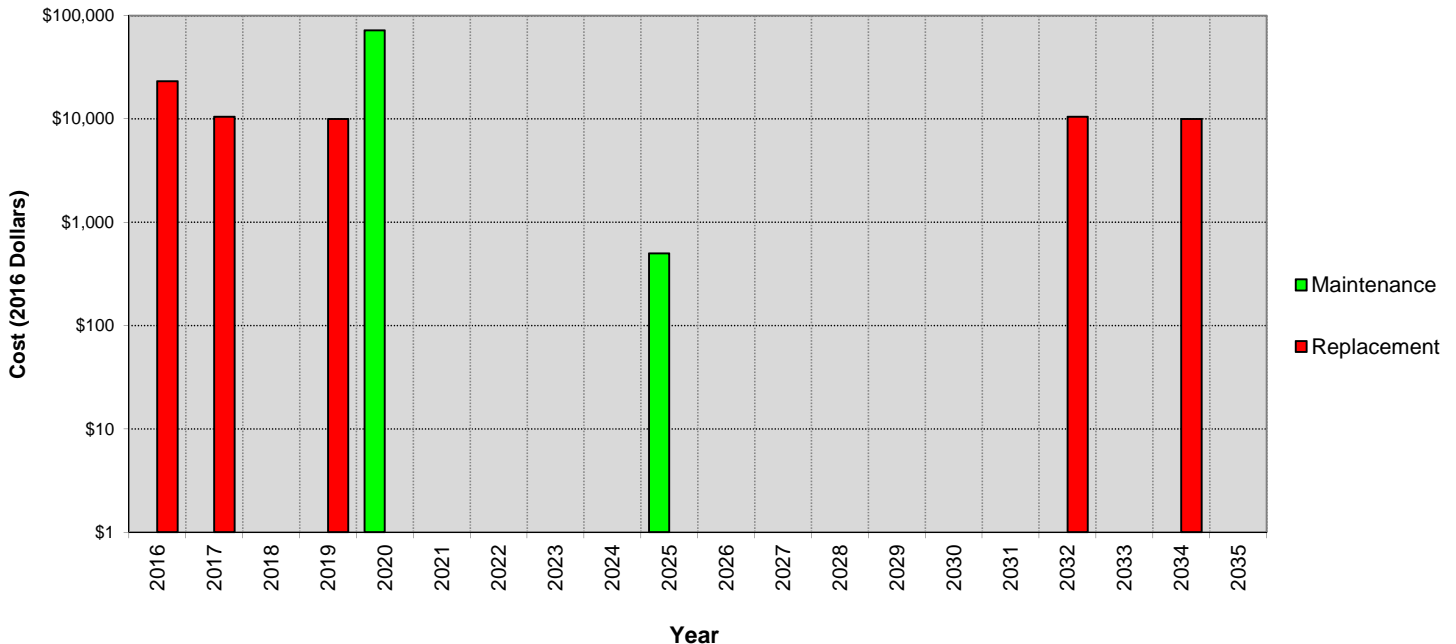
Interior wall maintenance includes repainting and renewing wallpaper.
 Wood laminate maintenance includes refinishing every 15 years.

Replacement:

Carpets at Engineering offices in NE corner have damage/mould from consistent condensate dripping from an exposed, capped, domestic cold water line.

Sealing wall penetrations and upgrading fire rating in the basement boiler room.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.2 Municipal Hall

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
CMU	Maintenance Replacement	\$ 10,200	2004	15		2019
Stucco	Maintenance Replacement	\$ 500	2004	15		2019
Aluminum Windows	Maintenance Replacement	\$ 137,500	1957	45	15	2017
Exterior Doors	Maintenance Replacement	\$ 9,600	1957	60		2017
SBS Membrane Roof - Upper	Maintenance Replacement	\$ 52,000	2007	25		2032
SBS Membrane Roof - Lower	Maintenance Replacement	\$ 38,000	2000	25		2025
Roof Scuppers	Maintenance Replacement	\$ 4,000				2017
Skylights Curb Mounted	Maintenance Replacement	\$ 1,800	2000	30	2	2032

NOTES:

Maintenance:

CMU and stucco maintenance includes cleaning and repainting every 15 years.

Exterior door maintenance assumed to be performed internally as needed.

Replacement:

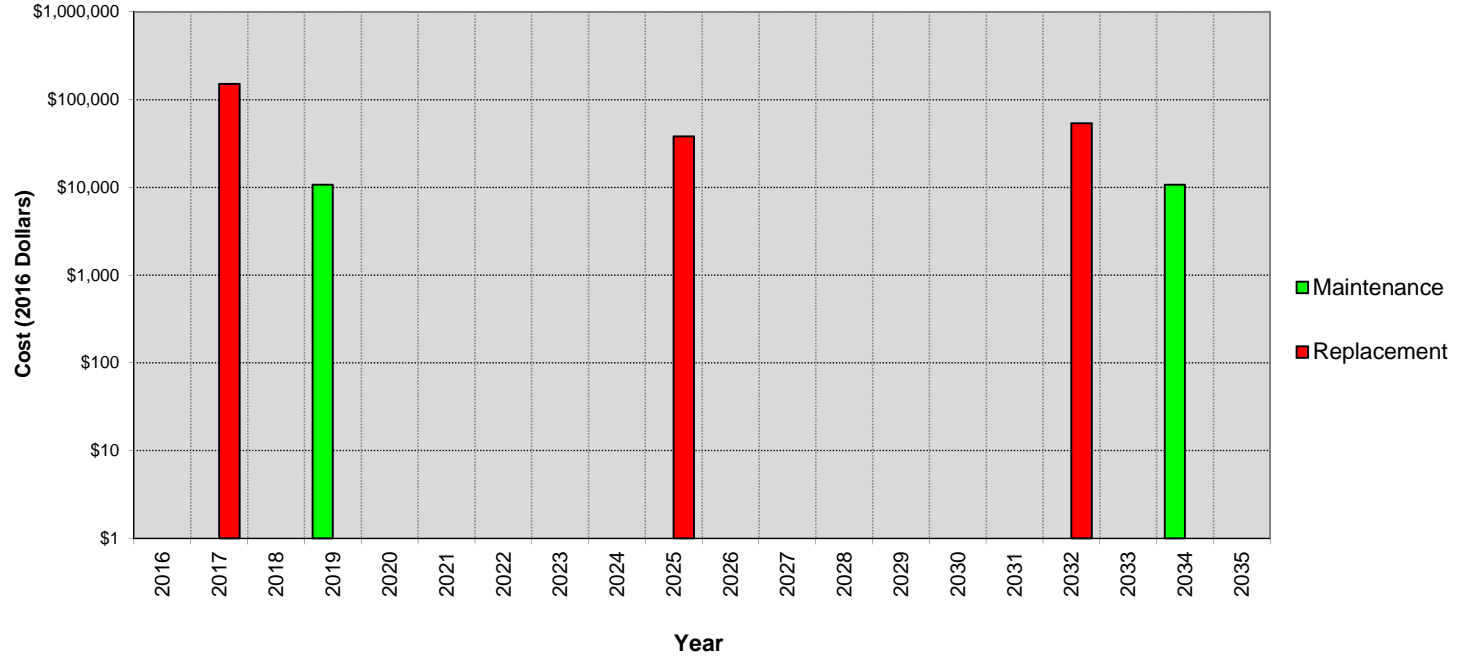
Aluminum-framed windows are original and single glazed. No gaskets present resulting in movement during wind events and poor air tightness. Estimate provided for replacement with aluminum, double-glazed product.

SBS membrane replacement includes perimeter cap flashing and installation of drain covers.

Roof scupper installation recommended between upper and lower roof levels to more effectively manage rainwater.

Skylight replacement to coincide with upper roof membrane replacement.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.2 Municipal Hall

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Boiler #1 & #2	Maintenance Replacement	\$ 20,000	1992	25		2017
AHU #1 Council Chamber	Maintenance Replacement	\$ 36,000	1957	20	39	2016
AHU #2 Admin Area	Maintenance Replacement	\$ 70,000	1957	20	39	2016
Heating Water Pumps 1-1/2"	Maintenance Replacement	\$ 4,000	1957	10	49	2016
Exhaust Fans	Maintenance Replacement	\$ 6,000	1957	20	39	2016
Hot Water Tank Electric	Maintenance Replacement	\$ 1,200	2002	15		2017
Plumbing Fixtures Washroom	Maintenance Replacement	\$ 5,200	2015	5		2020
Ductless Split 2.5 ton A/C	Maintenance Replacement	\$ 12,000	2010	15		2025
Ductless Split 1.5 ton A/C	Maintenance Replacement	\$ 10,000	2010	15		2025

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

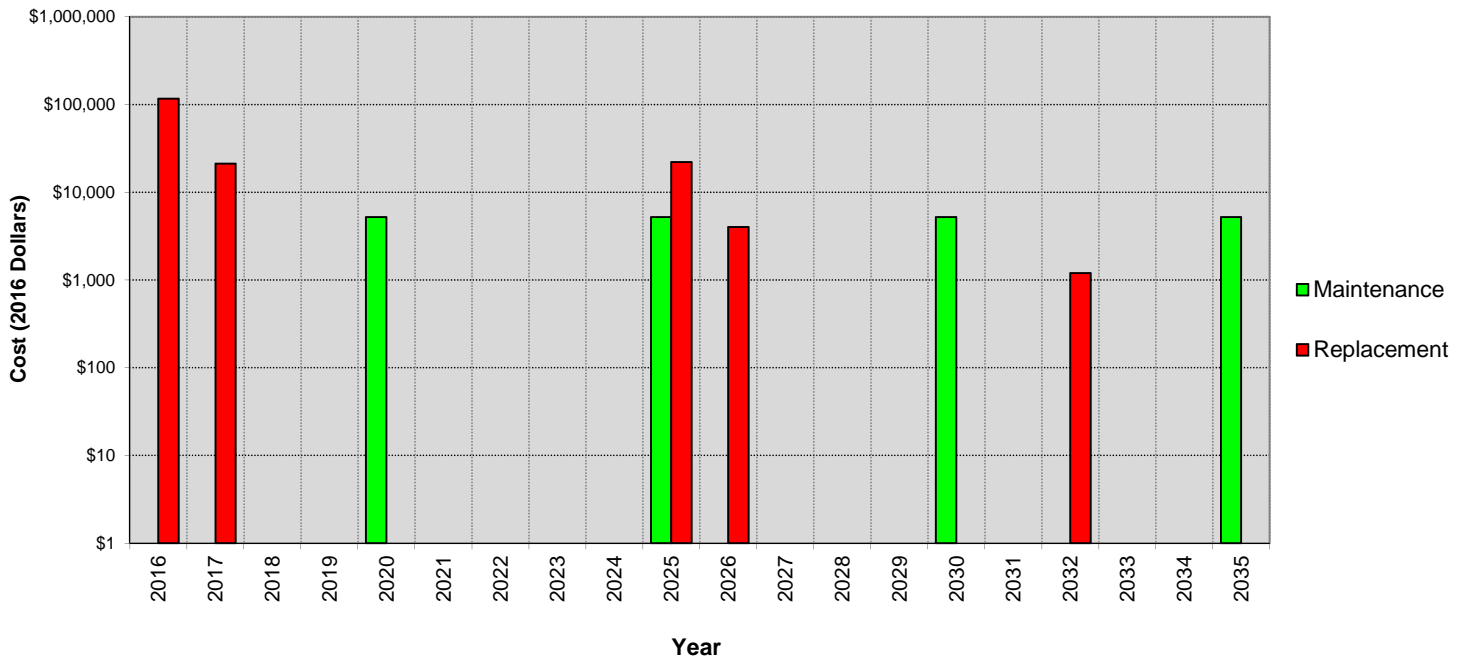
Plumbing Fixtures variable age. Replace as required.

Exhaust fans inaccessible.

Replacement:

Equipment exceeding expected service life is recommended for replacement.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.2 Municipal Hall Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Break Panel Main	Maintenance Replacement	\$ 60,000	1978	35	3	2016
Breaker Panel Secondary	Maintenance Replacement	\$310,000	1978	30	8	2016
Generator Emergency	Maintenance Replacement	\$ 65,000	2013	25		2038
Transfer Switch	Maintenance Replacement	\$ 15,000	2013	25		2038
Receptacle Duplex	Maintenance Replacement	\$ 30,000	1978	35	8	2021
Baseboard	Maintenance Replacement	\$ 6,300	1978	30	9	2017
Alarm Panels	Maintenance Replacement	\$ 15,000	1978	20	20	2018
Lighting Exit	Maintenance Replacement	\$ 8,750	1978	25	15	2018
Lighting Exterior	Maintenance Replacement	\$ 5,300	2000	30		2030
Lighting Interior	Maintenance Replacement	\$ 21,000	2000	30		2030
Communication System	Maintenance Replacement	\$ 50,000	2010	25		2035
Paging System	Maintenance Replacement	\$ 22,500	1978	25	15	2018
Intrusion Detection System	Maintenance Replacement	\$ 8,500	1978	20	21	2019
UPS	Maintenance Replacement	\$ 15,000	2010	15		2025
Lighting Emergency	Maintenance Replacement	\$ 5,000	1978	25	15	2018
Audio System	Maintenance Replacement	\$ 15,000	2000	25		2025
Electric Car Charges	Maintenance Replacement	\$ 20,000	2010	30		2040

NOTES:

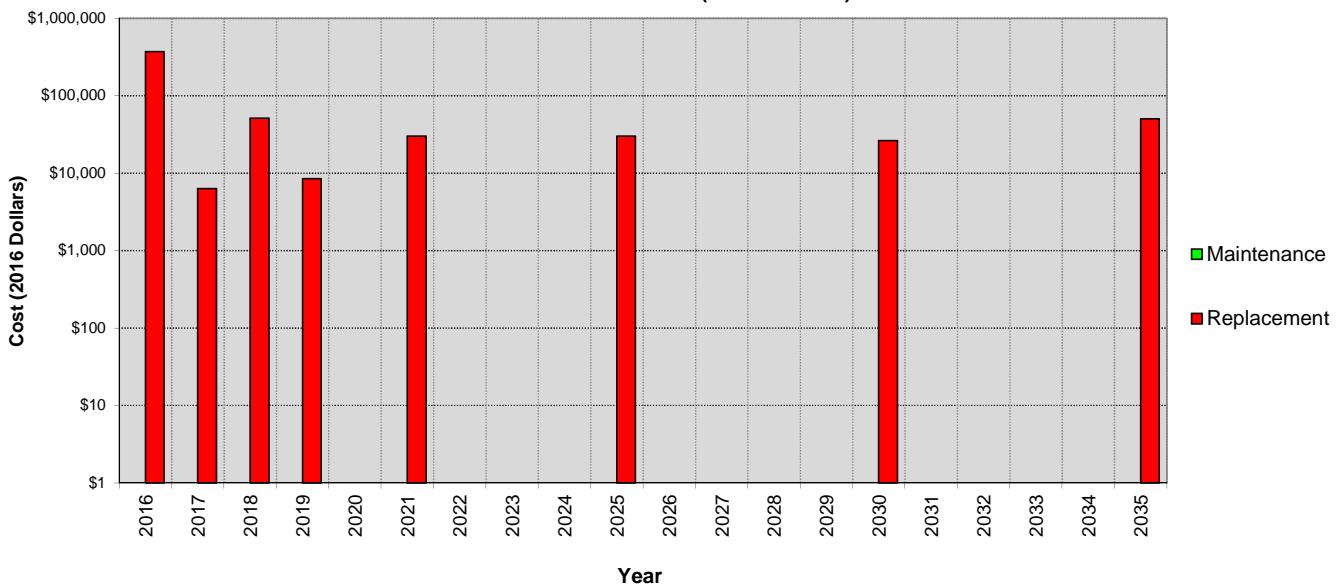
Maintenance:

Lighting and lighting controls should be upgraded over time to realize energy savings and meet current code.

Replacement:

The building requires an electrical system upgrade/replacement. The Fire Alarm System, Paging and Intrusion Detection Systems should be replaced.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.2 Municipal Hall Structural



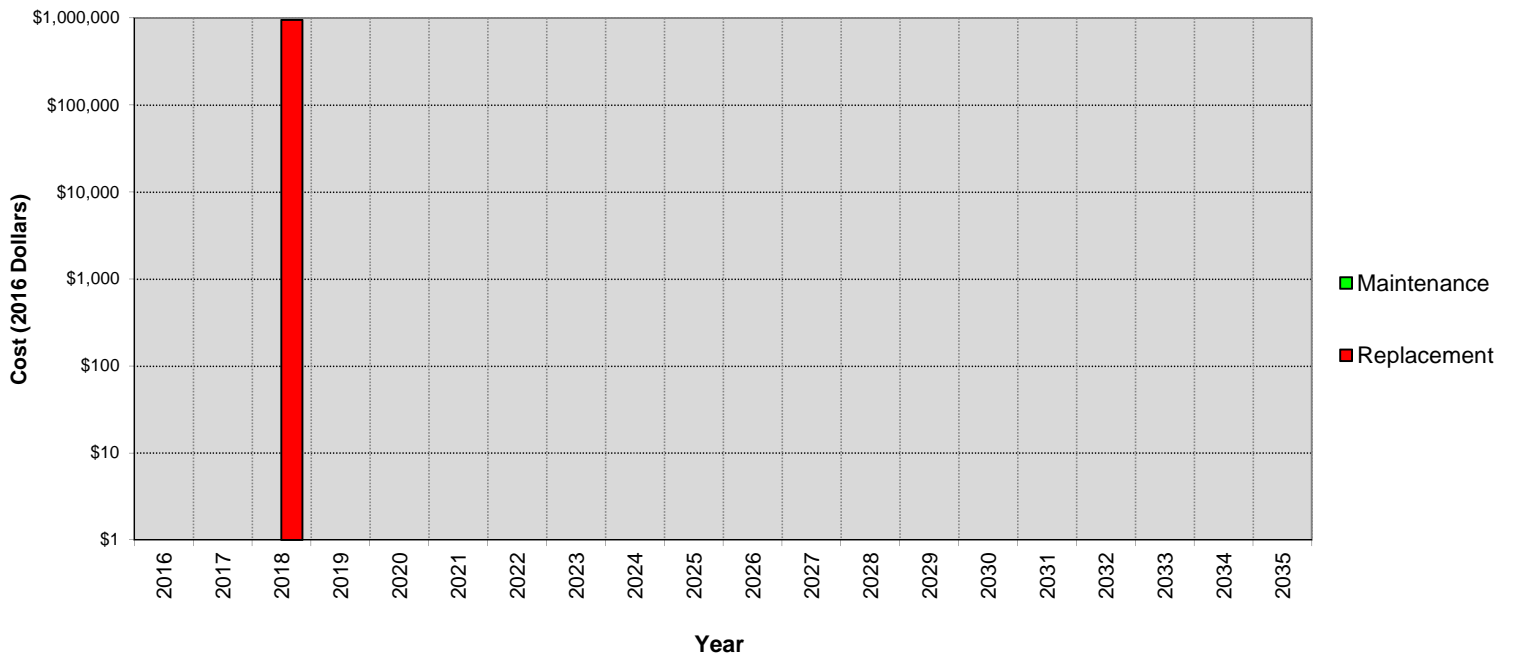
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance					
	Replacement	\$ 950,000				2018

NOTES:
Maintenance:

Replacement:



Seismic upgrade includes additional shear walls or steel braced frames with corresponding foundations. These shear walls or braced frames will likely block some of the existing window openings. Additional anchorage of the walls to the roof and floor structures will also be required, in addition to roof and floor diaphragm strengthening.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.5. No. 3a – Public Works - Office and Storage Building

<p>1771 Elgin Road</p> <p>Peak Occupancy: 65 persons</p> <p>Staffing (avg.): 54 persons</p> <p>Built: 1964 Addition(s): 1975 Renovation: 1997 (office) Current Area: 11,404 s.f.</p> <p>HVAC: Natural gas furnace, heat-pump, HRV</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 
<p><i>Figure 5 - No. 3a – Public Works - Office and Storage Building</i></p>	

2.1.5.1. Description

As the central building to the Public Works Yard, the Office and Storage building houses administration and operations staff while also providing storage of municipal road and water works equipment. Built in 1964, the original two-storey building has had another building butted up to it on the west (c.1975) which includes a Parks staff room, reception entry vestibule and open-air storage. For the purposes of this report the west building has been included with the Office and Storage building's financial asset management.

The utilitarian building is constructed with concrete block at exterior walls and wood-frame at roofs and floors. Wood flooring rests over a 2'-6" crawlspace. The walls and roof are not insulated, and windows are non-thermally broken aluminum frame. The lower level consists of offices, a staff lunch room, lockers, washrooms and a large storage area. The lower level is occupied by approx. 12 staff with workstations and is subject to significant off-site staff traffic. The upper level is under-utilized as it is not suited to any functional needs at this time. The upper level is used primarily as storage, with a former sign shop which has since been discontinued. Parking for the building is designated within the Yard and perpendicular to the south elevation where the main entrance to the building is located.

INTERIOR FINISHES & FURNISHINGS: The interior of the building is constructed of concrete block, and wood-framed drywall partitions in a few renovated locations. Interior flooring is finished with sheet flooring and ceramic tile, or unfinished concrete and plywood.

This Group D Classification Building is not required by current Code to be sprinklered. However, it is required to have a 45min fire rated floor. We have not included this upgrade within this scope due to the under-utilization of the second floor. Should the second floor become occupied, the 45 fire rating upgrade should be considered.

The public areas of the offices have been refreshed and are in good condition. The staff offices and support spaces are in poor condition due to a lack of replacement, cleanliness, and lack of sufficient office storage systems. The main floor interior requires periodic painting, sheet flooring replacement, locker replacement, hand washing fixture replacement, and first aid room renovation. The second floor is mostly used for file storage for the Oak Bay Recreation Centre. The interiors in this area are basic with exposed roof framing, however, the current functional non-use of the space is not triggering any interior upgrades. The building is not seismically upgraded. As the site use is currently inadequately planned, we would not recommend a seismic upgrade until an overall plan for the site is determined.

BUILDING ENVELOPE: Exterior walls are constructed from uninsulated, partially-or fully-grouted painted concrete masonry unit and wood-framed stucco cladding. The upper level features original, single-pane, non-thermally broken metal-framed windows. Lower level office windows were upgraded with double-paned vinyl-framed windows in 2002. Exterior doors are hollow-metal with roll-up garage doors featured on the west elevation to the large storage area and the adjoining Parks building. Roofing is entirely low-sloped with 2-ply SBS membrane except for a portion of built-up-roofing with gravel ballast over the open-air storage area on the adjoining west building. Roof-top drains are present in corners and along the cap-flashed roofing perimeter, and overall ponding and condition was acceptable.

STRUCTURAL: The Office and Storage building features wood roof joists and wood floor joists supported by beams and columns. The exterior walls are constructed from concrete masonry units. Some interior partition walls on the ground floor are also constructed from concrete block masonry units. No significant additions or alterations have been made to the original building. Based on what is observed on site and what is shown on the original drawings, it appears that the perimeter masonry walls are not anchored to the floor and the roof structure adequately. Furthermore, the perimeter masonry walls are not reinforced sufficiently to support the building laterally for current Code-level seismic forces. In its current condition, the Office and Storage building has a seismic capacity-to-demand ratio of about 0.2.

Seismic upgrade of this building involves the upgrade to the roof and floor diaphragms, addition of reinforcing to the existing masonry walls and anchorage of the masonry walls to the roof and floor structures.

MECHANICAL:

- Heating, Ventilation and Cooling (HVAC):

A natural gas meter set next to the Shops building supplies gas to the entire complex, including the Office and Storage building. The lunch area and storage areas on the 1st and 2nd levels are serviced by the original oil furnace system which has been upgraded and is powered by natural gas. The furnace is located in the basement mechanical room and its flue is connected to a brick chimney. Supply air ductwork uses the 2'-6" crawlspace below the office floor for distribution.

The Office area is serviced by a packaged heat-pump roof top unit (RTU) system installed c.1997. The existing furnace system ductwork is still in place and is decommissioned in this area to allow the new system to condition the office space. Supply air diffusers are installed in drop T-bar ceilings that were installed at the time of this area's renovation. The ceiling space is also used as a return plenum and is a combustible space. A combustible space such as this should therefore feature hard ducting back to the RTU. The furnace return air grilles have been capped off at floor level. The exposure of the users to the office space is fairly constant such that the single zone should be adequate for the comfort of the staff.

There are exhaust fans that service rooms based on their own loads. Two are located up on the 2nd level, another sidewall fan is located on the office single-storey extension serving a lunch room and another fan services the Printer room. There is an exhaust fan serving the ladies room on a manual timer. Ventilation for the other washrooms was not observed. A heat recovery ventilator (HRV) is used to ventilate sections of the 2nd level. It appears to run continuously and transfers heated outdoor air from one workroom/storage area to the opposite storage area on the 2nd level.

Electric baseboards are installed under windows around the perimeter on the 1st level. There are electric unit heaters in the storage areas.

Overall the heating and ventilation within this building is marginal for its intended function. The storage and general space areas are serviced by the furnace system and the office area is serviced by an independent air conditioning (AC) system from the roof. Some areas on the 2nd level have working uses and would require ventilation appropriate to their uses. Other transition areas have issues more related to their location as high traffic areas than to the HVAC system. The storage and workrooms have marginal occupancies and do not require continuous ventilation. Manual operation of equipment when areas are in use is acceptable.

Observations noted throughout the HVAC systems include:

- The 2nd level and 1st level work rooms are not specifically ventilated for the use of equipment and room.
- Return ducting to the AC unit, serving the office space, is not hard-ducted.
- The server station in the basement area is not ventilated.

- Plumbing:

Domestic cold water (25mm [1"]) entry is in the basement mechanical room and has proper backflow protection. Domestic cold water is supplied from the mechanical room and then distributed to the Office and Storage building. The piping is copper and steel-braided hose, and is not insulated as per today's Code. There are hose bibs located in various parts of the storage area for convenience. The water service is undersized for the number and type (flush valve) of fixtures served. A separate irrigation connection is located in the attached single storey storage work shop complete with back flow prevention. An electric 4.5KW 300L domestic hot water tank in the basement mechanical room supplies hot water to the Office building.

Plumbing fixtures are located in the Kitchen areas, in the washrooms and laundry sinks in three workshops. In general, the fixtures are aged, in various condition, and should be replaced as needed. The laundry or utility sinks are functional and well used in the shop areas. The main washroom has ceramic lavatory basins with older lever handle faucets, ceramic wall mounted basins with sensor flush valves and water closets with manual flow flush valves. The kitchen sinks and first aid room sink are all stainless steel with manual swing spout faucets. The locker rooms have two semi-circular wash-fountains hand wash stations that are likely original to the facility and well used. There are various older ceramic sink type drinking fountains one in the main lunch room and the other on the exterior of the building. Emergency eye wash stations are present in what appears to be accessible locations.

The sanitary sewer system is comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. The storm system is comprised of plastic rainwater leaders that collect roof drain water and direct it to concrete cast iron storm building mains.

Observations noted throughout the plumbing system include:

- Systems appear to be older with fixtures and piping systems approaching the end of their useful life expectancy.
- There is no floor drain in the basement.
- There is no domestic hot water recirculation line out to the single storey office lunch room.
- The 25 mm [1"] domestic water service is not large enough to supply the number of fixtures present in the building to today's Code.
- Domestic hot and cold water piping requires insulation as per today's Code.

- Fire Suppression:

The facility is generally not protected with a fire suppression system. There are hose stations that have been decommissioned and a minor two-sprinkler heads system is installed in the mechanical room that branch off the domestic water system complete with a back flow preventer. Fire extinguishers are present on walls in locations as per NFPA 10. A wet fire suppression system designed to NFPA 13 is recommended.

ELECTRICAL: The electrical system is past its serviceable life and needs to be replaced. The lighting and lighting controls are outdated and should be replaced to save energy and improve lighting levels.

2.1.5.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 9: Condition of Building Systems –No. 3a – Public Works - Office and Storage Building

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls		X			
Vinyl Sheet		X			
Carpet					
Guardrail			X		
Interior Doors		X			
Building Envelope					
Stucco			X ₁		
CMU				X	
Exterior Plywood				X	
SBS 2-Ply Roof Membrane				X ₂	
Built-Up Roofing			X ₃		
Windows, Metal			X ₄		
Exterior Metal Doors				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers				X	
Roof Top Unit HP AC unit				X	
Heating Furnace				X	
Heat Recovery Unit				X	
Exhaust Fans			X		
Plumbing Fixtures			X		
Domestic Water System			X		
Electrical					
Breaker Panel Main		X ₅			
Breaker Panel 2ndry		X ₅			
Receptacle Duplex			X		
Lighting Exterior			X ₆		
Lighting Interior			X ₆		
Motion Sensor					X
Communications System					X
Structural					
Seismic Restraint		X ₇			

Notes:

1. Portions of stucco near grade and over Parks Office entrance exhibit water staining.
2. Significant ponding (75% of upper roof area), granule worn in areas.
3. Significant ponding; organic matter within gravel ballast.
4. Original windows on west stucco elevation (Parks Office) are poorly flashed and lack perimeter sealant. Water staining was present below weep holes.
5. Consideration should be given to replacement of the aging electrical distribution system.
6. Consideration should be given to replacement of lighting fixtures for energy savings.
7. Seismic capacity-to-demand ratio of 0.2.

STRUCTURAL: Significant structural distress was not observed for this building. Masonry walls are not reinforced, nor anchored to the floor and roof structure very well.

2.1.5.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Public Works- Office and Storage: Baseline Recommendations:

2016

- Replace sheet flooring, paint interior, replace support area millwork, update first aid room equipment, and replace staff lockers.

2017

- Provide hard ducted return to the AC unit serving the office space.

2018

- Install domestic hot water recirculation.
- Insulate all domestic hot and cold water piping to the current BC building Code.
- Install a floor drain in the basement mechanical room complete with storm sump pump system.
- Improve ventilation in Basement area mechanical room for the server equipment.
- Ventilate each work room specific for their use to the current BC building Code.
- Seismic Upgrade

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Code.
- Replace existing domestic cold water service with one sized to meet the current BC Building Code.
- Design and installation of a fire sprinkler system to NFPA 13.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 10: Summary of Present-Value Building Costs every 5 years – No. 3a – Public Works - Office and Storage Building

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$39,000	\$22,000	\$4,000	\$4,000	\$69,000
Building Envelope	\$27,100	\$67,000	\$11,000	\$-	\$105,100
Mechanical Summary	\$20,000	\$5,000	\$3,000	\$13,000	\$41,000
Electrical Summary	\$62,300	\$1,900	\$-	\$10,000	\$74,200
Structural Summary	\$385,000	\$-	\$-	\$-	\$385,000
Total	\$533,400	\$95,900	\$18,000	\$27,000	\$675,000

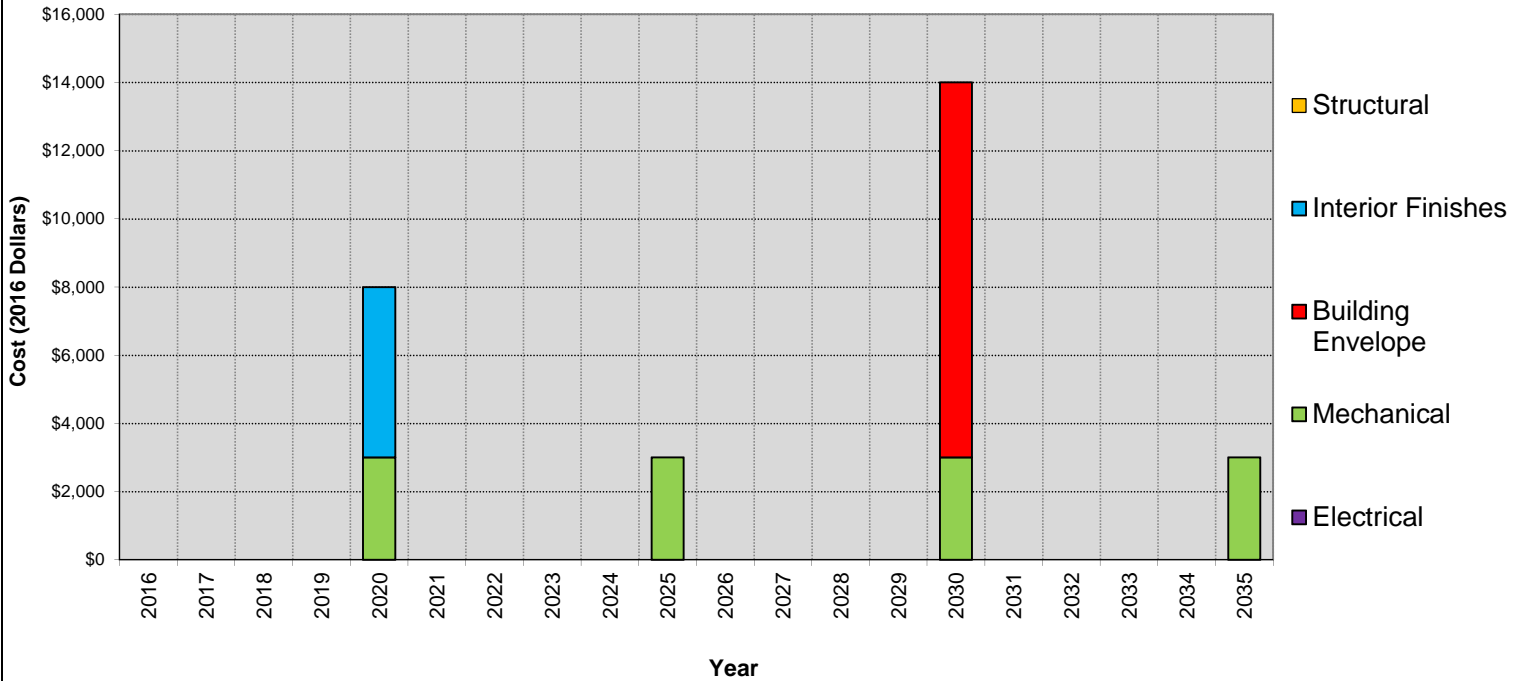
The site itself is currently dysfunctional due to a lack of available space to maneuver vehicles. There is also an unsafe amount of public traffic onto the Public Works Yard, due to the functional layout of the site. We recommend an analysis of the site layout and potential changes to accommodate current and future needs prior to investing significantly in the maintenance of this building.

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																			
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Section 1 - INTERIOR FINISHES COMPONENTS																										
Interior Walls	Maintenance Replacement	5000	2000	20		2020					5,000															
Vinyl-Sheet	Maintenance Replacement	18000	1995	30		2025									18,000											
Lockers	Maintenance Replacement	10000	1975	40	1	2016	10,000																			
First Aid Equipment	Maintenance Replacement	4000	1975	5	36	2016	4,000			4,000					4,000						4,000					
Int. Doors	Maintenance Replacement	5000	1975	25	17	2017		5,000																		
Millwork	Maintenance Replacement	15000	1975	25	17	2017		15,000																		
Interior Summary	Maintenance Replacement						14,000	20,000			5,000	4,000			18,000	4,000					4,000					
Section 2 - BUILDING ENVELOPE COMPONENTS																										
Stucco	Maintenance Replacement	1000	2010	20		2030																	1,000			
CMU	Maintenance Replacement	10000	2010	20		2030																	10,000			
Exterior Plywood	Maintenance Replacement	2500	1964	50	7	2021				2,500																
Exterior Metal Doors	Maintenance Replacement	6500	1975	50		2025									6,500											
Metal Windows	Maintenance Replacement	12400	1964	45	10	2019			12,400																	
SBS Membrane	Maintenance Replacement	58000	2005	20	-2	2023							58,000													
Built-Up Roofing	Maintenance Replacement	14700	1975	30	13	2018			14,700																	
Building Envelope Summary	Maintenance Replacement								14,700	12,400	2,500		58,000		6,500							11,000				
Section 3 - MECHANICAL COMPONENTS																										
RTU	Maintenance Replacement	5000	1997	15	5	2017		5,000															5,000			
4 Ton HP Furnace	Maintenance Replacement	5000	1991	18	7	2016	5,000																	5,000		
Exhaust Fans	Maintenance Replacement	2000	1997	20		2017		2,000																		
General HRV	Maintenance Replacement	5000	1998	20		2018			5,000																	
Domestic HWT	Maintenance Replacement	2000	2007	15		2022						2,000														
300L Nat. Gas Plumbing Fixtures	Maintenance Replacement	3000	2015	5		2020			3,000						3,000								3,000	3,000		
Mechanical Summary	Maintenance Replacement						5,000	7,000	5,000			3,000	2,000		3,000							3,000	5,000	5,000	3,000	
Section 4 - ELECTRICAL COMPONENTS																										
Breaker Panel Main	Maintenance Replacement	11000	1975	35	8	2018			11,000																	
Breaker Panel Secondary	Maintenance Replacement	22000	1975	35	8	2018			22,000																	
Receptacles	Maintenance Replacement	15800	1975	30	15	2020				15,800																
Duplex	Maintenance Replacement	3500	1975	30	15	2020				3,500																
Lighting Exterior	Maintenance Replacement	10000	1975	30	15	2020				10,000																
Lighting Interior	Maintenance Replacement	1900	2010	15		2025									1,900											
Motion Sensors	Maintenance Replacement	10000	2010	25		2035																		10,000		
Communication System	Maintenance Replacement																									
Electrical Summary	Maintenance Replacement								33,000	29,300					1,900									10,000		
Section 5 - STRUCTURAL COMPONENTS																										
Seismic Upgrade	Maintenance Replacement	385000				2018																				
Structural Summary	Maintenance Replacement																									
Building Summary	Maintenance Replacement						19,000	27,000	437,700	12,400	8,000	29,300	6,500	2,000	58,000	3,000	26,400	4,000				14,000	4,000	5,000	5,000	3,000
Yearly Totals							\$19,000	\$27,000	\$437,700	\$12,400	\$37,300	\$6,500	\$2,000	\$58,000	\$29,400	\$4,000						\$14,000	\$4,000	\$5,000	\$5,000	\$13,000
Totals Inflated at 2% per Year							\$19,000	\$27,540	\$455,383	\$13,159	\$40,375	\$7,177	\$2,252	\$66,624	\$35,136	\$4,876						\$18,473	\$5,383	\$6,864	\$7,141	\$18,939

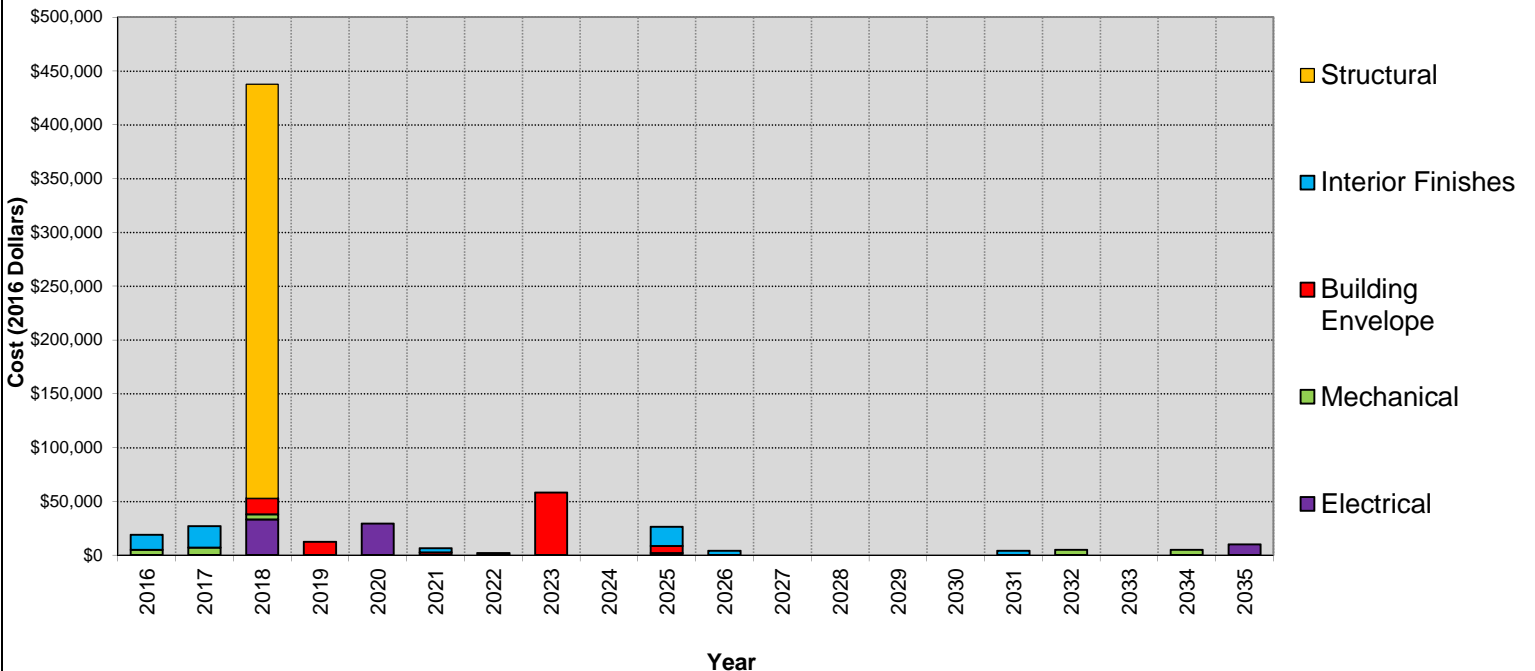
No.3a PW Office & Storage Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.3a PW Office & Storage

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 5,000	2000	20		2020
Vinyl-Sheet	Maintenance Replacement	\$ 18,000	1995	30		2025
Lockers	Maintenance Replacement	\$ 10,000	1975	40	1	2016
First Aid Equipment	Maintenance Replacement	\$ 4,000	1975	5	36	2016
Int. Doors	Maintenance Replacement	\$ 5,000	1975	25	17	2017
Millwork	Maintenance Replacement	\$ 15,000	1975	25	17	2017

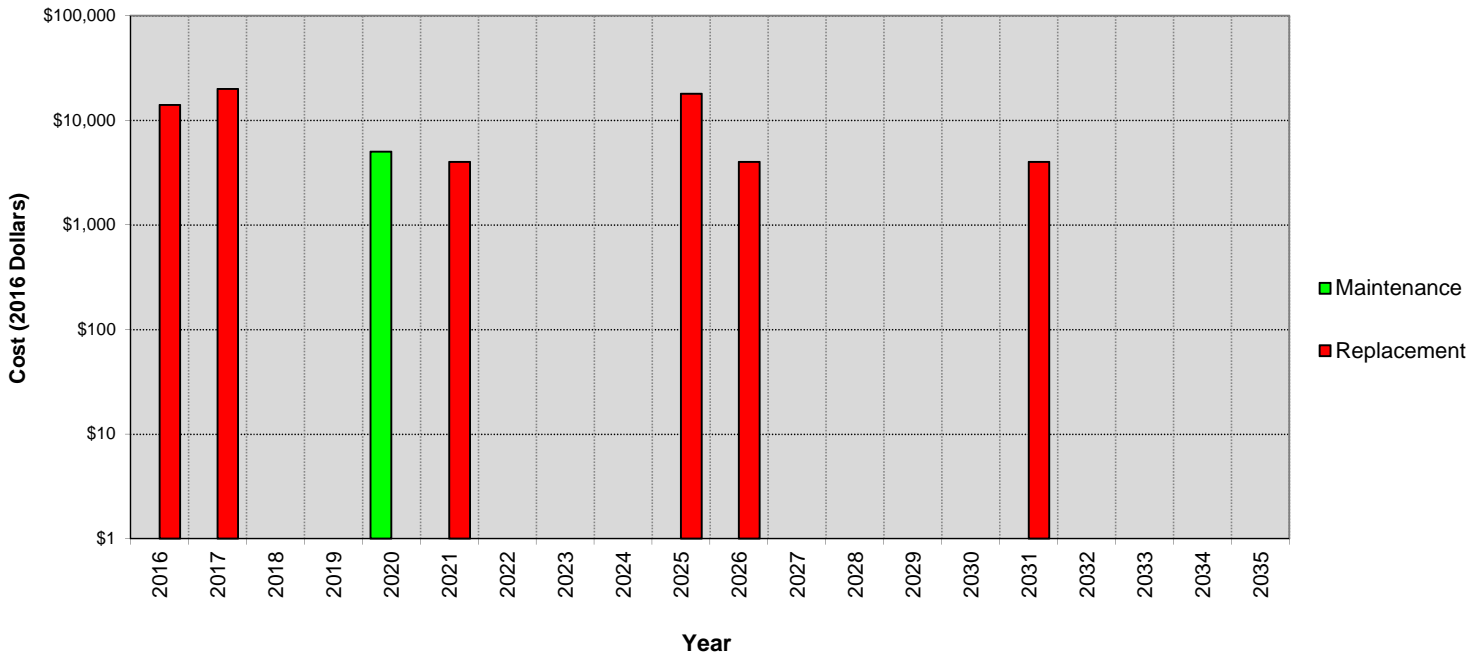
NOTES:

Maintenance:

Interior wall maintenance includes repainting gypsum wall board and trim on main level. Storage areas and utility rooms are not included.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3a PW Office & Storage

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 1,000	2010	20		2030
CMU	Maintenance Replacement	\$ 10,000	2010	20		2030
Exterior Plywood	Maintenance Replacement	\$ 2,500	1964	50	7	2021
Exterior Metal Doors	Maintenance Replacement	\$ 6,500	1975	50		2025
Metal Windows	Maintenance Replacement	\$ 12,400	1964	45	10	2019
SBS Membrane Roof	Maintenance Replacement	\$ 58,000	2005	20	-2	2023
Built-Up Roofing	Maintenance Replacement	\$ 14,700	1975	30	13	2018

NOTES:

Maintenance:

Cladding maintenance includes cleaning and repainting at respective specified periods.

Replacement:

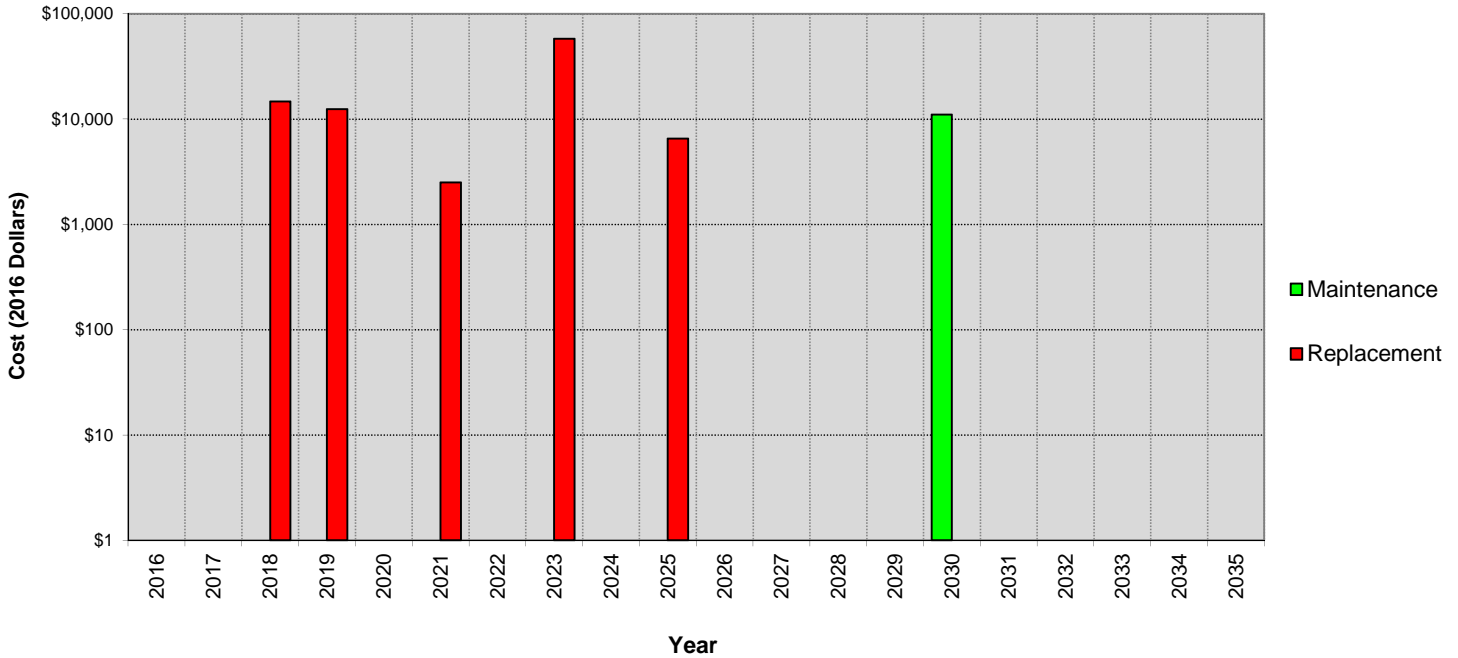
Exterior plywood present at west open storage area.

Exterior door replacement includes hollow-metal (5) and roll-up garage doors (2).

Aluminum window replacement for remaining, original windows. Vinyl-frame replacements installed 2002 are not expected for replacement in the next 20 years.

SBS membrane roof replacement includes perimeter cap flashing renewal also. Built-up roofing replacement over open storage area is estimated with SBS membrane.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.3a PW Office & Storage

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
RTU	Maintenance					
4 Ton HP	Replacement	\$ 5,000	1997	15	5	2017
Furnace	Maintenance					
	Replacement	\$ 5,000	1991	18	7	2016
Exhaust Fans	Maintenance					
General	Replacement	\$ 2,000	1997	20		2017
HRV	Maintenance					
	Replacement	\$ 5,000	1998	20		2018
Domestic HWT	Maintenance					
300L Nat. Gas	Replacement	\$ 2,000	2007	15		2022
Plumbing Fixtures	Maintenance	\$ 3,000	2015	5		2020
	Replacement					

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

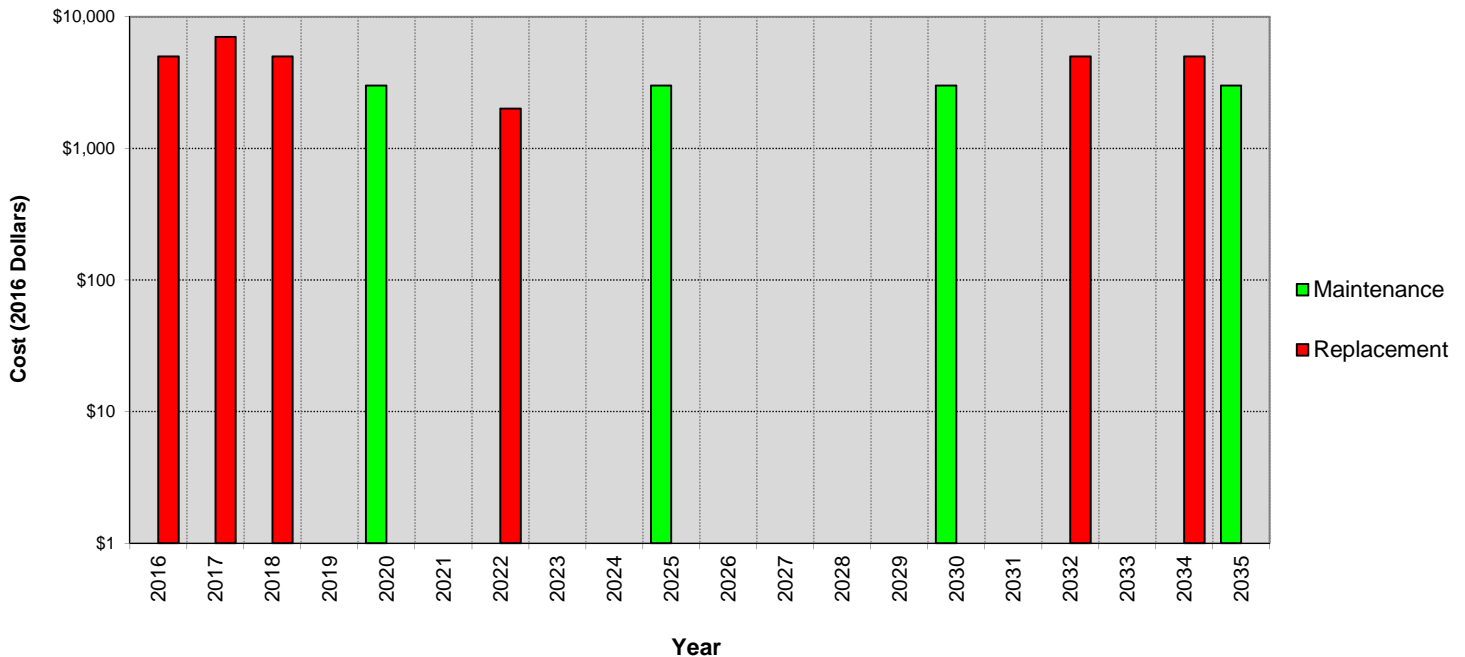
Plumbing Fixtures variable age. Replace as required.

Exhaust fans inaccessible.

Replacement:

RTU is in good condition and is lasting longer than ASHRAE Service Life Estimates. Furnace has been maintained and adjusted in 1997 when Office was upgraded. Service Life has been adjusted.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3a PW Office & Storage

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 11,000	1975	35	8	2018
Breaker Panel Secondary	Maintenance Replacement	\$ 22,000	1975	35	8	2018
Receptacles Duplex	Maintenance Replacement	\$ 15,800	1975	30	15	2020
Lighting Exterior	Maintenance Replacement	\$ 3,500	1975	30	15	2020
Lighting Interior	Maintenance Replacement	\$ 10,000	1975	30	15	2020
Motion Sensors	Maintenance Replacement	\$ 1,900	2010	15		2025
Communication System	Maintenance Replacement	\$ 10,000	2010	25		2035

NOTES:

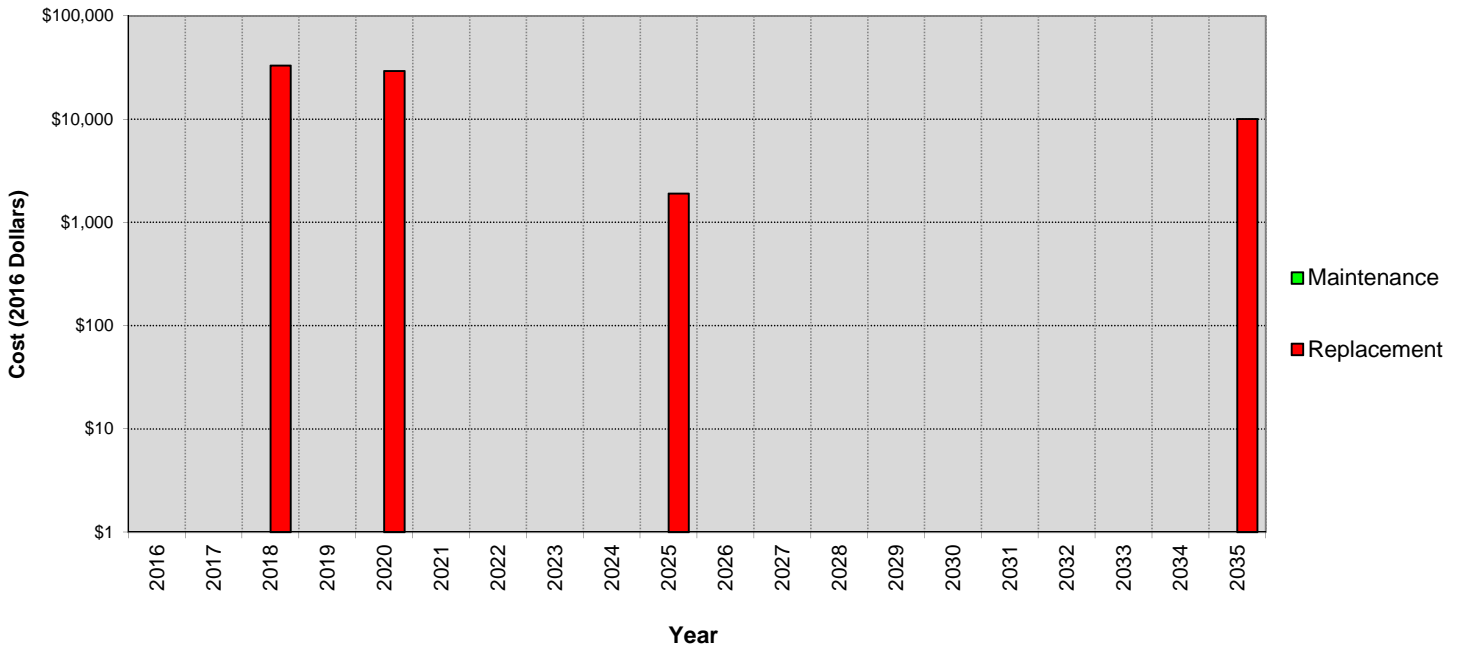
Maintenance:

Consideration should be given to replacement of the lighting and installation of new lighting controls for energy savings.

Replacement:

The electrical main service and distribution should be replaced as it is past its servicable life expectancy.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3a PW Office & Storage Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance					
	Replacement	\$ 385,000				2018

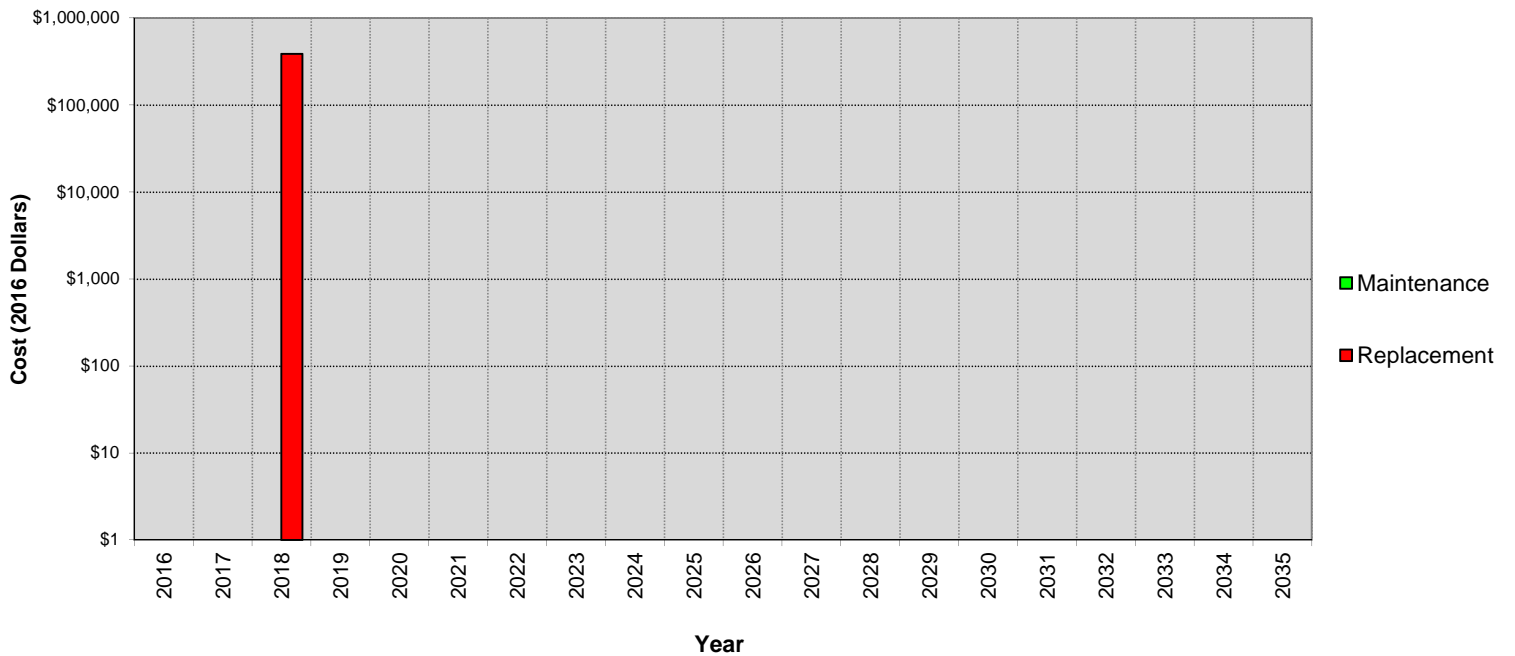
NOTES:

Maintenance:

Replacement:



Seismic upgrade includes upgrading roof and floor diaphragms, additional reinforcing to the existing masonry walls and anchorage of the masonry walls to the roof and floor structures.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.6. No. 3b – Public Works - Maintenance Building

<p>1771 Elgin Road</p> <p>Peak Occupancy: 20 persons</p> <p>Staffing (avg.): 12 persons</p> <p>Built: 1964 (6,660 sf)</p> <p>Addition(s): None</p> <p>Current Area: 6,660 sf</p> <p>HVAC: Natural gas Furnaces (3)</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 
	<p>Figure 6 No. 3b – Public Works - Maintenance Building</p>

2.1.6.1. Description

The Public Works Maintenance building functions as a servicing, repair and fabrication shop for District Works equipment. The single-storey building has three high-ceiling repair bays and division-specific shops including: carpentry, roads, water works, sewer and garbage, and parks. Built in unison with the Office and Storage building, the two buildings share much of the same construction and design: uninsulated, concrete block walls and wood-framed roof. As a maintenance building with shop space and storage, the building serves its purpose as a durable, utilitarian building with high ceiling space. The building is inefficient thermally night and day, frequently with a service bay door open during operating hours, and has equipment mechanical upgrades to meet WorkSafe BC requirements. The paint storage room is fire rated. The garage has a Code non-compliant service pit. As the garage is not fitted out with up to date equipment, the pit is still utilized.

INTERIOR FINISHES & FURNISHINGS: Interior finishes to the Maintenance building are limited; flooring is unfinished concrete and interior walls are not a priority to paint. Given the functionality of the building interior finishes are omitted from budgeting.

The interior spaces are F3 Classification Building with an 8” - 1.5hr fire resistant concrete block wall dividing the repair garage from the adjacent workshops, office and storage rooms. This wall is required to have a 2hr fire rating by current Code. While the building is durable, the garage spaces are dimensionally insufficient for their functional purpose to accommodate the size of trucks that are being serviced. Should renovations be provided

to this building, to accommodate the garage dimensional needs, we would also recommend the fire resistance rating upgrade. Most notable, the building severely lacks cleanliness that is expected in garages and workshops, posing hygienic concerns for the staff.

BUILDING ENVELOPE: Exterior walls are constructed primarily from uninsulated painted partially-or-fully grouted concrete masonry units; portions of wood-framed stucco cladding are present over service bays. All windows are original, single-pane, with non-thermally broken metal-frames. Exterior doors include hollow-metal, 11'-6" metal roll-up doors, and 14'-6" glazed roll-up doors. Roofing is entirely low-sloped with 2-ply SBS membrane and is found at three different roof heights over the building. Roof-top drains are present in corners and along the cap-flashed roofing perimeter. Roof parapet curbs are minimal. There is a mechanic's pit (4 ft. wide x 10 ft. long) 6 ft. below grade with a floor drain that did not exhibit symptoms of moisture, despite much of the site draining towards this location.

STRUCTURAL: The Maintenance building is a single storey building constructed in 1964. The roof for the repair shop is about 22.5 feet above the slab-on-grade; the roof for the electrical shop is about 16.5 feet above the slab-on-grade, while the roof over the rest of the shops is about 13 feet above the slab-on-grade. The roof over the repair shop consists of I-joists supported by glulam beams while the other roofs are supported by dimensional lumber joists. Based on observations on site and the original drawings, it appears that the masonry walls are anchored nominally or not at all to the roof structure. This condition poses the risk of the walls separating from the roof structure in a significant seismic event. Perimeter walls on the west, south and east sides have large openings for overhead doors and there is very little section of wall to resist lateral loads.

In its current condition, the Maintenance building has a seismic capacity-to-demand ratio of about 0.2. Seismic upgrade of this building involves upgrading the roof diaphragms, addition of reinforcing to the existing masonry walls and anchorage of the masonry walls to the roof structure.

MECHANICAL:

- Heating, Ventilation and Cooling (HVAC):

There is a natural gas meter set next to the Shops building that supplies gas to the entire complex including the maintenance shops. Heating of the garage bay area is serviced by a Dual Furnace System powered by natural gas. The furnaces are placed in parallel in the rear of the open space and their flue is connected to a brick chimney near by. The Sewer & Garage Shop has a decommissioned oil-fired furnace, likely original to the facility that used to supply heat. It is not functioning now and the area is without heat. The Water Works Shop and Paint Storage area has an existing and decommissioned oil fired furnace (located in the Water Works Shop), likely original to the facility, which was used to supply heat. It is not functioning now. These areas, as well as the Lining Shop are without heat. The Carpentry shop does not have any HVAC system installed. It was noted that an electric portable heater is in use.

All ductwork is exposed and also serves the electrical shop. A tail pipe exhaust system services the garage bays by removing tail pipe and general air fumes out through a wall cap on the back south side of the building. A welding station is also severed by this system. Controls were not identified at the time of the inspection. The Electrical shop is served by a supply grille from the Garage bay and does not have control of its own heating. The Metal Work Shop has a wall-mounted exhaust fan for use when equipment is used.

The main compressor for the entire complex is housed in the Garage Shop over the Oil Storage. This unit was inaccessible at the time of the site review; although it is reportedly in working order.

Overall the heating and ventilation within this building is as it was when originally built. The shops adjoining the main garage building are being used as storage areas and not as Workshops and do not have heat or ventilation.

Observations noted throughout the HVAC systems include:

- The Water Works, Sewer & Garage, Paint Storage, Carpentry, Electrical and Metal Work shop should do not have HVAC systems and controls to allow independent control of each area specific to their use.
- The Metal Works, Meter, and Carpentry Shops should have proper spot ventilation to address worker space as per today's Code.
- The existing vehicle exhaust system is not certified for this type of facility and is in use.
- Plumbing:

Record drawings indicate that a 20mm [3/4"] domestic water entry for the facility is in the Meter Shop under the service sink. The piping is copper, plastic and rubber hose. Domestic cold water is also tapped off the decommissioned 50 mm [2"] fire hose connection to supply a clothes washer in the Electrical Shop. A proper Double Check Valve Assembly (DCVA) is installed. There are now two water entry points for this facility. The domestic water service size is adequate for its current use. Domestic cold water piping is not insulated as per today's Code. Domestic hot water is not used; hot water tanks were not observed on site.

Plumbing fixtures are located in the Meter and Electrical Shops, a service sink is in the Meter room and a clothes washer is in the Electrical shop. The laundry service sink is functional and well-used and should be replaced as needed. Emergency eye wash stations were not observed and should be added in accessible locations.

The sanitary sewer system was not accessible and is like comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. The storm system is comprised of plastic rainwater leaders that collect roof drain water and direct it to concrete cast iron storm building mains.

There is an oil disposal sink that directs garage oil to an exterior below-grade oil interceptor culvert. The oil interceptor is evacuated on a schedule as required.

Observations noted throughout the plumbing system include:

- The plumbing systems appear to be older with fixtures and piping systems approaching the end of their useful life expectancy.
- Emergency eye wash stations were not observed.
- Only one domestic water service should be used for the maintenance shops to maintain a single service per building.

- **Fire Suppression:**

The facility is generally not protected with a fire suppression system. There is a hose station that has been decommissioned and converted to a 50 mm [2"] domestic water entry in the Electrical shop complete with a back flow preventer. Fire extinguishers are present on walls in locations as per NFPA 10.

- A wet fire suppression system designed to NFPA 13 is recommended.

ELECTRICAL: The electrical distribution is fed from the Municipal Yard building overhead; height of cables relative to trucks could be an issue should the trucks drive below the cables with lifts high the shielding is also falling off the raw wire. The electrical equipment is past its serviceable life and is in need of replacement. There is a non-Code compliant connection for a temporary generator installed; recommendation to remove or modify to meet Code requirements.

Lighting is out of date and inefficient and should be replaced; new lighting controls should be installed for additional energy savings.

End use devices, such as receptacles and switches, should be replaced on an ongoing maintenance schedule as they show signs of wear and are past their life expectancy.

2.1.6.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 11: Condition of Building Systems – No. 3b – Public Works - Maintenance Building

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior			X ₁		
Building Envelope					
CMU			X		
Stucco			X		
Windows, Metal			X		
Exterior Metal Doors				X	
Large Roll-Up Doors			X		

	Concealed	Poor	Fair	Average	Good
Standard Roll-Up Doors					X
2-Ply SBS Membrane				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers				X	
Heating Furnace				X	
Exhaust Fans			X		
Plumbing Fixtures			X		
Domestic Water System			X		
Electrical					
Breaker Panel Main		X ₂			
Breaker Panel 2ndry		X ₂			
Receptacle Duplex			X ₃		
Baseboard			X ₃		
Lighting Exterior		X ₄			
Lighting Interior		X ₄			
Intrusion Detection			X		
Structural					
Seismic Restraint		X ₅			

Notes:

1. Cleanliness of interior surfaces less than industry.
2. Recommend replacement of existing electrical service and distribution.
3. Consideration should be given to replacing these devices on a maintenance schedule.
4. Recommend replacement of luminaires as they are out of date and inefficient.
5. Seismic capacity-to-demand ratio of 0.2.

STRUCTURAL: Significant structural distress was not observed for this building. There is a small crack in the exterior masonry wall near the base at the north-east corner. This may have been caused by differential movement between the retaining wall foundations and the building foundations. The original drawings indicate the building foundations were founded at a higher elevation than the retaining wall foundation. This issue is evident in another location within the building: One of the non-load bearing masonry walls in the Water Works shop, also near the north end of the building where the retaining wall is, is showing signs of settlement. The ground areas where the settlement is observed have probably experienced the loading sufficiently over the years that further settlement is going to be unlikely. However, further monitoring is advisable. The north wall of the building is bearing directly on the retaining wall. The original drawings do not show sufficient details for this wall and it is questionable what capacity this wall has in resisting seismic loads. Further investigation and review of this wall is recommended.

2.1.6.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Public Works- Maintenance Building: Baseline Recommendations:

2016

- Install emergency eye wash stations in accessible locations.

2017

- Seismic Upgrade.
- Install hydraulic vehicle lift to replace service pit that is not Code compliant.

2018

- Ventilate each work room specific for their use to the current BC building Code.
- Insulate all domestic cold water piping to the current BC building Code.

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Code.
- Design and installation of a fire sprinkler system to NFPA 13.
- Replace existing domestic cold water service with one sized to meet the current BC Building Code.
- Design and installation of appropriate heating, ventilation, cooling and control systems given specific space type.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 12: Summary of Present-Value Building Costs every 5 years – No. 3b – Public Works - Maintenance Building

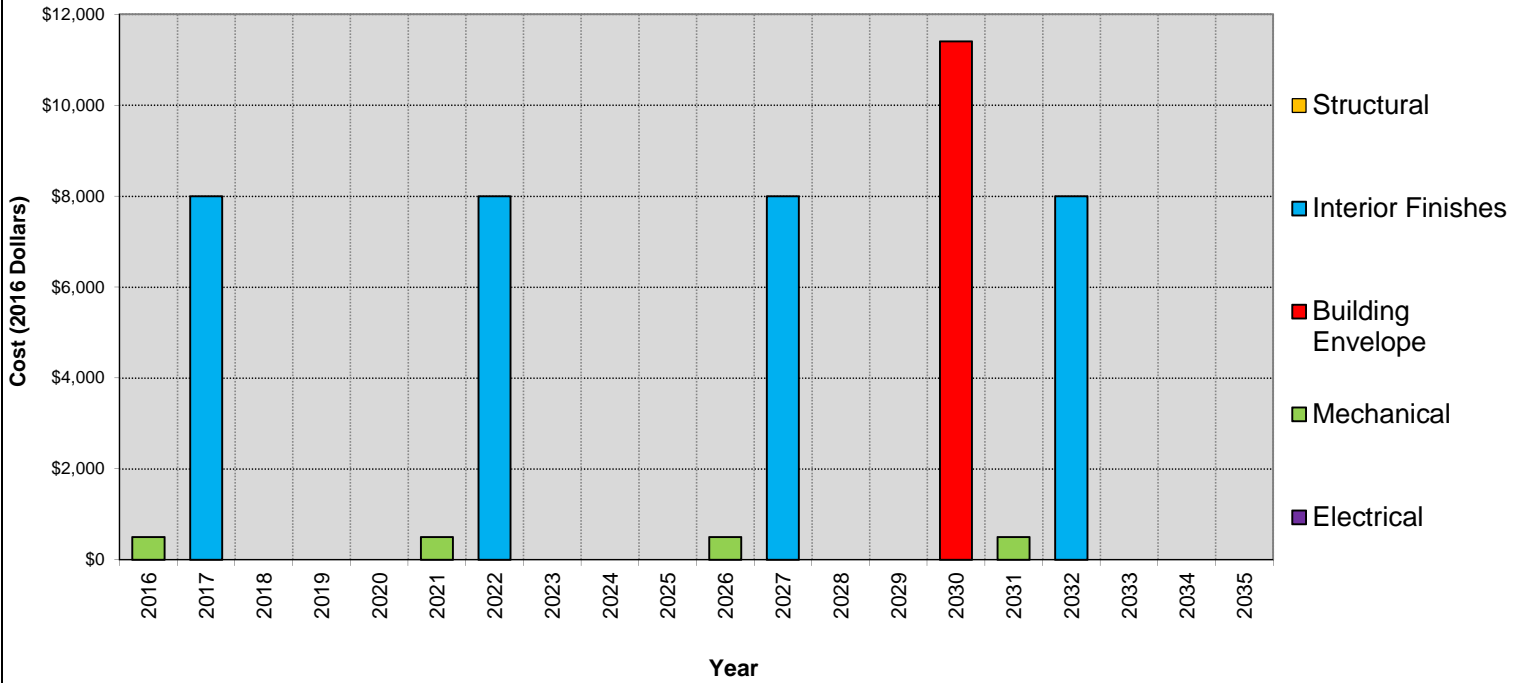
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$11,500	\$12,000	\$8,000	\$8,000	\$39,500
Building Envelope	\$13,800	\$72,000	\$16,400	\$-	\$102,200
Mechanical Summary	\$32,500	\$500	\$500	\$20,500	\$54,000
Electrical Summary	\$67,300	\$-	\$-	\$-	\$67,300
Structural Summary	\$320,000	\$-	\$-	\$-	\$320,000
Total	\$445,100	\$84,500	\$24,900	\$28,500	\$583,000

The Maintenance Building does not meet the functional needs of servicing the size of vehicles that Public Works owns and maintains. The Garage Doors must remain open to accommodate the length of some vehicles which extend into the trafficable yard space. Should some of the seasonal storage items find an alternate storage location we would recommend increasing the size of the storage garage, internally. The cost to doing this is significant and is reviewed in the Options Analysis.

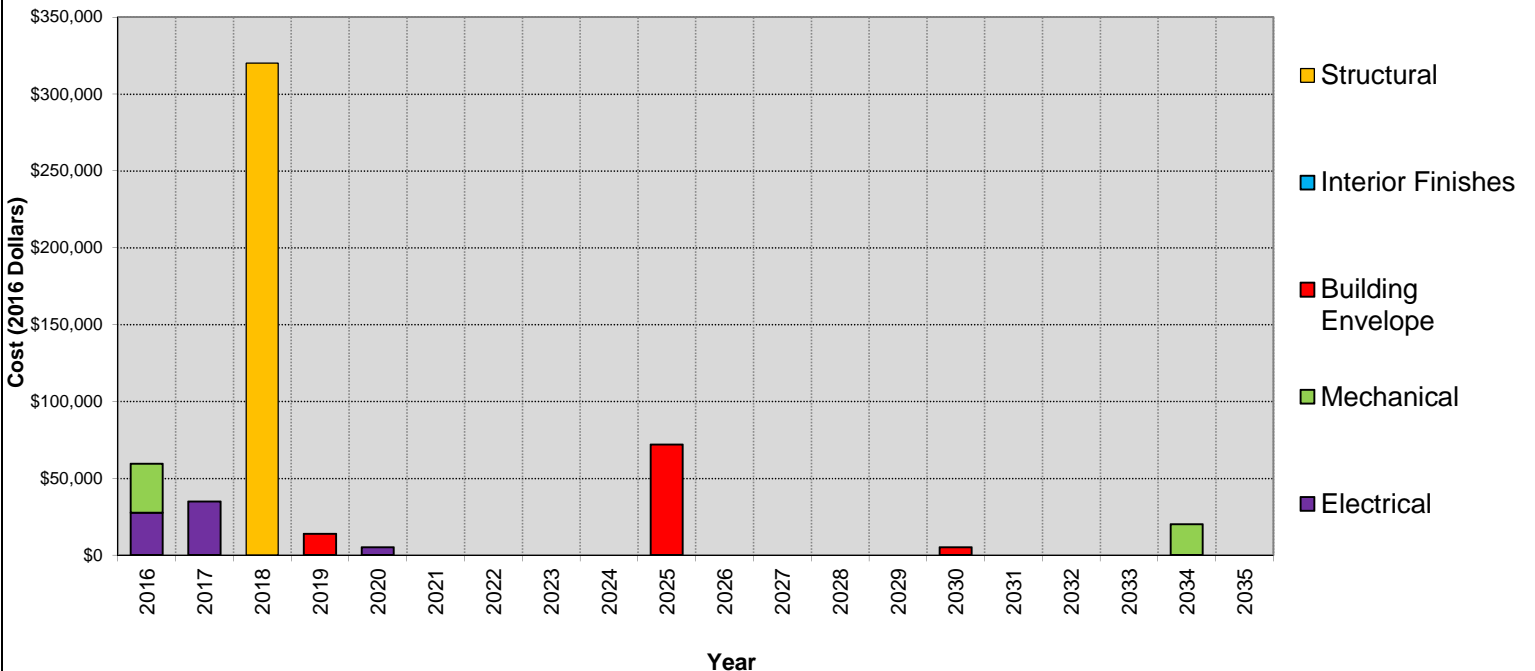
No.3b PW Maintenance Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.3b PW Maintenance

Interior Finishes



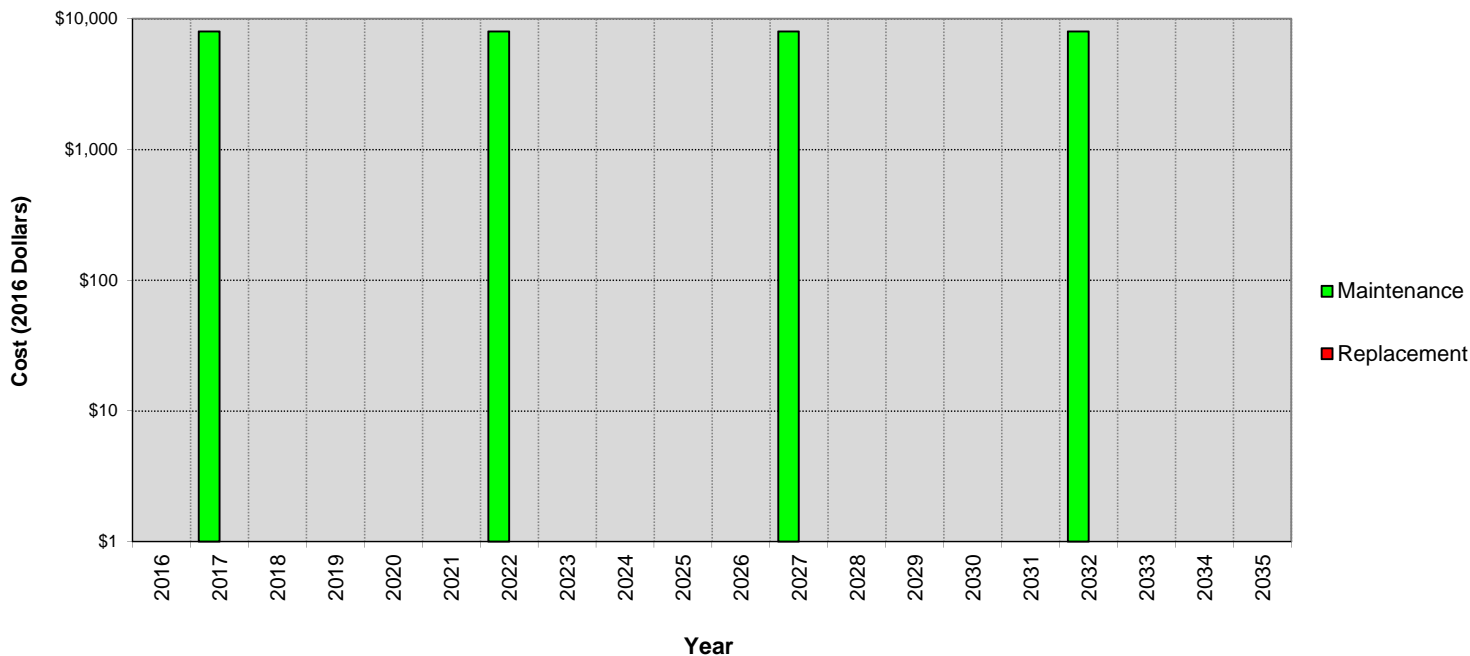
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 8,000	2012	5		2017
Pit Removal	Maintenance Replacement	\$ 3,500				2016
Int. Doors	Maintenance Replacement	\$ 4,000	1975	25	25	2025

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3b PW Maintenance

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
CMU	Maintenance Replacement	\$ 10,400	2010	20		2030
Stucco	Maintenance Replacement	\$ 1,000	2010	20		2030
Windows Aluminum	Maintenance Replacement	\$ 13,800	1964	45	10	2019
Exterior Doors	Maintenance Replacement	\$ 5,000	1975	50	5	2030
SBS Membrane Roof	Maintenance Replacement	\$ 72,000	2005	20		2025

NOTES:

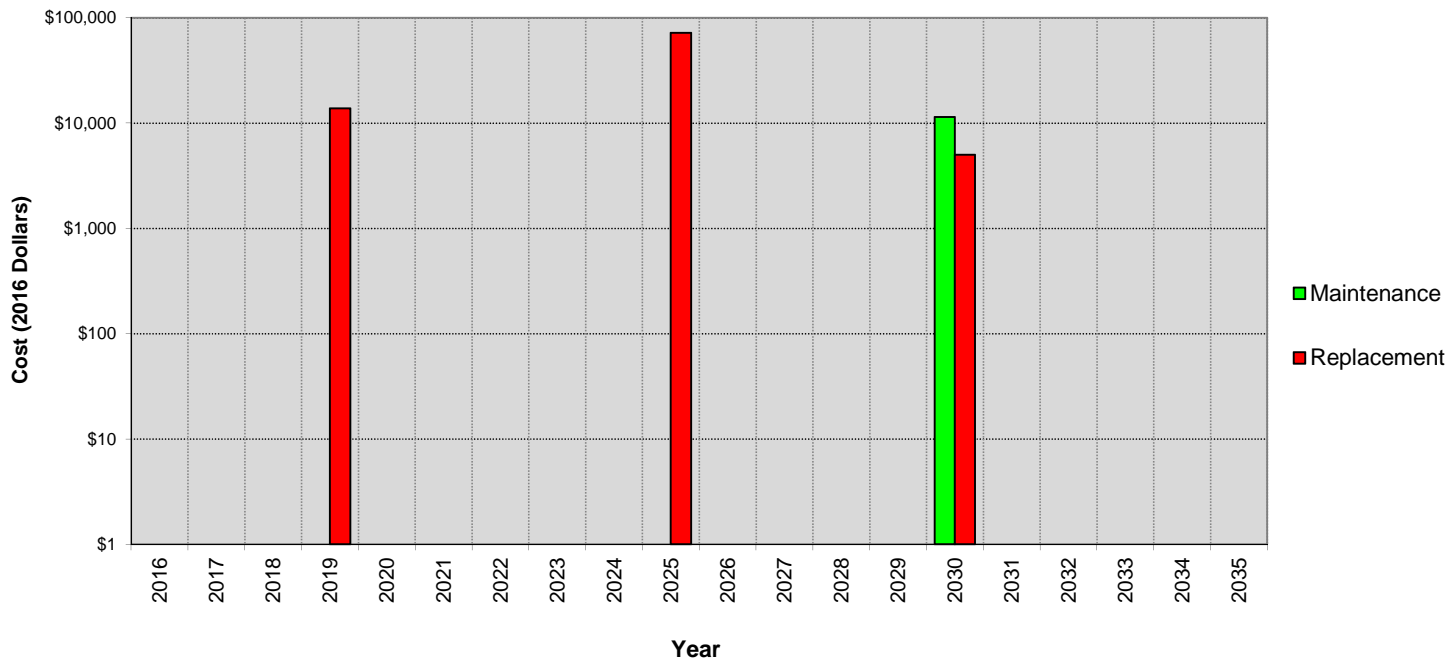
Maintenance:

Cladding maintenance includes cleaning and repainting. Scheduled to coincide together with PW Office Building.

Replacement:

Exterior door replacement includes man-doors only. Garage doors were replaced in 2014 and are not expected to require replacing within the next 20 years.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.3b PW Maintenance

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Furnace Garage	Maintenance Replacement	\$ 10,000	1996	18	2	2016
Furnace Water Works	Maintenance Replacement	\$ 5,000	1986	18	12	2016
Furnace Sewer & Garage	Maintenance Replacement	\$ 5,000	1986	18	12	2016
Exhaust Fans General	Maintenance Replacement	\$ 2,000	1996	20		2016
Exhaust Fans Vehicle	Maintenance Replacement	\$ 10,000	1996	20		2016
Plumbing Fixtures	Maintenance Replacement	\$ 500	1996	5	15	2016

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

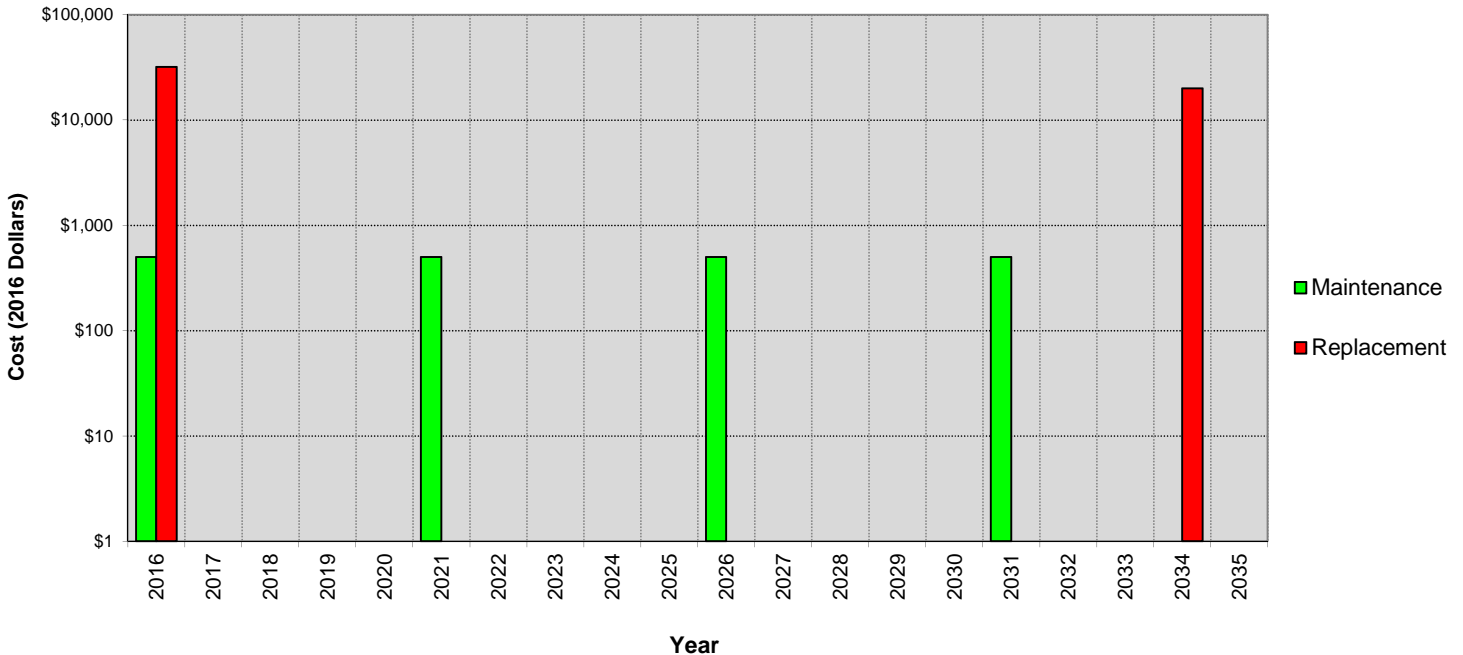
Plumbing Fixtures variable age. Replace as required.

Exhaust fans inaccessible.

Replacement:

Older oil fired Air Furnace units in Water works and Sewer & Garage

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3b PW Maintenance

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 11,000	1975	35	6	2016
Breaker Panel Secondary	Maintenance Replacement	\$ 16,500	1975	35	6	2016
Receptacles Duplex	Maintenance Replacement	\$ 17,500	1975	30	12	2017
Baseboards	Maintenance Replacement	\$ 3,800	1975	30	12	2017
Lighting Exterior	Maintenance Replacement	\$ 3,500	1975	30	12	2017
Lighting Interior	Maintenance Replacement	\$ 10,000	1975	30	12	2017
Intrusion Detection System	Maintenance Replacement	\$ 5,000	2000	20		2020

NOTES:

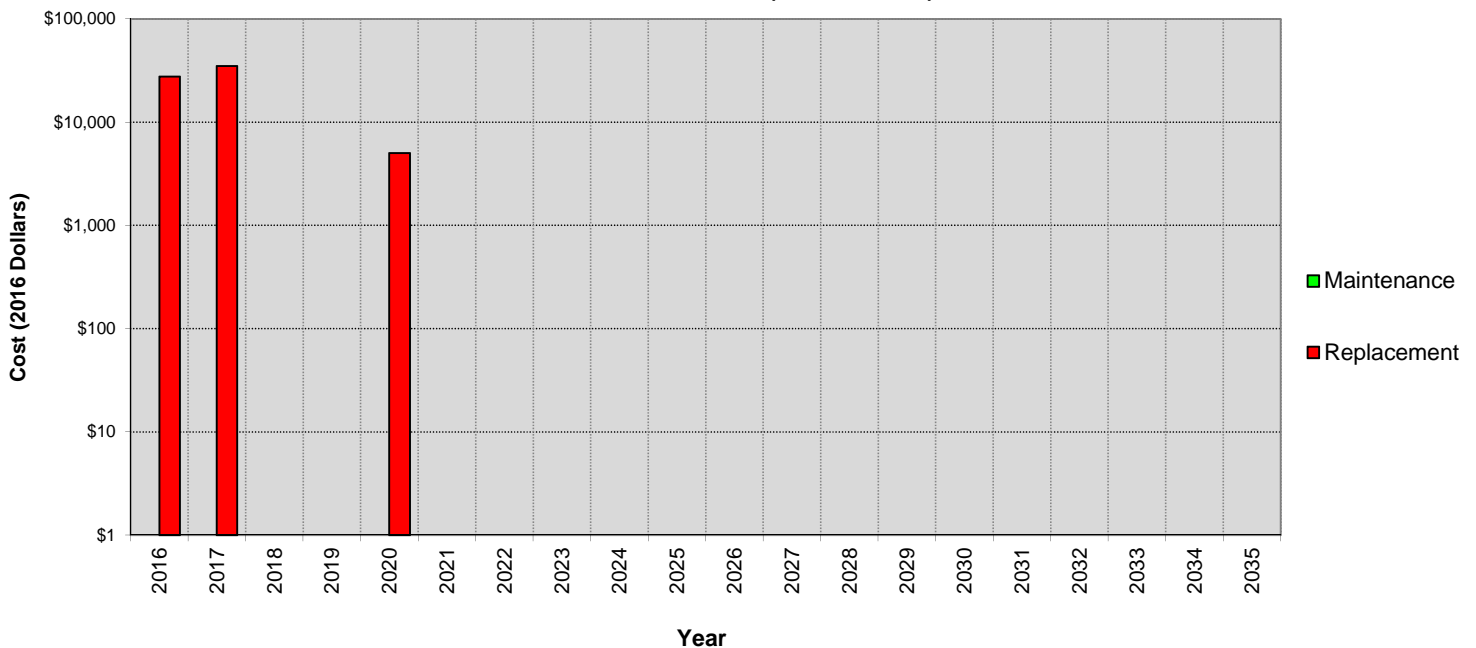
Maintenance:

Replacement:

Much of the electrical equipment is past its serviceable life and is in need of replacement.

There is a non-code compliant connection for a temporary generator installed; recommend it be removed or modified to meet code.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.3b PW Maintenance Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance Replacement	\$ 320,000				2018

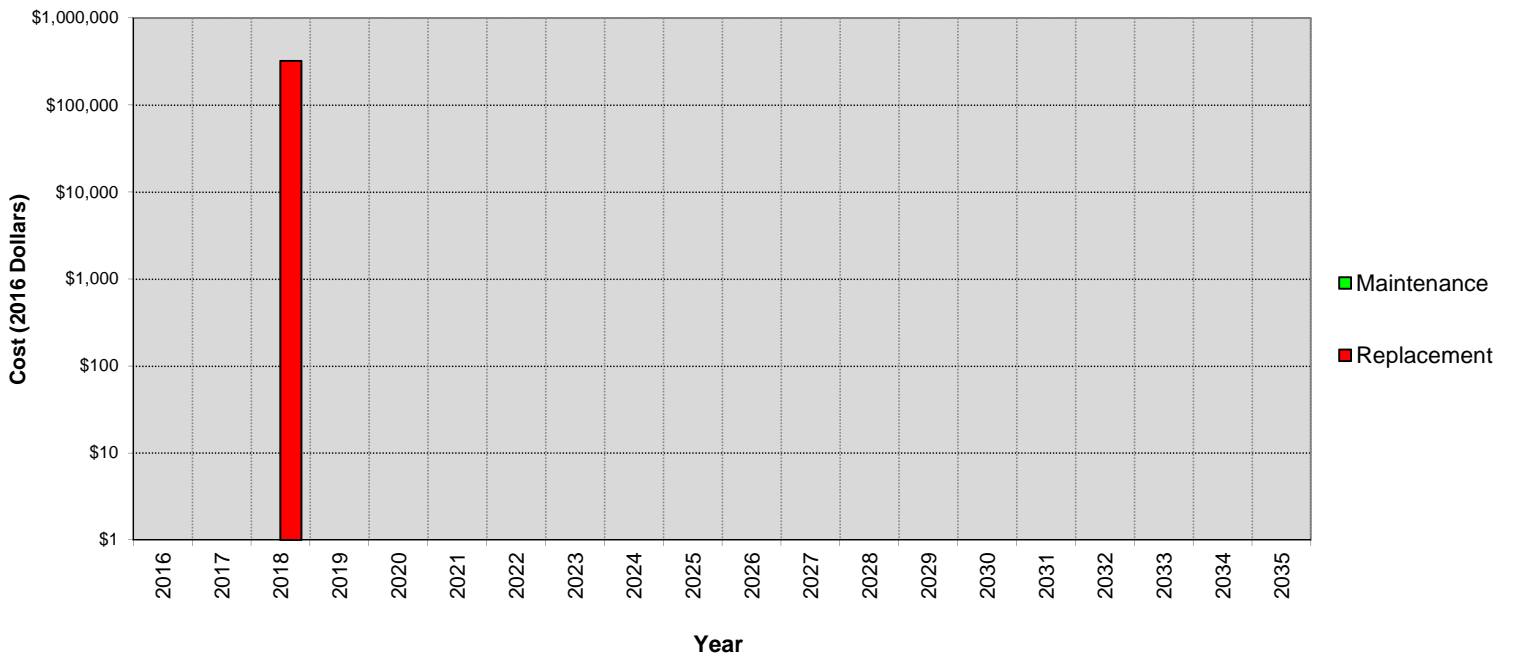
NOTES:

Maintenance:

Replacement:

Seismic upgrade includes upgrading roof diaphragms, additional reinforcing to existing masonry walls and anchorage of masonry walls to the roof structure.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.1.7. Public Works – Open Storage Shelter 1 (No. 4) and Shelter 2 (No. 5)

<p>Peak Occupancy: N/A</p> <p>Staffing (avg.): N/A</p> <p>Built: 1970</p> <p>Addition(s): None</p> <p>Current Area No.4/No.5: 2,082sf / 2,844sf</p> <p>HVAC: N/A</p> <p>Fire Suppression: None</p> <p>Access: Open-air</p>			
		Open Shelter #2 (Bldg. No.5)	Open Shelter #1 (Bldg. No.4)
<p><i>Figure 7 - Public Works – Open Storage Shelter 1 (No. 4) and Shelter 2 (No. 5)</i></p>			

2.1.7.1. Description

Open Storage Shelters 1 and 2 are located in the north east corner and west side of the yard respectively. Also built in 1964 with the other Yard infrastructure, the shelters are nearly identical in construction, footprint, and size. Each lean-to shelter is covered by a low-sloped roof, features rear and side concrete masonry walls, a concrete slab-on-grade and exposed steel pipe columns.

INTERIOR FINISHES & FURNISHINGS: This section is omitted due to the open-air storage function the shelters serve.

BUILDING ENVELOPE: Exterior walls are constructed with painted concrete masonry unit. Each low-sloped roof is waterproofed with 2-ply SBS membrane and features wooden fascia board trim.

STRUCTURAL: The back and side walls to each shelter are constructed with concrete masonry unit. The wood-framed, low-sloped, roof is supported by the CMU walls and steel columns that sit under the main structural beam. Bollards or cement casings to protect columns from accidental collision are not present.

MECHANICAL: Heating, Ventilation and Cooling (HVAC), Plumbing, or Fire Suppression is not present for the building.

ELECTRICAL: Electrical supply is not present for the building.

2.1.7.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 13: Condition of Building Systems – Public Works – Open Storage Shelter 1 (No. 4) and Shelter 2 (No. 5)

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
N/A					
Building Envelope					
#1: CMU		X ₁			
Columns		X ₂			
SBS 2-Ply Roof Membrane					X
Roof Joists		X ₃			
#2: CMU			X		
Columns		X ₄			
SBS 2-Ply Roof Membrane					X
Mechanical					
N/A					
Electrical					
N/A					
Structural					
Seismic Restraint		X ₅			

Notes:

1. The CMU wall at the south-east corner is damaged. It appears to have had two separate and fairly substantial impacts. The impact near the east corner has resulted in significant cracks in the wall along the head and bed joints. Cracks have also formed from fractures within individual concrete masonry units. There is also an impact near the west where the blocks were fractured. Replacement of this section of the wall is recommended.
2. Two of the steel pipe columns require repairs. One was bent very badly at about mid height (possibly hit by a vehicle) and requires replacement. The other column requires a new pedestal; the existing pedestal appears to have been damaged by heavy traffic.
3. Several joists have split and require replacement.
4. Paint has peeled and the columns are badly corroded.
5. Installation of concrete bollards/barriers recommended to protect structural columns from vehicle impact.

