Appendix A

AVS

Asset Performance Report

DFO-FWI - Main Lab-Administration Building

September 2013

Prepared by: PWGSC – A&E CoE
Winnipeg, Manitoba
Edmonton, Alberta
Project - R.060627.001

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Details	Values
Construction Year (YYYY)	1972
Gross Area (square meters)	21,725
Date of current BCR	9/23/2013

Narratives

BCR Project Team and Documents

The following BCR Project Team conducted the onsite inspections and data review:

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Drawings Provided:

Original Building:
Architectural: Original drawings (dated 1969) GBR Architect Ltd (Winnipeg)
Structural Engineering: Original drawings (dated 1969)) Eastman, Irving, Lexier
Mechanical Engineering: Original drawings (dated 1969) GBR Architect Ltd (Winnipeg)
Electrical Engineering: As Built drawings (dated 1969) GBR Architect Ltd (Winnipeg)

1974 Water Treatment System Addition
Architectural: James + Rollier Architect (Winnipeg)
Structural, Mechanical and Electrical Engineering: Reid Crowther Engineers (Winnipeg)

1984 Specimen Storage Room
Architectural, Mechanical and Electrical Engineering: PWGSC In-house

1993 New Freezer Room 2-123
Mechanical and Electrical Engineering: PWGSC In-house

Building History

The Freshwater Institute (FWI) is located on the University of Manitoba campus, located in the south end of the city of Winnipeg. The Institute houses several programs of Fisheries and Oceans Canada (DFO). It is a national centre of expertise in aquatic biology and freshwater and marine fisheries. In conjunction with the Bayfield Institute in Burlington, Ontario, FWI serves as a focal point of scientific research in the DFO Central and Arctic Region and for fishery, fish habitat and oceans management programs.

Approximately 120 staff work at FWI, including researchers, administrators and many graduate students from the University of Manitoba.

Since summer 2012, the cafeteria has not been in operation. (no interested vendors) Currently, plans are underway to convert the existing library to office space.

The original FWI facility was designed in 1969 by GBR Architects and Engineers of Winnipeg. The original facility was completed in 1971/72 and comprised of the following major components:
1) Main Lab/office building comprised of: 2 storey Administration block with full basement, 4 storey Lab block with full basement, 3 storey service block with full basement and,
2) 1 storey Workshop Building/Inspection Office Building (now referred to as Small Craft harbour Building) designed by GBR Architects and Engineers of Winnipeg.

Major building projects include:
1974: A 1 storey waste water treatment building.
1979: A 1 storey BioAssay Lab Building with full basement (now referred to as the Annex Building) Designed by PWGSC in house (connected to Lab/Administration block via tunnel).
1984: A 1 storey storage warehouse building (now referred to as the Solar Warehouse building) Designed by PWGSC in-house, in conjunction with Ed Faraci Mechanical Engineering.
1984: A 1 storey (with full basement) water treatment addition was constructed adjoining the Main building service block. The addition was designed by James and Rollier Architect in conjunction with Reid Crowther Engineering.
1992: The workshop space of the Shop and Storage Building was converted to office space for the Small Craft Harbour program.
1995: Roof on Waste Water Treatment building was replaced.
1998: The roof of the Main Lab/Administration block was replaced.
2008: The exterior stairs, ramp, handrails, and approach to the main entry were reconstructed.
2008: The northwest quadrant of the service block underwent major renovation to accommodate the National Aquatic Animal Health Protection (NAAHP) Lab.
2011: Fire Protection Upgrades (main Lab Building, construction of new doors, partitions, alarm devices, etc).
2012: Small Craft Harbour Interior Renovation (replacement of interior finishes, mezzanine access to file room ceiling).

The Main Laboratory and Administration Building is a cast-in-place and precast concrete building with five floor levels and was built in 1972. The 21,725sm square meter building is laid out with the 3 level Administration block at the east end of the building and a 5 level Laboratory block in the center and the 3 level Service block at the west end of the building. The Basement level of the Lab/Administration block is mostly under grade, however windows do serve offices located on this level.

Gross Building Areas of Main Lab/Administration Building
Basement: 7836sm
Main Floor: 7897sm
Second Floor: 6558sm
Third: 3405sm
Fourth: 3405sm
Mechanical Penthouse: 2186sm

Gross Areas of Secondary Buildings at FWI:
Annex Building: 880sm
Small Craft Harbour Building: 660sm
Wastewater Treatment Building: 147sm
Solar Warehouse: 721sm

BCR Executive Summary

This BCR summary pertains to the Main Lab /Administration building at the Freshwater Institute (FWI) and all the surrounding property at FWI.

There are separate BCR reports for: the Annex Building, the Small Craft Harbour Building, the Wastewater Treatment Building and the Storage Warehouse (Solar Warehouse) Building.

General
The building is in good condition and has benefited from a very good maintenance program.
PWGSC has recently provided notice to DFO that the outsourcing of facility management to some Alternative Form of Delivery (AFD) will occur April 1, 2013 or soon thereafter.
In FY 2012/2013 the facility had PWGSC on site staff consisting of the following:
- 1 Maintenance Supervisor,
- 1 Plumber and,
- 1 Maintenance Operator.

A MAXIMO computer program is used to support the preventive maintenance and track existing repairs or upgrades. This system should be upgraded as funds become available in the future.

Architectural
The reinforced concrete superstructure is robust and there are no apparent structural concerns. The building envelope is similarly robust, clad with precast concrete panels. There are no concerns with the building envelope, however a study is recommended to confirm the condition of the panel anchors at the east and west elevations (anchors on the north and south elevations were replaced in the 1980's). The built-up roof is only 13 years old but has had a history of leakage over the past 3 years. A roof report including a thermographic scan is recommended to determine the remaining service life of the roof. Replacement is required within a 5-10 year horizon. Replacement may be recommended within 5 years pending the recommendations of the roof report and if roof leakage persists.

Original finishes in the Administration block are of good quality, including porcelain tile floor at main entry foyer and corridors, linear metal ceilings, precast concrete and oak wall finish. These finishes remain in average/good condition. Original finishes in the Lab block such as paint and vinyl floor tile, have a dated and/or worn appearance and are in fair condition only and due for replacement. Approximately 25% of the original labs have been renovated to accommodate office and storage functions. Finishes in these rooms have a range of finishes, from new carpet flooring to existing tile flooring. Existing stairs in the lab block require modifications to hand and guardrails to comply with current codes.

To ensure continued architectural performance over the next 30 years, the following 5 and 25 year summarized costs are estimated;

First 5 years: $832K
Following 25 years: $10.6M

Mechanical
The Freshwater Institute Administration and Main Lab buildings have a variety of shared typical mechanical systems. The Laboratory building has a number of unique mechanical systems dedicated for the requirements of the research programs. Many of the mechanical systems date back to original construction.

Steam from the University of Manitoba is the source of heating (in a pressure reduced state or conversion to hot water/glycol). The devices in the heating systems are mostly original. One significant exception is the replacement of the steam preheat coils on the main laboratory serving air handling units AHU 1 & 2. Heating system components have otherwise been reliable with regular maintenance.

Chilled water from the University of Manitoba is the source of cooling for all the air handling units. It was once available for tempering the dechlorinated fish water via heat exchangers but this practice was abandoned over 20 years ago. The chilled water system components have been reliable.

Walk-in coolers and freezers have upgraded ozone friendly water-cooled refrigeration systems that are well maintained and reliable. There is a process loop and cooling tower that is approximately 15 years old that has experienced some recent problems and may require some upgrades to ensure capacity is adequate for this fiscal year.

Plumbing piping is extensive in the laboratory building. It includes what would normally be expected for domestic and sewage piping as well as glass & fuse seal piping for acid waste, polypropylene piping for reverse osmosis and dechlorinated water for fish research. There were no reported concerns with the integrity of the piping with the exception of the polypropylene which has been a concern over recent years. Plumbing fixtures have been slowly upgraded with renovations over the years and were not a concern.

Air Handling Units and Ventilation Systems are mechanically mostly original with some controls upgrades energy savings. Overall, the integrity of these systems is average, considering the age of the equipment. Eventual replacement will require some scheduling and coordination to spread out the large capital costs. The configuration of some air handling units may not be appropriate as some labs have been converted to administrative areas. Ventilation systems servicing the fume hoods also have updated controls while retaining most of the original mechanical components.

HVAC controls systems have been progressively updated with new technology and kept in a reliable operating condition through on-going service contracts. This includes DDC and electrical/pneumatics as well.

The dechlorinated water system (DCW) is in need of immediate replacement and is presently under review by DFO. The demand of this system has dramatically reduced over the last 20+ years. This system is very dated and has experienced failures resulting in disruption to service and some damage from flooding due to piping failures. Without specialized in-house knowledge, it would be very difficult to maintain continuity of service as some controls have failed and parts are no longer available. DFO is conducting a client needs analysis for the design and installation of a new dechlorinated water system. Some of the existing tanks and other equipment maybe preserved but not practical based on present requirements being a small fraction of original design.

To ensure continued mechanical performance over the next 30 years, the following 5 and 25 year summarized costs are estimated;

First 5 years: $3.4M
Following 25 years: $30.7M

Electrical
The Lab Building is the centre point of the electrical services to the FWI site. All systems begin from here and none of the other 4 buildings (Annex, Small Craft, WTP or Storage Warehouse) have standalone services. The building built in 1972 has had few major changes to the electrical infrastructure. On the power side, the Main Secondary Switchgear was replaced in 2002, one of the banks of Power Factor Correction capacitors has been replaced and several smaller Square D panels were added to facilitate the installation of mechanical equipment. However, all the other power equipment is original and now 41 years old and considered to be past its theoretical life expectancy.

The Generators are specifically vulnerable at this time because of their complexity, function and safety necessity.

The lighting of the building is in critical condition in that the majority is dependent on the availability of obsolete T12 lamps.