2.1.7.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Public Works- Open Storage Shelter #1 (No.4) and Storage Shelter #2 (No.5) - Baseline Recommendations:

2016

- Repair CMU walls, steel columns and wood roof members.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 14: Summary of Present-Value Building Costs every 5 years – Public Works – Open Storage Shelter 1 (No. 4) and Shelter 2 (No. 5)

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$-	\$-	\$-	\$-
Building Envelope	\$4,000	\$-	\$4,000	\$59,000	\$67,000
Mechanical Summary	\$-	\$-	\$-	\$-	\$-
Electrical Summary	\$-	\$-	\$-	\$-	\$-
Structural Summary	\$6,000	\$-	\$-	\$-	\$6,000
Total	\$10,000	\$-	\$4,000	\$59,000	\$73,000

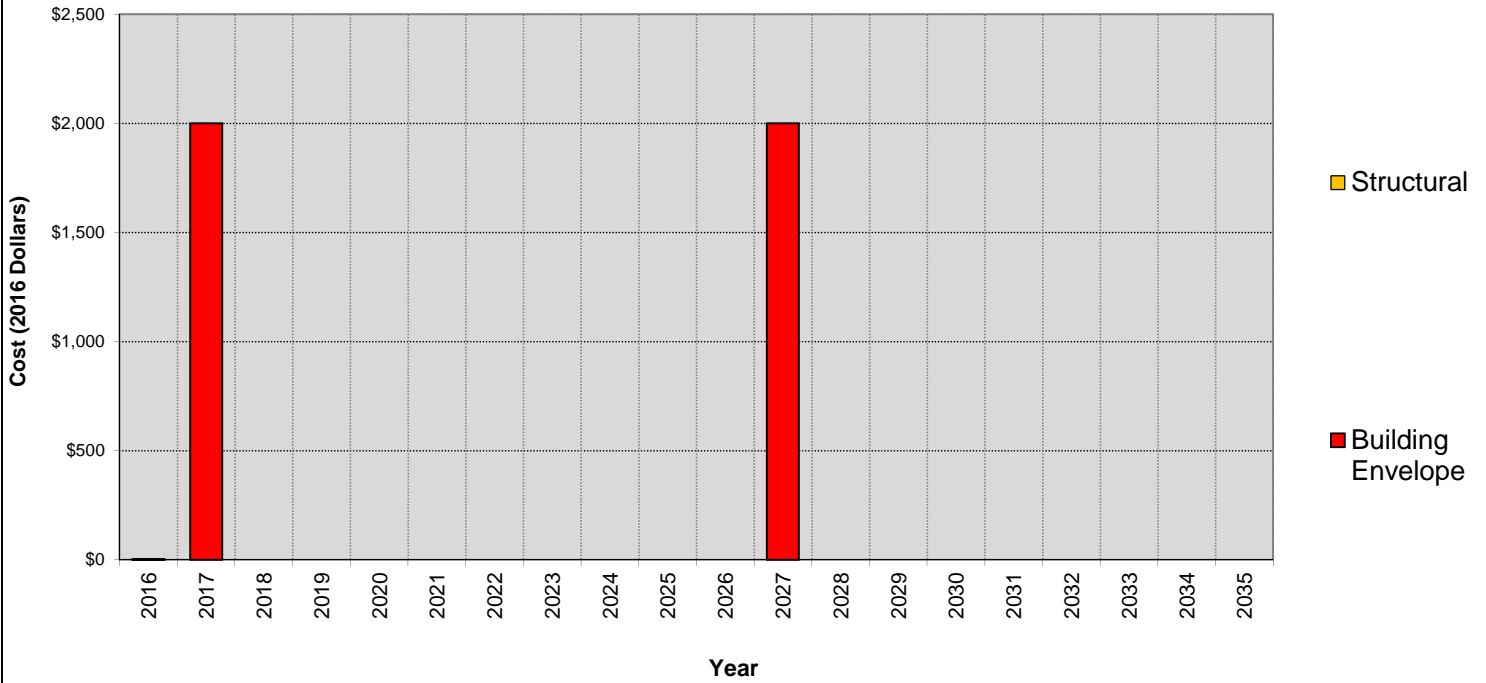
Functionally, Shelter 2 does not provide the clear height that is needed to utilize a lift when moving heavy parts to and from; this poses significant health concerns for staff that are manually lifting heavy parts. Shelter 1, interior space is functional, but has structural damage to the existing posts and walls. We recommend that an entire site analysis be conducted prior to making any changes to these buildings.

No.4 PW Shelter 1

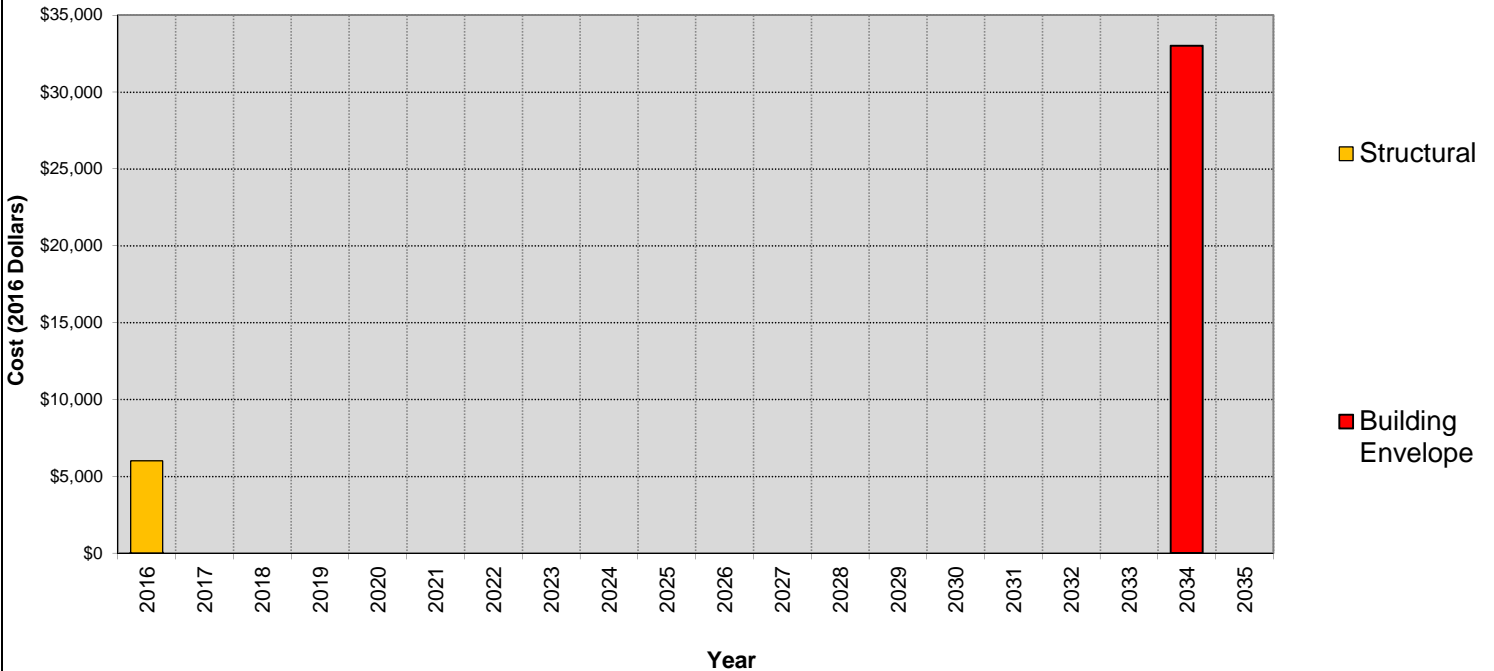
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.4 PW Shelter 1

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
SBS Membrane Roof	Maintenance Replacement	\$ 33,000	2014	20		2034
Wood and Steel Structure	Maintenance Replacement	\$ 2,000	2000	10	7	2017

NOTES:

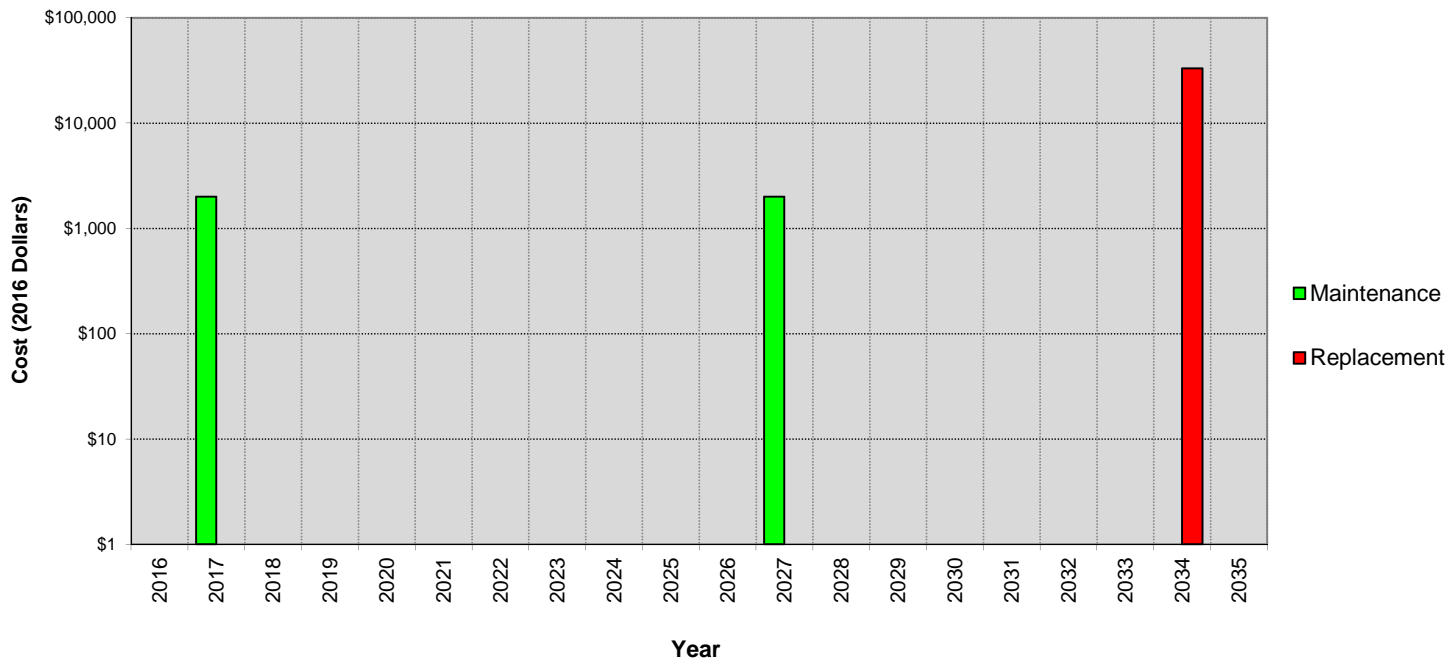
Maintenance:

Steel columns exhibit corrosion and paint on wood framing members was peeling. Maintenance estimate includes sanding and painting all affected areas.

Replacement:

SBS roofing membrane replacement includes all flashing.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.4 PW Shelter 1

Structural



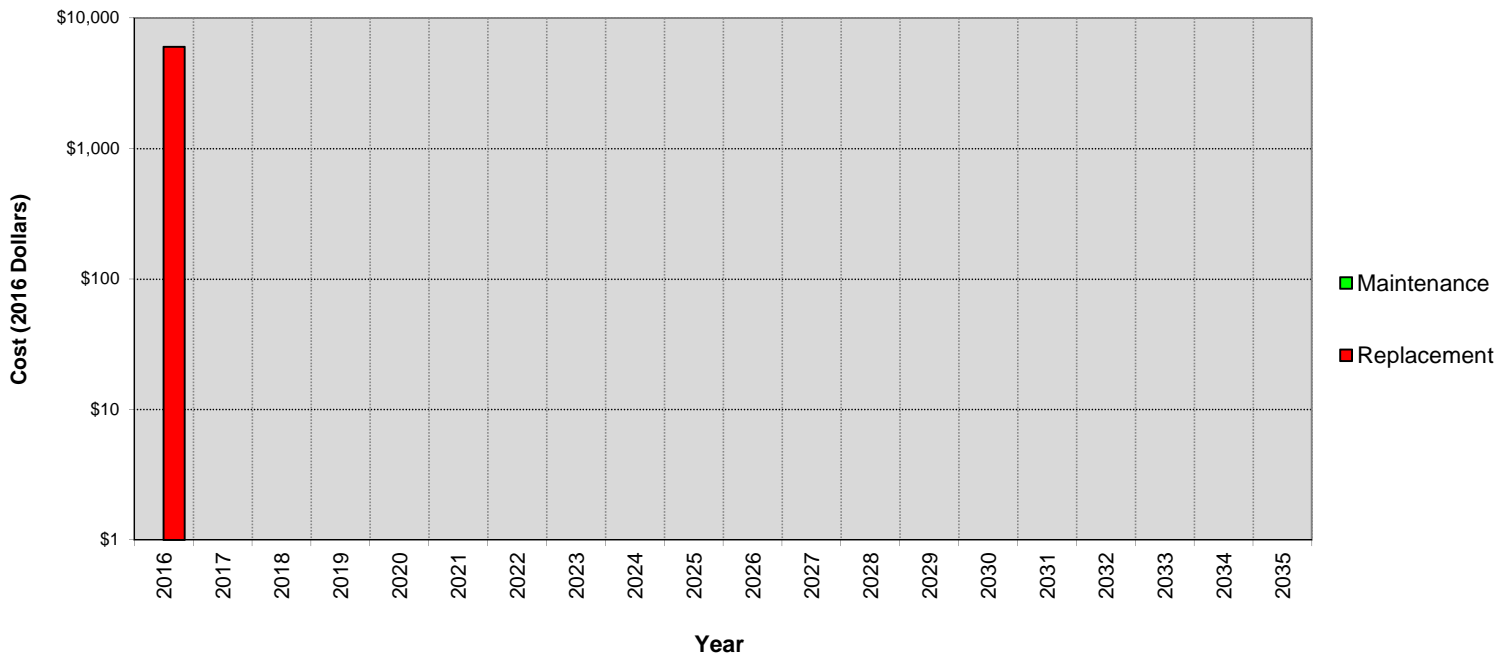
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Structural Repairs	Maintenance					
	Replacement	\$ 6,000				2016

NOTES:
Maintenance:

Replacement:

Structural repairs include: Replace bent steel pipe column, repair steel pipe column pedestals on others, replace damaged roof joists, replace damaged concrete masonry wall running east-west at south end of shelter.

PROJECTED EXPENSES (Present Value)



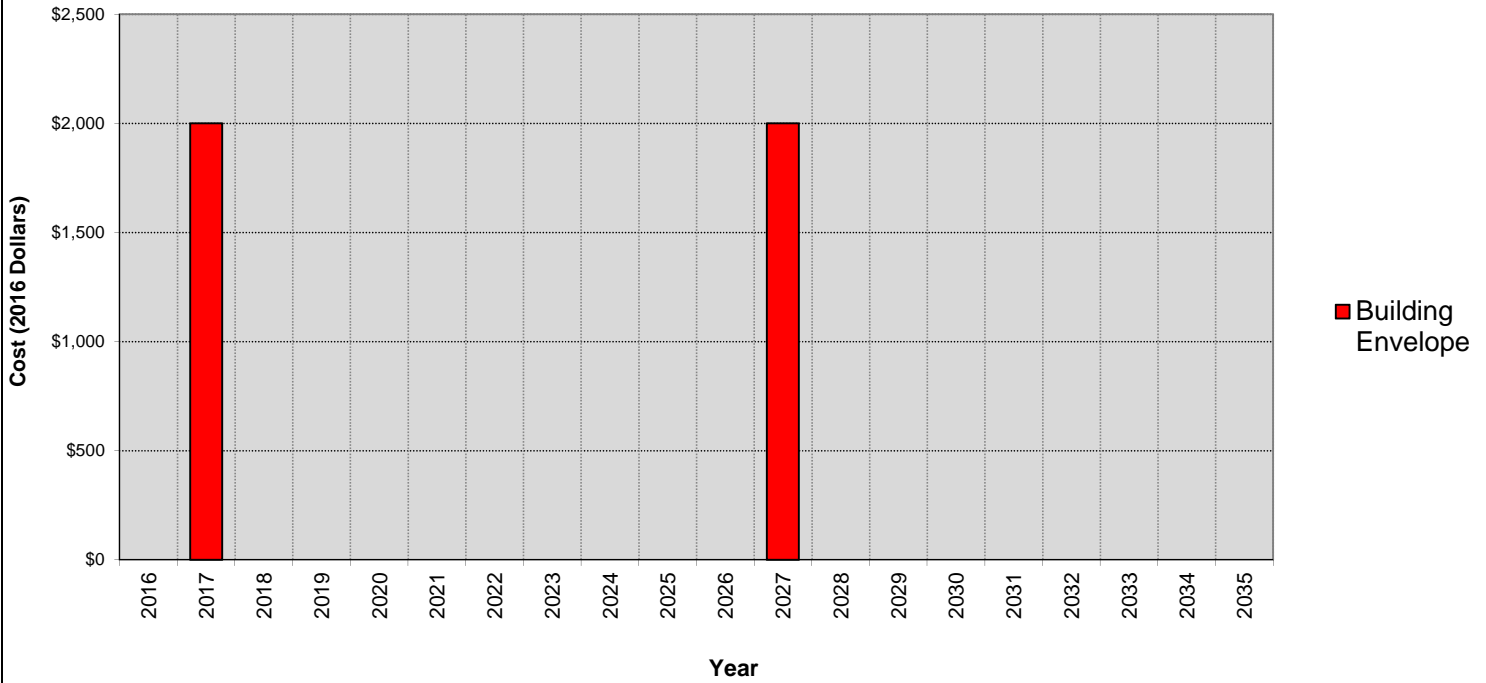
The dollar axis is in logarithmic scale for ease of presentation.

No.5 PW Shelter 2

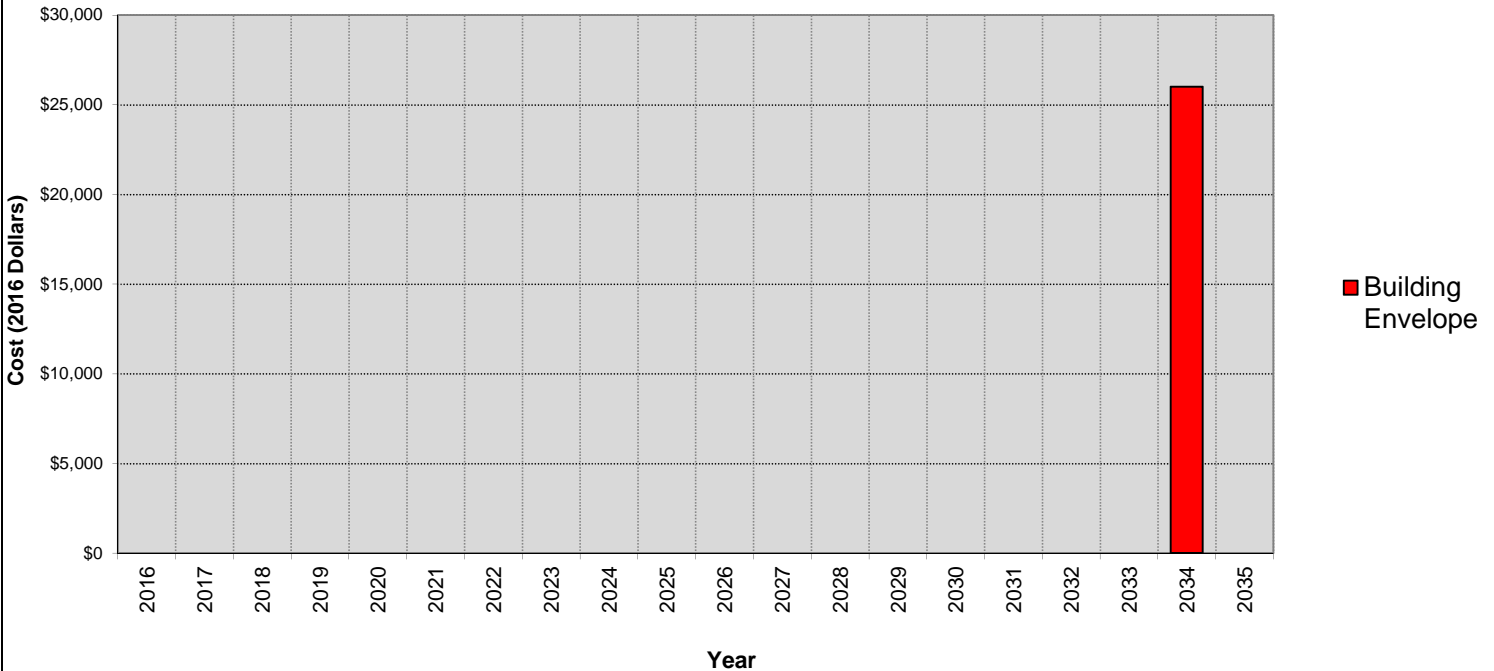
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.5 PW Shelter 2

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
SBS Membrane Roof	Maintenance Replacement	\$ 26,000	2014	20		2034
Wood and Steel Structure	Maintenance Replacement	\$ 2,000	2000	10	7	2017

NOTES:

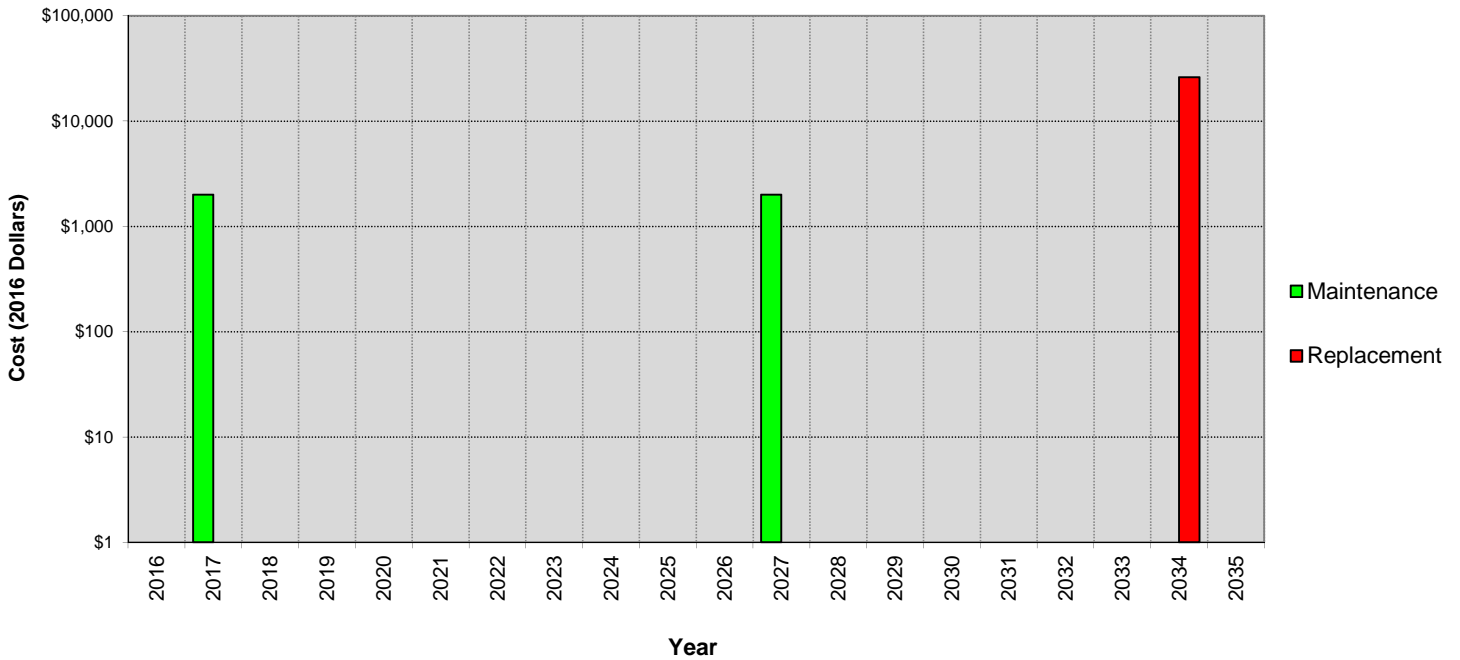
Maintenance:

Steel columns exhibit corrosion and paint on wood framing members was peeling. Maintenance estimate includes sanding and painting all affected areas.

Replacement:


SBS roofing membrane replacement includes all flashing.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

2.1.8. No. 6 - Public Works – Bulk Storage and Transfer Station

<p>Peak Occupancy: N/A</p> <p>Staffing (avg.): N/A</p> <p>Built: 1970 Addition(s): None Approx. Area: N/A</p> <p>HVAC: N/A</p> <p>Fire Suppression: None</p> <p>Access: Open air</p>	 <p>Red rectangle: public and staff parking and vehicle parking changing at 4pm, red arrow: gas pumps, yellow double arrow: covered bays of bulk storage. Dashed arrow: bins. Dotted arrow: transfer station bins.</p> <p><i>Figure 8 - No. 6 - Public Works – Bulk Storage and Transfer Station</i></p>
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2.1.8.1. Description

The Bulk Storage and Transfer Station consists of six covered storage bays for road materials, two uncovered bays for organic materials, and two industrial sized bins for garbage and compost. The bays are built into an embankment which enables depositing materials at the top of each bin or removal of materials at the base.

INTERIOR FINISHES & FURNISHINGS: This section is omitted due to the open-air storage function the transfer station serves.

BUILDING ENVELOPE / STRUCTURAL: The Transfer Station bins are constructed from concrete foundation walls, steel framed girders, and painted plywood sheathing. The covered bays feature corrugated-metal roofing and steel gates to keep material from sloughing.

MECHANICAL: Heating, Ventilation and Cooling (HVAC), Plumbing, or Fire Suppression is not present for this area.

ELECTRICAL: Electrical supply is not present for this area.

2.1.8.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 15: Condition of Building Systems – No. 6 - Public Works – Bulk Storage and Transfer Station

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
N/A					
Building Envelope					
Concrete Foundation Walls			X		
Plywood Sheathing		X ₁			
Corrugated Metal Roof		X ₂			
Steel Retaining Gates		X ₃			
Mechanical					
N/A					
Electrical					
N/A					

Notes:

1. Plywood sheathing is damaged from impact of materials and exposure to weather.
2. Metal roofing is not fastened securely and is corroded. Barrier to unauthorized access is recommended.
3. Gates exhibit significant corrosion. Corrosion at one east most gate was very significant and requires replacement/ temporary reinforcement for worker safety.

2.1.8.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. While it would be ideal to implement all recommendations at this time, each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Public Works- Bulk Storage and Transfer Station: Baseline Recommendations:

2017

- Install new metal retaining gates or temporarily reinforce existing gates.
- Provide signage and improve barrier from upper to lower level and roof.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

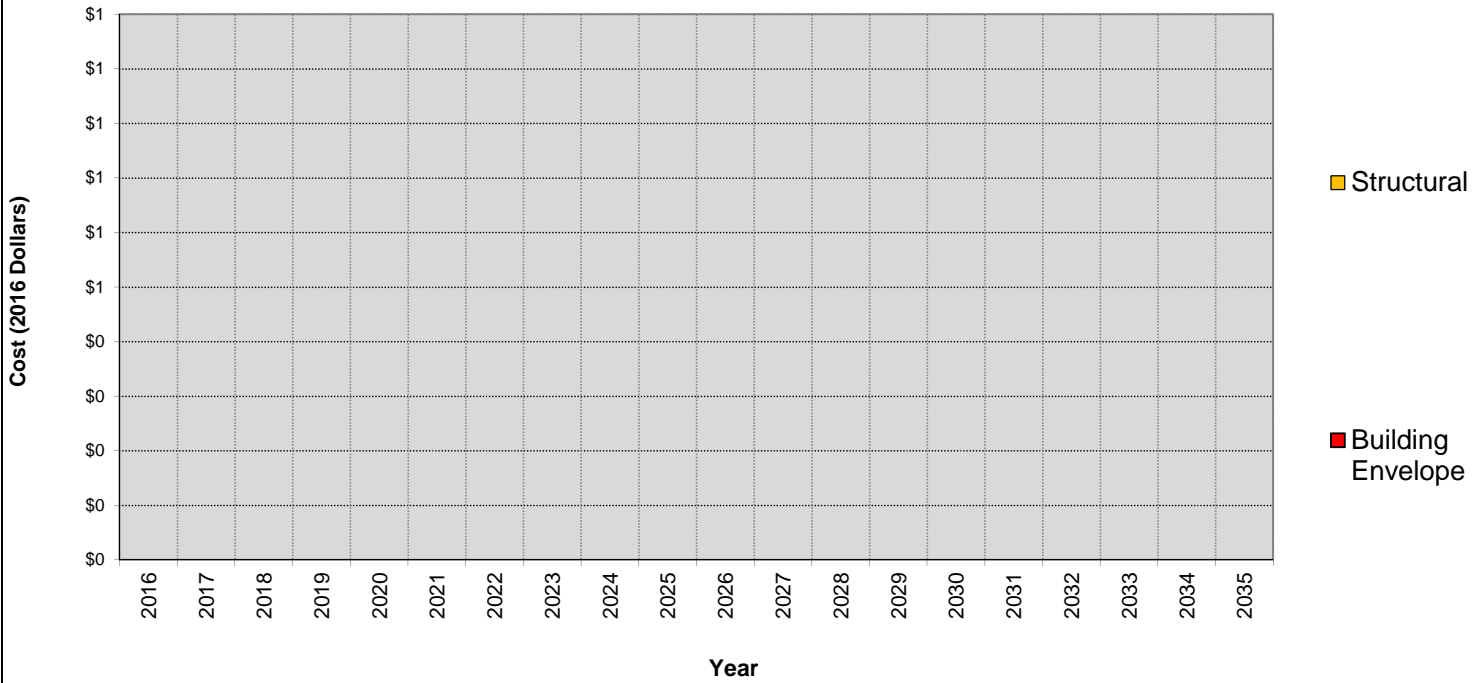
Table 16: Summary of Present-Value Building Costs every 5 years – No. 6 - Public Works – Bulk Storage and Transfer Station

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$-	\$-	\$-	\$-
Building Envelope	\$2,000	\$-	\$2,000	\$2,000	\$6,000
Mechanical Summary	\$-	\$-	\$-	\$-	\$-
Electrical Summary	\$-	\$-	\$-	\$-	\$-
Structural Summary	\$4,500	\$-	\$-	\$-	\$4,500
Total	\$6,500	\$-	\$2,000	\$2,000	\$10,500

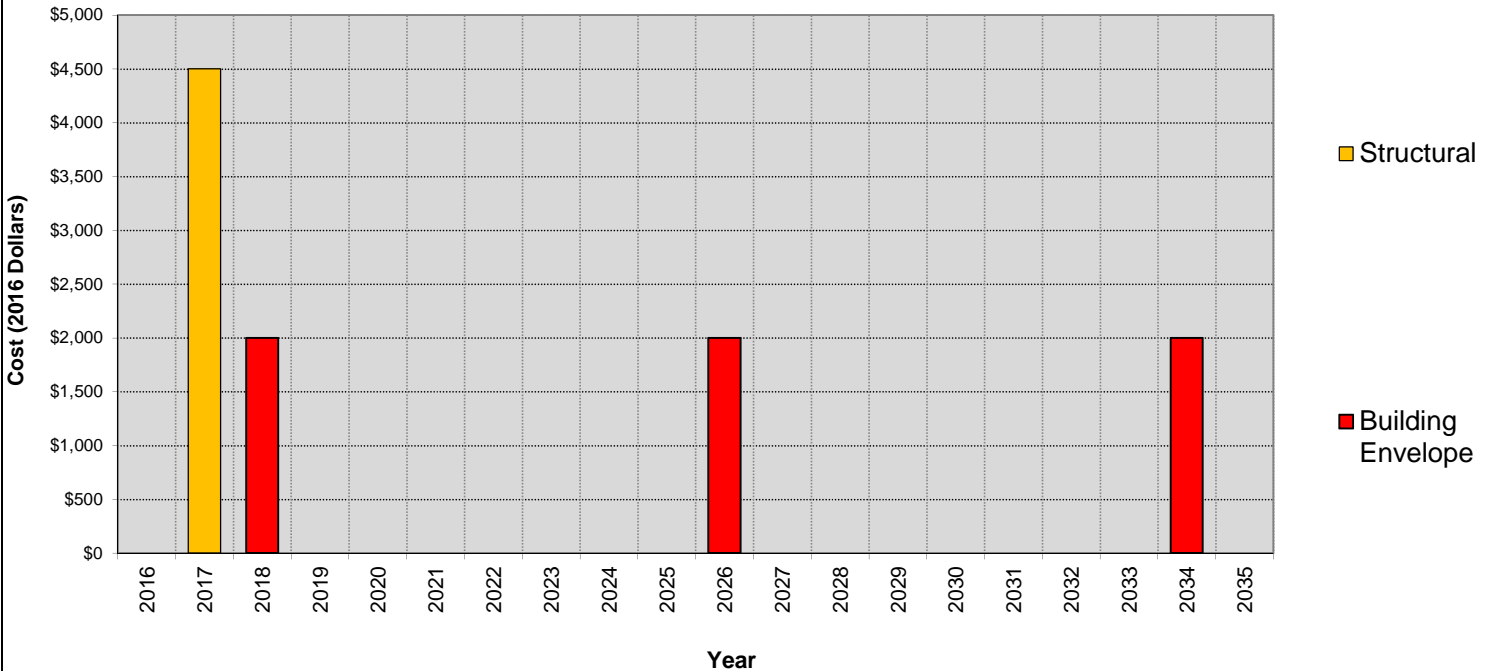
No.6 PW Bulk Transfer Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.6 PW Bulk Transfer

Building Envelope



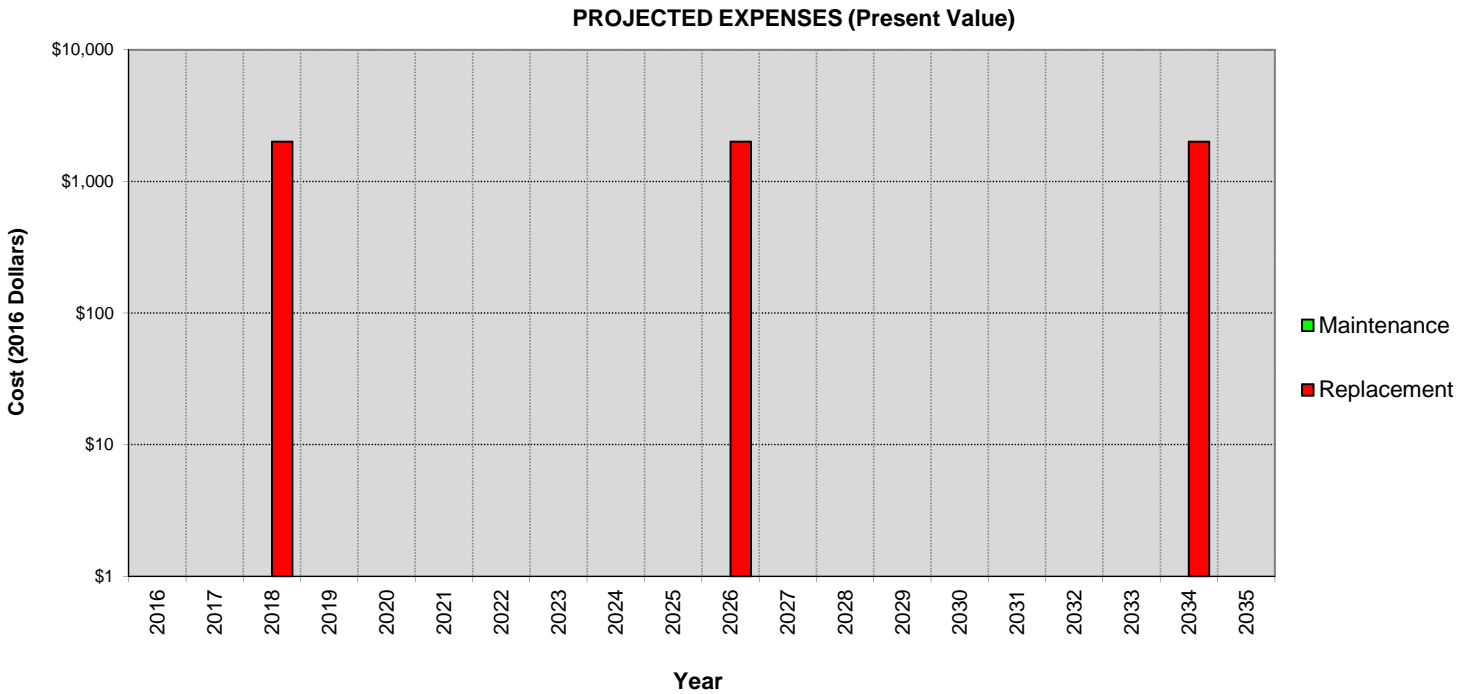
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Bin Plywood Cladding	Maintenance Replacement	\$ 2,000	2010	8		2018
Corrugated Metal Roofing	Maintenance Replacement	\$ 5,000	1975	50		2025

NOTES:

Maintenance:

Replacement:

Portions of plywood cladding damaged, replacement period scheduled within next five years and then every 8 years thereafter.



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.6 PW Bulk Transfer Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Metal Retaining Gates	Maintenance Replacement	\$ 4,500		30		2017

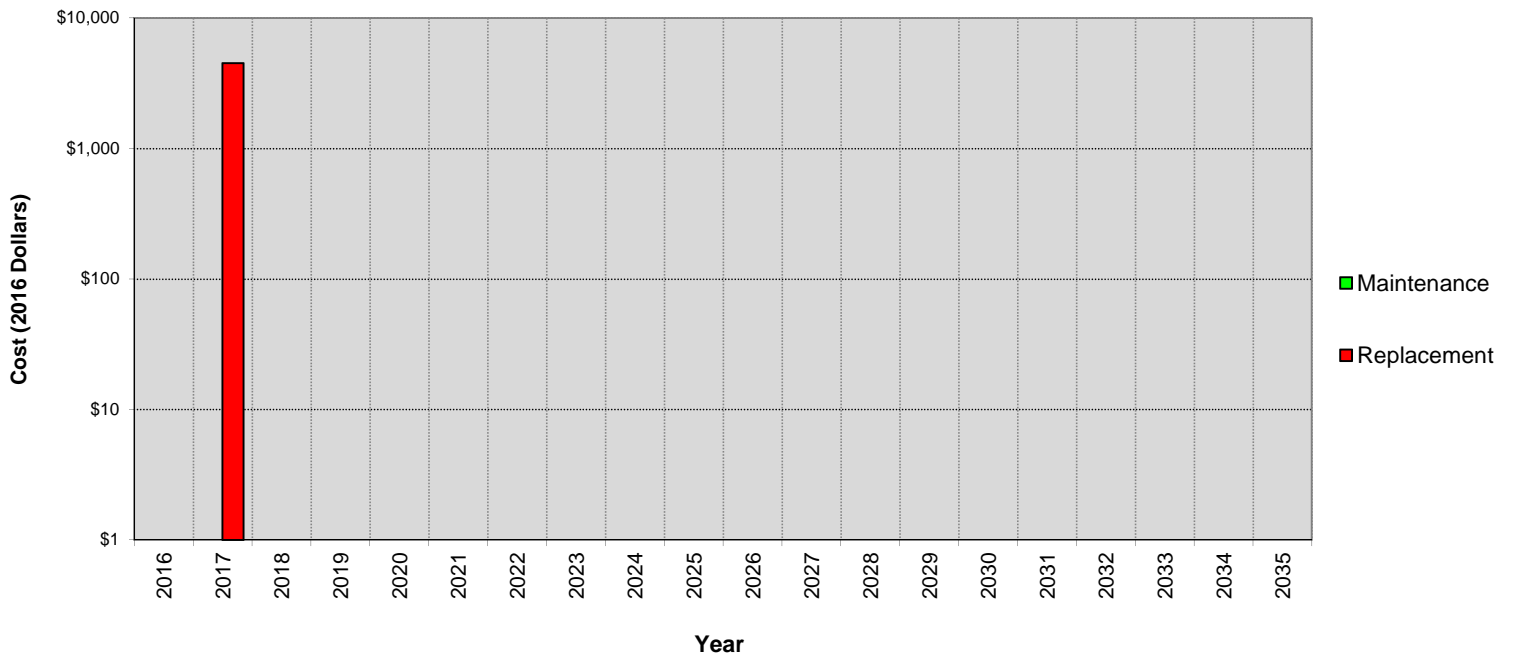
NOTES:

Maintenance:

Replacement:

Replacement of corroded, steel, retaining gates, at the base of western bins recommended.

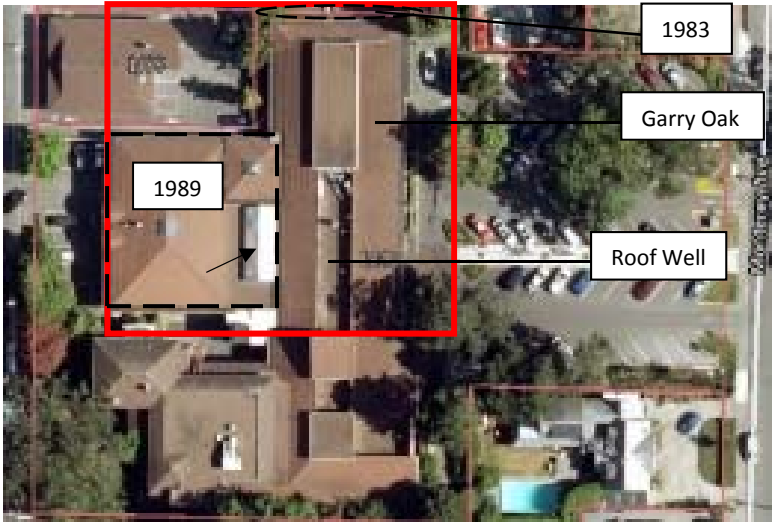
PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.2. RECREATION CENTRES

2.2.1. No. 7a – Monterey Centre

<p>1442 Monterey Avenue</p> <p>Peak Occupancy: 800 persons</p> <p>Staffing (avg.): 20 persons</p> <p>Built: 1971</p> <p>Addition(s): 1983, 1989</p> <p>Current Area: 26,562 sf</p> <p>HVAC: Furnaces (4), fan coil units, baseboard</p> <p>Fire Suppression: Sprinklers & extinguishers</p> <p>Access: Parking stalls at-grade and covered. Wheelchair access, elevator.</p>	 <p>Figure 9 - No. 7a – Monterey Centre</p>
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2.2.1.1. Description

The Monterey Centre was originally constructed in 1971 as a single building, Seniors' Centre with adjacent Library. The brick and wood-frame building is one storey plus a lower level with parkade. Several additions have occurred since construction due to the growing needs for adult/seniors community programming. The storage addition at the north end was added in 1983 (oval). The activity rooms and garden court over the parking area was added in 1989 (dashed box). The skylight over the garden area was added in 2000 (arrow). The Library also had an expansion in 1999 that joined an adjacent three storey wood-frame residential building with the original building, consequently forming one large, continuous building for the current day Monterey Centre, the Library and the apartments above the Library. The building is an eclectic mix of architectural styles and systems due to the multiple renovations over the years.

The Monterey Centre serves as the focal point for community programming in Oak Bay. The building is equipped to offer a broad range of clubs including billiards, art, carpet bowling, drama, garden club, and wood-crafting. A resident café and kitchen also provide members with dining options when visiting. The main building entrance is located on the east elevation which faces the original parking lot. Moving west along the building to Hampshire Road, the 1989 addition is suspended over an open-air parkade with alternate building access. The building has one elevator which services both Monterey Centre and Library visitors.

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists of carpeting at the main entrance, snooker room and east offices, marmoleum in activity rooms and corridors, and ceramic tile in east and west washrooms. Interior walls are finished with paint, vinyl-wallpaper and baseboard trim. The Monterey Centre appears well maintained for interior finishes and system needs.

Beyond the regular maintenance of the building we would recommend that the Garry Oak Room see an upgrade to door thresholds, storage door replacement, and acoustic paneling. We understand that modification of the mechanical system ducting is being investigated for acoustic control, where sound transfer is occurring between the community rooms.

BUILDING ENVELOPE: Exterior walls are constructed from original giant brick and brick veneer on wood-framing. Cedar siding clads upper portions of wood-framed walls and roof fascia. Original single-pane, aluminum-framed windows are present along the east elevation while the remaining elevations feature double-glazed, aluminum frames. A polycarbonate, pressure-glazed, skylight canopy rests over the garden area while two T-bar skylights are located at west roof peaks. The main and secondary (east and west) entrances are storefront assemblies that were recently renewed in 2012. The roof features three types of roofing products: low-sloped areas are waterproofed with 2-ply SBS membrane, sloped (4/12) portions feature DECRA® stone coated steel shingles, and gutters are lined with fully adhered EPDM. These shingles are easily dented under pedestrian weight and show damage along maintenance/ access paths to different parts of the roof.

STRUCTURAL: The original Monterey Centre was a single storey building that had a crawlspace. The roof and floor structure was wood-framed. The exterior walls were constructed with giant bricks. The brick walls along the east and west sides do not extend up to the underside of the roof structure where there is a short wood-frame pony wall in between; thus forming a buckling out-of-plane weakness in the wall. There are no structural walls that could resist lateral roof loads in between the foyer and the original north exterior wall which means that the roof diaphragm has to span 150 feet between the original north and south walls. Further weakening the roof diaphragm is the 6-foot deep steps that form the roof well. The expansion in 1989 was constructed tight to the original building. The roof structure over the café joined the roof of the 1989 expansion to the roof of the original building. The skylight roof framing added in 2000 also joined the 1989 roof to the roof of the original building. However, the light gauge (cold-formed) steel framing for the skylight roof, which projects higher than the older roofs, is likely unable to transfer any horizontal roof loads between the different roofs. The 1989 expansion uses wood-framed exterior walls that are clad in bricks. It also has some interior wood-frame bearing walls that could assist in supporting the roof laterally. However, the available walls in the 1989 expansion do not have the capacity to laterally support the original building roof. Overall, the existing Monterey Centre has a very weak lateral system that cannot resist lateral code-level seismic forces and the exterior walls of the original building could become unstable in an earthquake. In its current condition, the building has a seismic capacity-to-demand ratio of less than 0.2.

A seismic upgrade is recommended. To upgrade the building to the minimum life-safety level, additional concrete or masonry shear walls, or steel braced frames with corresponding foundations will be required. These shear walls or braced frames can replace existing partition walls so the floor layout is not affected. Additional anchorage of the masonry walls to the roof structure will also be required.

MECHANICAL:

- Heating, Ventilation and Cooling (HVAC):

The building is heated and ventilated by electric fan coil units and gas fired furnaces which provide heated air to the spaces. Supplemental heat is provided to spaces by electric baseboard heaters. Air handling units are located in mechanical rooms and on the roof around the building. Four gas fired furnaces are located in the Parkade Mechanical Room. Furnace heating and ventilation air is ducted through the crawlspace to floor grilles within spaces. Furnace 1 & 2 serve the Main Lounge and the central building spaces. Furnace 3 serves the Garry Room and Oak Room. Furnace 4 serves the Arbutus Room. AH1 is an electric fan coil unit located in an attic mechanical space above the public washrooms adjacent to the Douglas Room, and heating and ventilation air is ducted overhead by exposed ductwork to adjacent spaces. This unit serves the Douglas, Fir, Dogwood, Pine and Bamboo Rooms. AH2 is an electric fan coil unit located in the outdoor mechanical space above the corridor/kitchen. Ventilation air is ducted overhead exposed to the Fern Cafe and Kitchen. This unit is a 100% outdoor air unit which serves as the make-up for the Kitchen exhaust fan.

Other installed ventilation systems include:

- Sidewall exhaust fans located in the outdoor mechanical space which can be used for free cooling by exhausting hot air from high level in the Holly, Lilac and Reception Rooms.
- The Garden Court has exhaust fans at one end of the room and intake louvers at the other which can be used for free cooling by exhausting hot air from high level.
- The Parkade has exhaust extraction fans.

Each washroom has exhaust systems installed. The washrooms by the Kitchen do not appear to have sufficient exhaust airflow as they have an unpleasant odour. Washrooms adjacent to the Douglas Room appear to be well-ventilated.

The Kitchen is a commercial-type cooking facility and has heat collection exhaust hoods over the ovens, exhaust air in the cooler room and a NFPA rated hood connected to a grease laden exhaust fan. These fans are located in the outdoor mechanical space. Exhaust air make-up is provided by AH2.

Overall the heating and ventilation within this building is good. The furnaces located in the Parkade Mechanical Room appear to have been well maintained and are in good condition. AH1 also appears to have been well maintained and in good condition. AH2, the sidewall exhaust fans and the exhaust fans serving the Kitchen (except the NFPA hood fan) are in poor condition.

- Plumbing:

Domestic cold water is distributed to hot water tanks and each building plumbing fixture. There are hose bibs located in various places on the building exterior.

All the public washrooms have tank type water closets, automatic sensor urinals and heavy duty commercial faucets. The water closets appear to have been replaced with lower flow fixtures which would meet today's Building Code.

A 43L 1.5kW electric hot water tank is located in the attic mechanical space adjacent to the Douglas Room and serves the washrooms below. There are two 151L 40 MBH gas fired hot water tanks located in the Parkade Mechanical Room which serves the remaining building plumbing fixtures and the Kitchen.

The plumbing fixtures are all piped to the building's sanitary sewer system and are comprised of cast iron and copper drainage piping. The storm system is comprised of cast iron rainwater leaders connected to roof drains.

Observations noted throughout the plumbing system include:

- The plumbing systems are heavy duty commercial grade and appear to be in good condition.
- Due to Building Code revisions the domestic cold water service is most likely undersized and any renovations, i.e. adding fixtures, will require a larger service size.
- Building domestic cold water premise backflow prevention has been installed for the building.

- Fire Suppression:

Fire suppression sprinklers have been installed throughout this building. Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The main electrical service provides power to the Library and Apartments. The equipment is reaching the end of its expected life and consideration should be given to replace the equipment. Some of the electrical equipment is made by Commander and is no longer in production; replacement parts may become difficult to source.

Lighting in the building is a mixture of fluorescent, incandescent and compact fluorescent. Some fixtures are newer, but in general, consideration should be given to replacing the fixtures and lighting controls for energy savings and Code compliance.

The communication system is in good condition and is relatively new. The Utility connection enters the building via a fibre feed and connects to outlets via patch panels mounted on the wall.

There is a theatrical lighting system in the main multipurpose room as well as a sound system. These two systems are relatively new and are in good condition.

The fire alarm system is a Notifier and Edwards mixture and should be upgraded and merged into one system.

The intrusion detection system is an ADT and DSC combination and end use devices should be replaced to match the DSC main head end equipment.

2.2.1.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 17: Condition of Building Systems – No. 7a – Monterey Centre

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls					X ₁
Marmoleum				X	
Carpet				X	
Interior Doors					X ₂
Building Envelope					
Suspended Concrete Slab				X ₃	
Cedar Fascia Board			X ₄		
Brick				X	
SBS 2-Ply Roof Membrane			X ₅		
EPDM Membrane				X	
DECRA® Stone Coated Steel Shingles			X ₆		
Original Windows, Aluminum			X ₇		
Windows, Aluminum				X	
Pressure Glazed Skylight			X		
T-Bar Skylight				X	
Exterior Metal Doors				X	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Fan Coil unit					X
Furnaces					X
Kitchen Exhaust Fan		X ₈			
Kitchen Area AHU		X ₉			
Kitchen NFPA Exhaust Fan				X	
Sidewall Exhaust Fans		X ₁₀			
Exhaust Fans			X ₁₁		
Electric Hot Water Tanks				X	
Gas Hot Water Tank				X	
Plumbing Fixtures – washrooms			X		
Wet Fire Suppression System					X ₁₂
Domestic Water System				X	

	Concealed	Poor	Fair	Average	Good
Electrical					
Breaker Panel Main				X	
Breaker Panel 2ndry				X	
Lighting Emergency Exit				X	
Lighting Emergency With Battery			X		
Lighting Exterior			X		
Lighting Interior		X ₁₃			
Alarm Panel			X		
Baseboard				X	
Receptacle Duplex			X		
Intrusion Detection			X		
Paging System			X		
Sound System					X
Theatre Lighting					X
Communications System					X
Structural					
Seismic Restraint		X ₁₄			

Notes:

1. Acoustic panel installation at Garry Oak Room to be considered. Evidence of condensation noted at the windows and doors to this room.
2. Storage Room doors in Garry Oak Room in poor condition; have since been replaced.
3. Suspended concrete slab over parkade is uninsulated, not meeting today's Code.
4. Paint is peeling on cedar fascia board on west elevation exposing wood to elements.
5. Water-filled blisters of SBS membrane noted over kitchen corridor area.
6. DECRA® shingles has been deformed in areas from direct foot traffic. Walkway planks have been installed to prevent further damage.
7. Original single-pane windows at Garry Oak Room exhibiting condensation.
8. The heat collecting exhaust fans servicing the Kitchen are in poor condition and should be replaced.
9. AH2 is in poor condition and should be replaced.
10. The sidewall exhaust fans serving the Holly, Lilac and Reception Rooms are in poor condition, should be replaced and the controls tied into the room thermostat.
11. The washroom exhaust system serving the washrooms adjacent to the Kitchen should be reviewed. The fan's capacity should be reviewed as the odours within the washrooms are not acceptable.
12. At the time of this review there was a reoccurring leak on the sprinkler main in the Kitchen area. Also, there were numerous locations throughout the building where the sprinkler piping has leaked and has now been replaced.
13. Systematic replacement of lighting fixtures and controls should be undertaken on a maintenance schedule to realize energy savings and meet current Code.
14. Seismic capacity-to-demand ratio of less than 0.2.

STRUCTURAL: Significant structural distress was not observed for the building as a whole. The building appears to have carried the service loads satisfactorily to date.

2.2.1.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Monterey Centre: Baseline Recommendations:

2016

- Add Garry Oak Acoustic panels to Garry Oak

2017

- Install roof-access hatch at elevator staircase.
- Replace AH2 as it is at its end of useful life expectancy.
- Replace the sidewall exhaust fans serving the Holly, Lilac and Reception Rooms as they are likely inoperable.
- Provide and/or improve ventilation in the washrooms adjacent to the Kitchen.
- Maintain / fix sprinkler piping such that there are no further leaks.
- Renovate Washrooms
- Replace Garry Oak Marmoleum

2018

- Insulate exterior of suspended parkade slab.

2019

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.
- Seismic Upgrade

2020-21

- Replace Garry Oak Exterior Doors and threshold
- Replace Auto door operator
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 18: Summary of Present-Value Building Costs every 5 years – No. 7a – Monterey Centre

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$89,500	\$8,500	\$93,000	\$31,700	\$222,700
Building Envelope	\$37,000	\$124,900	\$53,200	\$15,200	\$230,300
Mechanical Summary	\$149,000	\$6,000	\$6,000	\$51,000	\$212,000
Electrical Summary	\$347,400	\$47,500	\$77,500	\$-	\$472,400
Structural Summary	\$1,430,000	\$-	\$-	\$-	\$1,430,000
Total	\$2,052,900	\$186,900	\$229,700	\$97,900	\$2,570,000

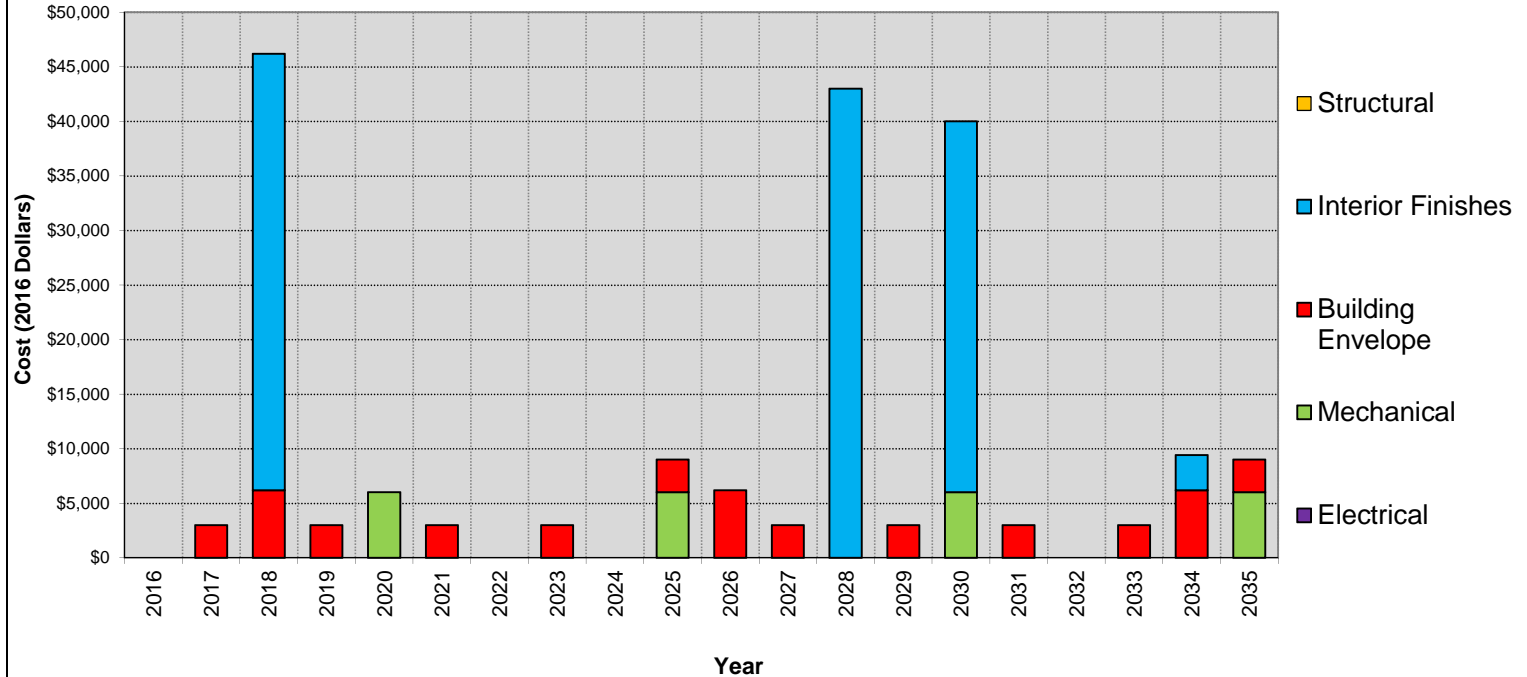
No.7a Monterey Centre

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																									
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035						
Section 4 - ELECTRICAL COMPONENTS																																
Breaker Panel	Maintenance																															
Main	Replacement	55000	1971	35	10	2016	55,000																									
Breaker Panel	Maintenance																															
Secondary	Replacement	110000	1971	35	10	2016	110,000																									
Lighting	Maintenance																															
Emergency Exit	Replacement	25000	1990	30		2020				25,000																						
Lighting Battery	Maintenance																															
Emergency	Replacement	6800	1990	25	2	2017		6,800																								
Lighting	Maintenance																															
Exterior	Replacement	35000	2000	25		2025									35,000																	
Lighting	Maintenance																															
Interior	Replacement	83000	1990	25	2	2017		83,000																								
Alarm Panel	Maintenance																															
	Replacement	25000	1990	25	2	2017		25,000																								
Baseboard	Maintenance																															
	Replacement	6300	1990	30		2020				6,300																						
Receptacle	Maintenance																															
Duplex	Replacement	11300	1990	30		2020				11,300																						
Intrusion	Maintenance																															
Detection	Replacement	10000	1990	20	7	2017		10,000																								
Paging	Maintenance																															
System	Replacement	15000	1990	25	2	2017		15,000																								
Sound System	Maintenance																															
	Replacement	12500	2010	15		2025									12,500																	
Theatre Lighting	Maintenance																															
	Replacement	12500	2010	20		2030																				12,500						
Communication	Maintenance																															
System	Replacement	65000	2010	20		2030																				65,000						
Electrical	Maintenance																															
Summary	Replacement						165,000	139,800			42,600				47,500										77,500							
Section 5 - STRUCTURAL COMPONENTS																																
Seismic	Maintenance																															
Upgrade	Replacement	1430000				2019				1,430,000																						
Structural	Maintenance																															
Summary	Replacement									1,430,000																						
Building Summary																																
	Maintenance							3,000	46,200	3,000	6,000	3,000		3,000		9,000	6,200	3,000	43,000	3,000	40,000	3,000										
	Replacement						198,000	221,300		1,454,800	120,600	42,400				129,500				41,000	93,500											
Yearly Totals							\$198,000	\$224,300	\$46,200	\$1,457,800	\$126,600	\$45,400		\$3,000		\$138,500	\$6,200	\$3,000	\$43,000	\$44,000	\$133,500	\$3,000		\$25,000	\$15,000	\$9,400	\$45,500					
Totals Inflated at 2% per Year							\$198,000	\$228,786	\$48,066	\$1,547,029	\$137,036	\$50,125		\$3,446		\$165,520	\$7,558	\$3,730	\$54,534	\$56,919	\$176,150	\$4,038		\$34,320	\$21,004	\$13,426	\$66,285					

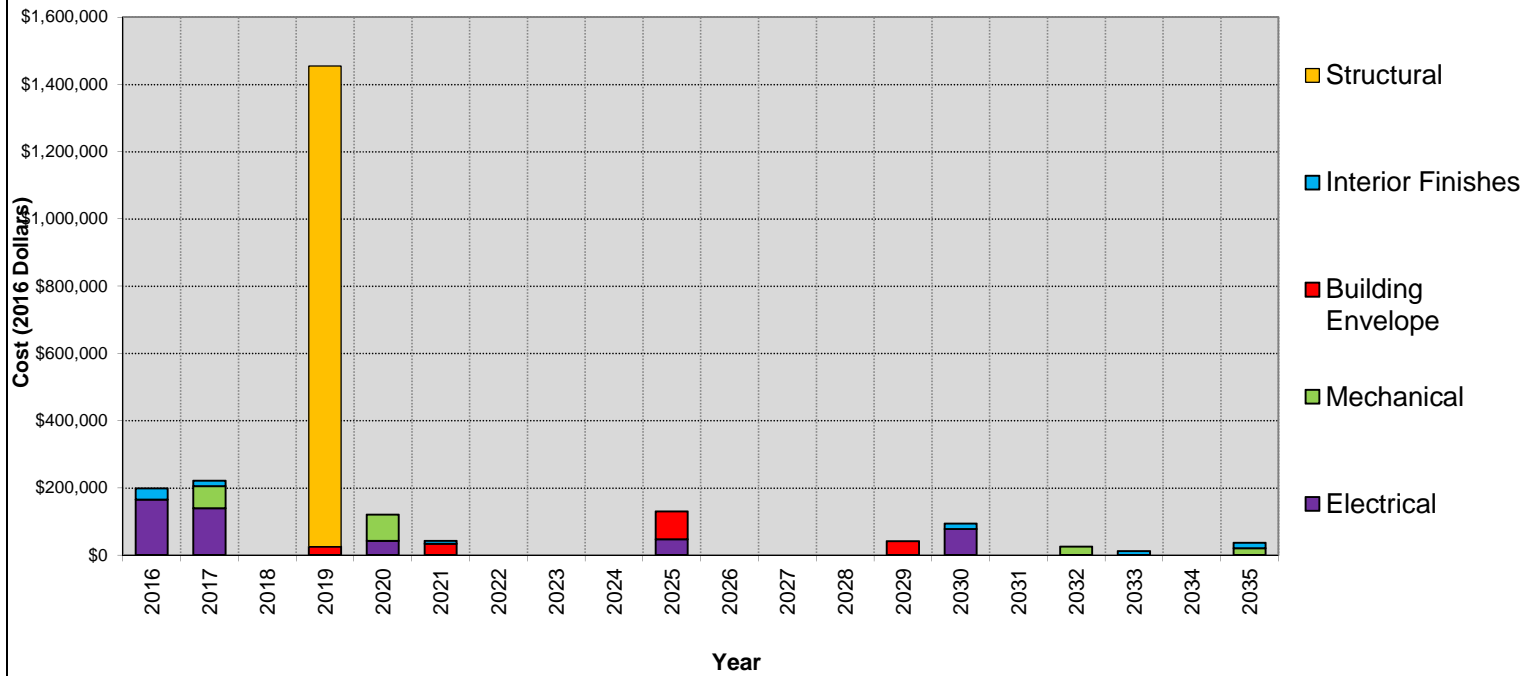
No.7a Monterey Centre Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.7a Monterey Centre

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 40,000	2008	10		2018
Marmoleum Corridors/Rooms	Maintenance Replacement	\$ 34,000	2010	20		2030
		\$ 150,000	1990	50		2040
Marmoleum Kitchen	Maintenance Replacement	\$ 3,000	2008	20		2028
Marmoleum Fern Café	Maintenance Replacement	\$ 17,000	2008	50		2058
Carpet	Maintenance Replacement	\$ 3,200	2014	20		2034
		\$ 16,000	2014	50		2064
Garry Oak Acoustic Reno	Maintenance Replacement	\$ 16,000	2010	20		2030
		\$ 21,000				2016
Garry Oak Storage Doors	Maintenance Replacement	\$ 12,000	1999	17		2016
Washroom	Maintenance Replacement	\$ 16,500	1999	18		2017
Autodoor Operator	Maintenance Replacement	\$ 8,500	1999	22		2021

NOTES:

Maintenance:

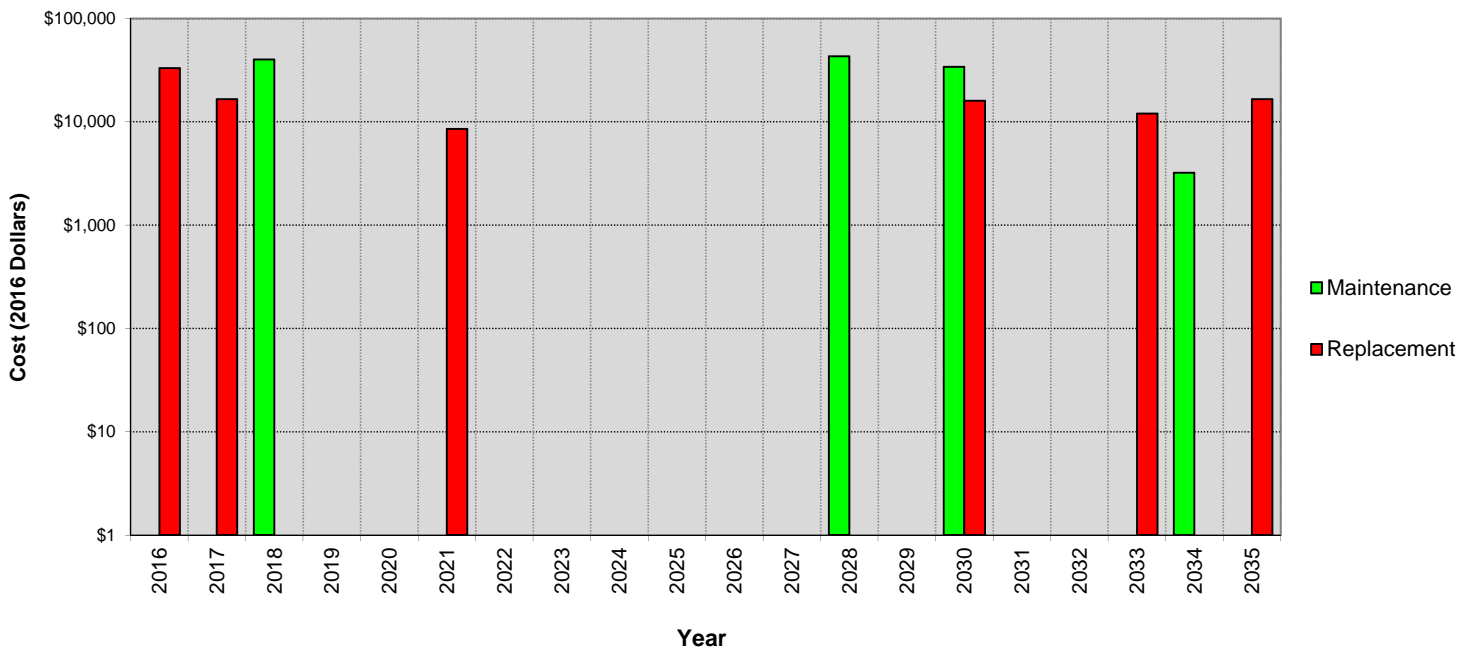
Marmoleum floor maintenance includes resealing (stripping) every 20 years.

Replacement:

Marmoleum flooring in all areas not expected for replacement within the next 20 years.

Garry Oak Room acoustic reno includes installing acoustic panels.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7a Monterey Centre

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Cedar Fascia Board	Maintenance	\$ 2,200	2010	8		2018
	Replacement	\$ 24,800	1971	40	10	2021
Brick	Maintenance	\$ 4,000	2010	8		2018
	Replacement					
SBS Membrane Roof	Maintenance	\$ 3,000	2015	2		2017
	Replacement	\$ 51,000	2000	25		2025
EPDM Membrane Roof	Maintenance					
	Replacement	\$ 31,000	2000	25		2025
Original Aluminum Windows	Maintenance					
	Replacement	\$ 24,800	1971	40	8	2019
Aluminum Windows	Maintenance					
	Replacement	\$ 41,000	1989	40		2029
Pressure Glazed Skylight	Maintenance					
	Replacement	\$ 24,000	2000	40		2040
T-Bar Skylight	Maintenance					
	Replacement	\$ 13,600	2006	40		2046
Exterior Metal Doors	Maintenance					
	Replacement	\$ 9,100	1971	50		2021

NOTES:

Maintenance:

SBS roof membrane maintenance includes patch repairs such as the present blistering over the kitchen corridor portion and other general roof maintenance and localized repairs.

Cladding maintenance includes repainting cedar fascia board and trim, and cleaning brick every 8 years.

Replacement:

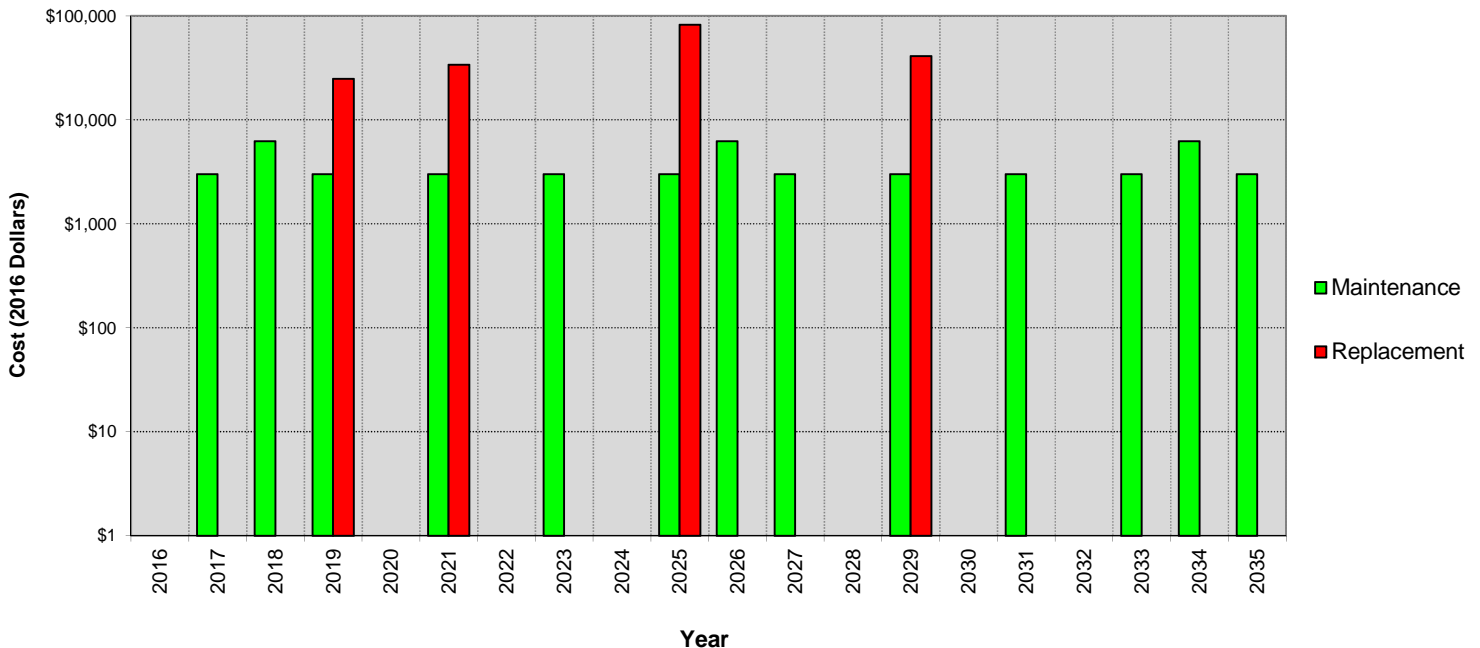
SBS roofing membrane replacement includes cap flashing. Decra metal tile not expected for replacement in the next 20 years (50-year service life).

Vinyl siding at step-down portion of roof over kitchen corridor not expected for replacement in the next 20 years.

Storefront assemblies installed in 2012 not expected for replacement in the next 20 years.

Skylight replacement falls outside the next 20-years but is included for reference.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.7a Monterey Centre

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
AH1 FC unit Electric	Maintenance Replacement	\$ 15,000	1990	15	15	2020
AH2 FC unit Electric	Maintenance Replacement	\$ 15,000	1990	15	12	2017
Furnaces Gas x 4	Maintenance Replacement	\$ 40,000	1990	18	12	2020
Exhaust Fans Sidewall	Maintenance Replacement	\$ 10,000	1990	15	12	2017
Exhaust Fans Kitchen	Maintenance Replacement	\$ 40,000	1990	20	7	2017
Exhaust Fans Parking	Maintenance Replacement	\$ 10,000	1990	20	10	2020
Exhaust Fans Washroom	Maintenance Replacement	\$ 5,000	1990	20	10	2020
HWT 43L Electric	Maintenance Replacement	\$ 1,000	1990	15	15	2020
HWT's 151L Nat. Gas x 2	Maintenance Replacement	\$ 4,000	1990	15	15	2020
Plumbing Fixtures Washroom	Maintenance Replacement	\$ 5,000	2015	5		2020
Plumbing Fixtures Kitchen	Maintenance Replacement	\$ 3,000	1990	20	10	2020
Controls Electric	Maintenance Replacement	\$ 1,000	2015	5		2020

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

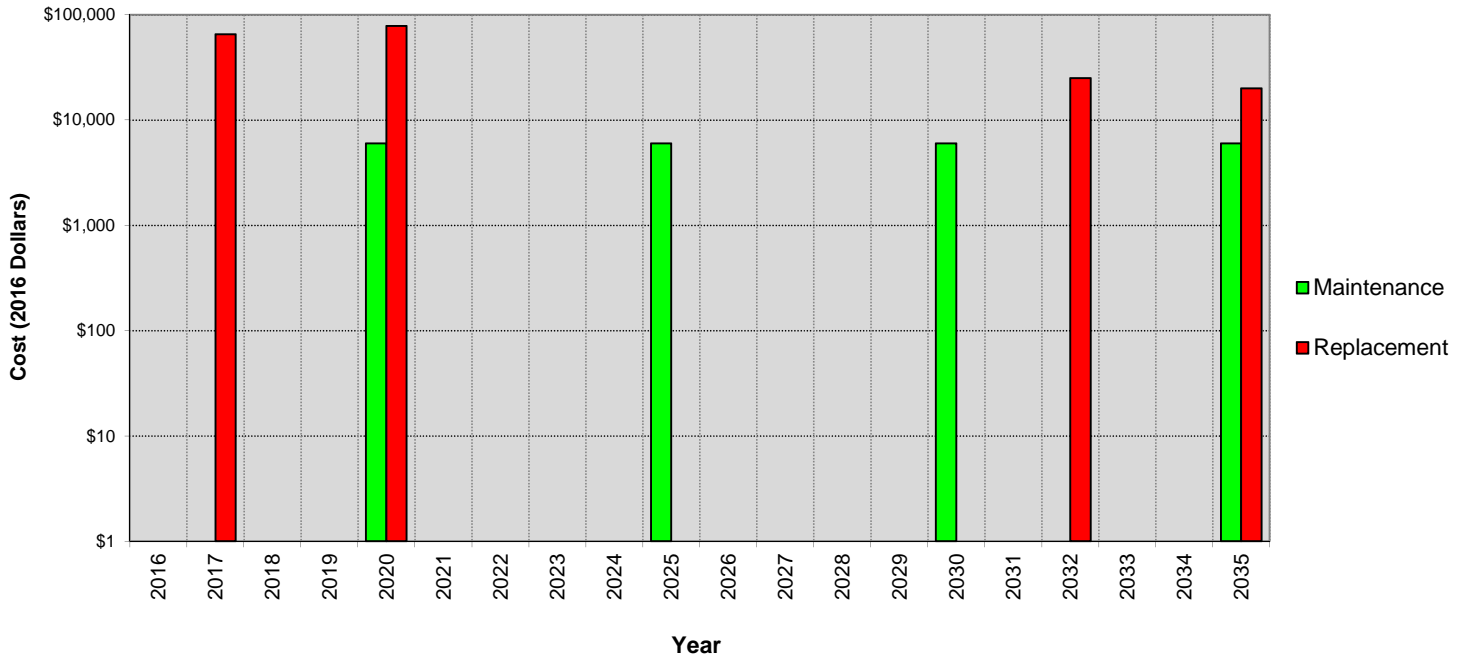
Plumbing Fixtures with variable age, replace as required as maintenance.

Replacement:

Exhaust fans inaccessible.

Sanitary Sump Inaccessible.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7a Monterey Centre Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 55,000	1971	35	10	2016
Breaker Panel Secondary	Maintenance Replacement	\$ 110,000	1971	35	10	2016
Lighting Emergency Exit	Maintenance Replacement	\$ 25,000	1990	30		2020
Lighting Battery Emergency	Maintenance Replacement	\$ 6,800	1990	25	2	2017
Lighting Exterior	Maintenance Replacement	\$ 35,000	2000	25		2025
Lighting Interior	Maintenance Replacement	\$ 83,000	1990	25	2	2017
Alarm Panel	Maintenance Replacement	\$ 25,000	1990	25	2	2017
Baseboard	Maintenance Replacement	\$ 6,300	1990	30		2020
Receptacle Duplex	Maintenance Replacement	\$ 11,300	1990	30		2020
Intrusion Detection	Maintenance Replacement	\$ 10,000	1990	20	7	2017
Paging System	Maintenance Replacement	\$ 15,000	1990	25	2	2017
Sound System	Maintenance Replacement	\$ 12,500	2010	15		2025
Theatre Lighting	Maintenance Replacement	\$ 12,500	2010	20		2030
Communication System	Maintenance Replacement	\$ 65,000	2010	20		2030

NOTES:

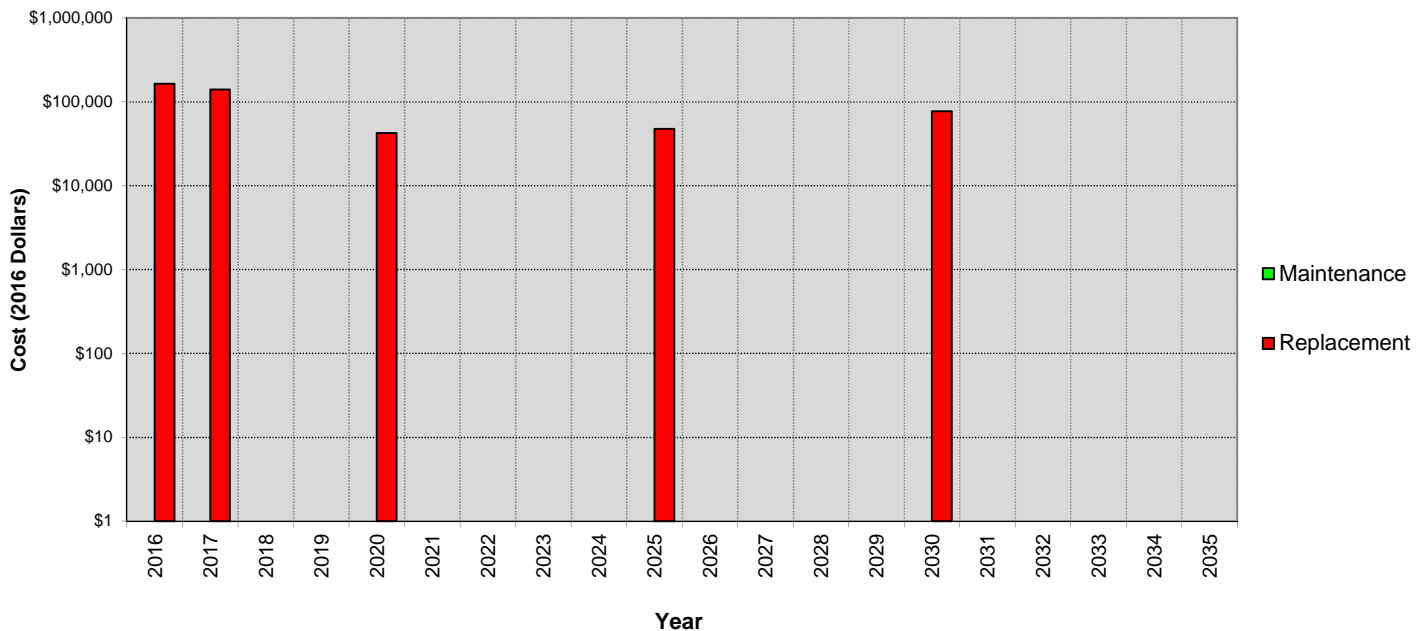
Maintenance:

Lighting and controls, as well as end use devices such as receptacles and switches should be replaced as part of an ongoing maintenance schedule.

Replacement:

The main electrical distribution and panels are at their end of life and should be replaced.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7a Monterey Centre

Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance Replacement	\$ 1,430,000				2019

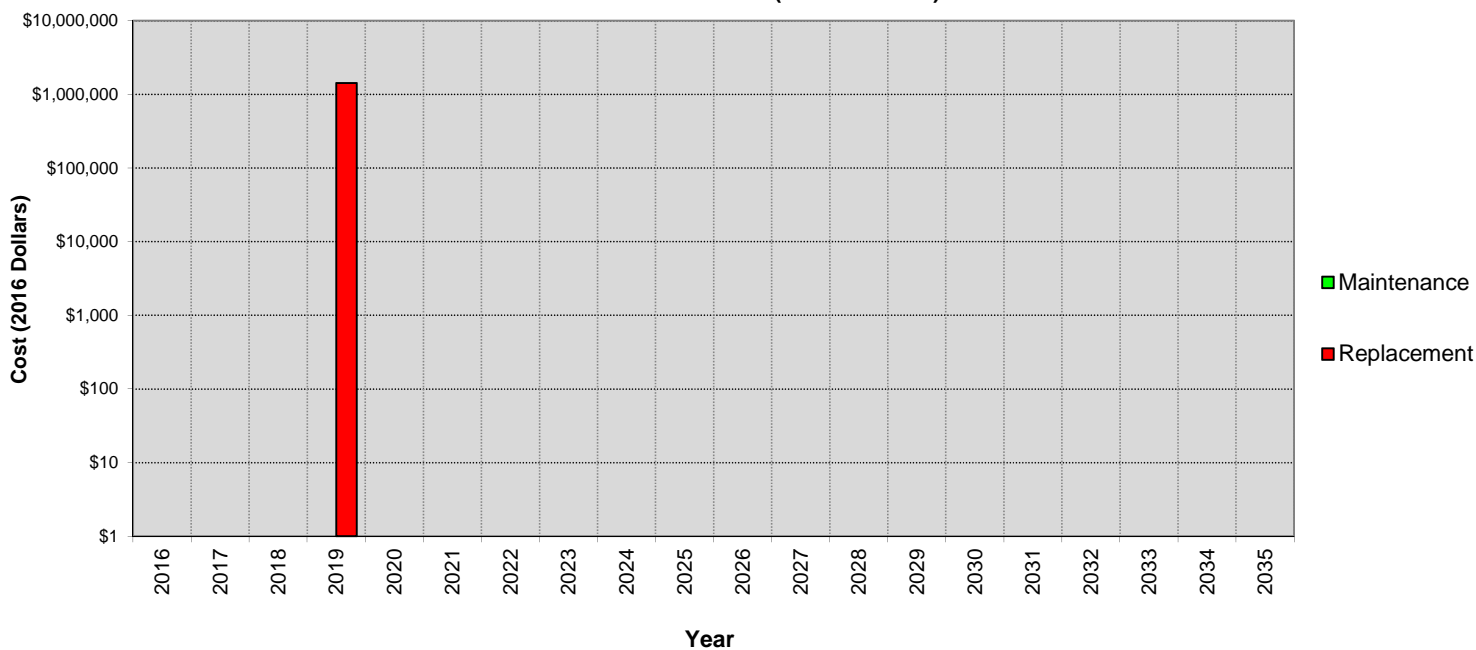
NOTES:

Maintenance:

Replacement:


To upgrade the building to the minimum life-safety level, additional concrete or masonry shear walls, or steel braced frames with corresponding foundations will be required. These shear walls or braced frames can replace existing partition walls so the floor layout is not affected. Additional anchorage of the masonry walls to the roof structure will also be required.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.2.2. No. 7b - Oak Bay Library

<p>1442 Monterey Avenue</p> <p>Peak Occupancy: 200 persons</p> <p>Staffing (avg.): 10 persons</p> <p>Built: 1971</p> <p>Addition(s): 1999</p> <p>Current Area: 11,358 sf</p> <p>HVAC: Furnaces (3), fan coil units, baseboard</p> <p>Fire Suppression: Sprinklers & extinguishers</p> <p>Access: Parking stalls at-grade and covered. Wheelchair access, elevator.</p>	 <p>Tonkin House (Built 1935, Reno 1999)</p> <p><i>Figure 10 -No. 7b - Oak Bay Library</i></p>
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2.2.2.1. Description

The Oak Bay Library originally opened in December of 1971 with the Monterey Centre. A three storey, 5,300 ft², addition was constructed in 1999 to address growing library programming needs. It joined the original building to the three-storey Tonkin heritage home on Hampshire Road. The main floor contains reception, circulation, book stacks, computers and quiet study areas. At the north east corner of the main floor, a half set of stairs/ramp connects users to reading and programming rooms with the Tonkin home. The heritage area has a comforting residential feel, with hardwood floors and heritage ornamental detailing that contrasts with the main open and contemporary library spaces. The lower level is split between the original basement and an open-air parkade. The original basement contains staff washrooms, kitchen, and storage and utility rooms. The western portion of the lower level is an open-air parkade which connects to the Monterey Centre parkade. The third level of the 1999 addition was developed into apartments which are described in section 2.4.3. The building envelope, structure, and main mechanical and electrical systems are shared between the apartments and Library; as such, their financial forecasting has been included within this section.

INTERIOR FINISHES & FURNISHINGS: Interior flooring is primarily carpet on the main and lower floors. Other floor finishes include: vinyl sheet at the lower level kitchen and washrooms, and original Tonkin House hardwood flooring. We would recommend that the central workstation, that is not well utilized, be removed

and the main check-out counter be replaced with a counter that provides improved functional, technical and accessibility needs. Other accessibility needs include the public computer stations, scooter parking area, and accessible staff washrooms; as the staff area is on the lower floor, accessibility to the area cannot be provided.

The interior wall of the sorting area corridor, behind reception, experiences frequent impact from book totes. The walls are extremely damaged as a result; protection with a durable surface, such as a high gauge of stainless steel wall plate, should be considered. This protection would save on repair/maintenance and improve the visual quality of the staff workspace.

BUILDING ENVELOPE: The building envelope for the Library is similar to the Monterey Centre, maintaining consistent aesthetic within the site. Original walls are mass giant brick (not insulated), and the exterior walls of the 1999 addition are also giant brick but have been constructed with a 35 mm air space and steel stud with insulation in the cavity. The wood-framed walls of Tonkin House are clad with rock-dash stucco. Upper portions of the original building are wood-framed like the Monterey Centre and feature cedar siding. Wooden fascia board, soffit and trim are consistent with Monterey Centre. A variety of window types are present on the Library. Original windows on the south elevation are metal-framed and single pane. The 1999 addition windows are aluminum framed glazing units and Tonkin House windows are heritage wood-framed. Exterior doors include the main storefront entrance, shared with the Monterey Centre, and hollow-metal doors. The roof, which includes the Oak Bay apartments, features three types of roofing products: low-sloped areas are 2-ply SBS membrane, sloped (4/12) portions feature DECRA® stone coated steel shingles, and at the perimeter of the DECA® shingled roof is a concealed gutter with fully adhered EPDM (rubber sheet).

STRUCTURAL: The Library was originally constructed in 1971 with the Monterey Centre as a single building. A three storey addition in 1999 joined the adjacent Tonkin Heritage home on Hampshire Road with the original building. The adjoining Monterey Centre also had several additions over the years. All of these additions were built tight to each other without any separation, thereby forming a very large, continuous building for the current day Monterey Centre, the Library and the apartments above the Library.

The original building for the Library area had two floors. It had a common roof with the Monterey Centre. Construction was similar to the Monterey Centre, with wood-frame roof and floor structures and giant brick exterior walls. The exterior walls also had a buckling out-of-plane weakness, similar to the Monterey Centre. The 1999 addition was primarily a wood-frame structure, with wood roof trusses and wood-frame walls on the upper floor and the main floor. The upper floor structure consists of wood joists and steel beams supported by steel columns that bear on the concrete floor at the main floor. This addition was designed to the 1992 BC Building Code which has seismic design requirements. Nevertheless, the original 1971 building, which has the same seismic deficiencies as the Monterey Centre, is not structurally connected to the 1999 addition such that the addition can laterally support the original 1971 building. In its current condition the original 1971 Library building has a seismic capacity-to-demand of less than 0.2.

A seismic upgrade is recommended. To upgrade the building to the minimum life-safety level, additional concrete or masonry shear walls, or steel braced frames with corresponding foundations will be required. These shear walls or braced frames can replace existing partition walls so the floor layout is not affected. Additional anchorage of the masonry walls to the roof structure will also be required. As the Monterey Centre and Library are seismically connected, there seismic upgrades have been scheduled together.

MECHANICAL:

- Heating, Ventilation and Air Conditioning (HVAC):

The building is heated and ventilated by electric fan coil units and gas fired furnaces which provide heated air to the spaces. Supplemented heat is supplied by electric baseboard heaters. Fan coil units are located in mechanical rooms around the building. There is a gas fired furnace located in the south Basement Mechanical Room. The heating and ventilation air from the unit is ducted to rooms in the Basement. A second gas fired furnace is located in the north Basement Mechanical Room. The heating and ventilation air from this unit is ducted to the multipurpose room on the west end of the Library. A third air handling unit is present in the mechanical room at roof level adjacent to the Residential suites. Heating and ventilation air from this unit is ducted overhead to ceiling diffusers within the main floor Library area. Each washroom has exhaust systems installed and appear to be well ventilated. Overall the heating and ventilation within this building is good. The furnaces and air handling unit appear to have been well maintained and are in good condition.

- Plumbing:

Domestic cold water is distributed to the hot water tanks and each building plumbing fixture. There are hose bibs located in various places on the building exterior. All the public washrooms have tank type water closets, automatic sensor urinals and heavy duty commercial faucets. There is a 189L 3.0kW electric hot water tank located in the south Basement Mechanical Room which serves the fixtures in the Library. A 27L 1.50kW electric hot water tank, located in the north Basement Mechanical Room, serves the multipurpose room on the west end of the Library. Plumbing fixtures are piped to the building's sanitary sewer system and are comprised of cast iron and copper drainage piping. The storm system is comprised of cast iron rainwater leaders connected to roof drains.

Observations noted throughout the plumbing system include:

- The plumbing systems are heavy duty commercial grade and appear to be in good condition.
- The main domestic water service is protected by a premise backflow preventer and appears to be of sufficient size to meet Building Code.

- Fire Suppression:

Fire suppression sprinklers have been installed throughout this building. Fire extinguishers are present on walls in locations as per NFPA 10

ELECTRICAL: The electrical distribution for the Library is serviced from the Monterey Recreation Center and is in good condition. The lighting is a mixture of older and newer luminaires; their replacement should be considered for energy savings, improved lighting levels and Code compliance with ASHRAE 90.1. The Fire alarm systems is older and replacement should be considered.

The Communication system and sound system in the Library are in good condition. The security system is reaching its end of life; replacement is recommended.

2.2.2.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 19: Condition of Building Systems – No. 7b - Oak Bay Library

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X ₁	
Vinyl Sheet			X		
Carpet			X		
Hardwood Flooring				X	
Guardrail				X	
Interior Doors				X	
Building Envelope					
Brick				X ₂	
Stucco-Tonkin House			X ₃		
Cedar Siding & Trim			X		
Windows, Aluminum			X		
Windows, Wood			X		
Curtain Wall Assembly					X
SBS 2-Ply Roof Membrane			X		
EPDM Membrane			X		
DECRA® Stone Coated Steel Shingles			X ₄		
Asphalt Shingles			X ₅		
Gutters and Downspouts				X	
Exterior Metal Doors				X	
Exterior Wood Staircase			X		
Exterior Metal Staircase			X		

	Concealed	Poor	Fair	Average	Good
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Fan Coil unit					X
Furnaces					X
Exhaust Fans			X		
Electric Hot Water Tanks				X	
Plumbing Fixtures – washrooms			X		
Wet Fire Suppression System					X
Domestic Water System				X	
Electrical					
Power Distribution 2ndry Panel					X
Fire Alarm Panel			X		
Lighting Emergency Exit				X	
Lighting Emergency with Battery					X
Lighting Exterior			X ₆		
Lighting Interior			X ₆		
Sound System					X
Communications System					X
Intrusion Detection				X	
Structural					
Seismic Restraint		X ₇			

Notes:

1. Cracking observed in plaster below window sill of west wall in Tonkin Home reading room.
2. Efflorescence, suggestive of water staining, is evident at the exterior corner of book sorting room. Exterior review did not identify an obvious source of moisture, and moisture was not present at the time of review. As walls are uninsulated, rain-wetted walls may be drying towards the interior, drawing soluble salts inward, causing staining.
3. Stucco on Tonkin Home exhibits water staining at corners and other areas of greater exposure. Stucco-brick and stucco-wood window joints are not adequately sealed. Stucco-brick joints displayed noticeably gap for water to penetrate.
4. DECRA® shingles has been deformed in areas from direct foot traffic. Walkway plates have been installed to prevent further damage. They are mounted on horizontal battens through and EPDM rubber layer, with fasteners penetrating it.
5. Heavy amounts of organic growth on south asphalt shingle roofing.
6. Older fixtures should be replaced on a maintenance schedule and lighting controls added for further energy savings and Code compliance.
7. Seismic capacity-to-demand ratio of less than 0.2.

STRUCTURAL: Significant structural distress was not observed for the Library. However, cracks are observed in the gypsum ceiling boards over the staff working area at the south-east corner of the building. The ceiling

gypsum boards are attached directly to the underside of the roof rafters that support the clay tile roof. There are no significant loads on the rafters, just lights suspended from them. It appears that the cracks may have been caused by excessive deflections of the rafters due to previous snow loads on the roof.

2.2.2.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Oak Bay Library - Baseline Recommendations:

2016

- Seal joints at stucco-brick and stucco-wood.

2019

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.
- Seismic Upgrade.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the ‘0-5 yrs’ year category; beyond this period more typical maintenance and replacement costing occurs.

Table 20: Summary of Present-Value Building Costs every 5 years –No. 7b - Oak Bay Library

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$92,200	\$29,200	\$8,000	\$14,000	\$143,400
Building Envelope	\$72,700	\$38,100	\$14,200	\$25,100	\$150,100
Mechanical Summary	\$79,200	\$43,000	\$4,000	\$37,500	\$163,700
Electrical Summary	\$48,500	\$-	\$7,500	\$15,000	\$71,000
Structural Summary	\$310,000	\$-	\$-	\$-	\$310,000
Total	\$602,600	\$110,300	\$33,700	\$91,600	\$840,000

Functionally, The Library is becoming deficient in all areas, including: reading space, children's programming space, library programming room size, insufficient workroom area, insufficient book marketing area, technology systems for book handling, access to staff areas on the lower level, out dated stacking systems, computer station quantities, poor access to community programming, etc. While the 1999 addition expanded the building significantly, it did not improve upon the Library's exposure and presence to the street.

This highly utilized Library is extremely successful with over 394,000 annual visits, however, it will be competing with newer updated Libraries soon, and we recommend that the Oak Bay Library also transforms significantly to accommodate current and future needs of the community. While the Library is deficient of high technology infrastructure and services, the space needed to improve the Library public and staff operations is unavailable. Therefore, we recommend consideration toward a building expansion or relocation prior to providing the technical or seismic infrastructure that is needed throughout the library.

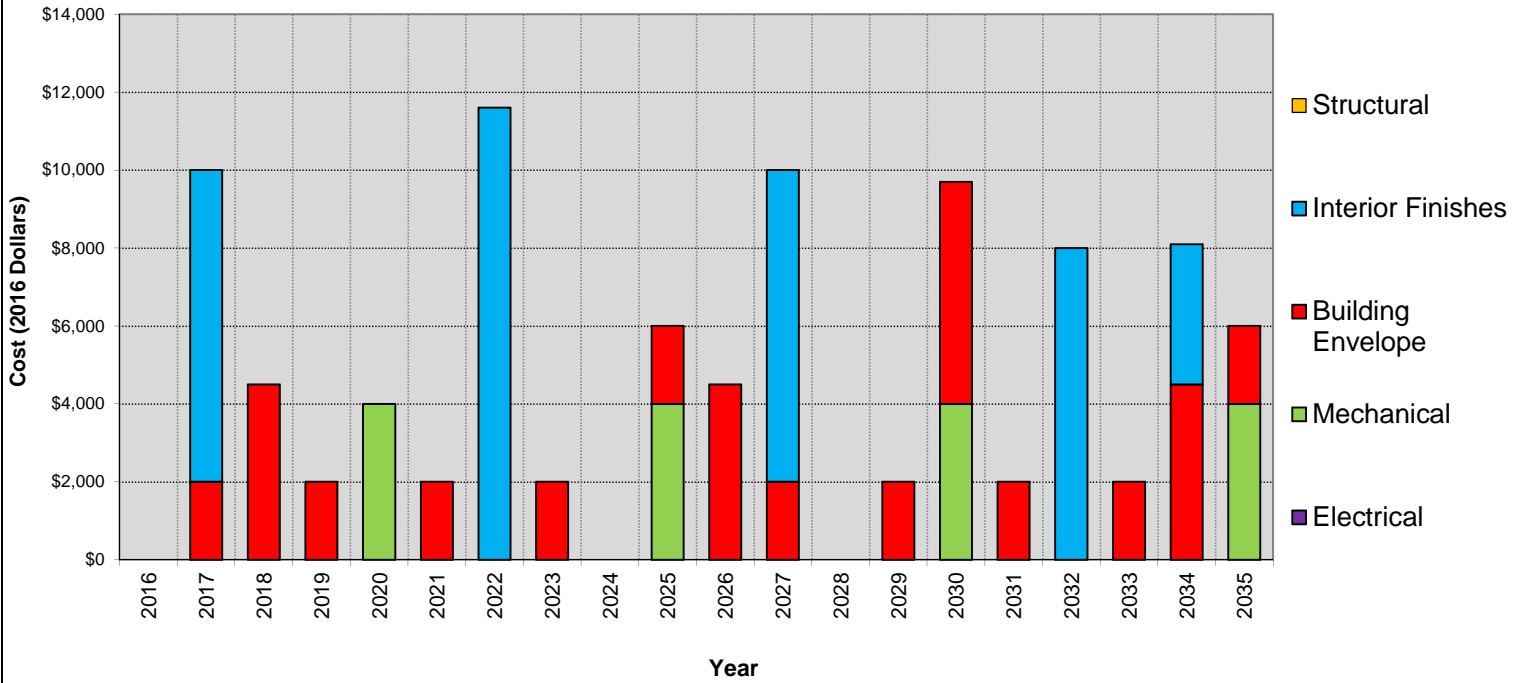
No.7b Oak Bay Library

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																				
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Section 4 - ELECTRICAL COMPONENTS																											
Breaker Panel	Maintenance																										
Main	Replacement	25000	2010	35		2045																					
Fire Alarm	Maintenance																										
Panel	Replacement	15000	1990	25	4	2019																					
Lighting Exit	Maintenance																										
Emergency	Replacement	3500	2010	30		2040																					
Lighting Battery	Maintenance																										
Emergency	Replacement	2300	2010	30		2040																					
Lighting	Maintenance																										
Exterior	Replacement	5300	1990	25	4	2019																					
Lighting	Maintenance																										
Interior	Replacement	20700	1990	25	4	2019																					
Sound System	Maintenance																										
	Replacement	7500	2010	20		2030																					
Communication	Maintenance																										
System	Replacement	15000	2010	25		2035																					
Intrusion	Maintenance																										
Detection	Replacement	7500	1990	20	6	2016	7,500																				
Electrical	Maintenance																										
Summary	Replacement						7,500																				
Section 5 - STRUCTURAL COMPONENTS																											
Seismic	Maintenance																										
Upgrade	Replacement	310000				2019																					
Structural	Maintenance																										
Summary	Replacement																										
Building Summary	Maintenance																										
	Replacement						7,500	10,000	4,500	2,000	4,000	2,000	11,600	2,000	19,000	41,400	6,000	4,500	10,000		2,000	9,700	2,000	8,000	2,000	8,100	6,000
Yearly Totals							\$7,500	\$10,000	\$21,200	\$447,400	\$116,500	\$30,300	\$11,600	\$2,000	\$19,000	\$47,400	\$4,500	\$10,000		\$2,000	\$17,200	\$19,000	\$8,000	\$2,000	\$8,100	\$54,500	
Totals Inflated at 2% per Year							\$7,500	\$10,200	\$22,056	\$474,784	\$126,103	\$33,454	\$13,063	\$2,297	\$22,262	\$56,647	\$5,485	\$12,434		\$2,587	\$22,685	\$25,571	\$10,982	\$2,800	\$11,569	\$79,386	

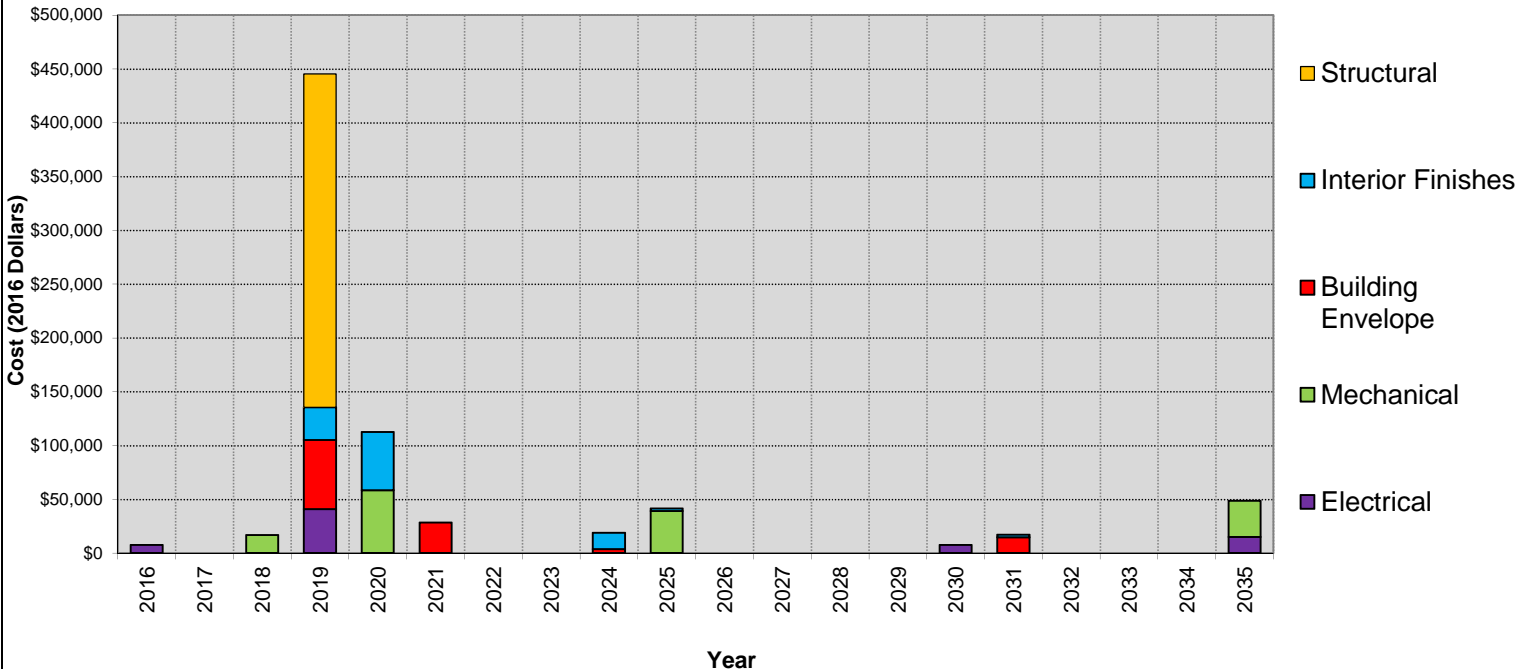
No.7b Oak Bay Library Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.7b Oak Bay Library

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 8,000	2012	5		2017
Vinyl Sheet Flooring	Maintenance Replacement	\$ 16,200	1999	20	1	2020
Carpet	Maintenance Replacement	\$ 37,800	1999	20	1	2020
Hardwood Flooring	Maintenance Replacement	\$ 3,600	2010	12		2022
Interior Millwork	Maintenance Replacement	\$ 20,000	1999	20		2019
Wall Protection	Maintenance Replacement	\$ 10,200	1999	20		2019
Washrooms Upgrade	Maintenance Replacement	\$ 15,200	1999	25		2024
Computer Stns Access	Maintenance Replacement	\$ 2,400	2019	6		2025

NOTES:

Maintenance:

Hardwood floor maintenance in original Hampshire House includes sanding, filling and two coats of varnish every 12 years.

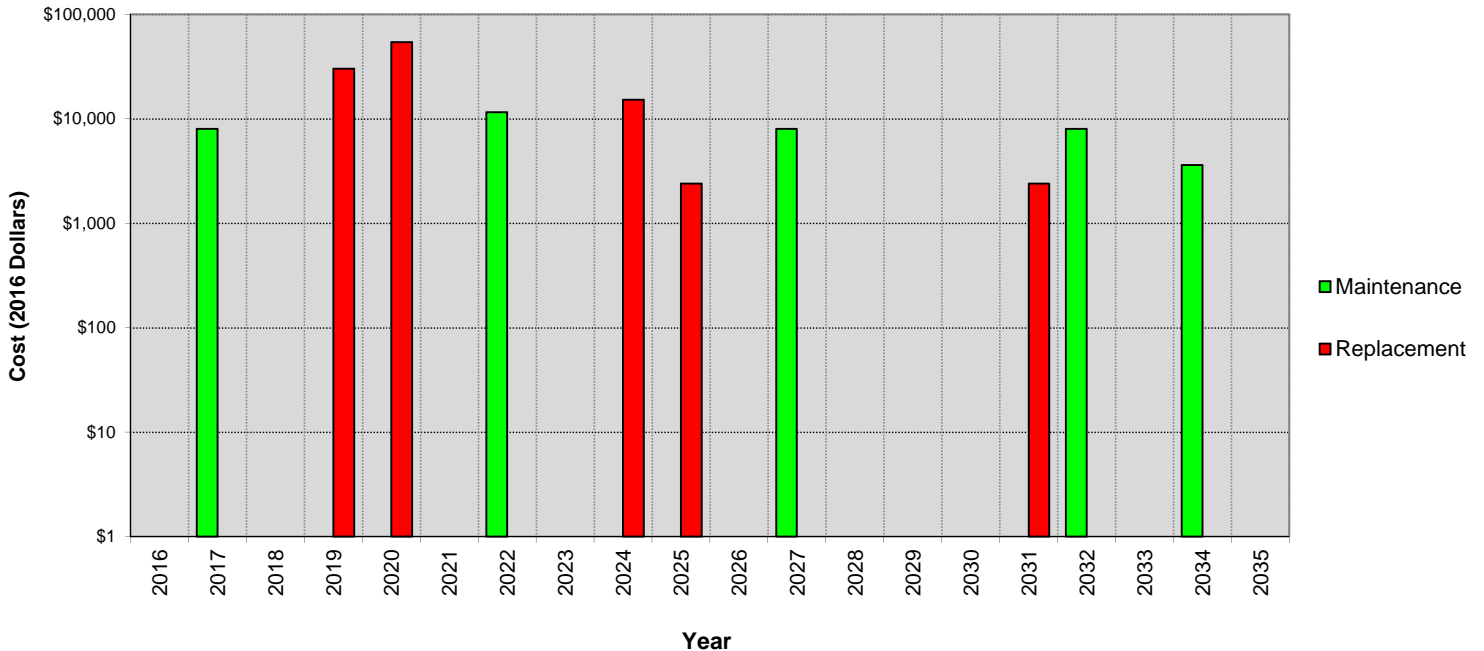
Interior wall maintenance includes repainting every 5 years.

Replacement:

Wall at sorting room corridor recommended to be resurfaced with a high durable surface such as a high gauge of stainless steel wall plates.

Improved access to computer stations.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7b Oak Bay Library

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Brick	Maintenance Replacement	\$ 2,700	2010	8		2018
Stucco	Maintenance Replacement	\$ 5,700	2010	20		2030
Tonkin House						
Cedar Board Siding & Trim	Maintenance Replacement	\$ 1,800	2010	8		2018
		\$ 14,600	1971	40	20	2031
Aluminum Windows	Maintenance Replacement	\$ 22,600	1999	45		2044
Aluminum Windows - Single	Maintenance Replacement	\$ 6,100	1971	45	5	2021
Wood Windows	Maintenance Replacement	\$ 22,200	1935	45	41	2021
Tonkin Home						
SBS Membrane Roof	Maintenance Replacement	\$ 2,000	2015	2		2017
		\$ 49,200	1999	20		2019
EPDM Membrane Roof	Maintenance Replacement	\$ 5,300	1999	20		2019
Asphalt Shingles Roof	Maintenance Replacement	\$ 9,700	1999	20		2019
Gutters & Downspouts	Maintenance Replacement	\$ 3,800	1999	25		2024

NOTES:

Maintenance:

SBS roof membrane maintenance includes patch repairs and general cleaning of accumulated organic growth of all roofing areas.

Cladding maintenance includes repainting cedar fascia board and trim, cleaning brick, repainting stucco, and renewing sealant on respective periods.

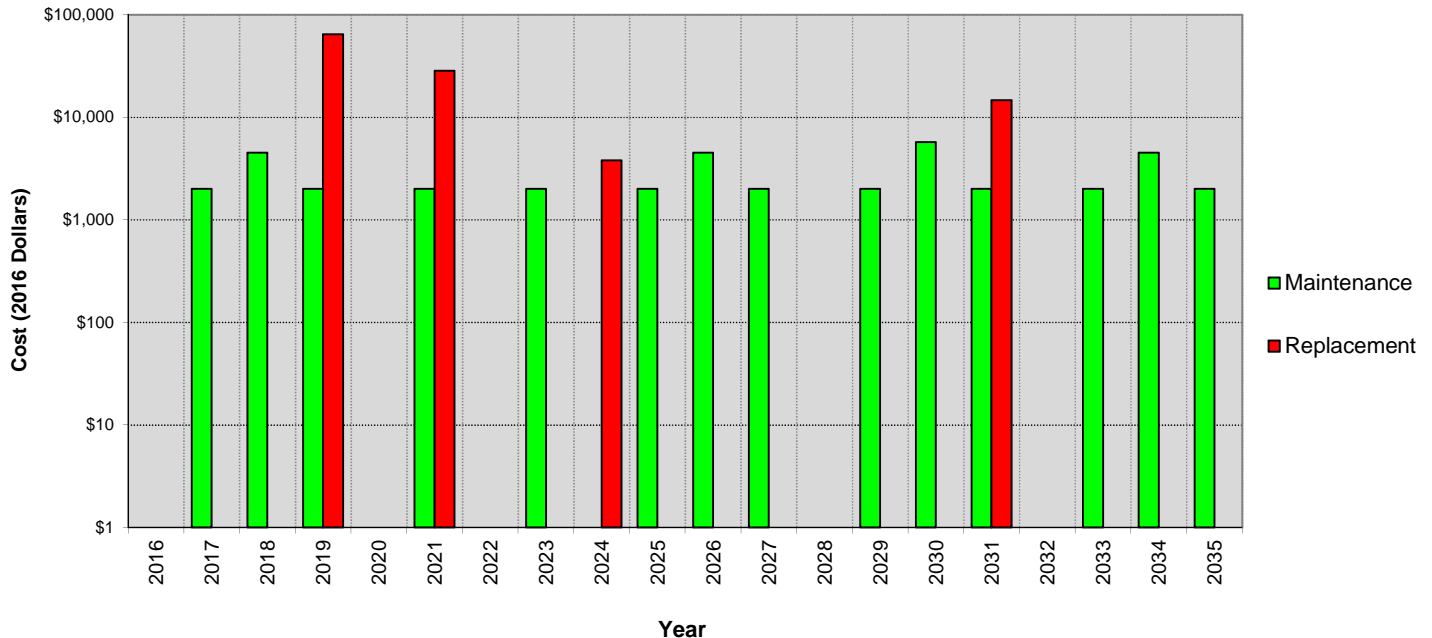
Replacement:

SBS roofing membrane replacement includes cap flashing. Decra metal tile not expected for replacement in the next 20 years (50-year service life). Gutters and downspout replacement at original house assumed to have been installed with 1999 asphalt shingles.

Aluminum windows from 1998 addition are not expected for replacement. Single-pane, aluminum-framed windows (1971) are expected to be replaced within the next 5 years along with replacement wood-frame windows at the original 1935 house.

Cedar board siding and trim replacement for pre-1998 areas only (north and east).

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.7b Oak Bay Library

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Elevator Short Term	Maintenance Replacement	\$ 16,700		25		2018
Elevator Long Term	Maintenance Replacement	\$ 39,000		25		2025
RTU AHU	Maintenance Replacement	\$ 30,000	1990	15	15	2020
Furnaces Gas x 2	Maintenance Replacement	\$ 20,000	1990	18	12	2020
Exhaust Fans Washroom	Maintenance Replacement	\$ 5,000	1990	20	10	2020
HWT 189L Electric	Maintenance Replacement	\$ 2,500	1990	15	15	2020
HWT's 27L Elec	Maintenance Replacement	\$ 1,000	1990	15	15	2020
Plumbing Fixtures Washroom	Maintenance Replacement	\$ 3,000	2015	5		2020
Controls Electric	Maintenance Replacement	\$ 1,000	2015	5		2020

NOTES:

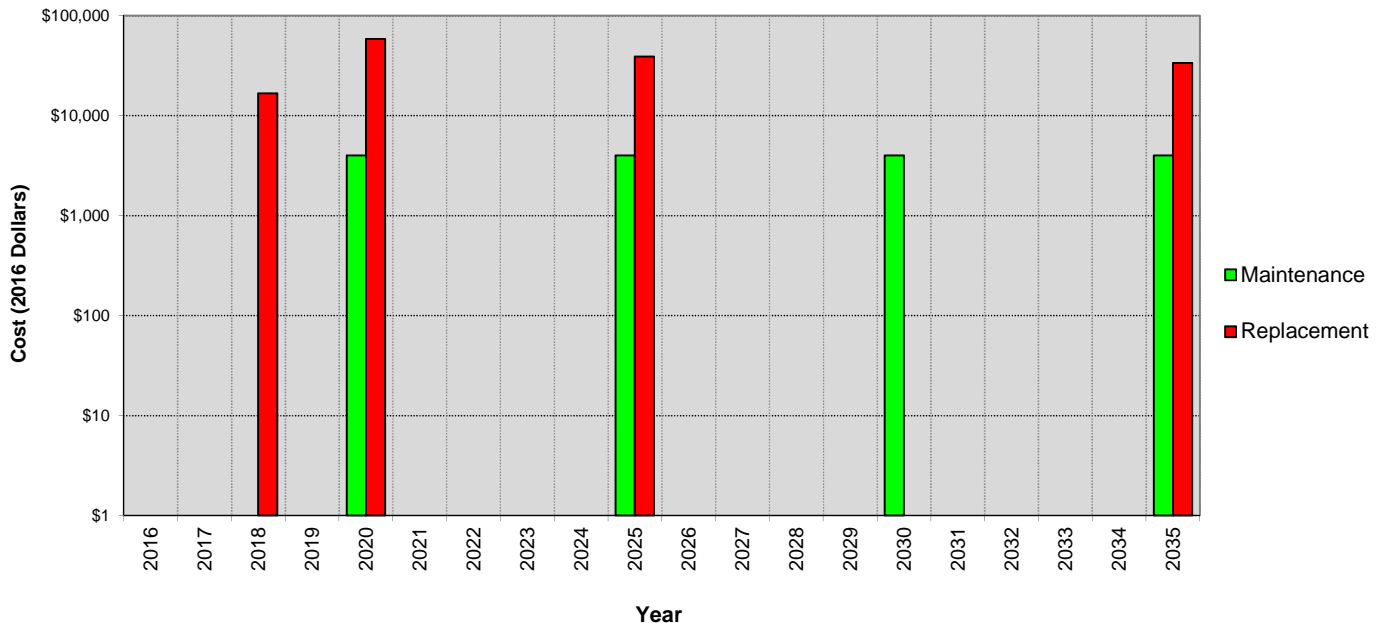
Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.
 Plumbing Fixtures with variable age, replace as required as maintenance.

Replacement:

Short term elevator costs include: auto dialing phone, door detectors, soft starter and a pipe rupture valve. Long term costs include a controller upgrade.
 Exhaust fans inaccessible.
 Sanitary Sump Inaccessible.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7b Oak Bay Library

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 25,000	2010	35		2045
Fire Alarm Panel	Maintenance Replacement	\$ 15,000	1990	25	4	2019
Lighting Exit Emergency	Maintenance Replacement	\$ 3,500	2010	30		2040
Lighting Battery Emergency	Maintenance Replacement	\$ 2,300	2010	30		2040
Lighting Exterior	Maintenance Replacement	\$ 5,300	1990	25	4	2019
Lighting Interior	Maintenance Replacement	\$ 20,700	1990	25	4	2019
Sound System	Maintenance Replacement	\$ 7,500	2010	20		2030
Communication System	Maintenance Replacement	\$ 15,000	2010	25		2035
Intrusion Detection	Maintenance Replacement	\$ 7,500	1990	20	6	2016

NOTES:

Maintenance:

A scheduled maintenance program should be considered to replace existing interior and exterior lighting for Code compliance and energy savings.

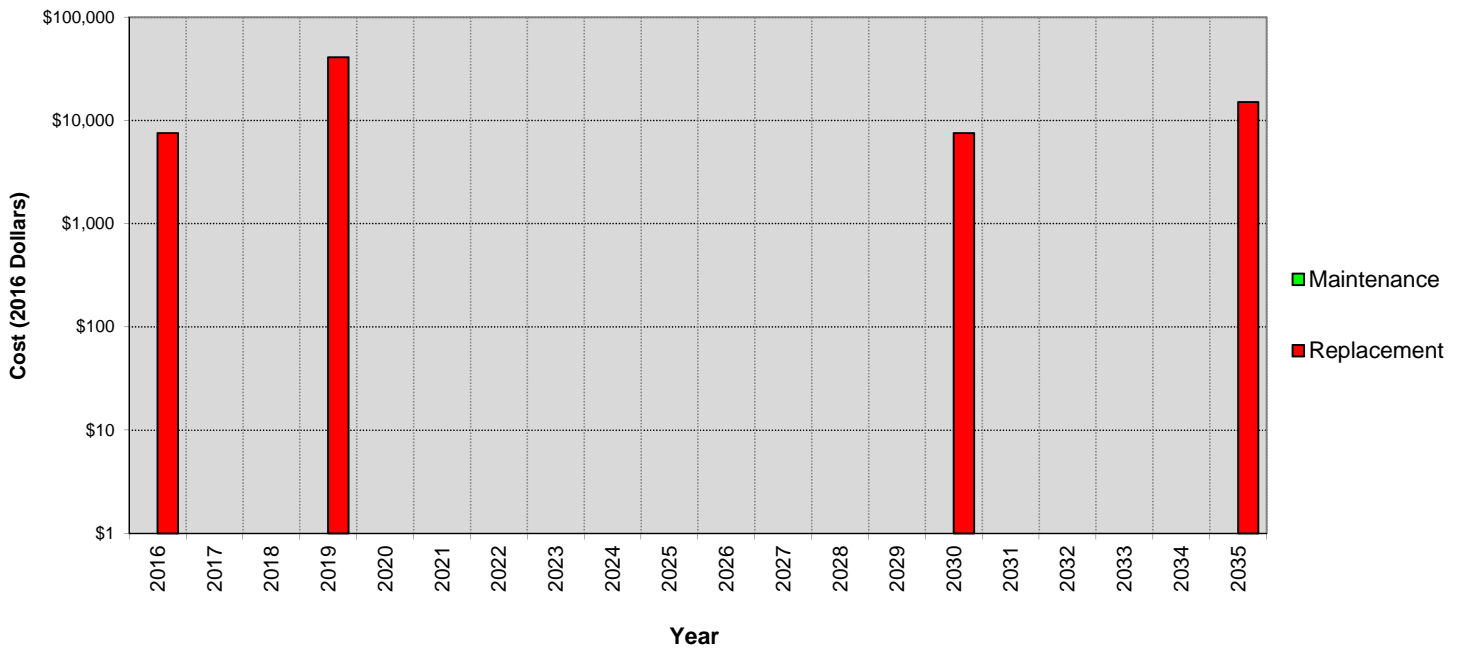
Replacement:

The Fire Alarm system is at the end of its expected servicable life; consideration for its replacement should be undertaken.

The Intrusion detection system is also at the end of its serviceable life.

Main breaker panel not expected for replacement in the next 20 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.7b Oak Bay Library Structural



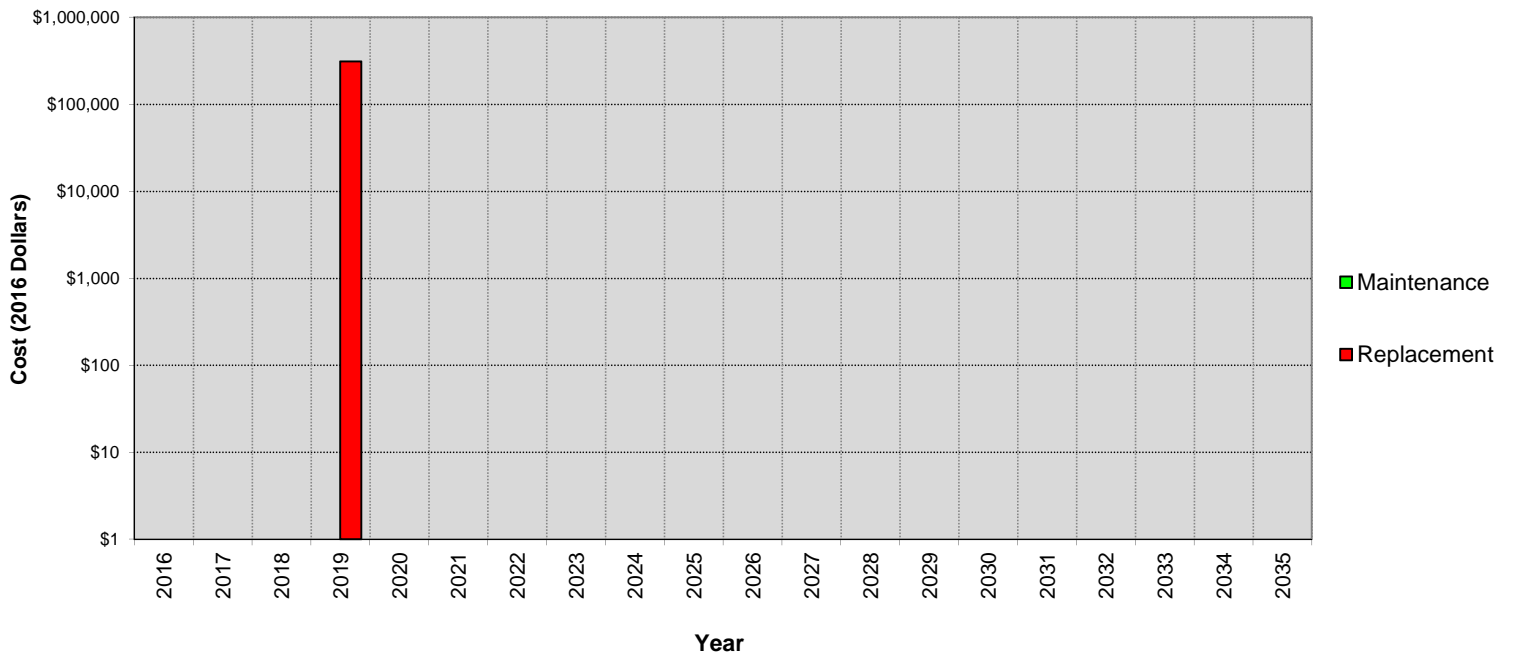
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Seismic Upgrade	Maintenance Replacement	\$ 310,000				2019

NOTES:
Maintenance:

Replacement:

To upgrade the building to the minimum life-safety level, additional concrete or masonry shear walls, or steel braced frames with corresponding foundations will be required. These shear walls or braced frames can replace existing partition walls so the floor layout is not affected. Additional anchorage of the masonry walls to the roof structure will also be required.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.2.3. No. 8 - Oak Bay Recreation Centre


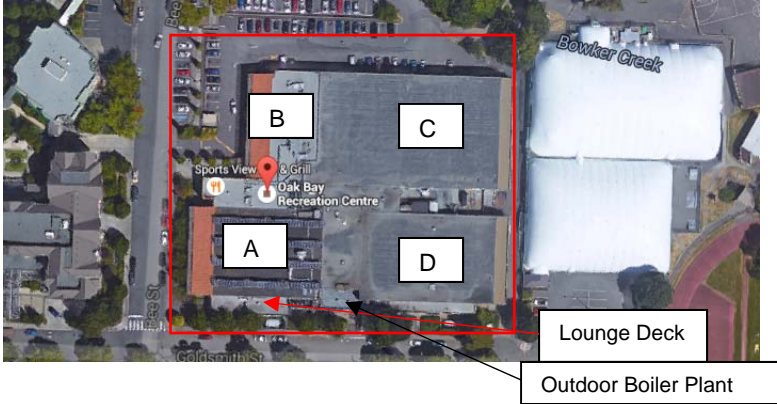
<p>1975 Bee Street</p> <p>Peak Occupancy: 500</p> <p>Staffing (avg.): 40</p> <p>Built: 1975</p> <p>Addition(s): 2003</p> <p>Current Area: 89,200 sf</p> <p>HVAC: Boilers, heat pumps, HRV, Solar HW</p> <p>Fire Suppression: Sprinklers (Wet & Dry)</p> <p>Access: Parking stalls at-grade, wheelchair access, elevator</p> <p>(A) BUR Roof, Pool (B) SBS Roof, Gym (NW) (C) SBS Roof, Rinks (E) (D) SBS Roof, Mechanical & Lounge</p>	 
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Figure 11 No. 8 - Oak Bay Recreation Centre

2.2.3.1. Description

Built in 1975, Oak Bay Recreation Centre offers a wide variety of health and leisure opportunities for users to enjoy. From swimming, skating, hockey, drop-in soccer, fitness and rehabilitation programs the centre is heavily utilized by members and drop-in users. In 2003 the centre had an extensive renovation and upgrade that refurbished the interior and added a new entrance, office area, and second-level fitness centre. With all of these energy intensive services the building represents 43% of the Districts 2013 energy costs. This figure has been reduced substantially over the past 20 years through numerous energy conservation and efficiency measures. From 1993 to 2013 the centre reduced its energy consumption (electricity and gas) by over 50% while the number of users continued to rise. Valuable heat reclaim features and an energy awareness campaign are examples of initiatives made towards realizing those savings. The main floor of the building represents the majority of the total floor area; the arena, pool, ice rink, change rooms, offices and multi-use playing field are

all located on the main floor. The second level features the fitness centre, yoga studio and original café and lounge areas. A single elevator services the two levels, giving full access to users.

INTERIOR FINISHES & FURNISHINGS: Interior flooring throughout the building includes: carpeting in offices and the restaurant/lounge, ceramic tile in main lobby, south corridor, change rooms, and washrooms, artificial turf at the playing field, and rubber flooring at arena and fitness centre areas. Interior walls and ceiling are painted internally by staff annually to maintain good appearance. There are several locations in the original building where asbestos content is present in the flooring and ceiling, and has been covered over with more recent finishes. The existing mechanical rooms do not have fire-stopping at through-wall penetrations and this work is recommended. The office space inside the Arena requires acoustic separation in the walls for workplace health and safety reasons.

BUILDING ENVELOPE: Exterior walls are constructed from 8" concrete masonry unit on lower levels and steel stud framing on the upper. The 2003 renovation and addition added glulam beams and columns, brick veneer and exposed concrete to the west elevation main entrance. Metal and cedar siding, both original and from 2003, are other types of cladding found on the building. Fenestration includes a 600 ft² pressure glazed skylight over the main lobby, aluminum-framed windows are single-pane from 1971 and double-pane from 2003, storefront entrance assemblies, and hollow-metal utility room doors. The roof is sectioned into several different materials and ages. Approximately 75% of the total roofing area is 2-ply SBS membrane; age of installation ranges from 1986-2003. In the south west corner, a built-up gravel-ballast roof spans the pool with solar hot water arrays mounted to curbs at several hundred locations. Sloped, standing-seam, metal roofing (red-coloured) is found along east and west elevations; the west elevation was installed during the 2003 renovation while the east is original 1975 construction. Along the south of the building an SBS membrane deck extends back from the lounge, providing outdoor seating and further room for mechanical/ventilation equipment.

MECHANICAL:

Heating, Ventilating and Air Conditioning

The building heating water system includes the following equipment.

- Boiler B-1 which replaced the original building boiler (Buderus 1582 MBH output).
- Boiler B-2 which is one of the original building boilers (Clever Brooks).
- Heating water circulation pumps.
 - P1 – Serves the swimming pool dehumidifier DH-1.
 - P2 – Serves AH2
 - P4 – Serves AH4
 - P5 – Primary circulation pump.
 - P6 – Domestic hot water heating.
 - P7 – Ice rink hot water heating.

The facility has the following major forced air systems for heating ventilating and air conditioning.

- The Skaters Lobby, Main Building Entry, Child Minding and Offices are served by make-up air unit MUA-1. Three hydronic duct heating coils (HC-1, HC-2 & HC-3) are used for zone temperature control. The gas heating section in MUA-1 has failed and has been disabled. A split system heat pump, HPO-2, has been installed to heat the MUA-1 outdoor air. The heat pump outdoor section is installed beside MUA-1. The heat pump indoor coil is located in the supply air ductwork in the ceiling of the Program Fitness Room. The heat pump provides both heating and cooling. There have been no reports of operational complaints with this modified system.
- The Level 2 Workout Area is served by heat recovery ventilator HRV-1 and two split system heat pumps which are all located on the roof. Split system heat pump HPO-1 is located beside HRV-1. The evaporator coil is located inside HRV-1. A second split system heat pump was added (the original heat pump did not provide sufficient cooling capacity). The heat pumps provide both heating and cooling.
- The Level 2 Locker Rooms, Fitness Room, Workout Room and Storage Room are served by heat recovery ventilator HRV-2 and split system heat pump HPO-2 which are located on the roof. The HPO-2 evaporator coil is located on the roof in the supply air ductwork downstream HRV-2.
- The Level 1 Administration Offices are served by packaged rooftop heat pump PHP-01. There are two temperature sensors located in the office area which are averaged for room temperature control.
- The Level 1 Board Room, Stor/Comm Room, Aquatics Manager office, First Aid and Reception area are served by packaged rooftop heat pump PHP-02. The temperature sensor is located in common corridor 109.
- A rooftop make-up air unit with a split system heat pump serves the Pool Storage Room 121, Pool Staff Room and Steam Heater Equipment Room.
- AH2: Air handling unit located in Fan Room #3 complete with supply fan, air filters, pumped hydronic heating coil, return air and outdoor air mixing section. This unit serves the ice rink Change Rooms and Pool Change Rooms.
- AH4: Air handling unit located in Fan Room #3 complete with supply fan, air filters, pumped hydronic heating coil, return air and outdoor air mixing section.
- The pool area is served by dehumidifier DH-1. The pool dehumidifier condensing unit (CU-1) is located on the lower roof. The dehumidifier also has a hot water heating coil. Heat recovered from this unit is used to heat the main pool water. The pool area dehumidifier has been hard on compressors: four compressors have recently been replaced.
- A desiccant dehumidifier located in the equipment roof well between the ice rink and Multi Sport Plex serves the Ice Rink.
- The Multi Sport Plex is ventilated by wall exhaust fans on the north exterior wall and outdoor air inlet louvres complete motorized control dampers located high on the south exterior wall.

Supplemental heating equipment is installed to serve the following areas.

- The north exit doors from the Skaters Lobby has a hydronic floor mounted force flow heater.
- The Multi Sport Plex south entry has a floor mounted hydronic forceflow heater.
- Offices 143, 144 & 145 have hydronic convector heaters installed along the exterior wall. The temperature sensor is located in Office 145.
- Convector heaters are installed in the skater's area Men's & Women's Washrooms and Skaters Lobby.
- Wallfin hydronic baseboard heaters are installed on the west wall of the Workout Area.
- Hot water convector heaters are installed in the Multi Sport Plex viewing corridor.

The following is a list of building exhaust fans with the year of installation.

- EF-1: Roof exhaust fan serves the skater's area Men's and Women's Washrooms, Washroom 159 and Referee Shower Room 148. (2013)
- EF-2: Roof exhaust fan serves the fitness area men's and women's Locker Rooms. (2003)
- EF-3: Roof exhaust fan serves the swimming pool Family Change Room. (2003)
- EF-4: Roof exhaust fan serves the pool staff Locker Rooms. (2003)
- EF-5: Inline cabinet exhaust fan serves the Boardroom. (2003)
- EF-6: Ceiling cabinet exhaust fan serves the Elevator Machine Room. (2003)
- EF-7: Roof exhaust fan that serves the kitchen. (1973)
- EF-8: Ceiling cabinet exhaust fan serves the reception area Work Room. (2003)
- EF-9: Ceiling cabinet exhaust fan serves the First Aid Room. (2003)
- EF-10: Roof exhaust fan that serves the Multi Sport Plex. (2003)
- EF-11: Roof exhaust fan that serves the dishwasher. (2003)
- EF-12: Roof exhaust fan that serves the pool (South). (2003)
- EF-13: Roof exhaust fan that serves the pool (North). (2003)
- EF-14: Roof exhaust fan that serves the lounge bar area. (2013)
- EF-15: Roof exhaust fan that serves the swimming pool change rooms and saunas. (2013)
- EF-16: Roof exhaust fan that serves the ice rink Change Rooms and lounge washrooms. (2013)
- EF-17: Centrifugal fan located on the roof that serves the ice plant Refrigeration Room. The exhaust duct has been extended up above the roof line so potentially hazardous exhaust air will not harm workers on the roof. (2007)
- EF-18: Roof exhaust fan that serves the Electrical Room. (2013)
- EF-19: Roof exhaust fan that serves the kitchen range hood. (1973)
- EF-20: Roof exhaust fan that serves the mezzanine. (unknown)
- EF-22: Exhaust fan serves the Pool Filter Room and is located in the Pool Filter Room. (1973)
- EF-23: Exhaust fan serves the Pool Filter Room and is located in the Pool Filter Room. (1973)

- EF-24: Exhaust fan serves the Boiler Room and is located in the Boiler Room. (unknown)
- EF-25: Exhaust fan serves the Boiler Room and is located in the Boiler Room. (unknown)
- EF-26: Axial exhaust fan installed to serve the swimming pool Chlorine Gas Room. This fan is located in the Chlorine Room and is ducted up approximately 2.4m above the roof line so potentially hazardous exhaust air will not harm workers on the roof. (unknown)
- EF-27: Wall exhaust fan serves the Ice Rink. (1973)
- EF-28: Wall exhaust fan serves the Ice Rink. (1973)

There are two abandoned heat recovery ventilators on the roof that previously served the pool area. These units were decommissioned in the 2003 building renovation and were replaced with the dehumidifier.

The building has an Allerton Direct Digital Controls (DDC) system. The controls system is currently being upgraded and the work is nearly complete. There is a pneumatic controls air compressor in the Boiler Room which is still active.

- Plumbing

This facility has numerous plumbing fixtures. Plumbing fixtures are installed in the following rooms.

- Skaters area Men's and Women's public washrooms.
- Ice rink Referee Shower Room.
- Ice rink Change Rooms.
- Level 1 office area private washroom.
- Level 1 Board Room (sink).
- Level 1 Child Minding (sink).
- Level 1 Men's and Women's public washrooms.
- Level 1 Janitor Room.
- Pool Family Change Rooms.
- Pool Men's and Women's Change rooms.
- Pool Men's Staff Change Room.
- Pool Women's Staff Change Room.
- Pool deck shower.
- Pool First Aid Room (sink).
- Level 2 fitness area Men's and Women's Locker Rooms.
- Level 2 Accessible Shower Room.
- Level 2 Janitor Rooms.
- Level 2 Lounge Kitchen.
- Level 2 Lounge Bar.
- Level 2 Men's and Women's public washrooms.

There are also a number of public drinking fountains installed throughout the facility.

Included in the 2003 building renovation, plumbing drains and domestic water lines were roughed-in for future change rooms located on the south side of the Multi Sport Plex.

There is a 150 mm domestic water service that reduces down to 100mm at the water entry valve station located in the basement swimming pool mechanical room. The valve station includes a backflow preventer and two pressure reducing valves piped in parallel.

Domestic hot water heating is provided by the boiler plant. The system includes a shell and tube hot water heat exchanger and six (6) 750 liter storage tanks. There is a domestic hot water recirculation system complete with circulation pump.

The building has both internal rainwater leaders and external downspouts for roof drainage. There is a 300 mm storm drain that serves the building and exterior area drains.

The building has a perimeter drainage system and a subsurface drainage system installed below the ice rink. A footing drain sump is located outside the east side of the building.

The building has a 200 mm sanitary sewer connection near the northwest corner of the building.

The building has an ice rink snow melt pit located outdoors.

- Fire Suppression

A 150 mm fire service water line was installed in 2003 and includes a backflow preventer. A sprinkler system was also installed in 2003 and the existing standpipe system serving fire hose cabinets was kept in service. The sprinkler system includes three wet zones and two dry zones which serve the ice rink and Multi Sport Plex. There is an air compressor which serves the dry sprinkler zones.

- Swimming Pool

The Learners Pool and Hot Pool use hi-rate sand filters for pool water filtration. The main pool uses diatomaceous earth (DE) for pool water filtration.

The building boiler system provides pool water heating. Three (3) shell & tube heat exchangers are installed and serve the Main Pool, Learners Pool and Hot Pool. Solar hot water heating panels are installed on the roof and are used for domestic water heating during the summer. The solar panels are approximately thirty (30) years old.

Pool chemical treatment includes the following systems.

- Chlorine gas is used for pool water chlorination.
- An ultra-violet (UV) system is used for supplemental water treatment.
- There is a chemical mixing tank and chemical metering pumps for each pool.

- Automatic chemical controllers are installed for each pool (Stranrol System 3i).

The following pumps are installed to serve the swimming pool systems.

- Main pool circulation.
- Learners pool circulation.
- Hot pool circulation.
- Hot pool hydro-air.
- Waterslide.

There is a Steam Room which is accessed from the pool deck. The steam generator is located in a storage room beside the Steam Room.

- Ice rink Refrigeration Plant.

The ice rink has an ammonia refrigeration plant. The refrigeration system includes the following equipment.

- Three (3) Mycom compressors, one of which was recently replaced.
- Brine chiller which was installed in 2005.
- Two brine circulation pumps. One is 10 HP and the second is 25 HP. The smaller pump is used when the ice plant demand is low and then switches to the 25 HP pump when the demand increases.
- An evaporative condenser located on the roof.
- Evaporative condenser water pump.

The following systems are installed to recover waste heat from the refrigerant plant.

- A shell & tube heat exchanger is used to heat the ice rink underslab heating piping system.
- Two (2) hot water storage tanks with immersion heaters are installed for the Zamboni ice resurfacing equipment.

Condenser water heat recovery is currently being planned for domestic hot water heating.

ELECTRICAL: The facility is serviced via an outdoor substation that has been retrofitted recently due to a primary voltage upgrade. The substation is old and should be either replaced or removed. Electrical distribution equipment within the facility is, for the most part, past expected serviceable life and should be replaced. The Motor Control Centers (MCC) are original and are no longer manufactured. These MCCs (three in total) need to be replaced prior to failure.

There are two generators in the facility; one is natural gas and the other diesel. Both are past their serviceable life and are in need of replacement. Some modifications to the transfer switches and load configuration may be required to meet current Codes.

The lighting in the facility varies in type and includes incandescent, compact fluorescent, fluorescent, Metal Halide, LED and Induction. Some newly renovated areas have Code compliant lighting controls. Consideration to replacing older inefficient lighting and installation of new lighting controls should be undertaken.

End use devices such as receptacles, switches, baseboard heaters are either damaged or worn out and should be replaced.

Exist signs are the red 'EXIT' style and vary from new to past serviceable life; consideration to replacement with new green pictogram style throughout.

The fire alarm system is a Notifier Quickstart addressable system and is in good condition.

The Communications system is new and in excellent condition.

2.2.3.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 21: Condition of Building Systems –No. 8 - Oak Bay Recreation Centre

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls					X
Artificial Turf					X
Gym Rubber Flooring			X ₁		
Arena Rubber Flooring			X ₂		
Carpet				X ₃	
Ceramic Tile			X ₄		
Guardrail					X
Interior Doors				X	
Building Envelope					
CMU			X ₅		
Brick Veneer					X
Cedar Siding			X		
Metal Siding			X		
SBS 2-Ply Roof Membrane			X ₆		
Standing Seam Metal Roofing				X	
BUR, Gravel Ballast			X ₇		
Pressure Glazed Skylight					X
Windows, Aluminum				X	
Exterior Metal Doors			X ₈		
Storefront Assemblies				X	
Deck Guardrail				X	

	Concealed	Poor	Fair	Average	Good
Mechanical					
Perimeter Drains and Clean Outs				X	
Fire Extinguishers				X	
Packaged Roof Top Heat Pump PHP-01			X		
Packaged Roof Top Heat Pump PHP-02			X		
Rooftop Make-up Air Unit MUA-1 (Fitness)			X		
Rooftop Make-up Air Unit (Pool Staff Rm)			X		
Rooftop Heat Recovery Ventilator HRV-1			X		
Rooftop Heat Recovery Ventilator HRV-2			X		
Heat Pump – Slit System – HPO-1			X		
Heat Pump – Slit System – HPO-2			X		
Heat Pump – Split System – (Serves HRV-1)			X		
Heat Pump–Split System–(Pool Staff MUA)			X		
Dehumidifier DH-1			X		
Condensing Unit – CU-1 (Serves DH-1)			X		
Air Handling Unit – AH2		X			
Air Handling Unit – AH4		X			
Dehumidifier – (Serves Ice Rink)			X		
Heating Water Boiler – B1					X
Heating Water Boiler – B2			X		
Heat Exchanger - DHW			X		
Heat exchanger – Main Pool			X		
Heat Exchanger – Learners Pool			X		
Heat Exchanger – Hot Pool			X		
Heating Water Pump					
Heating Water Radiators			X		
Exhaust Fans			X		
Plumbing Fixtures – Washrooms			X		
Plumbing Fixtures – Ice Rink Change rooms			X		
Plumbing Fixtures – Pool Change rooms			X		
Plumbing Fixtures – Fitness Change rooms			X		
Plumbing Fixtures – Lunch room			X		
Domestic Water System			X		
Domestic Hot Water Storage Tanks			X		
Building Management Controls System					X
Solar Panel Heating System			X		
Fire Sprinkler System				X	
Swimming Pool Filtration System				X	
Swimming Pool Chemical Controllers				X	
Swimming Pool Pumps			X		
Swimming Pool Chemical Metering Pumps				X	
Swimming Pool Chlorine System				X	

	Concealed	Poor	Fair	Average	Good
Swimming Pool UV					X
Steam Room Steam Generator				X	
Ice Plant Compressor 1					X
Ice Plant Compressor 2			X		
Ice Plant compressor 3			X		
Ice Plant Chiller				X	
Ice Plant Brine Pumps			X		
Ice Plant – Evaporative Condenser				X	
Heat Exchanger – Underfloor Heating Heat Exchanger				X	
Hot Water Storage Tanks – Ice Resurfacing				X	
Electrical					
Breaker Panel Main				X ₉	
Breaker Panel 2ndry		X _{9, 10}			
Breaker Panel Sub		X _{9, 10}			
Generator Emergency Diesel		X ₁₁			
Generator Emergency Natural Gas		X ₁₁			
Transfer Switch		X ₁₁			
Baseboard			X ₁₂		
Lighting Emergency Exit			X ₁₂		
Lighting Exterior				X	
Lighting Interior				X	
Alarm Panel				X	
Receptacle Duplex			X ₁₂		
Lighting Controls					X
UPS Units			X		
Paging System					X
CCTV					X
Audio/Visual System					X
Communications System					X
Intrusion Detection					X

Notes:

1. Gym flooring exhibiting signs of wear around high traffic weight lifting areas.
2. Arena flooring has reached expected service life and is anticipated for replacement in 2016.
3. Lounge carpet is dated and worn.
4. Tile and drain covers in the male and female washrooms exhibit damage and require repairs.
5. CMU has spalled in several areas along the base of wall of the east elevation. Steel base plates for steel columns are corroding causing spalling and corrosion was noted.
6. Alligator cracking and loss of granule evident on older portions of membrane. Control joint cap flashing is lacking, resulting in worn membrane at these areas. Some roof-top drains are missing drain caps.
7. Gravel ballast thin around edges and plumbing penetrations. Organic growth significant within ballast in shaded

- areas behind solar arrays. Roots may be penetrating rigid insulation.
8. Exterior doors on south elevation at multi-use playing field are in poor condition.
 9. The electrical main service connection is outside the building in an old unit substation. This substation has been retrofitted recently. Consideration should be given to relocating the service directly into the facility.
 10. Select electrical distribution, most notably the Motor Control Centers, are out of date and no longer manufactured; their replacement is recommended.
 11. The generators (both natural gas and diesel) are past their serviceable life expectancy and should be replaced.
 12. Several end use devices, such as receptacles, exit signs and baseboard heaters are damaged or worn out and are in need of replacement.

2.2.3.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Oak Bay Recreation Centre: Baseline Recommendations:

2016

- Upgrade acoustic separation of Arena Office.
- Replace arena rubber flooring.

2017

- Install cap flashing along roof control joints; packaged with east membrane replacement.
- Replace East SBS roofing membrane.
- Replace sub breaker panel

2018

- Replace gravel-ballast built-up roofing over pool.
- Replace interior/exterior lighting.
- Replace various mechanical equipment: heat pumps, dehumidifier, and air-handling unit.

2020-21

- Replace secondary breaker panel.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 22: Summary of Present-Value Building Costs every 5 years –No. 8 - Oak Bay Recreation Centre

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$125,400	\$54,000	\$178,700	\$37,000	\$395,100
Building Envelope	\$661,600	\$129,300	\$87,600	\$68,600	\$947,100
Mechanical Summary	\$366,700	\$344,000	\$70,000	\$152,000	\$932,700
Electrical Summary	\$451,700	\$234,000	\$57,500	\$135,000	\$878,200
Total	\$1,605,400	\$761,300	\$393,800	\$392,600	\$3,200,000

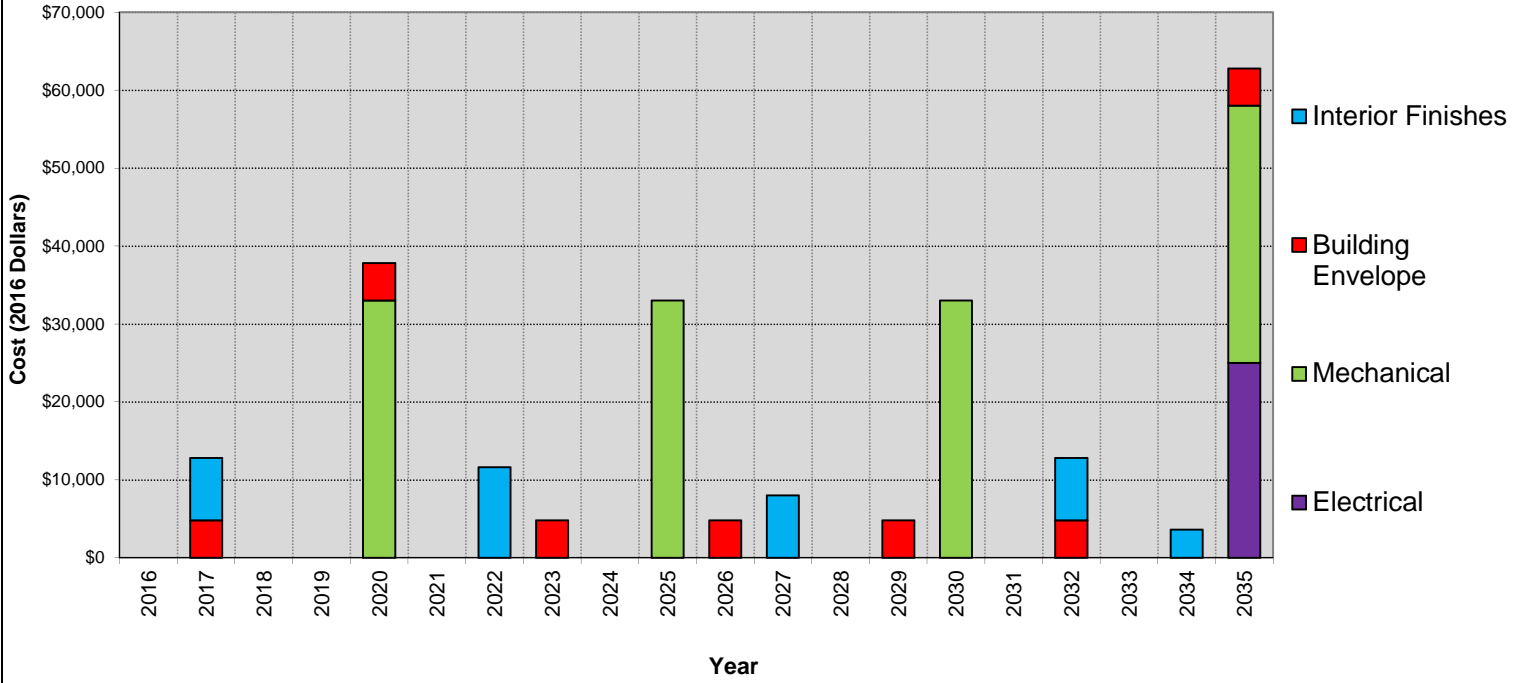
No.8 Oak Bay Rec Centre

Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																		
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Section 1 - INTERIOR FINISHES COMPONENTS																									
Carpet Offices	Maintenance Replacement	7500	2014	15		2029																			
Carpet Lounge	Maintenance Replacement																								
Upper Floor	Maintenance Replacement	8000	2001	15	1	2017	8,000																8,000		
Artificial Turf	Maintenance Replacement	140000	2015	12		2027																			
Gym Rubber Flooring	Maintenance Replacement	25000	2003	20		2023						25,000													
Arena Rubber Flooring	Maintenance Replacement	65000	1996	20		2016	65,000																		
Interior Walls	Maintenance Replacement	5800	2015	1		2016	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800
Marmoleum Main Floor	Maintenance Replacement	18000	2004	20		2016	18,000																		
Washroom Upgrade	Maintenance Replacement	33000																							
Stair Guard Rail	Maintenance Replacement	2200	2004	12		2016	2,200																		
Acoustic Separations	Maintenance Replacement	3200	1974	42		2016	3,200																		
Interior Summary	Maintenance Replacement						5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800
							65,000	8,000																	
Section 2 - BUILDING ENVELOPE COMPONENTS																									
BUR Over	Maintenance Replacement	230000	1986	30	2	2018			230,000																
SBS Membrane North West	Maintenance Replacement	78000	2003	25		2028																			
SBS Membrane East	Maintenance Replacement	408000	1987	25	5	2017	408,000																		
Mechanical&Lounge Standing Seam Metal	Maintenance Replacement	59000	2010	25		2035																			59,000
Pressure Glazed Skylight	Maintenance Replacement	56000	1975	50		2025								56,000											
Cedar Board Siding	Maintenance Replacement	53000	2013	30		2043																			
Aluminum Windows - Single	Maintenance Replacement	27500	1975	40	10	2025									27,500										
Exterior Doors Metal & Storefront	Maintenance Replacement	14000	1975	45		2020					14,000														
Exterior Painting	Maintenance Replacement	41000	1975	50		2025										41,000									
		4800	2014	3		2017	4,800			4,800			4,800			4,800			4,800			4,800			4,800
Building Envelope Summary	Maintenance Replacement							4,800	230,000		4,800		4,800		124,500	4,800		78,000	4,800		4,800			4,800	59,000

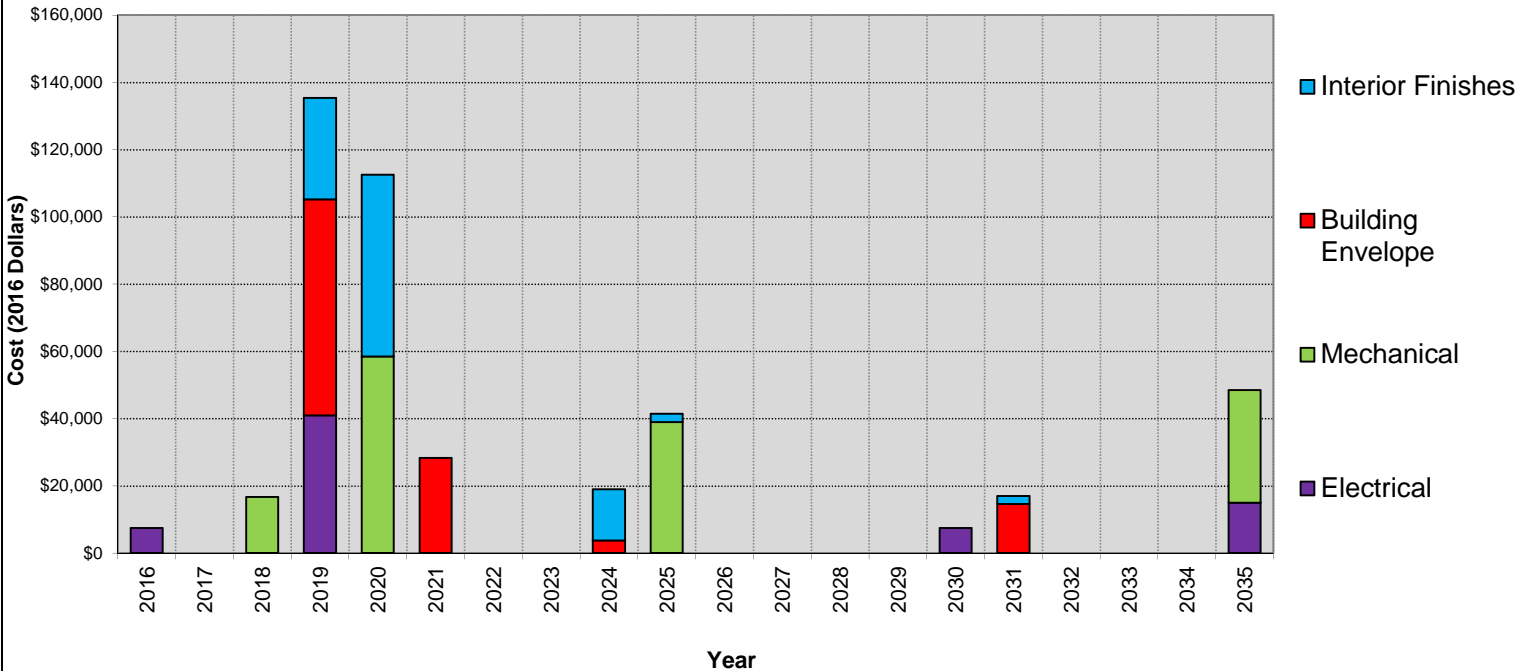
No.8 Oak Bay Rec Centre Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.8 Oak Bay Rec Centre

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Carpet Offices	Maintenance Replacement	\$ 7,500	2014	15		2029
Carpet Lounge Upper Floor	Maintenance Replacement	\$ 8,000	2001	15	1	2017
Artificial Turf	Maintenance Replacement	\$ 140,000	2015	12		2027
Gym Rubber Flooring	Maintenance Replacement	\$ 25,000	2003	20		2023
Arena Rubber Flooring	Maintenance Replacement	\$ 65,000	1996	20		2016
Interior Walls	Maintenance Replacement	\$ 5,800	2015	1		2016
Marmoleun Main Floor	Maintenance Replacement	\$ 18,000	2004	20	-8	2016
Washroom Upgrade	Maintenance Replacement	\$ 33,000				
Stair Guard Rail stair nosing	Maintenance Replacement	\$ 2,200	2004	12		2016
Acoustic Separations	Maintenance Replacement	\$ 3,200	1974	42		2016

NOTES:

Maintenance:

Interior painting estimate is an annual budget item that rotates between the arena, pool, corridors, fitness centre as needed. Painting performed internally by staff has been accounted for in estimate.

Tiled lobby and corridor areas are durable and are excluded from this model.

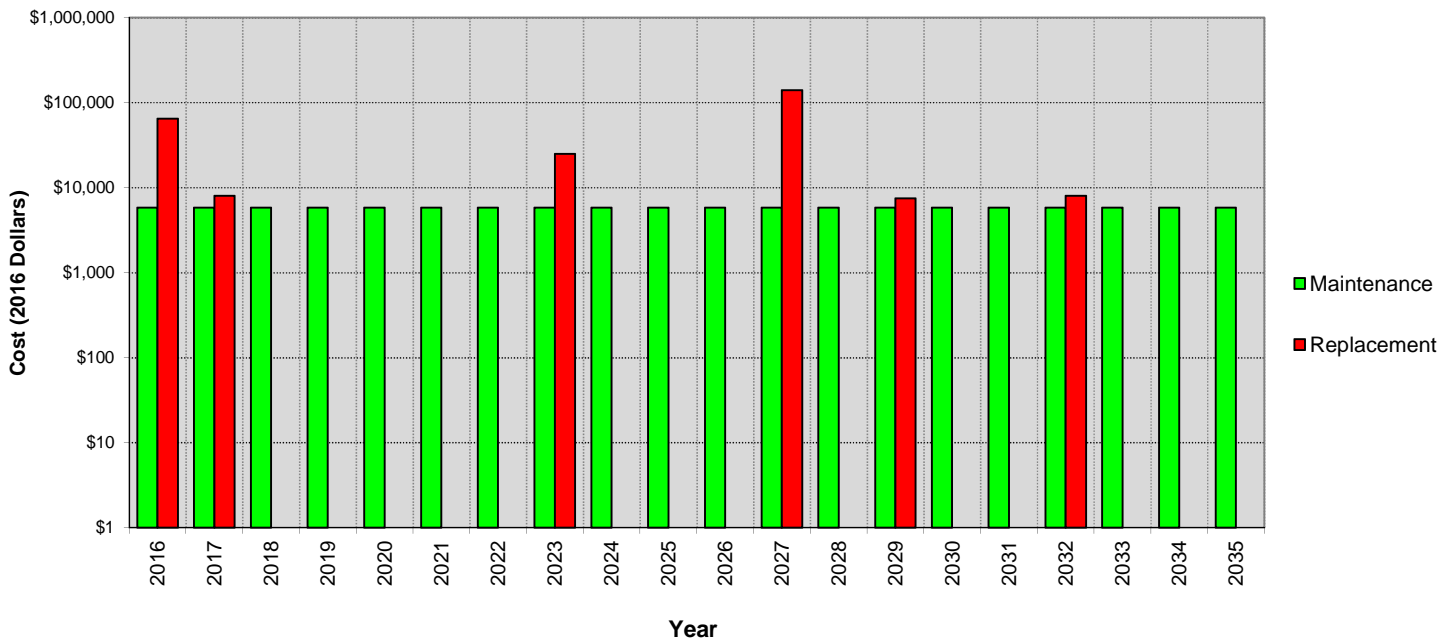
Replacement:

Acoustic separations at the office space inside the Arena recommended for workplace health and safety reasons.

Washroom upgrade includes repair tiling and floor drains.

Marmoleum replacement at main floor multipurpose room and fitness room.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.8 Oak Bay Rec Centre

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
BUR Over Pool	Maintenance Replacement	\$ 230,000	1986	30	2	2018
SBS Membrane North West	Maintenance Replacement	\$ 78,000	2003	25		2028
SBS Membrane East	Maintenance Replacement	\$ 408,000	1987	25	5	2017
SBS Membrane Mechanical&Lounge	Maintenance Replacement	\$ 59,000	2010	25		2035
Standing Seam Metal	Maintenance Replacement	\$ 56,000	1975	50		2025
Pressure Glazed Skylight	Maintenance Replacement	\$ 53,000	2013	30		2043
Cedar Board Siding	Maintenance Replacement	\$ 27,500	1975	40	10	2025
Aluminum Windows - Single	Maintenance Replacement	\$ 14,000	1975	45		2020
Exterior Doors Metal & Storefront	Maintenance Replacement	\$ 41,000	1975	50		2025
Exterior Painting	Maintenance Replacement	\$ 4,800	2014	3		2017

NOTES:

Maintenance:

Exterior painting includes all cladding materials: CMU, Cedar board, Glulam Struts. Advised by OB Rec staff that exterior painting is budgeted every 3 years and performed internally by staff. The cost modelled is for materials and staff labour.

Replacement:

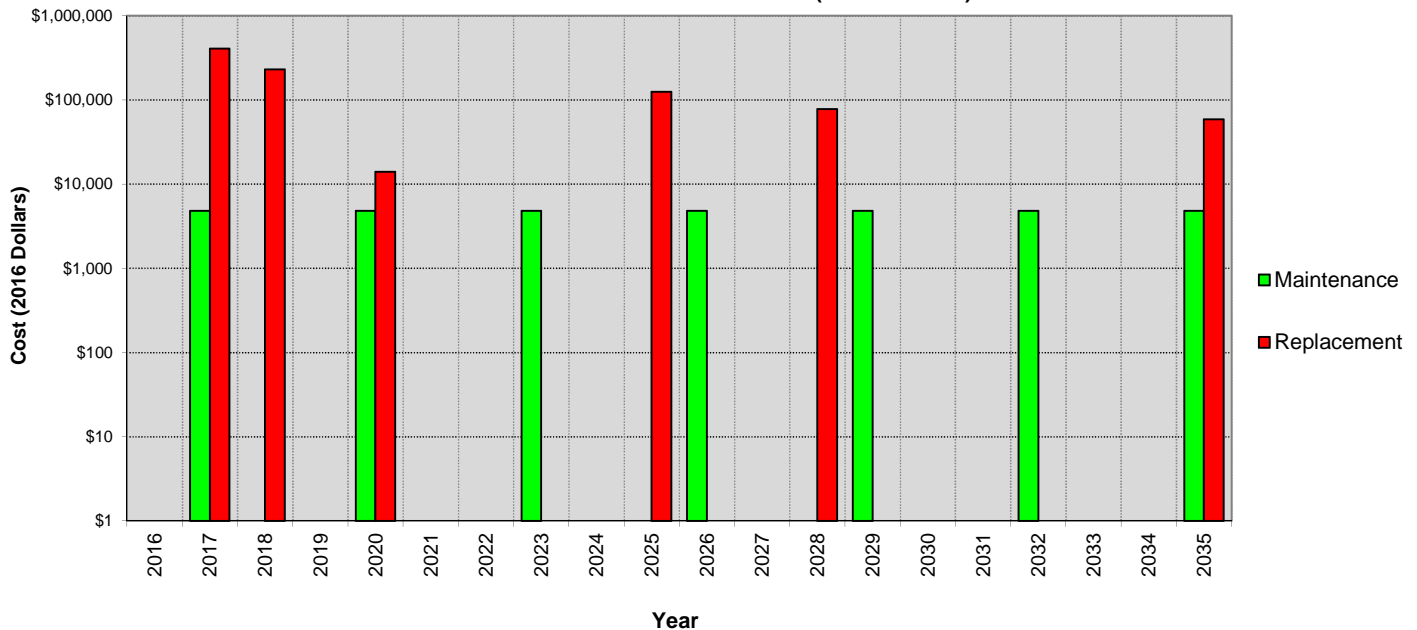
BUR over the pool is recommended to be replaced and redesigned with 2-ply SBS membrane.

SBS membrane east includes southeast and northeast areas from 1987 and 1989. Replacement within the next 3-5 years recommended. Installation of 220 feet of control joint cap flashing included. Standing seam metal roof replacement expected for original 1975 areas only.

Cedar siding replacement extended up to 10 years given current condition. CMU, brick, and metal siding not expected for replacement in the next 20 years.

Original, single-pane, aluminum-framed windows, on west elevation, expected to be replaced in the next 5 years.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.8 Oak Bay Rec Centre

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Elevator Short Term	Maintenance Replacement	\$ 11,700		25		2018
MUA-1 and heat pump	Maintenance Replacement	\$ 30,000	2003	20		2023
HRV-1&2	Maintenance Replacement	\$ 50,000	2003	20		2023
HPO-1&2	Maintenance Replacement	\$ 24,000	2003	15		2018
PHP-01&02	Maintenance Replacement	\$ 30,000	2003	15		2018
AH-1&2	Maintenance Replacement	\$ 100,000	1973	25	22	2020
Dehumidifier Pool	Maintenance Replacement	\$ 45,000	2003	15		2018
Dehumidifier Ice Rink	Maintenance Replacement	\$ 35,000	2006	15		2021
Exhaust fans 2003	Maintenance Replacement	\$ 27,000	2003	25		2028
Exhaust fans pre 2003	Maintenance Replacement	\$ 27,000	1973	25	22	2020
Hot Water Tanks 8 tanks	Maintenance Replacement	\$ 16,000	2006	15		2021
Plumbing Fixtures 165 Fixtures (est)	Maintenance Replacement	\$ 33,000	2015	5		2020

NOTES:

Maintenance:

Standard maintenance of perimeter drains (hydro-flush) and roof drainage system.

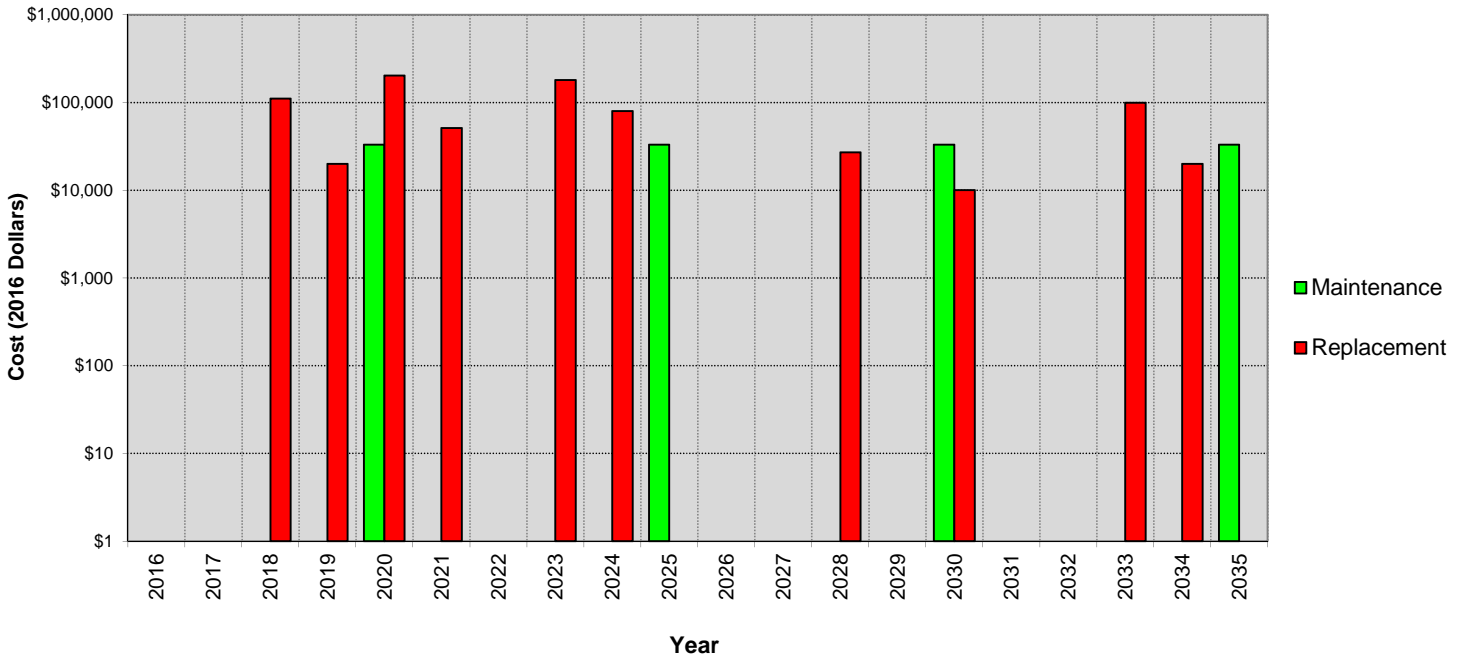
Plumbing Fixtures variable age. Replace as required.

Replacement:

Short term elevator costs include: soft starter and a pipe rupture valve.

Gas section of MUA-1 has failed and been decommissioned. The supplemental heat pump associated with this unit has been meeting the facilities heating needs.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.8 Oak Bay Rec Centre

Mechanical



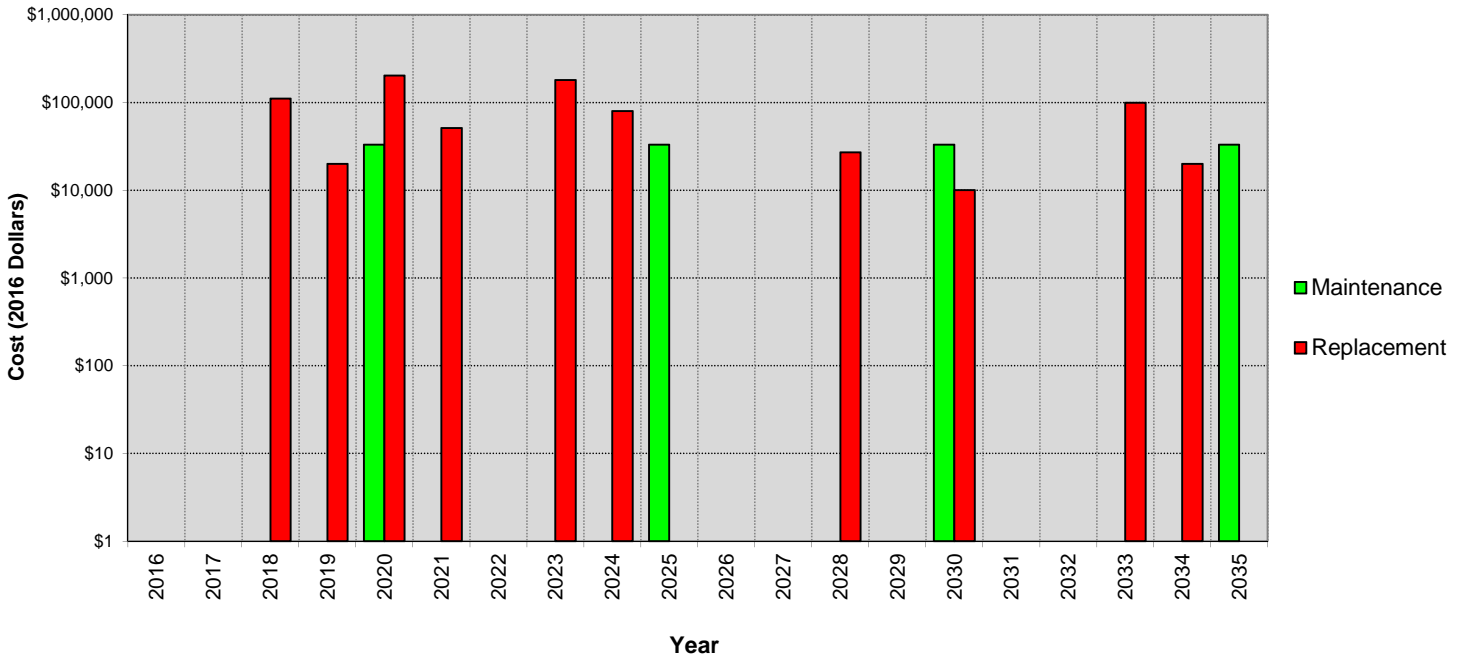
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Boiler 1	Maintenance Replacement	\$ 35,000	2012	25		2037
Boiler 2	Maintenance Replacement	\$ 35,000	1973	25	22	2020
Pumps - Pool	Maintenance Replacement	\$ 5,000	2004	20		2024
5 pumps						
Pumps - Ice Rink	Maintenance Replacement	\$ 5,000	1973	20	27	2020
3 pumps						
Pumps - Heating	Maintenance Replacement	\$ 6,000	1973	20	27	2020
6 pumps						
Compressor 1	Maintenance Replacement	\$ 50,000	2014	23		2037
Ice Rink						
Compressor 2&3	Maintenance Replacement	\$ 100,000	1973	23	27	2023
Ice Rink						
Chiller Barrel	Maintenance Replacement	\$ 50,000	1973	24	27	2024
Ice Rink						
Heat Exchangers	Maintenance Replacement	\$ 25,000	1973	24	27	2024
5 heat exchangers						
Main Pool Filter	Maintenance Replacement	\$ 30,000	1973	20	27	2020
DE Filter						
Pool Filters	Maintenance Replacement	\$ 20,000	2004	15		2019
Learners & Hot						
Controls	Maintenance Replacement	\$ 10,000	2015	15		2030

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.8 Oak Bay Rec Centre

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 150,000	1990	35		2025
Breaker Panel Secondary	Maintenance Replacement	\$ 175,000	1990	30		2020
Breaker Panel Sub	Maintenance Replacement	\$ 45,000	1970	30	17	2017
Gen Diesel Emergency	Maintenance Replacement	\$ 25,000	1976	30	10	2016
Gen Natural Gas Emergency	Maintenance Replacement	\$ 25,000	1980	30	6	2016
Transfer Switch	Maintenance Replacement	\$ 20,000	1976	30	10	2016
Baseboard	Maintenance Replacement	\$ 6,300	1976	35	7	2018
Lighting Exit Emergency	Maintenance Replacement	\$ 26,300	1990	30		2020
Lighting Exterior	Maintenance Replacement	\$ 22,800	1976	25	17	2018
Lighting Interior	Maintenance Replacement	\$ 87,500	1990	25	3	2018
Alarm Panel	Maintenance Replacement	\$ 65,000	2002	20		2022
Receptacle Duplex	Maintenance Replacement	\$ 18,800	1976	30	10	2016
Lighting Controls	Maintenance Replacement	\$ 12,500	2010	15		2025
UPS Units	Maintenance Replacement	\$ 6,500	2010	15		2025
Paging System	Maintenance Replacement	\$ 35,000	2010	25		2035
CCTV	Maintenance Replacement	\$ 50,000	2010	20		2030
Audio/Visual System	Maintenance Replacement	\$ 7,500	2010	20		2030
Communication System	Maintenance Replacement	\$ 75,000	2010	25		2035
Intrusion Detection	Maintenance Replacement	\$ 25,000	2010	25		2035

NOTES:

Maintenance:

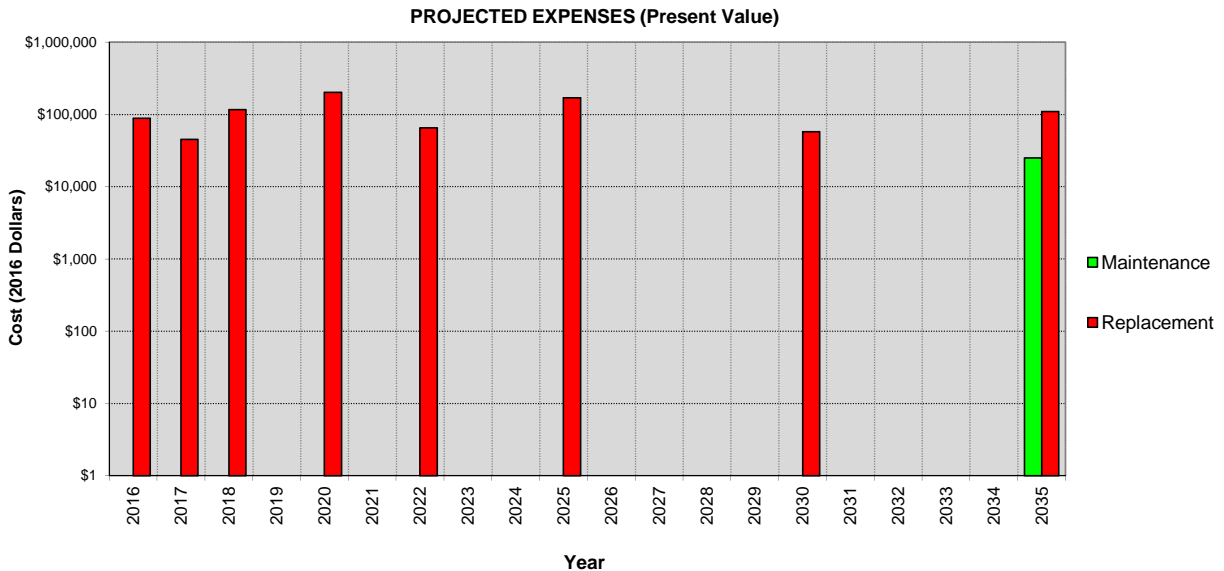
Select lighting in the facility should be replaced on a scheduled maintenance program and lighting controls installed.

Several end use devices, such as receptacles and baseboard heaters need replacement.

Replacement:


Several electrical pieces of equipment need to be replaced as they are well past their expected servicable life.

The Generators are past their expected servicable life and need to be replaced.



The dollar axis is in logarithmic scale for ease of presentation.

2.2.4. No.9 – Tennis Facility

<p>2151 Cranmore Avenue</p> <p>Peak Occupancy: 100</p> <p>Staffing (avg.): 2-5 persons</p> <p>Built: 1978</p> <p>Addition(s): 2013</p> <p>Current Area: 42,120 sf</p> <p>HVAC: Primary and secondary heat and inflation units.</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 <p style="text-align: center;"><i>Figure No.10 – Henderson Park Recreation Centre</i></p>
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2.2.4.1. Description

Oak Bay’s covered tennis facility is situated just to the east of Oak Bay Recreation Centre. The facility consists of seven indoor hard courts enclosed by two adjacent air-supported structures or ‘bubbles’. The 4-court bubble can be accessed from the parking lot from Bee Street while the 3-court bubble is located at the end of Goldsmith Road. Tennis programs are offered from youth camps through to Masters Tournaments.

INTERIOR FINISHES & FURNISHINGS: Each tennis court surface is constructed of asphalt and covered with an acrylic-silica paint to seal the surface, provide traction, and mark playing lines. Court dividers are present in the form of draped netting along wire that ties into retention cables near the dome’s base. The interior skin to each bubble is lined with ‘bubble pack’, a radiant-reflective insulation consisting of polyethylene bubbles sandwiched between two aluminum surfaces. This technology was implemented at the 3-court bubble in 2011 and the 4-court bubble in 2013 as part of the Districts Strategic Energy Management Plan. An estimated \$20,000 in natural gas savings are attributed towards these energy conservation measures each year.

BUILDING ENVELOPE: Each air-supported structure is made from longwearing vinyl-coated polyester fabric. The flame retardant fabric is treated to protect against UV radiation, mildew and chemical pollutants. All seams in fabric are sealed by Dielectric Welding which claims to create a watertight seam exceeding that of the fabric

itself. Each bubbles primary entrance and exit is a revolving metal door to help minimize loss in pressure. Metal swing doors are also present as emergency exits complete with emergency lighting. Swing doors are designed to be center-balanced to accommodate for the positive pressured interior.

STRUCTURAL: The structure of the dome consists of a concrete slab-on-grade foundation, galvanized steel anchoring and retention cabling along the domes curvature. The retention cables run over top of the fabric membrane within sheaths. The cables emerge at the base to anchor into galvanized steel angle plates bolted to the concrete slab-on-grade. The dome fabric ties into the structure by a clamping steel angle tied in with threaded rod from the slab-on-grade.

MECHANICAL: To maintain adequate inflation and temperature within each bubble a natural gas, max input 2,200 MBH, side-supply / side return, heat and inflation unit supplies 18,000 cfm; both bubbles are heated and inflated by this primary unit. Should a power failure or low-pressure situation occur, a standby inflation unit of similar capacity is available to assist the primary unit.

ELECTRICAL: Main electrical components to the tennis facility include: power distribution, interior court and lobby lighting, DDC fan controls, pressure fan motors, and an emergency generator. Interior court lighting consists of four, multi-luminaire 15 ft. high posts which must be protected in the event that the dome is deflated.

2.2.4.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 23: Condition of Building Systems – No.9 – Tennis Facility

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Court Surfaces					X
Court Dividers				X	
Building Envelope					
Four-Court Bubble				X ₁	
Three-Court Bubble				X ₁	
Exterior Metal Doors				X ₂	
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Furnace Inflation Unit					X
Standby Inflation Unit			X		
Sump Pumps (2)	X ₃				

	Concealed	Poor	Fair	Average	Good
Electrical					
Breaker Panel Main				X	
Controls					X
Wiring Devices					X
Electric Heating					X
Lighting Emergency				X	
Lighting Interior				X	
Emergency Generator					X
Surveillance Cameras (3)					X
Pressure Fan Motor					X
Standby Pressure Fan Motor				X	
Structural					
Concrete Foundation				X	
Retention Cables				X	

Notes:

1. Water staining and organic growth is present on exterior of each bubble. (Periodic power washing does occur).
2. Exterior metal doors include swing emergency exits and main revolving doors. Replaced with every second respective bubble (40 year service life).
3. Sump pumps were not viewed during the site visit. Understood from staff to be operating without problems since 2013 installation.

2.2.4.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Tennis Facility: Baseline Recommendations:

2017

- Replace backup fan motor

2019

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code

2020-21

- Replace emergency lighting
- Recommendations deferred from earlier years

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 24: Summary of Present-Value Building Costs every 5 years – No.9 – Tennis Facility

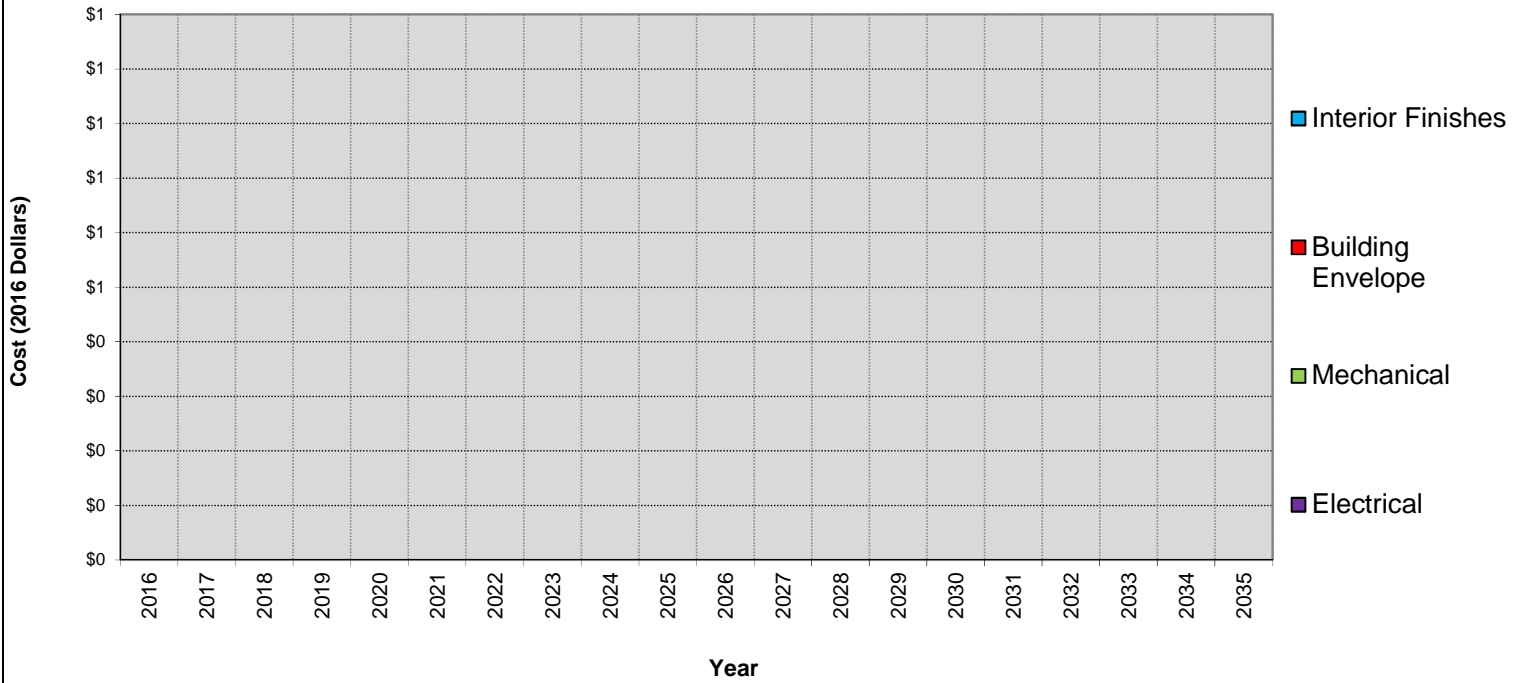
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$60,000	\$60,000	\$-	\$120,000
Building Envelope	\$-	\$-	\$280,000	\$370,000	\$650,000
Mechanical Summary	\$-	\$50,000	\$-	\$-	\$50,000
Electrical Summary	\$2,300	\$26,300	\$4,000	\$1,000	\$33,600
Total	\$2,300	\$136,300	\$344,000	\$371,000	\$854,000

No.9 Tennis Facility

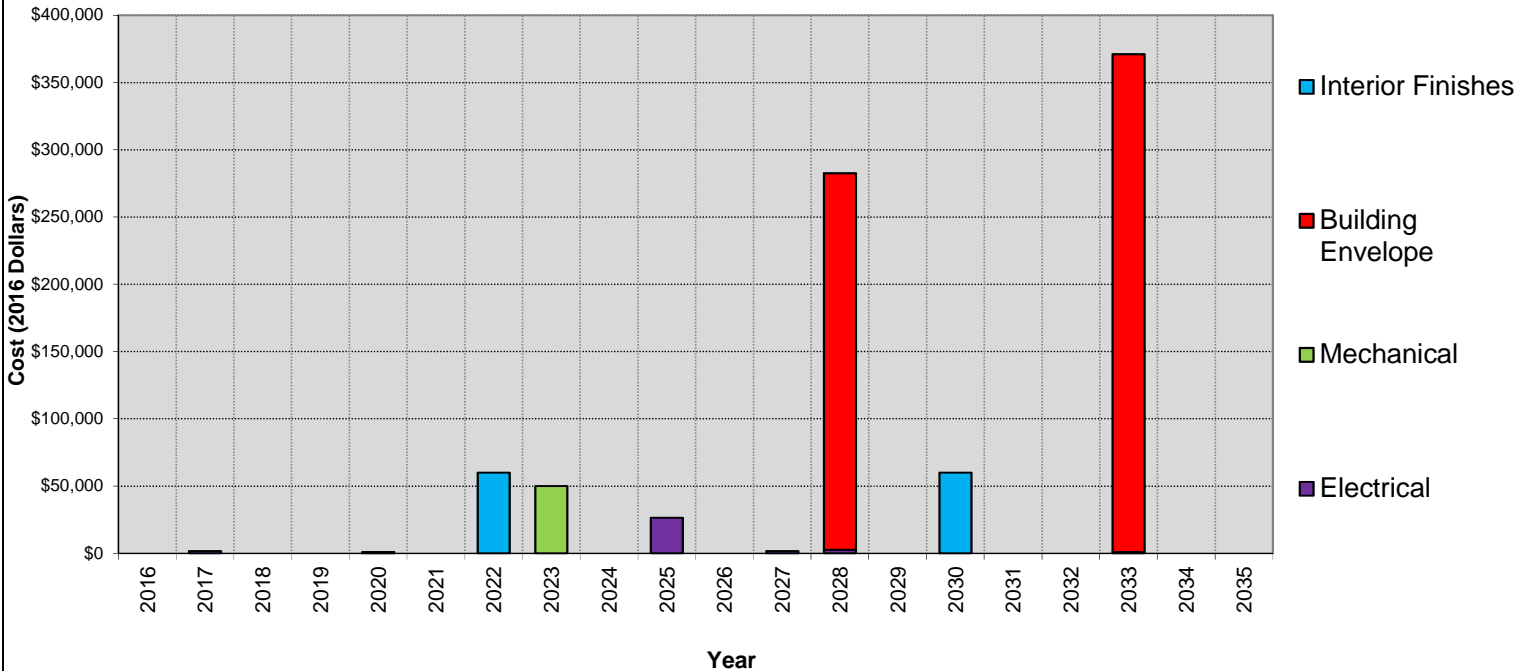
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.9 Tennis Facility

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Court Resurfacing	Maintenance					
	Replacement	\$ 60,000	2014	8		2022

NOTES:

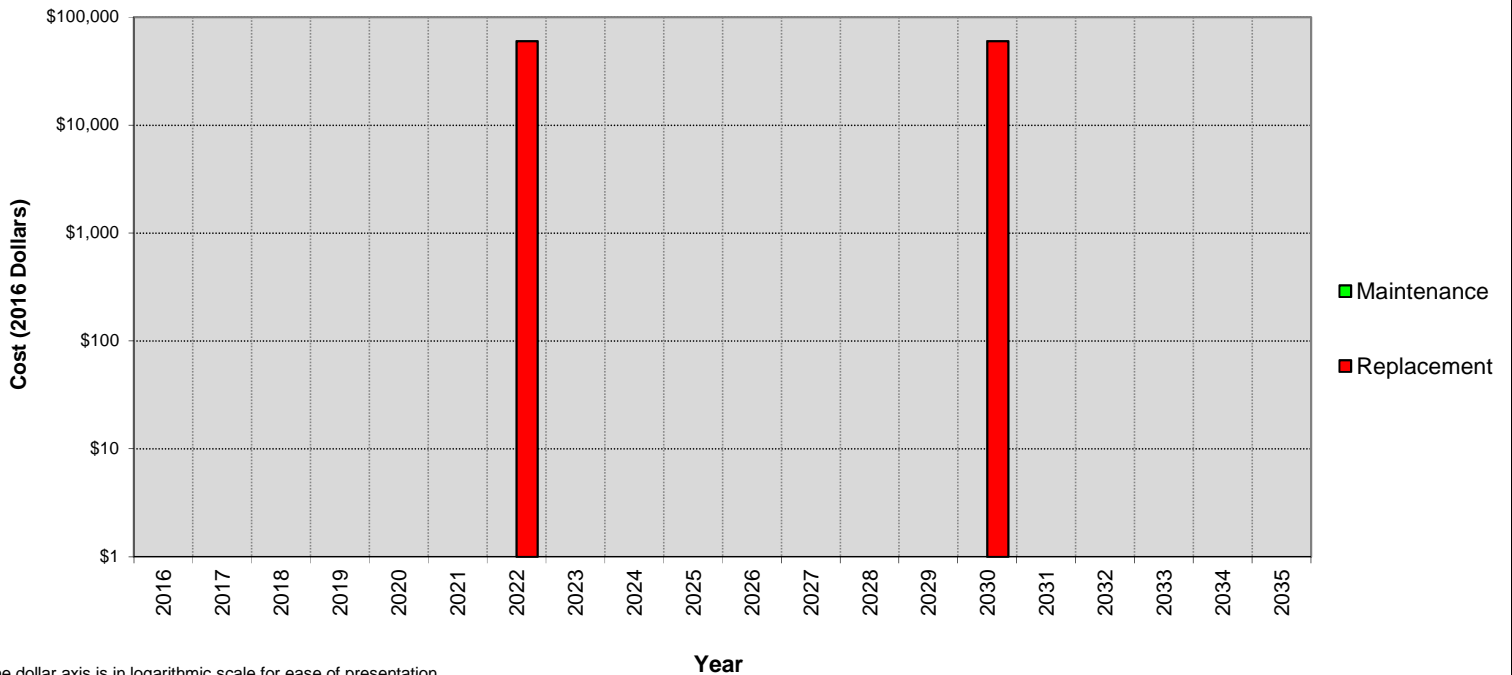
Maintenance:

Replacement:

Court resurfacing cost is estimated for all seven courts.