The low voltage systems, such as telecommunications, fire alarm, and access/security have been upgraded and modified to maintain operation and are operating satisfactorily. The telecommunications does not seem to have an integral approach to infrastructure and is separated by telephone with category 3 cable and data with category 5 cable.

The electrical distribution, with preventive maintenance, could extend life for 5 or maybe even 10 years but not without risk. At over 40 years, any system is vulnerable. Cleaning, retorquing and thermographic scanning of the electrical equipment would diminish the risk but not alleviate it.

To ensure continued electrical performance over the next 30 years, the following 5 and 25 year summarized costs are estimated;

First 5 years: $2M
Following 25 years: $29.2M

Elevators
The 2 traction style elevators are original equipment but otherwise are in average operating condition. The electrical-mechanical controls are dated but are still reliable and the regular elevator maintenance program is keeping any trouble service calls to a minimum. A reason for considering upgrades would be the access to spare parts, the elevators are now approximately 35 years old. The controls do not conform with current accessibility codes and cab finishes are dated and worn.

Property
Parking pavements are in fair condition only. Cracking, crack filling, rutting and surface ponding are extensive. Pavement reconstruction is recommended within the 25 year horizon of this report. The overflow parking lot (gravel) at the west of the site is regularly used to capacity for parking. A gravel lot is not suitable for regular parking of 30 vehicles and presents safety issues. Paving is recommended.

Concrete curbing is in poor/fair condition. Reconstruction of curbing is recommended.

Grade level next to the main building and at the base of exit stairs is low and should be built-up to reduce the possibility of water leakage through the basement foundation walls and provide safe egress from the building.

The Lab/Administration and Annex building are surrounded by generous areas of soft landscaping featuring grass areas, berms, planting beds, mature trees as well as a memorial garden. Soft landscaping is in generally average condition with some attention required to damaged grass areas and neglected planting beds.

To ensure continued property performance over the next 30 years, the following five and 25 year summarized costs are estimated;

First 5 years: $162K
Following 25 years: $3.3M

Taking into account all elements for all disciplines (Property, Architectural, Structural, Conveying, Mechanical and Electrical), this asset will require the following estimated 30 year funding to ensure the continued performance;

First 5 years: $6.5M
Following 25 years: $75M

Note, these summarized costs include all cyclical costs occurring within the 30 year time frame. However, they do not include all recommended inspections, studies, evaluations and audits. These costs are identified below;

First 5 years: $377K
Following 25 years: $1.7M

Overview Architectural & Structural Condition

The reinforced concrete superstructure is robust and there are no apparent structural concerns.

The building envelope is similarly robust, clad with precast concrete panels. The building envelope consists of a cavity wall system of precast cladding on masonry or reinforced concrete wall backup. The interior face of the wall is clad with gypsum board on metal furring. The envelope features a large sloping copper roof/wall extending from the roof of the main entry to the roof parapet. Windows are fixed double glazed units in aluminum frames. Windows are primarily on the east and west exposures of the building. Approximately 33% of the wall area on these walls is windows. There are no apparent concerns with the building envelope, however a study is recommended to confirm the condition of the panel anchors and the east and west elevations (anchors on the north and south elevations were replaced in the the 1980's). The built-up roof is only 13 years old but has had a history of leakage over the past 3 years. A roof report including a thermographic scan is recommended to determine the remaining service life of the roof. Replacement is required within a 5-10 year horizon. Replacement may be recommended within 5 years pending the recommendations of the roof report and if roof leakage persists.

- Interior finishes in the Administration block are of good quality, including porcelain tile floor at main entry foyer and corridors, linear metal ceilings, precast concrete and oak wall finish. These finishes remain in average/good condition.
- Interior finishes in approximately 50% of Labs appear to be original (paint on gypsum board and vinyl floor tile), have a dated and/or worn appearance and are in fair condition only and due for replacement.
- Interior finishes in approximately 25% of Labs have been replaced (vinyl flooring, paint),
- Approximately 25% of the Labs have been converted to office and storage functions. Finishes in these rooms have a range of finishes, from new carpet flooring to existing tile flooring.

The two existing elevator cabs are in fair condition only and do not conform with current accessibility standards. Existing stairs in the Lab block require modifications to hand and guardrails to comply with currents codes.

Please refer to the Executive Summary for further architectural element descriptions and evaluations.

Overview Site Condition

There are three paved main parking lots, all of which have paved asphalt and accommodate approximately 210 stalls. With the exception of the east (visitor parking), pavements are in generally poor/fair condition, and require recommended reconstruction.

Pavement markings are in poor/fair condition.

Concrete curbing is damaged or deteriorated in many locations and reconstruction / repairs are required.

Concrete sidewalks are in good condition. The main entry plaza was reconstructed in 2008 with paving stones and concrete stairs and stainless steel handrails.

Generally, the soft landscaping and natural landscape features are sufficient and in good condition. There are generous open grass areas surrounding the front of the Lab/Administration building. There is an adequate number of mature trees located in the open areas. The Lab/Administration building features precast concrete planters at the main entry and planting beds at the east and south sides of the office block.

The Annex building has a planting bed extending the length of the building on the west side.

Areas requiring improvement include: planting beds and some grass areas where underground utility work has been carried out in recent years.

The freestanding building pylon sign is in good structural condition however the board signage mounted on it is weathered and in fair condition only.

Costs to ensure continued performance, including design costs, are estimated as followed:

First 5 years: $162K
Following 25 years: $3.3M

Overview of Vertical & Horizontal Transportation Condition

The FWI Administration/Lab building has two vertical transportation device categories, they are: elevators (2) and one chain hoist. The elevator systems are regarded in fair and average conditions - with the hoisting controls in fair condition. Aside from upgrading the elevator cab control panels to the current accessibility standard in 2014, all other life extension and/or replacement expenditures (over $975K) are scheduled in the 25 out years.

To ensure continued conveying performance over the next 30 years, the following 5 and 25 year summarization estimates are as follows;

First 5 years: $14K
Out 25 years: $979K

Overview of Mechanical Systems Condition

The FWI Facility houses 26 primary mechanical systems. They include but are not limited to: (a) various HVAC systems, (b) piping systems, and (c) plumbing and sterilization systems. The majority of the 26 systems are in average condition with seven in either good or excellent condition. On the lower end of the condition scale, there are four systems rated fair or poor. These systems are slated for attention in the next four years for an estimated total cost of $3.4M. All other mechanical systems are scheduled for replacement or major attention in the 25 out years. The three most costly items are; (1) replace ductwork and mixing boxes for $5.6M in 2018 and 2022, (2) replace heating & cooling piping systems for $4.5M in 2021 and, (3) replace direct digital controls for $2.8M in 2020.

In order to ensure continued mechanical performance from all the various systems, for the next 30 years, the following 5 and 25 year summarized expenditure are required;

First 5 years: $3.4M
Out 25 years: $30.7M

Note, please refer to the BCR's Executive Summary for further detailed information concerning the various mechanical systems.

Overview of Electrical Systems Condition

The Lab Building is the centre point of the electrical services to the FWI site. All systems begin from here and none of the other 4 buildings (Annex, Small Craft, WTP or Storage Warehouse) have standalone services. The building built in 1972, has had few major changes to the electrical infrastructure. On the power side, the Main Secondary Switchgear was replaced in 2002, one of the banks of Power Factor Correction capacitors has been replaced and several smaller Square D panels were added to facilitate the installation of mechanical equipment. However, all the other power equipment is original and now 41 years old and considered to be past its theoretical life expectancy.

The Generators are specifically vulnerable at this time because of their complexity, function and safety necessity.

The lighting of the building is in critical condition in that the majority is dependent on the availability of obsolete T12 lamps.

The low voltage systems, such as telecommunications, fire alarm, and access/security have been upgraded and modified to maintain operation and are operating satisfactorily. The telecommunications does not seem to have an integral approach to infrastructure and is separated by telephone with category 3 cable and data with category 5 cable.

All in all, the electrical distribution systems are considered to be in fair condition. Additional preventive maintenance, could extend life for 5 or maybe even 10 years but not without risk. At over 40 years, any system is vulnerable. Cleaning, retorquing and thermographic scanning of the electrical equipment would diminish the risk but not alleviate it.

It is presumed, electrical power is a priority for all normal, life/safety and critical systems. As a result, to ensure continued performance for the next 30 years, the following estimated 5 and 25 year summarized funding is required;

First 5 years: $2M
Following 25 years: $29.2M

Refer to the Executive Summary for further electrical overview information.

Compliance with Accessibility Standards

The current BCR scope of work did not include an accessibility audit. The facility is reasonably compliant with the accessibility standard, however a full accessibility audit is required.

Observed items in non-compliance include:
- Interior doors (general) - Missing lever handles,
- Washrooms - missing lever handles at faucet,
- Washrooms - accessories mounting heights (mirrors, grab bars, etc),
- Elevator interiors - handrail not provided,
- Elevator controls - not tactile, not illuminated and,
- Elevator call buttons - mounting height

Overview of Seismic Screening

According to Environment Canada's National Earthquake Database (NEDB), Winnipeg is located in a relatively inactive zone. In the last 27 years, only 3 quakes have been recorded, with the most recent being in 2005 having a measure of 1.4. During this time period, the highest magnitude was a 1.4, back in 2005. All three earthquakes have been over 100 kilometers away. These quakes have all been east of Winnipeg and near the Manitoba/Ontario border. As a result, it is reasonable to presume, the surrounding ground and supporting structural elements are stable and have been appropriately designed for the designated seismic zone.

Overview of Environmental Issues

A review of Environmental Due Diligence by PWGSC Environmental services resulted in a report dated January 2012. Several non compliance issues were listed and correction of these issues has been part of the 2012/2013 project plans.

Code Compliance Summary

In 2009, a Fire Protection Upgrade project was carried out to address outstanding deficiencies with respect to Fire Protection. The Upgrades were prioritized and selected in conjunction with HRSDC Fire Protection Engineering, based on the agreement with DFO Real Property Management that the main Lab building would be sprinklered in the near future. A sprinkler project was carried out to completion of construction documents only. The building remains unsprinklered.

The current BCR scope of work did not include a comprehensive code review. However, items which are identified as non-conforming with current codes and which are considered to represent health and safety concerns include:

PROPERTY
1) Inadequate pavement markings identifying accessible stalls.

ARCHITECTURAL
1) Handrail extensions required in stairwells.

MECHANICAL
No apparent issues.

ELECTRICAL
1) Remedial electrical work is required on various components. Refer to event "CF National Codes [04.2A-050 Cabling, Raceways & Bus Ducts]" for clarification.
2) Replace Exit Signs. Refer to event "CF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]" for further clarification.
3) Fire Alarm System requires Visual Signal Devices. Refer to event "CF National Codes [04.5A-010 Fire Alarm System]" for further clarification.

ELEVATOR
1) Non-compliant with accessibility standard. Refer to overview "Compliance with Accessibility Standards" for further information.

00. Property

00.1-010C04 Area Posts/Bollards

Details	Values
Expected Life	40
Component Cost	20,484
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	12
Measurement unit/ Metric	ea

Narratives

Component Description

Bollards are concrete filled steel pipe (150mm diameter), with rounded concrete cap. Bollards are painted yellow.

Component Condition & Anticipated Replacement Date

Bollards in average condition but require repainting in 2016. Full bollard replacement may be required in 20 years or 2033.

Assessment Criteria	Existence
Deterioration or damage to surfaces	
Default	Yes

Typical exterior steel/concrete bollard with marred/rusted finish and dull/faded colour.

RP Life Extension [00.1-010C04 Area Posts/Bollards]

Details	Values
Brief Description (40 Characters)	Repaint Bollards
Current event Year (YYYY)	2016
Estimated Event Cost	$3,414

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	2	Base Rate for Material and Labour	$859	EACH	$1,718
2	00. Property	2	Construction Contingency	$129	EACH	$258
3	00. Property	2	Average Total Project Soft Costs	$296	EACH	$592
4		2	LCF - Material & Labour	$283	EACH	$566
5		2	LCF - Contingency & Soft Costs	$140	EACH	$280
6		0	Quantity of 2 used for refurbishment.	$0	EACH	$0

Narratives

Event Description

Repaint all 12 bollards and every 6 years thereafter.

Event Justification & Strategy

Bollard repairs and painting will maintain appearance and function.

Implication of Event Deferral (Risks)

Event delay would have low risk but noticeability would be impacted.

RP Replacement [00.1-010C04 Area Posts/Bollards]

Details	Values
Brief Description (40 Characters)	Replace Bollards
Current event Year (YYYY)	2033
Estimated Event Cost	$20,484

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	12	Base Rate for Material and Labour	$859	EACH	$10,308
2	00. Property	12	Construction Contingency	$129	EACH	$1,548
3	00. Property	12	Average Total Project Soft Costs	$296	EACH	$3,552
4		12	LCF - Material & Labour	$283	EACH	$3,396
5		12	LCF - Contingency & Soft Costs	$140	EACH	$1,680

Narratives

Event Description

Replace all 12 bollards with similar units.

Event Justification & Strategy

Bollard replacement will ensure proper function and protection of wall assemblies.

Implication of Event Deferral (Risks)

Delaying bollard replacement may promote improper protection for adjacent walls and structures.

00.1-010C05 Concrete Wall

Details	Values
Expected Life	50
Component Cost	74,800
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	100
Measurement unit/ Metric	m2

Narratives

Component Description

There is a one metre high continuous concrete wall at the west edge of the east visitor parking lot. Wall is painted white with parking lot sign. Stall numbers and assignments painted on the wall.

Component Condition & Anticipated Replacement Date

Wall in average condition with repainting in 2016. Full replacement may be required in 2038.

Assessment Criteria	Existence
Wall surface defects	
Default	Yes

Painted Concrete wall at East Parking lot.

RP Life Extension [00.1-010C05 Concrete Wall]

Details	Values
Brief Description (40 Characters)	Repaint Concrete Wall
Current event Year (YYYY)	2016
Estimated Event Cost	$3,740

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	5	Base Rate for Material and Labour	$377	m²	$1,885
2	00. Property	5	Construction Contingency	$56	m²	$280

3	00. Property	5	Average Total Project Soft Costs	$130	m²	$650
4		5	LCF - Material & Labour	$124	m2	$620
5		5	LCF - Contingency & Soft Costs	$61	m2	$305
6		0	Quantity of 5 used for refurbishment only.	$0	EACH	$0

Narratives

Event Description

Repaint concrete wall and every 10 years thereafter.

Event Justification & Strategy

Maintain appearance.
Maintain function (painted stall assignments).

Implication of Event Deferral (Risks)

Event delay may impact parking assignments.

CP Replacement [00.1-010C05 Concrete Wall]

Details	Values
Brief Description (40 Characters)	Replace Concrete Wall
Current event Year (YYYY)	2038
Estimated Event Cost	$74,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	100	Base Rate for Material and Labour	$377	m²	$37,700
2	00. Property	100	Construction Contingency	$56	m²	$5,600
3	00. Property	100	Average Total Project Soft Costs	$130	m²	$13,000
4		100	LCF - Material & Labour	$124	m2	$12,400
5		100	LCF - Contingency & Soft Costs	$61	m2	$6,100

Narratives

Event Description

Replace exterior concrete wall. Make all surrounding areas good.

Event Justification & Strategy

Concrete wall replacement will promote proper function.

Implication of Event Deferral (Risks)

Event delay may see concrete wall deterioration.

Concrete wall in parking lot.

00.1-010C10 Fence & Gates

Details	Values
Expected Life	20
Component Cost	224,400
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	850
Measurement unit/ Metric	m2

Narratives

Component Description

Vehicle compound: 2.4 metre high chain link fence with 3 strand barb-wire on top. Accessed by 2 - 2.4m wide chain link swing gates.

Storage compound: 2.4 metre high chain link fence with 3 strand barb-wire on top. Accessed by 2 - 2.4m wide chain link swing gates from the vehicle compound.

Component Condition & Anticipated Replacement Date

Fence and gates in average condition. Hardware replacement is slated for 2018 and full replacement is scheduled for 2025.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Chain link fence with 3 strand barb wire.

RP Life Extension [00.1-010C10 Fence & Gates]

Details	Values
Brief Description (40 Characters)	Replace Fence Hardware & General Repairs
Current event Year (YYYY)	2018
Estimated Event Cost	$10,560

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	40	Base Rate for Material and Labour	$132	m²	$5,280
2	00. Property	40	Construction Contingency	$20	m²	$800
3	00. Property	40	Average Total Project Soft Costs	$46	m²	$1,840
4		40	LCF - Material & Labour	$44	m2	$1,760
5		40	LCF - Contingency & Soft Costs	$22	m2	$880
6		0	Quantity of 40 used for repairs only.	$0	EACH	$0

Narratives

Event Description

Replace vehicle gate hinges, hardware and reinforce gates. Straighten bent posts.

Event Justification & Strategy

Maintain security and ease of operation.

Implication of Event Deferral (Risks)

Not performing maintenance tasks may see the fencing being replaced before its expected service life.

Vehicles gates in distance.

CP Replacement [00.1-010C10 Fence & Gates]

Details	Values
Brief Description (40 Characters)	Replace Fence & Gates
Current event Year (YYYY)	2025
Estimated Event Cost	$224,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	850	Base Rate for Material and Labour	$132	m²	$112,200
2	00. Property	850	Construction Contingency	$20	m²	$17,000
3	00. Property	850	Average Total Project Soft Costs	$46	m²	$39,100
4		850	LCF - Material & Labour	$44	m2	$37,400
5		850	LCF - Contingency & Soft Costs	$22	m2	$18,700

Narratives

Event Description

Replace all fencing, gates and all related accessories.

Event Justification & Strategy

Fencing and gate replacement will ensure security for both compounds.

Implication of Event Deferral (Risks)

Delaying this event may promote damaged and failed fencing and a poor appearance.

00.1-010C11 Flagpole

Details	Values
Expected Life	25
Component Cost	4,334
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

One - 40' (12m) high anodized aluminum flagpole, with a fixed shoe base mounted on a concrete pile. Flagpole has an internal halyard.

Component Condition & Anticipated Replacement Date

Overall flagpole condition is considered fair. Replacement may be warranted in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Aluminum flagpole with external halyard.

RP Replacement [00.1-010C11 Flagpole]

Details	Values
Brief Description (40 Characters)	Replace Flagpole
Current event Year (YYYY)	2018
Estimated Event Cost	$4,334

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	1	Base Rate for Material and Labour	$2,180	EACH	$2,180
2	00. Property	1	Construction Contingency	$327	EACH	$327
3	00. Property	1	Average Total Project Soft Costs	$752	EACH	$752
4		1	LCF - Material & Labour	$719	EACH	$719
5		1	LCF - Contingency & Soft Costs	$356	EACH	$356

Narratives

Event Description

Replace flagpole assembly.

Event Justification & Strategy

Flagpole assembly will have reached the end of its service life.

Implication of Event Deferral (Risks)

Event deferral may promote a poor functioning flagpole if damage is an issue.

00.1-010C20 Concrete Planters

Details	Values
Expected Life	25
Component Cost	6,933
Last Major Action Year	2008
Component Condition (For BCR use only)	Good
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

There are three precast concrete circular planters approximately 1m in height x 1.5m diameter located on front entry plaza. Planters were purchased in 2008.

Component Condition & Anticipated Replacement Date

Planters are considered in good condition. Replacement may be warranted in 2033.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report

Concrete planters at main entrance.