Installation of a new washroom and storage area at the three court bubble.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.9 Tennis Facility

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Four Court Bubble	Maintenance Replacement	\$ 370,000	2013	20		2033
Three Court Bubble	Maintenance Replacement	\$ 280,000	2008	20		2028

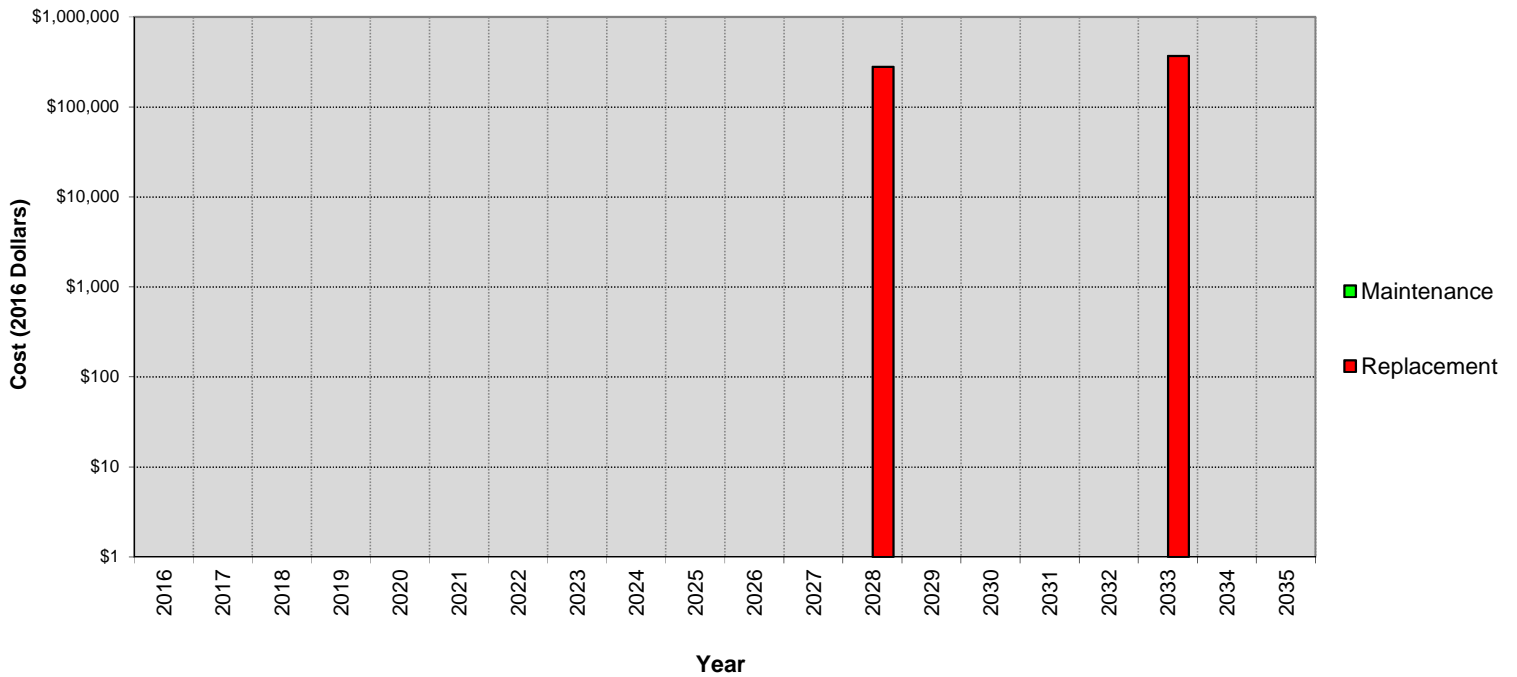
NOTES:

Maintenance:

Replacement:

Bubble replacement involves deflation, protection of interior lighting, removal and replacement. Bubble replacement includes exterior doors (revolving, swing) and cable reinforcement where required. Doors and cabling are expected to last two bubble periods.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.9 Tennis Facility

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Furnace Inflation Unit	Maintenance Replacement	\$ 65,000	2013	25		2038
Standby Inflation Unit	Maintenance Replacement	\$ 50,000	1998	25		2023
Sump Pumps (2)	Maintenance Replacement	\$ 500	2013	10		2023

NOTES:

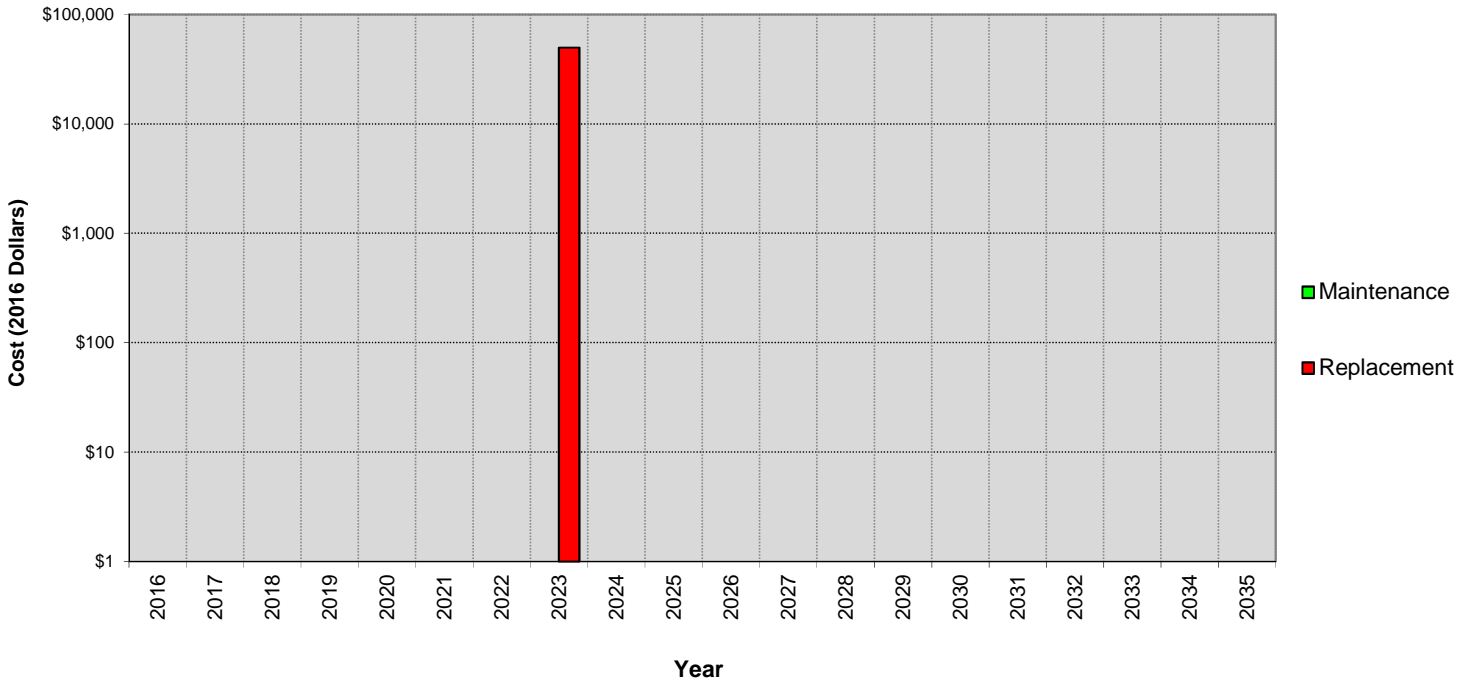
Maintenance:

Understood to occur within the operating budget.

Replacement:

Primary and standby inflation units are fueled by natural gas. Replacement cost includes furnace and fan. Replacement often occurs with bubble replacement by The Farley Group.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.9 Tennis Facility

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Main Power Distribution	Maintenance Replacement	\$ 17,800	1978	50	10	2038
Controls	Maintenance Replacement	\$ 500	2013	20		2033
Wiring Devices	Maintenance Replacement	\$ 800	2013	30		2043
Electric Heating	Maintenance Replacement	\$ 200	2013	30		2043
Lighting Emergency	Maintenance Replacement	\$ 800	1985	25	10	2020
Emergency Generator	Maintenance Replacement	\$ 3,500	2005	20		2025
Lighting - Interior HID	Maintenance Replacement	\$ 22,800	2013	12		2025
Surveillance Cameras (3)	Maintenance Replacement	\$ 500	2013	20		2033
Pressure Fan Motor	Maintenance Replacement	\$ 2,500	2013	10	5	2028
Back Up Fan Motor	Maintenance Replacement	\$ 1,500	2005	10	2	2017

NOTES:

Maintenance:

Clean baseboard heaters and fans annually.

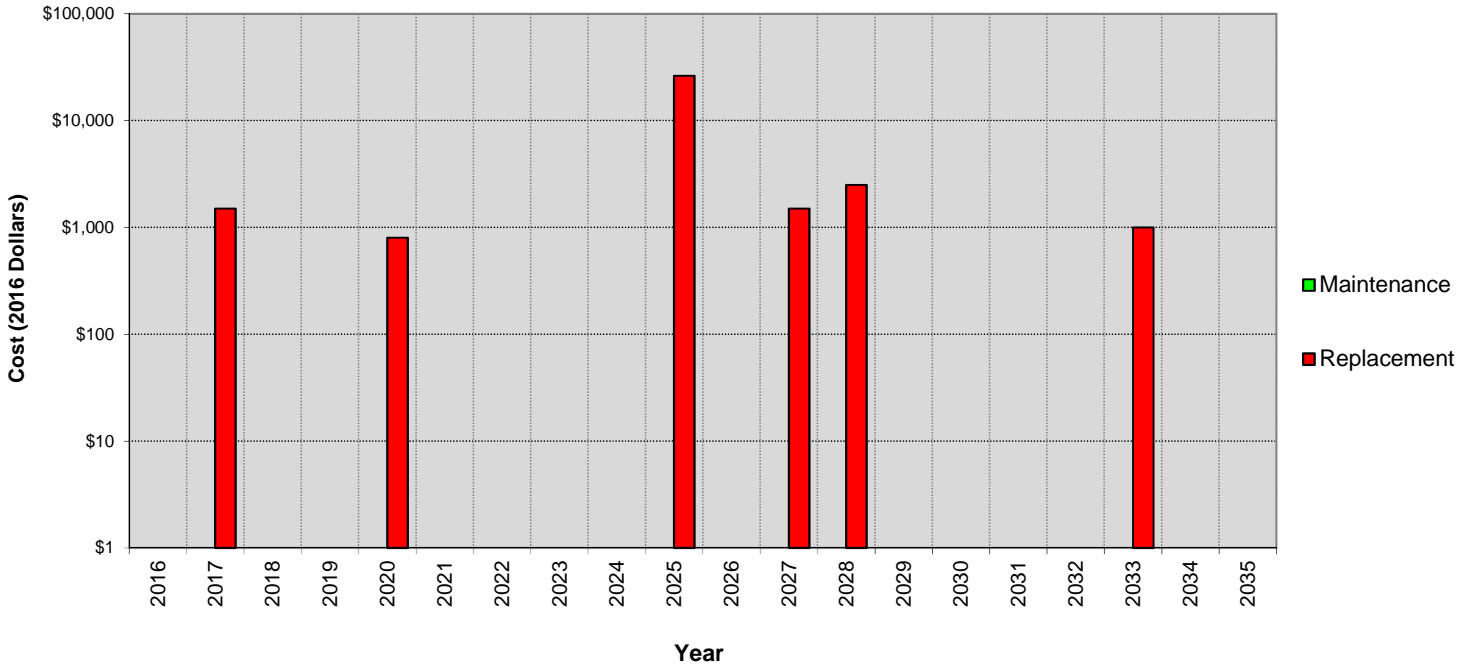
Test emergency generator and fire warning system annually.

Replacement:

Most components not expected for replacment in the next 20 years. Power distribution not expected for replacement in the next 20 years but listed for planning purposes.


Pressure fan motor and back-up scheduled to be renewed together, however back-up motor service life may be extended.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.2.5. No.10 – Henderson Park Recreation Centre

<p>2291 Cedar Hill X Road</p> <p>Peak Occupancy: 300</p> <p>Staffing (avg.): 10-15</p> <p>Built: 1971</p> <p>Addition(s): 2013</p> <p>Current Area: 16,805 sf</p> <p>HVAC: AHU, Boiler, Tankless DHW</p> <p>Fire Suppression: Standpipe hose stations, sprinkler at mechanical and storage areas.</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 <p style="text-align: center;"><i>Figure No.10 – Henderson Park Recreation Centre</i></p>
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2.2.5.1. Description

Henderson Recreation Centre serves as a social, recreational, and fitness community hub for patrons of all ages and demographics. Available programming includes amongst others, adult exercise classes, badminton, golf lessons, and dancing. The building was originally constructed in 1971 with a recent 2013 addition to the west elevation that provided an entrance facelift and new fitness gym facility. A large open parking lot is located to the north of the building. The main entrance along the west façade brings visitors to reception, administration offices and a lobby, but is not noticeable and is the result of practical expansion decisions. Although well-used, the buildings orientation relative to the road access is not ideal.

Several corridors connect the building’s interior spaces that are divided up into the aforementioned fitness gym, washrooms, change rooms, high-ceiling gymnasium, multi-purpose rooms such as ‘Quail Room’(gymnasium)

and 'The Nook', a registered massage therapy clinic, and storage areas. The Centre is surrounded by playing fields, outdoor tennis courts, a Par-3 golf course and wood-chip walking trail.

INTERIOR FINISHES & FURNISHINGS: Interior flooring throughout the building includes: carpeting in offices, ceramic tile in change rooms and washrooms, rubber flooring in the fitness studio, marmoleum flooring throughout corridors and multi-purpose rooms, and wood flooring within the 7,800 ft² multi-use gymnasium. Interior walls and ceiling are painted in piecemeal fashion every three years.

BUILDING ENVELOPE: Original exterior walls are constructed primarily of giant brick (15''x 3'' x 7'') which is considered durable, vandal-resistant, and for District buildings is considered and remains a good choice. Vinyl siding on wood-framing is present on the upper portion of the 25'-6'' gymnasium walls and attic portion between the roof parapet and main floor ceiling. Exterior walls of the 2013 addition are wood-framed and clad with horizontal cedar sealed with a clear coat. A variety of fenestration types are present on the building:

- 2016 metal-frame windows with sealed glazing unit (south and south west)
- 2013 addition curtain wall
- 2003 metal-frame windows with sealed glazing units
- 1971 metal-frame single pane windows, poly-carbonate dome skylights
- 1971 storefront door assemblies
- 1971 hollow-metal exterior doors.

The roof is primarily low-sloped and waterproofed with a 2-ply SBS membrane. Secondary portions of roof are sloped having the following assembly.

- Stone-coated DECRA® steel shingle
- Batten
- EPDM
- Sheathing
- Structure

STRUCTURAL: A structural assessment was not part of the scope of services for Henderson Recreation Centre.

MECHANICAL: The building is conditioned with roof-top air handling equipment, a high-efficiency natural gas boiler feeding perimeter convection radiators, and force-flow terminal units. Domestic hot water is provided by a high efficiency, natural gas, tankless water heater. This tankless system replaced the previous hot water storage tank and has adequately supplied visitor's needs. The hot water storage tank will be removed from the mechanical room in the coming years, freeing up significant usable space in this congested room (according to facilities reports). Washrooms and change rooms are ventilated with exhaust fans as well as 'The Nook' kitchen area.

ELECTRICAL: Main electrical components to the Henderson Recreation Centre include: power distribution, interior, emergency, and exterior lighting, and controls (photo cells, motion sensors, irrigation). Recent replacement of equipment includes:

- lighting from 2010-2015, and
- electrical distribution equipment (panels and breakers) in 1997.

2.2.5.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 25: Condition of Building Systems – No.10 – Henderson Park Recreation Centre

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Fitness Flooring					X
Gymnasium Flooring				X	
Marmoleum				X	
Muffin Nook Vinyl Sheet				X	
Washroom Stalls/Vanities			X ₁		
Washroom Tile			X ₁		
Building Envelope					
Giant Brick				X	
Vinyl Siding			X ₂		
Cedar Slat Siding					X
SBS 2-Ply Roof Membrane			X ₃		
DECRA® Stone Coated Steel Shingles				X ₄	
Original Windows, Aluminum		X ₅			
Windows, Aluminum				X	
Curtain wall					X
Storefront Doors					X
Polycarbonate Dome Skylights			X		
Exterior Metal Doors				X	
Gutters & Downspouts				X	
Mechanical					
Boiler-High Efficiency					X
Original Air Handling Unit			X		
Split System Heat Pump					X
Kitchen Hood Exhaust					X
Washroom Exhaust					X

	Concealed	Poor	Fair	Average	Good
Hot Water Circulation Pumps				X	
Tankless Water Heater					X
Fire Suppression				X	
Plumbing Fixtures					X
Back Flow Preventors & Zone Valves					X
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution				X	
Controls				X	
Fire Warning System					X
Lighting Emergency					X
Lighting Interior					X
Lighting Exterior				X ₆	
Wiring Devices					X
Electric Heating					X

Notes:

1. Washroom renovations are scheduled in 2016 & 2017.
2. Some opening at butt joints were noted. Vertical back-to-back J-trims should be caulked.
3. Poor slope on roof and lack of drains creating fair amounts of ponding. Staff have installed scupper to drain south portion. Ponding depth noted as 2 ½ ". (Note, ½" – ¾" depth 48-72+ hours evaporation time, RCABC recommends <72 hours unless custom measures are assessed (e.g. Posi-slope). New roof membrane likely should include re-sloping package.
4. Fair amounts of organic growth on north portion. Recommended for cleaning.
5. Staff experiencing drafts from original windows. Since our site visit, original windows at reception have been replaced.
6. Exterior lighting in parking lot noted in average condition while remainder in good condition.

2.2.5.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Henderson Park Recreation Centre: Baseline Recommendations:

2016

- Install additional roof scupper drains to alleviate ponding.

2017

- Replace original aluminum, single pane, windows (south elevation).
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2020-21

- Replace original air handling unit.
- Replace irrigation control panels.
- Replace exterior metal doors.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 26: Summary of Present-Value Building Costs every 5 years – No.10 – Henderson Park Recreation Centre

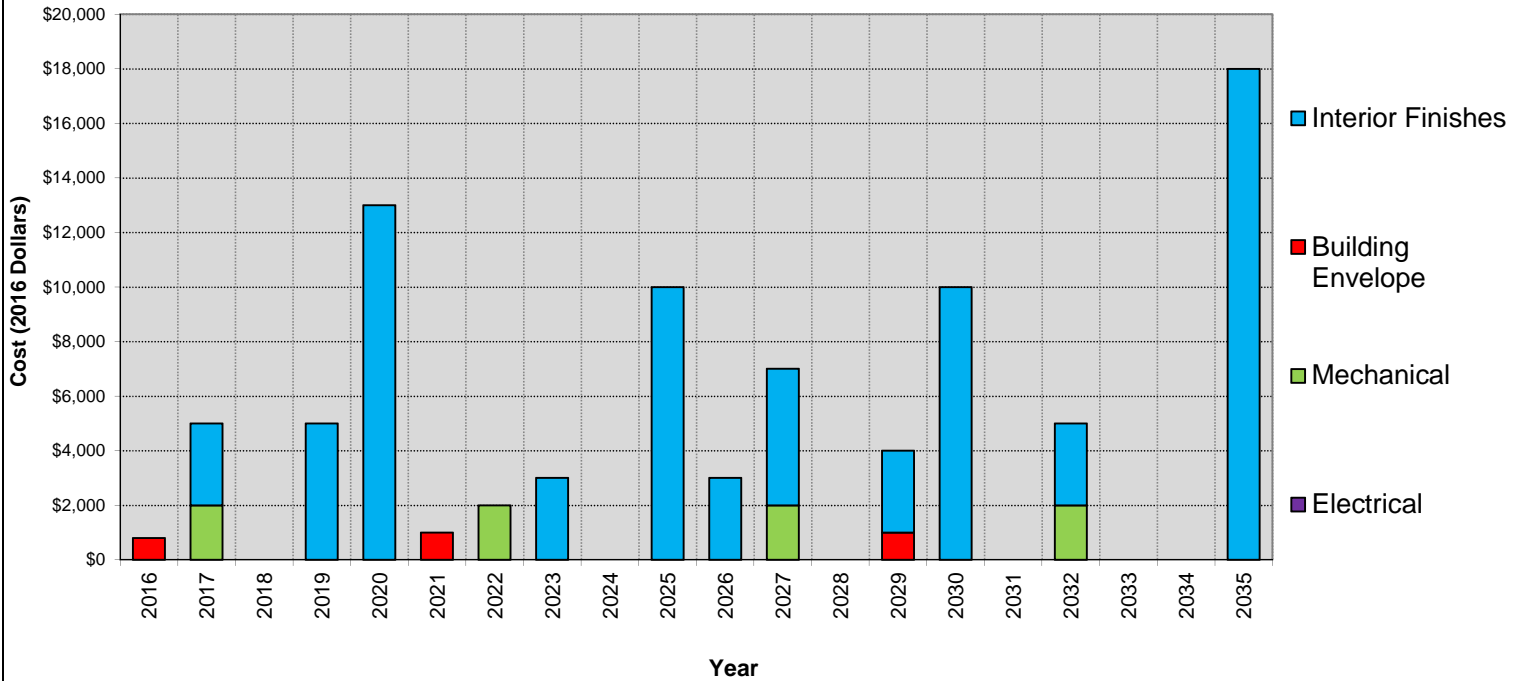
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$75,000	\$13,000	\$46,000	\$65,200	\$199,200
Building Envelope	\$174,800	\$11,500	\$5,600	\$-	\$191,900
Mechanical Summary	\$9,500	\$27,300	\$2,500	\$21,000	\$60,300
Electrical Summary	\$3,000	\$5,000	\$-	\$27,600	\$35,600
Total	\$262,300	\$56,800	\$54,100	\$113,800	\$487,000

No.10 Henderson Rec Centre

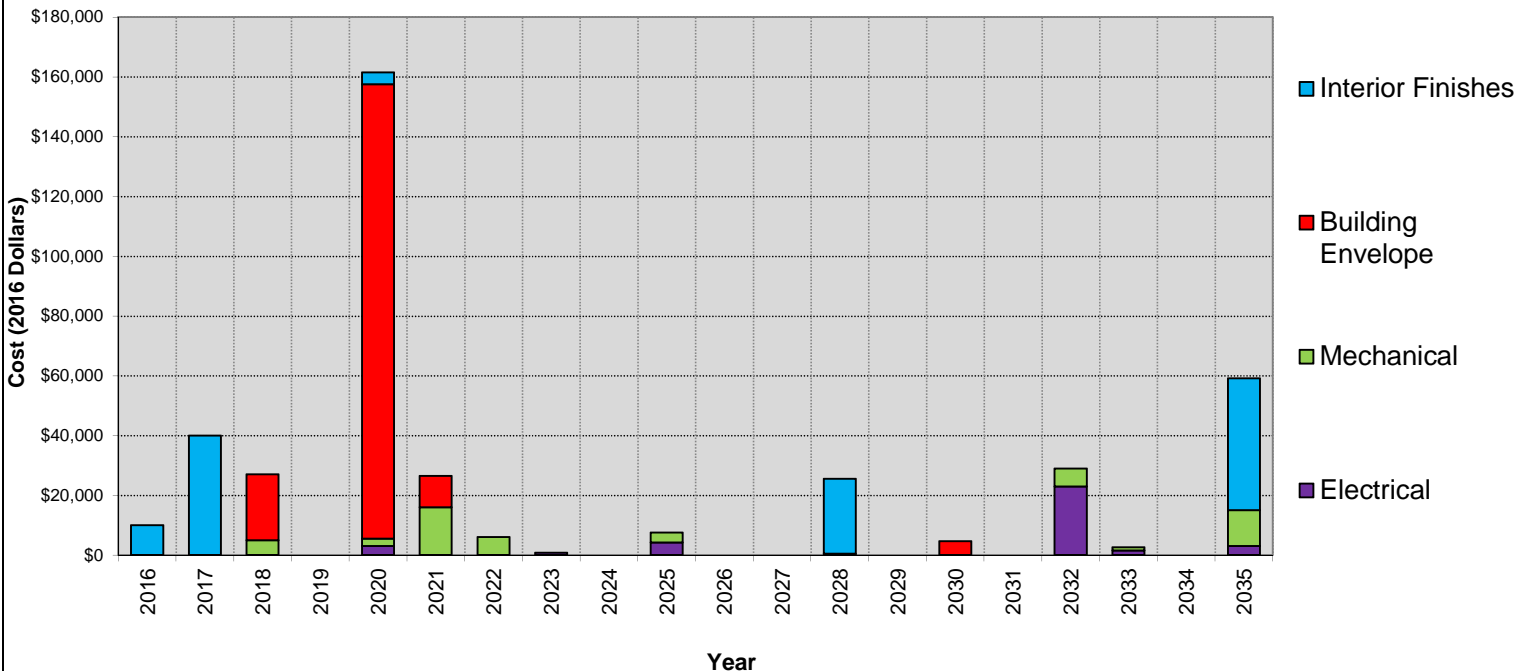
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.10 Henderson Rec Centre

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 3,000	2014	3		2017
Fitness Rubber Flooring	Maintenance Replacement	\$ 25,000	2013	15		2028
Gym Wood Flooring	Maintenance Replacement	\$ 10,000	2015	5		2020
Marmoleum	Maintenance Replacement	\$ 48,000	1971	70		2041
Corridors/Room	Maintenance Replacement	\$ 5,000	2011	8		2019
		\$ 44,200	2011	24		2035
Muffin Nook Vinyl Flooring	Maintenance Replacement	\$ 4,000	2000	20		2020
Washroom Stalls/Vanities	Maintenance Replacement	\$ 10,000				2017
Washroom Flooring	Maintenance Replacement	\$ 10,000				2016
Showers to Storage Convert	Maintenance Replacement	\$ 30,000				2017

NOTES:

Maintenance:

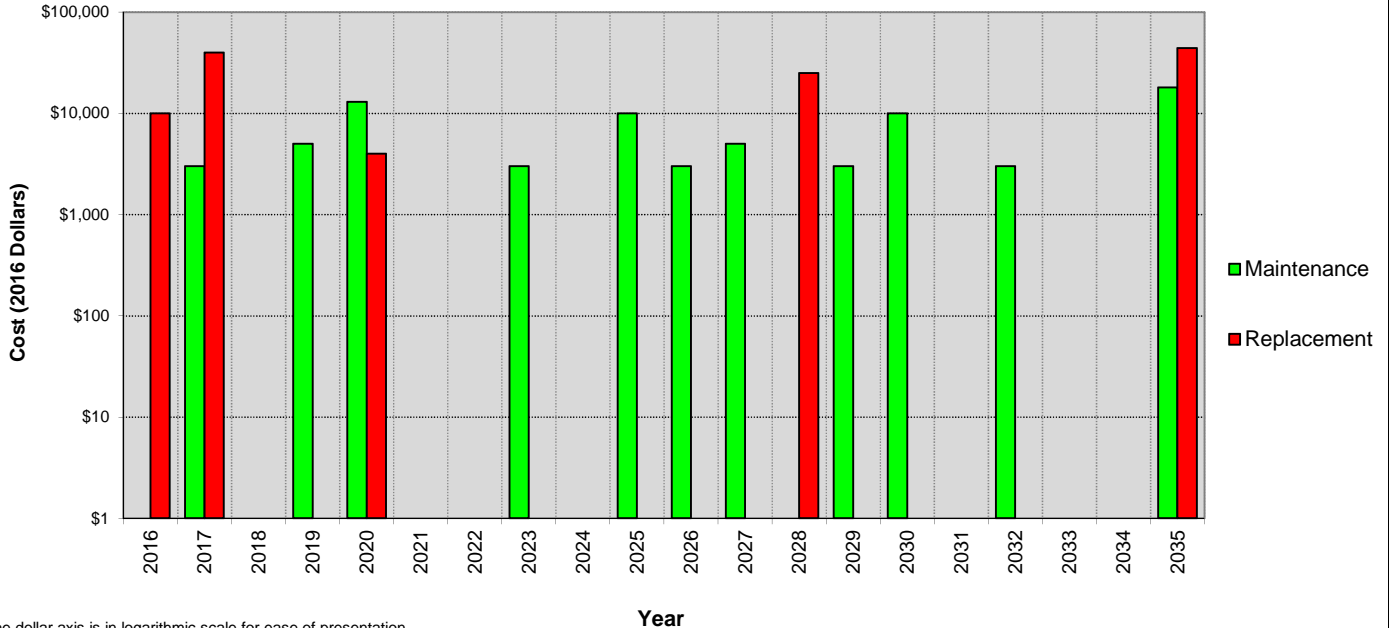
Recommended marmoleum maintenance includes stripping surface and refinishing.

Refinish gym wood flooring every 5 years. Replacement not expected within the next 20 years.

Replacement:

Washroom and shower replacement costs to align with Parks & Rec Capital Plan.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.10 Henderson Rec Centre

Building Envelope



Item	Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
SBS Membrane Roof	\$ 152,000	2000	25	-5	2020
Windows Aluminum	\$ 22,000	1971	40	7	2018
Cedar Board Siding	\$ 1,000	2013	8		2021
Gutters & Downspouts	\$ 800				2016
	\$ 4,600	2000	30		2030
Exterior Metal Doors	\$ 10,500	1971	50		2021

NOTES:

Maintenance:

Cedar board siding maintenance includes repainting and restaining (2013 addition) every 8 years.

Install additional scupper drains along south and west portion of low-slope roof parapet.

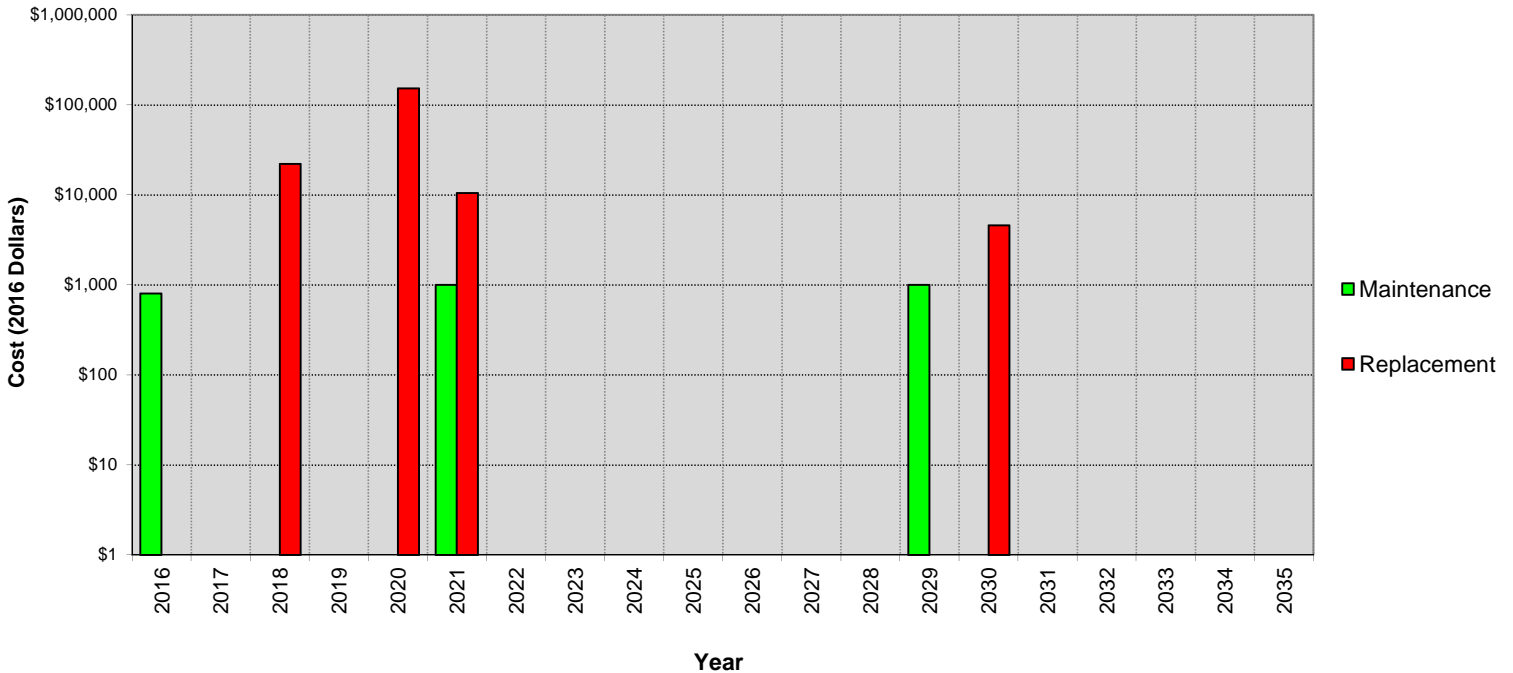
Replacement:

SBS membrane replacement includes all areas except 2013 addition. Includes perimeter cap flashing. Alternatively the project could be phased into lower areas (\$100,000) and upper (gym roof, \$52,000).

DECRA shingles not expected for replacement in the next 20 years due to east of damage.

Aluminum window replacement for remaining original windows on south and north elevations.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.10 Henderson Rec Centre

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Bolier-High Eff	Maintenance Replacement	\$ 12,000	2010	25		2035
Air Handling Unit	Maintenance Replacement	\$ 16,000	1971	50		2021
Kitchen Hood Exhaust Fan	Maintenance Replacement	\$ 500	2008	20		2028
Washroom Exhaust Fans	Maintenance Replacement	\$ 1,000	2013	20		2033
Hot Water Circulation Pumps	Maintenance Replacement	\$ 3,300	2010	15		2025
Tankless Water Heater	Maintenance Replacement	\$ 6,000	2012	10		2022
Remove Existing Hot Water Tank	Maintenance Replacement	\$ 5,000				2018
Fire Suppression	Maintenance Replacement	\$ 2,500	1970	50		2020
Plumbing Fixtures	Maintenance Replacement	\$ 2,000	2012	5		2017

NOTES:

Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

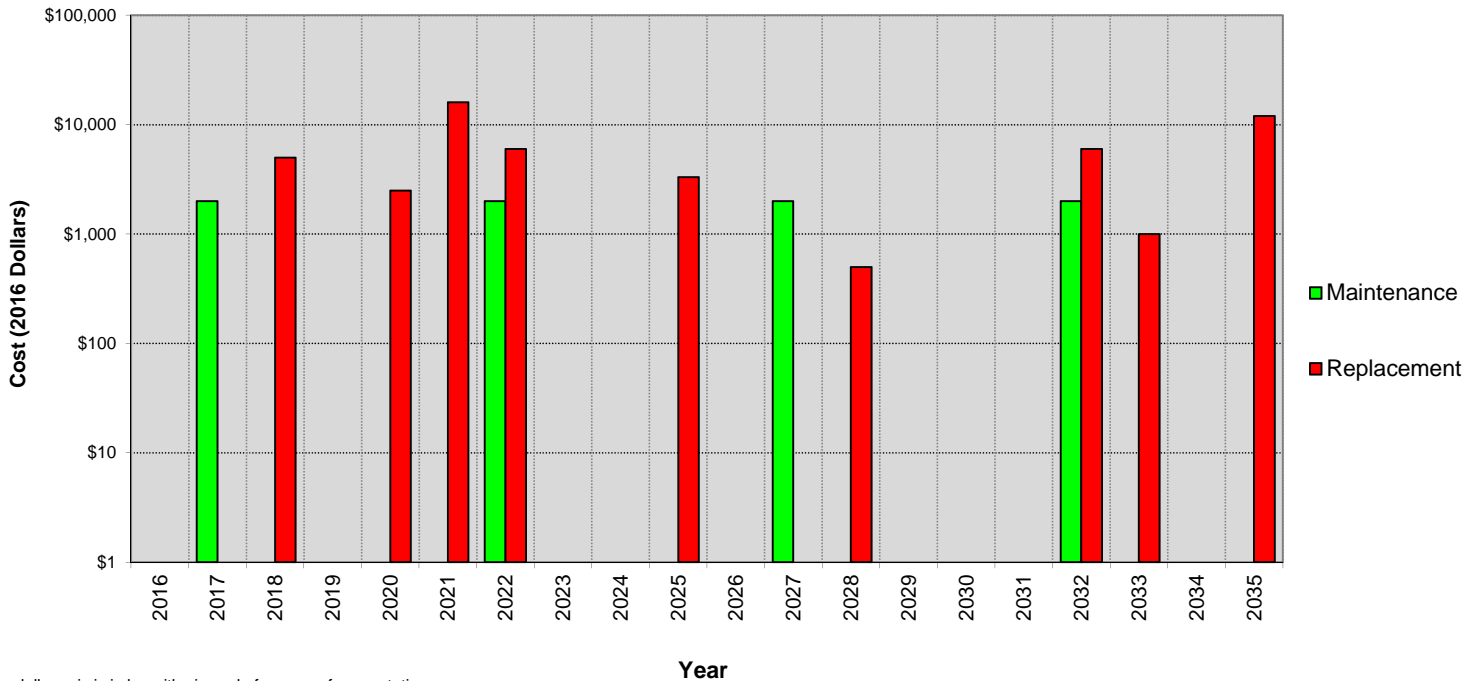
Replacement:

Fire suppression replacement estimate includes sprinkler heads in boiler and storage closets, as well as wall-mounted fire hose stations.

Hot water storage tank removal to free up significant space in mechanical room.

Air handling unit replacement includes original unit only.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.10 Henderson Rec Centre

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Controls	Maintenance					
Clocks&Cells	Replacement	\$ 800	2010	15		2025
Controls	Maintenance					
Motion Sensor	Replacement	\$ 800	2013	20		2033
Lighting	Maintenance					
Exterior	Replacement	\$ 500	2013	35		2048
Lighting	Maintenance					
Exterior	Replacement	\$ 23,000	1997	35		2032
Electric Door	Maintenance					
Opener	Replacement	\$ 800	2013	10		2023
Lighting	Maintenance					
Emergency	Replacement	\$ 2,500	2013	30		2043
Electric Convection	Maintenance					
Heaters	Replacement	\$ 1,400	2005	20		2025
Irrigation	Maintenance					
Panels	Replacement	\$ 3,000	2005	15		2020
Fire Alarm Panel	Maintenance					
& Annunciator	Replacement	\$ 2,000	2010	15		2025

NOTES:

Maintenance:

Clean exhaust fans, baseboard heaters annually.

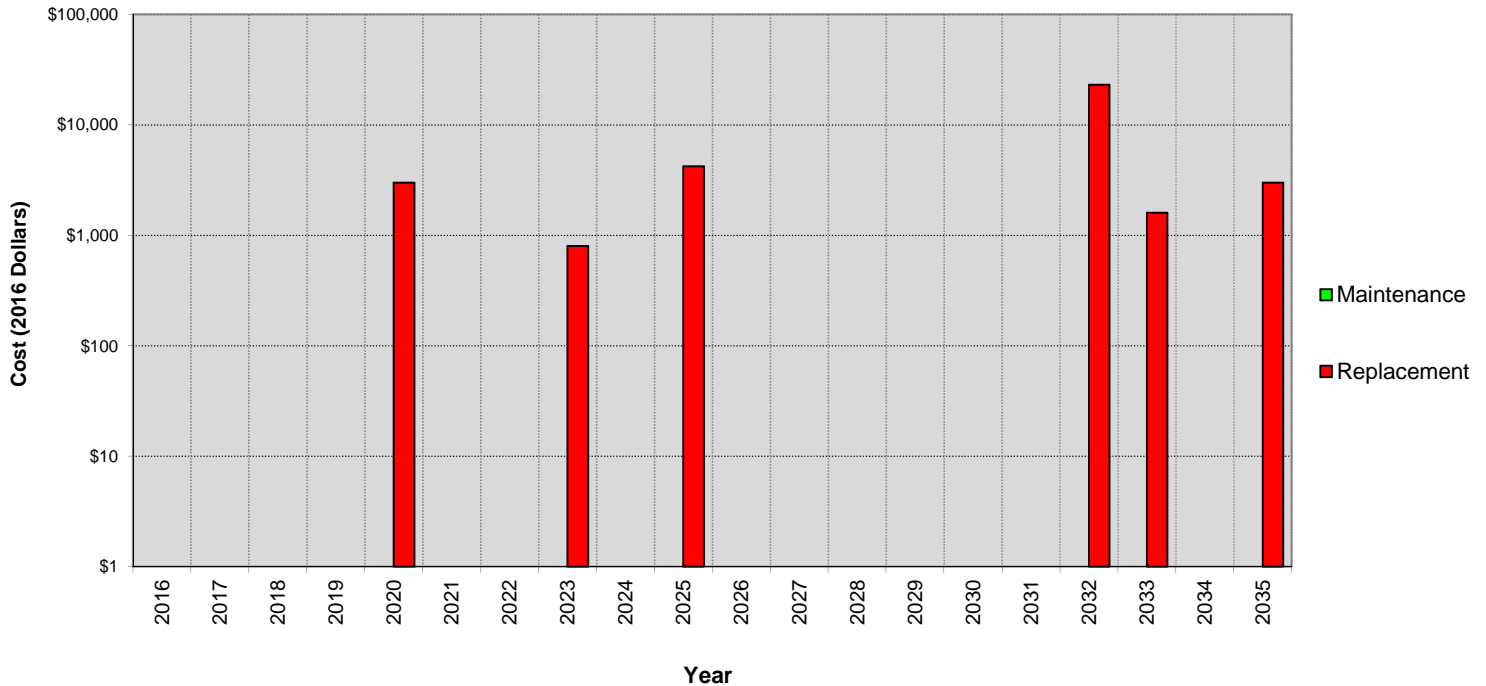
Test fire warning system and emergency lighting annually.

Replacement:

Exterior lighting (1997) represents parking lot lamps and surround lighting.

Controls include time clocks and photo cells.


PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3. PARKS AND PAVILIONS

2.3.1. No. 11 – Jack Groves Fieldhouse

<p>1709 Monterey Avenue – Oak Bay Fireman’s Park</p> <p>Peak Occupancy: 10</p> <p>Staffing (avg.): 2-5 during operation</p> <p>Built: 1989 Current Area: 800 sf</p> <p>Addition(s): None</p> <p>HVAC: Baseboard heat, electric hot water tank</p> <p>Fire Suppression: Extinguisher</p> <p>Access: Parking stalls located 200m to west. Wheelchair access to lower floor only.</p>	 <p style="text-align: center;"><i>Figure No. 11 – Jack Groves Fieldhouse</i></p>
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2.3.1.1. Description

Jack Groves Fieldhouse is located in Fireman’s Park along the Bowker Creek Greenway. The two-storey Fieldhouse was built in 1989 and serves as a seasonal concession and scorekeeping facility for the Carnarvon Baseball League. The building features a commercial kitchen and storage area on the lower floor, and a scorekeeping room and office on the upper. Male and Female public washrooms have exterior access on the north elevation.

INTERIOR FINISHES & FURNISHINGS: The building is minimally finished with vinyl-sheet flooring at the kitchen and upper floor washroom, and carpeting along the staircase and upper floor. The public washrooms and storage areas are unfinished concrete. Interior walls are painted gypsum wallboard.

BUILDING ENVELOPE: Exterior walls are constructed primarily with concrete masonry block. The upper floor dormer space is wood-framed with cedar siding and wood trim. Fenestration includes aluminum-framed windows, hollow-metal exterior doors, and most importantly during operation, two metal roll-up concession

doors. The roof is primarily sloped asphalt shingle with a portion of low-sloped 2-ply SBS membrane over the dormer. Gutters and downspouts collect roof runoff and transfer to storm drains.

MECHANICAL: The building is heated solely by electric baseboard. Adequate kitchen and bathroom exhaust is present, however there is no mechanical supply ventilation. Domestic hot water is supplied by an electric storage tank located in the lower-level storage room.

ELECTRICAL: Electrical systems in the Fieldhouse include: power distribution, electric baseboard heating, interior lighting, kitchen appliances (excluded from scope), and a PA speaker system. All electrical components are considered to be original to the building.

2.3.1.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 27: Condition of Building Systems – No. 11 – Jack Groves Fieldhouse

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X		
Vinyl Sheet		X ₁			
Carpet		X ₂			
Building Envelope					
Cedar Board Siding		X ₃			
SBS 2-Ply Roof Membrane					X
Asphalt Shingles					X
Gutters & Downspouts					X
Windows, Aluminum			X		
Exterior Metal Doors				X	
Concrete Foundation			X ₄		
Mechanical					
Hot Water Tank				X	
Expansion Tank				X	
Kitchen Hood Exhaust				X	
Washroom Exhaust				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution			X		
Electric Baseboard		X ₅			

	Concealed	Poor	Fair	Average	Good
Lighting Interior			X		
Wiring Devices			X		
PA Speaker System			X		

Notes:

1. Vinyl sheet worn at corners and base of staircase.
2. Carpet worn at staircase.
3. Cedar siding deteriorated at base of dormers and window sills.
4. Foundation has been damaged at west wall from impact.
5. Electric baseboards exhibit corrosion and are nearing the end of their expected service lives.

2.3.1.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Jack Groves Fieldhouse: Baseline Recommendations:

2016

- Replace deteriorated cedar siding on roof dormers.
- Repair concrete slab on grade at west landing.
- Replace failed glazing units (glass only) on west elevation.

2017

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2019

- Replace electric baseboards.
- Replace washroom exhaust fan.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 28: Summary of Present-Value Building Costs every 5 years – No. 11 – Jack Groves Fieldhouse

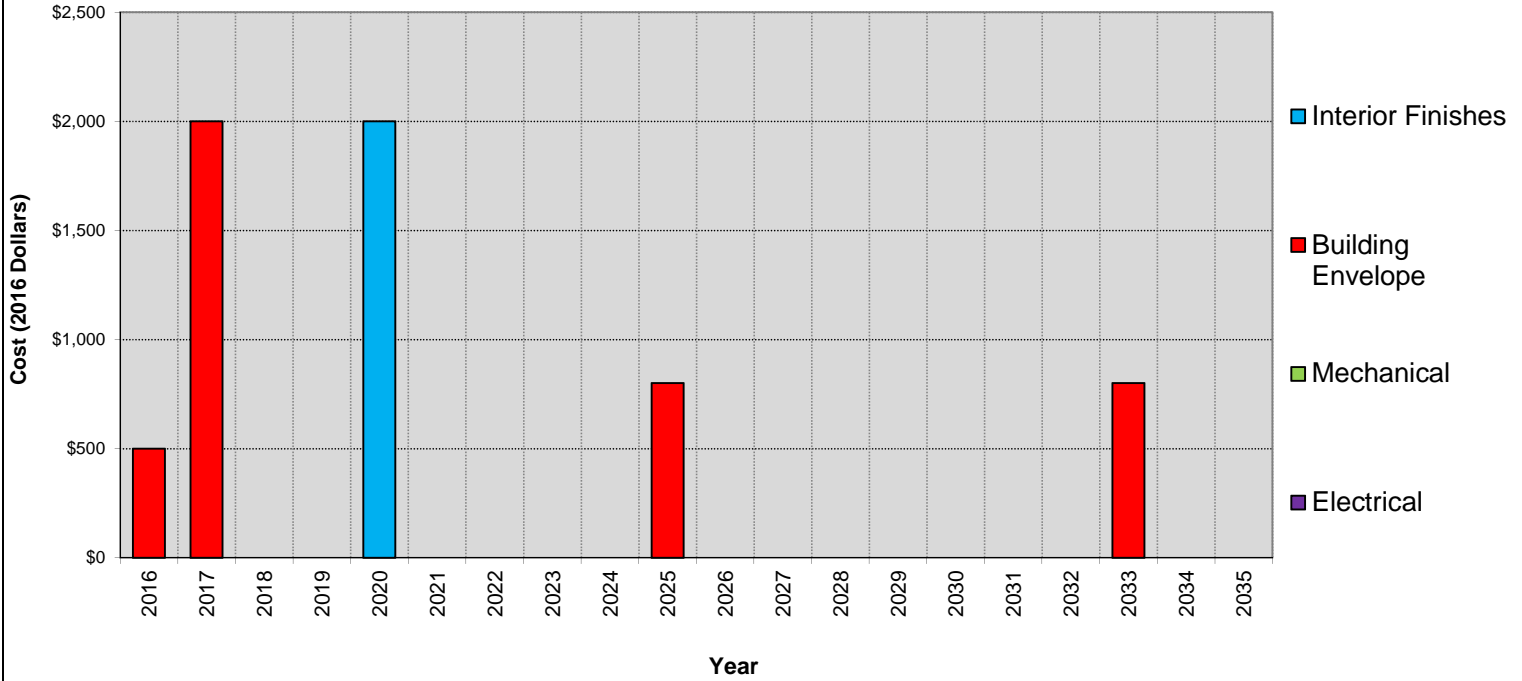
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$16,000	\$-	\$-	\$-	\$16,000
Building Envelope	\$15,500	\$800	\$4,000	\$7,400	\$27,700
Mechanical Summary	\$2,500	\$900	\$-	\$-	\$3,400
Electrical Summary	\$1,200	\$4,000	\$-	\$-	\$5,200
Total	\$35,200	\$5,700	\$4,000	\$7,400	\$52,000

No.11 Jack Groves Fieldhouse

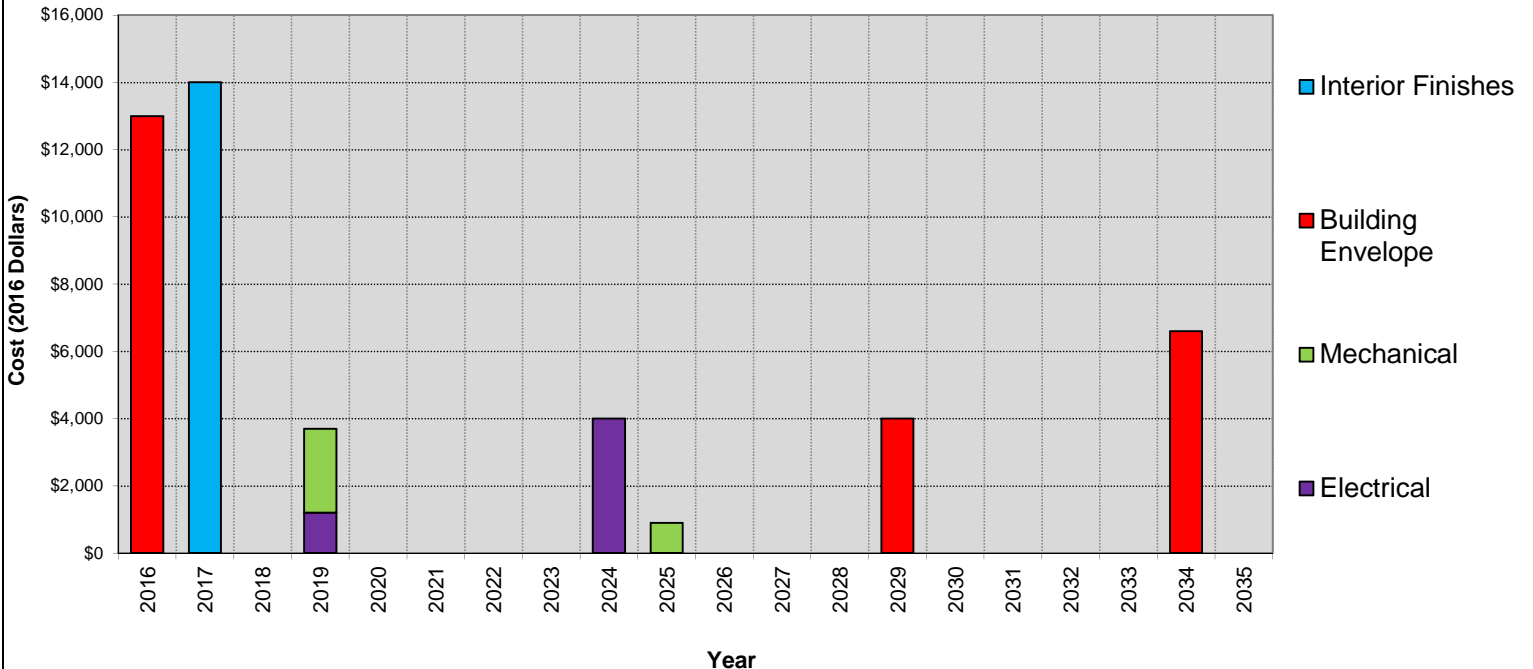
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.11 Jack Groves Fieldhouse

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 2,000	2000	20		2020
Vinyl Sheet Flooring	Maintenance Replacement	\$ 1,200	1989	30	-2	2017
Carpet	Maintenance Replacement	\$ 800	1989	20	8	2017
Millwork	Maintenance Replacement	\$ 12,000	1989	20	8	2017

NOTES:

Maintenance:

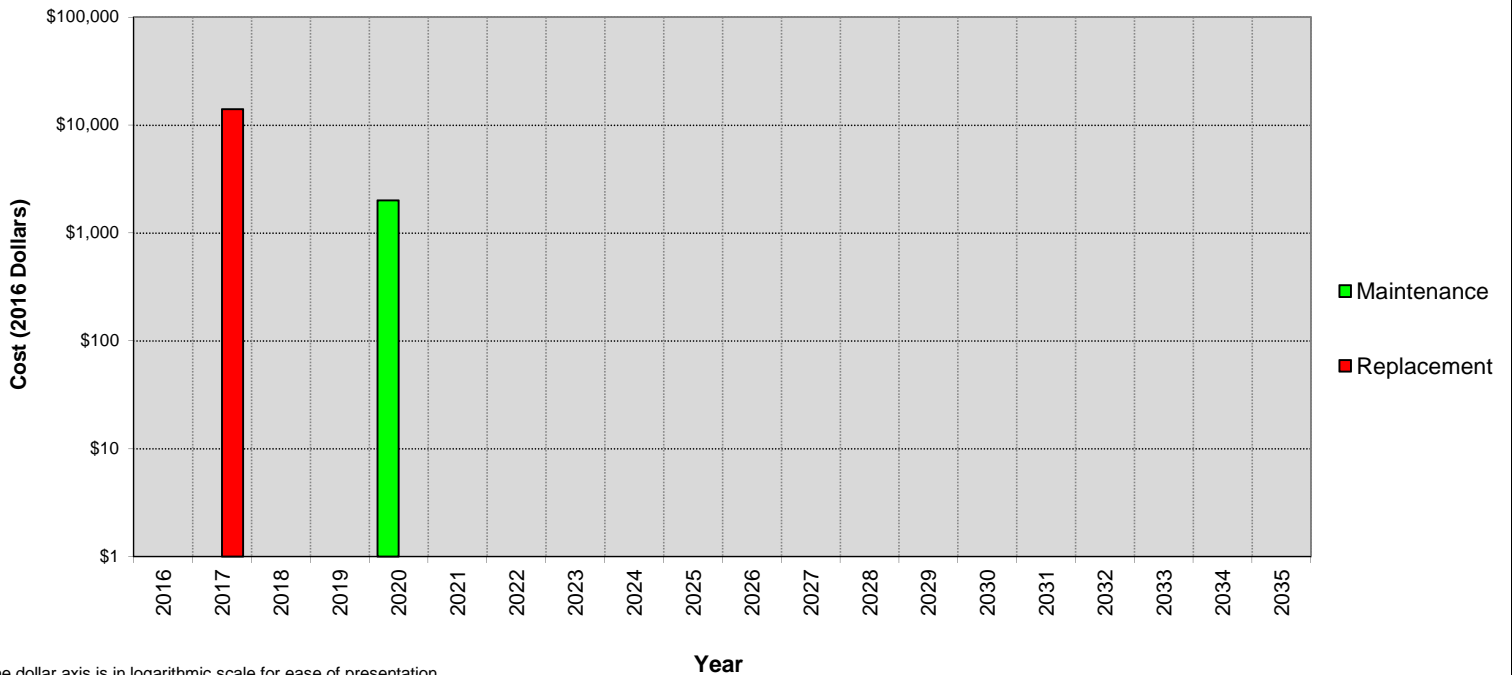
Interior wall maintenance includes painting

Replacement:

Carpet replacement on stairs and upper level. Stairs are quite worn.

Vinyl sheet flooring on lower level to coincide with carpets.
Millwork replacement at kitchen and score keeper areas.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.11 Jack Groves Fieldhouse

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Cedar Board Siding	Maintenance	\$ 800	2017	8		2025
	Replacement	\$ 13,000	1989	30	-3	2016
SBS Membrane Roof	Maintenance Replacement	\$ 2,500	2014	20		2034
Asphalt Shingle Roof	Maintenance Replacement	\$ 2,500	2014	20		2034
Gutters & Downspouts	Maintenance Replacement	\$ 1,600	2014	20		2034
Windows Aluminum	Maintenance	\$ 500	1989	20	7	2016
	Replacement	\$ 4,000	1989	40		2029
Exterior Doors Metal	Maintenance					
	Replacement	\$ 2,600	1989	50		2039
Concrete Foundation	Maintenance Replacement	\$ 2,000				2017

NOTES:

Maintenance:

Concrete slab-on-grade crack repairs west landing.

Repainting of cedar board siding and fascia every 8 years beginning after replacement in 2017.

Window maintenance includes replacing two glazing units on west elevation that have failed.

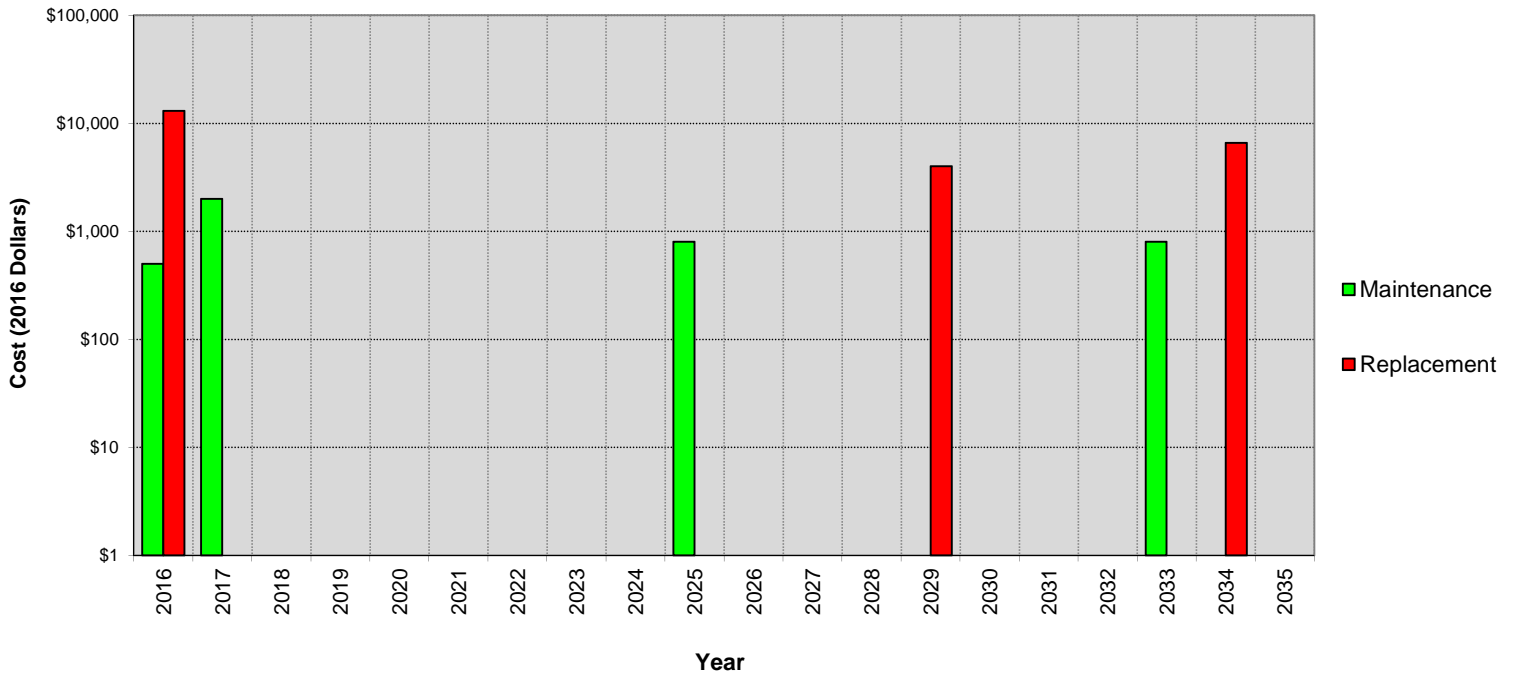
Reported water leakage at one washroom.

Replacement:

Replacement of tongue and groove siding and 1"x6" roofline fascia board. Poor condition on dormer portions.

SBS roof membrane, asphalt shingles and gutters & downspouts scheduled as replacement package.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.11 Jack Groves Fieldhouse

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Hot Water Tank	Maintenance Replacement	\$ 600	2010	15		2025
Expansion Tank	Maintenance Replacement	\$ 300	2010	15		2025
Exhaust Fans Washrooms	Maintenance Replacement	\$ 1,500	1989	20	10	2019
Exhaust Fan Kitchen	Maintenance Replacement	\$ 1,000	1989	20	10	2019
Plumbing Fixtures	Maintenance Replacement	\$ 500	2010	5	2	2017

NOTES:

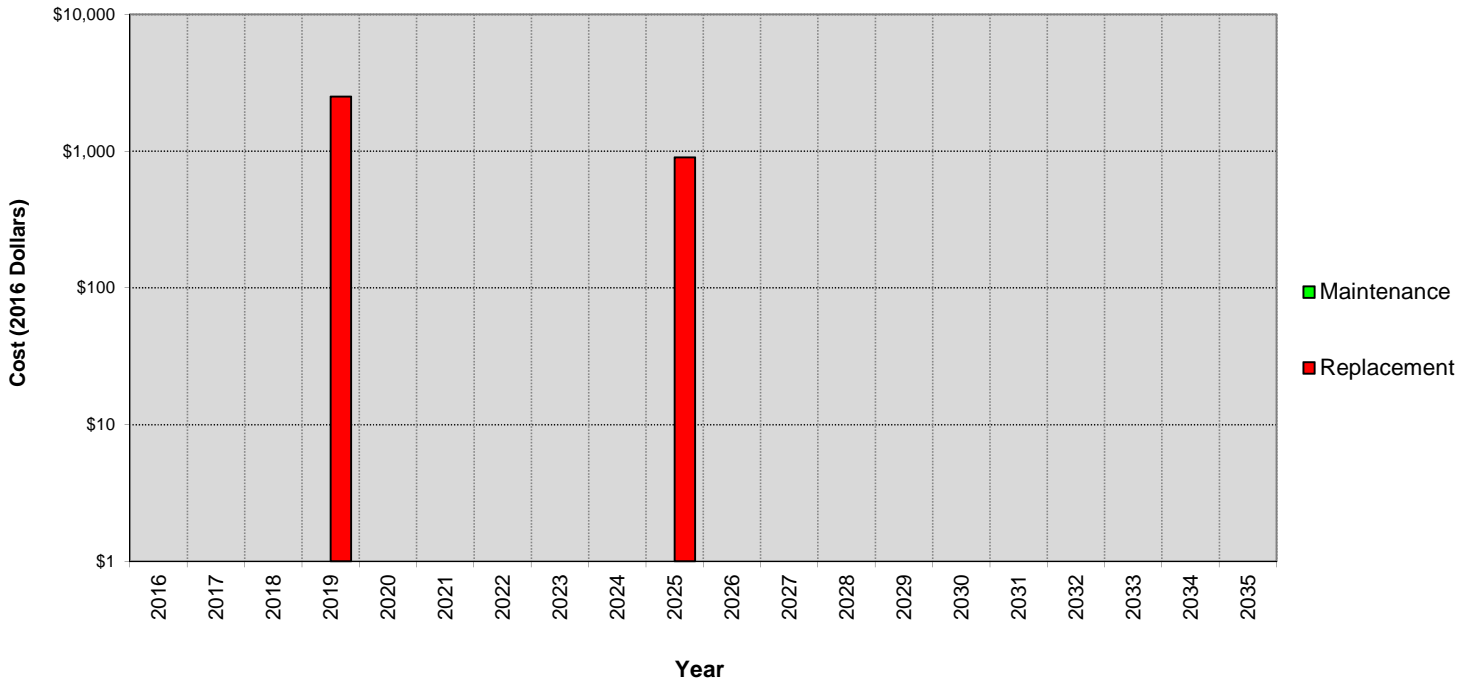
Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Washroom and kitchen exhaust assumed to be original and beyond service life. Adjusted for replacement within the next 5 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.11 Jack Groves Fieldhouse

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution Main	Maintenance Replacement	\$ 3,500	1989	50		2039
Electric Baseboard	Maintenance Replacement	\$ 1,200	1989	30		2019
Wiring Devices	Maintenance Replacement	\$ 1,400	1989	35		2024
Lighting Interior	Maintenance Replacement	\$ 1,500	1989	35		2024
PA Speaker System	Maintenance Replacement	\$ 1,100	1989	35		2024

NOTES:

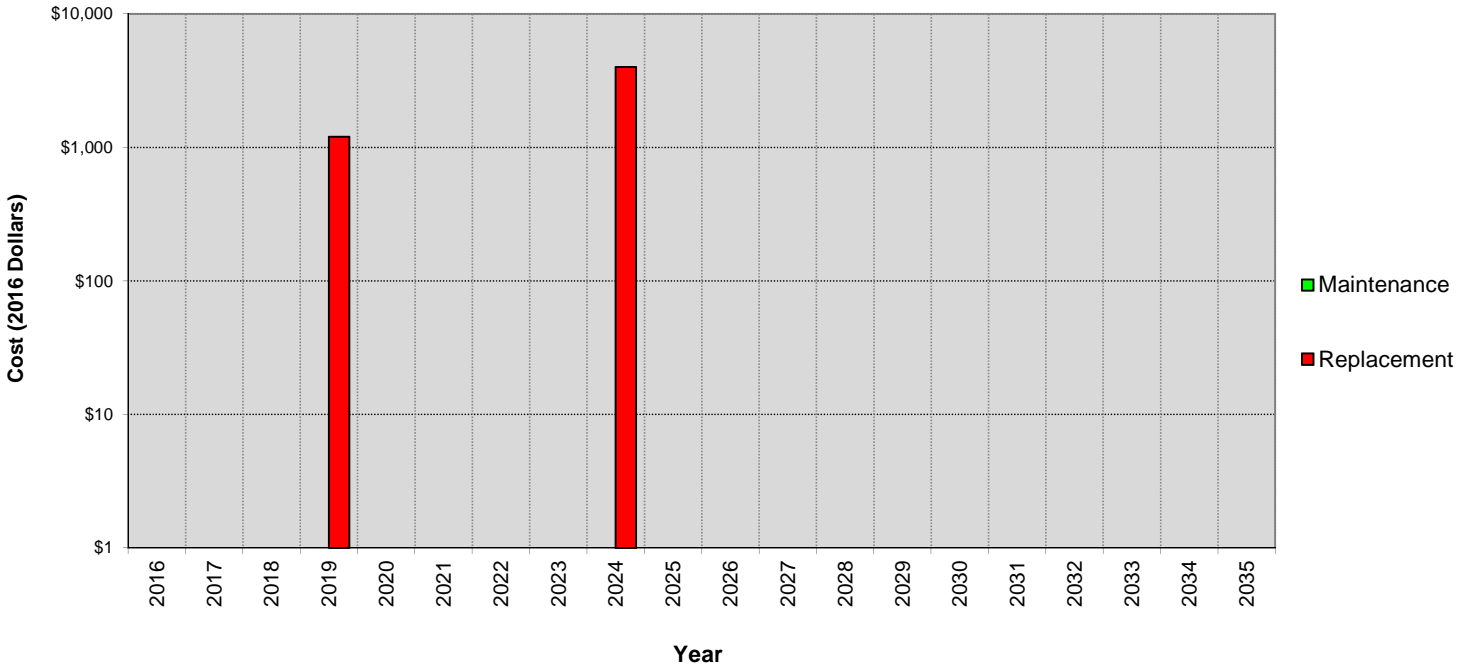
Maintenance:

Replacement:

Main power distribution not expected for replacement in the next 20 years.


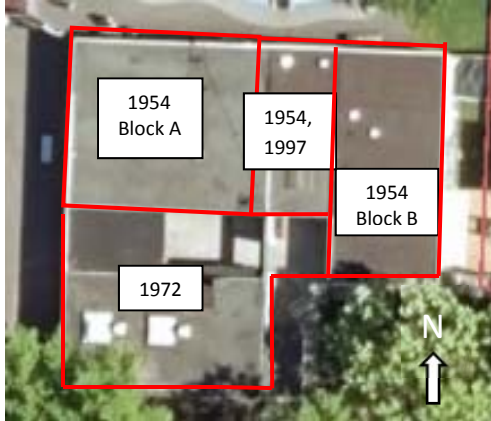

Wiring devices, interior lighting and PA system replacement scheduled to coincide within the next 10 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.2. No. 12 – Carnarvon Pavilion

 <p>2801 Henderson Road</p> <p>Peak Occupancy: 50</p> <p>Staffing (avg.): 0</p> <p>Built: 1970</p> <p>Addition(s): 1997 (now 4,523 sf)</p> <p>HVAC: Natural gas boiler, electric baseboard and DHW.</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	  <p><i>Figure No. 12 – Carnarvon</i></p>
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2.3.2.1. Description

Carnarvon Pavilion is located within Carnarvon Park, a developed 4 hectare sports park within a residential setting. The Pavilion is accessed from the east of Henderson Road and is situated between five tennis courts, a lacrosse box, and Rotary Water Park managed and financed by The Rotary Club of Oak Bay. The site was first developed in 1954 as two buildings: Block A, to the west, featured change rooms and washrooms, and Block B to the east, served as the parks caretaker suite. These two original buildings were connected with a pergola structure between them. In 1972, a third building, to the south of the two originals, was constructed along with a canopied breezeway between the north and south buildings. The pergola between the Block A and B was also roofed over at this time. In 1997 the space between the two north buildings was enclosed to form one single north building.

The south building (c. 1972) is home to Lansdowne Preschool while the north building features change rooms, showers, washrooms, and a space (east) that recently became vacant after housing a licensed daycare facility for 26 years. The vacant space and much of the change rooms is currently being used for storage.

INTERIOR FINISHES & FURNISHINGS: The preschool and former daycare spaces are finished with marmoleum tiled flooring and, painted concrete block and gypsum wallboard. The washrooms and change rooms are finished with ceramic tile and painted concrete slab floors and block walls.

BUILDING ENVELOPE: Exterior walls are constructed primarily from concrete masonry block with wood-framed stucco clad walls on the north and east elevations. Windows are mostly original wood-framed with the exception of vinyl-frame replacement on the east elevation. Original exterior doors are solid fir with a few hollow-metal replacements occurring throughout the buildings life. There are two polycarbonate drop-on skylights on the south building providing daylight. The roofing consists of a low-sloped 2-ply SBS membrane with a small portion of built-up gravel-ballast canopy on the north building. Roof-top drains transport runoff to storm drains.

MECHANICAL: The pavilion spaces are heated by electric baseboard and perimeter radiators fed from a natural gas boiler. Domestic hot water for washrooms and change room showers is provided from four electric hot water tanks. The washrooms change rooms have exhaust ventilation. Mechanical supply ventilation is not present for any of the buildings.

ELECTRICAL: Electrical systems in the Pavilion include: power distribution, electric baseboard heating, interior, exterior and emergency lighting, and controls (time clocks, photo cells, sprinkler panel). An electrical upgrade was performed for the building c.2007.

2.3.2.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 29: Condition of Building Systems – No.12 – Carnarvon

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X		
Vinyl Sheet		X			
Building Envelope					
Stucco			X		
CMU				X	
Cedar Board Siding & Trim		X ₁			
Wood Soffit		X ₂			
Windows, Wood					

	Concealed	Poor	Fair	Average	Good
Built Up, Gravel Ballast, Roof		X ₃			
SBS 2-Ply Roof Membrane		X ₄			X
Exterior Doors, Metal					X
Gutters & Downspouts		X ₅			X
Windows, Aluminum			X		
Exterior Metal Doors				X	
Curb Mounted Skylights		X ₆			
Mechanical					
Natural Gas Boiler			X		
Hot Water Tanks (4)				X	
Washroom Exhaust			X		
Plumbing Fixtures				X ₇	
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution			X		
Electric Baseboard				X	
Lighting Interior			X	X	
Lighting Exterior				X	
Lighting Emergency					X
Wiring Devices			X	X	
Controls			X		

Notes:

1. Cedar siding deteriorated at inside corners and butt joints. Soffit shows notable water damage in areas which may indicate water penetrating through cedar siding.
2. Wood soffit is deteriorated, water damage, at breezeway area. Wood roof fascia's are also deteriorating/ decaying locally.
3. Built up roofing exhibits significant ponding and organic growth.
4. SBS membrane exhibiting tenting (delamination) in many areas.
5. Gutters are deteriorated and are suspected to be leaking into roof soffit.
6. Corner of polycarbonate skylight on built-up roof is duct taped, indicating damage.
7. Repairs made to ruptured water main in 2015.

2.3.2.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Carnarvon Pavilion: Baseline Recommendations:

2016

- Renovate exterior washroom.
- Localized repair of wood soffit and siding at areas showing deterioration.
- Replace failed glazing units on west elevation.

2017

- Replace power distribution: main and sub breaker panels, and breakers.
- Replace damaged and corroded exterior light fixtures.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2018

- Replace low-sloped roof and dome skylights.

2019

- Replace cedar board siding.
- Replace washroom exhaust fans.

2020-21

- Replace natural gas boiler.
- Replace hot water tanks.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 30: Summary of Present-Value Building Costs every 5 years – No.12 – Carnarvon

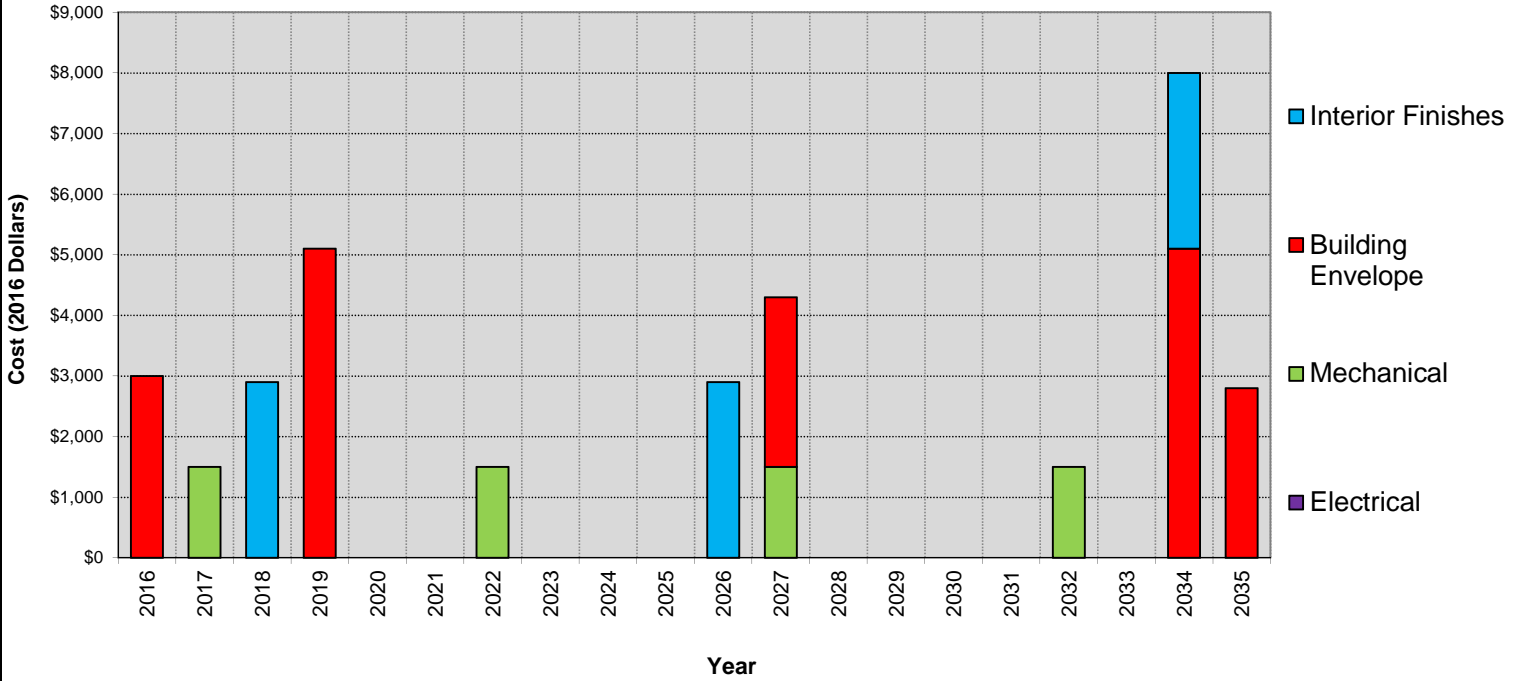
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$22,900	\$-	\$14,900	\$2,900	\$40,700
Building Envelope	\$84,300	\$11,000	\$2,800	\$7,900	\$106,000
Mechanical Summary	\$14,500	\$3,100	\$4,500	\$1,500	\$23,600
Electrical Summary	\$6,600	\$500	\$500	\$1,500	\$9,100
Total	\$128,300	\$14,600	\$22,700	\$13,800	\$180,000

No.12 Carnarvon Pavilion

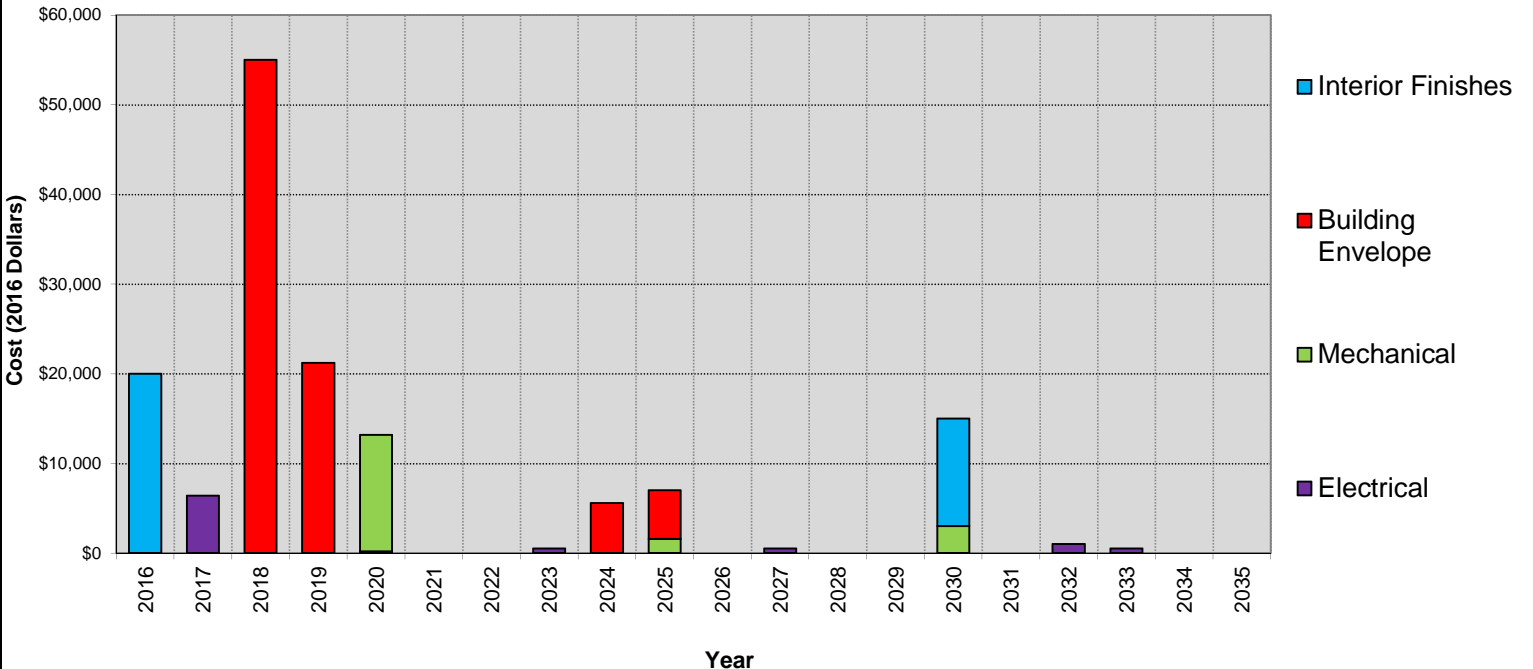
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.12 Carnarvon Pavilion

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 2,900	2010	8		2018
Vinyl Sheet Flooring	Maintenance Replacement	\$ 12,000	2000	30		2030
Exterior Washroom Reno.	Maintenance Replacement	\$ 20,000				2016

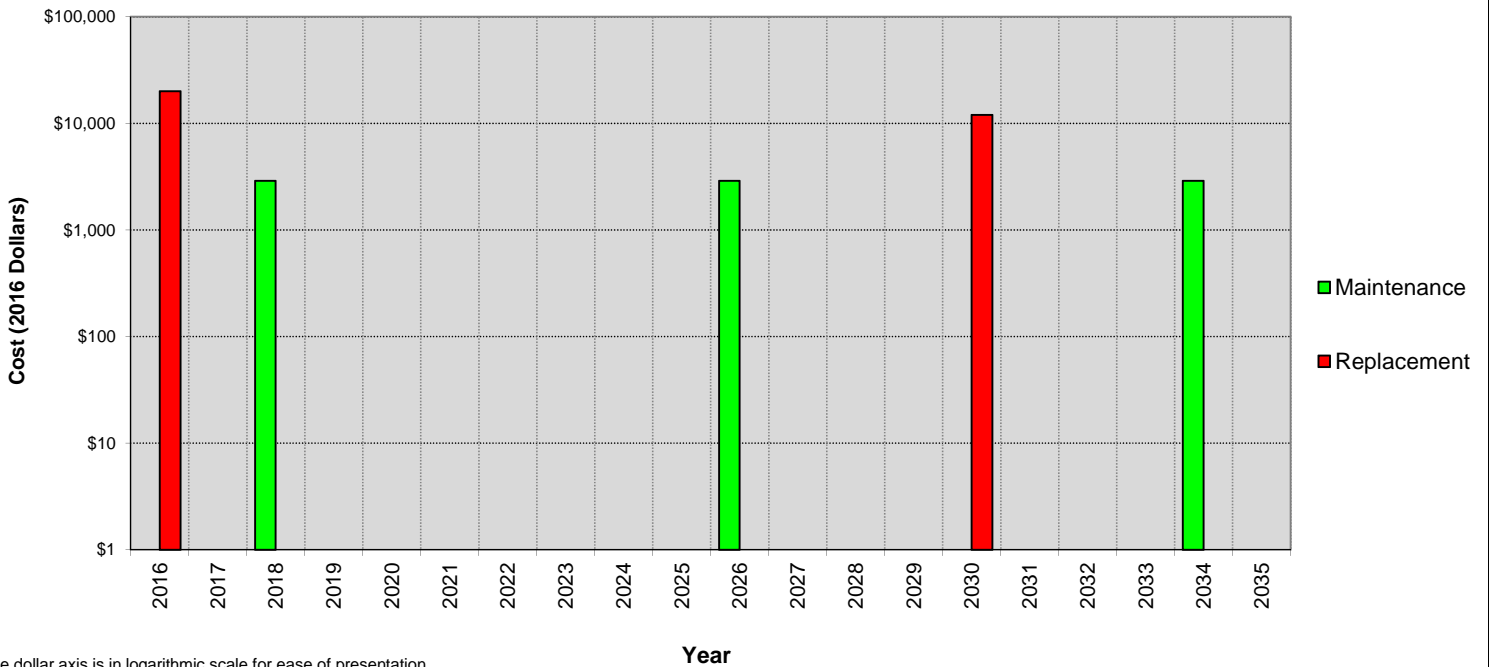
NOTES:

Maintenance:

Interior wall maintenance includes painting roughly 50% of total area every 8 years, alternating between the north and south spaces.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.12 Carnarvon Pavilion

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 1,600	2005	15	-1	2019
CMU	Maintenance Replacement	\$ 3,500	2005	15	-1	2019
Cedar Board Siding & Trim	Maintenance Replacement	\$ 2,800	2019	8		2027
Wood Soffit	Maintenance Replacement	\$ 21,200	1972	50	-3	2019
Windows, Wood	Maintenance Replacement	\$ 3,000				2016
SBS Membrane Roof	Maintenance Replacement	\$ 5,600	1954	50	20	2024
Exterior Doors Metal	Maintenance Replacement	\$ 53,000	1995	25	-2	2018
Curb Mounted Skylight	Maintenance Replacement	\$ 5,400	1970	50	5	2025
		\$ 2,000	1995	25	-2	2018

NOTES:

Maintenance:

Stucco, CMU and Cedar maintenance includes repainting and localized repair. Cedar maintenance to begin after replacement of decayed material, unless replacement is scheduled several years later.

Wood soffit maintenance includes localized replacement at deteriorated areas in breezeway

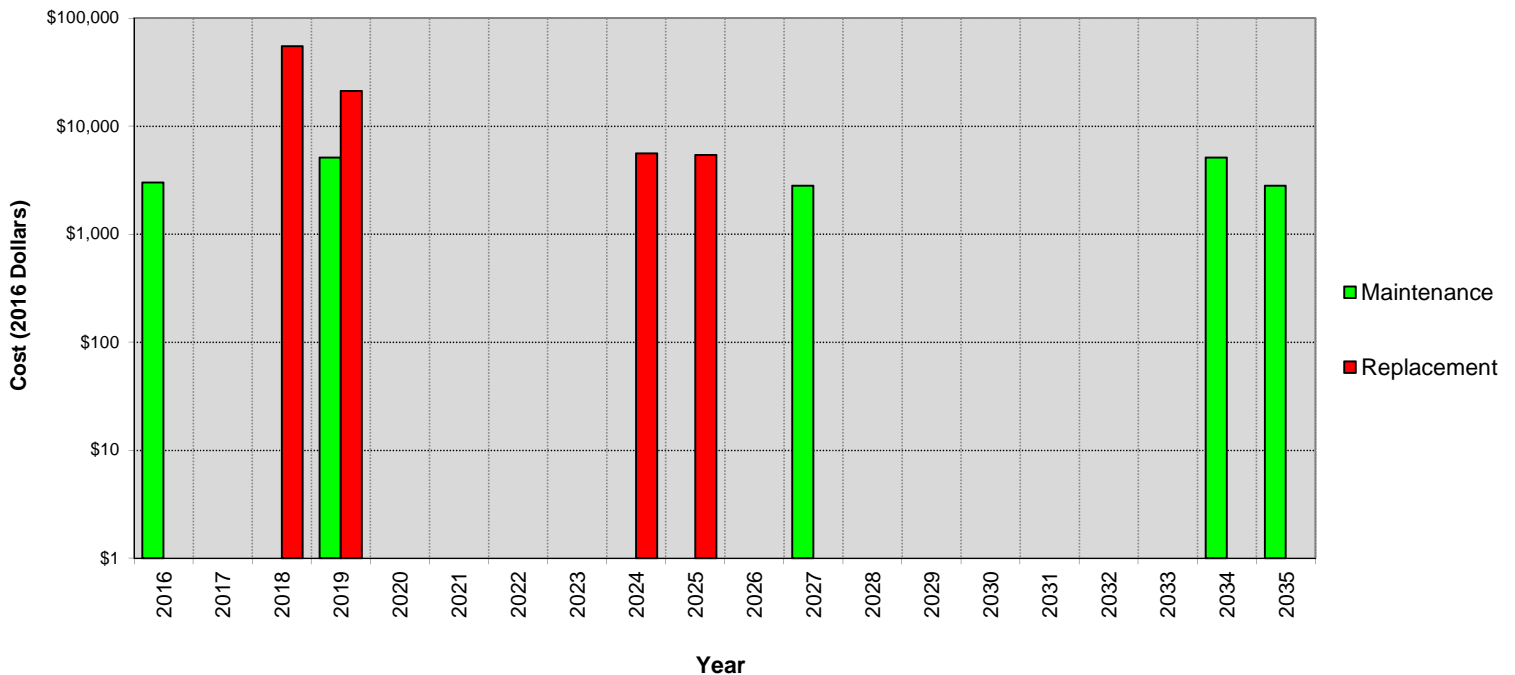
Replacement:

Original built up roof (gravel ballast) and current SBS membrane recommended for replacement within the next five years. Estimate includes perimeter cap flashing and gutters. Curb mounted skylight replacement to coincide.

Remaining original wood-framed windows to be replaced within the next 10 years with vinyl-framed windows similar to east elevation.

Cedar siding at roof fascia is deteriorated and is recommended for replacement within the next 5 years.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.12 Carnarvon Pavilion

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Natural Gas Boiler	Maintenance Replacement	\$ 10,000	1985	30	5	2020
Hot Water Tanks (4)	Maintenance Replacement	\$ 3,000	2007	10	3	2020
Exhaust Fans Washroom	Maintenance Replacement	\$ 1,600	2005	20		2025
Plumbing Fixtures	Maintenance Replacement	\$ 1,500	2012	5		2017

NOTES:

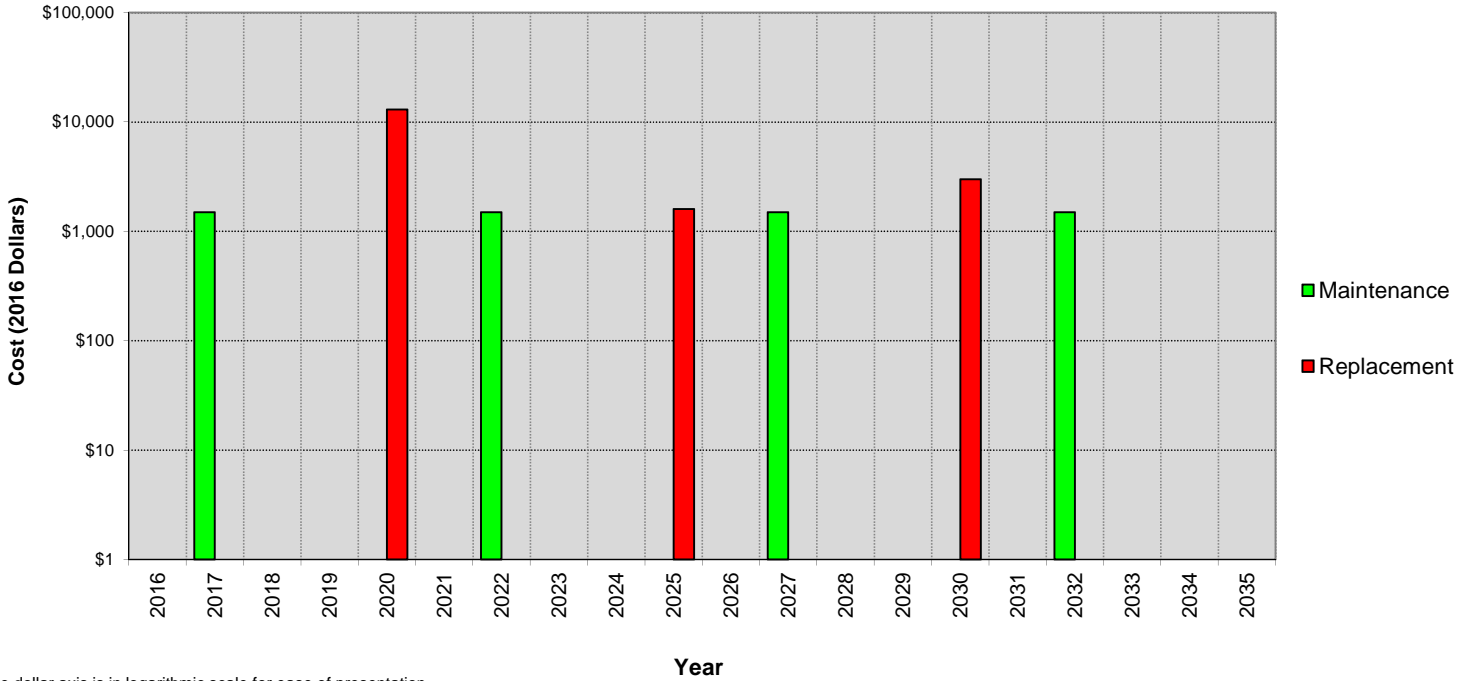
Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Viessman natural gas boiler and hot water tank replacement scheduled to coincide.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.12 Carnarvon Pavilion

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution	Maintenance Replacement	\$ 3,700	1985	50	-18	2017
Lighting Interior	Maintenance Replacement	\$ 200	1985	35		2020
Lighting Exterior	Maintenance Replacement	\$ 2,700	2007	35	-25	2017
Wiring Devices	Maintenance Replacement		1985	35		2020
Controls Clocks&Cells	Maintenance Replacement	\$ 800	2013	30		2043
Controls Sprinkler Panel	Maintenance Replacement	\$ 500	2013	10		2023
Electric Heating	Maintenance Replacement	\$ 500	2007	20		2027
Lighting Emergency	Maintenance Replacement	\$ 1,000	2007	25		2032

NOTES:

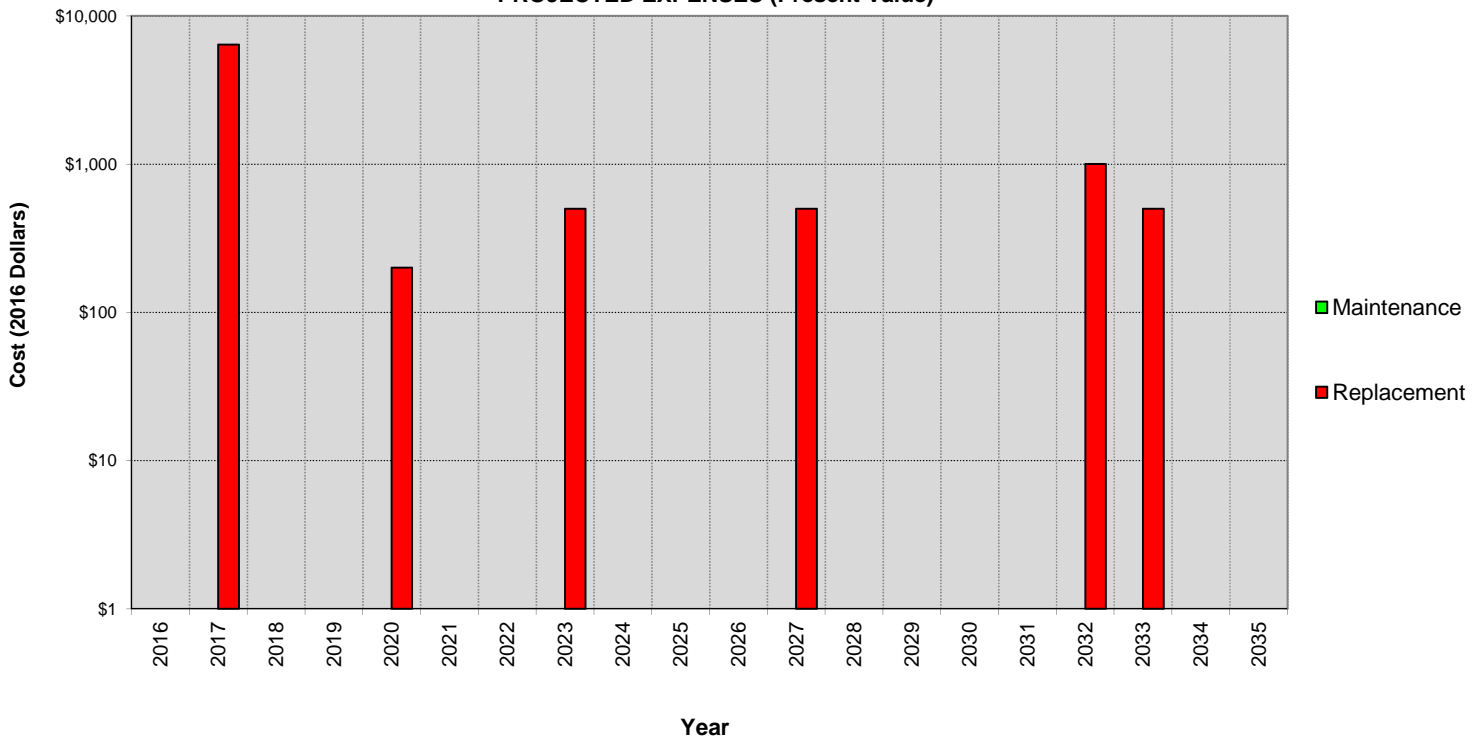
Maintenance:

Annual testing of emergency lighting and wiring devices recommended.
Annual cleaning of baseboard and space heaters recommended.

Replacement:

Power distribution recommended for early priority replacement.
Exterior light fixtures exhibiting accelerated corrosion and are recommended for priority replacement. Almost all of the interior lighting was recently replaced in 2007.
Electric heating includes 2 Ouellet fan-force heaters.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.3. No. 13 – Carnarvon Old Bowling Pavilion



2801 Henderson Road

Peak Occupancy: 20

Staffing (avg.): 0

Built: 1960 (1,396 sf)

Addition(s): None

HVAC: Electric baseboard, space heaters

Fire Suppression: Extinguishers

Access: Parking stalls at-grade, wheelchair access



Figure No.13 – Carnarvon Old Bowling Pavilion

2.3.3.1. Description

The Carnarvon Old Bowling Pavilion known as ‘Anderson House’ was built in 1960 and acts as the Oak Bay Lawn Bowling Club’s sports pavilion. The clubhouse building is single-storey, wood-framed, rectangular in footprint, and built over a crawlspace. Two 8-rink greens lie to the south of Anderson House whose interior is lined with 240 interior lockers for member’s equipment storage, and features washrooms, a small office area, and a carpeted 40’ short-mat rink for indoor winter training. A small lean-to storage shed is located on the west elevation of the building.

INTERIOR FINISHES & FURNISHINGS: Interior finishes include carpet flooring, finished wood lockers and painted walls.

BUILDING ENVELOPE: Exterior walls are wood-framed with rock-dash stucco cladding. Windows are original wood-framed and the two north elevation exterior doors are solid wood. The roof is sloped 4/12 with asphalt shingles and features gutters and downspouts along the north and south eaves.

MECHANICAL: The building is heated by electric baseboard and force fan space heaters. Domestic hot water for washrooms is provided by an electric hot water tank. The washrooms have exhaust ventilation, while mechanical supply ventilation is not present.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior, exterior and emergency lighting, and wiring devices (switches and receptacles).

2.3.3.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 31: Condition of Building Systems – No.13 – Carnarvon Old Bowling Pavilion

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls					X
Carpet					X
Building Envelope					
Stucco				X	
Windows, Wood			X ₁		
Exterior Metal Doors				X	
Cedar Trim				X	
Gutters & Downspouts				X	
Asphalt Shingles				X ₂	
Mechanical					
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution			X		
Electric Heating (Baseboard & Space)				X	
Lighting Interior			X	X	
Lighting Exterior				X	
Lighting Emergency				X	
Wiring Devices				X	

Notes:

1. Wood windows exhibited condensation and mould growing at sill corners.
2. Vantage point to view asphalt shingles not available, condition based on average wear with approximately 10 years of service.

2.3.3.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Carnarvon Old Bowling Pavilion: Baseline Recommendations:

2017

- Replace main distribution panel and breakers.

2018

- Replace electric baseboard and space heaters.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2020-21

- Replace exterior metal doors.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the ‘0-5 yrs’ year category; beyond this period more typical maintenance and replacement costing occurs.