RP Replacement [00.1-010C20 Concrete Planters]

Details	Values
Brief Description (40 Characters)	Replace Concrete Planters
Current event Year (YYYY)	2033
Estimated Event Cost	$6,933

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	3	Base Rate for Material and Labour	$1,163	EACH	$3,489
2	00. Property	3	Construction Contingency	$174	EACH	$522
3	00. Property	3	Average Total Project Soft Costs	$401	EACH	$1,203
4		3	LCF - Material & Labour	$383	EACH	$1,149
5		3	LCF - Contingency & Soft Costs	$190	EACH	$570

Narratives

Event Description

Replace all three precast concrete planters with update units.

Event Justification & Strategy

By 2033, the concrete planters will have reached their expected service life.

Implication of Event Deferral (Risks)

Event delay may promote planter deterioration and a poor appearance.

00.1-020C20 Handrails and Railings-Site Related

Details	Values
Expected Life	15
Component Cost	9,525
Last Major Action Year	2007
Component Condition (For BCR use only)	Average
Quantity	25
Measurement unit/ Metric	m

Narratives

Component Description

Front Plaza: Stainless steel handrails installed at ramp and stairs in 2007 (plaza upgrade project). Exterior stairs at south exit stair has painted steel pipe handrails.

Component Condition & Anticipated Replacement Date

Stainless steel handrails showing signs of surface deterioration. Both handrail types are considered in average condition and replacement may be warranted in 2023.

Assessment Criteria	Existence
Minor surface deterioration	
Default	Yes

Entry Stairs and handrails.

RP Replacement [00.1-020C20 Handrails and Railings-Site Related]

Details	Values
Brief Description (40 Characters)	Replace Exterior Handrails
Current event Year (YYYY)	2023
Estimated Event Cost	$9,525

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	25	Base Rate for Material and Labour	$192	m	$4,800
2	00. Property	25	Construction Contingency	$29	m	$725
3	00. Property	25	Average Total Project Soft Costs	$66	m	$1,650
4		25	LCF - Material & Labour	$63	m	$1,575
5		25	LCF - Contingency & Soft Costs	$31	m	$775

Narratives

Event Description

Replace all site related handrails. If applicable, replacement units should be stainless steel assemblies.

Event Justification & Strategy

By the indicated time, the exterior handrails will have served their expected life.

Implication of Event Deferral (Risks)

Event deferral may promote damaged and unsafe handrail usage during normal and emergency situations.

00.1-020C30 Ramps-Site Related

Details	Values
Expected Life	20
Component Cost	10,500
Last Major Action Year	2008
Component Condition (For BCR use only)	Good
Quantity	20
Measurement unit/ Metric	m2

Narratives

Component Description

Front Plaza: 8m long (25') ramp located on south side of entry plaza. The ramp is located between the existing building and a 900mm concrete wall. Unit paving stones were installed on the ramp and handrails replaced as part of the 2008 plaza upgrade project.

Component Condition & Anticipated Replacement Date

Overall, ramp and associated handrails are sound and considered in good condition. Replacement is scheduled for 2028.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Ramp at Main entry.

RP Replacement [00.1-020C30 Ramps-Site Related]

Details	Values
Brief Description (40 Characters)	Replace Ramp and Handrails
Current event Year (YYYY)	2028
Estimated Event Cost	$10,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	20	Base Rate for Material and Labour	$264	m²	$5,280
2	00. Property	20	Construction Contingency	$40	m²	$800
3	00. Property	20	Average Total Project Soft Costs	$91	m²	$1,820
4		20	LCF - Material & Labour	$87	m2	$1,740
5		20	LCF - Contingency & Soft Costs	$43	m2	$860

Narratives

Event Description

Replace ramp and all related components.

Event Justification & Strategy

Ramp deterioration may be significant in 2028 and replacement will be warranted.

Implication of Event Deferral (Risks)

Delaying this event may promote an unsafe walking surface. Tripping hazards may become issues.

00.1-020C40 Stairs-Site Related

Details	Values
Expected Life	25
Component Cost	21,384
Last Major Action Year	2008
Component Condition (For BCR use only)	Good
Quantity	22
Measurement unit/ Metric	m2

Narratives

Component Description

Front Plaza: Concrete stairs with aluminum nosings. Stairs were reconstructed in 2008 (plaza upgrade project).

Grounds: South of Lab block. Two flights of 7 risers at concrete sidewalk.

Component Condition & Anticipated Replacement Date

Front Plaza: Concrete Stairs with aluminum nosings. Stairs were reconstructed in 2008 (plaza upgrade project) - good condition.

Grounds: South of Lab block. Two flights of 7 risers at concrete sidewalk - good condition.

Both site related stair locations may require replacement in 2033.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Exterior Stairs - South of building.

RP Replacement [00.1-020C40 Stairs-Site Related]

Details	Values
Brief Description (40 Characters)	Replace Site Related Stairs & Railings
Current event Year (YYYY)	2033
Estimated Event Cost	$21,384

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	22	Base Rate for Material and Labour	$489	m²	$10,758
2	00. Property	22	Construction Contingency	$73	m²	$1,606
3	00. Property	22	Average Total Project Soft Costs	$169	m²	$3,718
4		22	LCF - Material & Labour	$161	m2	$3,542
5		22	LCF - Contingency & Soft Costs	$80	m2	$1,760

Narratives

Event Description

Replace nosings, provide / modify handrails and patch concrete.

Event Justification & Strategy

By 2033, stairs may have deteriorated and safety may be an issue.

Implication of Event Deferral (Risks)

Event delay may promote stair deterioration for safe usage.

Main entry stair - 5 risers, stainless steel handrails. Constructed 2008.

00.1A-055 Freestanding Signage

Details	Values
Expected Life	15
Component Cost	6,056
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	4
Measurement unit/ Metric	m2

Narratives

Component Description

There is a 3m wide x 1m high signage (as per federal identity building signage) secured to a 5m wide x 1m high freestanding concrete structure mounted on 2 concrete posts. Signage lettering is vinyl letters applied to sign board.

Component Condition & Anticipated Replacement Date

Current exterior signage has scrapes, nicks and is fading. Replacement is scheduled for 2015.

Assessment Criteria	Existence
Physical damage	
Default	Yes
Surface fading	
Default	Yes

Freestanding Building Signage. Signage worn, missing information.

RP Replacement [00.1A-055 Freestanding Signage]

Details	Values
Brief Description (40 Characters)	Replace Exterior Signage
Current event Year (YYYY)	2015
Estimated Event Cost	$6,056

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		2	Base Rate Material & Labour	$1,525	EACH	$3,050
2		2	Construction Contingency	$229	EACH	$458

3	2	Project Soft Costs	$526	EACH	$1,052
4	2	LCF - Material & Labour	$503	EACH	$1,006
5	2	LCF - Contingency & Soft Costs	$245	EACH	$490

Narratives

Event Description

Replace freestanding signage on property near main entrance. The costing does not include replacing the supporting concrete structure. There is no AVS costing for signage. Used RSMeans Commercial Renovation Cost Data 2012.

Event Justification & Strategy

Conform with current Federal Identity Program.

Implication of Event Deferral (Risks)

Delaying this task may promote improper facility identification.

00.1A-065 Soft Landscaping

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	9,850
Measurement unit/ Metric	m2

Narratives

Component Description

North site area:
: Grassed area
: Large berm on north side, with memorial garden built into south side of berm
: Sunken area at cafeteria entrance
: 10-15 mature coniferous and deciduous trees

South site area:
: Grassed area, generally flat
: 2-3 mature trees

East site area:
: Approximately 30 shrubs in 3m wide continuous strip beside east parking (visitor parking)

South courtyard (between Administration wing and Lab wing)
: Approximately 5 mature trees

North courtyard (between Administration wing and Lab wing)
: no trees

Component Condition & Anticipated Replacement Date

North site area: Poor condition - Damage from underground utility work carried out by University of Manitoba in recent years.

South site area: Good condition - Planting bed at south wall of Administration Block - exposed weed barrier fabric, planter requires regrading and cleanup.

East site area: Good condition.

South courtyard (between Administration wing and Lab wing): Good condition.

North courtyard (between Administration wing and Lab wing): Grass in poor condition, courtyard receives no sunlight.

General: The grade level has sunken at the building perimeter, most notably at exit stairs. This condition will result in foundation leakage if left as is. Planting beds in general, in fair condition and require general maintenance, trimming etc. All noted soft landscaping maintenance deficiencies should be addressed in 2014.

Assessment Criteria	Existence
Inadequate surface drainage	
Default	Yes
Uneven ground settlement	
Default	Yes

Grounds at Southeast area of site. Three metre high grass berm.

CF Deferred Maintenance [00.1A-065 Soft Landscaping]

Details	Values
Brief Description (40 Characters)	Soft Landscaping - Maintenance
Current event Year (YYYY)	2014
Estimated Event Cost	$78,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	1200	Base Rate for Material and Labour	$33	m²	$39,600
2	00. Property	1200	Construction Contingency	$5	m²	$6,000
3	00. Property	1200	Average Total Project Soft Costs	$11	m²	$13,200

4	1200	LCF - Material & Labour	$11	m2	$13,200
5	1200	LCF - Contingency & Soft Costs	$5	m2	$6,000
6	0	Quantity of 1200 used for maintenance only.	$0	EACH	$0

Narratives

Event Description

General Maintenance on planting beds, trimming, removing excess vegetation and filling beds with topsoil. Buildup grade at exterior wall and base of exit stairs. Regrade and re-sod damaged areas of North site.

Event Justification & Strategy

Event justification included;

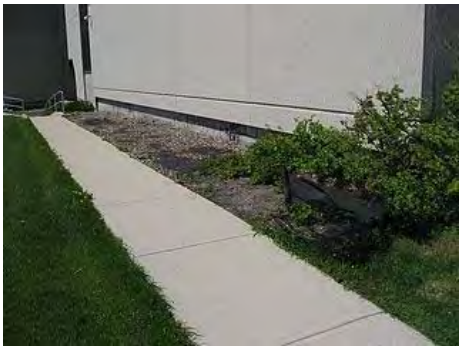
- Maintain appearance.
- Provide positive drainage away from building.
- Maintain building appearance.