Table 32: Summary of Present-Value Building Costs every 5 years – No.13 – Carnarvon Old Bowling Pavilion

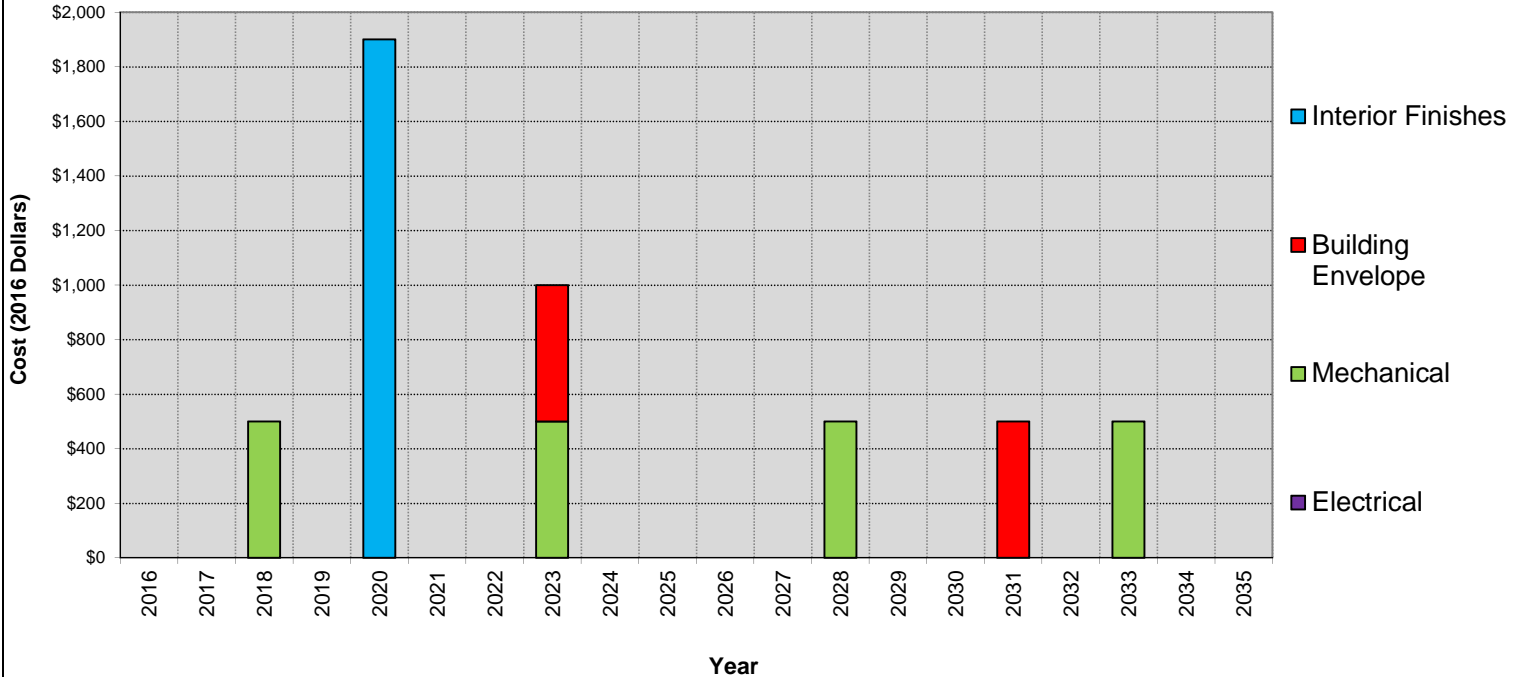
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$1,900	\$-	\$8,000	\$-	\$9,900
Building Envelope	\$1,400	\$15,300	\$-	\$500	\$17,200
Mechanical Summary	\$500	\$500	\$500	\$500	\$2,000
Electrical Summary	\$6,000	\$500	\$4,300	\$500	\$11,300
Total	\$9,800	\$16,300	\$12,800	\$1,500	\$40,000

No.13 Carnarvon Old Bowling Pav

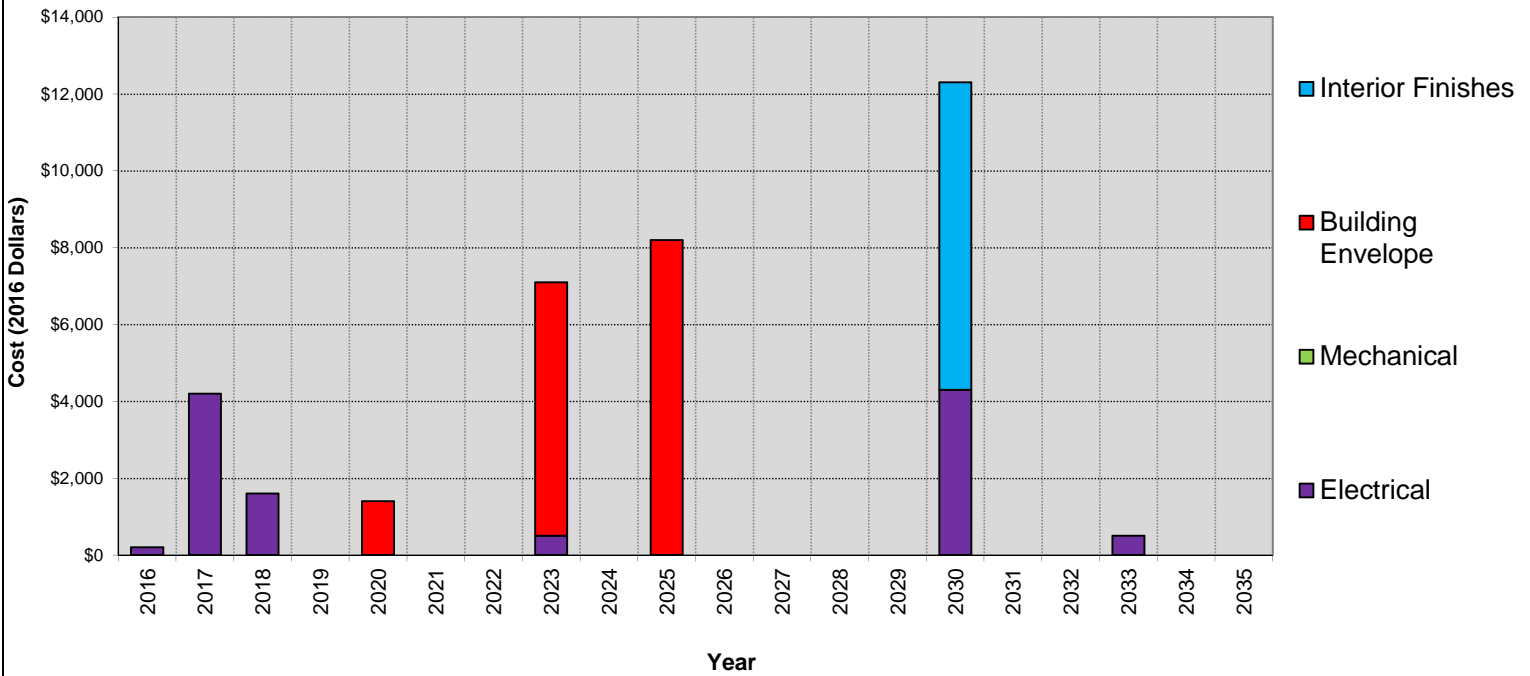
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.13 Carnarvon Old Bowling Pav

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 1,900	2000	20		2020
Carpet	Maintenance Replacement	\$ 8,000	2010	20		2030

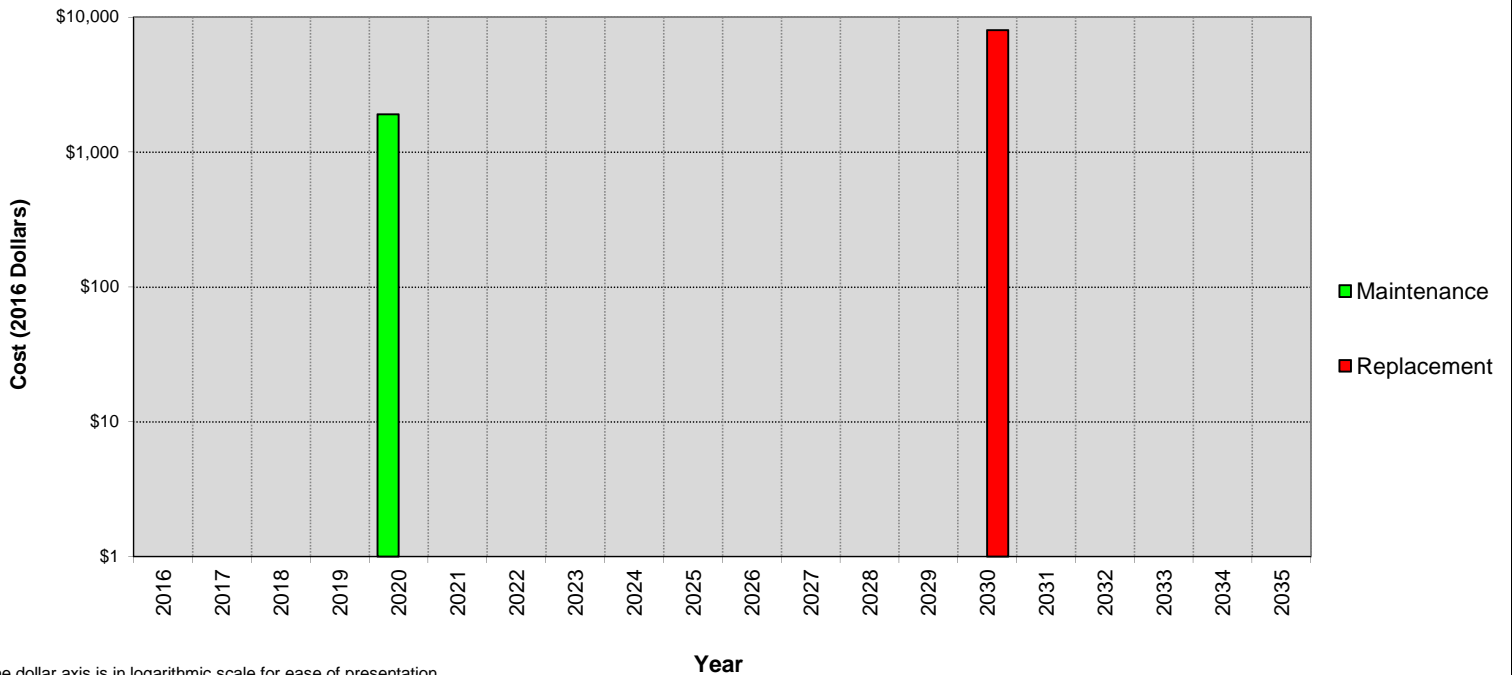
NOTES:

Maintenance:

Room could use updating however low-maintenance appearance appeared acceptable to users.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.13 Carnarvon Old Bowling Pav

Building Envelope



Item	Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Wood Windows					
Maintenance Replacement	\$ 6,600	1960	45	18	2023
Exterior Doors					
Metal Maintenance Replacement	\$ 1,400	1960	50	10	2020
Gutters & Downspouts					
Maintenance Replacement	\$ 2,200	2005	20		2025
Asphalt Shingles					
Maintenance Replacement	\$ 6,000	2005	20		2025
Cedar Trim					
Maintenance Replacement	\$ 500	2015	8		2023

Maintenance:

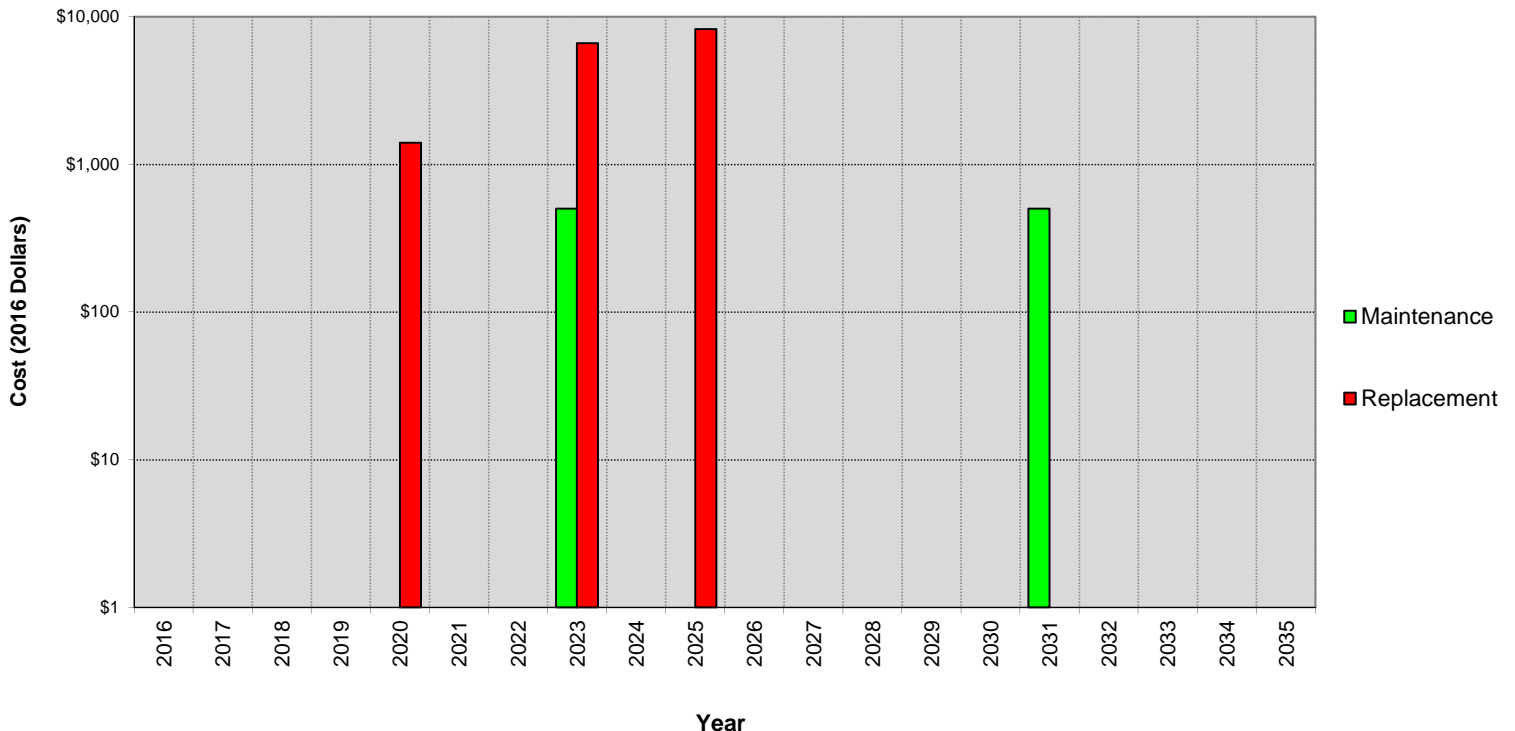
Cedar trim maintenance around windows and doors includes sanding and repainting.

Replacement:

Single-pane wood-framed windows would be cost-effectively upgraded. Cost estimate modelled for double-pane or vinyl-framed window replacement.

Asphalt shingle roof and gutters scheduled for replacement together.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.13 Carnarvon Old Bowling Pav

Mechanical

Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Plumbing Fixtures	Maintenance Replacement	\$ 500	2013	5		2018

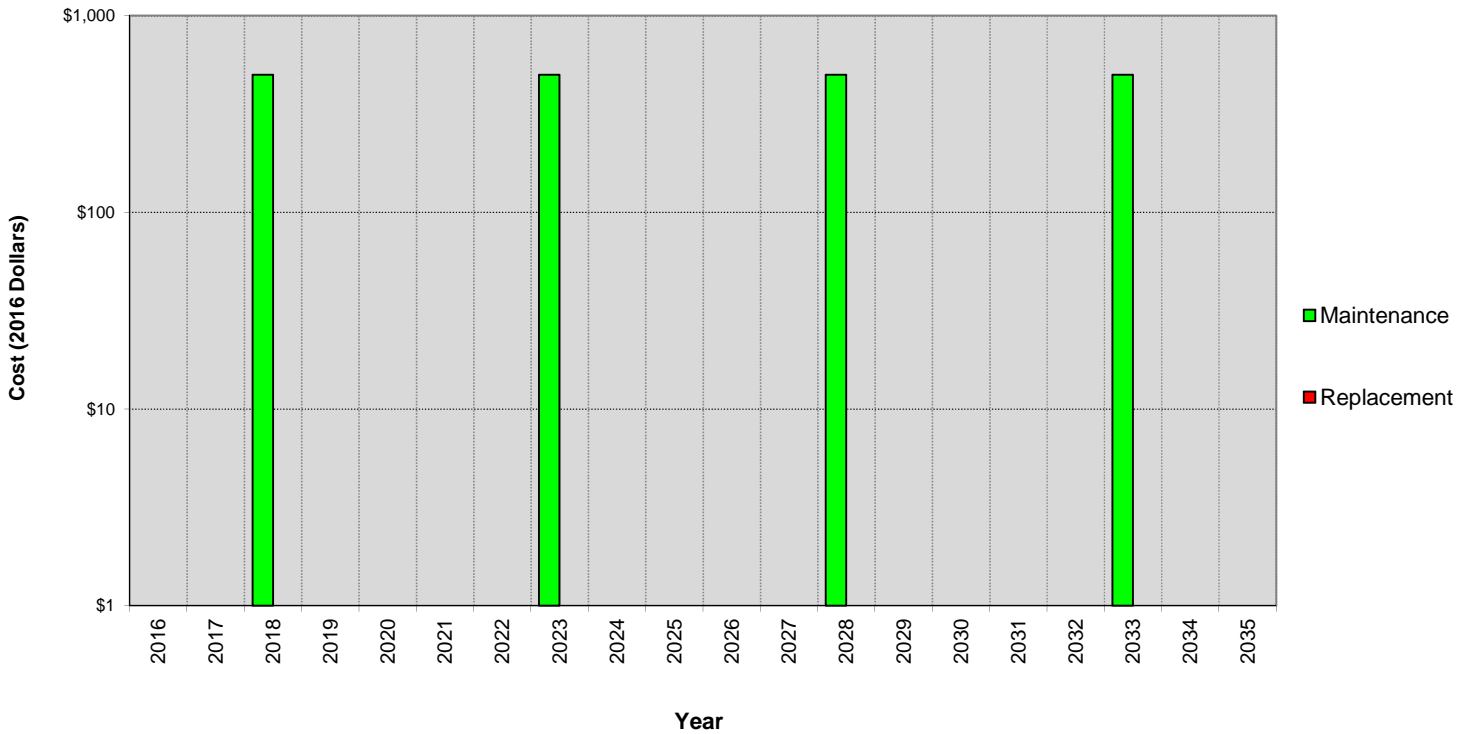
Access to Mechanical areas not available during site visit

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.13 Carnarvon Old Bowling Pav

Electrical



Item	Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Main Distribution Panel	\$ 2,500	1960	50	7	2017
Controls	\$ 3,500	2013	35		2048
Wiring Devices	\$ 1,700	1960	35	22	2017
Sump Pumps (2)	\$ 500	2013	10		2023
Electric Heating	\$ 1,600	1985	30	3	2018
Lighting-Interior	\$ 200	1960	35	21	2016
Lighting-Interior	\$ 3,300	1995	35		2030
Lighting-Exterior	\$ 500	1995	35		2030
Lighting Emergency	\$ 500	2005	25		2030

NOTES:

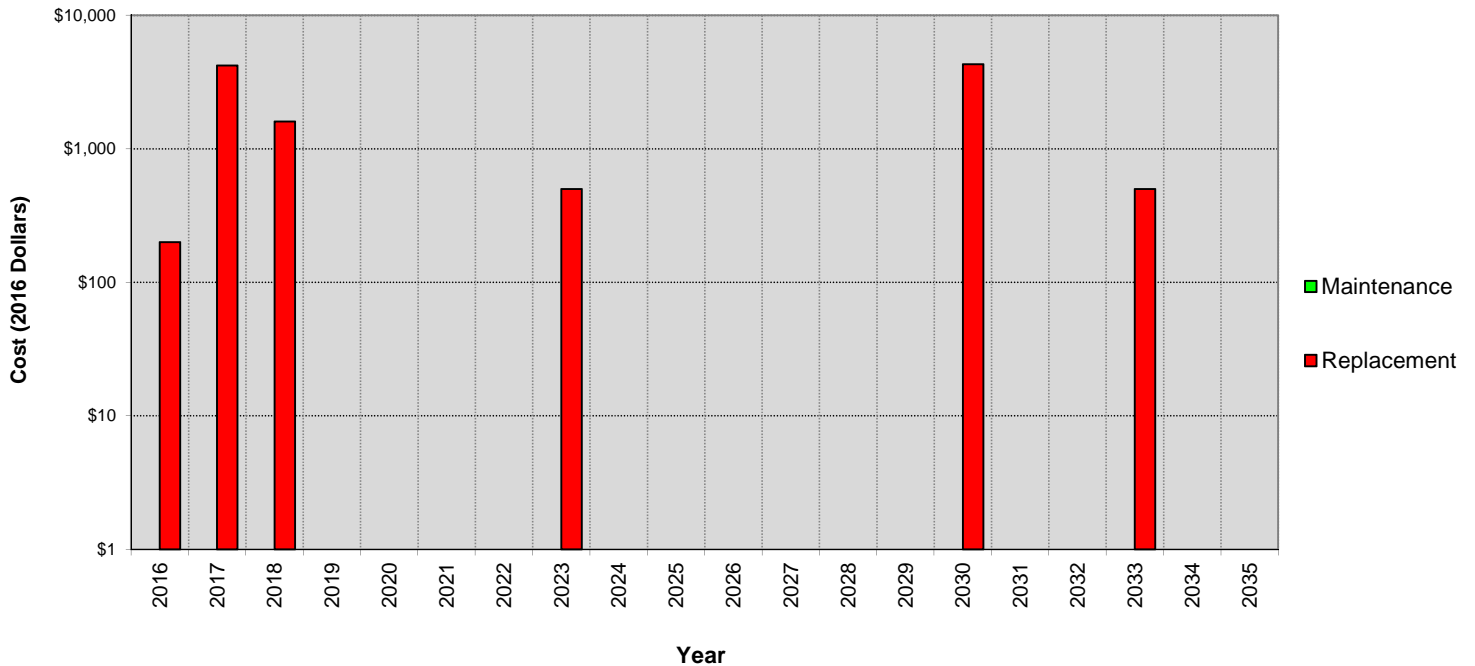
Maintenance:

Annual testing of emergency lighting and wiring devices recommended.
Annual cleaning of baseboard and space heaters recommended.
IR scan on main breaker panel recommended to determine internal condition.

Replacement:

Electric heating includes baseboards, space heaters, and thermostats.
Wiring device replacement includes switches and receptacles.
Main breaker panel recommended for priority replacement.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.4. No. 14 – Carnarvon Bowling Pavilion

	
<p>2801 Henderson Road</p> <p>Peak Occupancy: 200</p> <p>Staffing (avg.): 0</p> <p>Built: 1985</p> <p>Addition(s): 2007 (now 2,877 sf)</p> <p>HVAC: Electric baseboard, space heaters, and electric DHW</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	
<p><i>Figure No. 14 – Carnarvon Bowling Pavilion</i></p>	

2.3.4.1. Description

The Carnarvon Bowling Pavilion or ‘Carnarvon House’ lies between the Carnarvon Pavilion and the Old Bowling Pavilion. Termed the Bowling Clubs ‘social pavilion’ the single-storey, wood-framed, building was built in 1985 with a western addition and interior renovation in 2007. The pavilion features washrooms, and full kitchen and bar facilities to host events for up to 200 people. The buildings open floor plan is used during the winter months by members for alternate activities to bowling such as bridge, darts, table tennis, cribbage and mah-jong.

INTERIOR FINISHES & FURNISHINGS: Interior finishes include carpet, vinyl-sheet flooring (kitchen and washrooms) and painted walls and ceiling. They are relatively new-looking and appear well maintained.

BUILDING ENVELOPE: Exterior walls are wood-framed with stucco cladding. Original windows are single pane in metal frames while 2007 additions feature vinyl frames with double pane units. Both original and 2007 addition exterior doors are hollow-metal. The roof is sloped 6/12 and is covered with asphalt shingles and features gutters and downspouts along the north and south eaves.

MECHANICAL: The building is heated by electric baseboard and force fan space heaters. Domestic hot water for washrooms and the kitchen is provided by an electric hot water tank. The washrooms have exhaust ventilation, while mechanical supply ventilation is not present.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior, exterior and emergency lighting, and wiring devices (switches and receptacles).

2.3.4.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 33: Condition of Building Systems – No.14 – Carnarvon Bowling Pavilion

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Carpet				X	
Vinyl Sheet				X	
Building Envelope					
Stucco				X	
Windows, Aluminum			X ₁		
Windows, Vinyl				X	
Exterior Metal Doors			X		
Cedar Fascia Board			X ₂		
Gutters & Downspouts				X	
Asphalt Shingles				X	
Mechanical					
Hot Water Tank				X	
Exhaust Fans Washroom				X	
Exhaust Fan Kitchen				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution				X	
Electric Heating (Baseboard & Fan Forced)				X	
Lighting Interior				X	
Lighting Exterior				X	
Lighting Emergency				X	
Wiring Devices			X		

Notes:

1. Aluminum windows exhibit condensation near frames in kitchen. Continuous sealant lacking at exterior between frame and stucco.
2. Fascia board on south elevation is weathered, paint peeling at drip ends.

2.3.4.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Carnarvon Bowling Pavilion: Baseline Recommendations:

2017

- Replace hot water tank.

2020-21

- Replace baseboard heaters and wiring devices (receptacles & switches).
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 34: Summary of Present-Value Building Costs every 5 years – No.14 – Carnarvon Bowling Pavilion

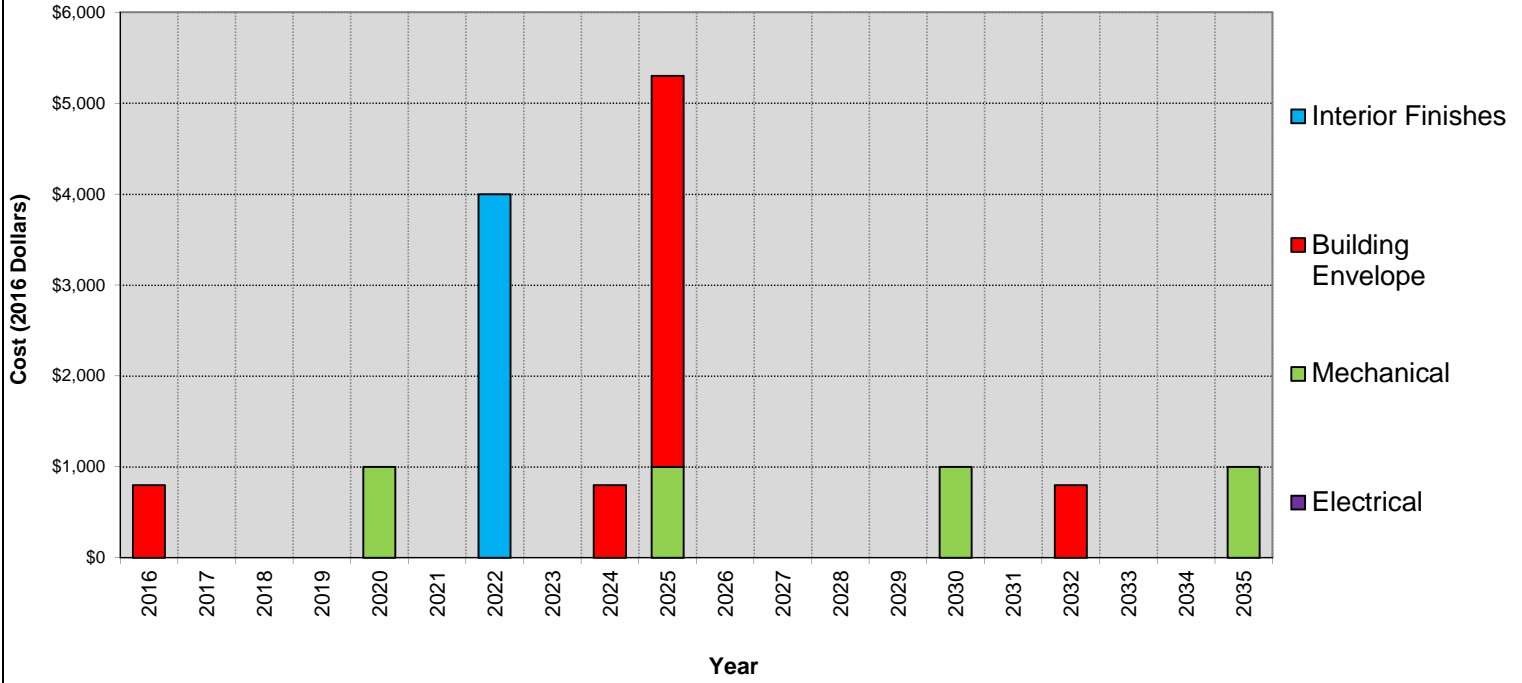
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$4,000	\$14,000	\$-	\$18,000
Building Envelope	\$800	\$12,800	\$-	\$2,900	\$16,500
Mechanical Summary	\$1,500	\$2,000	\$2,800	\$1,000	\$7,300
Electrical Summary	\$5,100	\$-	\$800	\$1,200	\$7,100
Total	\$7,400	\$18,800	\$17,600	\$5,100	\$49,000

No.14 Carnarvon Bowling Pav

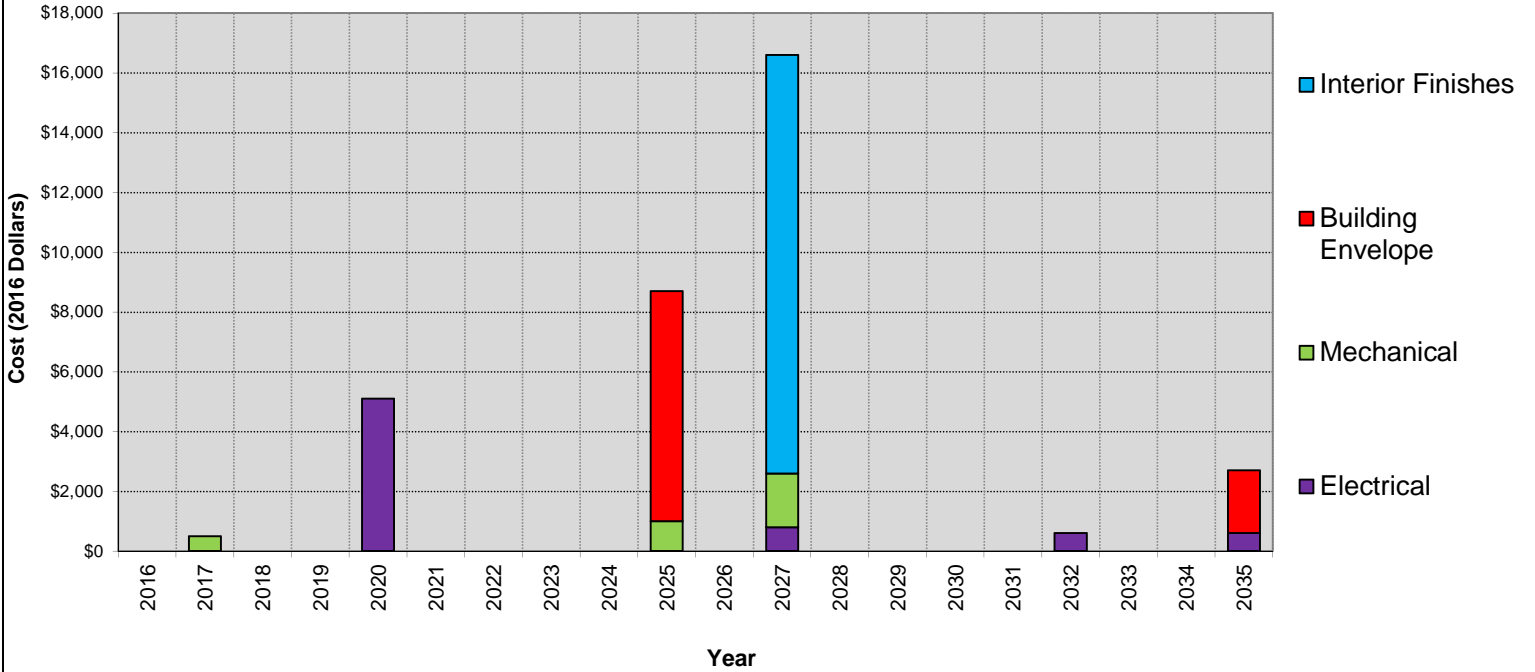
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.14 Carnarvon Bowling Pav

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 4,000	15	2007		2022
Carpet	Maintenance Replacement	\$ 11,300	2007	20		2027
Vinyl Sheet Flooring	Maintenance Replacement	\$ 2,700	2007	20		2027

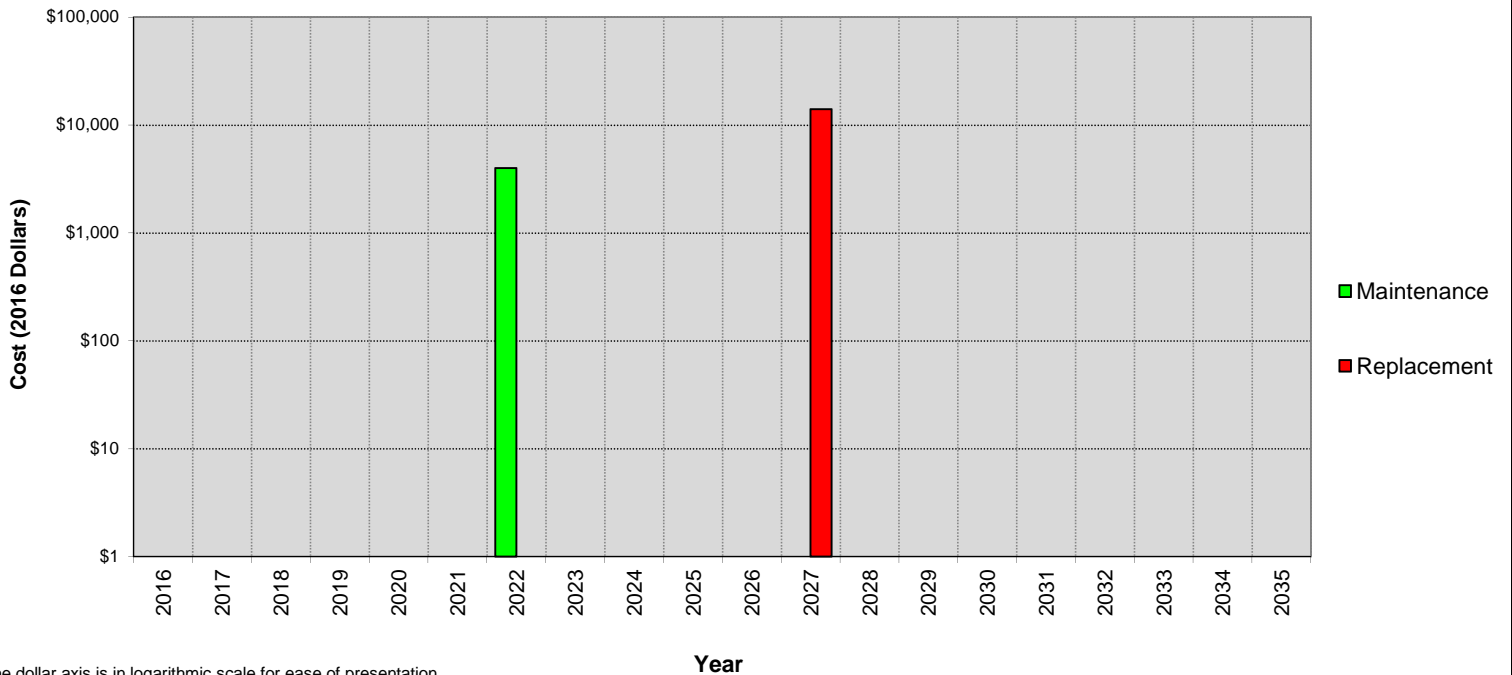
NOTES:

Maintenance:

Interior wall maintenance includes repainting walls and ceiling if required.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.14 Carnarvon Bowling Pav

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 4,300	2007	20	-2	2025
Windows Aluminum	Maintenance Replacement	\$ 7,700	1985	40		2025
Exterior Doors	Maintenance Replacement	\$ 2,100	1985	50		2035
Gutters & Downspouts	Maintenance Replacement		2007	20	2	2029
Asphalt Shingles	Maintenance Replacement		2007	20	2	2029
Cedar Fascia Board	Maintenance Replacement	\$ 800	2007	8	1	2016

NOTES:

Maintenance:

Cedar trim maintenance along roofline fascia board includes sanding and repainting.

Stucco maintenance includes repainting every 20 years to maintain face seal moisture barrier.

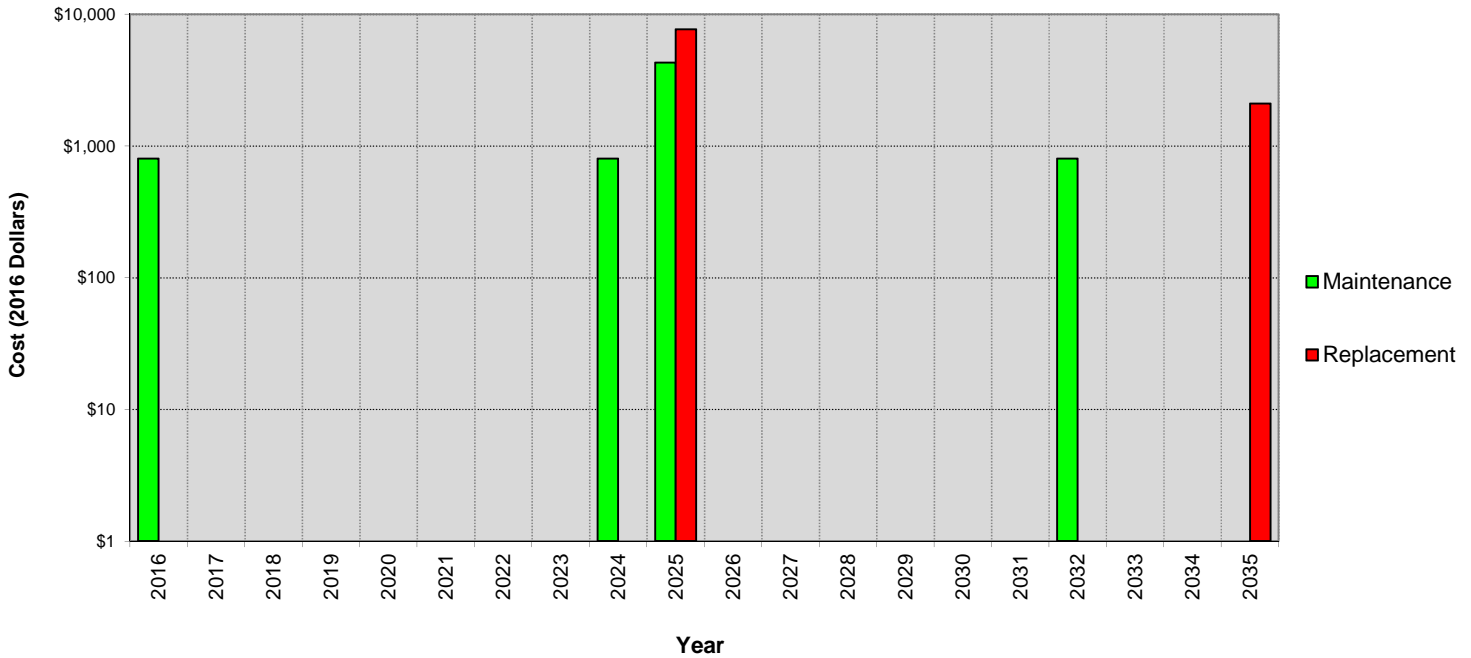
Replacement:

Replace remaining, original, aluminum-framed windows with vinyl-frames to match 2007 addition.

Original exterior doors may require replacment in the next 20 years.

Asphalt shingle roof and gutters scheduled for replacement together.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.14 Carnarvon Bowling Pav

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Hot Water Tank	Maintenance Replacement	\$ 500	2007	10		2017
Exhaust Fans Washrooms	Maintenance Replacement	\$ 1,300	2007	20		2027
Kitchen Range Exhaust	Maintenance Replacement	\$ 1,000	2005	20		2025
Plumbing Fixtures	Maintenance Replacement	\$ 1,000	2015	5		2020

NOTES:

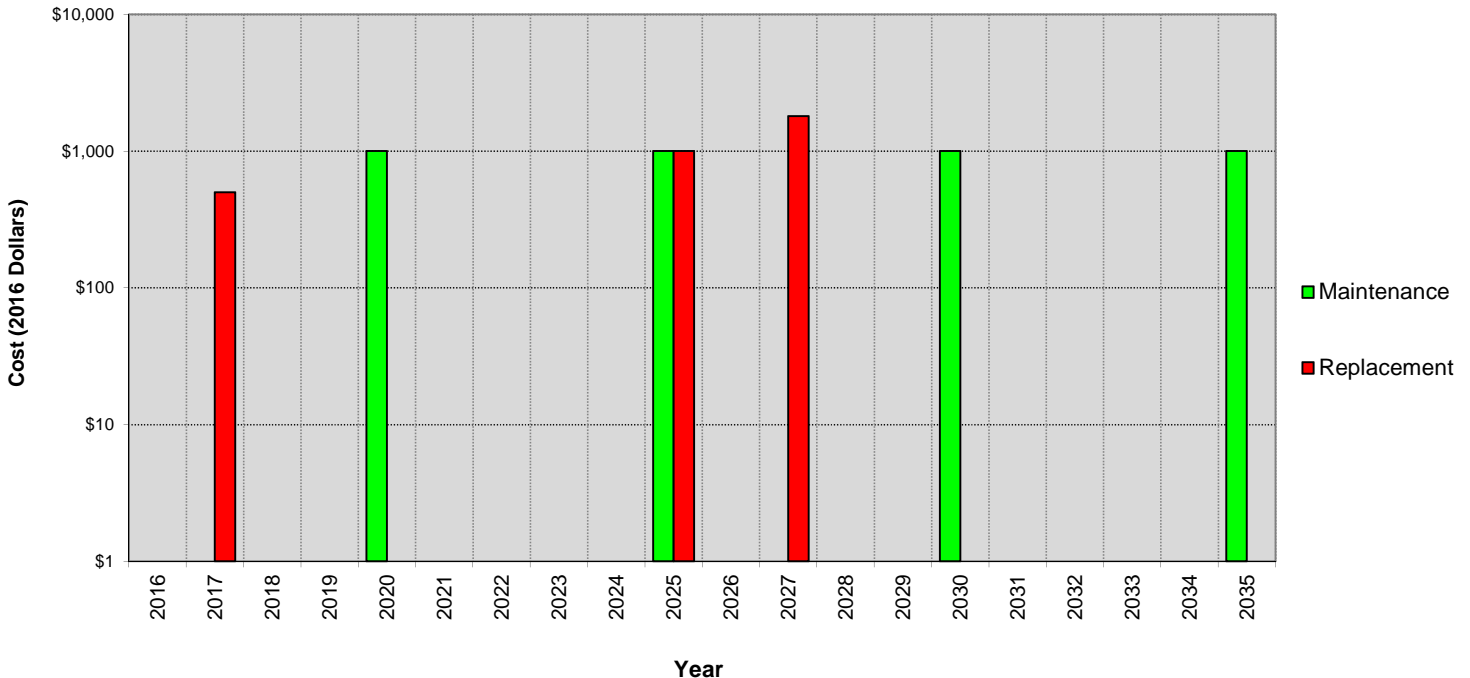
Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Kitchen range exhaust assumed to have been replaced in 2005, 20 years after original construction.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.14 Carnarvon Bowling Pav

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution	Maintenance Replacement	\$ 600	1985	50		2035
Wiring Devices	Maintenance Replacement	\$ 800	1985	35		2020
Electric Baseboard Heating	Maintenance Replacement	\$ 2,200	1985	35		2020
Electric Fan Force Heating	Maintenance Replacement	\$ 800	2007	20		2027
Lighting Emergency	Maintenance Replacement	\$ 600	2007	25		2032
Lighting - Interior	Maintenance Replacement	\$ 2,100	1985	35		2020

NOTES:

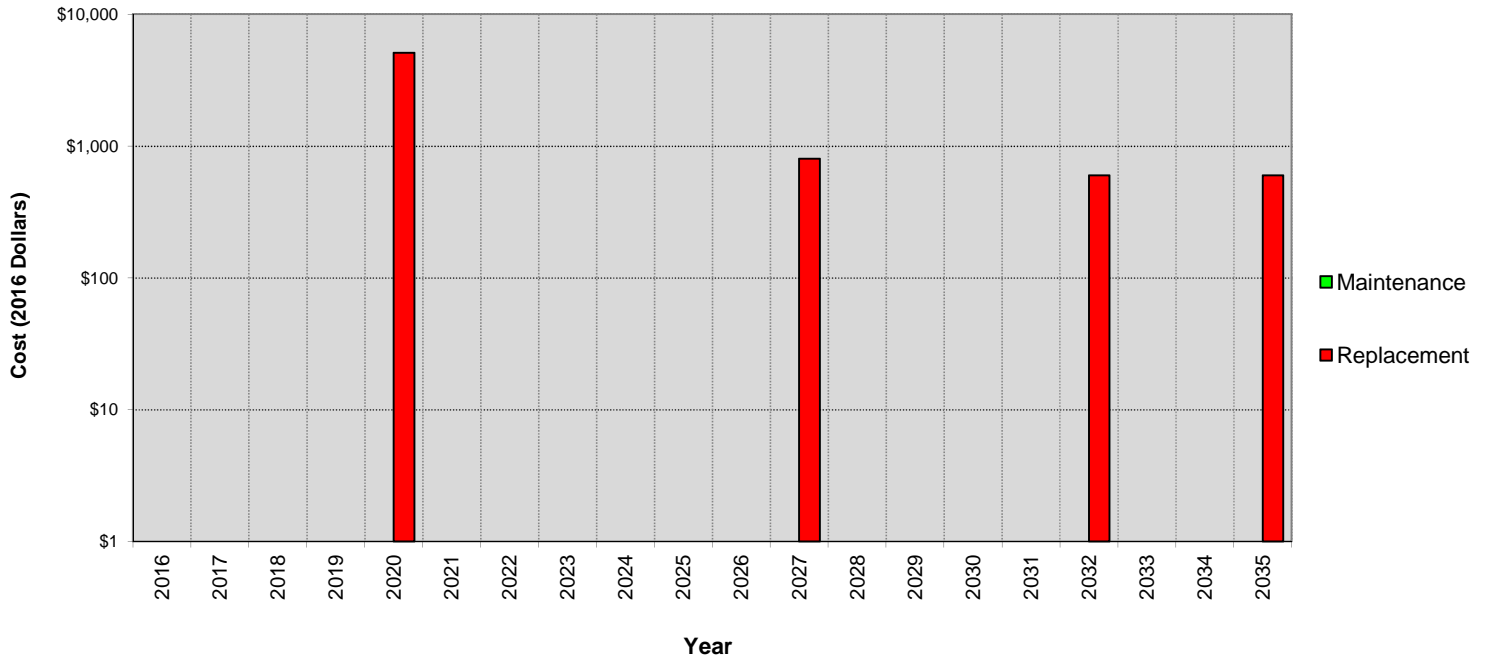
Maintenance:

Annual testing of emergency lighting and wiring devices recommended.
Annual cleaning of baseboard and space heaters recommended.

Replacement:



Most components of power distribution not expected for replacement in the next 20 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.5. No. 15 – Willows Park Pavilion “The Teahouse”

<p>Willows Park Esplanade</p> <p>Peak Occupancy: 30</p> <p>Staffing (avg.): 5-10 volunteers</p> <p>Built: 1949 (1,928 sf)</p> <p>Addition(s): None</p> <p>HVAC: Electric baseboard, DHW</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	  <p><i>Figure No. 15 – Willows Park Pavilion “The Teahouse”</i></p>
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2.3.5.1. Description

Willows Park Pavilion, also known as “The Teahouse” is leased from the District to the Kiwanis Club of Oak Bay. The Kiwanis Club built The Teahouse in 1949 as a seaside building for social events. The small, single storey, wood-framed building is built into the embankment sloping down towards Willows Beach. The main floor features a sitting area and commercial kitchen. A single washroom is also present on the main floor for kitchen users. There is a full-height concrete basement which is used for storage. Parking is available curbside to the building while the main entrance is on the north side of the building.

INTERIOR FINISHES & FURNISHINGS: Interior finishes include marmoleum flooring and painted walls and ceiling.

BUILDING ENVELOPE: Exterior walls are wood-framed and clad with an exterior plywood product similar to CREZON® with wood trim. Original wood-framed windows were replaced in 2012 with vinyl-framed, sealed glazing unit assemblies. The roof is sloped 4/12 with asphalt shingles and does not feature gutters and downspouts, and generously overhangs the walls below.

MECHANICAL: The building is heated by electric baseboard and internal gains from kitchen equipment when operating. Domestic hot water for washrooms and the kitchen is provided by an electric hot water tank. Exhaust ventilation is present in the washroom as well as the fire-suppressed kitchen vent hood. Mechanical supply ventilation is not present.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior and exterior lighting, and wiring devices (switches and receptacles).

2.3.5.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 35: Condition of Building Systems – No.15 – Willows Park Pavilion “The Teahouse

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Marmoleum			X		
Building Envelope					
Exterior Plywood Cladding		X ₁			
Cedar Trim Board		X ₂			
Windows, Vinyl					X
Soffit			X ₃		
Flashing			X ₃		
Asphalt Shingles			X		
Exterior Doors			X		
Concrete Foundation			X ₄		
Mechanical					
Hot Water Tank					X
Exhaust Fan Washroom				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution			X ₅		
Electric Heating, Baseboard					X
Lighting Interior			X		
Lighting Exterior			X		
Wiring Devices			X		

Notes:

1. Paint worn and cracking on south and east elevations. Exterior plywood sheet is deteriorated at base of wall where it is in direct contact with grade on south elevation.

2. Paint worn, deteriorated at corner joints of window sills.
3. Roof fascia flashing does not have adequate drip edge from soffit; wind-rain is tracking back onto soffit.
4. Foundation cracked in basement, west wall, with visible water ingress. Cracking around guardrail penetrations on north east exterior corner.
5. Power distribution does not appear to have been adequately maintained. Replacement recommended within the next 2 to 5 years.

2.3.5.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Willows Park Pavilion: Baseline Recommendations:

2016

- Remove saturated wood/ panels.
- Repair concrete foundation at west wall below-grade and east elevation.
- Consider among other design options spray foam (insulation and air barrier) wood-frame floor cavity (ceiling of basement). Thickness to be determined.
- Electrical upgrade: replace wiring devices (switches, receptacles), and lighting.
- Determine basement water management (sump, concrete floor with perforated drainage to beach, etc.).

2017

- Exterior renovation: replaced cladding, trim board, soffit, and flashing.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2018

- Replace main distribution, panel and breakers.

2020-21

- Replace exterior doors.
- Replace baseboard heaters and wiring devices (receptacles & switches).
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 36: Summary of Present-Value Building Costs every 5 years – No.15 – Willows Park Pavilion “The Teahouse

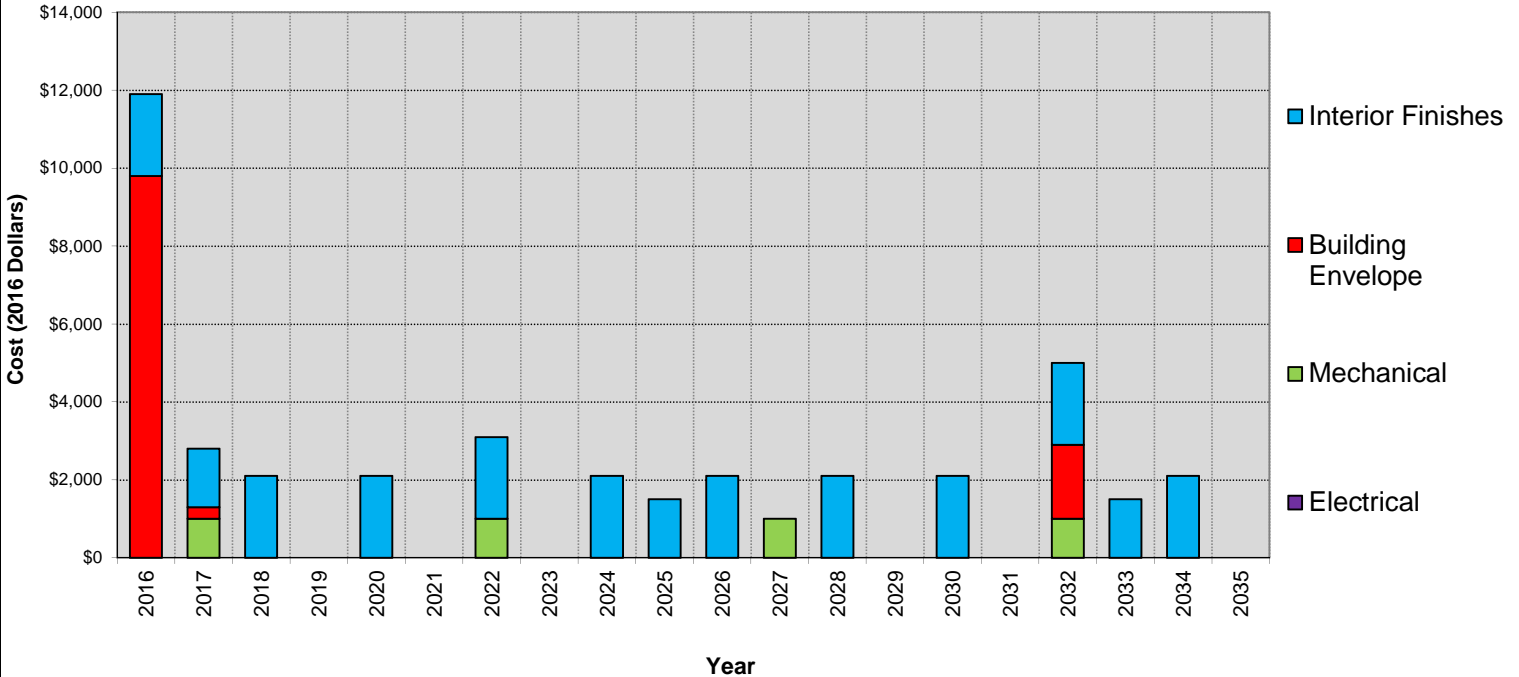
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$22,800	\$14,200	\$6,300	\$20,700	\$64,000
Building Envelope	\$28,900	\$-	\$5,000	\$1,900	\$35,800
Mechanical Summary	\$1,000	\$1,800	\$1,400	\$1,000	\$5,200
Electrical Summary	\$7,600	\$-	\$-	\$700	\$8,300
Total	\$60,300	\$16,000	\$12,700	\$24,300	\$113,000

No.15 Willows Park Pavilion

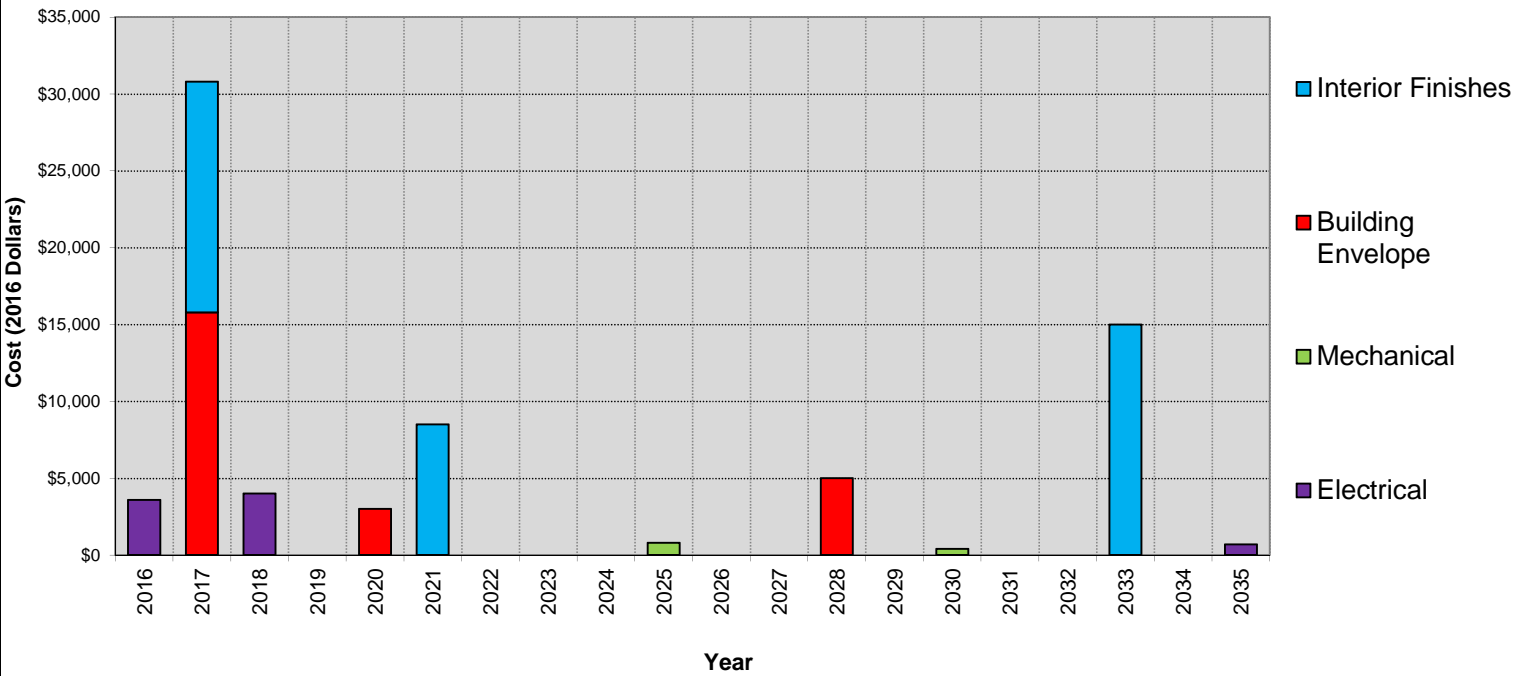
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.15 Willows Park Pavilion

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance	\$ 2,100	2014	2		2016
	Replacement					
Marmoleum	Maintenance	\$ 1,500	2009	8		2017
	Replacement	\$ 8,500	2001	20		2021
Millwork	Maintenance	\$ 15,000	2001	16		2017
	Replacement					

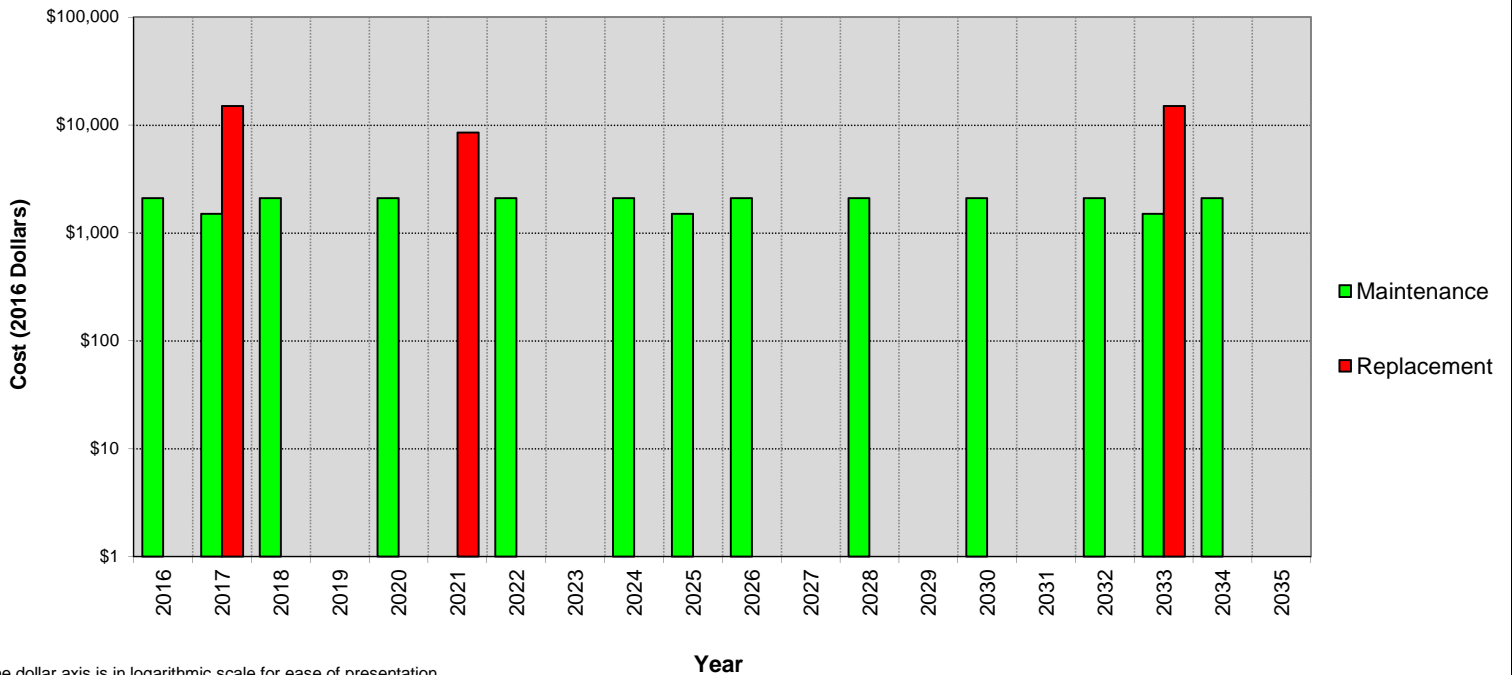
NOTES:

Maintenance:

Marmoleum maintenance includes stripping and refinishing.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.15 Willows Park Pavilion

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Exterior Plywood (CREZON®)	Maintenance	\$ 800		15		2032
	Replacement	\$ 7,000		30		2017
Cedar Trim Board	Maintenance	\$ 300		15		2017
	Replacement					
Windows Vinyl	Maintenance	\$ 800	2012	10		2032
	Replacement					
Soffit	Maintenance	\$ 1,200				
	Replacement	\$ 7,200		30		2017
Asphalt Shingles	Maintenance					
	Replacement	\$ 5,000	2003	25		2028
Flashing	Maintenance					
	Replacement	\$ 1,600				2017
Exterior Doors	Maintenance					
	Replacement	\$ 3,000				2020
Concrete Foundation	Maintenance	\$ 5,000				2016
	Replacement					
Spray Foam Flooring	Maintenance	\$ 4,800				2016
	Replacement					

NOTES:

Maintenance:

Window maintenance includes periodic replacement of sealed glazing units as required every 10 years beginning after 20 year service life is reached.

Cladding and soffit maintenance includes repainting every 15 years after upcoming replacement.

Partial concrete foundation repairs in basement were observed at east elevation guardrail penetrations. Remove the large amount of wood in basement at risk of decay on floor as it poses a risk to the air quality.

Site runoff towards beach and ocean storms occasionally floor the basement, which is then allowed to partially dry via passive ventilation. Insulation and air barrier separation of basement from cafe is recommended by use of spray foam.

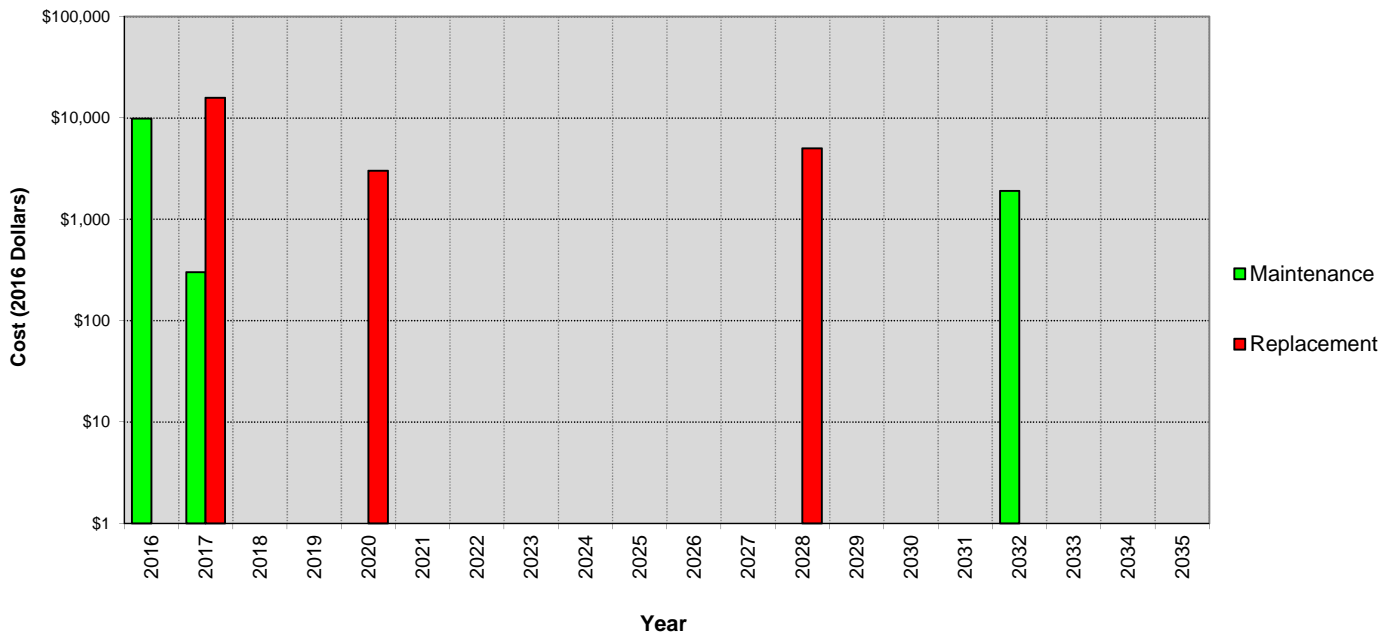
Replacement:

Plywood cladding and soffit are in fair to poor condition and are recommended for replacement in the next few years. Replacement with CREZON® exterior plywood sheet.

Roofline flashing to be replaced with soffit. An improved drip-edge to prevent water wicking back is recommended.

Exterior wood doors are recommended for replacement with hollow-metal doors within the next five years.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.15 Willows Park Pavilion

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Hot Water Tank	Maintenance Replacement	\$ 800	2013	12		2025
Exhaust Fan	Maintenance Replacement	\$ 400	2010	20		2030
Washroom	Maintenance	\$ 1,000	2012	5		2017

NOTES:

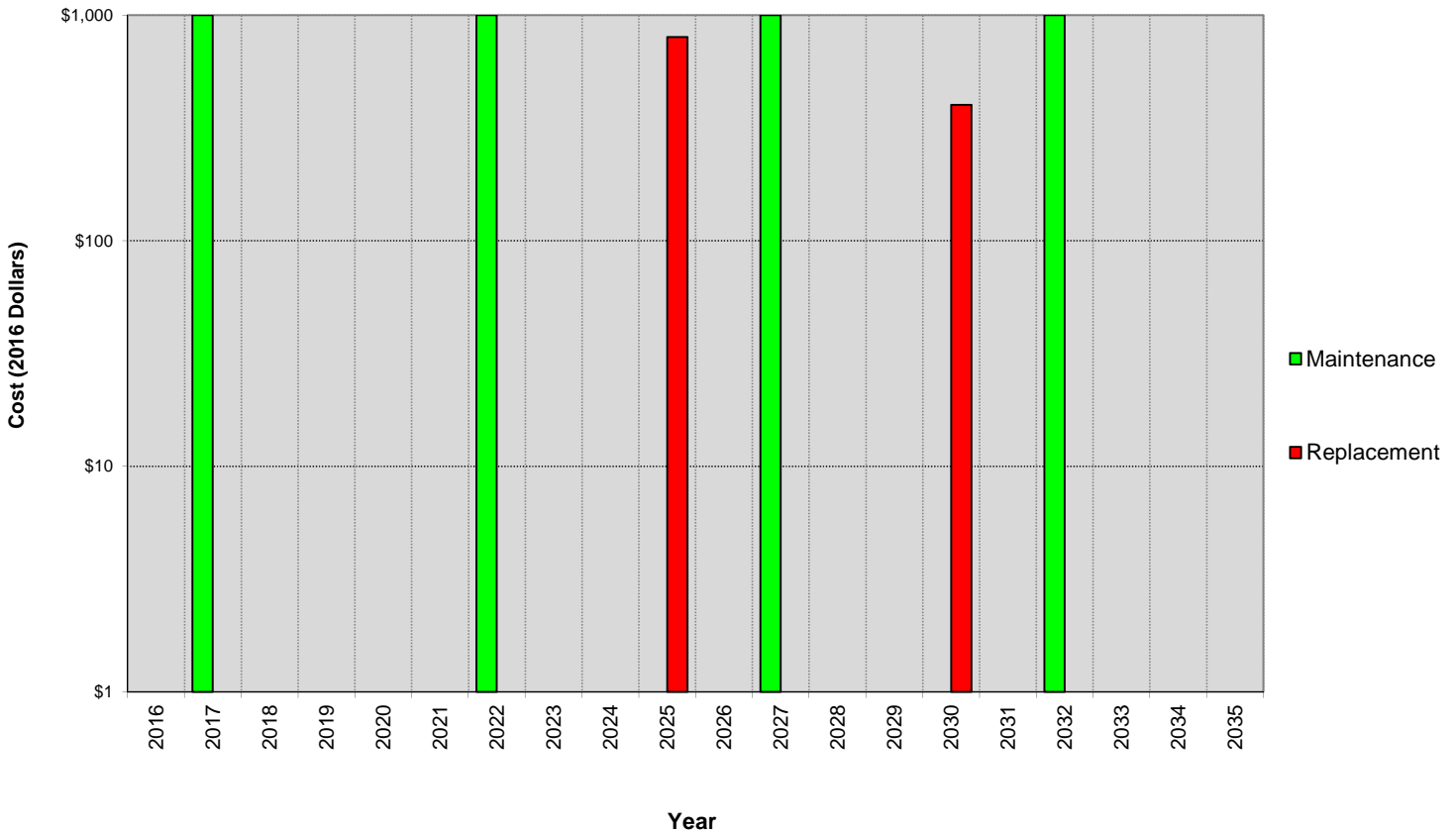
Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Kitchen fire-rated exhaust system is not expected for replacement in the next 20 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.15 Willows Park Pavilion

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Main Power Distribution	Maintenance Replacement	\$ 4,000	1975	50	-7	2018
Secondary Power Distribution	Maintenance Replacement	\$ 700	1985	50		2035
Wiring Devices	Maintenance Replacement	\$ 2,300	1975	35	6	2016
Lighting - Interior	Maintenance Replacement	\$ 500	1975	35	6	2016
Lighting - Exterior	Maintenance Replacement	\$ 800	1975	35	6	2016

NOTES:

Maintenance:

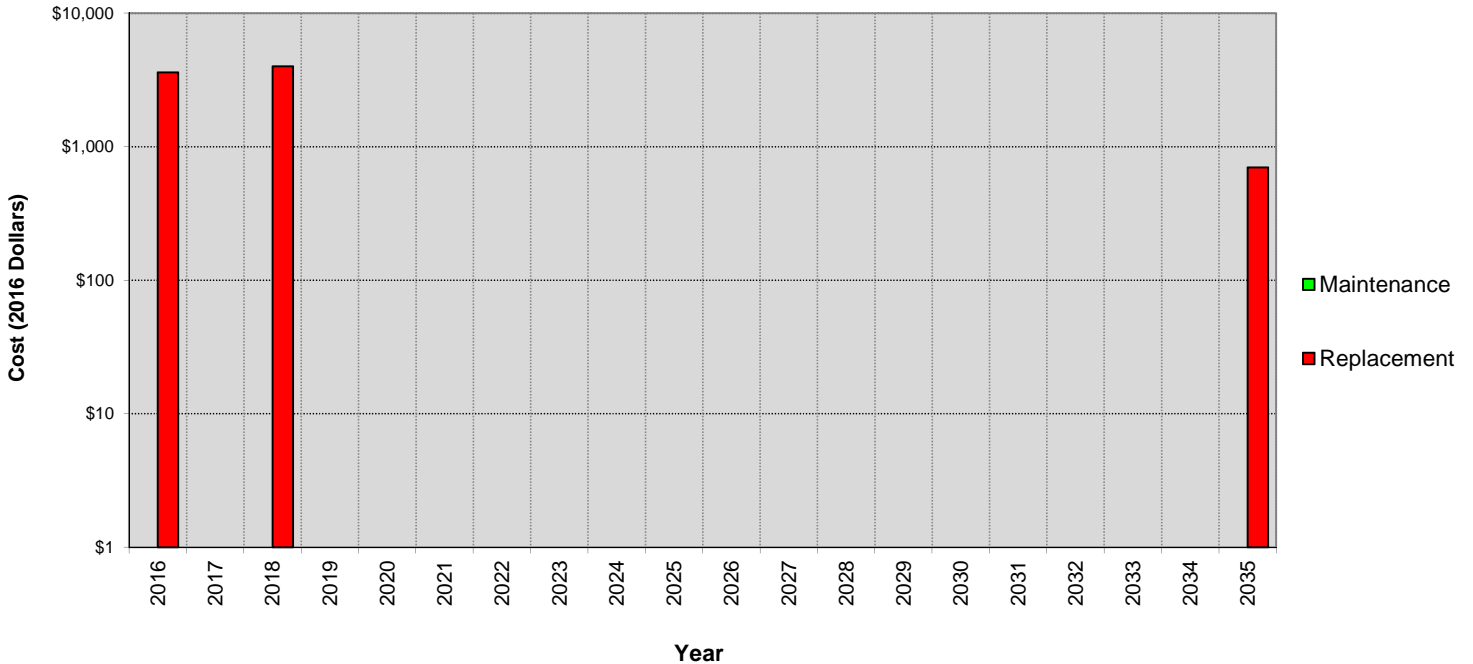
Annual cleaning of baseboard and space heaters recommended.

Replacement:

Wiring devices (receptacles and switches), interior and exterior lighting are priority replacements.


Power distribution includes panels and breaker replacement.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.6. No.16 – Willows Park Washroom

<p>Willows Park Esplanade</p> <p>Peak Occupancy: 5-10</p> <p>Staffing (avg.): 0</p> <p>Built: 1982 (951 sf)</p> <p>Addition(s): None</p> <p>HVAC: Electric baseboard, DHW</p> <p>Fire Suppression: None</p> <p>Access: Wheelchair access</p>	
<p><i>Figure No. 16 – Willows Park Washroom</i></p>	

2.3.6.1. Description

Located on the north end of Willows Park is a single-storey concrete block building. The building was constructed in 1982 and houses washrooms and change rooms for park and beach users. Between the Female and Male sides of the building is a service corridor that contains all electrical and mechanical equipment.

INTERIOR FINISHES & FURNISHINGS: The interior of the building features robust brick floor tile and painted concrete block walls. Wooden benches and partitions are present along with appropriate vanities.

BUILDING ENVELOPE: The building’s exterior walls are constructed with concrete masonry block to a height of 7’; a further 3’8” is wood-framed with wood-framed windows and cedar board siding to the height of the roof parapet. Portions of concrete block are faced with stone tile on the east elevation. Exterior doors are all hollow-metal. The original roof was built-up with gravel ballast, but it has since been replaced with 2-ply SBS membrane with rooftop drains. All assemblies are not insulated.

MECHANICAL: The only source of heating present in the building is a single electric 1500W baseboard in the service corridor. Exhaust ventilation (200cfm) for each washroom is present with 10”x20” overhead grilles between change rooms and washrooms to allow airflow between the two spaces. Domestic hot water is not present in the building.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior and exterior lighting, and wiring devices (switches and receptacles).

2.3.6.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 37: Condition of Building Systems – No.16 – Willows Park Washroom

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Ceramic Tile				X	
Building Envelope					
CMU				X	
Cedar Trim & Fascia				X	
Windows, Aluminum				X	
Exterior Metal Doors			X ₁		
SBS 2-Ply Roof Membrane		X ₂			
Roof Drains & Downspouts		X ₃			
Mechanical					
Exhaust Fan Washroom				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				
West Grade		X ₄			
Electrical					
Power Distribution				X	
Electric Heating, Baseboard				X	
Lighting Interior				X	
Lighting Exterior				X	
Wiring Devices				X	

Notes:

1. Visible corrosion of doors at top, bottom and hinges. Paint beginning to flake off.
2. Roof observed with significant debris and ponding. Re-sloping package recommended with membrane replacement.
3. Downspout at west elevation disconnected.
4. West grade is sloped into building, recommend it be re-sloped to drain away. Soil is saturated at this elevation which may mean perimeter drains require flushing.

2.3.6.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these

recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Willows Park Washroom: Baseline Recommendations:

2016

- Repair west elevation downspout and install two additional downspouts.

2017

- Replace baseboard heater in utility corridor.
- Replace wiring devices (switches and receptacles).
- Replace SBS roofing membrane.

2018

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.
- Re-grade west slope, flush perimeter drains.

2020-21

- Replace exterior doors.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 38: Summary of Present-Value Building Costs every 5 years – No.16 – Willows Park Washroom

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$10,900	\$900	\$10,400	\$900	\$23,100
Building Envelope	\$16,800	\$8,900	\$1,200	\$1,200	\$28,100
Mechanical Summary	\$3,500	\$2,700	\$1,000	\$1,000	\$8,200
Electrical Summary	\$700	\$1,700	\$-	\$3,000	\$5,400
Total	\$31,900	\$14,200	\$12,600	\$6,100	\$65,000

No.16 Willows Park Washroom

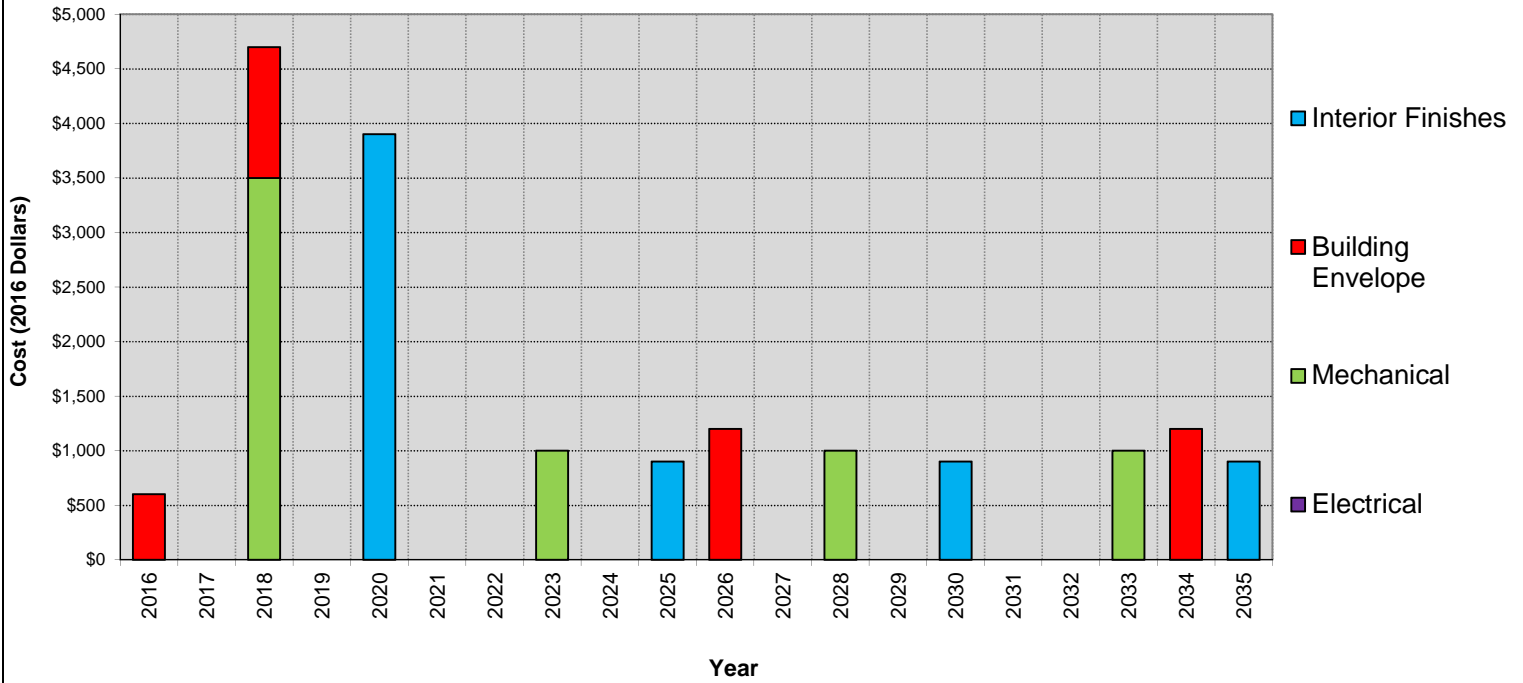
Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																				
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Section 1 - INTERIOR FINISHES COMPONENTS																											
Interior Walls	Maintenance Replacement	900	2010	5		2015					900					900					900				900		
Ceramic Tile	Maintenance Replacement	3000	2000	20		2020				3,000																	
Washrooms	Maintenance Replacement	9500	1970	60		2030															9,500						
Partitions	Maintenance Replacement	7000	2000	20		2020				7,000																	
Interior Summary	Maintenance Replacement									3,900					900						900				900		
										7,000											9,500						
Section 2 - BUILDING ENVELOPE COMPONENTS																											
Cedar Board	Maintenance Replacement	1200	2010	8		2018			1,200							1,200									1,200		
Windows	Maintenance Replacement	6100	1982	40		2022					6,100																
Exterior Doors	Maintenance Replacement	2800	1982	50	-10	2022					2,800																
Downspouts	Maintenance Replacement	600				2016	600																				
SBS Membrane	Maintenance Replacement	15000				2017		15,000																			
Roof	Maintenance Replacement						600		1,200							1,200									1,200		
Building Envelope Summary	Maintenance Replacement							15,000			8,900														1,200		
Section 3 - MECHANICAL COMPONENTS																											
Plumbing Fixtures	Maintenance Replacement	1000	2013	5		2018			1,000				1,000						1,000						1,000		
Exhaust Fans	Maintenance Replacement																										
Washrooms	Maintenance Replacement	1700	2002	20		2022					1,700																
Regrade West	Maintenance Replacement	2500				2018			2,500																		
Slope	Maintenance Replacement								3,500																		
Mechanical Summary	Maintenance Replacement										1,700	1,000					1,000							1,000			
Section 4 - ELECTRICAL COMPONENTS																											
Power Distribution	Maintenance Replacement	3000	1982	50		2032																		3,000			
Wiring Devices	Maintenance Replacement	400	1982	35		2017		400																			
Lighting - Interior	Maintenance Replacement	1400	1982	35		2022					1,400																
Lighting - Exterior	Maintenance Replacement	300	1982	35		2022					300																
Electric Heating	Maintenance Replacement	300	1982	30		2017		300																			
Electrical Summary	Maintenance Replacement							700			1,700													3,000			
Building Summary	Maintenance Replacement						600	15,700	4,700		3,900	7,000	12,300	1,000	900	1,200		1,000			900			3,000	1,000	1,200	900
Yearly Totals							\$600	\$15,700	\$4,700		\$10,900	\$12,300	\$1,000	\$900	\$1,200		\$1,000			\$10,400			\$3,000	\$1,000	\$1,200	\$900	
Totals Inflated at 2% per Year							\$600	\$16,014	\$4,890		\$11,799	\$13,852	\$1,149	\$1,076	\$1,463		\$1,268			\$13,723			\$4,118	\$1,400	\$1,714	\$1,311	

No.16 Willows Park Washroom

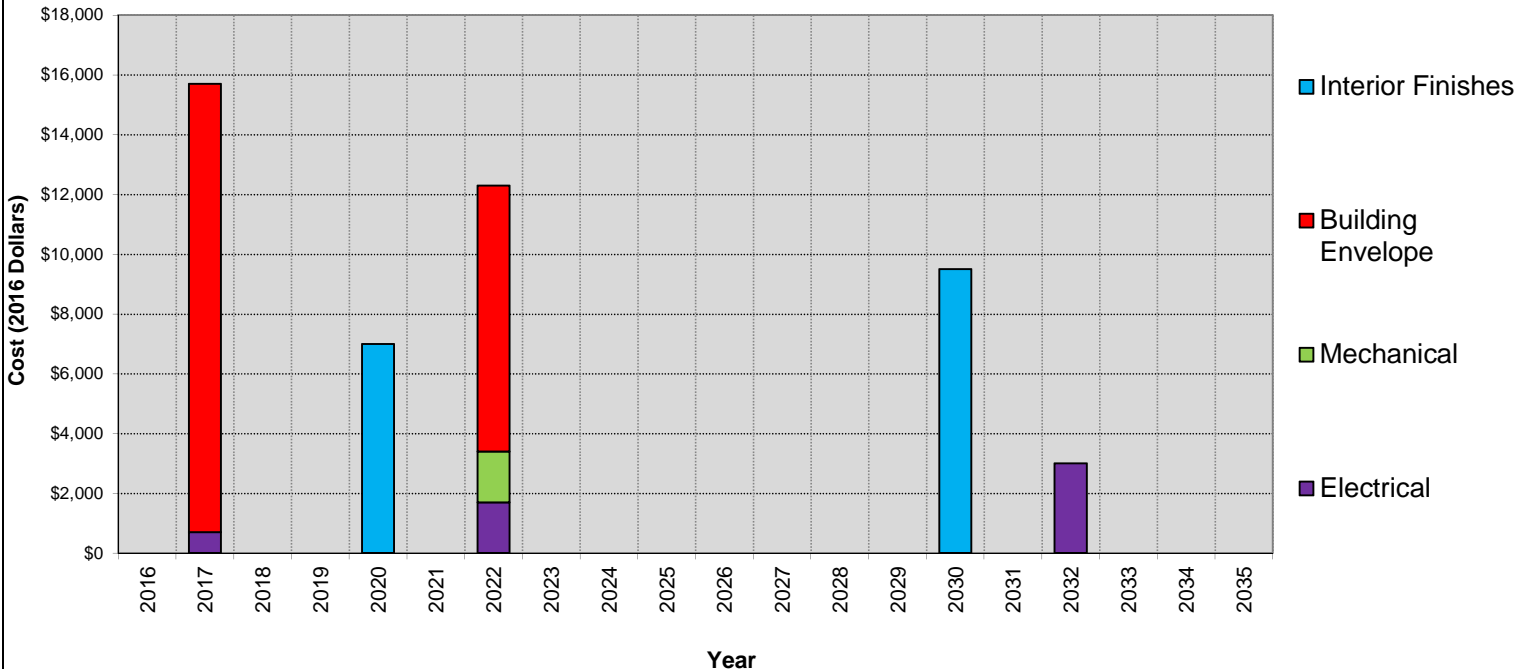
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.16 Willows Park Washroom

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance	\$ 900	2010	5		2015
	Replacement					
Ceramic Tile Washrooms	Maintenance	\$ 3,000	2000	20		2020
	Replacement	\$ 9,500	1970	60		2030
Partitions	Maintenance	\$ 7,000	2000	20		2020
	Replacement					

NOTES:

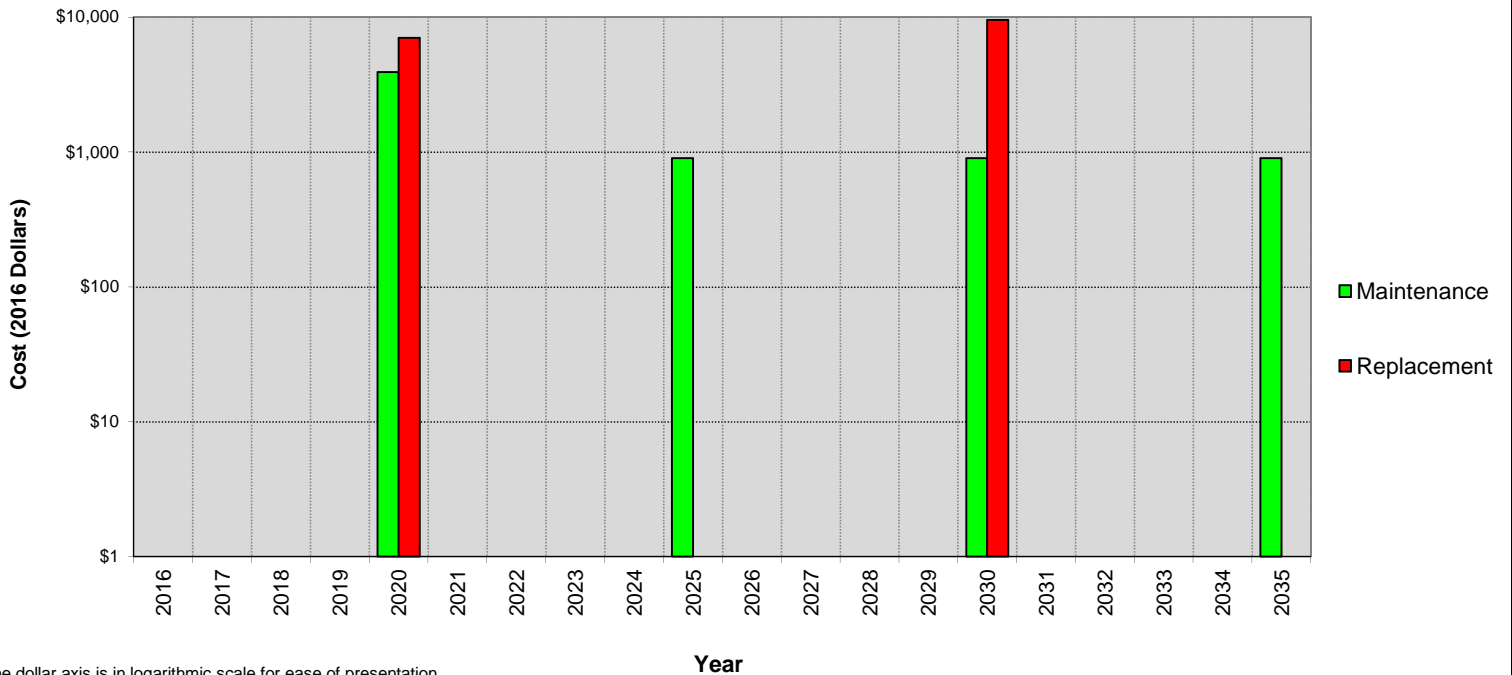
Maintenance:

Interior walls includes washroom partitions on both men's and women's sides. Maintenance includes repainting every 5 years by staff and volunteers (paint cost only is modelled).

Replacement:

Ceramic tile in washrooms may require replacement in the next 30 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.16 Willows Park Washroom

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Cedar Board	Maintenance Replacement	\$ 1,200	2010	8		2018
Windows Wood	Maintenance Replacement	\$ 6,100	1982	40		2022
Exterior Doors Metal	Maintenance Replacement	\$ 2,800	1982	50	-10	2022
Downspouts	Maintenance Replacement	\$ 600				2016
SBS Membrane Roof	Maintenance Replacement	\$ 15,000				2017

NOTES:

Maintenance:

Cedar board maintenance includes repainting and part replacement as required.

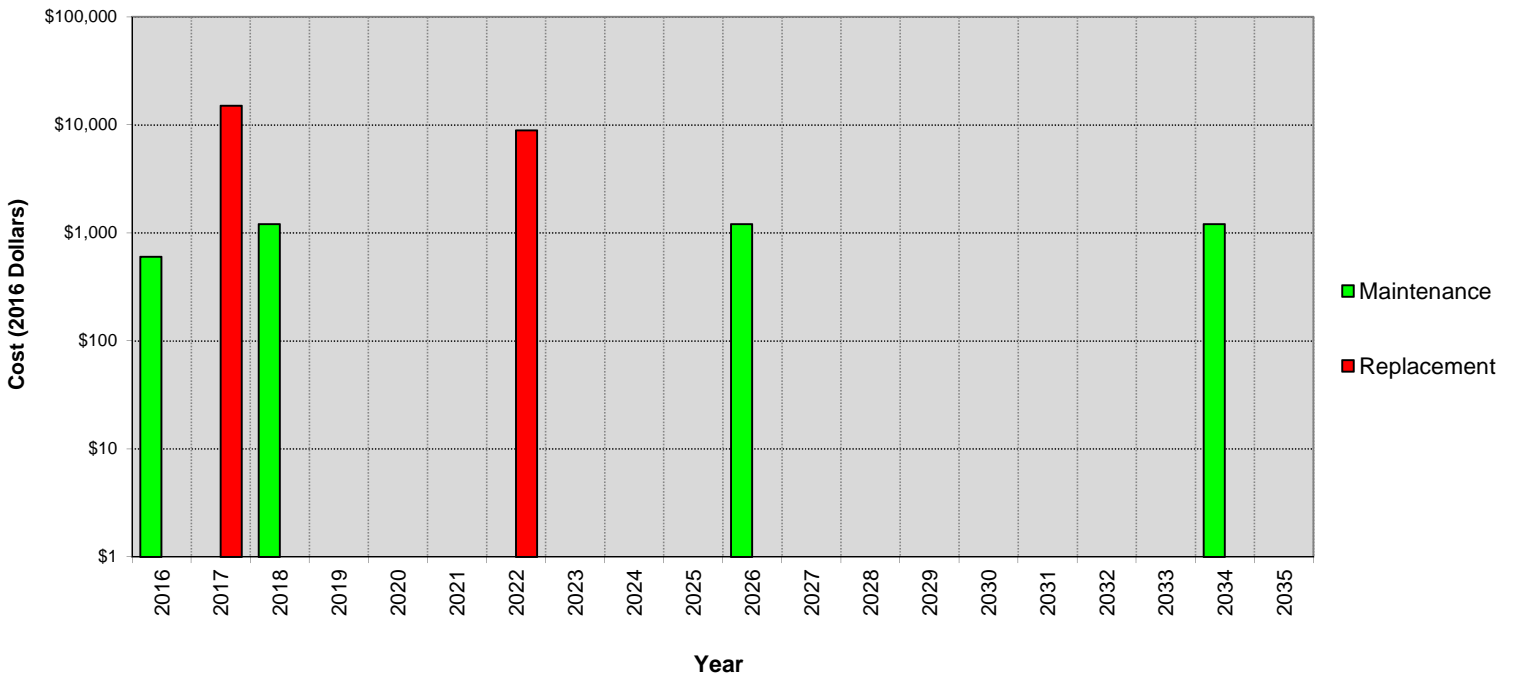
Downspout on west elevation needs to be reconnected. Installation of two additional downspouts at low-points to distribute flow of roof runoff. Significant ponding and leafy/tree deposits on roof due to surrounding mature trees.

Replacement:

Replace remaining, original, wood-framed windows with aluminum within the next 5-10 years with exterior doors.

SBS membrane replacement recommended in the next 3 years. Replacement estimate includes resloping package to relieve ponding concerns. An alternative would be to covert the flat roof to sloped. A sloped roof would cost less to maintain and improve drainage. The budgeted amount is for membrane replacement.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.16 Willows Park Washroom

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Plumbing Fixtures	Maintenance Replacement	\$ 1,000	2013	5		2018
Exhaust Fans Washrooms	Maintenance Replacement	\$ 1,700	2002	20		2022
Regrade West Slope	Maintenance Replacement	\$ 2,500				2018

NOTES:

Maintenance:

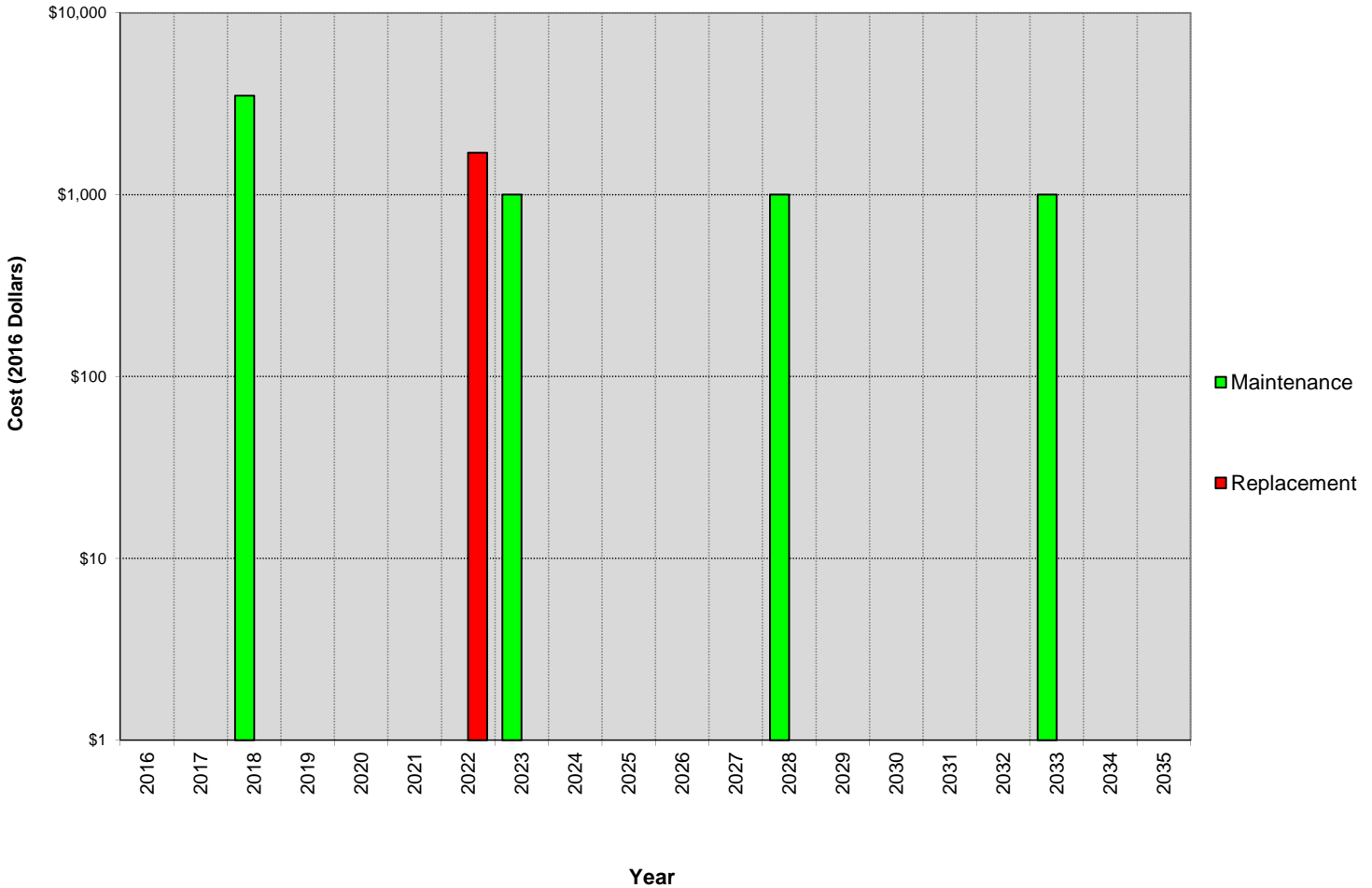
Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Exhaust fans (200 cfm) in each washroom recommended for replacement within the next 5-10 years.