Implication of Event Deferral (Risks)

Event delay would promote a diminished appearance, possible foundation leakage and diminished building appearance. Uneven surface would cause tripping hazards. Unwanted weed growth may be an issue.

Settlement of Grade at Exterior wall.

Vehicle damage in unpaved parking area.



Exposed weed barrier, lack of plantings in Planting Bed at South wall of Administration block.

00.2-014C01 Bituminous Walkway & Areaways

Details	Values
Expected Life	22
Component Cost	35,400
Last Major Action Year	1972
Component Condition (For BCR use only)	Poor
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

There is a 3m wide asphalt walkway along west side of east parking lot.

Component Condition & Anticipated Replacement Date

Current walkway is in poor condition. Surface is deteriorated. Replacement should take place in 2015.

Assessment Criteria	Existence
Loss of asphalt binder material	
Default	Yes
Surface cracking or spalling	
Default	Yes
Uneven surface profile	
Default	Yes
Vegetation damage	
Default	Yes

Asphalt walkway showing moderate cracking and uneven surface.

CP Replacement [00.2-014C01 Bituminous Walkway & Areaways]

Details	Values
Brief Description (40 Characters)	Install New Paving Stone Walkway
Current event Year (YYYY)	2015
Estimated Event Cost	$35,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	150	Base Rate for Material and Labour	$119	m²	$17,850
2	00. Property	150	Construction Contingency	$18	m²	$2,700
3	00. Property	150	Average Total Project Soft Costs	$41	m²	$6,150
4		150	LCF - Material & Labour	$39	m2	$5,850
5		150	LCF - Contingency & Soft Costs	$19	m2	$2,850

Narratives

Event Description

Replace asphalt sidewalk with paving stones to match front entry plaza.

Event Justification & Strategy

Walkway replacement would reduce tripping hazards and improve appearance.

Implication of Event Deferral (Risks)

Event delay would promote tripping hazards and diminished appearance.

00.2-014C02 Concrete Walkway & Areaways

Details	Values
Expected Life	25
Component Cost	39,600
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

1) 1.5m wide concrete sidewalk extending along south side of main Lab/Administration building.
2) 2m wide asphalt concrete sidewalk at west edge of east (visitor) parking lot.

Component Condition & Anticipated Replacement Date

These concrete walkways are in good condition. Another 20 service years is granted. Replacement scheduled for 2033.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Concrete sidewalk at south side of Administration Block.

CP Replacement [00.2-014C02 Concrete Walkway & Areaways]

Details	Values
Brief Description (40 Characters)	Replace Concrete Walkways
Current event Year (YYYY)	2033
Estimated Event Cost	$39,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	150	Base Rate for Material and Labour	$132	m²	$19,800
2	00. Property	150	Construction Contingency	$20	m²	$3,000
3	00. Property	150	Average Total Project Soft Costs	$46	m²	$6,900
4		150	LCF - Material & Labour	$44	m2	$6,600
5		150	LCF - Contingency & Soft Costs	$22	m2	$3,300

Narratives

Event Description

Replace the following concrete walkways;

1) 1.5m wide concrete sidewalk extending along south side of main Lab/Administration building.
2) 2m wide asphalt concrete sidewalk at west edge of east (visitor) parking lot.

Event Justification & Strategy

Walkway replacement would reduce tripping hazards and improve appearance.

Implication of Event Deferral (Risks)

Event delay would promote tripping hazards and diminished appearance.

00.2-014C02 Concrete Walkway & Areaways - Curbing

Details	Values
Expected Life	12
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Poor
Quantity	600
Measurement unit/ Metric	m

Narratives

Component Description

There is a concrete curb at perimeter of paved parking lot and edge of building.

Component Condition & Anticipated Replacement Date

Current condition is poor and replacement should be scheduled for 2017.

Assessment Criteria	Existence
Surface cracking or spalling	
Default	Yes

Damaged concrete curb (typical).

RP Life Extension [00.1-010C15 Concrete Curbing]

Details	Values
Brief Description (40 Characters)	Repair & Replace Damaged Curbing
Current event Year (YYYY)	2017
Estimated Event Cost	$15,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	60	Base Rate for Material and Labour	$132	m²	$7,920
2	00. Property	60	Construction Contingency	$20	m²	$1,200
3	00. Property	60	Average Total Project Soft Costs	$46	m²	$2,760
4		60	LCF - Material & Labour	$44	m2	$2,640
5		60	LCF - Contingency & Soft Costs	$22	m2	$1,320
6		0	Quantity of 60 used for curbing only.	$0	EACH	$0

Narratives

Event Description

Repair and/or replace damaged curbing where required.

Event Justification & Strategy

Walkway replacement would reduce tripping hazards and improve appearance.

Implication of Event Deferral (Risks)

Event delay would promote tripping hazards and diminished appearance.

Damaged concrete walkway in parking lot.

00.2-014C03 Walkway Pavers & Areaways

Details	Values
Expected Life	25
Component Cost	6,600
Last Major Action Year	2008
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Main entry plaza: Unit paving stones (installed approximately 2008).

Walkway along south side of Annex building: precast concrete pavers.

Component Condition & Anticipated Replacement Date

Main entry plaza: Unit paving stones: Good condition.

Walkway along south side of Annex building: Precast concrete pavers in good condition. However, a paved walkway is recommended for serviceability and safety. This event is scheduled for 2015.

Assessment Criteria	Existence
Local settlement	
Default	Yes
Tripping hazard	
Default	Yes
Uneven surface profile	
Default	Yes

Precast concrete paver walkway (to overflow parking).

RP Replacement [00.2-014C03 Walkway Pavers & Areaways]

Details	Values
Brief Description (40 Characters)	Install New Concrete Sidewalk - Annex Bldg. - South
Current event Year (YYYY)	2015
Estimated Event Cost	$6,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	25	Base Rate for Material and Labour	$132	m²	$3,300
2	00. Property	25	Construction Contingency	$20	m²	$500
3	00. Property	25	Average Total Project Soft Costs	$46	m²	$1,150
4		25	LCF - Material & Labour	$44	m2	$1,100
5		25	LCF - Contingency & Soft Costs	$22	m2	$550

Narratives

Event Description

Replace concrete pavers with new concrete sidewalk at south side of Annex Building.

Event Justification & Strategy

Reduced maintenance, improved appearance an improved safety conditions.

Implication of Event Deferral (Risks)

Event deferral would promote increased maintenance, reduced appearance and tripping hazards.

00.2A-010 Paved Parking Lots

Details	Values
Expected Life	20
Component Cost	1,325,500
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	13,255
Measurement unit/ Metric	m2

Narratives

Component Description

Asphalt surface with concrete curbs:
Area 1: East (visitor) Parking Lot: approximately 15 stalls (diagonal parking). The construction of this area is 150mm of Portland cement concrete over 200mm of granular base. Area: 1060m2.

Area 2: South staff parking (east of water treatment addition) approximately 130 stalls straight parking. The construction of this area is 50mm of asphalt concrete pavement over 225mm of granular base. Area: 5100m2.

Area 3: Not Used

Area 4: Access road and pavement at Solar warehouse, construction unknown. Area: 1500m2.

Area 5: Access road between Small Craft Harbour and Main Building. The construction of this pavement was originally 75mm of asphalt concrete pavement over 300mm of granular base, however the construction of the present pavement is unknown. Area: 125m2.

Area 6: Marine Storage Lot including fleet parking lot. Construction unknown but likely 50mm of asphalt concrete pavement over 225mm of granular base. Area: 2700m2.

Area 7: Access Road between Small Craft Harbour and Annex Building. The construction of this area is 75mm of asphalt concrete pavement over 300mm of granular base. Area: 750m2.

Area 8: West Staff Parking lot (between Annex and main building) approximately 35 stalls (straight parking). The construction of this area is 75mm of asphalt concrete pavement over 300mm of granular base. Area: 2020m2.

The construction of the various pavements varies from 50 to 75mm of asphalt concrete to 150mm of Portland cement concrete over 200 to 300mm of granular base.

Component Condition & Anticipated Replacement Date

Asphalt surface with concrete curbs:
Area 1: East (visitor) Parking Lot: Approximately 15 stalls (diagonal parking). The pavement is in generally good condition and contains only minor slab cracking with the exception of two slabs located at the north end of the parking area. These slabs have some fairly significant cracking as a result of the movement of the manholes which are contained within the area of the slabs. The majority of the joints are also in good to very good condition and the joint sealant shows little sign of adhesion failure. There are a few joints that have widened due to slab movement and the sealant has failed. There is some minor snow plowing damage to the curbs in this area, but nothing that requires immediate attention. Drainage of the surface is good and there are no significant areas of water ponding.

Area 2: South staff parking, approximately 130 stalls straight parking:
The pavement is in generally fair to good condition with no significant areas of failure or fatigue. There is a small area of pavement adjacent to the building, which appears to have been damaged by a large refuse container which was placed there temporarily during a recent roofing repair contract. Most of the major longitudinal and transverse cracks have secondary cracking adjacent to them and in most cases have some settlement associated with the crack. The significant portion of the area is frost heaved and/or settled, however the only area of concern is around the storm drainage manhole in the southeast corner. The depression around the manhole results in some minor water ponding, however it is located in the aisle and does not inconvenience employees parking in the area.

The area is divided by concrete medians which are constructed of 200mm of Portland cement concrete over 150mm of granular base. These medians are in good condition although they have some minor snowplow damage and show signs of surface spalling due to the action of road salt. Neither of these problems requires immediate attention, however an action plan should be put in place to deal with the continued deterioration. The concrete mountable curb along the south edge of the parking area is in good condition and is not of concern at this time. Surface drainage of the area is good and with the exception of the ponding around the manhole in the southeast corner, there is no significant drainage problems. A sizable crack has developed in the pavement directly over the steam line, and in the area southeast of the workshop the pavement has heaved up significantly.