Regrade base of wall on west elevation to improve drainage.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.16 Willows Park Washroom

Electrical



Item	Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution Main	\$ 3,000	1982	50		2032
Wiring Devices	\$ 400	1982	35		2017
Lighting - Interior	\$ 1,400	1982	35	5	2022
Lighting - Exterior	\$ 300	1982	35	5	2022
Electric Heating	\$ 300	1982	30	5	2017

NOTES:

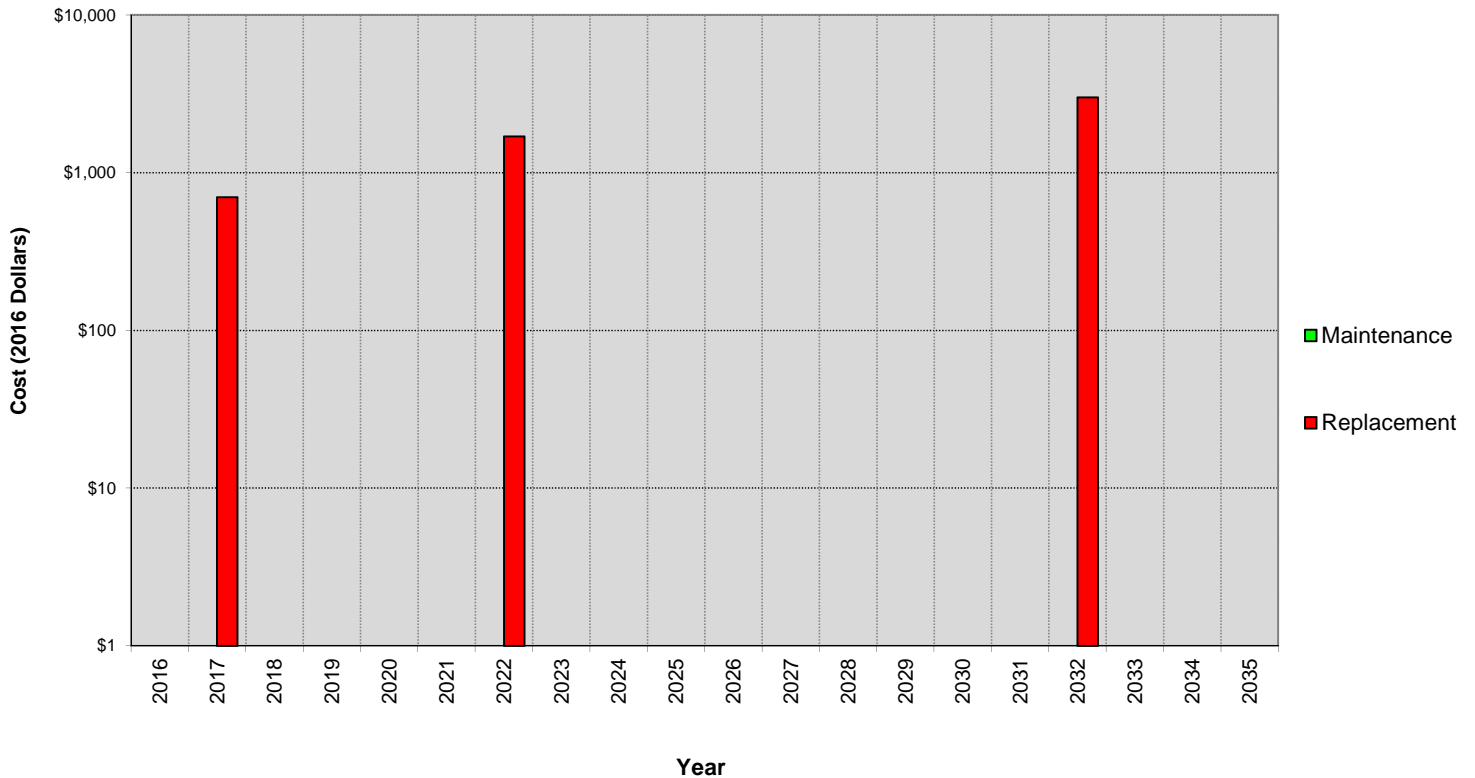
Maintenance:

Electrical maintenance assumed under Parks operating budget.

Replacement:


Power distribution includes main panel and breakers.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.3.7. No. 17 – Quimper Park Washroom

<p>2115 Quimper Street</p> <p>Peak Occupancy: 5-10</p> <p>Staffing (avg.): 0</p> <p>Built: 1970 (318 sf)</p> <p>Addition(s): None</p> <p>HVAC: None</p> <p>Fire Suppression: None</p> <p>Access: Wheelchair access</p>	 <p style="text-align: center;"><i>Figure No. 17 – Quimper Park Washroom</i></p>
--	--

2.3.7.1. Description

Quimper Park, named after Spanish explorer Manuel Quimper, is located in the south west of Oak Bay near the Chinese Cemetery. A small washroom/shelter building is situated near the south west corner of the 0.23 hectare neighbourhood park. The building was constructed c.1970 and features washrooms either side of wood-framed covered shelter.

INTERIOR FINISHES & FURNISHINGS: The washrooms are minimally finished for low-maintenance with painted concrete floors, block walls, and wood partitions.

BUILDING ENVELOPE: The exterior walls are constructed of concrete masonry block that is not insulated, and portions of the top of this wall exposed to weather are open and not capped with flashing which absorbs water and accelerates aging and organic growth. Exterior doors are hollow-metal while a single window in each washroom is wood-framed. The roof parapet is features painted cedar fascia board that is cap flashed. Roof and canopy areas are low-sloped 2-ply SBS membrane. Washroom roofs feature roof-top drains, however the canopied area does not.

MECHANICAL: The building is not heated or supplied with hot water. The washrooms are not mechanically ventilated.

ELECTRICAL: The building is not supplied with electricity.

2.3.7.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 39: Condition of Building Systems – No. 17 – Quimper Park Washroom

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X		
Concrete Flooring			X		
Building Envelope					
CMU				X	
Cedar Fascia Board			X		
Windows, Wood			X		
Exterior Metal Doors			X		
SBS 2-Ply Roof Membrane				X ₁	
Roof Drains & Downspouts		X ₂			
Mechanical					
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X				

Notes:

1. Significant ponding observed. Membrane observed in average condition throughout.
2. The canopied roof does not feature drainage pathways. Installation of perimeter cant strips (3"x3"), along with two low-side scupper drains is recommended to alleviate ponding and drain through washroom roof-top drains. Washroom roof-top drain covers damaged and require replacement with improved design (cast, mechanically secured).

2.3.7.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Quimper Park Washroom: Baseline Recommendations:

2016

- Install new roof drain covers and two scupper drains on canopied roof portion.
- Install cap flashing on top of CMU walls.

2018

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2020-21

- Replace exterior doors.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 40: Summary of Present-Value Building Costs every 5 years – No. 17 – Quimper Park Washroom

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$1,300	\$4,000	\$1,300	\$1,000	\$7,600
Building Envelope	\$5,100	\$-	\$1,500	\$7,800	\$14,400
Mechanical Summary	\$1,000	\$1,000	\$1,000	\$1,000	\$4,000
Electrical Summary	\$-	\$-	\$-	\$-	\$-
Total	\$7,400	\$5,000	\$3,800	\$9,800	\$26,000

No.17 Quimper Park Washroom

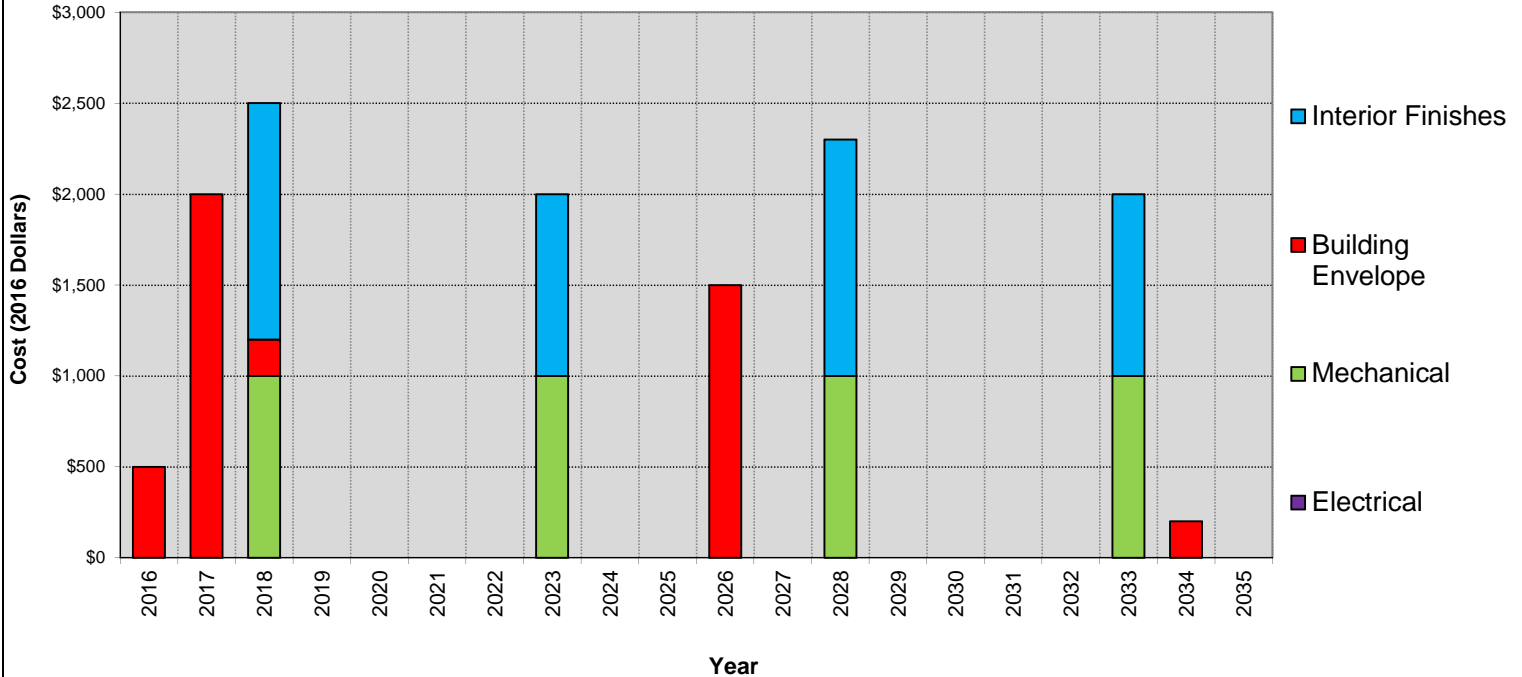
Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																						
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035			
Section 1 - INTERIOR FINISHES COMPONENTS																													
Interior Walls	Maintenance Replacement	1000	2008	5		2013			1,000					1,000					1,000						1,000				
Concrete Flooring	Maintenance Replacement	300	2008	10		2018			300									300											
Partitions	Maintenance Replacement	3000	2008	15		2023								3,000															
Interior Summary	Maintenance Replacement								1,300					1,000				1,300							1,000				
Section 2 - BUILDING ENVELOPE COMPONENTS																													
Cedar Board	Maintenance Replacement	200	2010	8		2018			200								200										200		
Exterior Doors	Maintenance Replacement	2400	1970	50		2020					2,400																		
SBS Membrane	Maintenance Replacement	2000				2017			2,000																				
Roof	Maintenance Replacement	7600	2010	25		2035																						7,600	
CMU	Maintenance Replacement	1300	2010	16		2026											1,300												
Cap Flashing	Maintenance Replacement	500				2016			500																				
Building Envelope Summary	Maintenance Replacement								500	2,000	200			2,400				1,500									200	7,600	
Section 3 - MECHANICAL COMPONENTS																													
Plumbing Fixtures	Maintenance Replacement	1000	2013	5		2018								1,000						1,000							1,000		
Mechanical Summary	Maintenance Replacement													1,000						1,000							1,000		
Section 4 - ELECTRICAL COMPONENTS																													
Electrical Summary	Maintenance Replacement																												
Building Summary	Maintenance Replacement								500	2,000	2,500			2,400				2,000		1,500							2,000	200	7,600
Yearly Totals									\$500	\$2,000	\$2,500			\$2,400				\$5,000		\$1,500							\$2,000	\$200	\$7,600
Totals Inflated at 2% per Year									\$500	\$2,040	\$2,601			\$2,598				\$5,743		\$1,828							\$2,800	\$286	\$11,072

No.17 Quimper Park Washroom

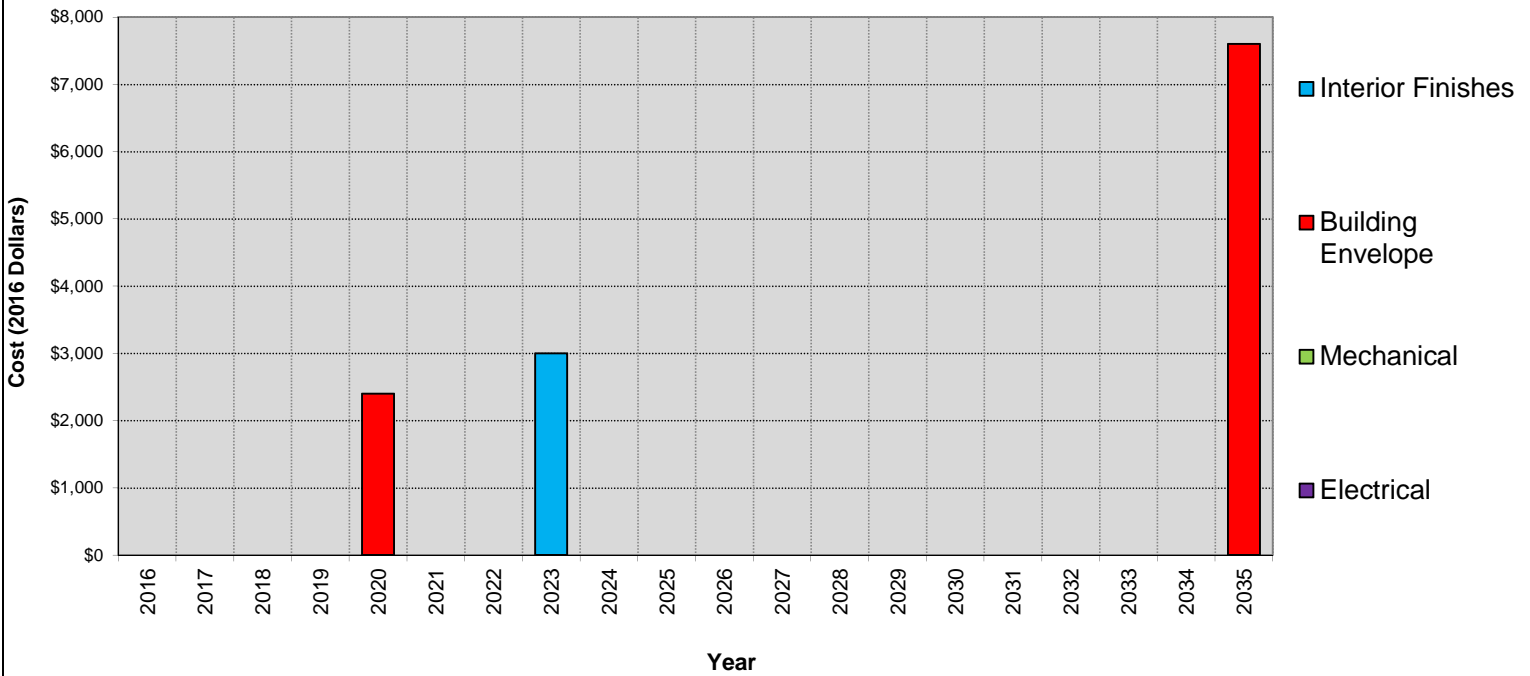
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.17 Quimper Park Washroom

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 1,000	2008	5		2013
Concrete Flooring	Maintenance Replacement	\$ 300	2008	10		2018
Partitions	Maintenance Replacement	\$ 3,000	2008	15		2023

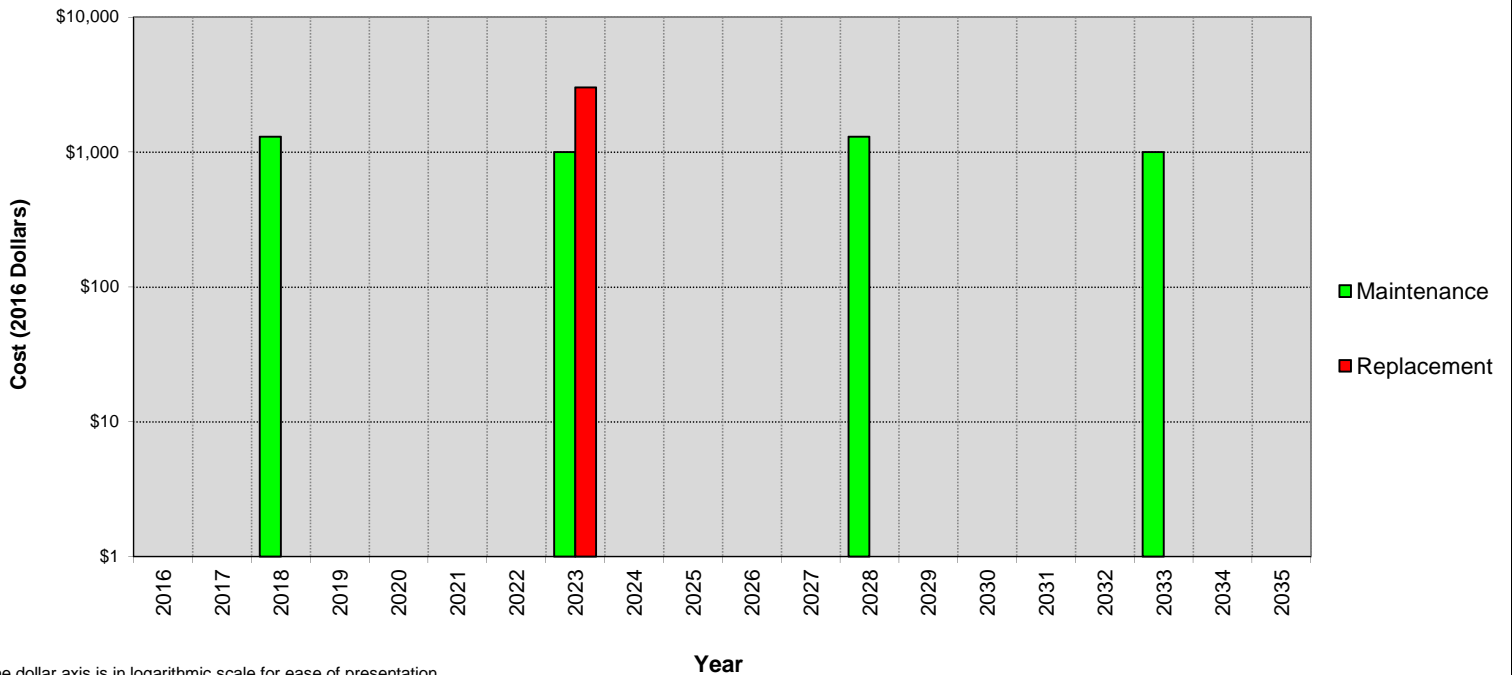
NOTES:

Maintenance:

Wall and floor maintenance includes repainting every 5 years.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.17 Quimper Park Washroom

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Cedar Board	Maintenance Replacement	\$ 200	2010	8		2018
Exterior Doors Metal	Maintenance Replacement	\$ 2,400	1970	50		2020
SBS Membrane Roof	Maintenance Replacement	\$ 2,000				2017
		\$ 7,600	2010	25		2035
CMU	Maintenance Replacement	\$ 1,300	2010	16		2026
Cap Flashing	Maintenance Replacement	\$ 500				2016

NOTES:

Maintenance:

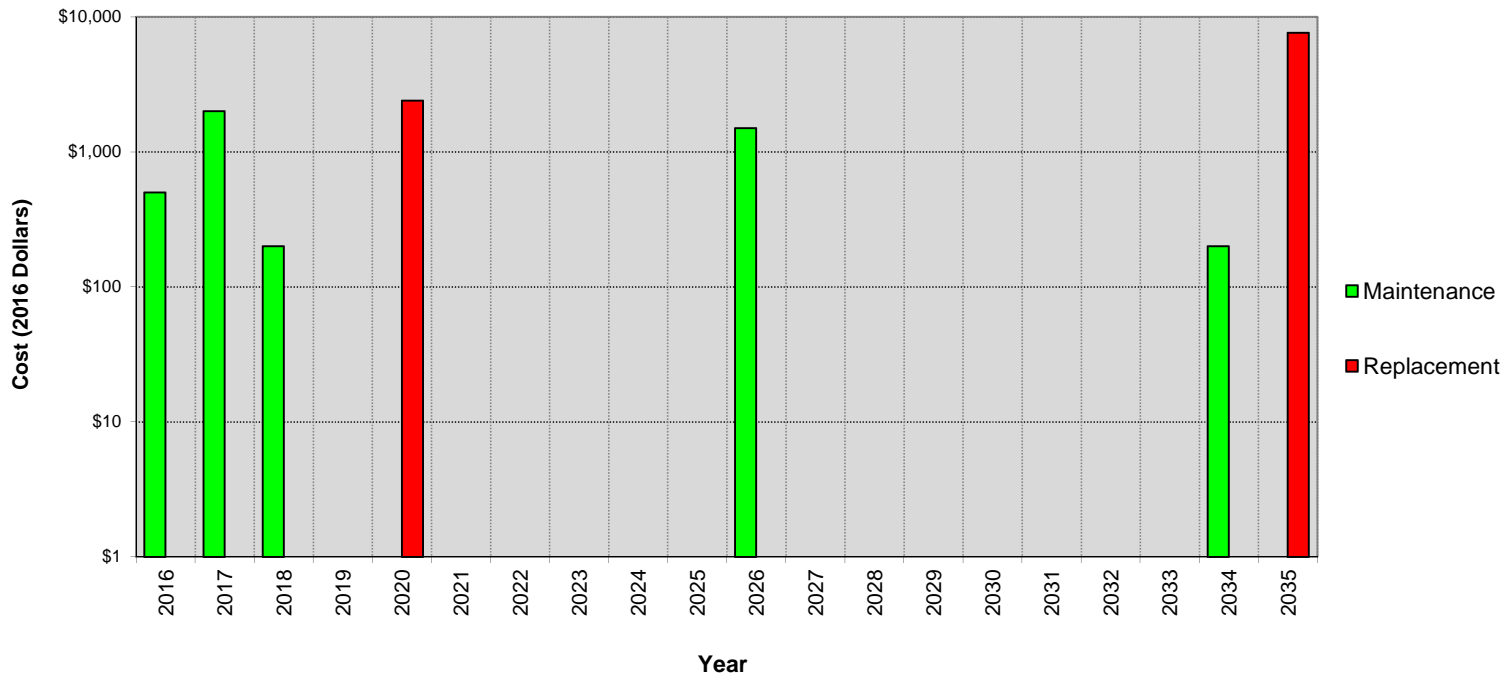
SBS membrane roof maintenance to include new, robust drain covers, and installation of two scupper drains on upper to lower roofs.

Cedar board and CMU maintenance includes repainting every 8 and 16 years respectfully.

Install cap flashing over top of wall (photo, left) to address organic growth/ deterioration due to rain penetration.

Replacement:

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.17 Quimper Park Washroom

Mechanical

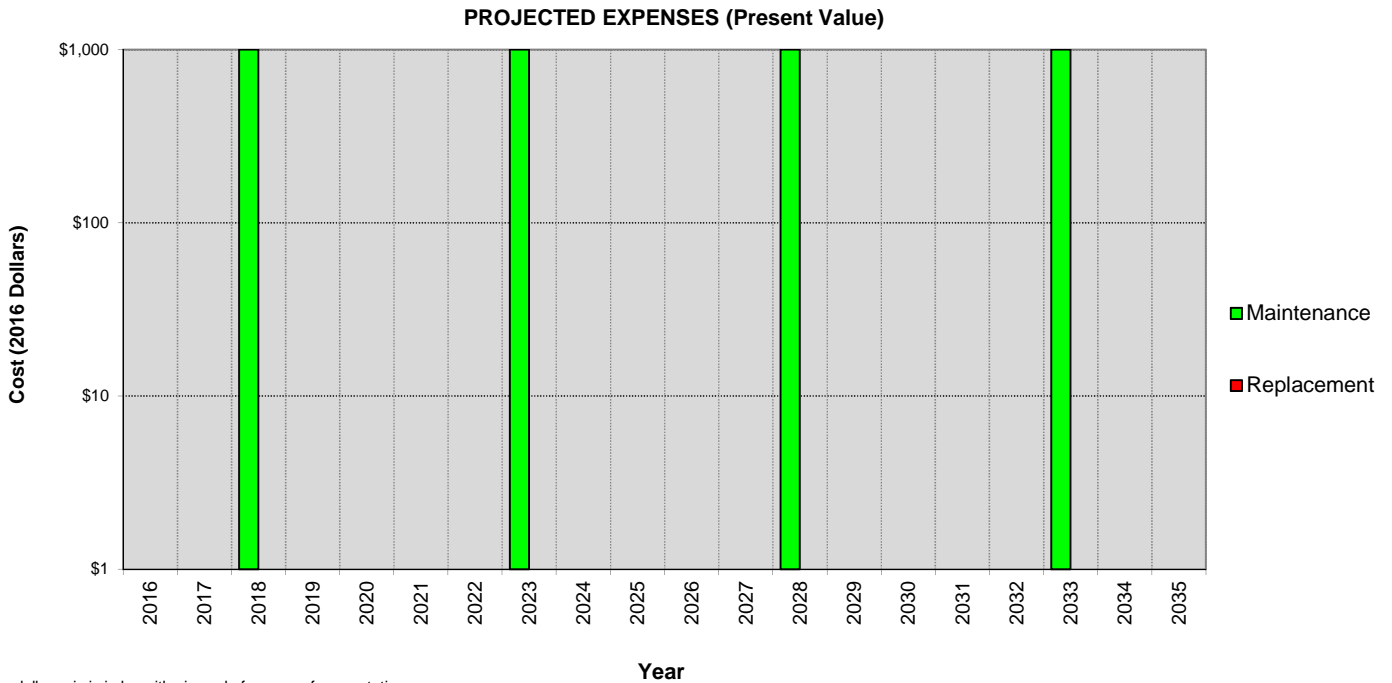


Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Plumbing Fixtures	Maintenance Replacement	\$ 1,000	2013	5		2018

NOTES:

Maintenance: _____


Replacement: _____



The dollar axis is in logarithmic scale for ease of presentation.

2.4. USER-SPECIFIC BUILDINGS

2.4.1. No.19 – Boy Scout Hall

<p>1703 Monterey Avenue – Oak Bay Firemans Park</p> <p>Peak Occupancy: 100</p> <p>Staffing (avg.): 0</p> <p>Built: 1954 (4,868 sf)</p> <p>Addition(s): c.1987</p> <p>HVAC: Oil Furnace, DHW</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 <p style="text-align: center;"><i>Figure No.19 – Boy Scout Hall</i></p>
--	--

2.4.1.1. Description

The Boy Scout Hall is located to the east of the Police and Fire Stations at Fireman’s Park and is home to the 5th Garry Oak group of Scouts. The original 1954 building was single-storey and wood-framed. A two-storey addition was adjoined to the south at an undetermined date; it is believed to have occurred c.1987, when the neighbouring Girl Guides Hall is known to have constructed an addition. The building plan features two rectangular halls orientated north-south that are connected at the south end. Washrooms and a kitchen are located at the south end connector along with storage and utility room areas. The two-storey addition at the south was not accessible during the site visit but is understood to house further meeting and storage areas.

INTERIOR FINISHES & FURNISHINGS: The halls interior flooring includes thick vinyl-sheet in each hall, ceramic tiled washrooms, and further vinyl-sheet flooring in the kitchen. Interior walls and ceiling are painted plywood.

BUILDING ENVELOPE: The wood-frame floor assembly is raised above grade with an uninsulated crawlspace on a concrete foundation. Exterior walls are wood-frame construction and clad with Spanish-style stucco finish. Wood trim and fascia board finish gable ends, rooflines and windows. Windows are original metal-frame (fixed,

single-pane), while exterior doors are hollow-metal. The roof is sloped 6/12 with asphalt shingles, provides 8” of overhang with wood soffit, and features gutters and downspouts along the east and west eaves.

MECHANICAL: The building is heated by an oil-fired furnace and supplementing electric baseboard. Domestic hot water for washrooms and the kitchen is provided by an electric hot water tank. Exhaust ventilation is present in the washroom as well as the kitchen. While the drawings indicate perimeter drains, visual review revealed that they were not installed, or that cleanouts were not installed.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior, exterior, and emergency lighting, and wiring devices (switches and receptacles).

2.4.1.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 41: Condition of Building Systems – No.19 – Boy Scout Hall

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Vinyl-Sheet, Halls				X	
Vinyl-Sheet, Kitchen				X	
Building Envelope					
Stucco		X ₁			
Cedar Trim & Fascia			X ₂		
Soffit, Wood			X		
Windows, Aluminum			X		
Exterior Metal Doors				X ₃	
Asphalt Shingles				X	
SBS 2-Ply Roof Membrane	X ₄				
Gutters & Downspouts		X ₅			
Exterior Wood Staircase (South)				X	
Mechanical					
Oil-Fired Furnace				X	
Hot Water Tank					X
Exhaust Fans				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X ₆				
Electrical					
Power Distribution			X ₇		
Electric Heating, Baseboard				X	
Lighting Interior				X	

	Concealed	Poor	Fair	Average	Good
Wiring Devices				X	

Notes:

1. Stucco extends down to grade, visible wetting near grade. Visible staining and wetting where south elevation of original building meets west elevation of addition. Extensive cracking noted, leaving the face sealed assembly susceptible to water ingress. A pencil was easily inserted into the wood at the base of wall along the east elevation without much resistance, indicating wall assembly is compromised.
2. Painted has peeled along drip edge of gable fascia board.
3. Door sills and thresholds in poor condition.
4. Low-sloped SBS membrane roof was available for review during site visit.
5. Downspouts not connected to storm and perimeter drains. Gutters in concentrated runoff areas appear overtaxed by visible water staining (see Note #1), installing diverter flashing in these areas is recommended.
6. While drawings indicate perimeter drains, field review revealed they were not installed.
7. Original power distribution nearing the end of expected service life.

2.4.1.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Boy Scout Hall: Baseline Recommendations:

2016

- Undertake building envelope condition assessment (BECA) by a Building Envelope Consultant prior to any significant future investment in the building.

2017

- Remediate exterior: stucco cladding, windows, cedar trim, and wood soffit, extent is to be determined from the BECA recommendations.
- Replace wiring devices (switches and receptacles).
- Replace SBS roofing membrane.

2018

- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2019

- Install perimeter drainage.

2020-21

- Replace power distribution (panel and breakers).
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 42: Summary of Present-Value Building Costs every 5 years – No.19 – Boy Scout Hall

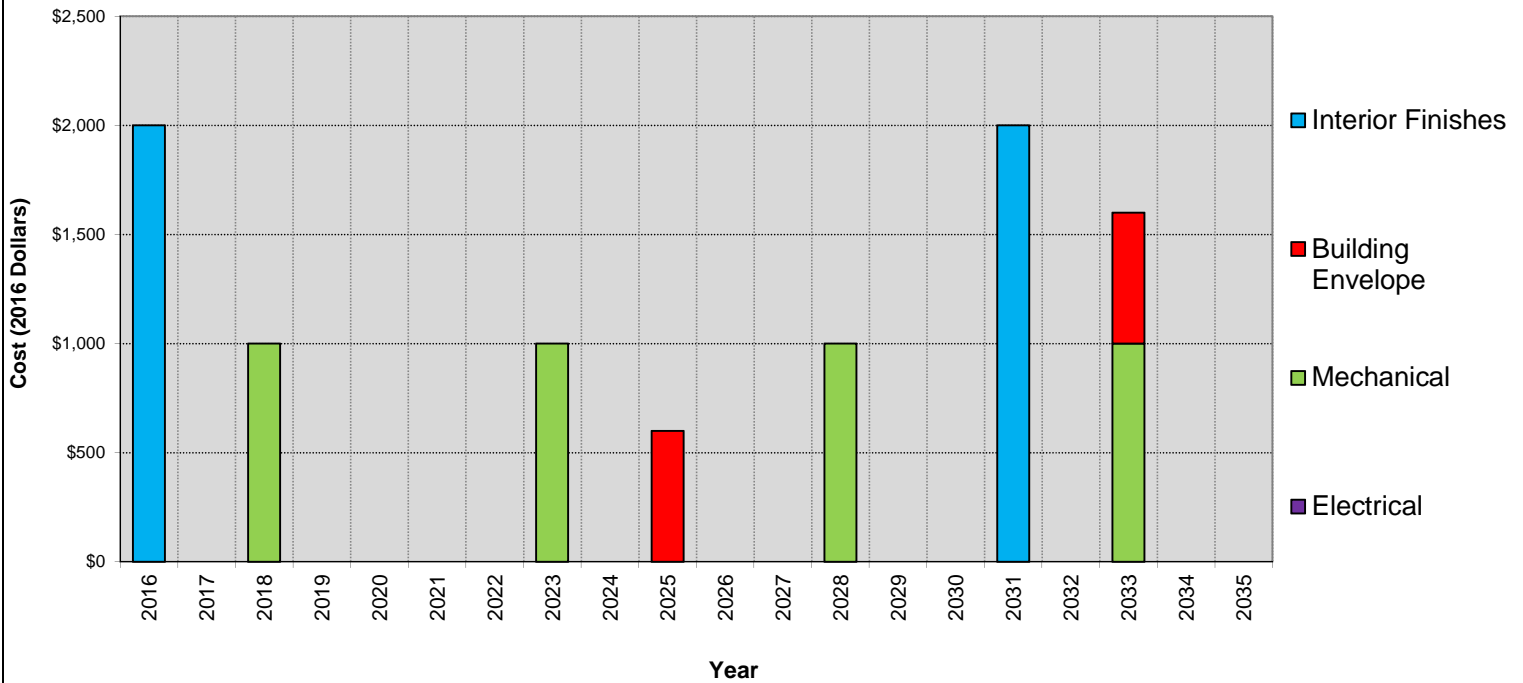
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$2,000	\$500	\$-	\$2,000	\$4,500
Building Envelope	\$71,800	\$24,600	\$-	\$600	\$97,000
Mechanical Summary	\$1,800	\$8,800	\$1,000	\$1,800	\$13,400
Electrical Summary	\$3,500	\$-	\$2,800	\$2,800	\$9,100
Total	\$79,100	\$33,900	\$3,800	\$7,200	\$124,000

No.19 Boy Scout Hall

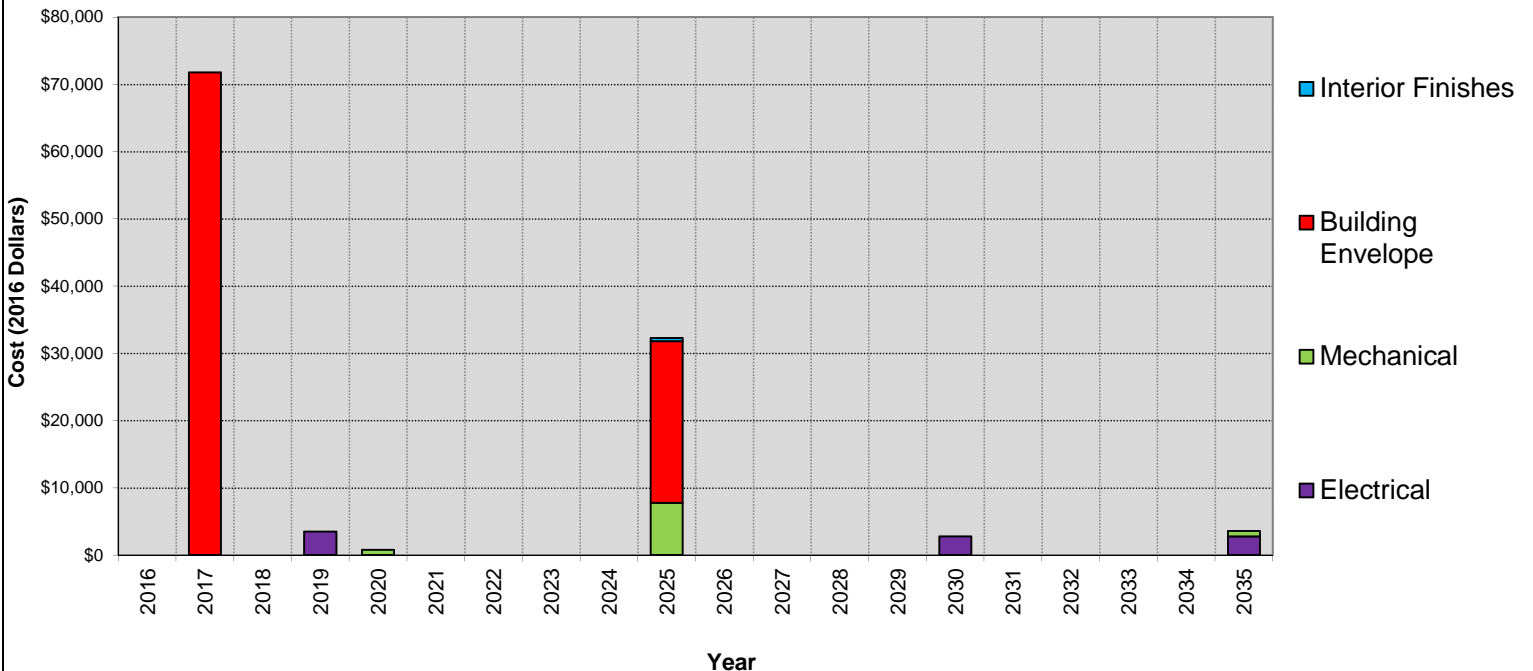
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.19 Boy Scout Hall

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls, Paint	Maintenance Replacement	\$ 2,000	2005	15	-4	2016
Vinyl-Sheet Halls	Maintenance Replacement	\$ 20,000	2005	30	5	2040
Vinyl-Sheet Kitchen	Maintenance Replacement	\$ 500	2005	20		2025

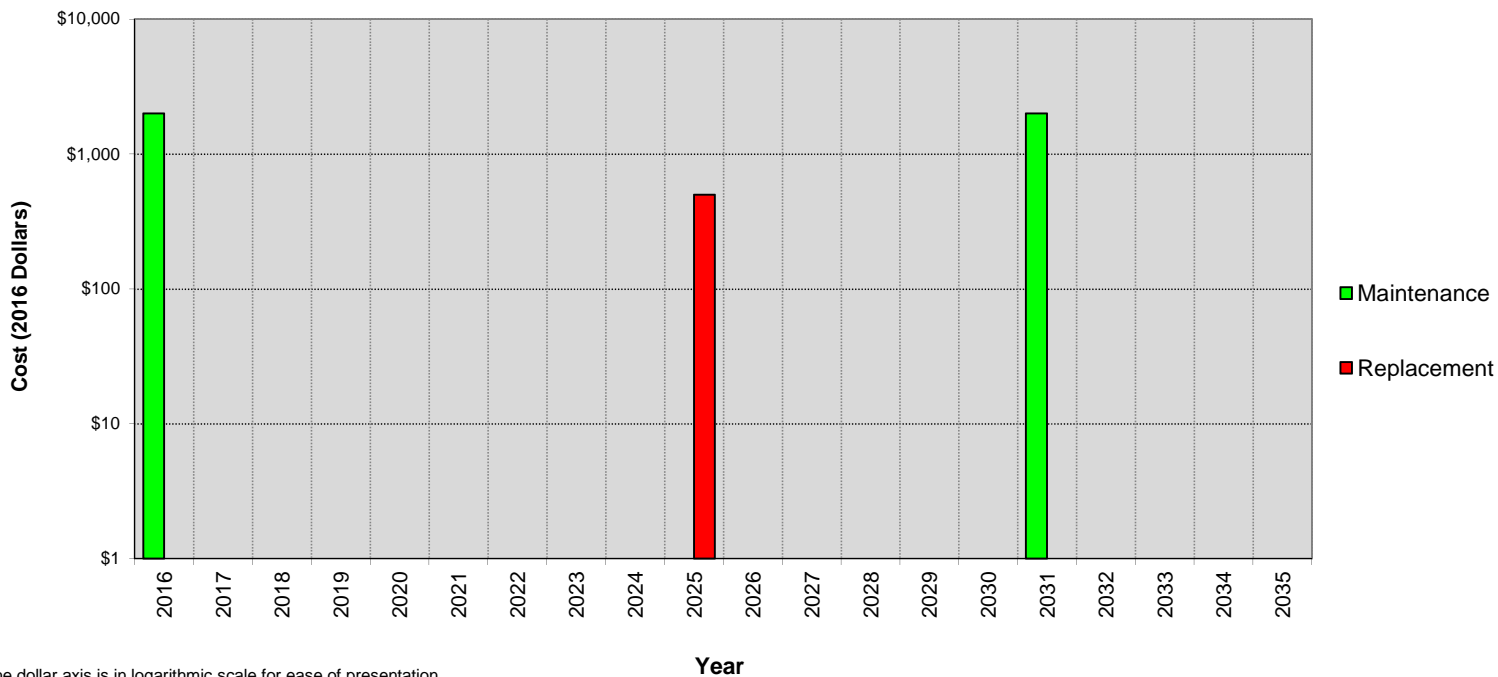
NOTES:

Maintenance:

Wall maintenance includes repainting every 15 years.
Allow \$3,000 for Professional sterilization of the interior due to condensation-based mould due to lack of heating.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.19 Boy Scout Hall

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 55,000	1954	60	3	2017
Cedar Trim & Fascia	Maintenance Replacement	\$ 600	2017	8		2025
		\$ 2,400				2017
Soffit Wood	Maintenance Replacement	\$ 2,000				2017
Exterior Doors Metal	Maintenance Replacement	\$ 6,300	2014	40		2054
Windows Aluminum	Maintenance Replacement	\$ 12,400	1954	45	18	2017
Asphalt Shingles	Maintenance Replacement	\$ 10,100	2005	20		2025
Gutters & Downspouts	Maintenance Replacement	\$ 2,400	2005	20		2025
SBS Membrane Roof	Maintenance Replacement	\$ 11,500	2005	20		2025

NOTES:

Maintenance:

Painting of cedar trim to begin after recommended replacement.

The heat was not left on consistently causing mould to establish itself in numerous locations. All interior walls require cleaning and sterilization.

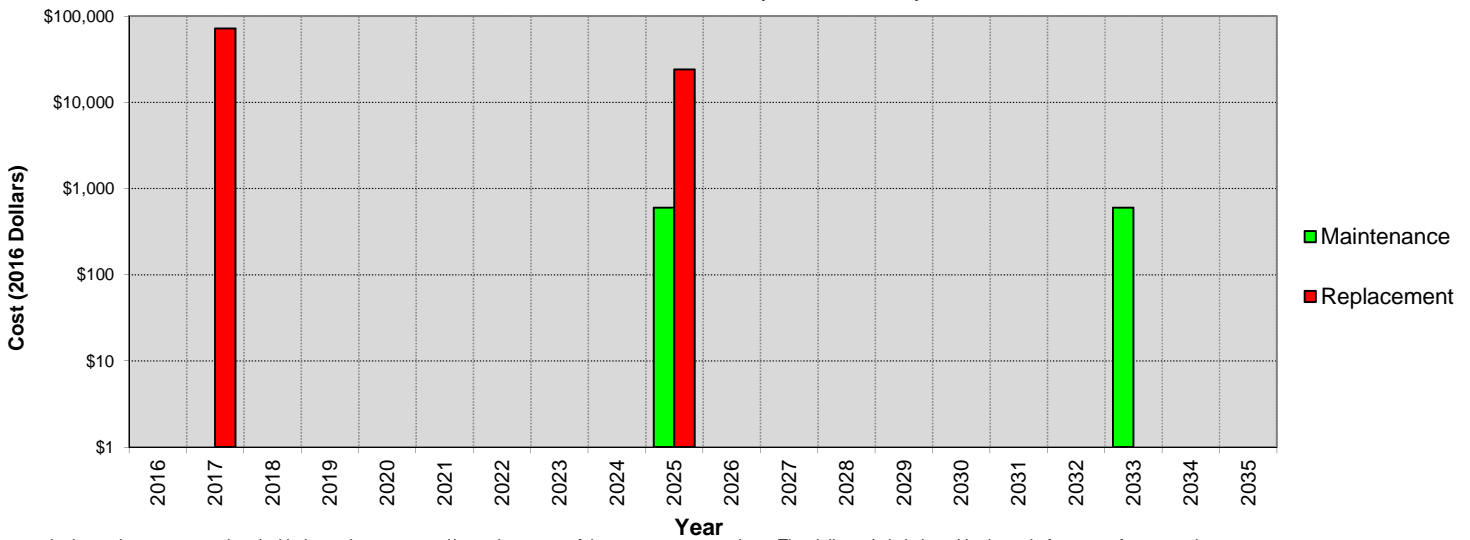
Allow \$200,000 including design and permits as the BECA is pending we have modelled a minimum investment of \$50,000 to prolong the life of the building for the short term.

Replacement:

A building envelope condition assessment is recommended on the building to determine the full condition. From visual review only, replacement of stucco, cedar trim, wood soffit, and single-pane windows are scheduled together within the next 5 years. An allowance of 1/3 the replacement cost is budgeted to refurbish existing.

Roof replacement to include asphalt shingles, SBS membrane and gutters/downspouts.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.19 Boy Scout Hall

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Oil Fired Furnace	Maintenance Replacement	\$ 7,000	2000	25		2025
Hot Water Tank	Maintenance Replacement	\$ 800	2015	10		2025
Plumbing Fixtures	Maintenance Replacement	\$ 1,000	2013	5		2018
Exhaust Fans Washrooms	Maintenance Replacement	\$ 800	2000	20		2020
Perimeter Drains	Maintenance Replacement	\$ 25,000				2019

NOTES:

Maintenance:

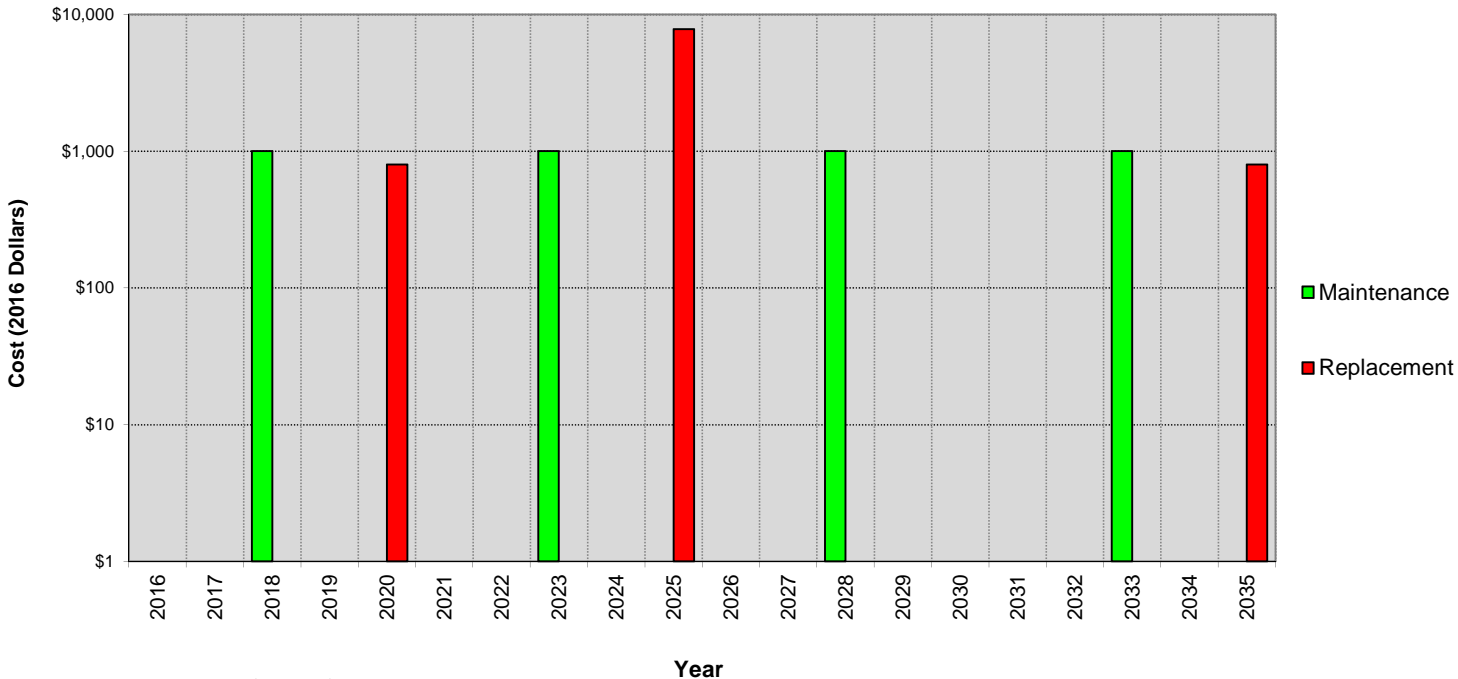
Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Oil furnace serviced every 5 years. Oil storage tank not expected to require replacement.

Building lacks perimeter drainage which is contributing to deteriorating base of wall. Estimate is to excavate and install perimeter drains with connection to municipal storm line (Pacific Group Developments).

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.19 Boy Scout Hall

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution Main	Maintenance Replacement	\$ 3,500	1954	50	15	2019
Lighting - Interior	Maintenance Replacement	\$ 2,800	2000	35		2035
Wiring Devices	Maintenance Replacement	\$ 800	2000	30		2030
Electric Heating Baseboard	Maintenance Replacement	\$ 2,000	2000	30		2030

NOTES:

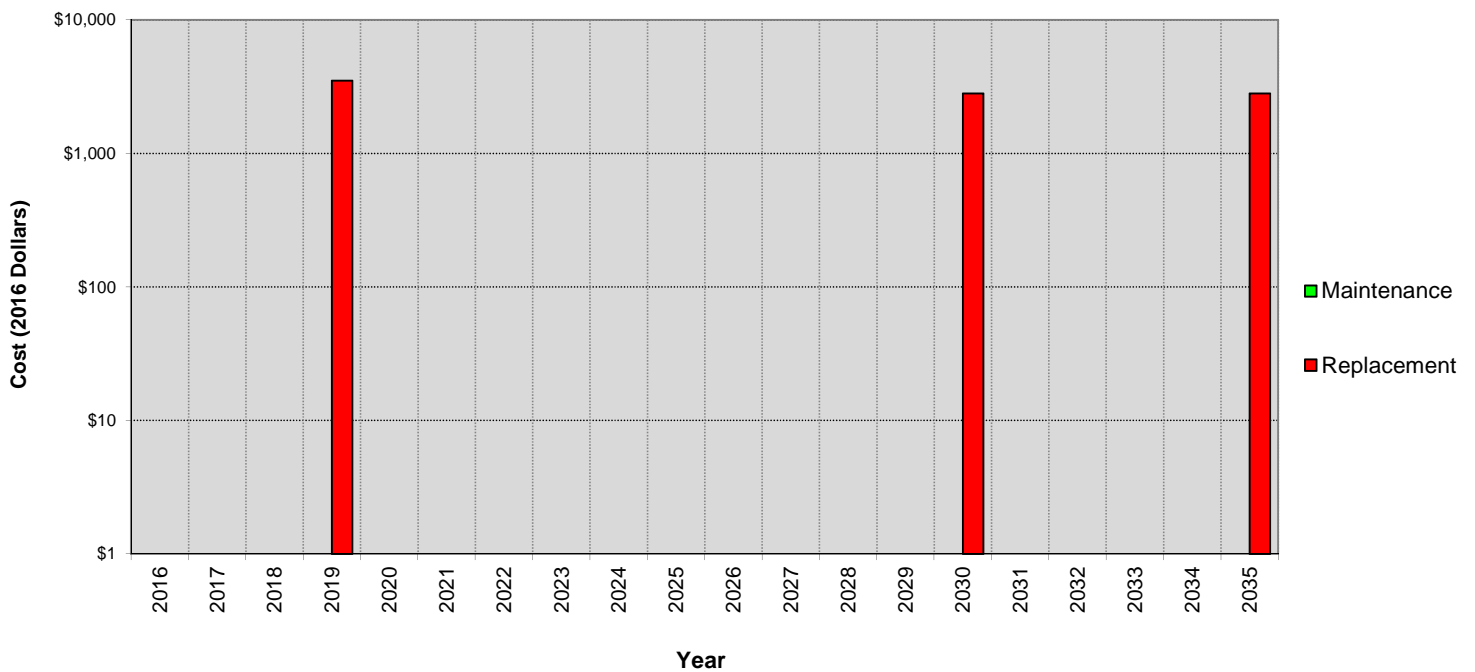
Maintenance:

Replacement:

Interior lighting may require replacement in the next 20 years. Scheduled at the end of the 20-year period for consideration.


Original distribution panel is beyond it's expected service life.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.4.2. No.20 – Girl Guides Hall

<p>1703 Monterey Avenue – Oak Bay Fireman’s Park</p> <p>Peak Occupancy: 100</p> <p>Staffing (avg.): 0</p> <p>Built: 1970</p> <p>Addition(s): 1987 Area (current): 2,644 sf</p> <p>HVAC: Oil-fired furnace, electric baseboard and DHW</p> <p>Fire Suppression: Extinguishes</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 <p style="text-align: center;"><i>Figure No.20 – Girl Guides Hall</i></p>
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2.4.2.1. Description

The Girl Guides Hall or Bowker Hall was built c.1970 and neighbours the Boy Scout Hall to the east in Fireman’s Park. The building provides a congregation space for Girl Guides of Canada - Chatham District. The two-storey, wood-framed, T-shaped building had a second-level addition to the south elevation in 1987. A lean-to shed at the south elevation houses the buildings oil-fired furnace. The main entrance is located at the north elevation, there are exits on either side of the main hall, and an exterior staircase at the south which accesses the second-level. The lower-level floor plan contains a rectangular main hall, washrooms, and utility and kitchen areas; a staircase in the south east corner brings users up to the 1987 multi-purpose room addition.

INTERIOR FINISHES & FURNISHINGS: Interior flooring is the more durable marmoleum tile throughout while interior walls are finished with painted gypsum wall board.

BUILDING ENVELOPE: The building envelope is very similar in construction to the Boy Scout Hall with an exception being resting on a slab-on-grade versus over a crawlspace. Exterior walls are wood-frame construction and clad with Tudor-style stucco. Wood trim and fascia board finish gable ends, rooflines and windows. Windows are original non-thermally broken metal-frame (fixed, single-pane), while exterior doors

appear to be hollow-metal. The roof is sloped 6/12 with asphalt shingles, provides 8” of overhang, has a wood soffit, and features gutters and downspouts along the east and west edges.

MECHANICAL: The building is heated by an oil-fired furnace and electric baseboard. Domestic hot water for washrooms and the kitchen is provided by an electric hot water tank. Exhaust ventilation is present in the washroom as well as the kitchen. While the drawings indicate perimeter drains, visual review revealed that they were not installed.

ELECTRICAL: Electrical systems in the building include: power distribution, electric heating, interior, exterior, and emergency lighting, fire warning system, and wiring devices (switches and receptacles).

2.4.2.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 43: Condition of Building Systems – No.20 – Girl Guides Hall

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Marmoleum				X	
Building Envelope					
Stucco		X ₁			
Cedar Trim & Fascia			X		
Soffit, Wood			X		
Windows, Aluminum			X		
Exterior Metal Doors			X		
Asphalt Shingles		X ₂			
Gutters & Downspouts			X ₃		
Exterior Wood Staircase		X ₄			
Mechanical					
Oil-Fired Furnace	X ₅				
Hot Water Tank					X
Exhaust Fans				X	
Plumbing Fixtures				X	
Perimeter Drains and Clean Outs	X ₆				
Electrical					
Power Distribution				X	
Electric Heating, Baseboard				X	
Fire Warning System					X
Lighting Interior				X	

	Concealed	Poor	Fair	Average	Good
Lighting Exterior			X		
Lighting Emergency				X	
Wiring Devices				X	

Notes:

1. Similar to No.19 Boy Scout Hall, stucco extends down to grade with visible wetting near grade. Extensive cracking noted, leaving the face sealed assembly susceptible to potential water ingress. Further potential water ingress where the lean-to shed meets the south elevation; notable gap between stucco and low sloped roof that drains back into wall. Walls are assumed to be “at-risk” pending BECA study.
2. Asphalt shingles exhibited significant amounts of organic growth on north and west facing areas.
3. Downspouts are not connected to perimeter drains.
4. Three-step staircase at west elevation entrance/exit is severely deteriorated and requires replacement.
5. Oil furnace not accessible to review during site visit, was located in locked shed.
6. While the drawings indicate perimeter drains, visual review revealed that they were not installed.

2.4.2.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Girl Guides Hall: Baseline Recommendations:

2016

- Replace wooden three-step staircase on west elevation.
- Undertake building envelope condition assessment (BECA) by Building Envelope Consultant.

2018

- Remediate exterior: stucco cladding, windows, cedar trim, and wood soffit.*
- Install perimeter drains.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2020-21

- Replace oil-fired furnace.
- Replace exhaust fans.

- Recommendations deferred from earlier years.
- * An allowance of 1/3 the replacement cost of upgrading to rainscreen stucco is set aside to refurbish existing.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 44: Summary of Present-Value Building Costs every 5 years – No.20 – Girl Guides Hall

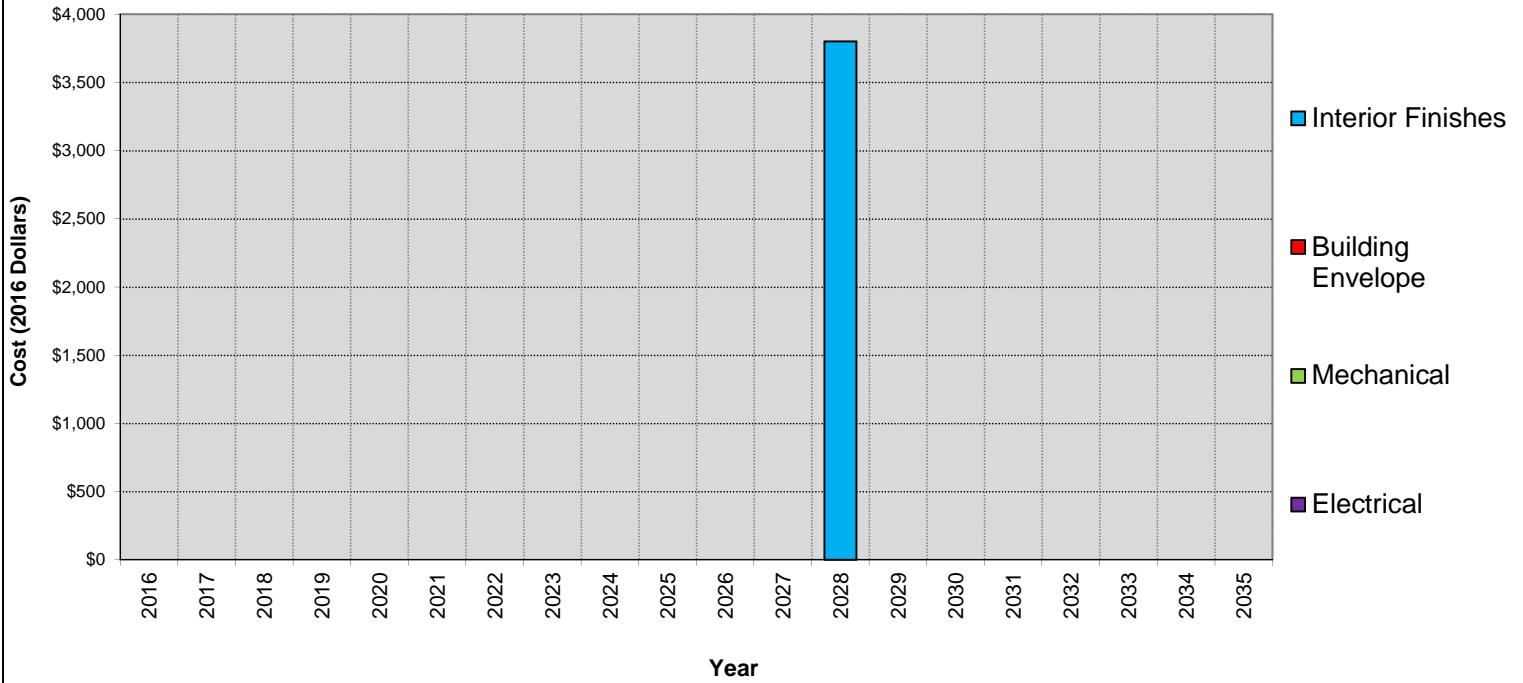
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$-	\$3,800	\$20,800	\$24,600
Building Envelope	\$73,700	\$8,900	\$2,100	\$-	\$84,700
Mechanical Summary	\$34,500	\$1,800	\$1,000	\$1,800	\$39,100
Electrical Summary	\$-	\$2,500	\$2,800	\$12,000	\$17,300
Total	\$108,200	\$13,200	\$9,700	\$34,600	\$166,000

No.20 Girl Guides Hall

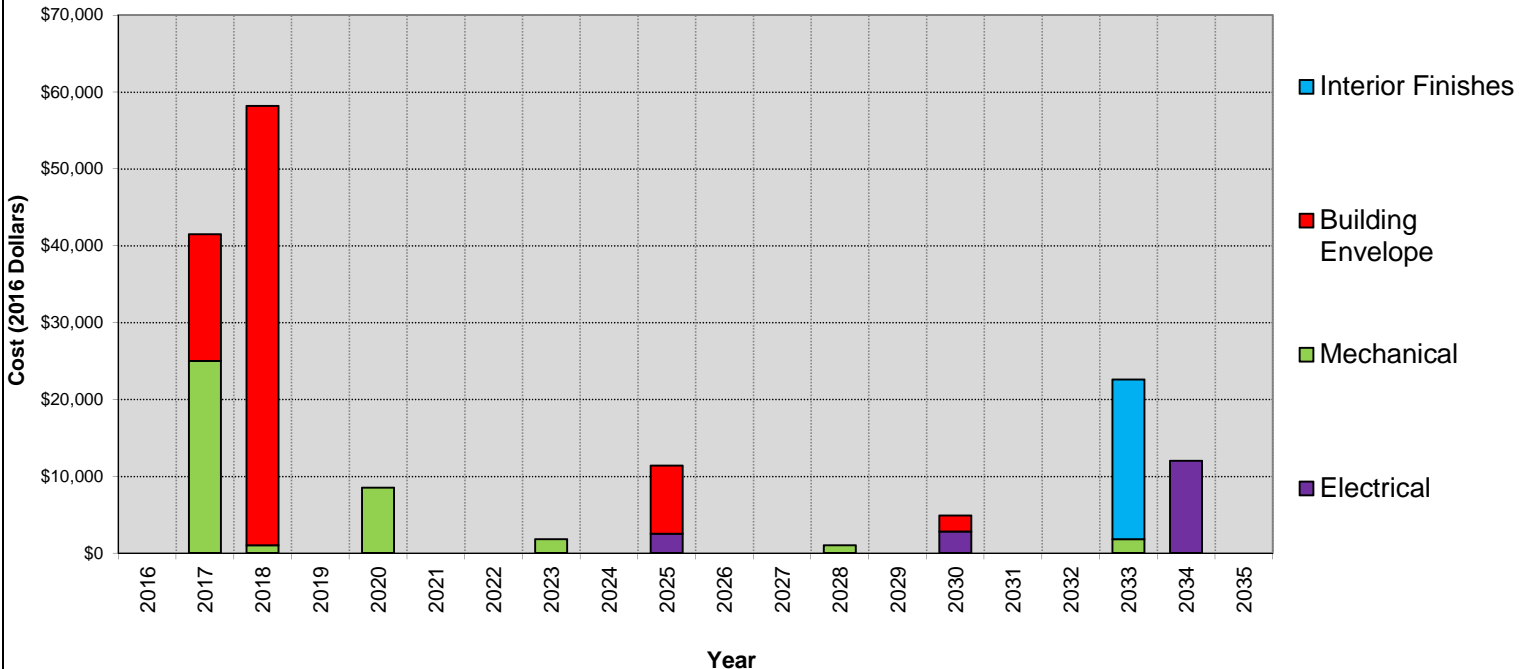
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.20 Girl Guides Hall

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 3,800	2013	15		2028
Marmoleum Flooring	Maintenance Replacement	\$ 20,800	2013	20		2033

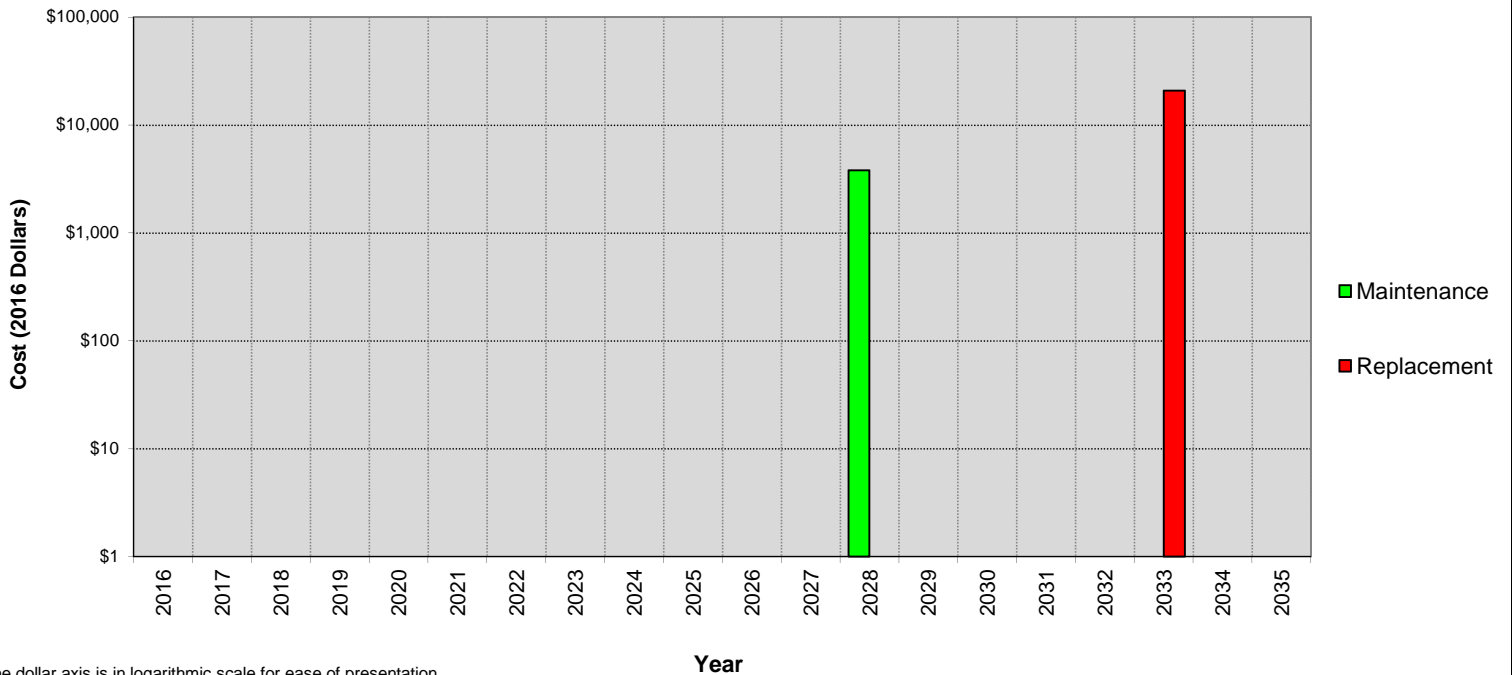
NOTES:

Maintenance:

Interior wall maintenance includes repainting every 15 to 20 years.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.20 Girl Guides Hall

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance					
	Replacement	\$ 55,000	1970	60	-12	2018
Cedar Trim	Maintenance					
	Replacement	\$ 1,500	1970	60	-12	2018
Soffit Wood	Maintenance					
	Replacement	\$ 700	1970	60	-12	2018
Exterior Doors Metal	Maintenance					
	Replacement	\$ 2,100	1970	60		2030
Windows Aluminum	Maintenance					
	Replacement	\$ 16,500	1970	45	2	2017
Asphalt Shingles	Maintenance					
	Replacement	\$ 7,300	2005	20		2025
Gutters & Downspouts	Maintenance					
	Replacement	\$ 1,600	2005	20		2025
Exterior Staircase	Maintenance					
	Replacement	\$ 800				2016

NOTES:

Maintenance:

Stucco maintenance allowance for refurbishment set at 1/3 of the cost of renewal pending outcome of BECA.

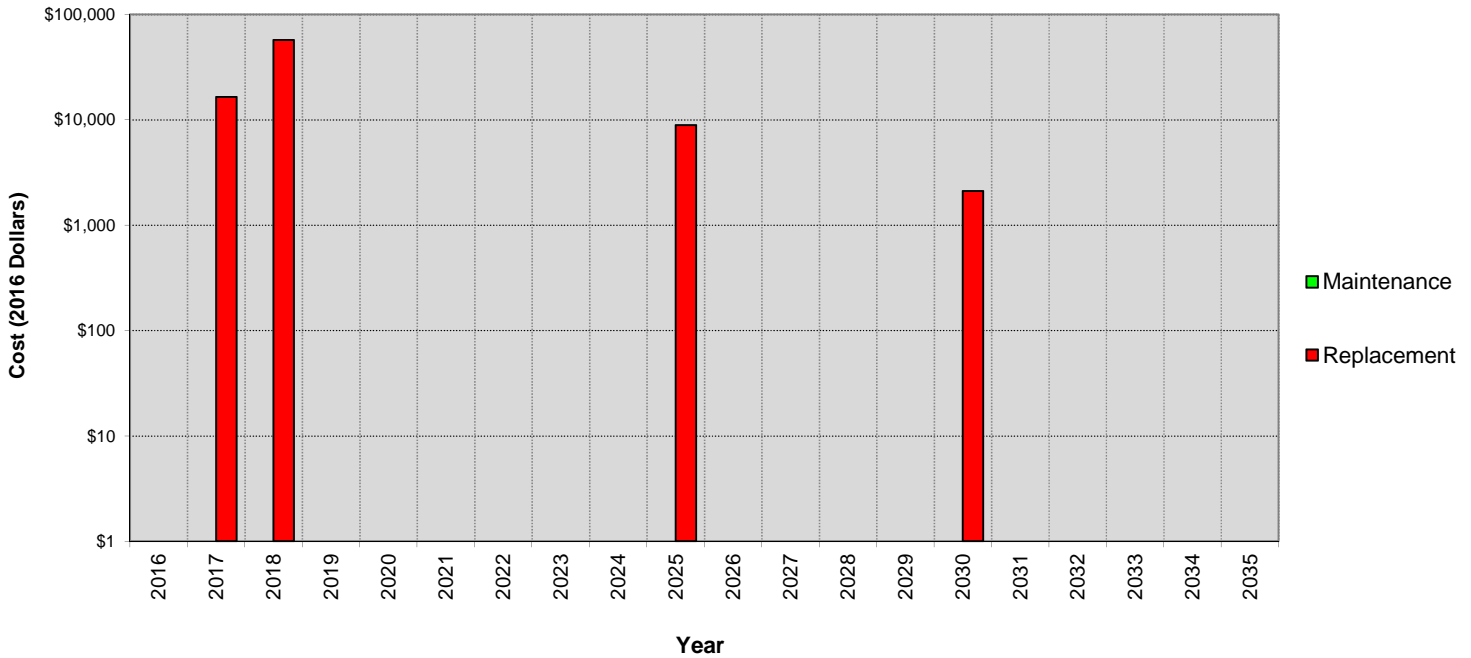
Asphalt shingles exhibited substantial organic growth which is recommended for cleaning as annual maintenance to maintain shingle integrity.

A building envelope condition assessment (BECA) is recommended on the building to determine the underlying condition. From visual review, replacement of stucco, cedar trim, wood soffit, and single-pane windows is scheduled together within the next five years. An allowance of 1/3 the replacement cost is budgeted to refurbish existing.

Small exterior staircase on east side of building is deteriorated and unsafe. Recommended for replacement ASAP.

Windows are scheduled for renewal with either the refurbishment or rainscreen upgrade.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.20 Girl Guides Hall

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Oil Fired Furnace	Maintenance Replacement	\$ 7,000	1990	25	5	2020
Hot Water Tank	Maintenance Replacement	\$ 800	2013	10		2023
Plumbing Fixtures	Maintenance Replacement	\$ 1,000	2013	5		2018
Exhaust Fans	Maintenance Replacement	\$ 1,500	2000	20		2020
Perimeter Drains	Maintenance Replacement	\$ 25,000				2017

NOTES:

Maintenance:

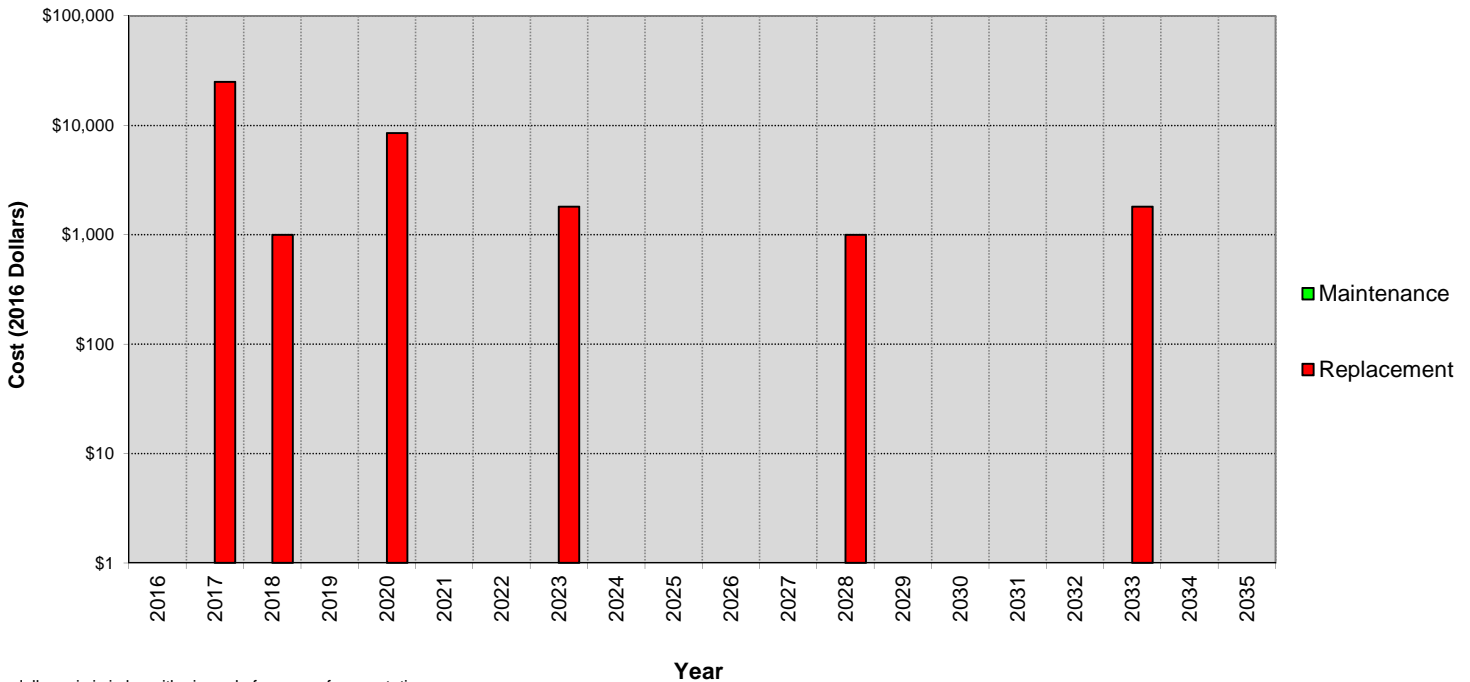
Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Oil storage tank not scheduled for replacement in the next 20 years. Confirm with insurance provider who may require upgrade.

Building is without perimeter drainage. Inadequate drainage appears to be contributing to deteriorating base of wall. Estimate is to excavate and install perimeter drains with connection to municipal storm line (Pacific Group Developments).

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.20 Girl Guides Hall

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Lighting-Interior	Maintenance Replacement	\$ 2,500	1990	35		2025
Wiring Devices	Maintenance Replacement	\$ 800	2000	30		2030
Electric Heating Baseboard	Maintenance Replacement	\$ 2,000	2000	30		2030
Fire Warning System	Maintenance Replacement	\$ 12,000	2014	20		2034

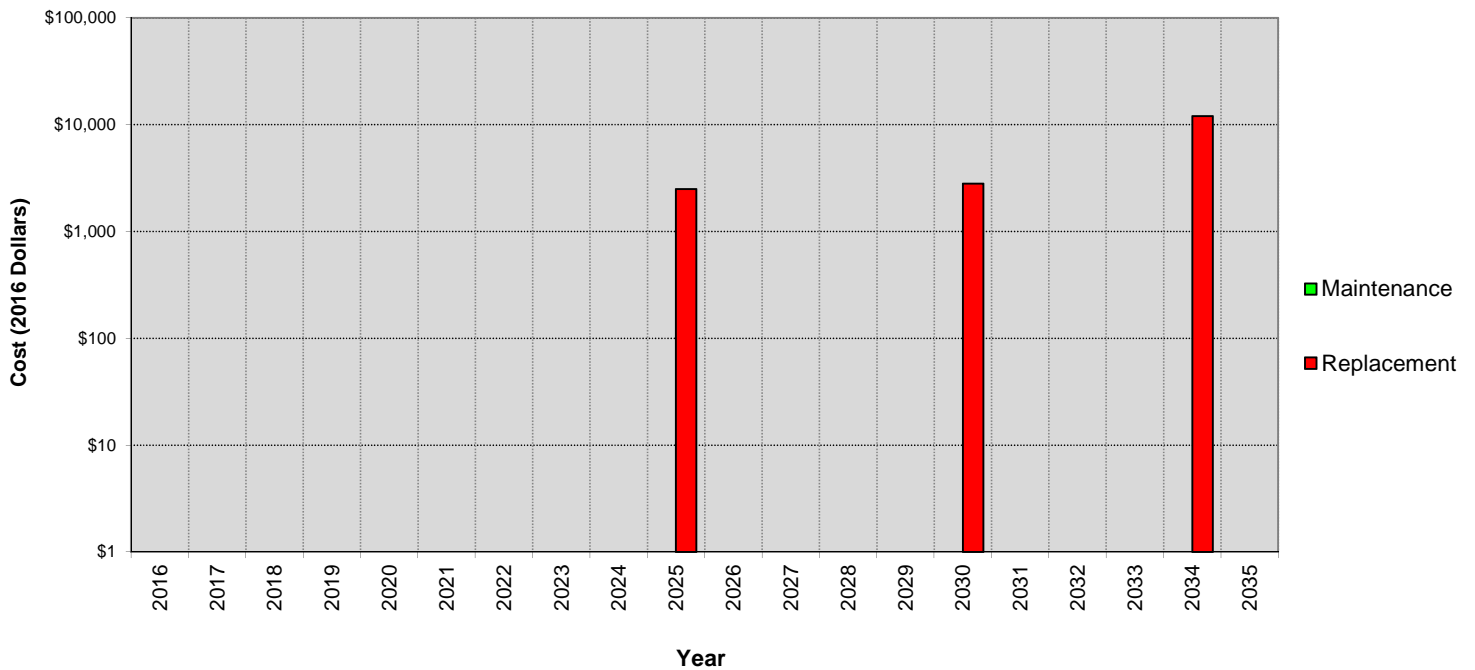
NOTES:

Maintenance:

Replacement:


Distribution panel not expected for replacement in the next 20 years.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.4.3. No.21 – Oak Bay Apartments

<p>1442 Monterey Avenue</p> <p>Peak Occupancy: 30</p> <p>Staffing (avg.): 0</p> <p>Built: 1934/1999</p> <p>Addition(s): None</p> <p>Area (current): 3,485 sf</p> <p>HVAC: Central AHU shared with Library, electric baseboard.</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Shared parking with Monterey Centre, wheelchair access</p>	 <p><i>Figure 21 – Oak Bay Apartments</i></p>
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2.4.3.1. Description

The Oak Bay Apartments are located on the upper level of the Oak Bay Library at 1442 Monterey Avenue. The apartments contains five suites branching off of a single corridor orientated north-south. All five suites are leased by The District to tenants, and is managed by Complete Residential Property Management Ltd. Four of the five suites were constructed during the 1999 addition to the Library while the fifth suite was converted from the upper floor of the Tonkin House which the 1999 addition tied into. The Tonkin House suite is 2 bedroom, all other suites are 1 bedroom. A shared laundry facility on the east side of the corridor houses a coin-operated washer and dryer; roof access to the Library is also located in this room. The apartment lobby is accessed by an enterphone system on the south elevation, whereby entrants may take a Schindler-serviced elevator or staircase to the upper floor. An emergency exterior metal staircase provides residents with an alternate exit at the north elevation.

INTERIOR FINISHES & FURNISHINGS: The lobby and corridors are fully carpeted along with much of the suites. Portions of vinyl-sheet and wood laminate flooring are also present at suite entrances, washrooms, and kitchens. All interior walls are painted gypsum wallboard (GWB).

BUILDING ENVELOPE: The building envelope is shared with the Library and Tonkin House. Exterior walls at the lower-level lobby are giant brick with a 35mm air space and steel stud cavity insulation. Tonkin House and 1999 addition wood-framed walls are clad with rock-dash stucco. Wood fascia board, soffit, and trim are consistent

with the Library and Monterey Centre. The 1999 addition windows are aluminum-framed glazing units and Tonkin House windows are heritage wood-framed. Exterior doors include the storefront lobby entrance and a hollow-metal door to the north exterior staircase. The low-sloped areas of the roof are 2-ply SBS membrane while sloped (4/12) portions feature asphalt shingles to gutters and downspouts.

MECHANICAL: Central mechanical systems are shared with the Library. Each suite and the shared laundry facility feature hot water tanks. Exhaust ventilation in each suite is provided at washrooms and kitchen areas.

ELECTRICAL: Central electrical systems such as the main distribution and fire warning system are shared with the Library. A house distribution panel is located within the corridor that feeds individual suite panels. Specific systems to the apartments include interior and emergency lighting, electric baseboard heating, enterphone system, and wiring devices (switches and receptacles).

2.4.3.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 45: Condition of Building Systems – No.21 – Oak Bay Apartments

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls				X	
Carpet				X	
Vinyl Sheet				X	
Interior Doors				X	
Building Envelope					
Vinyl Balcony Membrane			X		
Storefront Door Assembly					X
Exterior Metal Staircase				X ₁	
Brick				X ₁	
Stucco-Tonkin House			X _{1,2}		
Cedar Siding & Trim			X ₁		
Windows, Aluminum			X ₁		
Windows, Wood			X ₁		
SBS 2-Ply Roof Membrane			X ₁		
EPDM Membrane			X ₁		
DECRA® Stone Coated Steel Shingles			X _{1,3}		
Asphalt Shingles			X _{1,4}		
Gutters and Downspouts				X ₁	
Exterior Metal Doors				X	
Mechanical₂					
Hot Water Tanks					X

	Concealed	Poor	Fair	Average	Good
Plumbing Fixtures				X	
Exhaust Fans				X	
Washer & Dryer				X	
Elevator				X ₅	
Electrical₄					
Enterphone System				X	
Electric Heating, Baseboard				X	
Lighting Interior				X	
Wiring Devices				X	

Notes:

1. Building envelope component shared with Library.
2. Stucco on Tonkin Home exhibits water staining at corners and other areas of greater weather exposure. Stucco-brick and stucco-wood window joints are not adequately sealed. Stucco-brick joints displayed noticeable gap for water to penetrate, preventative action is recommended.
3. DECRA® shingles has been significantly deformed (crushed) in areas from direct foot traffic. Walkway planks have been installed in a attempt to prevent further damage.
4. Significant organic growth on south asphalt shingle roofing was observed and should be removed by brush/chemicals/ both.
5. Elevator serviced by Schindler Elevator (contact: Sheldon Lau), they do not foresee any significant upgrades to the lift in the next 20 years.

2.4.3.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies. As the apartments share building envelope, mechanical, and electrical components with the Library, please view Library recommendations, section 2.2.2.2, for further discussion.

Oak Bay Apartments: Baseline Recommendations:

Relative to other buildings within The District, this buildings recommendations may be deferred:

2019

- Replace vinyl-sheet flooring within suites and laundry room.
- Replace vinyl membrane on balcony of suite #205.
- Replace hot water tanks.

2020-21

- Replace washroom exhaust fans.
- Replace washer and dryer.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 46: Summary of Present-Value Building Costs every 5 years – No.21 – Oak Bay Apartments

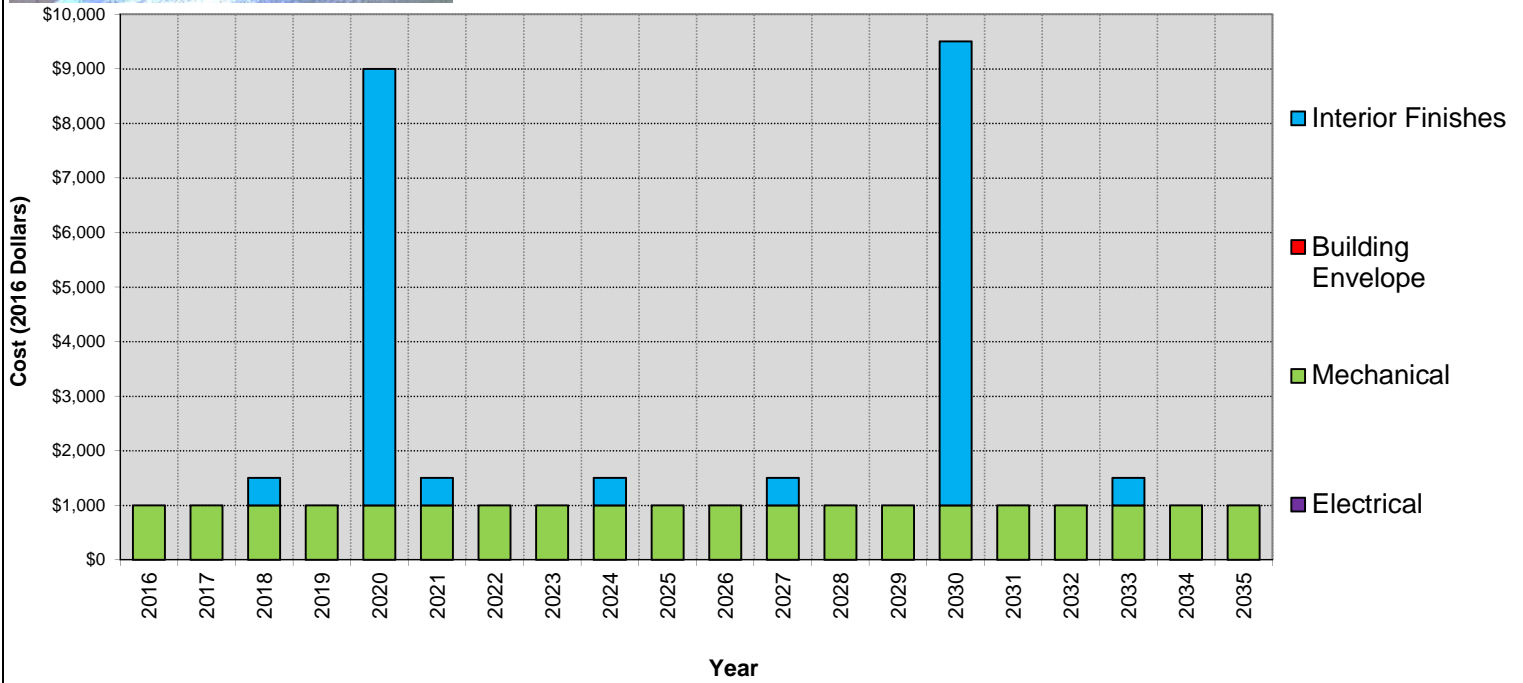
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$19,800	\$1,000	\$15,500	\$500	\$36,800
Building Envelope	\$1,000	\$-	\$-	\$-	\$1,000
Mechanical Summary	\$10,100	\$11,700	\$10,100	\$6,500	\$38,400
Electrical Summary	\$-	\$1,500	\$10,800	\$5,000	\$17,300
Total	\$30,900	\$14,200	\$36,400	\$12,000	\$94,000

No.21 Oak Bay Apartments

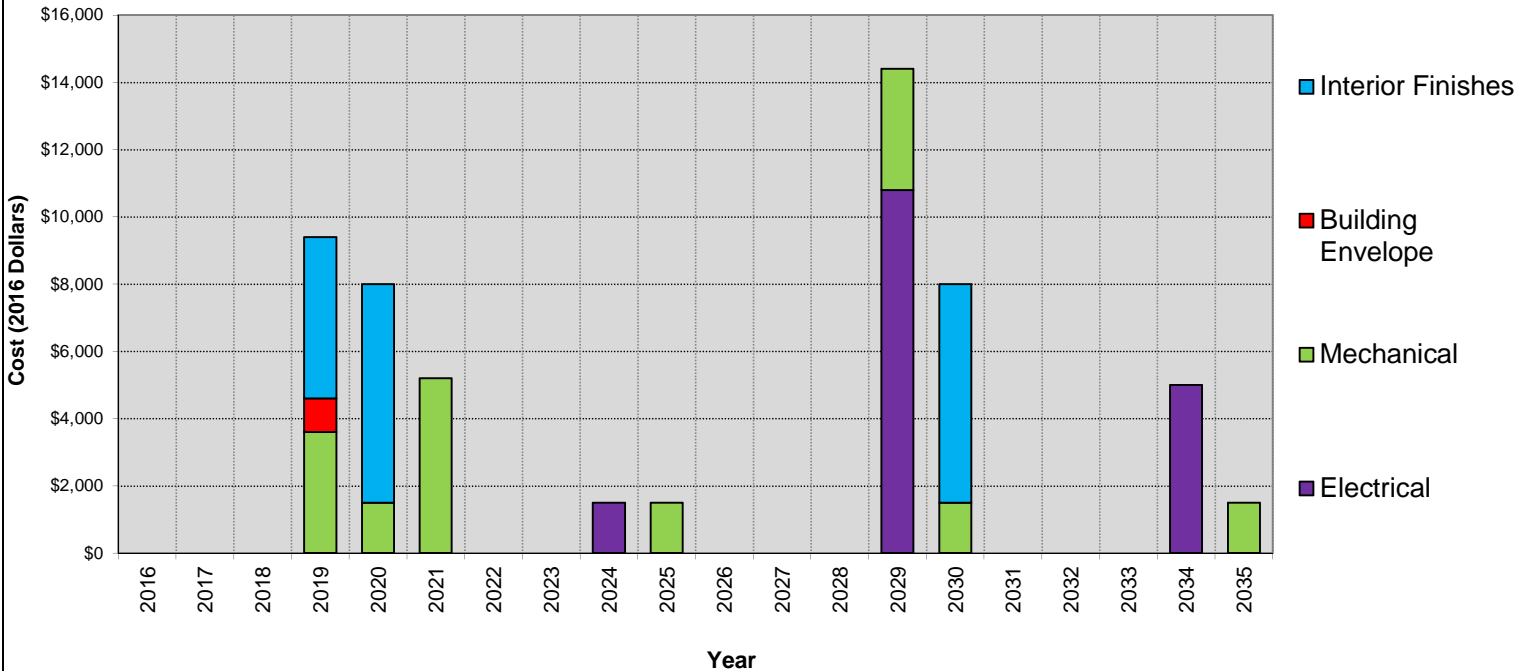
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.21 Oak Bay Apartments

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 8,000	2010	10		2020
Vinyl Sheet	Maintenance Replacement	\$ 4,800	1999	20		2019
Carpet	Maintenance Replacement	\$ 6,500	2010	10		2020
Int. Doors	Maintenance Replacement	\$ 500	2015	3		2018

NOTES:

Maintenance:

Interior wall maintenance includes repainting suites, corridors and stairwells. The total estimated cost has been divided in half, alternating between corridors and stairwells, and suites every 10 years (e.g. \$8,000 for corridors and stairwells in 2020, 2040..., \$8,000 for suites in 2030, 2050...).

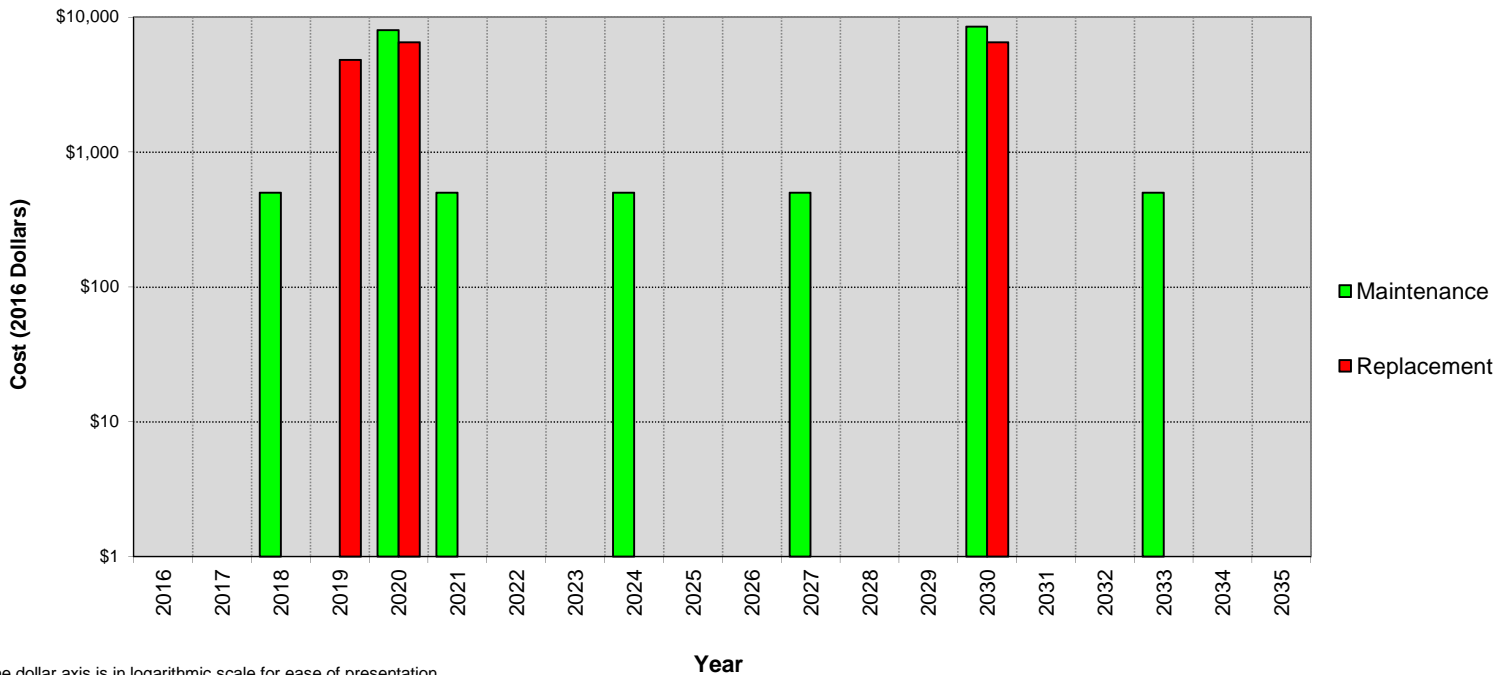
Interior door maintenance includes adjustment and hardware replacement as required every 3 years.

Replacement:

Carpet replacement includes suites, corridors, and stairwells. The total estimated cost has been divided in half, alternating between corridors and stairwells, and suites; alternating every 10 years.

Vinyl sheet flooring in suite washrooms and kitchens.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.21 Oak Bay Apartments

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Vinyl Membrane Balcony	Maintenance Replacement	\$ 1,000	1999	20		2019

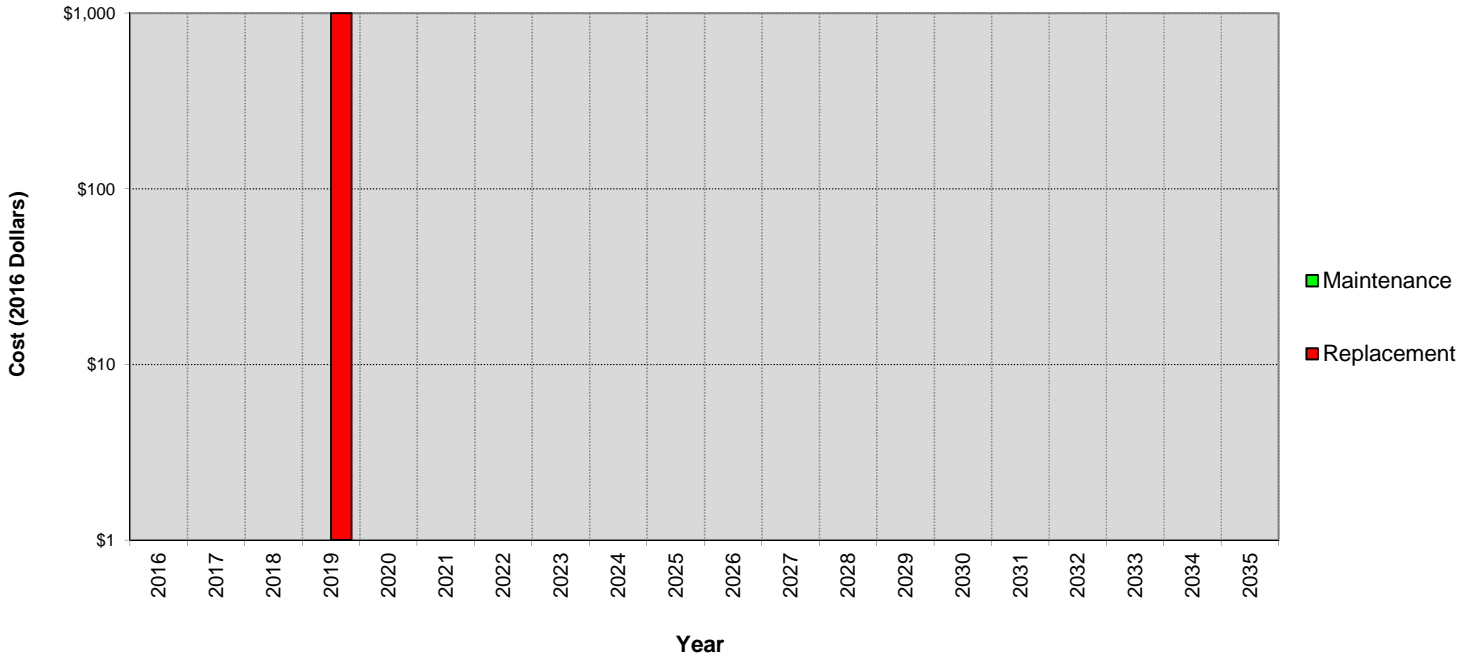
NOTES:

Maintenance:

Replacement:

Note: A part from those specific items listed above, building envelope has been included within Library reporting.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.21 Oak Bay Apartments
BAMP



No.21 Oak Bay Apartments

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Hot Water Tanks (6)	Maintenance Replacement	\$ 3,600	2009	10		2019
Plumbing Fixtures	Maintenance Replacement	\$ 1,500	2015	5		2020
Exhaust Fans	Maintenance Replacement	\$ 4,000	1999	20	2	2021
Washer & Dryer	Maintenance Replacement	\$ 1,200	1999	20	2	2021
Elevator Schindler 330A	Maintenance	\$ 1,000	1999	1	16	2016
	Replacement		1999	25		2024

NOTES:

Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.
Elevator maintenance of \$1000/year is allocated.