As with are #1, the longitudinal and transverse cracks have secondary cracks and are depressed. The area has a substantial amount of frost heaving and subgrade settlement, however no areas are significant enough to effect operations. The concrete medians which divide the area are in good condition with some minor snowplow damage and surface spalling. The concrete mountable curb along the south edge of the parking area is in good condition and does not represent a concern at this time. Surface drainage is good and there are no significant water ponding.

Area 3: Not used

Area 4: Access road to Solar warehouse:
The pavement is in very poor condition and contains significant areas of failure and/or fatigue. There are numerous areas where the pavement is severely damaged due to a combination of overloading and poor construction.

Area 5: Access road between Small Craft Harbour and Main Building:
The pavement is in fair to poor condition and there are several small areas where the asphalt pavement has failed completely. The asphalt concrete surface has spalled, leaving only the granular base material, and in some cases a significant pothole. The area has heaved and settled above and around the underground tank location, but at the time of inspection this was not a significant problem.

Area 6: Marine Storage Lot including fleet parking lot:
The pavement is in generally fair to good condition with no significant areas of failure or fatigue. As with the other asphalt pavements, most of the area is either frost heaved or settled to some degree, however the only significant movements are small and localized. The longitudinal and transverse cracks have minor secondary cracking and some of the wider cracks have vegetation growing along them. The area appears to be relatively flat, however surface drainage is good and there are no distinguishable ponding areas.

Area 7: Access Road between Small Craft Harbour and Annex Building:
The pavement is in good condition with only minor longitudinal and transverse cracking. Most of the area has some minor frost heaving and/or subgrade settlement and there is a small area by the refuse container that has been rutted due to heavy loading of the trucks front wheels. Concrete curbing around the area is in good condition with only minor snowplow damage. Surface drainage on the paved area is good, however there is a drainage problem southwest of the paved area which effects the gravel road surface at this location. This drainage problem will be addressed under the gravel road area to follow.

Area 8: West Staff Parking lot (between Annex and main building) approximately 35 stalls (straight parking):
The major longitudinal and transverse cracks have secondary cracking and have settled to varying degrees. The repaved area over the tunnel has cracking parallel to the underlying tunnel, however this cracking is not significant at this time. Concrete curbing around the area is in good condition with only minor snowplow damage. Surface drainage of the area is good and there are no notable low lying areas of water ponding.

Anticipated Replacement Dates:
All pavements (except Area 1 East Parking Lot): 2020
Area 1 East Parking Lot): 2040

Assessment Criteria	Existence
Damaged or deteriorated furnishings, line painting, curbs, block heaters etc.	
Default	Yes
Loss of asphalt binder material	
Default	Yes
Major surface deterioration	
Default	Yes
Visible settling or uplift	
Default	Yes

Deteriorated pavement - access road approaching solar warehouse.

CP Replacement [00.2A-010 Paved Parking Lots]

Details	Values
Brief Description (40 Characters)	Reconstruct Parking Lots
Current event Year (YYYY)	2020
Estimated Event Cost	$1,219,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	12195	Base Rate for Material and Labour	$50	m²	$609,750
2	00. Property	12195	Construction Contingency	$8	m²	$97,560
3	00. Property	12195	Average Total Project Soft Costs	$17	m²	$207,315
4		12195	LCF - Material & Labour	$17	m2	$207,315
5		12195	LCF - Contingency & Soft Costs	$8	m2	$97,560

Narratives

Event Description

Reconstruct parking lots and access roads (other than Area 1 East Visitor Lot).

Event Justification & Strategy

Repaving at end of service life, due to deterioration, is warranted.

Implication of Event Deferral (Risks)

Delaying this event would promote safety concerns, diminished appearance and maintenance problems.

CP Replacement [00.2A-010 Paved Parking Lots] - Area 1

Details	Values
Brief Description (40 Characters)	Replace Paved Parking - Area 1
Current event Year (YYYY)	2040
Estimated Event Cost	$106,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	1060	Base Rate for Material and Labour	$50	m²	$53,000
2	00. Property	1060	Construction Contingency	$8	m²	$8,480
3	00. Property	1060	Average Total Project Soft Costs	$17	m²	$18,020
4		1060	LCF - Material & Labour	$17	m2	$18,020
5		1060	LCF - Contingency & Soft Costs	$8	m2	$8,480

Narratives

Event Description

Replace paved parking lot designated as Area 1.

Event Justification & Strategy

Repaving at end of service life, due to deterioration, is warranted.

Implication of Event Deferral (Risks)

Event deferral would see increased maintenance and poor roadway conditions for vehicles and foot traffic.

00.2A-015 Pavement Marking

Details	Values
Expected Life	5
Component Cost	13,063
Last Major Action Year	2007
Component Condition (For BCR use only)	Fair
Quantity	14,355
Measurement unit/ Metric	m2

Narratives

Component Description

Pavement marking is yellow paint.

1) West Staff parking Lot (between Annex and main building) approximately 35 stalls.
2) South Parking Lot: approximately 135 stalls.
3) East Parking Lot (Visitors): approximately 15 stalls.
4) Fleet Vehicle Parking Lot (west of Small Craft harbour building): approximately 20 stalls.

Component Condition & Anticipated Replacement Date

Pavement markings in fair condition. Repaint every 5 years starting in 2015.

Assessment Criteria	Existence
Deterioration of line markings	
Default	Yes
Fading Colours	
Default	Yes

South Parking Area. Faded pavement markings.

RP Replacement [00.2A-015 Pavement Marking]

Details	Values
Brief Description (40 Characters)	Repaint Pavement Markings
Current event Year (YYYY)	2015
Estimated Event Cost	$13,063

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		14355	Base Rate Material & Labour	$0.46	m2	$6,603
2		14355	Construction Contingency	$0.07	m2	$1,005
3		14355	Project Soft Costs	$0.16	m2	$2,297
4		14355	LCF - Material & Labour	$0.15	m2	$2,153
5		14355	LCF - Contingency & Soft Costs	$0.07	m2	$1,005

Narratives

Event Description

Repaint pavement markings in all parking areas. There is no AVS costing. Used RSMeans 2012 Facilities Maintenance & Repair Cost Data.

Event Justification & Strategy

Cyclical pavement marking painting will promote proper parking lot management.

Implication of Event Deferral (Risks)

Event delay would promote poor parking assignments and improper parking for all.

Faded and worn parking stall markings in parking lot - typical.

00.3A-010 Unpaved Parking Lots

Details	Values
Expected Life	10
Component Cost	110,000
Last Major Action Year	1972
Component Condition (For BCR use only)	Poor
Quantity	1,100
Measurement unit/ Metric	m2

Narratives

Component Description

Overflow and Student Parking (west of Annex building): approximately 30 stalls. The Building Management Report 2012/13 recommends paving this lot and providing lighting. The report indicates staff injuries have occurred at this gravel parking lot.

Component Condition & Anticipated Replacement Date

Poor condition would suggest some areas are structurally insufficient for the traffic using the area. In addition, the drainage of the road and parking south of area 7 is very poor. The area collects and holds much of the runoff from the paved and grassed areas south of the Annex Building. This results in saturated subgrade conditions and exacerbates the problem. Recommend to pave area in 2020.

Assessment Criteria	Existence
Local settlement	
Default	Yes
Potholes	
Default	Yes
Surface ponding	
Default	Yes
Uneven surface profile	
Default	Yes

West Parking (overflow) Student Area.

CP Replacement [00.3A-010 Unpaved Parking Lots]

Details	Values
Brief Description (40 Characters)	Install New Pavement Structure
Current event Year (YYYY)	2020
Estimated Event Cost	$110,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	1100	Base Rate for Material and Labour	$50	m²	$55,000
2	00. Property	1100	Construction Contingency	$8	m²	$8,800
3	00. Property	1100	Average Total Project Soft Costs	$17	m²	$18,700
4		1100	LCF - Material & Labour	$17	m2	$18,700
5		1100	LCF - Contingency & Soft Costs	$8	m2	$8,800

Narratives

Event Description

Replace granular lot with pavement structure and exterior lighting.

Event Justification & Strategy

Improved safety, match pavement structure of other parking lots.

Implication of Event Deferral (Risks)

Event delay would promote poor surface parking conditions and uneven ground for foot traffic. Injuries may be an issue.

01. Architectural & Structural

01.1A-010 Footings & Foundations

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	4,150
Measurement unit/ Metric	m2

Narratives

Component Description

Lab block:
At perimeter wall 400mm diameter x 16m (55') long concrete piles single or grouped in twos, threes or fours at 3.6m o.c. Note, in addition there are two 6-pile groupings. Both occur along the north-south gridline C-D (one north wall and one south wall). Internal columns: 400mm diameter x 16m (55') long concrete piles single or grouped in twos, threes or fours at 7.2m o.c.

Administration block:
400mm diameter x 16m (55') long concrete piles (typically grouped in twos) at 3.6m o.c.

Note: All pile caps are 2'-6" (762mm) deep.

Component Condition & Anticipated Replacement Date

Average Condition. Replacement is not for another 50 years and no event is included.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.1A-011 Basement Walls

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1,600
Measurement unit/ Metric	m2

Narratives

Component Description

All basement exterior walls are reinforced concrete and 305mm (12") thick.

Component Condition & Anticipated Replacement Date

Walls are currently in average condition. Since another 50 service years are probable, no replacement event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-010C05 Frame - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	10,000
Measurement unit/ Metric	m2

Narratives

Component Description

Administration Block:
Structure framing is reinforced concrete. Column range in size from 305mm x 305mm (12"x12") to 305mm x 500mm (12"x20"). Typical size is 305mm x 410mm (12"x16").

Lab. Block:
Structure framing is reinforced concrete. Column range in size from 305mm x 305mm (12"x12") to 500mm x 500mm (20"x20"). Typical size is 305mm x 410mm (12"x16").

Component Condition & Anticipated Replacement Date

Concrete frame is currently in average condition. Since another 50 service years are probable, no replacement event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-020C10 Structural Slab - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	7,900
Measurement unit/ Metric	m2

Narratives

Component Description

Basement slab:
Lab Block: 38mm (1.5") concrete topping on 150mm (6") structural slab.
Service Block: 200mm (8") thick structural slab.

Loading Dock Slab: 200mm (8") thick structural slab.

Component Condition & Anticipated Replacement Date

Basement slab:
Lab Block: Average condition
Service Block: Average condition
Replacement is not anticipated for another 50 years, no event is included.

Loading Dock Slab: Poor condition - major deterioration. Recommend a structural study in 2014.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Loading dock slab: Excessive cracking and spalling.

RF Design Problems and Deficiencies [01.2-020C10 Structural Slab - Concrete]

Details	Values
Brief Description (40 Characters)	Consultant Study - Loading Bay Slab
Current event Year (YYYY)	2014
Estimated Event Cost	$7,695

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	45	Base Rate for Material and Labour	$86	m²	$3,870
2	01. Architectural & Structural	45	Construction Contingency	$13	m²	$585
3	01. Architectural & Structural	45	Average Total Project Soft Costs	$30	m²	$1,350
4		45	LCF - Material & Labour	$28	m2	$1,260
5		45	LCF - Contingency & Soft Costs	$14	m2	$630
6		0	Quantity of 45 used for Consultant Study only.	$0	EACH	$0

Narratives

Event Description

Implement Consultant study to assess deterioration of loading dock slab and make recommendations.

Event Justification & Strategy

Slab requires repairs to correct current tripping hazards.

Implication of Event Deferral (Risks)

Event delay would promote potential tripping hazards.

01.2-030C05 Slab above Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	7,900
Measurement unit/ Metric	m2

Narratives

Component Description

Administration Block:
225mm (9") concrete slab with 2.5mx 2.5m x 110mm deep drop panels

Lab Block:
150mm (6") concrete slab (on concrete beams at 600mm (2') o.c. at labs only).
150mm (6") concrete slab at offices and corridors.

Component Condition & Anticipated Replacement Date

Above grade slabs are considered in average condition. Another 50 years are anticipated before replacement. No event is offered.

A structural floor was constructed at the northwest corner of the service block (date unknown and currently used as a Second Floor Storage room (above NAAHP lab). The floor is a concrete slab; there are visible cracks that run in a north / south direction. Cracks are not wide, however the length and regularity of the cracks warrant monthly visual monitoring starting in 2013.

Assessment Criteria	Existence
Settlement or movement cracks	
Default	Yes

RF Design Problems and Deficiencies [01.2-030C05 Slab above Grade - Concrete]

Details	Values
Brief Description (40 Characters)	Visually Monitor 2nd Floor Slab - Monthly
Current event Year (YYYY)	2013
Estimated Event Cost	$0

Narratives

Event Description

Visually monitor the size of cracks in floor slab in 2nd floor general storage room. No cost is associated with this event.

Event Justification & Strategy

Scheduled slab monitoring will identify structural deficiency in early stage.

Implication of Event Deferral (Risks)

Not monitoring the slab cracks as scheduled would have low risk. Slab monitoring could be flexible.

Hairline cracking in concrete slab (storage room).

01.2-040C05 Roof Structure - Concrete Joist + Concrete Deck

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	7,900
Measurement unit/ Metric	m2

Narratives

Component Description

Administration Block:
225mm (9") concrete slab with 2.5mx 2.5m x 110mm deep drop panels.

Lab Block:
125mm (5") concrete slab supported by concrete beams at 3.6m (12') o.c.

Component Condition & Anticipated Replacement Date

Roof structure is considered in average condition and should provide another 50 service years. As a result, no event is offered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-050C15 Exterior Stairs

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Poor
Quantity	7
Measurement unit/ Metric	flts

Narratives

Component Description

The following stairs are located immediately outside of building entrances. For stairs located on the grounds, refer to report section "00.1-020C40 Stairs - Site Related".

All stairs approximately 1.2m wide except as noted;

Administration Main Entry (facing east): 1 flight concrete stair (5 risers) 3.6m wide.

Administration Seminar room (facing courtyard): 1 flight concrete stair (11 risers).

Lab Block Exit stair (facing south): 2 flights concrete stairs (6 risers each).

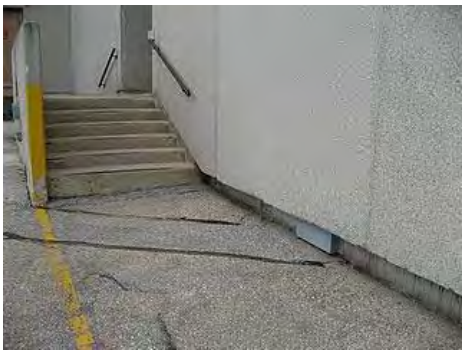
Lab Block Exit stair (facing north): 2 flights concrete stairs (6 risers each).

Lab Block Main Entry (facing west): 1 flight concrete stair (8 risers).

Component Condition & Anticipated Replacement Date

All stairs have varying deficiencies from spalled concrete to missing handrails. Overall condition is considered poor. All issues should be corrected in 2014.

Assessment Criteria	Existence
Handrail missing, damaged or deteriorated	
Default	Yes
Hazardous conditions	
Default	Yes
Major surface deterioration	
Default	Yes



Lab Block, South Exit Exterior Landing and Stair. Concrete repairs and nosings required. First tread exceeds allowable height.

RP Life Extension [01.2-050C15 Exterior Stairs]

Details	Values
Brief Description (40 Characters)	Replace Nosings & Concrete Repairs
Current event Year (YYYY)	2014
Estimated Event Cost	$19,286

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$5,285	Flts	$10,570
2	01. Architectural & Structural	2	Construction Contingency	$793	Flts	$1,586
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$1,823	Flts	$3,646
4		2	LCF - Material & Labour	$1,742	Flts	$3,484
5		2	LCF - Contingency & Soft Costs	$0	Flts	$0
6		0	Quantity of 2 used for appropriate Material & Labour tender costing.	$0	EACH	$0

Narratives

Event Description

Conduct concrete patching and replace nosings of all exterior stairs.

Event Justification & Strategy

Exterior stair repairs are required for safety.

Implication of Event Deferral (Risks)

Event delay would promote unsafe conditions for use.

Exterior stair at south exit stair from Lab block. Deteriorated concrete and handrails non-compliant with NBC.

Missing handrail. Provide proper landing at base of stair.

Exterior stair at north exit. Missing handrails. Makeshift wood landing at base of stairs.

Exterior Stair - West Entry. Handrail extensions required.

01.2-050C35 Loading Docks

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is an internal (enclosed) concrete loading dock having the following dimensions;

- 1320mm (4'4" high) x 7.9m (26') wide,
- 2 dock levelers

Component Condition & Anticipated Replacement Date

Average condition.

Note: The access ladder is deemed a safety hazard. A ships ladder with handrail should be provided in 2014.

Assessment Criteria	Existence
Unsafe and structurally unsound	
Default	Yes Access ladder to loading bay from loading dock is considered unsafe.

Loading dock ladder is dangerous. Maintenance staff report falls at this location.

RF Building Code/Canada Labour Code [01.2-050C35 Loading Docks]

Details	Values
Brief Description (40 Characters)	Install New Access Ladder
Current event Year (YYYY)	2014
Estimated Event Cost	$2,559

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	3	Base Rate for Material and Labour	$429	m	$1,287
2	01. Architectural & Structural	3	Construction Contingency	$64	m	$192
3	01. Architectural & Structural	3	Average Total Project Soft Costs	$148	m	$444
4		3	LCF - Material & Labour	$142	m	$426
5		3	LCF - Contingency & Soft Costs	$70	m	$210
6		0	Used 01.6A-037 Ladder costing and 3 meters for total ladder height.	$0	EACH	$0

Narratives

Event Description

Provide steel ships ladder from loading dock to loading bay floor.

Event Justification & Strategy

New loading dock ladder is required to improve safety.

Implication of Event Deferral (Risks)

Event deferral would be a code violation and unsafe conditions would persist.

01.3-020C05 Exterior Wall - Precast Concrete Panels

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	4,050
Measurement unit/ Metric	m2

Narratives

Component Description

Administration Block exterior wall construction:

- 10mm precast concrete panel,
- 25 (1") air space,
- 50mm rigid insulation,
- air barrier,
- 200mm reinforced concrete or 200mm concrete block,
- plaster

Lab Block (East and West walls) construction:

- 10mm ribbed precast concrete panel,
- 275mm (11") air space,
- 50mm rigid insulation,
- air barrier,
- 200mm reinforced concrete
- air space,
- metal furring,
- gypsum board

Exterior precast cladding consists of ribbed and flat panels, light to medium exposed aggregate. Vertical joints are intended to be caulked, horizontal joints are intended to be left open. Failure of two anchors (date unknown) precipitated structural analysis of the entire cladding system and ultimately resulted in the replacement of the anchors on the north and south walls in 1995. It is not known why the east and west wall panel anchors were not replaced at that time. A study is recommended to ensure anchors on these walls are sound.

Lab Block (North and South walls) construction:

- 10mm precast concrete panel,
- 25mm air space,
- 50mm rigid insulation,
- air barrier,
- 200mm reinforced concrete or 200mm concrete block,
- plaster

Component Condition & Anticipated Replacement Date

Precast panels are in average condition. There were no apparent major cracks or misalignments or areas of damage. There are localized areas of spalling, caused by rusting of reinforcing steel in the panels. Spalling is relatively minor; repairs are recommended for cosmetic, not structural reasons. In 2016, implement a consultant study to determine panel anchor integrity and serviceability.

Joint sealant is in average condition. In 2020, fix precast concrete issues and reseal joints.

Assessment Criteria	Existence
Surface cracking or spalling	
Default	Yes

Typical precast panel joint. Vertical panels sealed, horizontal joints open.