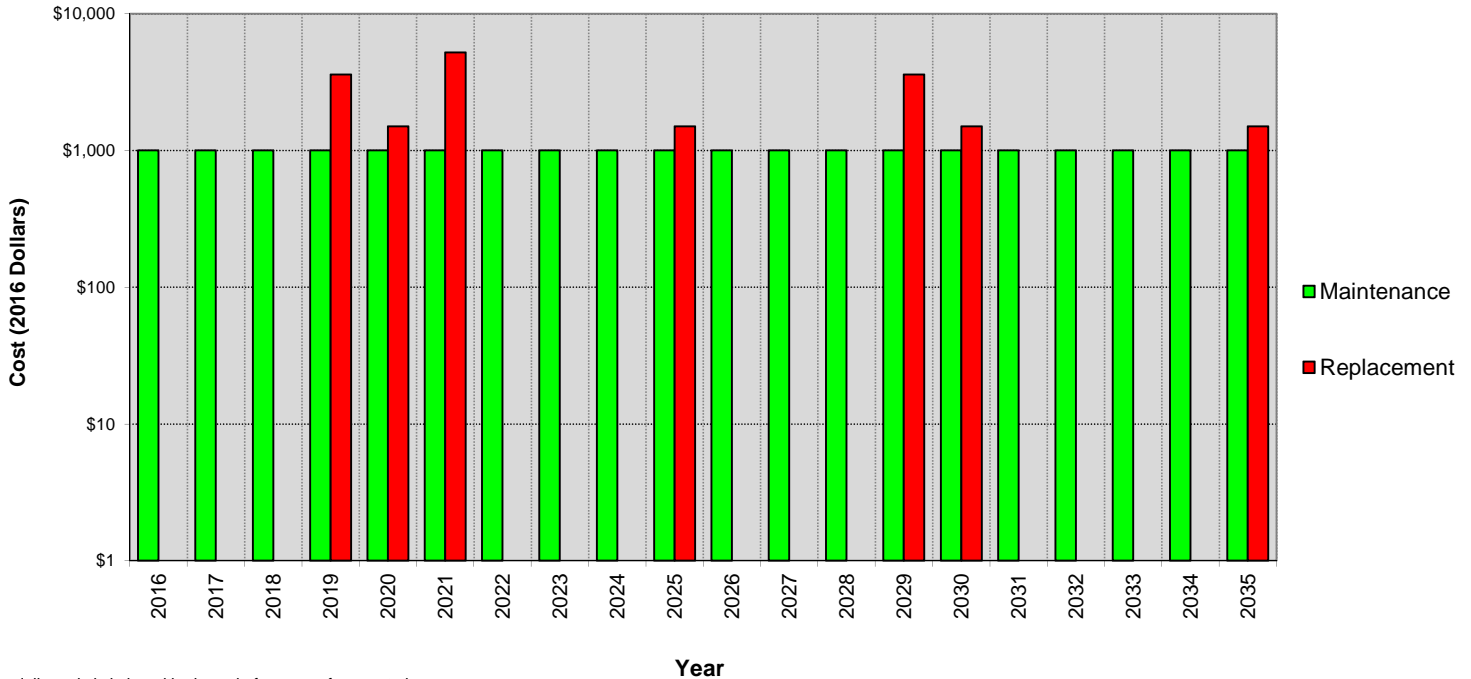
Replacement:

Hot water tank assumed to have been replaced 10 after 1999 construction.
Exhaust fans include one washroom and one kitchen, per suite.

Schindler was contacted to determine a capital plan for the elevator (330A model); Schindler does not recommend any major upgrades or repairs at this time.

Note: Central mechanical systems such as fire suppression and corridor ventilation, have been included within Library reporting.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.21 Oak Bay Apartments

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Lighting - Interior	Maintenance Replacement	\$ 5,000	1999	35		2034
Wiring Devices	Maintenance Replacement	\$ 4,800	1999	30		2029
Electric Heating Baseboard	Maintenance Replacement	\$ 6,000	1999	30		2029
Enterphone System	Maintenance Replacement	\$ 1,500	1999	25		2024

NOTES:

Maintenance:

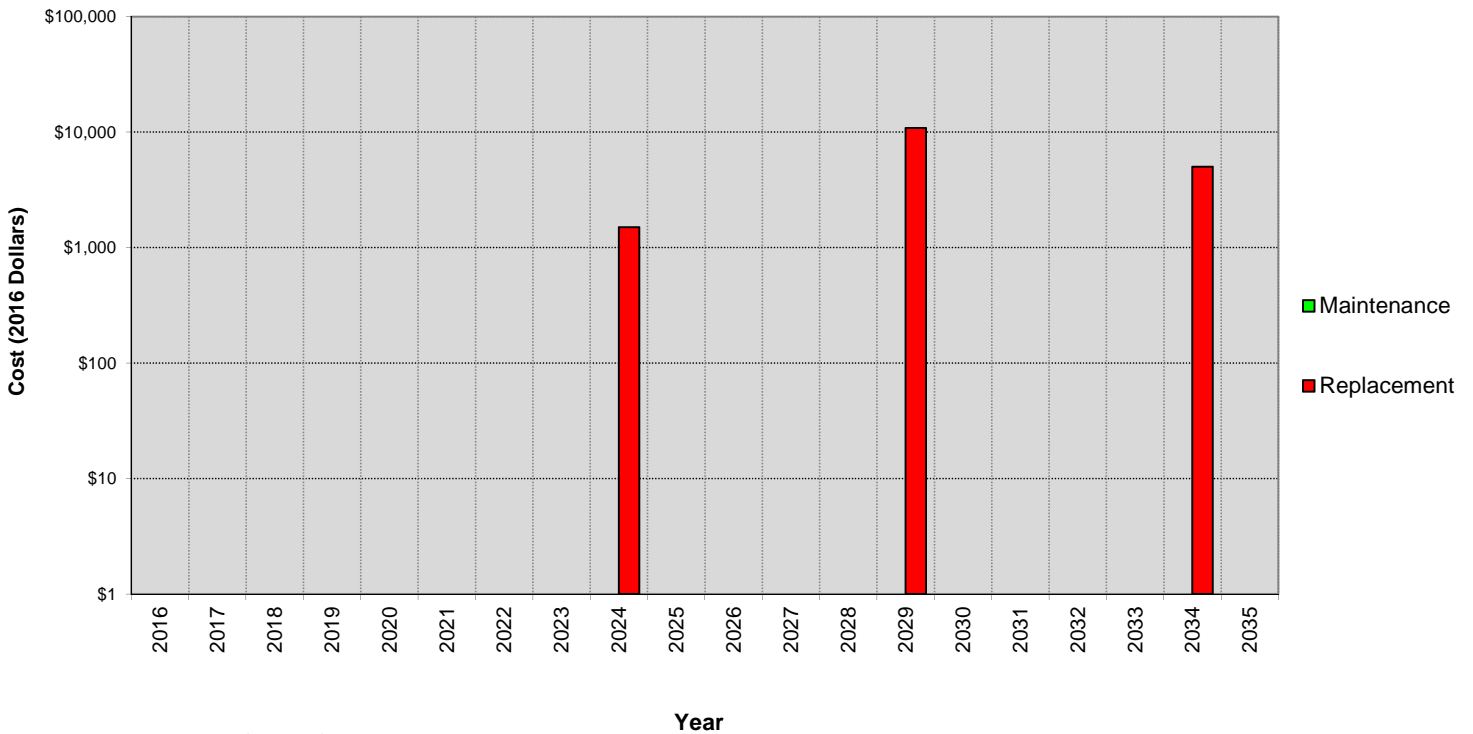
Replacement:

Distribution and suite panels are not expected for replacement in the next 20 years.

Interior lighting, wiring devices, and electric baseboard heating includes corridors and suites.

Note: Central mechanical systems, such as fire suppression and corridor ventilation, have been included within Library reporting.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.4.4. No. 22 – 1531 Hampshire Road

<p>1531 Hampshire Road</p> <p>Peak Occupancy: 20</p> <p>Staffing (avg.): 0</p> <p>Built: c.1950</p> <p>Addition(s): None</p> <p>Area (current): 2,112 sf</p> <p>HVAC: Natural gas furnace & hot water</p> <p>Fire Suppression: None</p> <p>Access: Garage parking, no wheelchair access</p>	 <p><i>Figure 22 – 1531 Hampshire Road</i></p>
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2.4.4.1. Description

1531 Hampshire Road is built c.1950, and is a three-storey, residential building. The original District purchase had the intention of converting the lot to parking or park land. The property has been leased to tenants in the past but has more recently sat vacant. In 2012 The District issued a Request For Public Input to Oak Bay residents. More recently, the idea of renovating the property for sale or for offering Syrian refugee housing, has been discussed. The main floor of the 2-bedroom house contains the kitchen, washroom, bedrooms and living room. From the main floor, interior wooden staircases access the open partially finished loft space, as well as the unfinished concrete slab-on-grade basement. Pedestrian access to the house is from a west elevation wood staircase on Hampshire Road. Vehicle access is present on the south side of the home, through a 9' x 6'-6" garage door, from Theatre Lane.

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists of original fir floors, vinyl-sheet and carpets. The interior walls are gypsum wall board, finished with wallpaper or paint.

BUILDING ENVELOPE: Exterior walls are wood-framed and clad with rock-dash stucco. Wood trim and fascia board finish windows and rooflines. The original windows are wood-framed, however some have been replaced with metal and vinyl-framed double-paned substitutes. Exterior doors are wood with the exception of a sliding vinyl-frame door at the dining room. The roof is pitched 4/12 with asphalt shingles; runoff is gathered by gutters

and directed to downspouts and perimeter drains. The rear of the house (east elevation) features a wood-framed deck that faces the wooden fenced yard. A wood staircase steps down to grade at Theatre Lane.

MECHANICAL: The house is conditioned by a fan-forced, natural gas, furnace in the basement. Domestic hot water is provided by a natural gas tank also in the basement. There is no mechanical exhaust ventilation, nor is fresh air brought in to the furnace for supply. The building relies on poor airtightness, open windows and doors, and a basement duct (hole) to draw in fresh air.

ELECTRICAL: Electrical systems in the building include: original power distribution, interior lighting, and wiring devices (switches and receptacles).

2.4.4.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 47: Condition of Building Systems – No.22 – 1531 Hampshire Road

	<i>Concealed</i>	<i>Poor</i>	<i>Fair</i>	<i>Average</i>	<i>Good</i>
Interior Finishes and Furnishings					
Interior Walls		X			
Vinyl Sheet		X			
Carpet		X			
Hardwood Flooring			X		
Ceramic Tile			X		
Interior Doors			X		
Building Envelope					
Concrete Foundation		X ₁			
Stucco			X ₂		
Cedar Trim & Fascia			X		
Asphalt Shingles				X	
Brick Chimney			X ₃		
Windows, Wood		X ₄			
Windows, Aluminum		X			
Sliding Door, Vinyl			X		
Exterior Metal Doors			X		
Garage Doors, Wood		X ₅			
Exterior Staircases, Wood		X ₆			
Wood-Framed Deck			X ₇		
Gutters & Downspouts		X ₈			
Mechanical					
Fan Forced Furnace				X	
Plumbing Fixtures			X		

	<i>Concealed</i>	<i>Poor</i>	<i>Fair</i>	<i>Average</i>	<i>Good</i>
Perimeter Drains and Clean Outs	X				
Hot Water Tank				X	
Electrical					
Power Distribution		X ₉			
Lighting Interior		X			
Wiring Devices		X			

Notes:

1. Visible water ingress along east foundation wall in basement. Crack of approximately 1” width noted where south elevation of west staircase meets west elevation of building.
2. Stucco exhibits water staining, organic growth, cracking, and has landscaping within close proximity. These deficiencies make the wood framing susceptible to water ingress and constant wetting.
3. West face of brick chimney exhibits significant patch concrete repairs. Access onto to sloped roof was not available, further investigation into the condition of brick and concrete repairs may be warranted.
4. Wood windows exhibit condensation at frames. Attic wood window is swollen or mal-aligned and would not close.
5. Wood garage swing doors have poor seal and do not appear secure. Exterior asphalt slopes into doors, no cleanout drain present, allowing storm water to enter the basement.
6. Wood steps and railing are deteriorated at both staircases.
7. Deck is fair condition, fair amounts of organic growth present on decking and at base of picket guard walls.
8. Downspout at south west corner was disconnected.
9. Original electrical systems recommended for replacement.

2.4.4.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

1531 Hampshire Road: Baseline Recommendations:

2016

- Repair west elevation downspout and install two additional downspouts.
- Regrade west slope, flush perimeter drains.

2017

- Replace plumbing fixtures (valves, backflow preventors, taps) as required.

- Full interior renovation: wall finishes, vinyl sheet flooring, carpets, refinish wood flooring, paint and replace hardware (as needed) on interior doors.
- Replace original wood-framed windows with vinyl-frame. Replace window trim at the same time.
- Replace wood garage swing doors.
- Replace wood staircase steps and railings.
- Electrical upgrade: replace power distribution (panels and breakers), interior lighting fixtures and bulbs, and wiring devices (switches and receptacles).

2018

- Clean and repaint stucco.
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2019

- Replace hot water tank.

2020-21

- Replace exterior doors.
- Replace asphalt shingles.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 48: Summary of Present-Value Building Costs every 5 years – No.16 – Willows Park Washroom

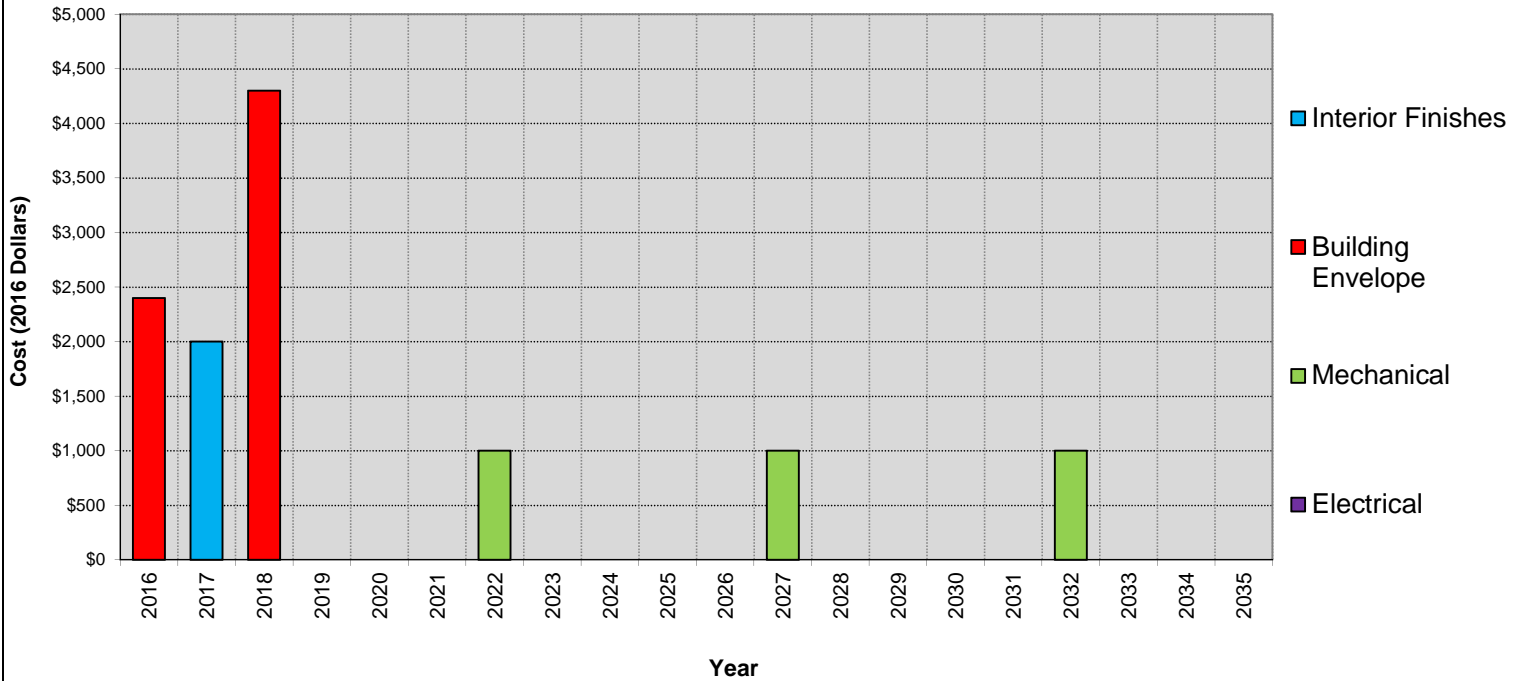
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$38,100	\$-	\$-	\$-	\$38,100
Building Envelope	\$29,200	\$5,500	\$-	\$-	\$34,700
Mechanical Summary	\$5,800	\$1,000	\$1,800	\$6,000	\$14,600
Electrical Summary	\$6,200	\$-	\$-	\$-	\$6,200
Total	\$79,300	\$6,500	\$1,800	\$6,000	\$94,000

No.22 1531 Hampshire Road

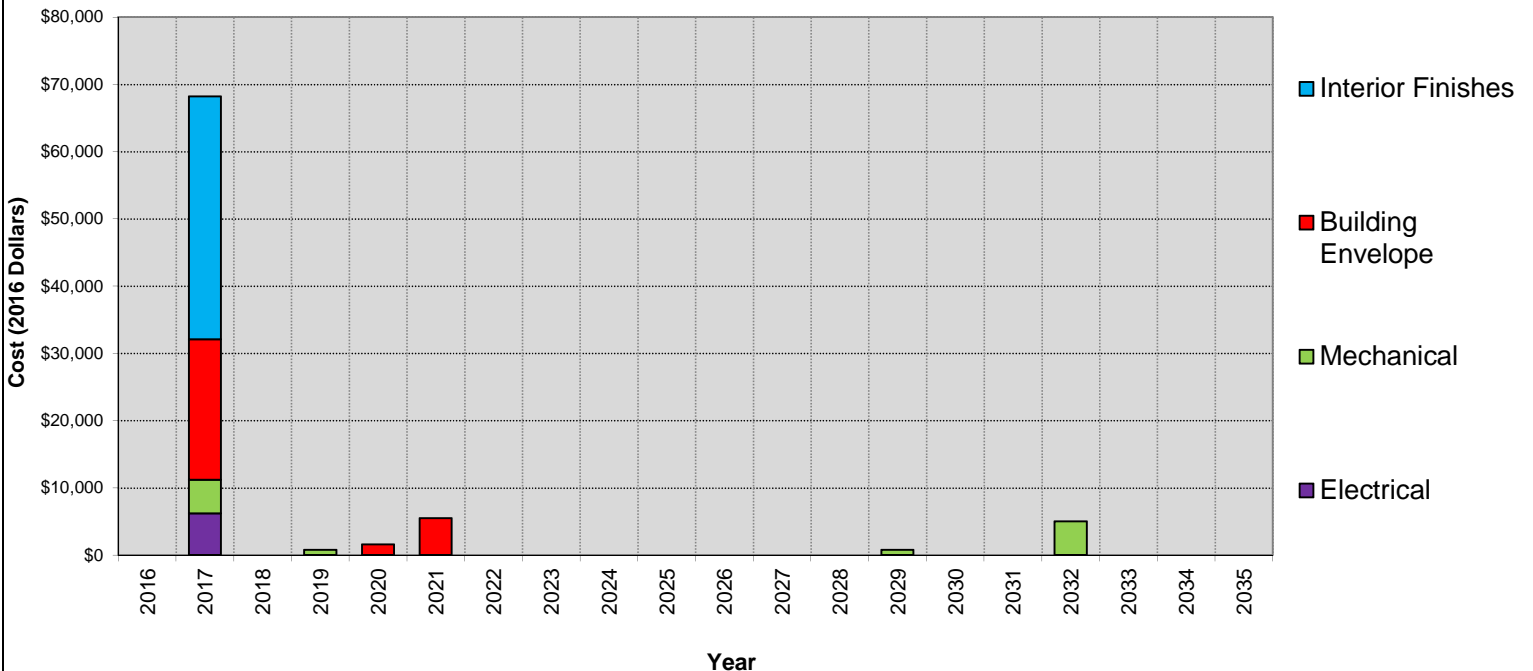
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.22 1531 Hampshire Road

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 8,900				2017
Vinyl Sheet	Maintenance Replacement	\$ 1,600				2017
Carpet	Maintenance Replacement	\$ 2,600				2017
Hardwood Flooring	Maintenance Replacement	\$ 4,000				2017
Int. Doors	Maintenance Replacement	\$ 2,000				2017
Kitchen	Maintenance Replacement	\$ 22,000				2017
Bathroom	Maintenance Replacement	\$ 9,900				2017

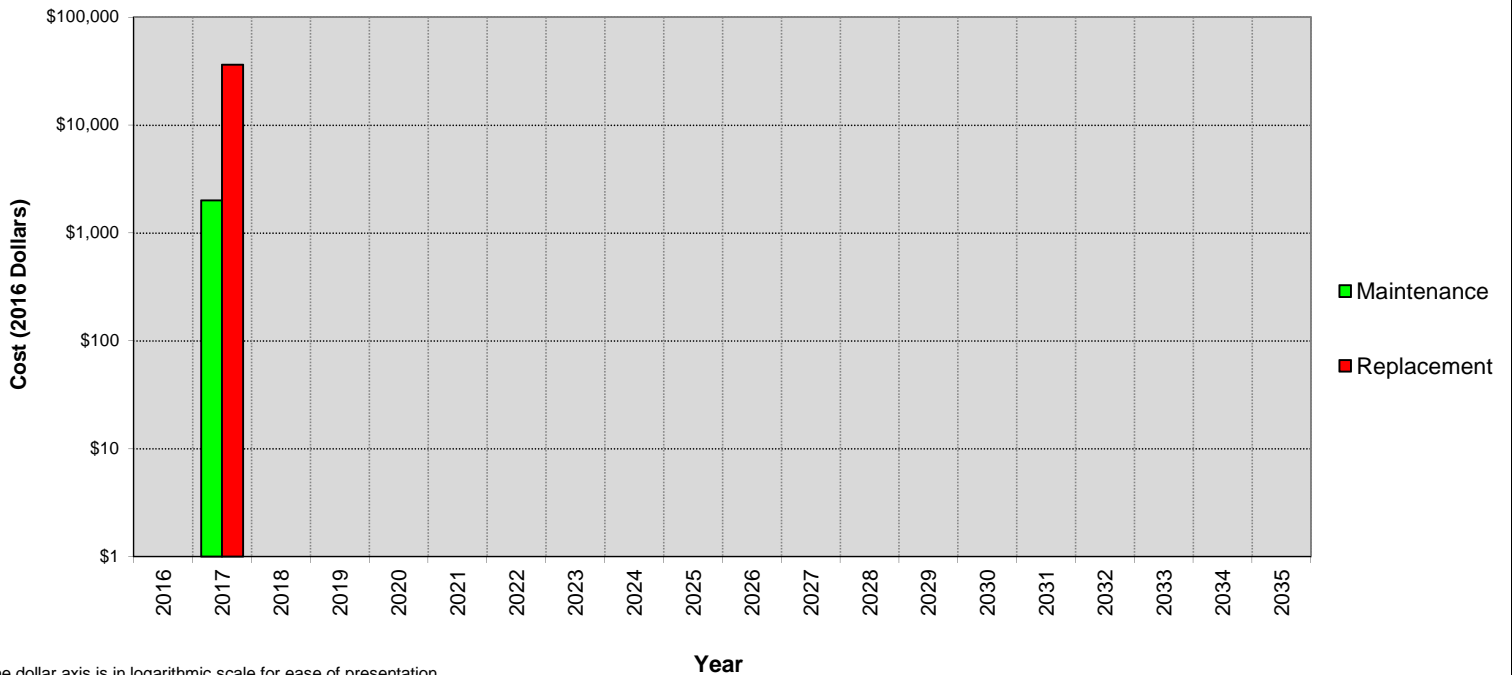
NOTES:

Maintenance:

Replacement:

Full renovation scheduled for 2017 to upgrade interior for new tenants or sale.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.22 1531 Hampshire Road

Building Envelope



Item	Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco Maintenance Replacement	\$ 4,300		20		2018
Wood Windows Maintenance Replacement	\$ 12,600	1950	45	22	2017
Cedar Trim Maintenance Replacement	\$ 1,300	1950	45	22	2017
Garage Door Wood Maintenance Replacement	\$ 3,000	1950	40	27	2017
Exterior Doors Metal Maintenance Replacement	\$ 1,600	1980	40		2020
Exterior Stairs Wood Maintenance Replacement	\$ 4,000				2017
Asphalt Shingles Maintenance Replacement	\$ 3,500	1995	25	1	2021
Gutters & Downspouts Maintenance Replacement	\$ 2,000	1995	25	1	2021
Concrete Foundation Maintenance Replacement	\$ 2,400				2016

NOTES:

Maintenance:

Concrete foundation maintenance includes waterproofing portion of north foundation wall where water is entering basement.

Stucco maintenance includes cleaning and repainting with acrylic latex paint.

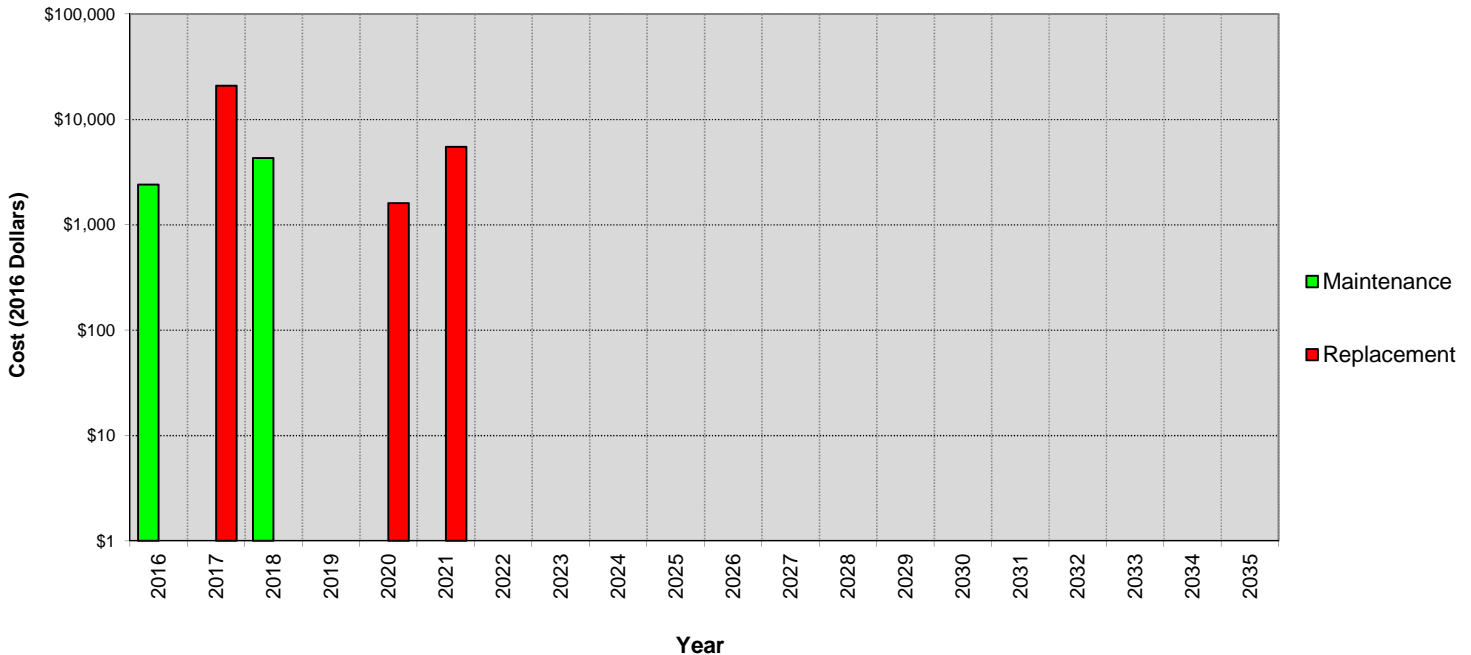
Replacement:

Replace remaining, original, wood-framed windows with vinyl-frames. Cedar trim scheduled for coinciding replacement.

Replace wooden swing garage doors with sliding or roll-up metal door complete with weather stripping.

Asphalt shingle sloped roof and gutters and downspouts to be replaced together within the next 5 years.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.22 1531 Hampshire Road

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Fan Forced Nat Gas Furnace	Maintenance Replacement	\$ 5,000	2007	25		2032
Hot Water Tank Natural Gas	Maintenance Replacement	\$ 800	2007	10	2	2019
Plumbing Fixtures	Maintenance	\$ 1,000	2017	5		2022
	Replacement	\$ 5,000	2017			2017

NOTES:

Maintenance:

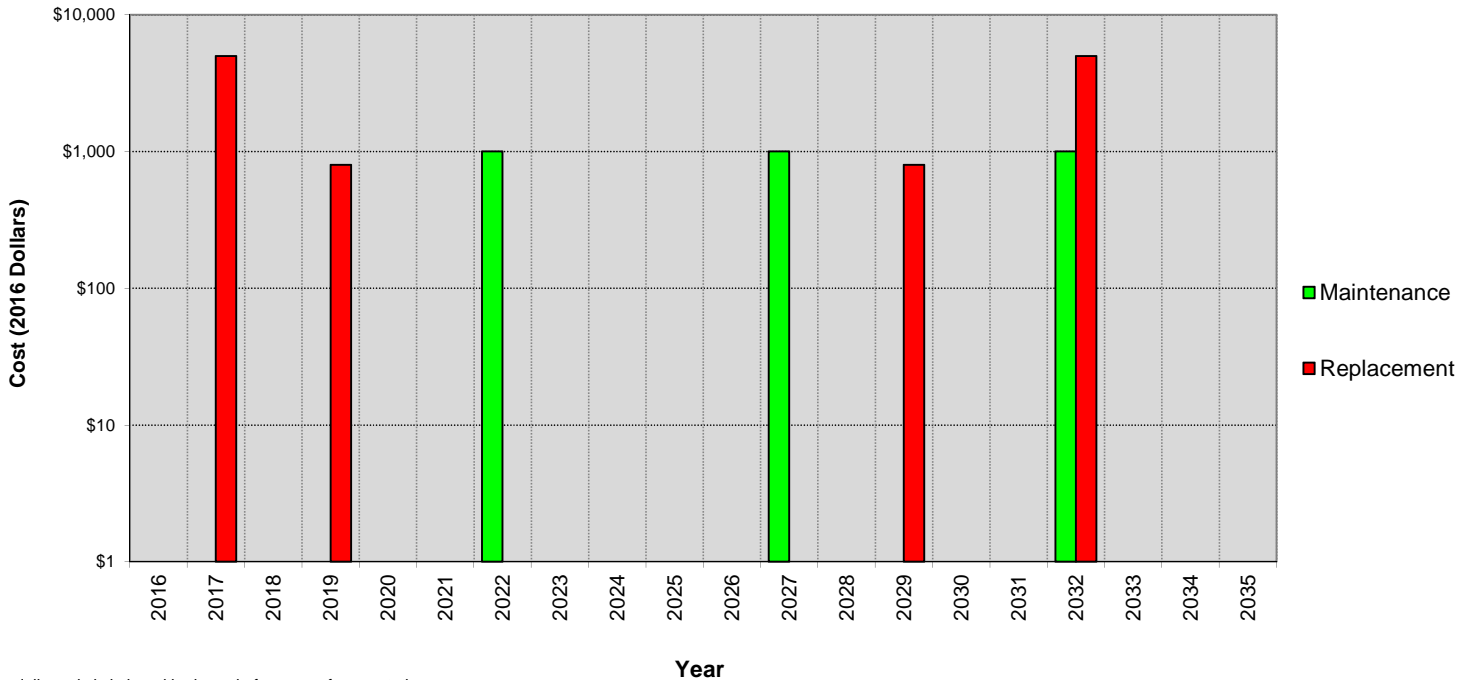
Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

Plumbing fixtures (valves, backflow preventors, taps) to be replaced and then maintained on 5-year basis.

Natural gas furnace and hot water tank both serviced by West Bay Mechanical.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.22 1531 Hampshire Road

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution	Maintenance Replacement	\$ 2,500	1950	50	17	2017
Power Distribution House Panel	Maintenance Replacement	\$ 1,500	1950	50	17	2017
Lighting - Interior	Maintenance Replacement	\$ 1,000				2017
Wiring Devices	Maintenance Replacement	\$ 1,200				2017

NOTES:

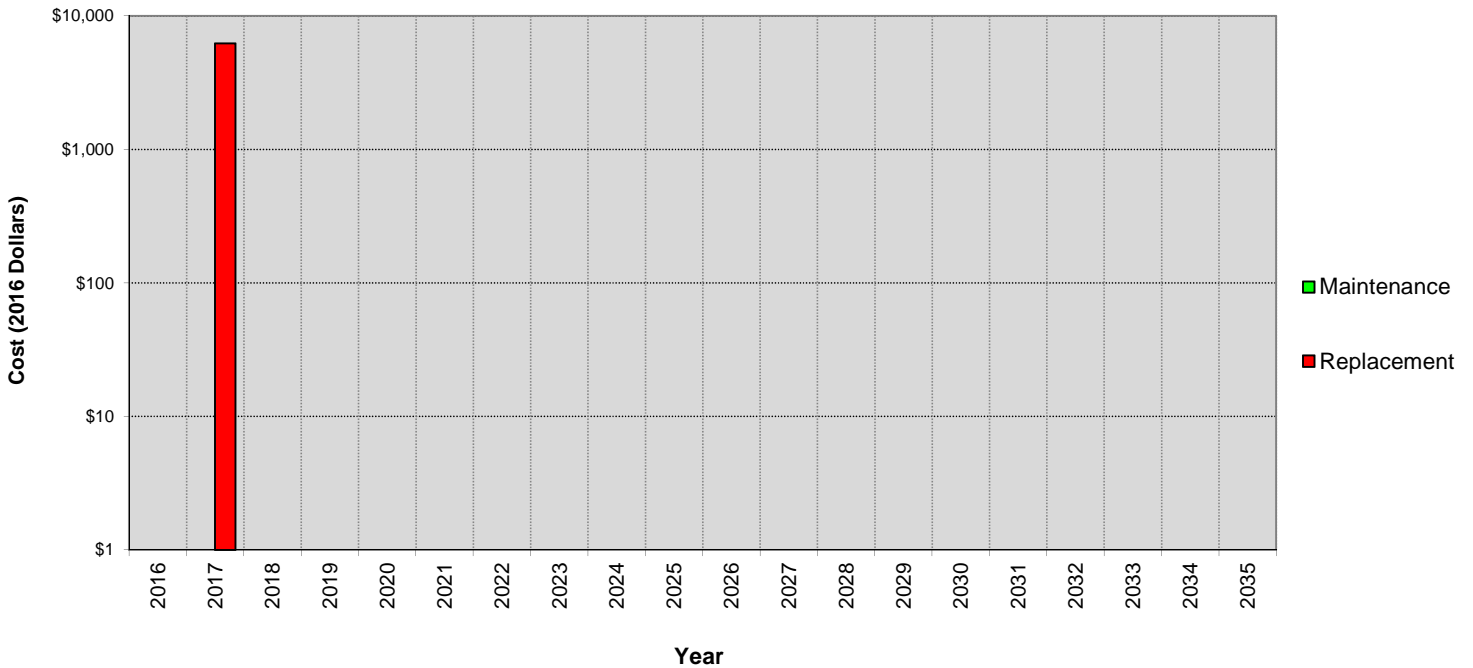
Maintenance:

Replacement:

Power distribution includes main panel, fused disconnect and breakers.



Replacement values are based on typical service call requirements.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.4.5. No. 23 – 2564 Heron Street “Tod House”

<p>2564 Heron Street</p> <p>Peak Occupancy: 10</p> <p>Staffing (avg.): 0</p> <p>Built: 1850-1852</p> <p>Addition(s): 1860's</p> <p>Area (current): 2,124 sf</p> <p>HVAC: Electric furnace and hot water</p> <p>Fire Suppression: Extinguishers</p> <p>Access: No attached parking, no wheelchair access</p>	  <p><i>Figure No. 23 – 2564 Heron Street “Tod House”</i></p>
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2.4.5.1. Description

2564 Heron Street, commonly known as ‘Tod House’, was built by John Tod, a Hudson Bay Company Chief Trader and one of the first appointed members to BC’s Legislative Council, in 1850. It was later expanded in the 1860s to its present day form and remains as the longest continuously occupied residence in western Canada. The one-storey building is a rare example of the French Canadian style, piece-sur-piece (post-and-plank) construction. The building also nicely illustrates evolution of building techniques, from the 1850-1852 log construction to the 1860s frame construction addition. The building first received Canadian Heritage designation in 1974. Since 1975 The District and Province of British Columbia have jointly owned Tod House.

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists of rough finished fir board, carpet, and vinyl-sheet. The interior walls are painted plaster and gypsum wallboard. Hand-hewn beams and fieldstone fire places add to the interior heritage character.

BUILDING ENVELOPE: The original building foundation was rubble masonry (‘rubblework’) which has since been reinforced with exterior perimeter concrete foundation walls. Exterior walls are wood-framed and feature clapboard siding. Windows, doors, corners, base of wall, and rooflines are all finished with wood trim. The

windows are wood-framed (single pane) and exterior doors are solid wood. The gable bellcast roof is pitched primarily at 8/12 and covered with cedar shingles. A small portion of SBS roofing membrane sloped (4/12) is present at the north elevation. Roof runoff is gathered by gutters and directed to downspouts and perimeter drains. A concrete paver patio is present at the north east corner of the building, and a concrete slab, wood post, veranda shelters the main entrance on the south elevation.

MECHANICAL: The house is conditioned by a fan-forced electric furnace in the basement. Domestic hot water is provided by an electric tank also located in the basement. Mechanical exhaust is present in the washroom, but not in the kitchen space. A washer and dryer are installed in the electrical room which is located out the back of the kitchen at the north east patio.

ELECTRICAL: Electrical systems in the building include: Power distribution, interior and exterior lighting, fire detection, and wiring devices (switches and receptacles).

2.4.5.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement *regarding their respective condition as observed.*

Table 49: Condition of Building Systems – No. 23 – 2564 Heron Street “Tod House”

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X		
Vinyl-Sheet				X	
Hardwood Flooring			X		
Carpet				X	
Building Envelope					
Rubble & Concrete Foundation		X ₁			
Cedar Board Siding & Trim			X ₂		
Windows, Wood			X ₃		
Exterior Wood Doors			X ₃		
Cedar Shingle Roof			X		
SBS 2-Ply Roof Membrane			X ₄		
Gutters & Downspouts			X		
Brick Chimneys		X ₅			
Mechanical					
Fan Forced Furnace					X
Hot Water Tank				X	
Exhaust Fan Washroom			X		
Plumbing Fixtures			X		

	Concealed	Poor	Fair	Average	Good
Perimeter Drains and Clean Outs	X				
Electrical					
Power Distribution			X		
Lighting Interior				X	
Lighting Exterior			X		
Wiring Devices			X		
Smoke & Heat Detectors				X ₆	

Notes:

1. Significant cracking and differential settlement at concrete slab on grade at front veranda.
2. Majority of clap board siding in fair to average condition, however base of wall shows deterioration. Base of wall and corner trim deteriorated. Roof fascia paint peeling near drip edges.
3. Tenants comment on drafty windows and doors; weather stripping not present.
4. Significant organic growth under eaves.
5. Herold Engineering report (February 2016) notes chimney caps in deteriorated condition: failed mortar joints, loose brick, and deteriorated counter flashings. Mortar jointing of the kitchen, field stone, chimney chase noted in poor condition.
6. Appear in average condition, immediate testing recommended by Houle Electric.

2.4.5.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

2564 Heron Street “Tod House”: Baseline Recommendations:

2016

- Repairs concrete slab-on-grade and wood posts at front veranda. Condition assessment of rubblework foundation walls recommended.
- Replace wiring devices (switches and receptacles) as required.

2017

- Replace deteriorated siding and trim (~15% of total).
- Repair chimney caps and chase.
- Replace wiring devices (switches and receptacles).
- Replace SBS roofing membrane.

2018

- Replace exterior and interior lighting fixtures as required
- Ongoing replacement of plumbing fixtures with flow rates to meet present Building Code.

2020-21

- Repaint interior walls.
- Refinish hardwood flooring.
- Replace cedar shingle roof along with gutters and downspouts.
- Replace power distribution.
- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 50: Summary of Present-Value Building Costs every 5 years – No. 23 – 2564 Heron Street “Tod House”

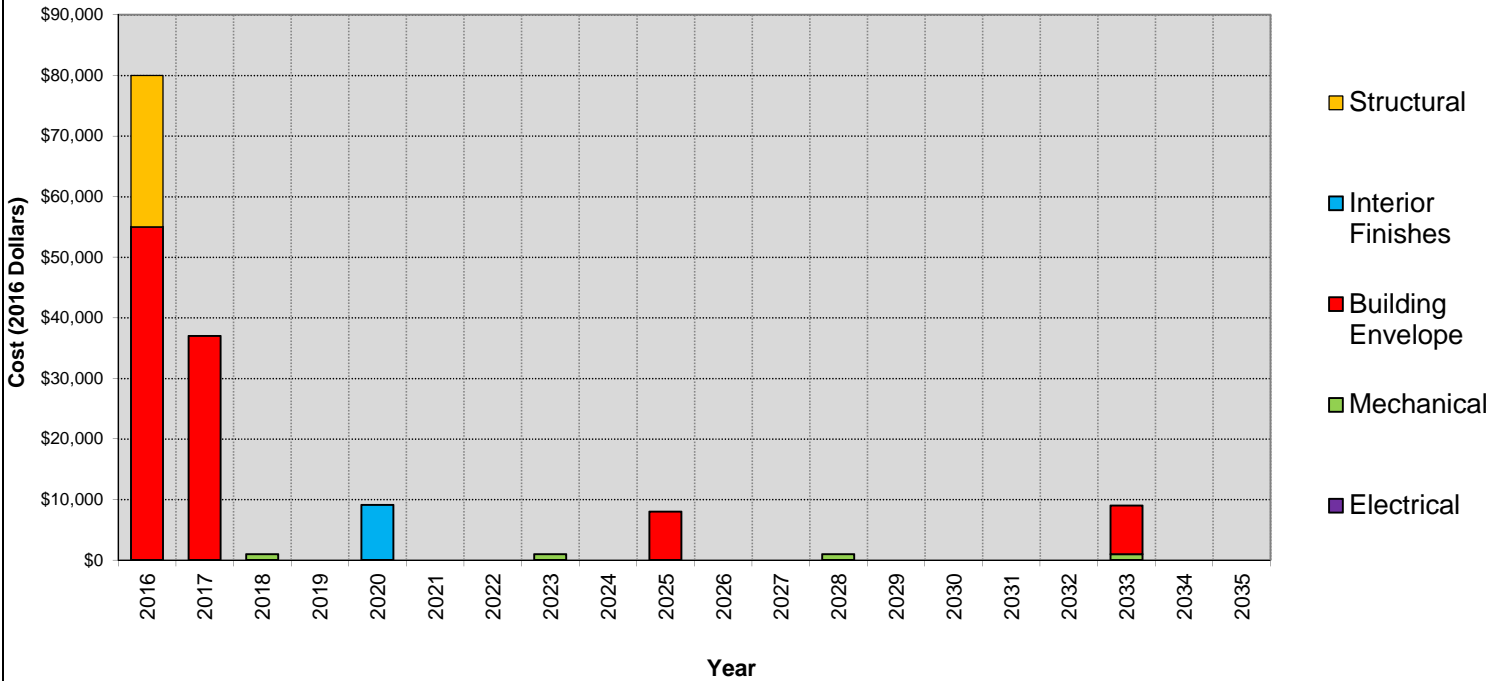
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$9,100	\$2,600	\$-	\$-	\$11,700
Building Envelope	\$149,500	\$8,000	\$-	\$8,000	\$165,500
Mechanical Summary	\$1,000	\$5,600	\$1,000	\$1,800	\$9,400
Electrical Summary	\$8,600	\$-	\$-	\$-	\$8,600
Total	\$168,200	\$16,200	\$1,000	\$9,800	\$195,000

No.23 2564 Heron Street

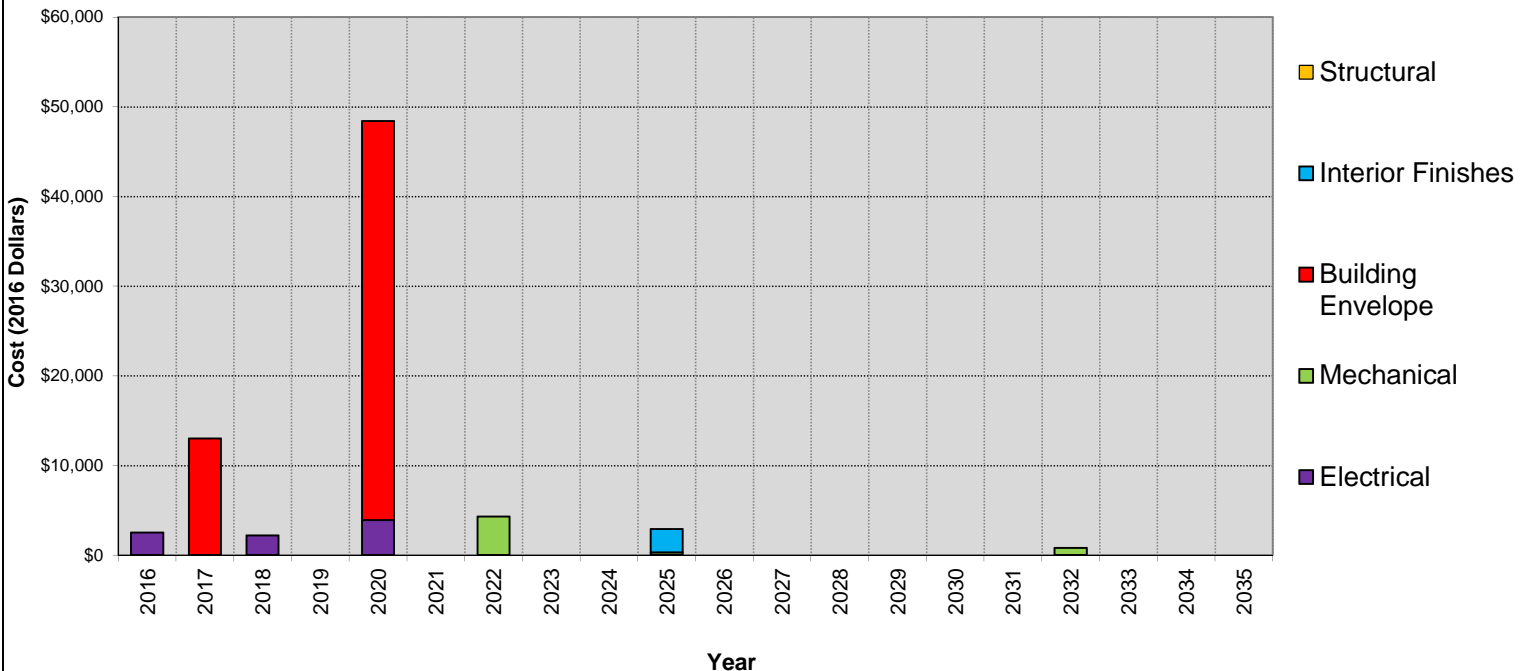
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.23 2564 Heron Street

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 5,300	2000	20		2020
Vinyl Sheet	Maintenance Replacement	\$ 1,600	2005	20		2025
Hardwood Flooring	Maintenance Replacement	\$ 3,800	2000	20		2020
Carpet	Maintenance Replacement	\$ 1,000	2005	20		2025

NOTES:

Maintenance:

Wood flooring maintenance includes refinishing (sand and seal).

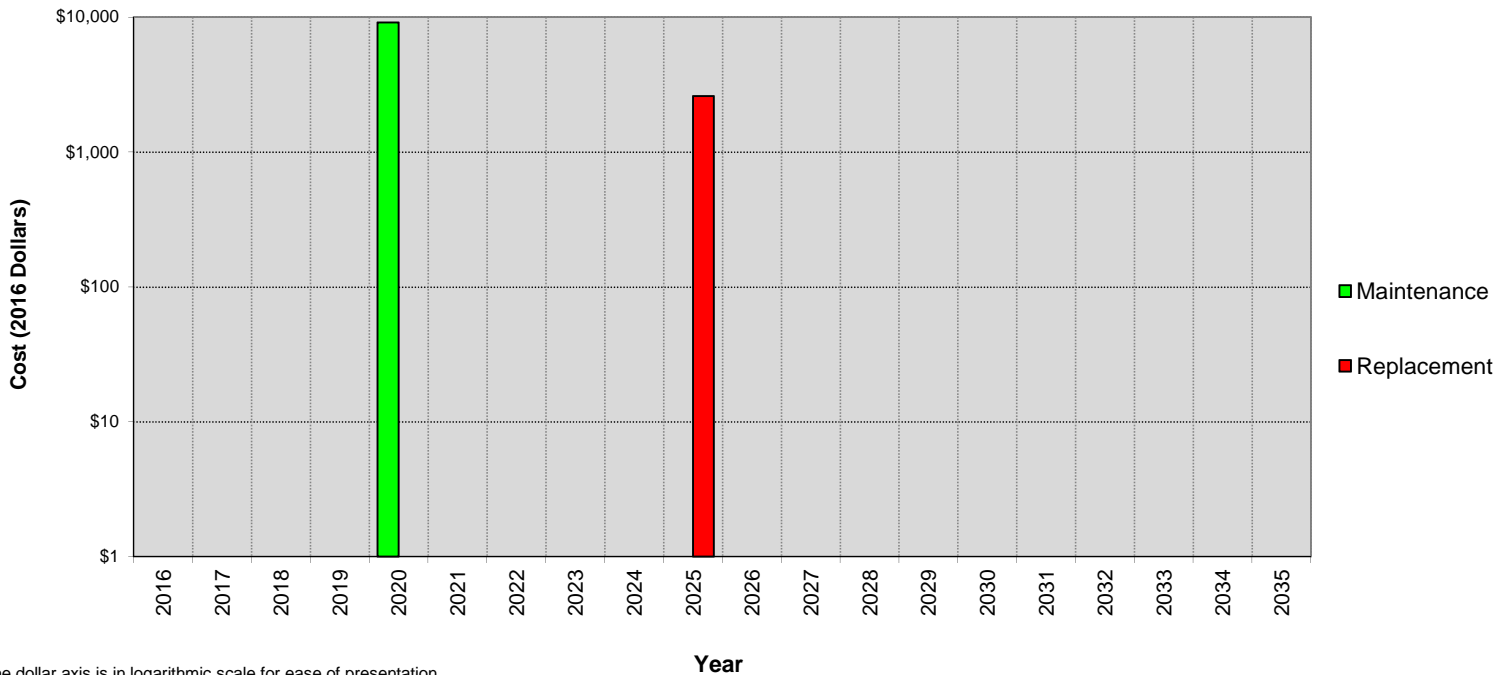
Interior wall maintenance includes repainting.

Replacement:

Vinyl sheet flooring replacement in kitchen and washroom. Dining area flooring not expected for replacement in the next 20 years.

Carpet replacement for secondary bedroom and corridor.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.23 2564 Heron Street

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Cedar Board Siding & Trim	Maintenance	\$ 4,000	2017	8		2025
	Replacement	\$ 13,000				2017
Windows	Maintenance	\$ 3,000		8		2017
	Replacement					
Cedar Shingle Roof	Maintenance					
	Replacement	\$ 43,000	1995	25		2020
Gutters & Downspouts	Maintenance					
	Replacement	\$ 1,500	1995	25		2020
Exterior Doors	Maintenance	\$ 1,000		8		2017
	Replacement					
Rubble & Concrete Foundation	Maintenance	\$ 55,000				2016
Brick Chimney	Maintenance	\$ 33,000				2017
	Replacement					

NOTES:

Maintenance:

Foundation maintenance includes a \$5,000 estimate for condition assessment and a \$50,000 contingency for resultant repairs.

Maintenance to siding, trim, windows, and doors includes sanding, part replacement and painting every 8 years to preserve heritage construction.

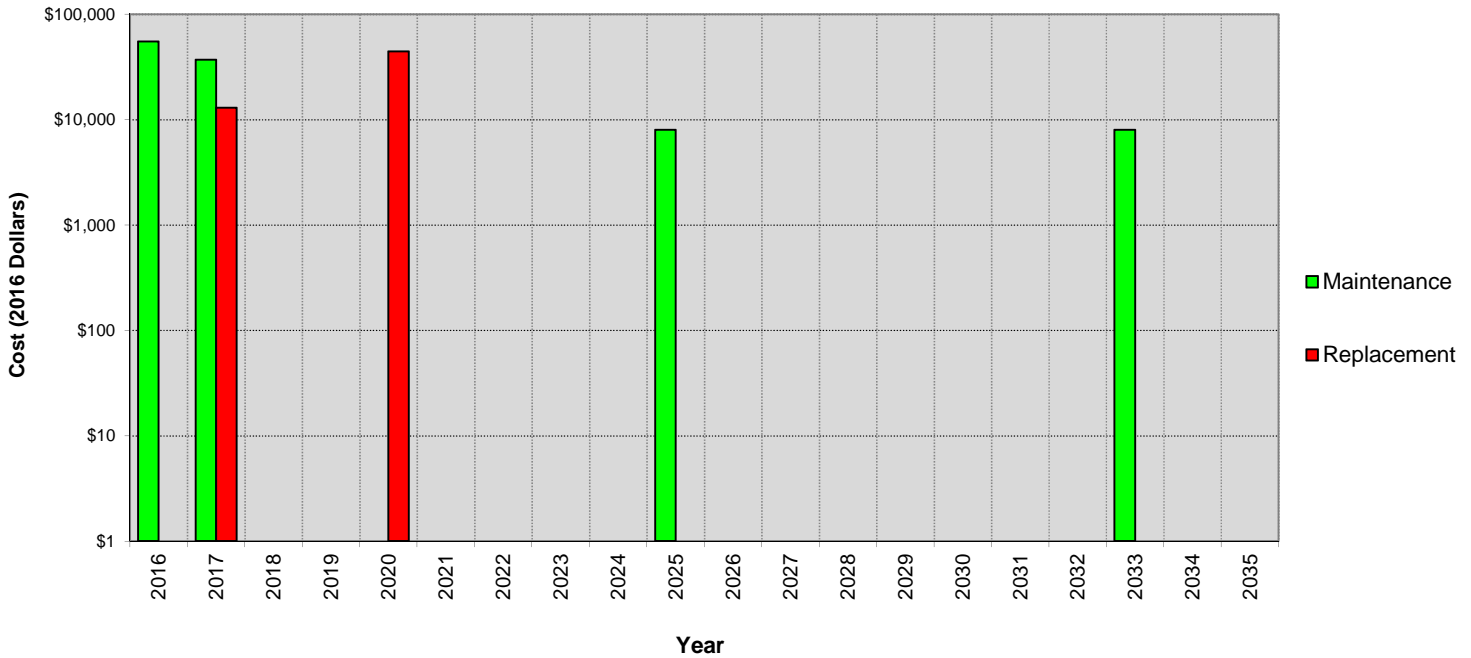
Chimney chase and cap maintenance as recommended from February 2016 Herold Engineering report: revitalize caps, repoint fieldstone chase, remove encroaching landscaping and Dutchman repair on mud sill.

Replacement:

Cedar board siding and trim replacement includes areas that have deteriorated: approximately 15% of total siding (lower wall) and corner trim.

Cedar shingle roof to be replaced in the next 5 years along with gutters and downspouts.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.23 2564 Heron Street

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Hot Water Tank	Maintenance Replacement	\$ 800	2000	10	12	2022
Electric Furnace	Maintenance Replacement	\$ 3,500	1980	35	7	2022
Washroom Exhaust Fan	Maintenance Replacement	\$ 300	2005	20		2025
Plumbing Fixtures	Maintenance Replacement	\$ 1,000		5		2018

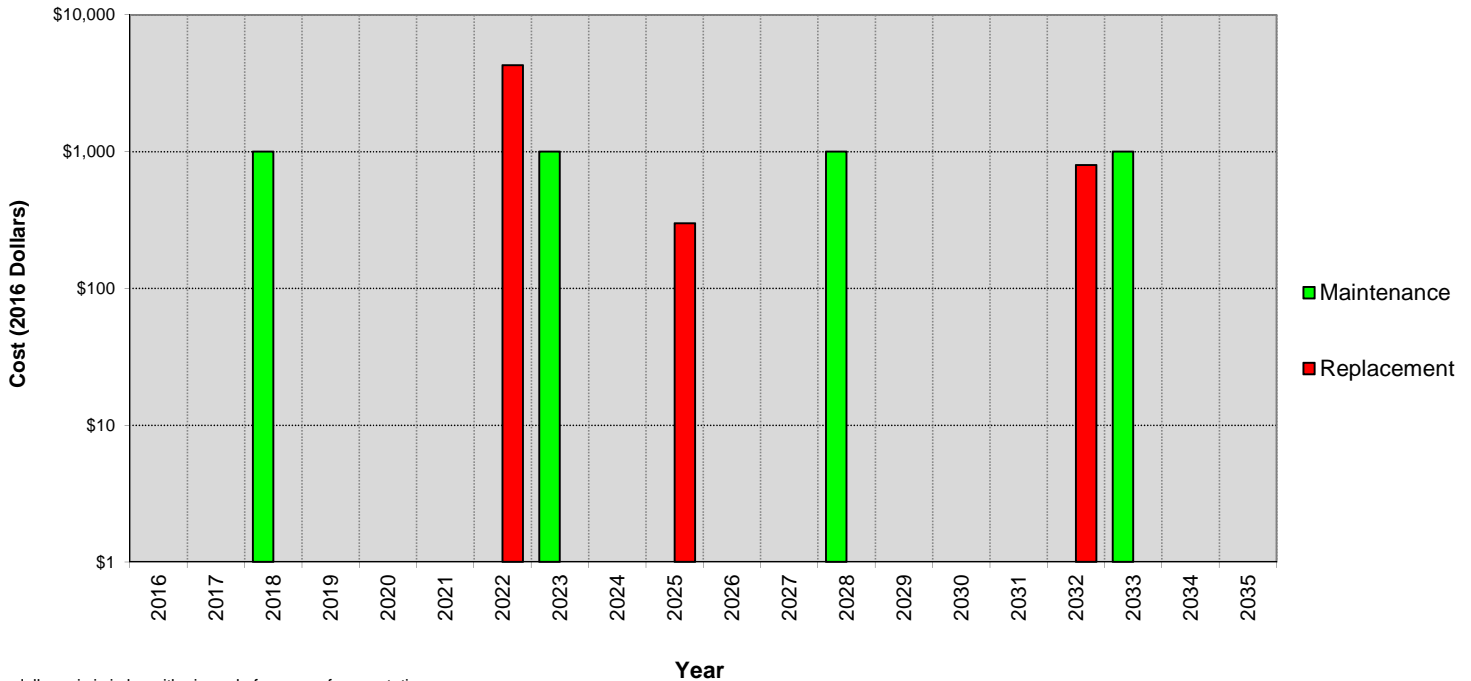
NOTES:

Maintenance:

Plumbing fixtures scheduled on maintenance program replacement every 5 years as needed.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.23 2564 Heron Street

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Power Distribution	Maintenance Replacement	\$ 3,600	1970	50		2020
Lighting Exterior	Maintenance Replacement	\$ 1,000	1980	35	3	2018
Lighting Interior	Maintenance Replacement	\$ 1,200	1970	35	13	2018
Smoke & Heat Detectors	Maintenance Replacement	\$ 300	2000	20		2020
Wiring Devices	Maintenance Replacement	\$ 2,500	1970	35	11	2016

NOTES:

Maintenance:

Have Prices Alarms test heat & smoke detectors immediately.

Maintain distribution equipment annually. Infra-red test for internal condition every 5 years.

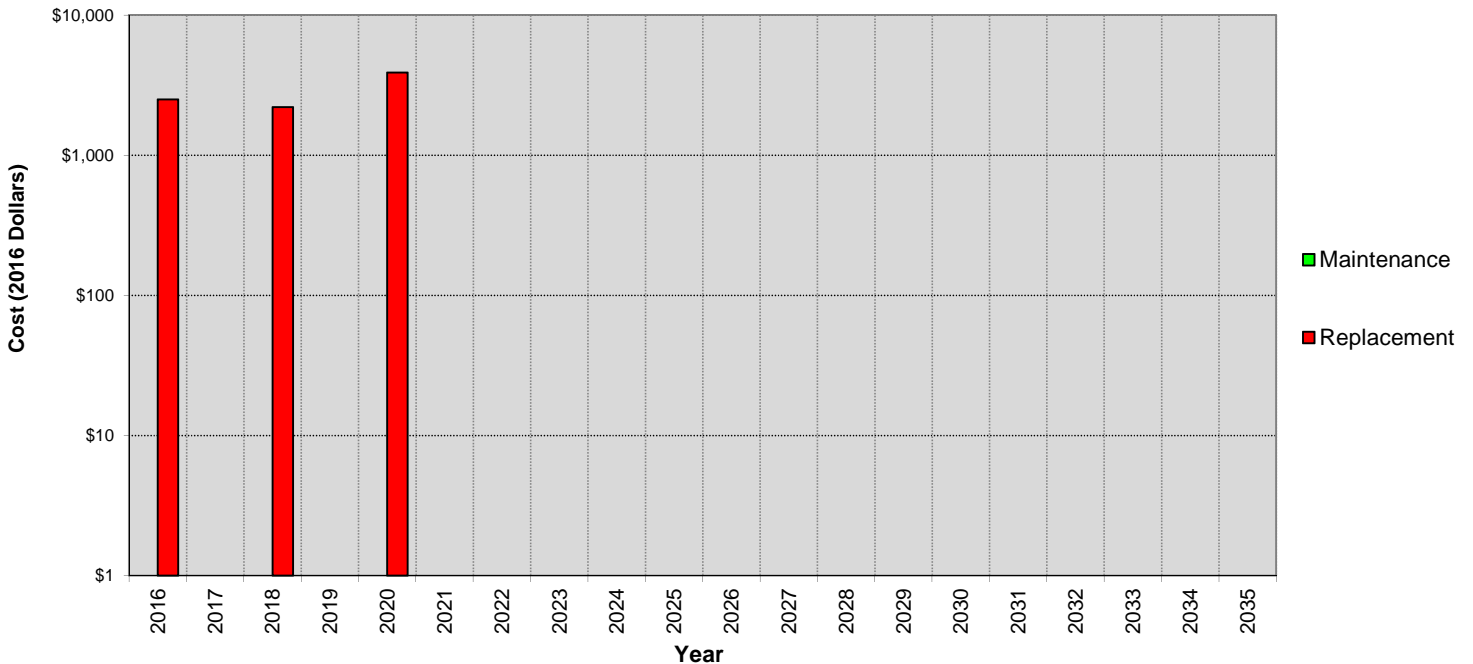
Replacement:

Smoke detector installation near electric furnace recommended.

Wiring devices replacement includes all switches and receptacles.

Lighting fixture and wiring replacement should be considered.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.23 2564 Heron Street

Structural



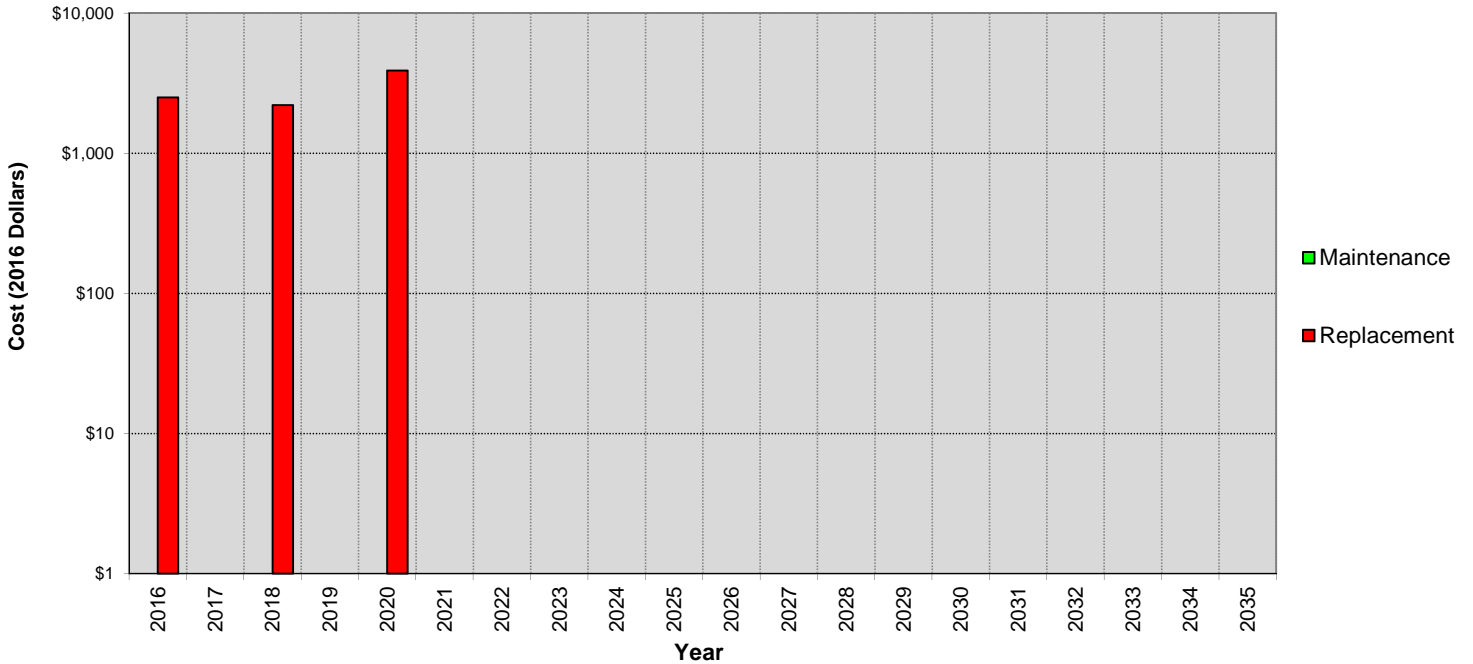
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Lift Main Level	Maintenance	\$ 25,000	1854	100	62	2016
Flooring	Replacement					

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)

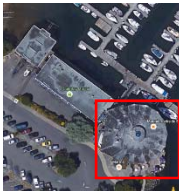



The dollar axis is in logarithmic scale for ease of presentation.

2.5. OAK BAY MARINA

The Oak Bay Marina is situated at Turkey Head Point in south Oak Bay. While the breakwater was built in 1959 by the Government of Canada, the Marina was developed three years later in 1962. The Marina consists of three buildings positioned southeast to northwest along the east side of the point: Marina Restaurant, Marina Office, and Marina Dockworks respectively. A large parking lot is located to the west of the buildings. All buildings are leased by The District to The Oak Bay Marine Group who staff, operate, and maintain them. The long term lease is expected to be renewed for another 30 years in 2022. The three buildings are elevated over the water foreshore with a wood-decked, over-water walkway running along the east side from the Marina Restaurant to the Dockworks building.

2.5.1. No. 24 – Marina Restaurant

<p>1327 Beach Drive</p> <p>Peak Occupancy: 300</p> <p>Staffing (avg.): 30</p>		
<p>Built: 1962</p> <p>Addition(s): 1994</p> <p>Current Area: 10,212 sf</p> <p>HVAC: Natural gas boilers (2), heat-pump, chiller, refrigerator condensing units</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>		<p><i>Figure 12 No. 24 – Marina Restaurant</i></p>

2.5.1.1. Description

The Marina Restaurant was constructed in 1963 with a large renovation occurring in 1993. It is a two-storey, circular looking building that overhangs the ocean on concrete piles. The building is leased from The District by Oak Bay Marine Group. The main entrance is located at the south west quadrant and brings guests into the main restaurant area which features the dining area, bar, sushi bar, kitchen, and washrooms. Staff can access

the lower level through a staircase from the kitchen while public access is separate and exterior for upper and lower levels. The lower level features The Marina Dockside Eatery, management offices, kitchen, storage areas, staffroom, laundry facilities, and washrooms.

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists of a combination of carpet and hardwood flooring in the eatery and restaurant, anti-slip vinyl-sheet flooring in the restaurant kitchen, marmoleum corridor flooring on the lower level and ceramic tile in washrooms. Interior walls and ceiling are painted gypsum wall board and finished wood veneer.

BUILDING ENVELOPE: The Marina Restaurant is a wood-framed and concrete two-storey structure. The exterior walls are clad with face-sealed stucco and wood siding, while wooden fascia board and trim finish rooflines and fenestration. Windows are predominantly original, single-pane, metal frames. Some windows have been replaced near the main entrance with double-pane units. The northwest portion of the building features a SBS membrane deck and a vinyl membrane balcony. The gable-dormer roof is sloped (2/12) with SBS membrane and features a wood-framed, stucco, rotunda that rises from the centre and is capped with a pressure glazed skylight.

STRUCTURAL: The Oak Bay Marina buildings consists of a one story circular restaurant at the north end of the site (Building #24), and a one story block of commercial space and industrial space to the south (Buildings #25 & #26). The foundation of the buildings is partially bedded on rock/fill on the east and on columns in the foreshore on the west.

The original structural drawings by Read Jones Christoffersen Ltd. dated April 1963 show that the columns at the periphery of the radial structure of building #24 and the columns supporting a cantilevered slab of building #25 are cast into blasted rock.

The columns are cast-in-place concrete which support reinforced concrete beams over the foreshore. The general notes of the original structural drawings specify the 28 day compressive strength of the concrete to be as follows:

- Slab on grade 2500 psi
- Walls and Columns 3000 psi
- Slabs and Beams 3500 psi

The concrete cover was specified to be:

- Surfaces in contact with ground 3"
- Surfaces exposed to ground and weather 2"
- Surfaces if exposed slab soffit 1 ½ "
- Surfaces of slabs generally ¾ "

WSP conducted a more detailed survey of the concrete underneath the restaurant and identified areas of concrete cover that had spalled due to corrosion with less cover than that specified above.

MECHANICAL:

- Heating, Ventilation and Air Conditioning (HVAC):

Natural gas is supplied through a meter set on the south west side of the site and serves all the buildings on the site (Dockworks, Offices and Restaurant). The gas supply runs through the office building and over to the Restaurant.

A central hot water heating system is located in the lower level boiler room and services the Restaurant building. The heating system is composed of two boilers with several heating loops that service the domestic hot water storage system (through a heat exchanger), perimeter wall fin radiators on both levels and various fan duct heating coils. The boiler room also houses a chiller unit and condensing units that serve several refrigerators above. The boilers were changed out in 1993 to run on natural gas. Both boiler flues run up and into an existing chimney to above the roof. The heating water circulating pumps looked to be in good condition and well maintained.

There is supplementary air conditioning provided from a 2.5 Ton (c.2000), roof mounted, packaged heat pump unit that serves the Upper Restaurant seating area. This was added after the 1993 renovation and is in good condition.

There is an AHU with hot water heating coil (1993) that supplies ventilated air to the Kitchen service area. Diffusers in the kitchen area appear worn and could be replaced under regular maintenance. This air handling unit was installed in the 1993 renovation to take over service of the Kitchen area from the original 1963 system. There is an AHU with a hot water heating coil (pre-1993 likely 1963) that now supplies ventilated air only to the basement restaurant service areas. This is an older unit and looks to be well maintained.

There are five mushroom-type roof exhaust fans serving the various kitchen exhaust hoods. One is open and rusting that serves a kitchen hood in the lower level restaurant which is no longer in use. Each fan appears to be in good condition for their age. There are several ducted NFPA exhaust heat collecting and ventilation hoods on the main floor that appear to be maintained and in good condition. The kitchen equipment was all replaced in the 1993 renovation. The washrooms were ventilated and appear to be as indicated on the 1993 design drawings.

There is a coin-operated clothes dryer on the lower level by the public washrooms for use by clients.

Overall the heating and ventilation within this building is good with sufficient zones to accommodate each area. Observations noted throughout the HVAC systems include:

- One roof exhaust fan should be removed.
- Rusty diffusers in the upper kitchen should be replaced.
- Plumbing:

The facility contains public washrooms complete with showers, staff washrooms, and kitchen equipment. Overall there are 13 tank type ceramic water closets, 13 lavatories (single handle faucets with ceramic basins), 4 urinals (each flush valve), 4 showers (tiled), 1 clothes washer and 1 laundry sink, not including the kitchen equipment. The staff washrooms have fixtures that are older and nearing the end of their useful life (3 sinks and 3 water closets). The public washroom fixtures have been replaced recently and are in good condition. The showers were not accessible and were reported to have tiled surrounds and can be assumed to be well maintained. The Kitchen equipment, sinks, dishwashers and spray nozzles are all stainless steel from 1993 and in good condition. Plumbing fixtures all appear to be of proper water usage other than the older models in the lower level staff washrooms. There is a plastic laundry sink in the boiler room that is functional and well used. There is a laundry area with one coin operated washing machine on the lower level with exterior access for the marina users.

There are three grease interceptors (GI), each installed during the 1993 renovation. Two GI's (less than 50Gal) are floor mounted under pot sinks for the main and upper floors. The other GI (larger than 75Gal) is exterior to the building, was upgraded c.2004 and services, as per design drawings, another pot sink and two wash-down hoods on the upper floor. The two smaller GI units are plastic and in good condition. The exterior unit was not accessible; however, it has been maintained.

There are two 450L domestic hot water storage tanks that supply domestic hot water to the Facility. They appear to be in good condition and adequate for the facilities requirements. Hot water is made through a heat exchanger off the boiler loop to maintain proper water temperatures.

Domestic cold water (75 mm [3"]) is supplied from the water entry in the Boiler Room and has appropriate dual backflow protection and pressure regulation. A second 65 mm [2 1/2"] domestic cold water branch, complete with dual reduced pressure backflow protection, exists and likely supplies the kitchen area; a water meter is installed to track water to this portion of the building. There is smaller branch take-off with reduced pressure backflow protection to the make-up water for the boilers. The piping is copper and steel braided hose. There are hose bibs located around the exterior. The water service is sized adequately to serve the facility to today's BC Building Code.

The sanitary sewer system is comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. There is a sanitary sump pit, with pump, in the boiler room that receives the lower level fixtures from each building (Dockworks, Offices and Restaurant) and lifts it up to the building sewer.

The storm system is comprised of internal cast iron rainwater leaders connected to roof drains. The storm lines do not appear to be ganged together, piped to the building storm main, and then out to the municipal main; rainwater appears to be drained directly to the ocean.

The plumbing systems are in good condition overall and need only be maintained for the foreseeable future for its current use. Observations noted throughout the plumbing system include:

- Rainwater from this building is not connected back to the municipal main and is directed to the ocean it resides by.
- Domestic water and sanitary sewer systems also serve the neighbouring Dockworks and Office buildings.

- Fire Suppression:
 The facility is not protected with a sprinkler fire suppression system. Fire extinguishers are present on walls in locations as per NFPA 10. All NFPA 96 Kitchen Hoods and ducts have individual fire extinguishing systems, and are all maintained in good condition.

ELECTRICAL: The main electrical supplies power to the Dockworks, Restaurant, Marina and Administration Offices. The manufacturer, Commander (by Westinghouse), is no longer in production and is not supported by the Manufacturer. It is recommended that the electrical equipment be replaced to avoid a replacement issues. There are several older original panels in the restaurant that are in need of replacement due to age; newer panels installed in the building are in good condition and are not in need of replacement.

End use devices such as receptacles and switches are in need of replacement due to age and wear.

Lighting in the restaurant is generally in average condition, consideration should be given to replacing inefficient fixtures with LED style ones and lighting controls installed to reduce energy consumption. The exit lights are nearing the expected serviceable life and should be replaced with the new green pictorial 'running man' style to meet current Code.

The fire alarm system is out of date and past its expected serviceable life; replacement of the system is recommended. The communication system was recently replaced and is in good condition, as is the sound system in the 'front of house'. The music system head end is out of date and in need of replacement.

2.5.1.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 51: Condition of Building Systems –No. 24 – Marina Restaurant

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls & Ceiling				X	
Kitchen Anti-Slip Flooring			X ₁		
Carpet, Restaurant					X
Carpet, Eatery & Offices					X
Stair Tread			X		
Marmoleum			X ₂		
Hardwood Flooring				X	
Building Envelope					
Stucco			X ₃		
Cedar Siding & Fascia			X ₄		
Wood Soffit				X	
Exterior Wood Doors			X ₅		
Windows, Aluminum			X ₆		
SBS Membrane, Roof			X ₇		
SBS Membrane, Deck			X ₈		
Vinyl Membrane, Balcony		X ₉			
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Roof Top Unit HP AC unit					X
Air Handling Fan Coil Units Upper Kitchen				X	
Air Handling Fan Coil Units Lower Level			X		
Heating Water Boilers					X
Heating Water Pumps					X
Heating Water Radiators					X
Sanitary Sump Pump	X				
Exhaust Fans				X	
Hot Water Storage Tanks				X	
Plumbing Fixtures – Washrooms					X
Plumbing Fixtures – Staff			X		
Domestic Water System				X	
Electrical					
Breaker Panel Main			X ₁₀		
Breaker Panel 2ndry			X ₁₁		
Baseboard			X		
Alarm Panel		X ₁₂			
Lighting Emergency Exit			X		
Lighting Emergency with Battery			X		
Lighting Exterior				X	
Lighting Interior				X	

	Concealed	Poor	Fair	Average	Good
Intrusion Detection				X	
Sound System					X
Communications System					X
UPS				X	
CCTV System					X
Receptacle Duplex				X	
Door Entry System				X	
Paging System			X		
Structural					
Radial Reinforced Concrete Beams		X			
East-West Reinforced Concrete Beams			X		
Columns Supporting Beams		X			

Notes:

1. Kitchen flooring exhibiting average wear. A few instances of cracking were noted.
2. Lower level marmoleum flooring very worn and chipped. Original 1960's marmoleum exposed in areas, Haz-Mat consultation should occur before removal.
3. Consistent wetting at base of wall apparent due to close proximity to grade. Most noticeable along North West deck.
4. Paint peeling in many areas, most noticeably near fascia drip edges.
5. Wood restaurant doors on north balcony in poor condition.
6. Original single pane windows are beyond their expected service life. Single-pane windows more likely to create thermal discomfort with patrons sitting near windows. Restaurant loses usable floor space by having to bring patrons further away from windows.
7. SBS membrane roof has been replaced since the time of the site visit.
8. Current leak into Marine Office is in close proximity to SBS membrane deck which is worn at the 3-stair staircase.
9. Seams and joints exhibit adhesive failure, membrane has peeled back to expose wood framing.
10. The fire alarm system is past its serviceable life and is in need of replacement.
11. Some of the electrical distribution is at the end of its serviceable life and should be replaced.
12. Main Hydro service connection is in basement of the building which feeds the remainder of the facility. The equipment is no longer supported and consideration should be given to its replacement.

Structural review by the WSP Construction Materials Division: Additional visual review of the concrete marine foundation structure was concluded; we note the following:

- Radial Reinforced Concrete Beams

The reinforced concrete beams supporting the restaurant at the north end of the structure are showing signs of reinforcement corrosion and spalling of the concrete cover. Spalling has occurred on the sides and

underside of the beam. Reinforcement is significantly corroded at the connection of the beams to the wall below middle of building.

Active corrosion of the reinforcing steel was noted. Repair of spalled concrete and installation of additional reinforcement is required at discrete locations. Protection of the beams from chloride ingress is recommended increase the service life of the structure.



Figure 25-A: Radial beams supporting boardwalk and restaurant.



Figure 25-B: East-West concrete beams supporting building 25 offices.



Figure 25-C: Cracks and saltwater ingress at column supporting restaurant has reduced strength and accelerated corrosion.



Figure 25-D: Sample of spalling concrete.

- East-West Reinforced Concrete Beams

The reinforced concrete beams supporting the commercial space on the west portion of the building above the marina appear to be in fair condition with no significant spalling or cracking observed.

The corrosion state of the reinforcement within the beams is not known at this time. Protection of the beams from chloride ingress is recommended increase the service life of the structure.

- Columns Supporting Radial Beams and East–West Beams

The majority of the reinforced concrete columns (thin arrow, Fig 25-A) appear to have been jacketed with a concrete shell (thick arrow, Fig 25-A) as the original drawings showed a much more slender column profile. This repair was likely completed to address reinforcement corrosion and spalling of concrete cover on the columns. The longevity of the repair is not known at this time, as no historical records related to the design and construction of the repair have been provided.

The structural concrete jacket has been installed to varying heights below the beams with a flat surface that can retain water. The connection appears to rely on the internal concrete of the original column as the concrete jacket was not extruded up to support the structure. It is therefore recommended to review the corrosion state of the reinforcement in the original column and the retrofit concrete jacket.

One reinforced concrete column shows vertical cracking at two corners which indicates corrosion of the reinforcing steel. A structural concrete repair will be required at this location. All maintenance and repair work will need to undergo scrutiny for hazardous materials due to its proximity to and impaction to marine life.

Protection of the columns through application of a protective galvanic current is likely required to increase the service life of the structure.

The corrosion state of the reinforcement within the columns is not known at this time.

A condition assessment is required for all three of these critical structural elements to determine the most cost effective remedial approach for the beams. The condition assessment would include a cover meter survey and sampling of the concrete for determination of soluble chloride profile within the concrete.

2.5.1.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Marina Restaurant: Baseline Recommendations:

2016

- Carry out a condition assessment on reinforced concrete beams and columns. The condition assessment shall include a survey of the concrete cover on the beams and columns, cataloging deterioration, and sampling of the concrete to determine the chloride profile of the original and repair concrete. (\$10,000 Consulting Fees)

2017

- Rehabilitate reinforced concrete beams. Chip to remove debonded concrete, prepare reinforcing bar and substrate, install additional reinforcing steel as directed by engineer, patch concrete.
- Reduce chloride ingress on concrete beams. Apply protective coating to prepared concrete beams. It is noted that the optimal timing for applying a protective coating to the beams would be determined through the condition assessment on the beams. If building service life is preferred beyond 20 more years then coat.
- Repair reinforced concrete column that exhibits cracking. Chip to remove debonded concrete, prepare surface and reinforcing steel, install galvanic jacket cathodic protection system around column (1). (\$150,000 Construction, \$20,000 Consulting)

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Building Code.

2020-21

- Rehabilitate reinforced concrete beams at new locations of spalled concrete. Remove debonded concrete, prepare/replace steel reinforcement bar and substrate, patch concrete.
- Inspect 2017 coating condition.
- Install galvanic jacket cathodic protection system around columns (18). It is noted that the feasibility, optimal timing and full work scope of this approach would not be known unless a condition assessment on the columns is completed. (\$220,000 Construction, \$30,000 Consulting)

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 52: Summary of Present-Value Building Costs every 5 years –No. 24 – Marina Restaurant

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$34,800	\$17,300	\$22,900	\$13,500	\$88,500
Building Envelope	\$189,200	\$22,500	\$-	\$12,200	\$223,900
Mechanical Summary	\$94,000	\$28,000	\$112,000	\$49,000	\$283,000
Electrical Summary	\$117,700	\$29,800	\$157,500	\$15,000	\$320,000
Structural Summary	\$180,000	\$250,000	\$-	\$-	\$430,000
Total	\$615,700	\$347,600	\$292,400	\$89,700	\$1,345,000

No.24 Marina Restaurant

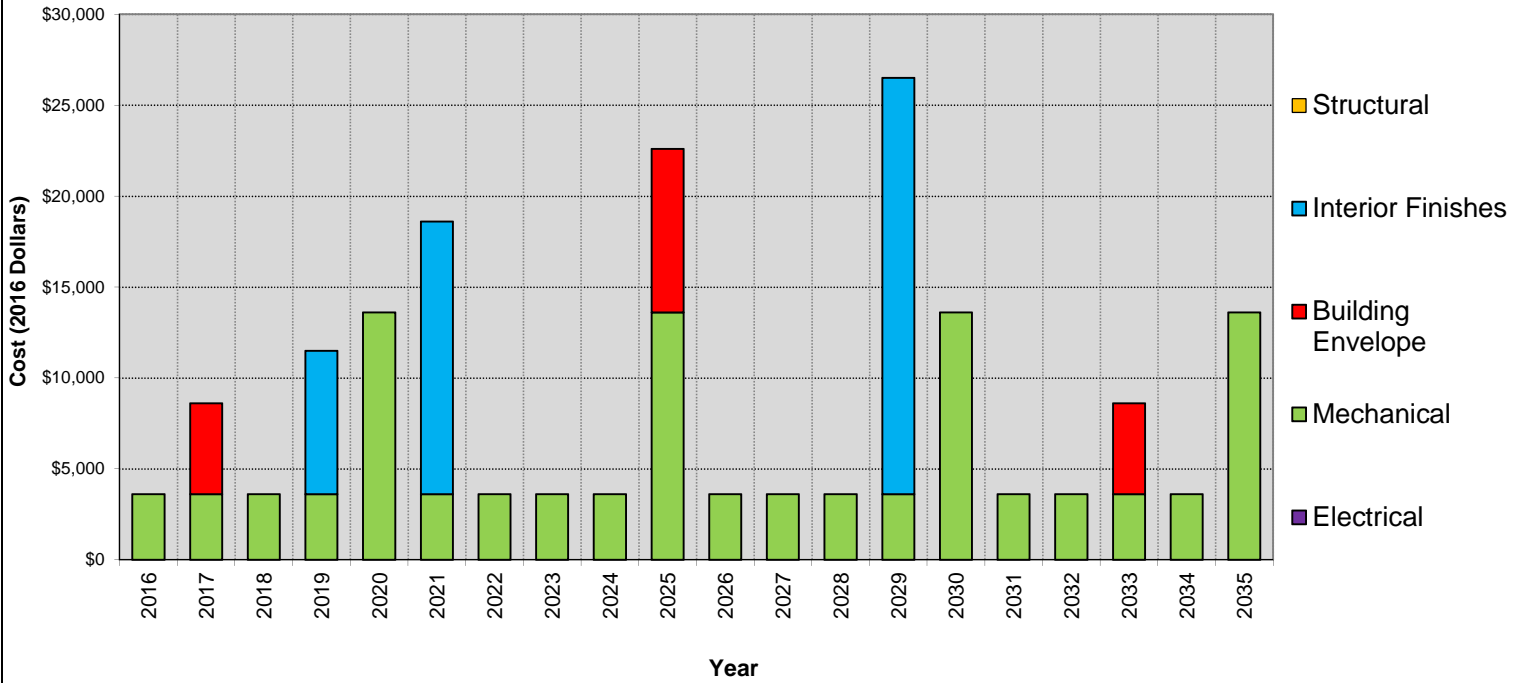
Component Name	Task	Cost (\$)	Install Date	Period (years)	Adjusted (years)	Next Year	Expenses																		
							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Section 4 - ELECTRICAL COMPONENTS																									
Breaker Panel	Maintenance																								
Main	Replacement	150000	1994	35		2029																			
Breaker Panel	Maintenance																								
Secondary	Replacement	50000	1970	30	18	2018			50,000																
Baseboard	Replacement	2300	1994	30		2024																			
Alarm Panel	Maintenance													2,300											
	Replacement	12500	1994	25		2019																			
Lighting Exit	Maintenance																								
Emergency	Replacement	5300	1994	25		2019				5,300															
Lighting Battery	Maintenance																								
Emergency	Replacement	2300	1994	25		2019				2,300															
Lighting	Maintenance																								
Exterior	Replacement	8800	1994	25		2019				8,800															
Lighting	Maintenance																								
Interior	Replacement	16300	1994	20	2	2016	16,300																		
Intrusion	Maintenance																								
Detection	Replacement	12500	1994	20	2	2016	12,500																		
Sound System	Maintenance																								
	Replacement	5000	2010	15		2025									5,000										
Communication	Maintenance																								
System	Replacement	15000	2010	25		2035																		15,000	
UPS	Maintenance																								
	Replacement	5000	2010	15		2025									5,000										
CCTV System	Maintenance																								
	Replacement	7500	2010	20		2030															7,500				
Receptacle	Maintenance																								
Duplex	Replacement	12000	1994	30		2024								12,000											
Door Entry	Maintenance																								
System	Replacement	5500	2000	25		2025									5,500										
Paging	Maintenance																								
System	Replacement	10000	1990	20	7	2017			10,000																
Electrical	Maintenance																								
Summary	Replacement						28,800	10,000	50,000	28,900				14,300	15,500					150,000	7,500			15,000	
Section 5 - STRUCTURAL COMPONENTS																									
Condition	Maintenance																								
Assessment	Replacement	10000				2016	10,000																		
Priority Concrete	Maintenance																								
Beams & Column	Replacement	170000				2017			170,000																
Remaining Concrete	Maintenance																								
Beams & Columns	Replacement	250000				2021									250,000										
Structural	Maintenance																								
Summary	Replacement						10,000	170,000							250,000										
Building Summary	Maintenance						3,600	8,600	3,600	11,500	13,600	18,600	3,600	3,600	3,600	22,600	3,600	3,600	3,600	26,500	13,600	3,600	3,600	13,600	
	Replacement						129,000	186,000	150,000	99,800	10,000	263,500	2,300	14,300	15,500	9,000	70,000	155,000	7,500	2,300	6,000	13,500	5,000	32,200	
Yearly Totals							\$132,600	\$194,600	\$153,600	\$111,300	\$23,600	\$282,100	\$3,600	\$5,900	\$17,900	\$38,100	\$12,600	\$3,600	\$73,600	\$181,500	\$21,100	\$3,600	\$9,600	\$22,100	
Totals Inflated at 2% per Year							\$132,600	\$198,492	\$159,805	\$118,112	\$25,545	\$311,461	\$4,054	\$6,777	\$20,973	\$45,533	\$15,359	\$4,476	\$93,343	\$234,790	\$27,841	\$4,845	\$13,179	\$30,945	

No.24 Marina Restaurant

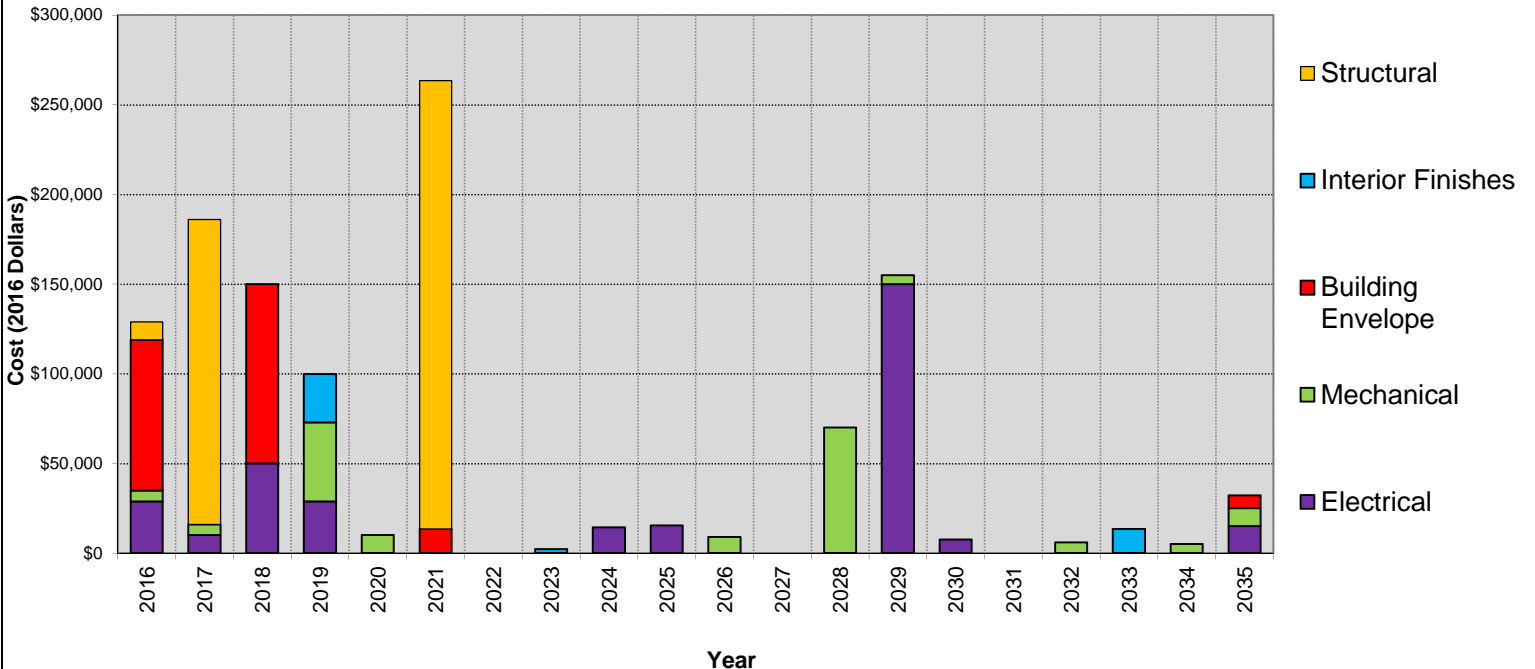
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.24 Marina Restaurant

Interior Finishes



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls & Ceiling	Maintenance Replacement	\$ 15,000	2013	8		2021
Kitchen Flooring	Maintenance Replacement	\$ 12,000	1994	20	5	2019
Hardwood Flooring	Maintenance Replacement	\$ 7,900	2009	10		2019
Carpet Restaurant	Maintenance Replacement	\$ 14,900	1994	20	5	2019
Carpet Café & Offices	Maintenance Replacement	\$ 7,500	2013	20		2033
Stair Tread	Maintenance Replacement	\$ 2,300	1993	30		2023
Marmoleum Lower Floor	Maintenance Replacement	\$ 6,000	1993	40		2033

NOTES:

Maintenance:

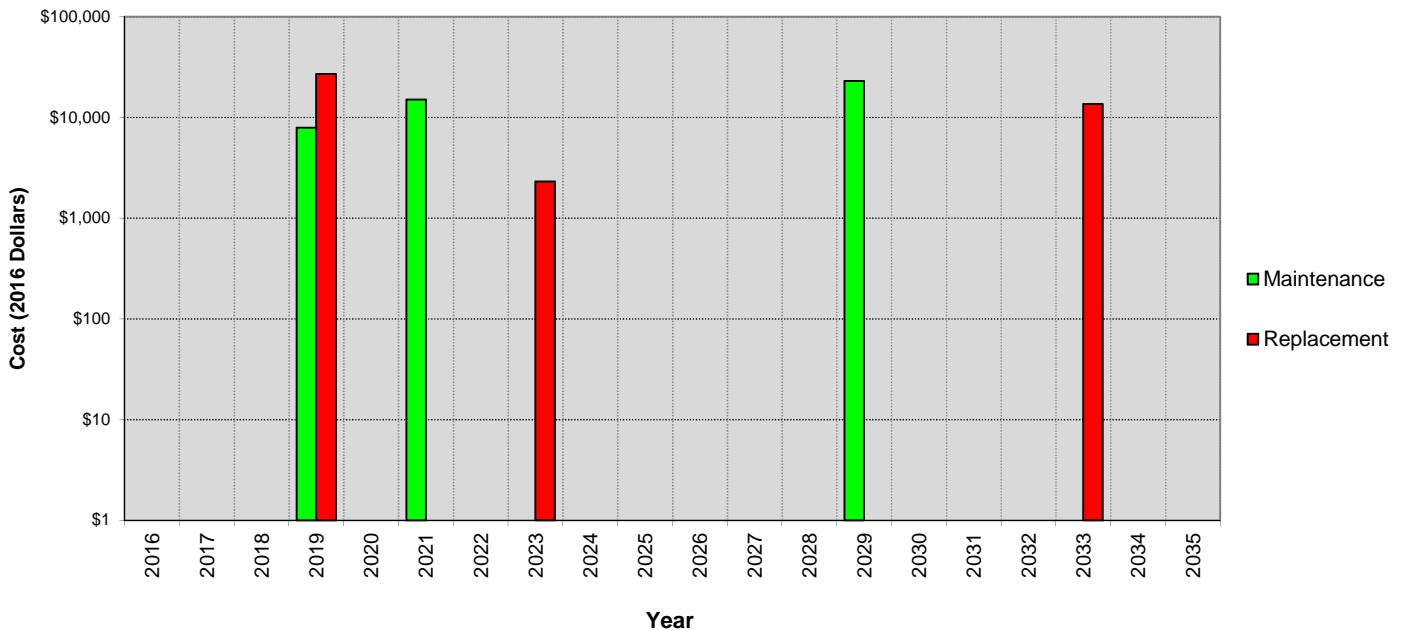
Interior wall and ceiling, and hardwood floor maintenance includes repainting and resealing respectively. The cost is split between Oak Bay and Oak Bay Marine Group (OBMG) and is scheduled to alternate every 8 years between the main level restaurant areas, and the lower level café and OBMG management offices. As the lower level was repainted in 2013, 2021 painting is scheduled for the restaurant areas.

Replacement:

Replacement of kitchen flooring may be phased, i.e. line area in 2016, rear portion in 2019. Carpeting scheduled to be replaced at the same time to minimize disruption.

Marmoleum flooring in lower level will require Haz Mat disposal as it has been adhered to original asbestos flooring.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.24 Marina Restaurant

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance	\$ 4,000	2009	16		2025
	Replacement		1993	60		2053
Cedar Board Siding & Trim	Maintenance	\$ 5,000	2009	8		2017
	Replacement		1993	60		2053
Exterior Wood Doors	Maintenance	\$ 5,000	1993	30	-5	2018
Replacement						
Aluminum Windows-Single	Maintenance	\$ 95,000	1963	45	10	2018
Replacement						
SBS Membrane Roof	Maintenance	\$ 84,200	1993	25	-2	2016
Replacement						
SBS Membrane Deck	Maintenance	\$ 7,200	2015	20		2035
Replacement						
Vinyl Membrane Balcony	Maintenance	\$ 13,500	1993	20	8	2021
Replacement						
Wood Soffit	Maintenance	\$ 4,000	1993			1993
Replacement						

NOTES:

Maintenance:

Stucco and vertical cedar siding maintenance includes repainting every 16 and 8 respectively.

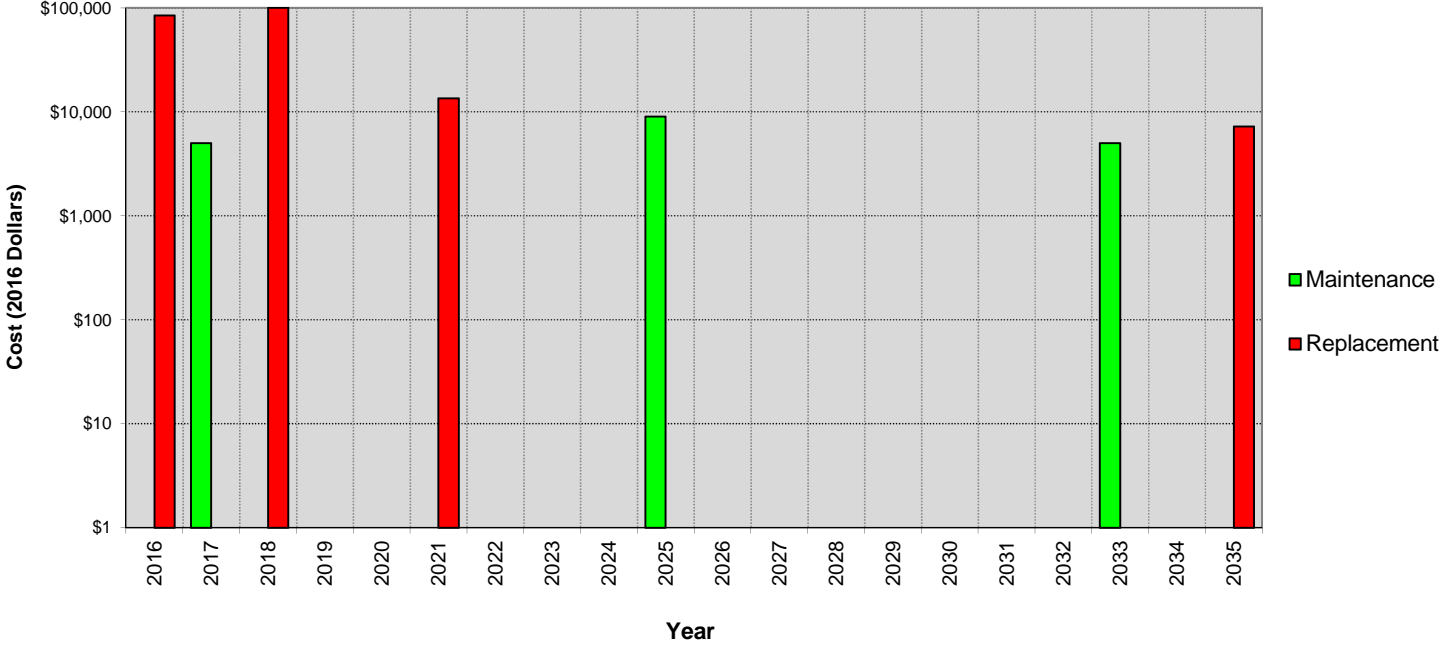
Replacement:

Original, aluminum-framed, single-pane windows recommended for replacement in the next 5 years.

Exterior wood doors recommended for replacement with original aluminum-framed windows in the next 5 years.

SBS membrane for roof and rotundra undertaken in winter of 2016.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.24 Marina Restaurant

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
RTU- York	Maintenance					
2.5 ton HP	Replacement	\$ 10,000	2000	15	5	2020
RTU	Maintenance					
3 ton HP	Replacement	\$ 5,000	1999	15	5	2019
Heating Water	Maintenance					
6 x Pumps 1-1/2"	Replacement	\$ 6,000	1994	10	12	2016
Sanitary Sump	Maintenance					
Pump 3"	Replacement	\$ 5,000	2000	10	9	2019
Boiler Burnham x 2	Maintenance					
High Temp	Replacement	\$ 70,000	1993	35		2028
Exhaust Fans	Maintenance					
Fume Hoods x 4	Replacement	\$ 4,000	1993	20	6	2019
Exhaust Fans	Maintenance					
Washroom	Replacement	\$ 3,000	2006	20		2026
Fan Coil 5800cfm	Maintenance					
Kitchen	Replacement	\$ 15,000	1993	20	6	2019
Fan Coil 7000cfm	Maintenance					
Basement	Replacement	\$ 15,000	1993	20	6	2019
Hot Water Tanks x	Maintenance					
450L Stg Tanks	Replacement	\$ 6,000	1993	15	9	2017
Plumbing Fixtures	Maintenance	\$ 8,000	2015	5		2020
Washroom	Replacement					
Plumbing Fixtures	Maintenance	\$ 2,000	2015	5		2020
Kitchen	Replacement					
Grease Intercepts	Maintenance	\$ 3,600	2015	1		2016
	Replacement					

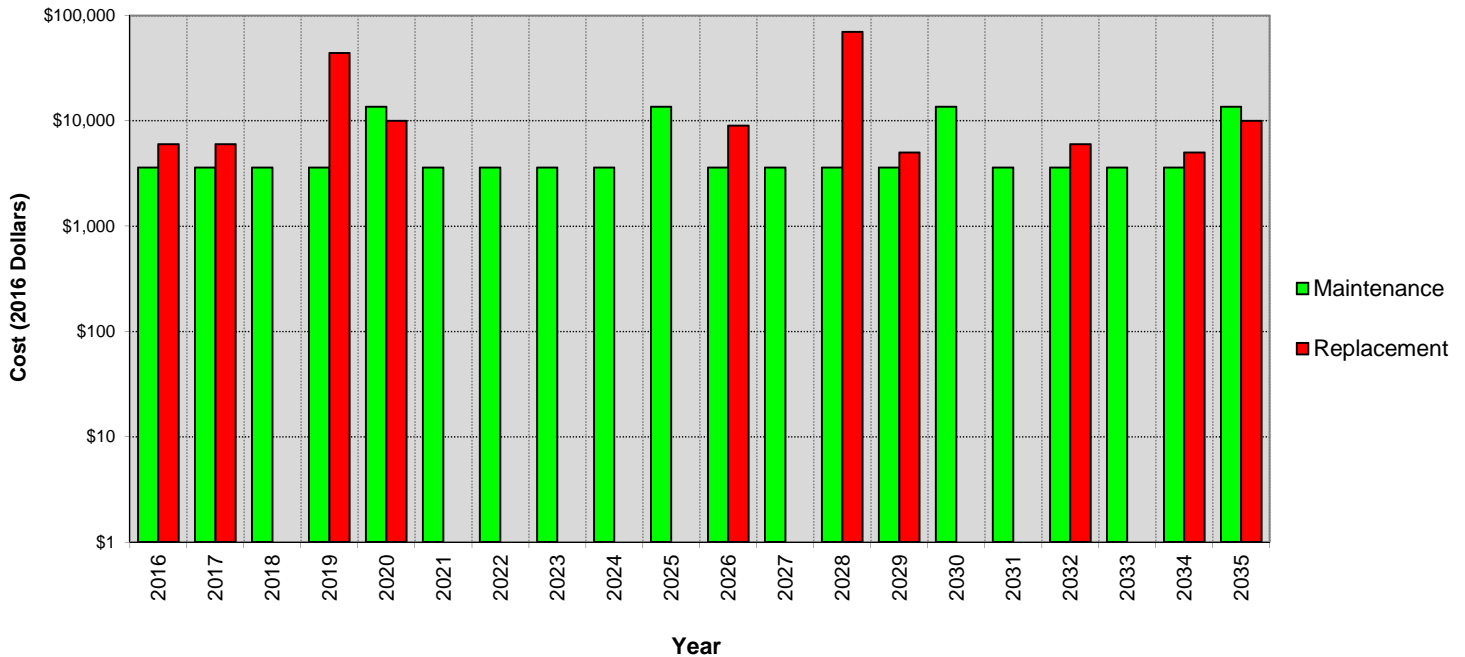
NOTES:

Maintenance:

Standard maintenance of roof drainage system.
 Plumbing Fixtures with variable age, replace as required as maintenance.

Exhaust fans inaccessible at the time of the assessment.
 Sanitary Sump Inaccessible at the time of the assessment.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.24 Marina Restaurant

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Main	Maintenance Replacement	\$ 150,000	1994	35		2029
Breaker Panel Secondary	Maintenance Replacement	\$ 50,000	1970	30	18	2018
Baseboard	Maintenance Replacement	\$ 2,300	1994	30		2024
Alarm Panel	Maintenance Replacement	\$ 12,500	1994	25		2019
Lighting Exit Emergency	Maintenance Replacement	\$ 5,300	1994	25		2019
Lighting Battery Emergency	Maintenance Replacement	\$ 2,300	1994	25		2019
Lighting Exterior	Maintenance Replacement	\$ 8,800	1994	25		2019
Lighting Interior	Maintenance Replacement	\$ 16,300	1994	20	2	2016
Intrusion Detection	Maintenance Replacement	\$ 12,500	1994	20	2	2016
Sound System	Maintenance Replacement	\$ 5,000	2010	15		2025
Communication System	Maintenance Replacement	\$ 15,000	2010	25		2035
UPS	Maintenance Replacement	\$ 5,000	2010	15		2025
CCTV System	Maintenance Replacement	\$ 7,500	2010	20		2030
Receptacle Duplex	Maintenance Replacement	\$ 12,000	1994	30		2024
Door Entry System	Maintenance Replacement	\$ 5,500	2000	25		2025
Paging System	Maintenance Replacement	\$ 10,000	1990	20	7	2017

NOTES:

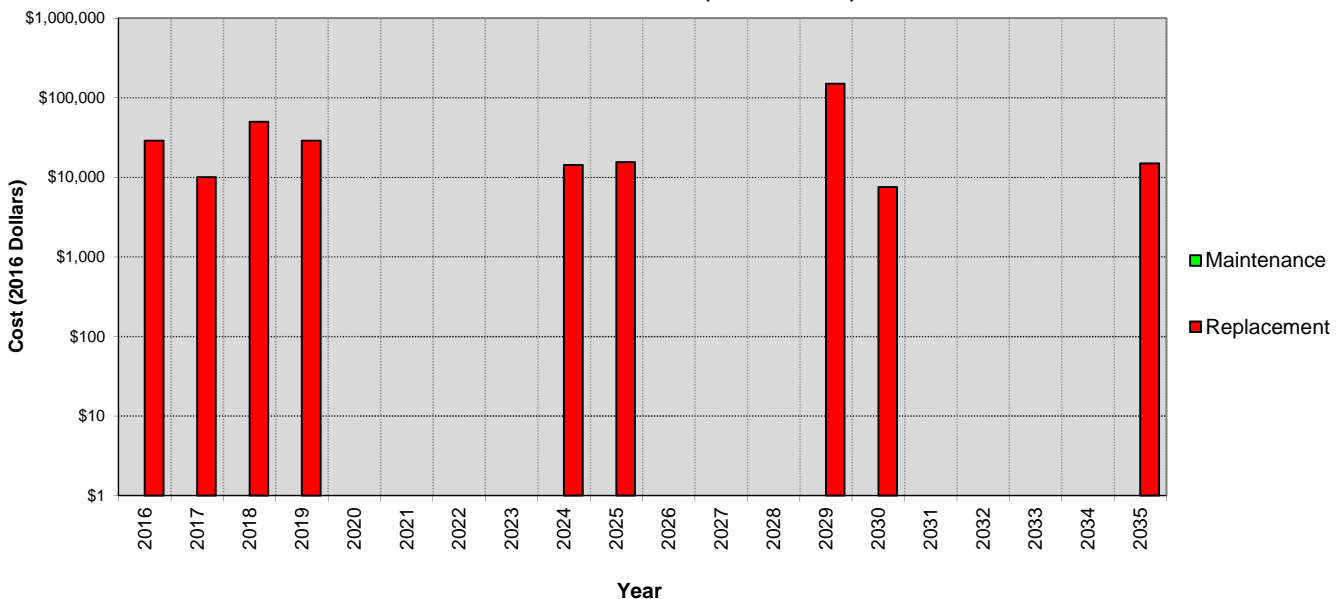
Maintenance:

Existing lighting should be replaced on a maintenance schedule to meet current codes and reduce energy consumption.
Receptacles and other end use devices should be replaced.

Replacement:

Consideration to replacement of the existing main switchboard should be undertaken as the manufacturer no longer supports Commander equipment.
Older Panels in the restaurant should be replaced due to age and wear.
The fire alarm system is out of date and in need of replacement.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.24 Marina Restaurant

Structural



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Condition Assessment	Maintenance Replacement	\$ 10,000				2016
Priority Concrete Beams & Column	Maintenance Replacement	\$ 170,000				2017
Remaining Concrete Beams & Columns	Maintenance Replacement	\$ 250,000				2021

NOTES:

Maintenance:

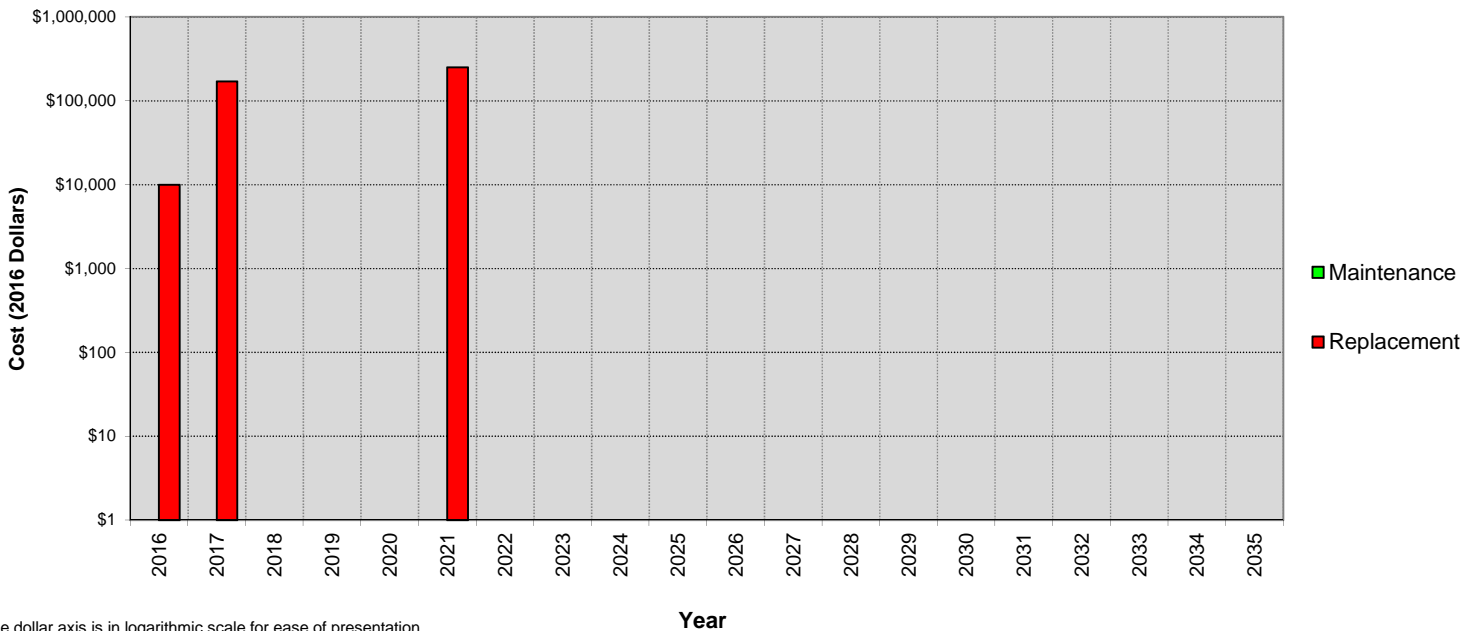
Replacement:

Condition assessment recommended ASAP to determine extent of repairs required.

Extent of initial repairs and rehabilitation dependent on assessment findings. Priority beams and columns to receive initial work. Beams to be patched and have damaged rebar replaced. Column that exhibits cracking to have cathodic protection system installed. Application of chloride protective coating to beams.

Remaining concrete repairs and rehabilitation to occur five years later along with monitoring of coating condition. Includes beam repairs and installation of cathodic protection system to the 18 remaining columns.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.5.2. No. 25 – Marina Office and Retail



<p>1327 Beach Drive</p> <p>Peak Occupancy: 50 Persons</p> <p>Staffing (avg.): 20 Persons</p> <p>Built: 1962</p> <p>Addition(s): None Area (current): 4,564</p> <p>HVAC: Fan coil units (3), condensing units (3)</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 
---	--

Figure 13 No. 25 – Marina Office

2.5.2.1. Description

The Marina Office lies to the west of the Marina Restaurant. The two buildings are connected via a concrete and wood-framed deck that passes between them. The Marina Office is a single-storey building of wood-frame structure built in the 1962 Marina development. The east portion of the building serves as a visitor gift shop and retail space while the remainder is administration offices and storage for The Oak Bay Marine Group (OBMG).

INTERIOR FINISHES & FURNISHINGS: Interior flooring consists predominantly of carpet except for vinyl-sheet within staff washrooms. Interior walls are painted gypsum wall board while ceilings are dropped T-Bar.

BUILDING ENVELOPE: Exterior walls are wood-framed with face sealed stucco cladding, with a noticeable overhang. Cedar fascia board and decorative trim (south elevation) finish rooflines. The windows are aluminum-frame with double-pane sealed glazing units. Storefront door assemblies are present for both the retail and office entrances. A large portion of pressure-glazed skylight runs along the south and east elevations; the south portion is a canopy over exterior space while the east section lies over interior retail space. The low-sloped roof is 2-ply SBS membrane with cap flashing along its perimeter.

STRUCTURAL: Refer to Section 2.5.1.1 for details on Marina foundation structure.

MECHANICAL:

- Heating, Ventilation and Air Conditioning (HVAC):

Natural gas is supplied through a meter set on the south west side of the site and serves all the buildings on the site (Dockworks, Offices and Restaurant). The gas supply runs through the office building and continues on to the Restaurant.

There are three (3), approximately 2000 cfm sized, gas-fired heating and cooling Lennox fan coil units that provide conditioned air to zoned sections of the Office Building. Cooling is supplied by 3 condensing/cooling units located on the roof that are linked through refrigerant loops (R22) to DX coils located in each Lennox fan coil unit. Conditioned supply air is ducted from the fan coil in the attic space to supply diffusers and then returned back to the air handling unit through return air ducts from the space. A single, programmable, thermostat controls the operation of each zone. Diffusers are installed in drop T-bar ceilings that were installed at the time of the last major renovation (c.1992). The south office zone has back up air conditioning (installed in 2013) from a Daikin split, wall-hung, air conditioner and condensing unit. This is likely because the Lennox unit is underperforming. This south office zone is using the ceiling space as a return air plenum which is not allowed under the BCBC. The other HVAC systems appears to be adequate for their use. The washrooms were ventilated and fan grilles appear to be in good condition.

Overall the heating and ventilation within this building is good. There are an adequate number of zones to accommodate each area. Observations noted throughout the HVAC systems include:

- Lennox condensing units are nearing the end of their useful life.
 - The south zone is using the ceiling space as a return air plenum which is not allowed under the BCBC. It should be hard ducted back to the fan coil unit, due to potential contaminants.
- Plumbing:

The Office building contains two small staff washrooms, complete with two tank type ceramic water closets and two lavatories (dual handle faucets with ceramic basins). The staff washrooms have fixtures that are older and do not appear to conform to today's BCBC water conservation requirements. They are in good condition and should be maintained.

There is a 48L domestic hot water tank (2005) in the Attic space that supplies domestic hot water to the two washroom sinks. It appears to be in good condition and adequate for the facilities requirements. Domestic cold water is supplied from the water entry in the Boiler Room of the Restaurant building and is sized adequately for its use. There is a hose bib located on the front exterior of the building.

The sanitary sewer system is comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. The Office building sanitary sewer pipe run under the suspended slab to connect

into the Restaurant sanitary sump. The sanitary sump pump in the boiler room pumps the sewer waste up to the main building sewer.

The storm system is comprised of internal cast iron rainwater leaders connected to roof drains. The storm lines do not appear to be ganged together, but are piped to the building storm main and then out to the municipal main; rainwater appears to be drained directly to the ocean.

The plumbing systems are in good condition overall and need only be maintained for the foreseeable future for its current use. Observations noted throughout the plumbing system include:

- Rainwater from this building is not connected back to the municipal main and is directed to the ocean it resides by.
 - Domestic cold water is supplied from the Restaurant building water entry.
 - The sanitary sewer system runs under the suspended slab over to the Restaurant building sanitary sump.
- Fire Suppression:

The facility is not protected with a sprinkler fire suppression system. Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The electrical system is supplied from the main electrical room below the restaurant. The original panel is past its serviceable life and needs replacement; the remaining panels appear to be in average condition.

The fire alarm system is an extension of the system in the restaurant and the devices appear to need replacement due to age as is the security devices.

Lighting in the offices and retail are fluorescent and are in fair condition; consideration to replacing them with LED on an ongoing scheduled maintenance program is recommended along with installation of lighting controls to ASHRAE 90.1 requirements.

The communication system is newer and in good condition, a new UPS to back up power to the communication is recommended.

2.5.2.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 53: Condition of Building Systems – No. 25 – Marina Office and Retail

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Interior Walls			X		
Carpet		X			
Vinyl-Sheet			X		
Building Envelope					
Stucco				X ₁	
Cedar Fascia Board				X	
Pressure Glazed Skylight/Canopy			X ₂		
Windows, Aluminum				X	
Storefront Door Assemblies				X	
SBS 2-Ply Roof Membrane			X ₃		
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Roof Top Condensing Units		X ₄			
Indoor Fan Coil Units			X		
Sanitary Sump Pump	X				
Ductless Split AC unit					X
Exhaust Fans	X				
Electric Hot Water Tanks				X	
Plumbing Fixtures – washrooms				X	
Domestic Water System				X	
Electrical					
Power Distribution Secondary Panel				X	
Fire Annunciator				X	
Intrusion Detection System				X	
Lighting Exterior			X ₅		
Lighting Interior			X ₅		
Communications System					X
UPS				X	

Notes:

1. Stucco cladding extends right down to wood decking which encourages constant wetting. Recommend cutting back up wall 8”.
2. Water ingress occurring at north curb wall of east portion of skylight. Water staining visible on ceiling tile and ceiling wood framing. Further investigation recommended to determine source.
3. Loss of granule in several areas. Ponding present, but not significant.
4. Installation of additional A/C for south office zone in 2013 likely due to condensing unit underperforming. Ceiling space is being used as a return air plenum to unit which is not allowed under the BCBC.
5. Lighting should be replaced on a regular maintenance schedule and lighting controls installed to reduce energy and meet current Codes.

2.5.2.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Marina Office and Retail: Baseline Recommendations:

2016

- Investigate/ repair water ingress at retail skylight curb wall to determine cause.

2017

- Hard duct return air back to the fan coil unit to conform to the BCBC.

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Building Code.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

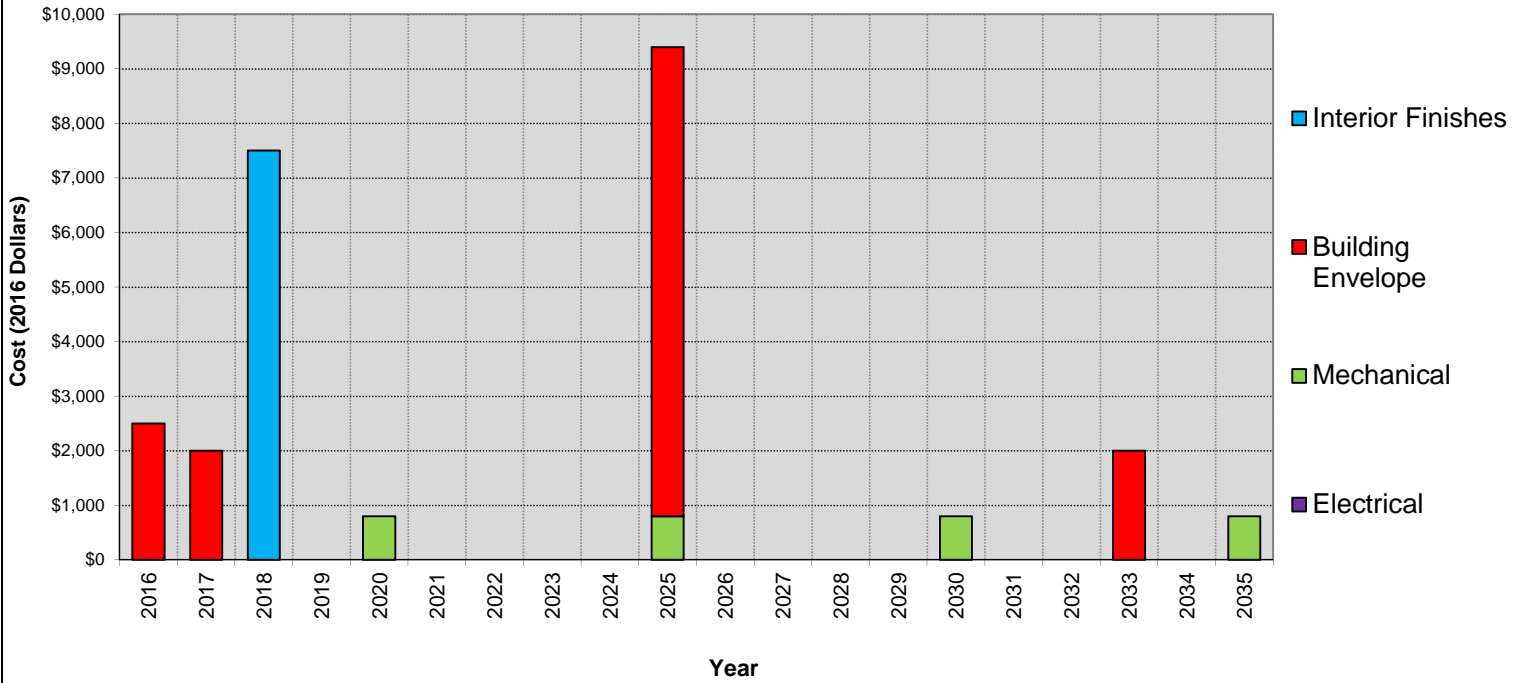
Table 54: Summary of Present-Value Building Costs every 5 years – No. 25 – Marina Office and Retail

Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$32,500	\$-	\$-	\$-	\$32,500
Building Envelope	\$4,500	\$8,600	\$56,000	\$55,200	\$124,300
Mechanical Summary	\$68,400	\$800	\$36,800	\$43,600	\$149,600
Electrical Summary	\$28,300	\$17,000	\$-	\$12,500	\$57,800
Structural Summary	\$-	\$-	\$-	\$-	\$-
Total	\$133,700	\$26,400	\$92,800	\$111,300	\$364,000

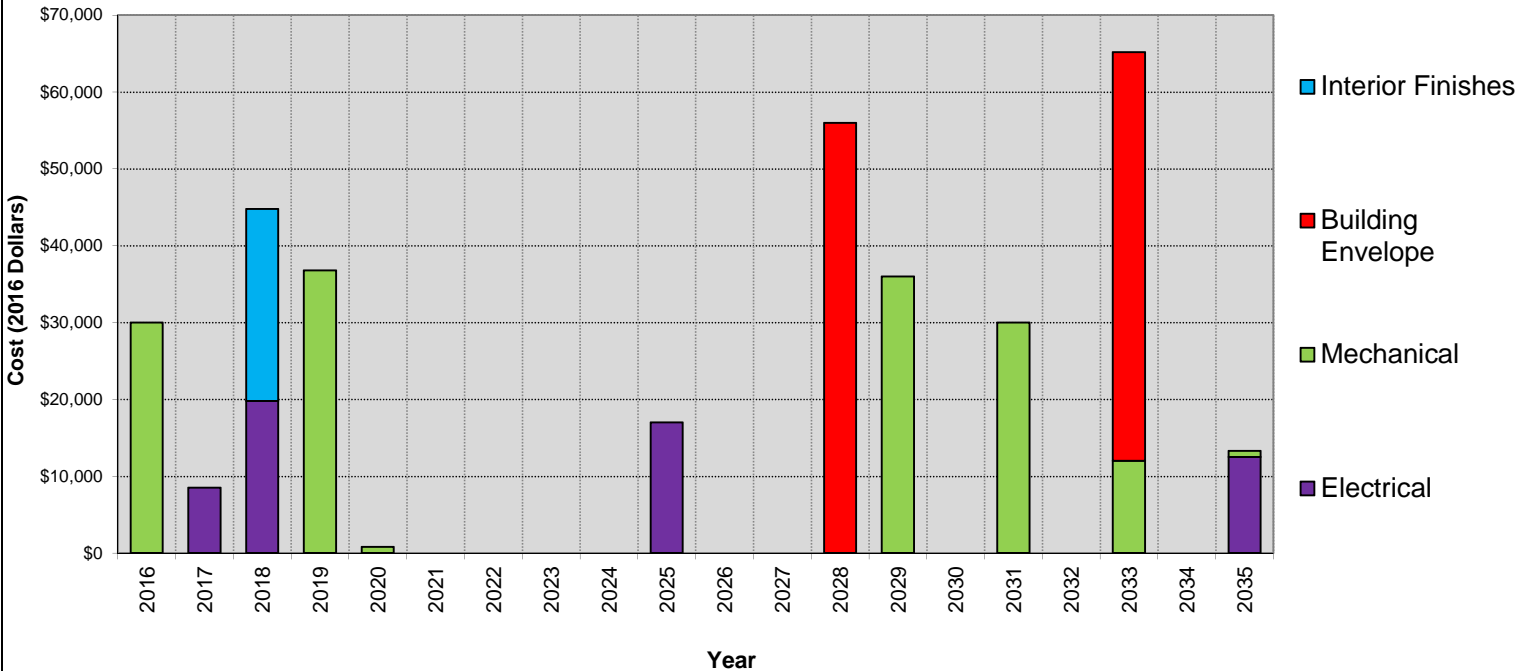
No.25 Marina Office Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.25 Marina Office

Interior Finishes



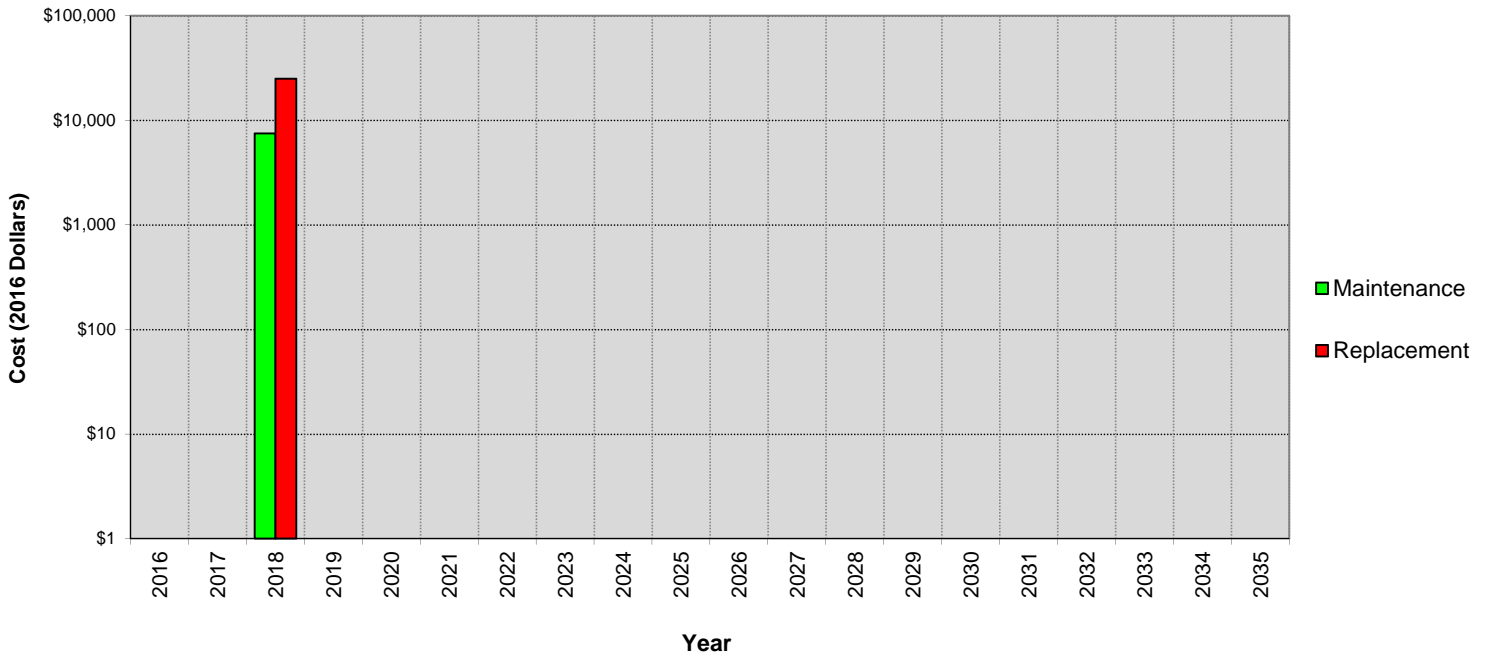
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Interior Walls	Maintenance Replacement	\$ 7,500	1993	25		2018
Carpet	Maintenance Replacement	\$ 24,000	1993	25		2018
Vinyl Sheet	Maintenance Replacement	\$ 1,000	1993	25		2018

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.25 Marina Office

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Stucco	Maintenance Replacement	\$ 6,600	2009	16		2025
Cedar Fascia Board & Trim	Maintenance Replacement	\$ 2,000	2009	8		2017
Pressure Glazed Skylight / Canopy	Maintenance Replacement	\$ 53,200	1993	40		2033
SBS Membrane Roof	Maintenance Replacement	\$ 56,000	1993	25	10	2028
Water Ingress Investigation	Maintenance Replacement	\$ 2,500				2016

NOTES:

Maintenance:

Stucco and cedar maintenance includes repainting every 16 and 8 years respectively. Scheduled to occur with restaurant cladding maintenance.

Glazing unit replacement assumed to occur out of operating budget on an as needed basis.

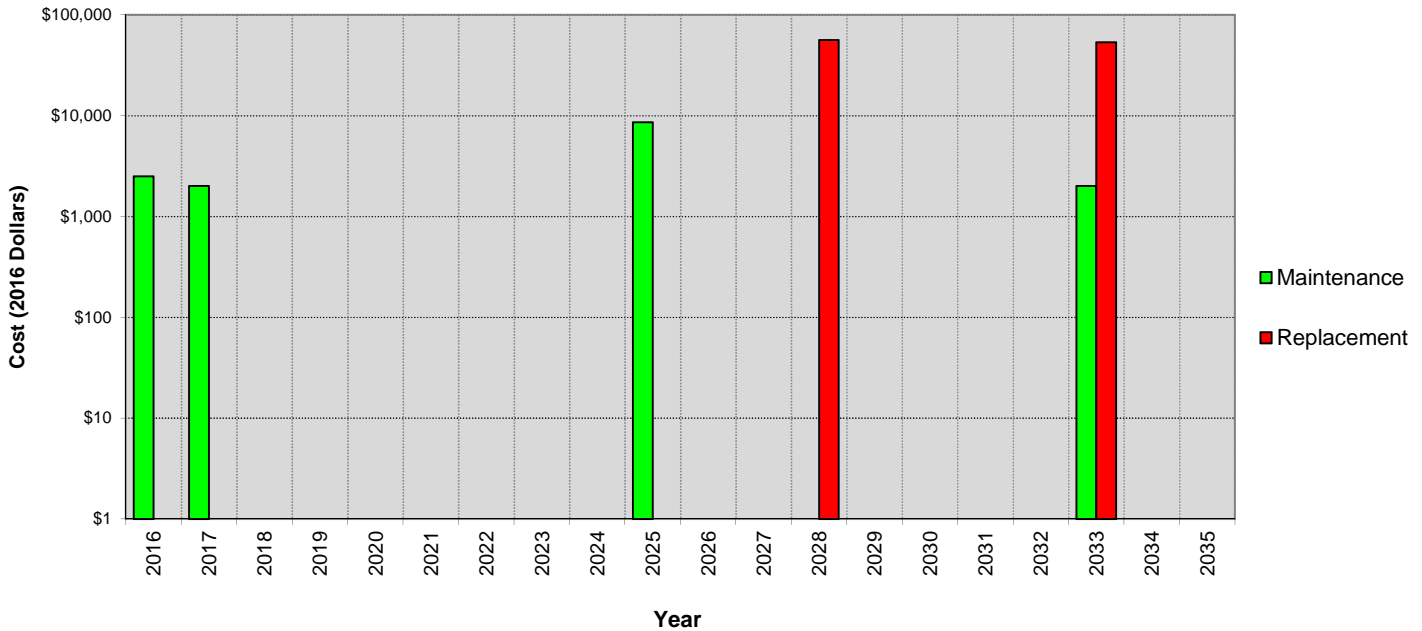
Water ingress investigation from accredited Building Professional.

Replacement:

Windows (installed c.1993) are not expected to be replaced within the next 20 years.

SBS membrane replacement includes flashing.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.25 Marina Office

Mechanical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
RTU x2 3.5 ton CU	Maintenance Replacement	\$ 20,000	1992	15	9	2016
RTU 2.5 ton CU	Maintenance Replacement	\$ 10,000	1992	15	9	2016
Lennox FCU x 3 Gas Fired	Maintenance Replacement	\$ 36,000	1992	10	17	2019
Exhaust Fans Washroom	Maintenance Replacement	\$ 800	1992	20	7	2019
Hot Water Tank 48L 1.5Kw	Maintenance Replacement	\$ 800	2005	15		2020
Plumbing Fixtures Washroom	Maintenance Replacement	\$ 800	2015	5		2020
2 ton Daikin Spit System	Maintenance Replacement	\$ 12,000	2013	20		2033

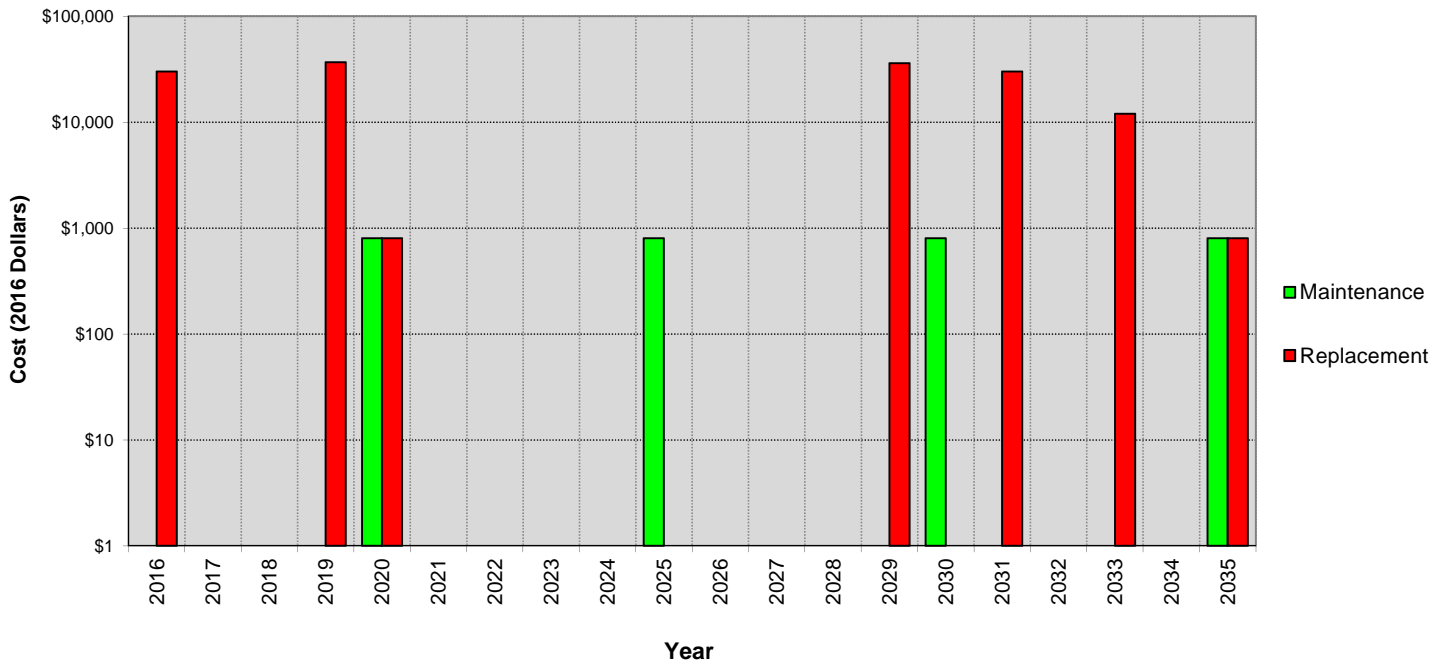
NOTES:

Maintenance:

Standard maintenance of roof drainage system.
 Plumbing Fixtures with variable age, replace as required as maintenance.
 Exhaust fans inaccessible.

Replacement:

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

No.25 Marina Office Electrical



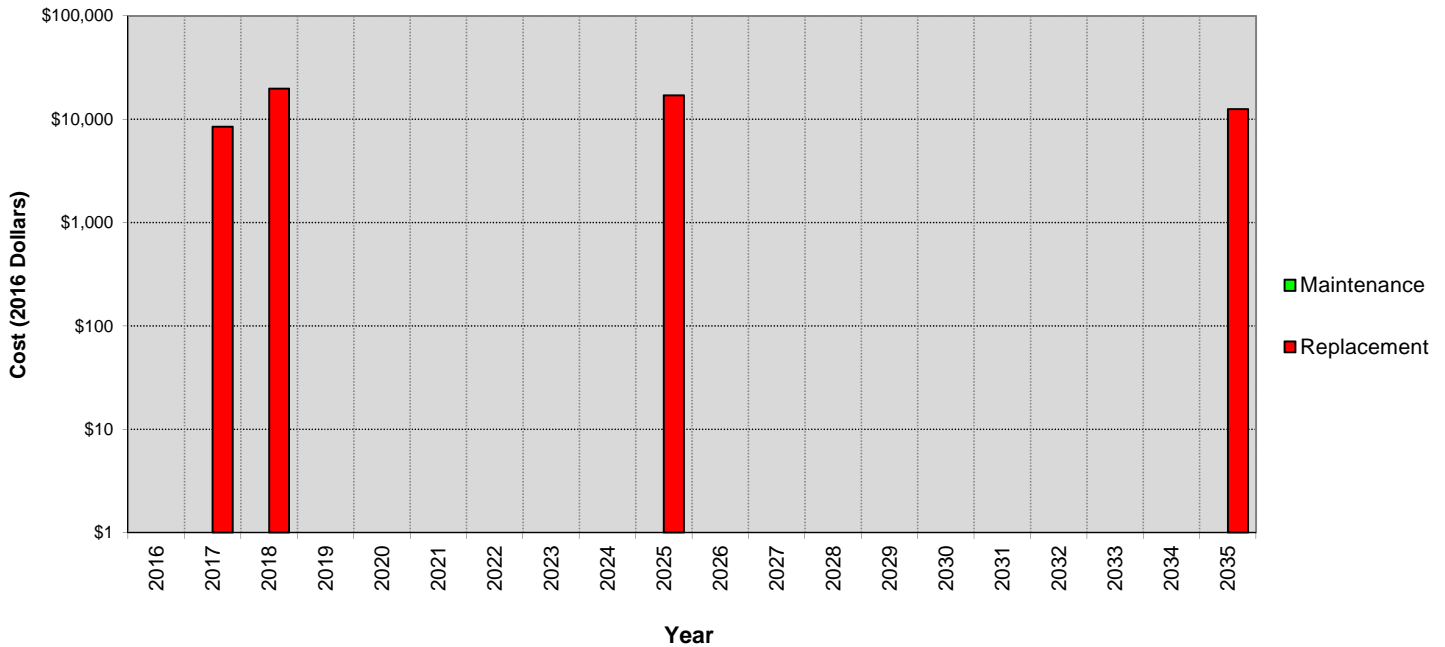
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Secondary	Maintenance Replacement	\$ 12,000	1995	30		2025
Fire Annunciator	Maintenance Replacement	\$ 8,500	1990	25	2	2017
Intrusion Detection System	Maintenance Replacement	\$ 7,500	1990	20	8	2018
Lighting Exterior	Maintenance Replacement	\$ 3,500	1990	25	3	2018
Lighting Interior	Maintenance Replacement	\$ 8,800	1990	25	3	2018
Communication System	Maintenance Replacement	\$ 12,500	2010	25		2035
UPS Units	Maintenance Replacement	\$ 5,000	2010	15		2025

NOTES:

Maintenance: _____

Replacement: _____

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

2.5.3. No. 26 – Marina Dockworks

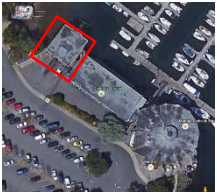

<p>1327 Beach Drive</p> <p>Peak Occupancy: 10 Persons</p> <p>Staffing (avg.): 5 Persons</p> <p>Built: 1964</p> <p>Addition(s): None</p> <p>Current Area: 1,824 sf</p> <p>HVAC: Oil-fired furnace</p> <p>Fire Suppression: Extinguishers</p> <p>Access: Parking stalls at-grade, wheelchair access</p>	 
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Figure 14 No. 26 – Marina Dockworks

2.5.3.1. Description

The Marina Dockworks is a detached building that lies to the west of the Marina Office. It was constructed with the other Marina buildings in 1964 and is accessed on the east façade via the wood decking walkway (parking lot side). At one time the building hauled boats up its north (water) facing gang way for servicing; present day, the gang way is no longer operating. The Oak Bay Dockworks building, managed by OBMG repairs marine engines and parts. The building plan is composed of a main shop floor with a wooden staircase on the west side leading up to loft storage and a workshop.

INTERIOR FINISHES & FURNISHINGS: The building’s interior is primarily operational, functioning as a workshop with storage. Interior finishes are not a priority to the building, are assumed to be addressed internally by staff, and have been omitted from further analysis.

BUILDING ENVELOPE: The building’s exterior walls are built robustly with painted reinforced concrete masonry units. Fenestration throughout the building includes: clerestory metal-frame, single-pane, windows along east and west elevations, hollow-metal exterior doors, and an original wooden roll-up garage door on the south

elevation. The roof is low-sloped 2-ply SBS membrane with perimeter cap flashing, two foot overhang, and wood soffit.

STRUCTURAL: Refer to Section 2.5.1.1 for details on Marina foundation structure.

MECHANICAL:

- Heating, Ventilation and Air Conditioning (HVAC).

A single oil-fired furnace circulates heated air to the shop through uninsulated ductwork. The oil tank is located in the shop and is only a day tank. Electric space heaters are present to supplement heating demands.

Ventilation includes an old exhaust hood for the paint booth that is old and outdated for its use, and washroom exhaust fans that appear to be ventilated to an exterior wall cap.

The HVAC system has been installed to suit the tenant and is adequate for its use. Observations noted throughout the HVAC system include:

- Paint booth ventilation is outdated.
- There is no spot ventilation in the grease removal area.

- Plumbing:

The Dockworks building contains one small staff washroom with one tank type ceramic water closet and one lavatory with dual handle faucet and ceramic basin. These fixtures are older and do not appear to conform to today's BCBC water conservation requirements. They are in working condition and should be maintained. Domestic cold water is supplied from the water entry in the Boiler Room of the Restaurant building and is sized adequately for its use. There is a hose bib located on the front exterior of the building. The hot water tank was not accessible.

The sanitary sewer system is comprised of cast iron piping with plastic and chrome plated brass pipe take-offs to fixtures under sinks. The sanitary sewer pipe runs under the suspended slab to eventually connect into the Restaurant sanitary sump. The sanitary sump pump in the boiler room of the restaurant pumps the sewer waste up to the main building sewer.

The storm system is comprised of internal cast iron rainwater leaders connected to roof drains. The storm lines do not appear to be ganged together, piped to the building storm main, and then out to the municipal main; rainwater appears to be drained directly to the ocean.

The plumbing systems are minor and in fair condition and need only be maintained for the foreseeable future for its current use. Observations noted throughout the plumbing system include:

- Rainwater from this building is not connected back to the municipal main and is directed to the ocean it resides by.
- Domestic cold water is supplied from the Restaurant building water entry.
- The sanitary sewer system runs under the suspended slab over to the Restaurant building sanitary sump.
- Fire Suppression:
The facility is not protected with a fire suppression system. Fire extinguishers are present on walls in locations as per NFPA 10.

ELECTRICAL: The electrical service is fed from the main electrical service at the Restaurant. The electrical equipment is past its expected serviceable life and should be replaced. End use devices are in need of replacement and should be part of an ongoing maintenance program.

The lighting is original to the building and out of date; replacement of the lighting should be undertaken to improve light levels, decrease energy consumption and meet current Codes. Lighting controls should also be considered to further improve energy savings and meet Code.

The CCTV camera on the exterior of the building is an extension of the CCTV system in the main part of the building and is in good condition.

The telephone system is original and is outdated. New cabling to the building should be installed.

The Intrusion detection system is an extension the main Restaurant system; end devices in the Dockworks building should be replaced.

2.5.3.2. Visual Review of Condition

The following table lists the building systems and their individual items, or group of elements as one item, and provides a statement regarding their respective condition as observed.

Table 55: Condition of Building Systems –No. 26 – Marina Dockworks

	Concealed	Poor	Fair	Average	Good
Interior Finishes and Furnishings					
Building Envelope					
CMU				X ₁	
Cedar Fascia Board and Soffit				X	
Windows, Metal, Single Pane			X		
Exterior Metal Doors					X
Garage Door			X		
SBS 2-Ply Roof Membrane			X		

	Concealed	Poor	Fair	Average	Good
Mechanical					
Perimeter Drains and Clean Outs	X				
Fire Extinguishers					X
Oil Fired Furnace			X		
Sanitary Sump Pump	X				
Exhaust Fans	X				
Electric Hot Water Tanks				X	
Plumbing Fixtures – Washroom				X	
Domestic Water System				X	
Electrical					
Power Distribution Secondary Panel		X ₂			
Intrusion Detection			X		
Lighting Exterior		X ₃			
Lighting Interior		X ₃			
CCTV					X
Receptacle Duplex		X ₄			
Telephone System			X		
Power Distribution 2ndry Panel		X ₂			
Intrusion Detection			X		
Lighting Exterior		X ₃			
Lighting Interior		X ₃			
CCTV					X

Notes:

1. CMU is in average condition for age. A crack along a vertical mortar joint was observed in the loft workshop on the west wall, but did not appear concerning at the time.
2. Electrical equipment should be replaced due to age.
3. Lighting should be replaced and lighting controls installed for energy efficiency and to meet Code.
4. End use devices are showing signs of wear and degradation and should be replaced.

2.5.3.3. Recommendations and Anticipated Expenses

The following are discipline-specific recommendations for the building, the allowances of which are found in Appendix B, Table B1, and summarized below. Each discipline has used its discretion to prioritize these recommendations over a five year period to assist with cash flow, alternately the recommendations could be implemented in combination to leverage synergies.

Marina Dockworks Baseline Recommendations:

2017-2018

- Replace secondary electrical distribution, intrusion detection, and lighting components.

2019

- Ongoing replacement of plumbing fixtures. Flow rates to meet present Building Code.

2020-21

- Recommendations deferred from earlier years.

The table below provides a summary of the costs for each category in five-year increments. The recommendations above typically influence the '0-5 yrs' year category; beyond this period more typical maintenance and replacement costing occurs.

Table 56: Summary of Present-Value Building Costs every 5 years –No. 26 – Marina Dockworks

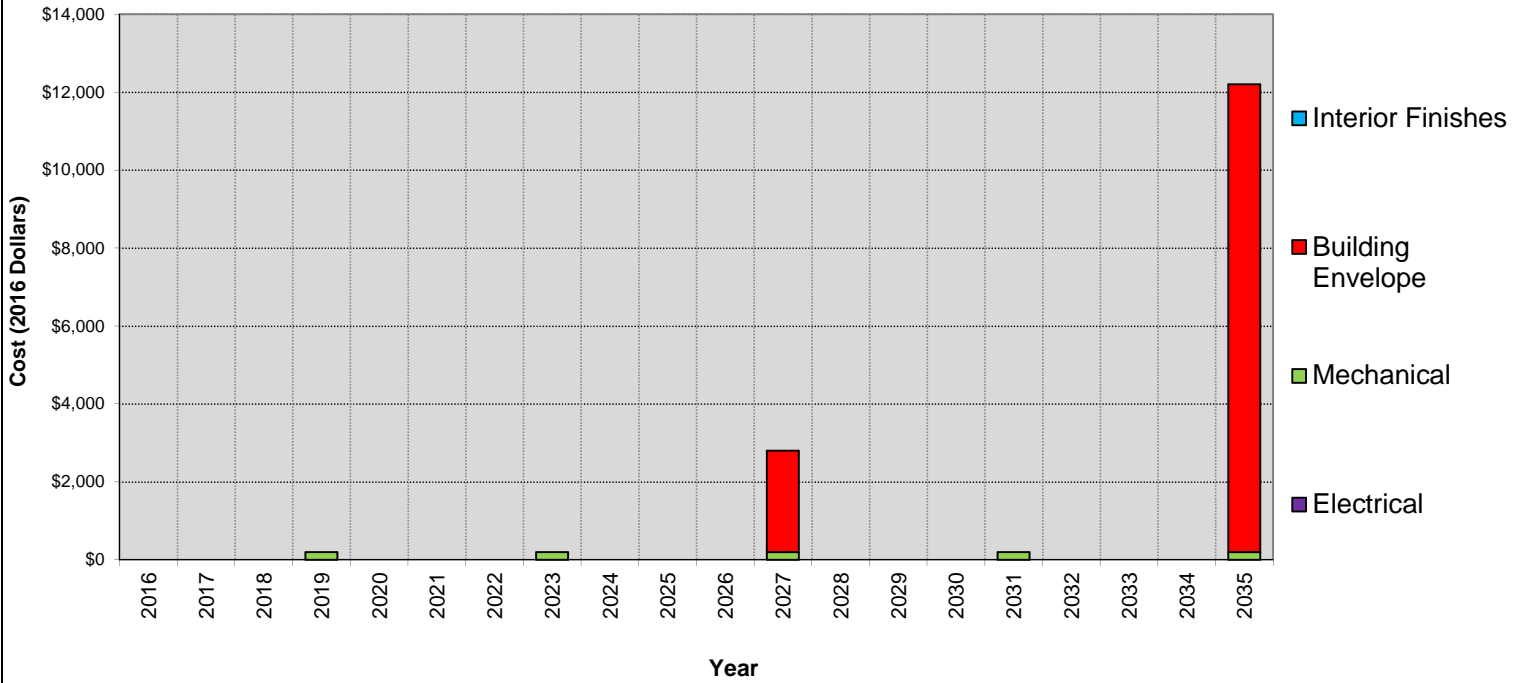
Category	0-5yrs	6-10yrs	11-15yrs	16-20yrs	0-20yrs
Interior Finishes & Furnishings	\$-	\$-	\$-	\$-	\$-
Building Envelope	\$-	\$42,700	\$2,600	\$12,000	\$57,300
Mechanical Summary	\$200	\$20,700	\$700	\$400	\$22,000
Electrical Summary	\$27,400	\$-	\$1,000	\$-	\$28,400
Structural Summary	\$-	\$-	\$-	\$-	\$-
Total	\$27,600	\$63,400	\$4,300	\$12,400	\$108,000

No.26 Marina Dockworks

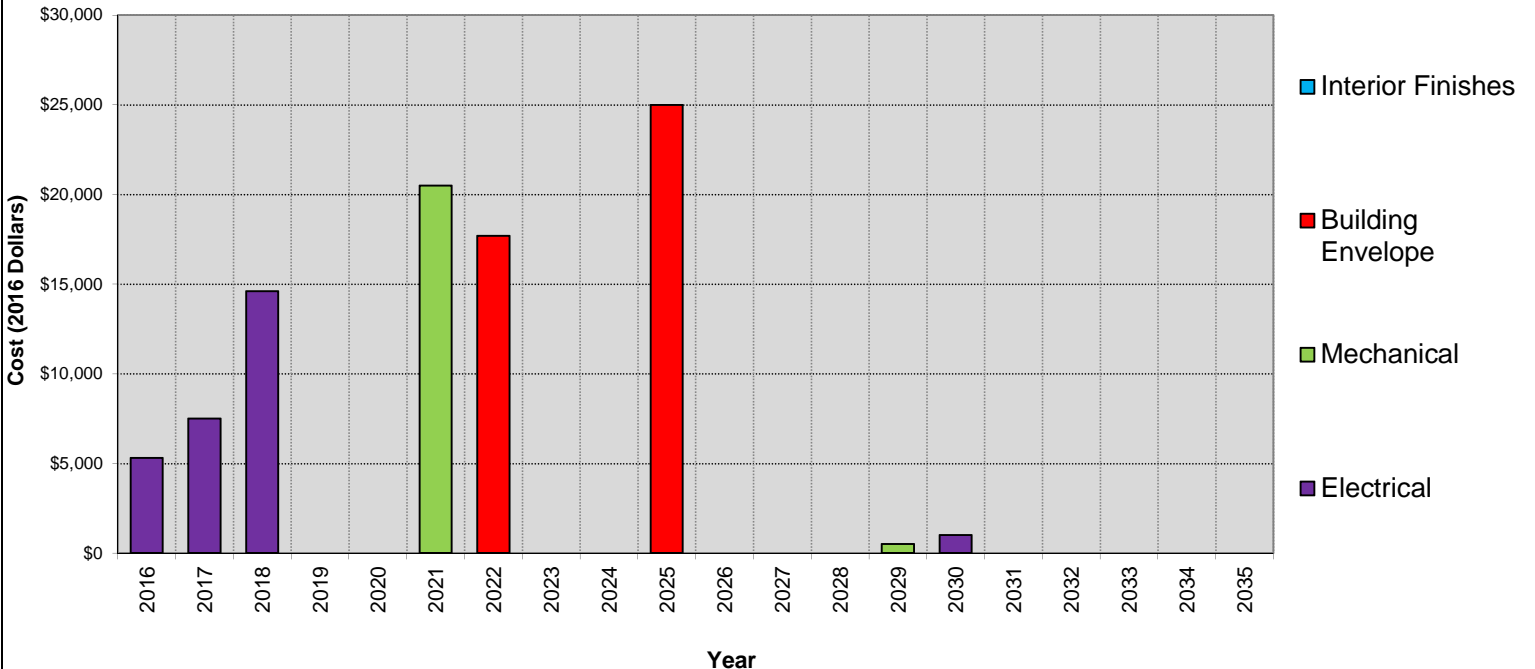
Building Summary



PROJECTED MAINTENANCE EXPENSES (Present Value)



PROJECTED REPLACEMENT EXPENSES (Present Value)



No.26 Marina Dockworks

Building Envelope



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
CMU	Maintenance Replacement	\$ 12,000	2015	20		2035
Garage Door	Maintenance Replacement	\$ 5,000	1962	60		2022
Exterior Metal Doors	Maintenance Replacement	\$ 1,600	1993	60		2053
Cedar Soffit & Fascia Board	Maintenance Replacement	\$ 2,600	2015	12		2027
SBS Membrane Roof	Maintenance Replacement	\$ 25,000	2000	25		2025
Metal-Frame Windows-Single	Maintenance Replacement	\$ 12,700	1962	45	15	2022

NOTES:

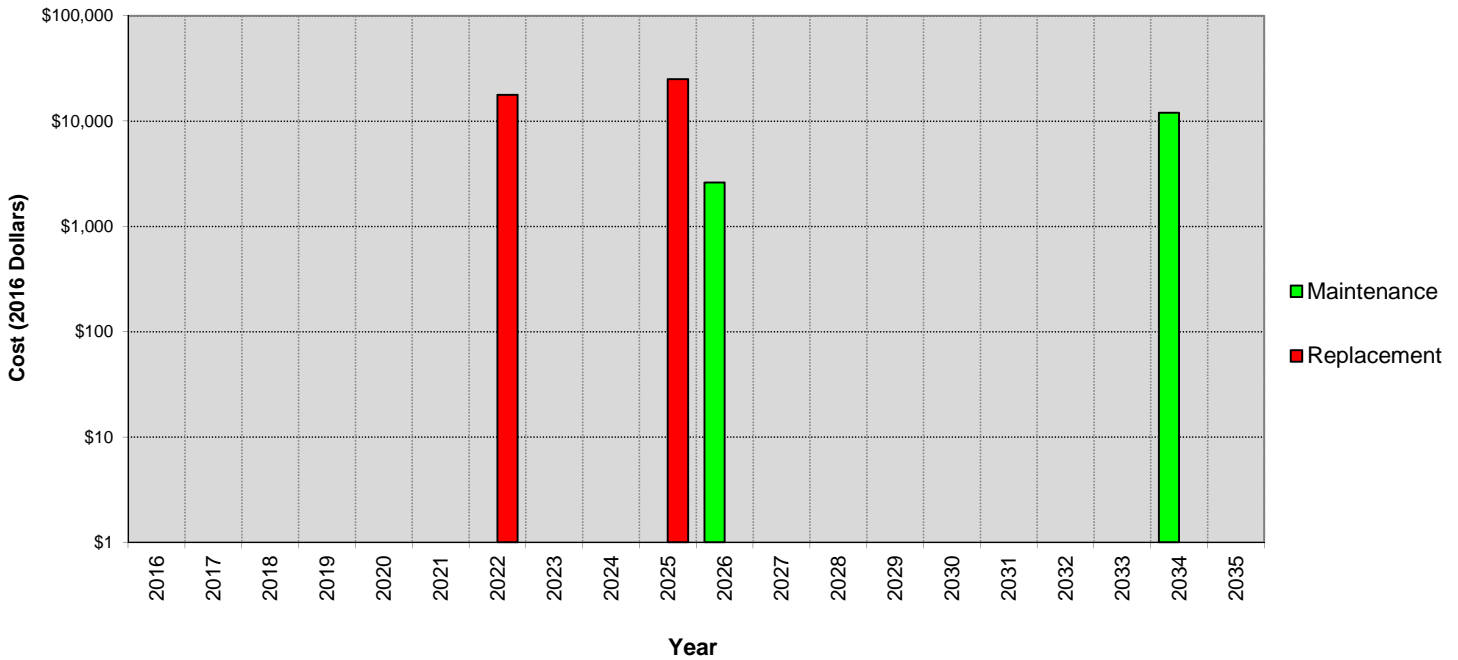
Maintenance:

CMU and Cedar maintenance includes repainting, ledges created by architecture retain water and facilitate climbing, cut to 45° before repainting. Cost estimates include difficult access to the north and west elevations over the water.

Replacement:

Original metal-frame windows recommended to be replaced with aluminum double-pane. Garage door replacement scheduled with windows.

PROJECTED EXPENSES (Present Value)



The graph shows the costs associated with the maintenance and/or replacement of the component over time. The dollar axis is in logarithmic scale for ease of presentation.

No.26 Marina Dockworks

Mechanical



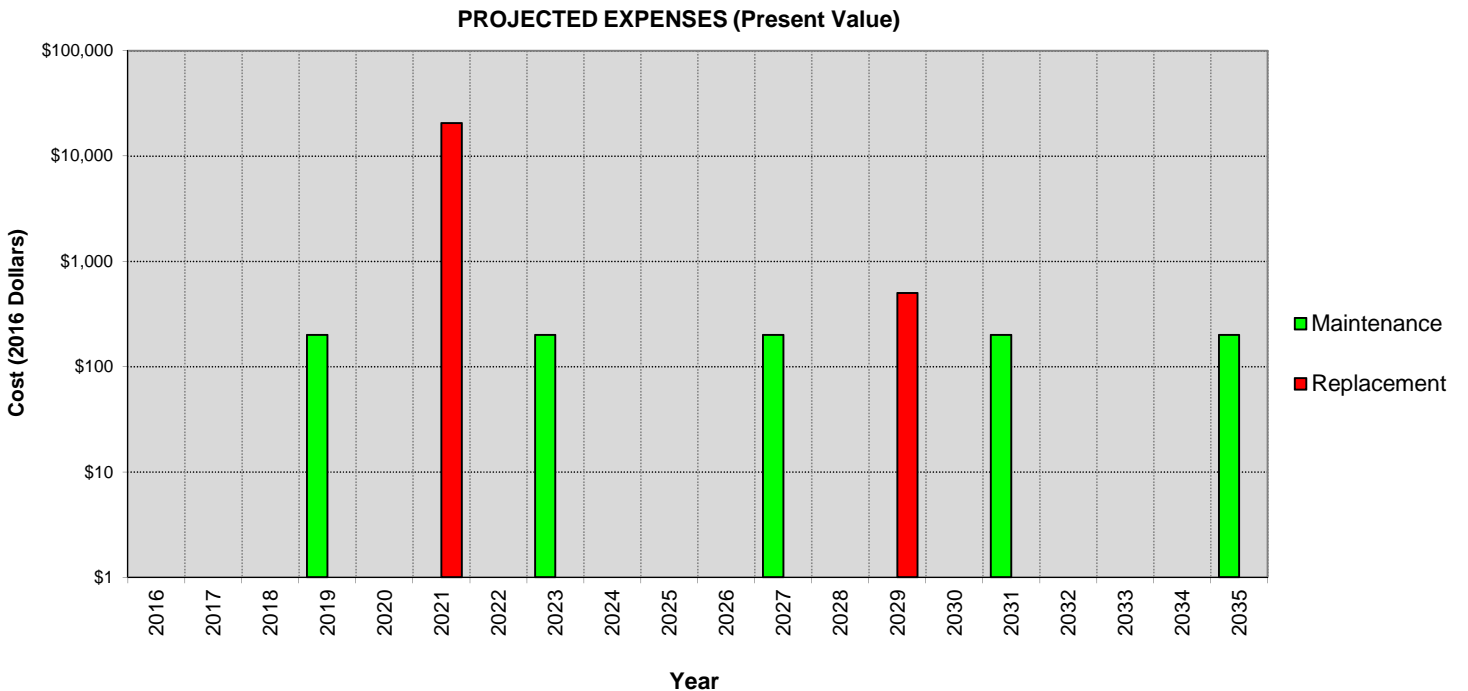
Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Furnace Oil Fired	Maintenance Replacement	\$ 10,000	1998	18	5	2021
Paint Booth	Maintenance Replacement	\$ 10,000	1996	20	5	2021
Fume Hood	Maintenance Replacement	\$ 500	1996	20	5	2021
Exhaust Fans	Maintenance Replacement	\$ 500	2014	15		2029
Washroom	Maintenance Replacement	\$ 200	2015	4		2019
Hot Water Tank	Maintenance Replacement					
Elec	Maintenance Replacement					
Plumbing Fixtures	Maintenance Replacement					
Washroom	Maintenance Replacement					

NOTES:

Maintenance:

Standard maintenance of roof drainage system.
 Plumbing Fixtures with variable age, replace as required as maintenance.
 Exhaust fans inaccessible.

Replacement:



The dollar axis is in logarithmic scale for ease of presentation.

No.26 Marina Dockworks

Electrical



Item		Cost (\$)	Last (Year)	Period (yrs)	Adjusted (yrs)	Next (Year)
Breaker Panel Secondary	Maintenance Replacement	\$ 7,500	1970	35	12	2017
Intrusion Detection	Maintenance Replacement	\$ 3,000	1970	25	23	2018
Lighting Exterior	Maintenance Replacement	\$ 2,800	1970	25	23	2018
Lighting Interior	Maintenance Replacement	\$ 6,300	1970	25	23	2018
CCTV	Maintenance Replacement	\$ 1,000	2010	20		2030
Receptacles Duplex	Maintenance Replacement	\$ 5,300	1970	30	16	2016
Telephone System	Maintenance Replacement	\$ 2,500	1970	25	23	2018

NOTES:

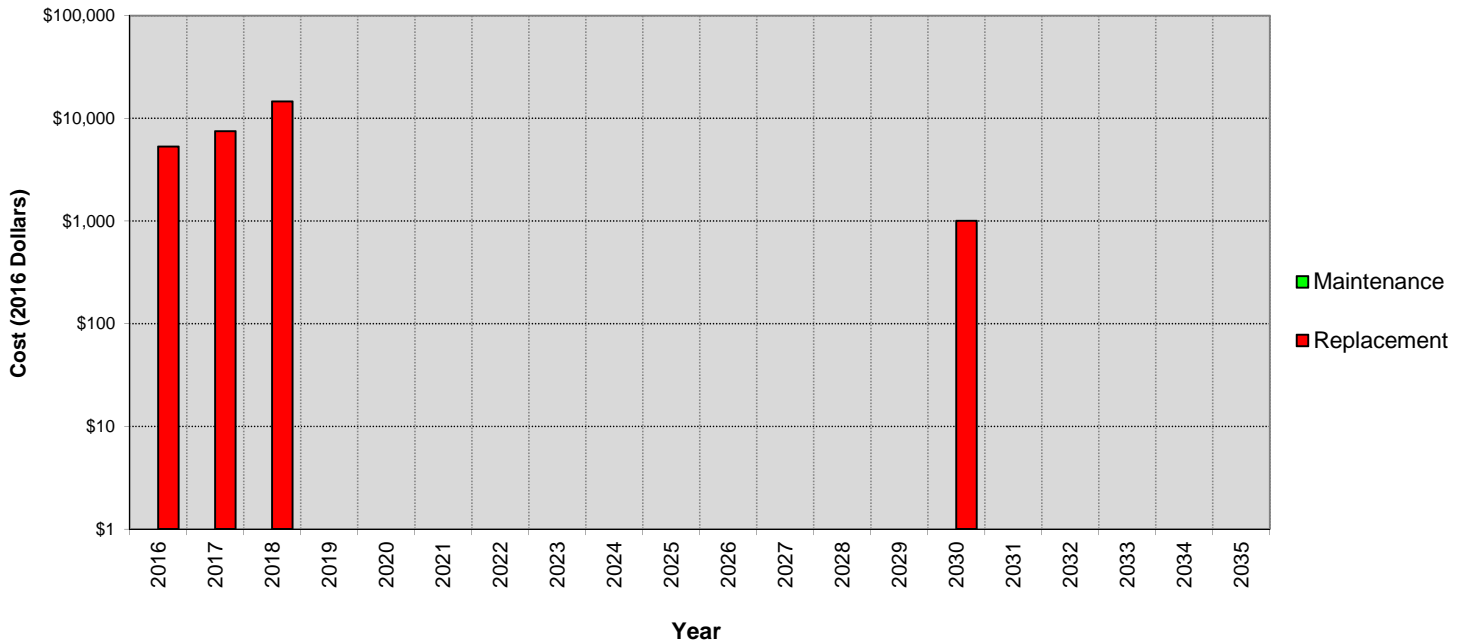
Maintenance:

Lighting and end use devices such as receptacles should be replaced on a scheduled maintenance program.

Replacement:

Electrical distribution is reaching the end of its servicable life and should be replaced.

PROJECTED EXPENSES (Present Value)



The dollar axis is in logarithmic scale for ease of presentation.

APPENDIX A - MUNICIPAL BUILDINGS OVERVIEW TABLE - EXISTING



Building Reference	ANALYSIS TYPE	BLDG GROUP	BUILDING NAME	BUILDING IDENTIFICATION		ORIGINAL YEAR BUILT	ADDITION YEAR(S)	SF	ADDRESS	Drawings Y/N						Reports				Uses		
				Image (Street View)	Image (Plan View)					Arch.	Struct	Mech	Elec	Civil	Other	Hazmat	Energy	Environmental	Elevator	Leased	Heritage	Post Disaster
1a	Needs Assess.	Essential Services	Fire Station			c.1938	1963	8,400	1703 Monterey Avenue Oak Bay Firemans Park	Y	Y	Y	Y			N	Y	N			Y	Y
1b	Needs Assess.	Essential Services	Police Station			c.1958	1978	7,300	1703 Monterey Avenue Oak Bay Firemans Park	Y	Y	Y	Y			N	Y	N			Y	Y
1c	Needs Assess.	Essential Services	Garage			1958		600	1703 Monterey Avenue Oak Bay Firemans Park	N						N	N	N			Y	
2	Needs Assess.	Essential Services	Municipal Administration Hall			1958		14,897	2167 Oak Bay Avenue	Y	Y	Y	Y			N	Y	N				Y
3a	Needs Assess.	Essential Services	Municipal Yard Office, Storage &			1964	1975	11,404	1771 Elgin Road	Y	Y	Y	Y	Y		N	N	N				

Building Reference	ANALYSIS TYPE	BLDG GROUP	BUILDING NAME	Image (Street View)	Image (Plan View)	ORIGINAL YEAR BUILT	ADDITION YEAR(S)	SF	ADDRESS	Arch.	Struct	Mech	Elec	Civil	Other	Hazmat	Energy	Environmental	Elevator	Leased	Heritage	Post Disaster	Additions
3b	Needs Assess.	Essential Services	Municipal Yard Maintenance			1964		6,660	1771 Elgin Road	Y			Y			N	N	N					
4	BAMP	Essential Services	PW Open Storage Shelter 1			1970		2,086	1771 Elgin Road	Y						N	N	N					
5	BAMP	Essential Services	PW Open Storage Shelter 2			1970		2,844	1771 Elgin Road	Y						N	N	N					
6	BAMP	Essential Services	PW Bulk Storage & Transfer Station			1970			1771 Elgin Road							N	N	N					
7A	Needs Assess.	Recreation Centres	Monterey Centre			1971	19,831,989	26,562	1442 Monterey Avenue	Y	Y	Y	Y			N	Y	Y					Y
7b	Needs Assess.	Recreation Centres	Oak Bay Library			1971	1999	11,358	1442 Monterey Avenue	Y	Y	Y	Y			N	Y	Y	Two, 2012, new		Y		Y
8	BAMP	Recreation Centres	Oak Bay Recreation Centre			1975	2003	89,208	1975 Bee Street	Y	Y	Y	Y	Y	Y	N	Y	Y	Single				Y

Building Reference	ANALYSIS TYPE	BLDG GROUP	BUILDING NAME	Image (Street View)	Image (Plan View)	ORIGINAL YEAR BUILT	ADDITION YEAR(S)	SF	ADDRESS	Arch.	Struct	Mech	Elec	Civil	Other	Hazmat	Energy	Environmental	Elevator	Leased	Heritage	Post Disaster	Additions
9	BAMP	Recreation Centres	Tennis Facility			1978	2013	42,120	2151 Cranmore Road	Y	Y	Y	Y			N	N	N					
10	BAMP	Recreation Centres	Henderson Park Recreation Centre			1971	2013	16,805	2291 Cedar Hill X Road	Y	Y	Y	Y	Y		N	Y	N					Y
11	BAMP	Parks and Pavilions	Jack Groves Fieldhouse (Fireman's Park Concession??)			1989		800	1703 Monterey Avenue Oak Bay Firemans Park	Y						N	N	N					
12	BAMP	Parks and Pavilions	Carnarvon Pavilion			1970	1997	4,523	2801 Henderson Road	Y	Y	N	N			N	N	N					Y
13	BAMP	Parks and Pavilions	Carnarvon Old Bowling Pavilion			1960		1,396	2801 Henderson Road	N	N	N	N			N	N	N					
14	BAMP	Parks and Pavilions	Carnarvon Bowling Pavilion			1985	2007	2,877	2801 Henderson Road	Y	Y	N	N			N	N	N					Y
15	BAMP	Parks and Pavilions	Willows Park Pavilion "The Teahouse"			1949		1,928	Willows Park Esplanade	Y	Y					N	N	N		Y			

Building Reference	ANALYSIS TYPE	BLDG GROUP	BUILDING NAME	Image (Street View)	Image (Plan View)	ORIGINAL YEAR BUILT	ADDITION YEAR(S)	SF	ADDRESS	Arch.	Struct	Mech	Elec	Civil	Other	Hazmat	Energy	Environmental	Elevator	Leased	Heritage	Post Disaster	Additions
16	BAMP	Parks and Pavilions	Willows Park Washroom			1982		951	Willows Park Esplanade	Y	Y	Y	Y			N	N	N					
17	BAMP	Parks and Pavilions	Quimper Park Washroom			1970		318	2115 Quimper Street	N	N					N	N	N					
19	BAMP	Specific Use Buildings	Boy Scout Hall			c.1954	c.1987	4,868	1703 Monterey Avenue Oak Bay Firemans Park	Y						N	Y	N		Y			Y
20	BAMP	Specific Use Buildings	Girl Guides Hall			1970	1987	2,644	1703 Monterey Avenue Oak Bay Firemans Park	Y						N	Y	N		Y		Y	Y
21	BAMP	Specific Use Buildings	Oak Bay Apartments			1934	1999	3,485	1442 Monterey Avenue	Y						N	N	N		Y			
22	BAMP	Specific Use Buildings	1531 Hampshire Road			c.1950		2,112	1531 Hampshire Road	Y						N	N	N					
23	BAMP	Specific Use Buildings	2564 Heron Street "Tod House"			1850-1852		2,124	2563 Heron Street	Y		Y	Y			Y	Y	N			Y		Y

Building Reference	ANALYSIS TYPE	BLDG GROUP	BUILDING NAME	Image (Street View)	Image (Plan View)	ORIGINAL YEAR BUILT	ADDITION YEAR(S)	SF	ADDRESS	Arch.	Struct	Mech	Elec	Civil	Other	Hazmat	Energy	Environmental	Elevator	Leased	Heritage	Post Disaster	Additions
24	BAMP	Marina	Oak Bay Marina Restaurant			1962	1994	10,212	1327 Beach Drive	Y	Y	Y	Y	Y		N	N	N					Y
25	BAMP	Marina	Oak Bay Marina Office			1962		4,564	1327 Beach Drive	Y	Y	Y	Y			N	N	N					
26	BAMP	Marina	Oak Bay Marina Dockworks			1964		1,824	1327 Beach Drive	Y	Y					N	N	N					

APPENDIX B - 20-YEAR FINANCIAL FORECASTING- EXISTING

Building	Task	Total (20yrs)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Essential Services																						
No.1a Fire Station	Maintenance	129,700	14,000	1,000	13,900	1,000	21,000	6,000	1,000	7,300	6,000	4,000	3,600	6,000	1,000	1,000	9,000	14,000	1,000	11,300	3,600	4,000
	Replacement	804,460	14,800	618,000		900	32,200	2,000		23,760		70,200	11,500		1,000	2,000	5,000	15,800				7,300
No.1b Police Station	Maintenance	151,800	14,900	2,500	4,000	7,500	10,700	1,500	1,500	1,500	22,600	6,500	4,000	1,500	3,900	27,500	5,500	11,500	3,900	2,500	10,000	8,300
	Replacement	593,560	70,760	265,000	50,000	27,500	45,700	2,000			16,000	35,000	10,000		4,400	49,200	10,000	2,000		5,000	1,000	
No.1c Garage	Maintenance	3,000					2,400										600					
	Replacement	147,300	23,000	72,500	46,000				5,800													
No.2 Municipal Hall	Maintenance	114,600				10,700	77,100					5,700					5,200				10,700	5,200
	Replacement	1,993,750	509,100	189,100	1,001,250	18,500	30,000					90,000	4,000				26,300		65,500		10,000	50,000
No.3a PW Office & Storage	Maintenance	28,000					8,000					3,000					14,000					3,000
	Replacement	646,300	19,000	27,000	437,700	12,400	29,300	6,500	2,000	58,000		26,400	4,000					4,000	5,000		5,000	10,000
No.3b PW Maintenance	Maintenance	45,400	500	8,000			500	8,000					500	8,000			11,400	500	8,000			
	Replacement	530,100	59,500	34,800	320,000	13,800	5,000					72,000					5,000					20,000
No.4 PW Shelter 1	Maintenance	4,000		2,000										2,000								
	Replacement	39,000	6,000																			33,000
No.5 PW Shelter 2	Maintenance	4,000		2,000										2,000								
	Replacement	26,000																				26,000
No.6 PW Bulk Transfer	Maintenance	-																				
	Replacement	10,500		4,500	2,000								2,000									2,000
Recreation Centres																						
No.7a Monterey Centre	Maintenance	192,800		3,000	46,200	3,000	6,000	3,000		3,000		9,000	6,200	3,000	43,000	3,000	40,000	3,000		3,000	9,400	9,000
	Replacement	2,374,600	198,000	221,300		1,454,800	120,600	42,400				129,500				41,000	93,500		25,000	12,000		36,500
No.7b Oak Bay Library	Maintenance	94,400		10,000	4,500	2,000	4,000	2,000	11,600	2,000		6,000	4,500	10,000		2,000	9,700	2,000	8,000	2,000	8,100	6,000
	Replacement	743,800	7,500		16,700	445,400	112,500	28,300			19,000	41,400					7,500	17,000				48,500
No.8 Oak Bay Rec Centre	Maintenance	306,600	5,800	10,600	5,800	5,800	43,600	5,800	5,800	10,600	5,800	38,800	10,600	5,800	5,800	10,600	38,800	5,800	10,600	5,800	5,800	68,600
	Replacement	2,820,900	153,800	461,000	457,300	20,000	418,300	51,000	65,000	205,000	80,000	293,500			140,000	105,000	7,500	67,500	8,000	99,000	20,000	169,000
No.9 Tennis Facility	Maintenance	-																				
	Replacement	853,600		1,500			800		60,000	50,000		26,300		1,500	282,500		60,000				371,000	
No.10 Henderson Rec Centre	Maintenance	86,800	800	5,000		5,000	13,000	1,000	2,000	3,000		10,000	3,000	7,000		4,000	10,000		5,000			18,000
	Replacement	400,200	10,000	40,000	27,000		161,500	26,500	6,000	800		7,500			25,500		4,600		29,000	2,600		59,200
Parks and Pavilions																						
No.11 Jack Groves Fieldhouse	Maintenance	6,100	500	2,000			2,000					800								800		
	Replacement	46,200	13,000	14,000		3,700					4,000	900				4,000					6,600	
No.12 Carnarvon Pavilion	Maintenance	33,500	3,000	1,500	2,900	5,100			1,500				2,900	4,300					1,500		8,000	2,800
	Replacement	145,900	20,000	6,400	55,000	21,200	13,200			500	5,600	7,000		500			15,000		1,000	500		
No.13 Carnarvon Old Bowling Pavilion	Maintenance	4,900			500		1,900			1,000					500			500		500		
	Replacement	35,500	200	4,200	1,600		1,400			7,100		8,200					12,300			500		
No.14 Carnarvon Bowling Pavilion	Maintenance	14,700	800				1,000		4,000		800	5,300					1,000		800			1,000
	Replacement	34,200		500			5,100					8,700		16,600					600			2,700
No.15 Willows Park Pavilion	Maintenance	41,500	11,900	2,800	2,100		2,100		3,100		2,100	1,500	2,100	1,000	2,100		2,100		5,000	1,500	2,100	
	Replacement	71,800	3,600	30,800	4,000		3,000	8,500				800			5,000		400			15,000		700
No.16 Willows Park Washroom	Maintenance	17,300	600		4,700					1,000		900	1,200		1,000		900			1,000	1,200	900
	Replacement	47,500		15,700			7,000		12,300								9,500		3,000			
No.17 Quimper Park Washroom	Maintenance	13,000	500	2,000	2,500					2,000			1,500		2,300					2,000	200	
	Replacement	13,000					2,400			3,000												7,600
User-Specific Buildings																						
No.19 Boy Scout Hall	Maintenance	9,200	2,000		1,000					1,000		600					1,000			1,600		
	Replacement	114,800		71,800		3,500	800					32,300					2,800					3,600
No.20 Girl Guides Hall	Maintenance	3,800													3,800							
	Replacement	161,900		41,500	58,200		8,500			1,800		11,400			1,000		4,900			22,600	12,000	
No.21 Oak Bay Apartments	Maintenance	39,000	1,000	1,000	1,500	1,000	9,000	1,500	1,000	1,000	1,500	1,000	1,000	1,500	1,000	1,000	9,500	1,000	1,000	1,500	1,000	1,000
	Replacement	54,500				9,400	8,000	5,200			1,500	1,500				14,400	8,000				5,000	1,500
No.22 1531 Hampshire Road	Maintenance	11,700	2,400	2,000	4,300				1,000						1,000							
	Replacement	81,900		68,200		800	1,600	5,500								800				5,000		
No.23 2564 Heron Street	Maintenance	146,100	80,000	37,000	1,000		9,100			1,000		8,000			1,000						9,000	
	Replacement	74,100	2,500	13,000	2,200		48,400		4,300			2,900								800		
Marina																						
No.24 Marina Restaurant	Maintenance	176,800	3,600	8,600	3,600	11,500	13,600	18,600	3,600	3,600	3,600	22,600	3,600	3,600	3,600	26,500	13,600	3,600	3,600	8,600	3,600	13,600
	Replacement	1,168,600	129,000	186,000	150,000	99,800	10,000	263,500		2,300	14,300	15,500	9,000		70,000	155,000	7,500		6,000	13,500	5,000	32,200
No.25 Marina Office	Maintenance	25,800	2,500	2,000	7,500		800					9,400					800			2,000		800
	Replacement	338,400	30,000	8,500	44,800	36,800	800					17,000			56,000	36,000			30,000		65,200	13,300
No.26 Marina Dockworks	Maintenance	15,600				200				200				2,800					200			12,200
	Replacement	92,100	5,300	7,500	14,600			20,500	17,700			25,000				500	1,000					
Portfolio Summary	Maintenance	1,720,100	144,800	103,000	106,000	52,800	229,200	39,900	44,100	38,200	42,400	133,100	44,700	59,500	70,000	75,600	172,100	44,100	49,400	53,100	63,700	154,400
Present Values	Replacement	14,464,470	1,275,060	2,402,800	2,688,350	2,168,500	1,036,100	491,900	173,100	352,260	140,400	923,000	40,500	158,600	550,400	310,400	340,800	68,800	148,900	606,900	145,600	442,100
Portfolio Summary	Maintenance	2,070,167	144,800	105,060	110,282	56,032	248,093	44,053	49,664	43,880	49,678	159,067	54,489	73,981	88,777	97,797</						

APPENDIX - C GLOSSARY OF TERMS

Air Barrier	Materials and components that together control the flow of air through an assembly and thus limit the potential for heat loss and condensation due to air movement.
Adhesion	The property of a coating or sealant which measures its ability to stick or bond to the surface to which it is applied.
Alligatoring	Shrinkage cracking of the bituminous surface of built-up roofing, or the exposed surface of smooth-surface roofing, producing a pattern of deep cracks with the scaly look of an alligator's hide.
Adhesion Failure	Failure of a compound by pulling away from the surface with which is in contact.
Asphalt	A highly viscous hydrocarbon produced from the residuum left after the distillation of petroleum used as the waterproofing agent of a built-up roof.
Assembly	The collective layers of components and materials which together comprise the complete cross-section of the wall or roof.
Balcony	A horizontal surface exposed to outdoors and intended for pedestrian use, but projected from the building so that it is not located over a living space or is acting as a roof.
Ballast	An anchoring material, such as rounded river rock, gravel, or precast concrete pavers, which is used to hold roof membranes in place and resist wind uplift forces.
Base Flashing	The part of the roofing that is turned up at the intersection of a roof with a wall or another roof penetration. It may be made of the same material as the main roofing membrane or of a compatible material.
Bitumen	A generic term for either asphalt or coal tar pitch used in the roofing industry.
Blister	A spongy, raised portion of roofing membrane, ranging in size from 25 mm (1") in diameter and barely detectable to as much as 4.6 m ² (50 ft ²) in area and 300 mm (12") high. Blisters result from the pressure of entrapped air or water vapour.
Bond Breaker	Used where it is desired that the sealant not adhere.
Building Envelope	Now called an environmental separator in Building Codes, building envelope refers to those parts of the building which separate the inside, conditioned space from unconditioned or outside space, and includes windows, doors, walls, roofs, and foundations.
Built-up Roofing (BUR)	A continuous, semi-flexible roof covering, consisting of laminations of plies of saturated or coated felts alternated with layers of bitumen. Surfaced with bitumen, and in some cases covered with aggregate.
Cant Strip	A continuous strip of triangular cross-section, fitted into the angle formed by a structural deck and a wall or other vertical surface. Used to provide a gradual transition for base flashing and horizontal roof membrane.
Cap Flashing	Component that sheds water from the tops of walls. It is difficult to make metal cap flashing waterproof at joints and intersections, and it therefore requires a secondary, continuous and waterproof membrane below it.
Caulking	A material used for joint sealing where minor or no elastomeric properties are required.

Cladding	A material or component of the wall assembly, which forms the exterior surface of the wall and is exposed to the environment forces.
Cohesive Failure	Splitting and opening of a compound resulting from over extension of the compound caused by excessive movement (see adhesion failure).
Concealed Barrier	A strategy for rain penetration control that relies on the elimination of holes through a combination of the cladding and a secondary plane further into the assembly.
Contract	The undertaking by the parties to perform their respective duties, responsibilities, and obligations as prescribed in the Contract Documents and represents the entire agreement between the parties.
Counter Flashing	Prevents water from penetrating behind the top edge of base flashing, and consists of a separate piece of flashing placed over the top of the base flashing. It is usually made of sheet metal.
Cross Cavity Flashing	Flashing that intercepts and directs water flowing down the cavity of a wall assembly to the outside of the building.
Deck	A horizontal surface exposed to outdoors, located over a living space, and intended for pedestrian use in addition to performing the function of a roof.
Delamination	Separation of the plies in a roof membrane system or separation of laminated layers of insulation.
Drainage	Uses surfaces of the assembly to drain water away from the assembly.
Drip Flashing	A component that directs water flowing down the face of vertical elements, such as walls or windows, away from the surface.
Durability	Terminology describing the capacity of a material to tolerate environmental forces.
Efflorescence	A white powdery deposit on the surface indicating moisture ingress through the concrete. This is caused when water travelling through the concrete reacts with calcium hydroxide.
Element	A material or component within the assembly.
Emulsion	An intimate mixture of bitumen and water, with uniform dispersion of the bitumen globules, achieved through a chemical of clay emulsifying agent.
Exterior Glazed	Glass set from the exterior of the building.
Exterior Stop	The removable molding or bead holding the glass or panel in place when it is on the exterior side of the glass or panel, as contrasted to an interior stop located on the interior side of the glass.
Face Seal	A strategy for rain penetration control that relies on the elimination of holes through the cladding.
Felt	A fabric made by the interlocking of fibres. Roofing felts are manufactured from cellulosic fibres (organic felts), asbestos fibres (asbestos felts), or glass fibres (glass fibre felts). Felts are either saturated, or saturated and coated with bitumen.
Fenestration	The arrangement of windows and doors on the elevations of a building. Fenestration also includes curtain wall, storefront, skylights and other sloped glazing systems.

Fishmouth	An opening formed by an edge wrinkle in a felt where it overlaps another felt in a built-up roofing membrane.
Flashing	Connecting devices that seal membrane joints, drains, gravel stops and other places where the membrane is interrupted. Base flashing forms the upturned edges of the watertight membrane. Cap or counter flashing shields the exposed edges and joints of the base flashing.
Frame	Outside member of a window unit, which encloses the sash. Compound of side jambs, head and sill.
Grade	The classification of materials by quality. Also, the ground elevation or level, contemplated or existing, at the outside walls of a building, or elsewhere on the building site.
Granules	Opaque, natural, or synthetically coloured aggregate commonly used to surface cap sheets and roofing shingles.
Gravel	Coarse granular aggregate, having rounded edges, resulting from the natural erosion of rock.
Gravel Stop	Flanged device, normally metallic, designed to prevent loose aggregate from washing off the roof and to provide a finished edge detail for the built-up roofing assembly.
HPO	Homeowner Protection Office. The HPO is a provincial Crown corporation formed in response to the recommendations of the Barrett Commission.
Head	The upper horizontal cross member, between the jambs , which forms the top of a door or window frame; may provide structural support for construction above if required, as a door head or window head.
Horizontal Joint	A horizontal joint on a wall which provides capability for differential movement of portions of the building structure (expansion joint) or prevents or localizes cracking of brittle materials such as stucco (control joint).
Housewrap	A sheet plastic material used as a breather type sheathing membrane. It is generally installed between the wall sheathing and the exterior cladding. Although at one time used as a proprietary term, housewrap is now used to represent a generic group of materials. One common type of housewrap consists of Spun-bonded Polyolefin (SBPO); another is made of perforated polyethylene.
Interior Glazed	Glass set from the interior of the building.
Jamb	A vertical member at either side of a doorframe, window frame or door lining.
Loosely Laid Membrane	Membranes which are not attached to the substrate except at the perimeter of the roof. They are held in place with appropriate and adequate ballast.
Maintenance	A scheduled process of periodic inspection and minor repairs to the building envelope.
Modified Bitumen	Asphalt enhanced by the addition of polymer modifiers to increase cold temperature flexibility and warm temperature flow resistance and stability. The most common modifiers are SBS (styrene butadiene styrene) and APP (atactic polypropylene).

GLOSSARY OF TERMS



Moisture Barrier	Any material used to retard the passage or flow of moisture into the assembly, thus preventing condensation.
Moisture Content	With respect to wood: The weight of water contained in wood expressed as a percentage of the weight of oven-dry wood.
Parapet	The part of any wall entirely above the roof.
Penetration	An intentional opening through an assembly.
Ply	A layer of roofing membrane. A four-ply membrane has at least four plies of felt at any vertical cross section cut through the membrane.
Pressure Treatment	A process for treatment of wood to provide greater durability against moisture.
PVC (Poly Vinyl Chloride)	A thermoplastic sheet material used for single ply roofing membranes.
Rainscreen	A wall designed to prevent rain penetration by providing a cavity between the cladding and the backup wall and vents the wall to allow moisture drainage.
Reglet	A groove in a wall or other vertical surface adjoining a roof surface for the embedment of counter flashing.
Ridging	An upward “testing” displacement of a roof membrane, frequently occurring over insulation joints, deck joints, and base sheet edges.
Saddle	The junction of small horizontal surfaces, such as the top of a balcony guardrail or parapet wall, with a vertical surface, such as a wall.
Sealant	Compound used to fill and seal joint or opening, contrasted to a sealer which is a liquid used to seal a porous surface.
Sealed Unit	Two or more sheets of glass separated by a spacer bar and hermetically sealed for airtightness. Has a desiccant in between the sheets of glass to absorb and hold any moisture to prevent condensation inside the unit.
Service Life (Expected)	The actual period during which building envelope materials, components and assemblies perform without unforeseen maintenance and renewal costs.
Sheathing	Sheet material attached to the wall framing to provide structural backing for the cladding and sheathing paper. Can be designed to provide structural lateral stiffness for the wall.
Sheathing Membrane	Sheet material in an exterior wall assembly used to retard penetration of water further into the structure once past the cladding. Waterproof type sheathing membranes can also perform the function of the air barrier and the vapour barrier. These materials include both breather type sheathing membranes such as sheathing paper and housewraps, and waterproof sheathing membranes.
Sheathing Paper	Asphalt-impregnated organic sheet material (breather-type sheathing membrane) attached to the sheathing exterior which creates a water-shedding surface.
Sill	The horizontal member that forms the bottom of a window frame. It is generally slanted down to the outside to shed standing water.

Single Ply Membrane	Roofing membranes that are field applied using a pre-manufactured sheet of single layer membrane material (either homogenous or composite) rather than multiple layer.
Smooth-Surfaced Roof	A built-up roofing membrane surfaced with a coating of hot asphalt, asphalt emulsion or asphalt cutback.
Stepped Flashing	The material installed at the junction between a sloping roof and a wall running parallel to the slope. Both base and counter flashing are overlapped and installed in pieces following the slope to form the complete stepped flashing.
Substantial Performance	A stage that is reached when the work is ready for use or is being used for the purpose intended as is so certified by the consultant
Substrate	The surface upon which the roofing membrane is placed – structural deck or insulation.
Threshold	A strip fastened to the floor beneath a door, usually required to cover a joint where two types of floor material meet; may provide weather protection at exterior doors (also referred to as doorsill).
Through-wall Flashing	A waterproof membrane or metal flashing that 1) allows water behind the cladding to shed away from the building, 2) prevents water from entering the wall at joints, and 3) prevents capillary transfer of moisture through porous materials such as concrete or masonry if the moisture source is below grade.
Valley Flashing	Flashing installed in the valleys of sloping shingled roofs to give continuity to the roofing system.
Vapour Barrier	A material with low vapour permeability that is located within the assembly to control the flow of vapour and limit the potential for condensation due to diffusion.
Vapour Retarder	A material designed to restrict the passage of water vapour through a wall or roof assembly.
Walkway	A pedestrian corridor exposed to outdoors, which provides access between suites and stairwells or elevators. It may also be a roof.
Weephole	Opening at the base of a cavity wall to collect moisture and dispense it or breather put in to sealant to relieve moisture.
Work	The total construction and related services required by the Contract Documents

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- Canada Mortgage and Housing Corporation, "Best Practice Guide Wood Frame Envelopes in The Coastal Climate of British Columbia" 1st Edition, September 1998 as a basis for this glossary.
- Canada Mortgage and Housing Corporation, "Building Envelope Rehabilitation – Consultants Guide" 1st Edition, 2001
- Canadian Construction Documents Committee, "CCDC 2 – Definitions", 1994
- Dictionary of Architecture and Construction, Edited by Harris, Cyril M., McGraw Hill Inc., 1975