R Whole Building Expenditures [01.3-020C05 Exterior Wall - Precast Concrete Panels]

Details	Values
Brief Description (40 Characters)	Consultant Study - Assess Condition of Panel Anchors
Current event Year (YYYY)	2016
Estimated Event Cost	$23,443

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	17	Base Rate for Material and Labour	$694	m²	$11,798
2	01. Architectural & Structural	17	Construction Contingency	$104	m²	$1,768
3	01. Architectural & Structural	17	Average Total Project Soft Costs	$239	m²	$4,063
4		17	LCF - Material & Labour	$229	m2	$3,893
5		17	LCF - Contingency & Soft Costs	$113	m2	$1,921
6		0	Quantity of 17 used for Study only.	$0	EACH	$0

Narratives

Event Description

Implement Consultant study to assess condition of precast panel wall anchors on east and west walls.

Event Justification & Strategy

Failure of two anchors (date unknown) precipitated structural analysis of the entire cladding system and ultimately resulted in the replacement of the anchors on the north and south walls in 1995. It is not known why the east and west wall panel anchors were not replaced at that time. A study is recommended to ensure anchors on these walls are sound.

Implication of Event Deferral (Risks)

Event postponement would have medium to low risk. East and west panel anchor assessment should be done but timing is flexible.

Typical exterior precast concrete panels.

CP Life Extension [01.3-020C05 Exterior Wall - Precast Concrete Panels]

Details	Values
Brief Description (40 Characters)	Replace Panel Joints & Patch Panels
Current event Year (YYYY)	2020
Estimated Event Cost	$41,370

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$694	m²	$20,820
2	01. Architectural & Structural	30	Construction Contingency	$104	m²	$3,120
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$239	m²	$7,170
4		30	LCF - Material & Labour	$229	m2	$6,870
5		30	LCF - Contingency & Soft Costs	$113	m2	$3,390
6		0	Quantity of 30 used for precast panel repairs only.	$0	EACH	$0

Narratives

Event Description

Reseal panel joints where required. Remove and patch iron-spotting in precast panels.

Event Justification & Strategy

The panel repairs will prevent water ingress and maintain appearance of panels.

Implication of Event Deferral (Risks)

Event delay would have a low risk but a professional appearance would be at risk.

01.3-030C05 Exterior Wall - Copper Panels

Details	Values
Expected Life	50
Component Cost	475,830
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	510
Measurement unit/ Metric	m2

Narratives

Component Description

Copper panels at following locations:

Administration Block:
1) A main building design feature are sloping copper panels which extend from the top of the lab block down to the main entry.

Lab Block:
1) 1.5m strip which extend above windows (north and south elevation) to top of building.
2) Mechanical Penthouse (west wall).

Copper panels approximately 400m wide, installed vertically and with a standing seam connection. Panels have a dark brown patina. Panels are well secured, do not show visible signs of damage.

Component Condition & Anticipated Replacement Date

Exterior copper panels appear to be in average condition. Replacement may be warranted in 20 years or 2033.

Where the flat panels are used as siding on the west elevation, "oil canning" is noticeable, however, no building issues have been reported in connection with the panels.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to “No”, they have been removed from this report.

Standing seam copper panels above main entry (sloped and vertical application).

CP Replacement [01.3-030C05 Exterior Wall - Copper Panels]

Details	Values
Brief Description (40 Characters)	Replace Exterior Wall - Copper Panels
Current event Year (YYYY)	2033
Estimated Event Cost	$475,830

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	510	Base Rate for Material and Labour	$469	m²	$239,190
2	01. Architectural & Structural	510	Construction Contingency	$70	m²	$35,700
3	01. Architectural & Structural	510	Average Total Project Soft Costs	$162	m²	$82,620
4		510	LCF - Material & Labour	$155	m2	$79,050
5		510	LCF - Contingency & Soft Costs	$77	m2	$39,270

Narratives

Event Description

Replace exterior walls having copper panels.

Event Justification & Strategy

By 2033, panel deformations may warrant replacement.

Implication of Event Deferral (Risks)

Event delay would promote further panel decay and safe anchors may be an issue.

01.3-060C01 Aluminum Doors

Details	Values
Expected Life	50
Component Cost	155,472
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	16
Measurement unit/ Metric	ea

Narratives

Component Description

All Aluminum entrance doors are dark bronze anodized, fully glazing with 6mm tempered glazing.

Administration Block: Main Entry (facing east). 4 exterior doors; 4 interior vestibule doors.

Lab Block: North exit stairs. 1 door; 1 interior vestibule door.

South exit stairs: 1 door; 1 interior vestibule door.

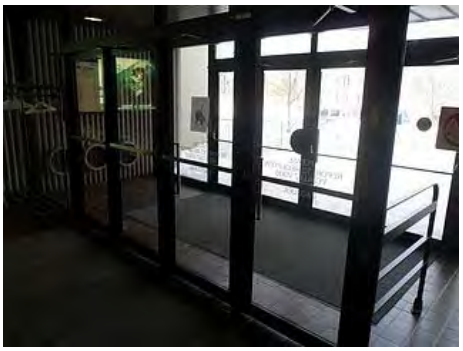
Main Entry (facing west): 2 doors; 2 interior vestibule doors.

Component Condition & Anticipated Replacement Date

All Aluminum entrance doors are in good working condition. With continued general maintenance, another 25 service years is probable and replacement not warranted until 2038.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Fully glazed aluminum doors at main entry.

CP Replacement [01.3-060C01 Aluminum Doors]

Details	Values
Brief Description (40 Characters)	Replace Aluminum Doors
Current event Year (YYYY)	2038
Estimated Event Cost	$155,472

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	16	Base Rate for Material and Labour	$4,888	EACH	$78,208
2	01. Architectural & Structural	16	Construction Contingency	$733	EACH	$11,728
3	01. Arch & Struc	16	Average Total Project Soft Costs	$1,686	EACH	$26,976
4		16	LCF - Material & Labour	$1,612	EACH	$25,792
5		16	LCF - Contingency & Soft Costs	$798	EACH	$12,768

Narratives

Event Description

Replace all exterior aluminum doors and reuse hardware where possible.

Event Justification & Strategy

Poorly functioning doors would warrant replacement.

Implication of Event Deferral (Risks)

Event delay may impede proper door function for operating condition during normal and emergency situations.

01.3-060C10 Exterior Metal Doors

Details	Values
Expected Life	45
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

Exterior Hollow metal doors at following locations:

- Mechanical Penthouse doors (from roof),
- Seminar room exit door,
- Service block exit doors.

Refer to report section "01.5-060C15 Paint" for door refinishing.

Component Condition & Anticipated Replacement Date

Doors in average condition. Replacement may be warranted in 2033.

Assessment Criteria	Existence
Air penetration	
Default	Yes
	Weather-stripping required.
Physical damage or deterioration	
Default	Yes
	Scratches and general wear.

Typical exterior metal door.

01.3-060C18 Exterior Overhead Door

Details	Values
Expected Life	20
Component Cost	68,940
Last Major Action Year	1998
Component Condition (For BCR use only)	Fair
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

Lab Block loading dock:
Two 4.88m high x 3.96m wide insulated sectional metal doors (vision lites), electrically operated, steel flush panel, push button controls with 3/4 H.P. Jackshaft operator, safety bottom edge and emergency chain hoist for manual operation, 76mm heavy duty hardware. These doors are operated regularly (several times a day). A man door has been built into one of the overhead doors (to facilitate small deliveries).

Water Treatment Addition:
One 3.6m x 4.2m overhead door, high headroom, standard sectional steel construction, unglazed, hand operated, torsion spring balanced, 76mm heavy duty hardware. There is no weather-stripping at the top edge of the door and the side weather-stripping is damaged. This door is operated infrequently.

Service Block (serving wet lab):
One overhead door: vertical lift, sectional steel construction, unglazed, hand operated, torsion spring balanced, 50mm hardware. This door is operated infrequently.

Service Block (serving electrical genset room): One sectional overhead door. This door is operated infrequently.

Component Condition & Anticipated Replacement Date

Doors in fair condition. Doors are in good working order. All door assemblies may require replacement in 2020.

Water Treatment Addition overhead door - there is no weather-stripping at the top edge of the door and the side weather-stripping is damaged. In 2014, conduct repairs for all overhead doors were required.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Loading Bay overhead door, with built-in man door.

RP Life Extension [01.3-060C18 Exterior Overhead Door]

Details	Values
Brief Description (40 Characters)	Conduct Repairs - All Overhead Doors
Current event Year (YYYY)	2014
Estimated Event Cost	$13,788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$6,936	EACH	$6,936
2	01. Architectural & Structural	1	Construction Contingency	$1,040	EACH	$1,040
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$2,393	EACH	$2,393
4		1	LCF - Material & Labour	$2,287	EACH	$2,287
5		1	LCF - Contingency & Soft Costs	$1,132	EACH	$1,132
6		0	Quantity of 1 used for all door repairs.	$0	EACH	$0

Narratives

Event Description

Conduct all necessary overhead door repairs and repeat when necessary.

Event Justification & Strategy

Cyclical door repairs will promote continued performance.

Implication of Event Deferral (Risks)

Delaying this maintenance event will promote premature replacement.

CP Replacement [01.3-060C18 Exterior Overhead Door]

Details	Values
Brief Description (40 Characters)	Replace All Overhead Door Assemblies
Current event Year (YYYY)	2020
Estimated Event Cost	$68,940

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$6,936	EACH	$34,680
2	01. Architectural & Structural	5	Construction Contingency	$1,040	EACH	$5,200

3	01. Architectural & Structural	5	Average Total Project Soft Costs	$2,393	EACH	$11,965
4		5	LCF - Material & Labour	$2,287	EACH	$11,435
5		5	LCF - Contingency & Soft Costs	$1,132	EACH	$5,660

Narratives

Event Description

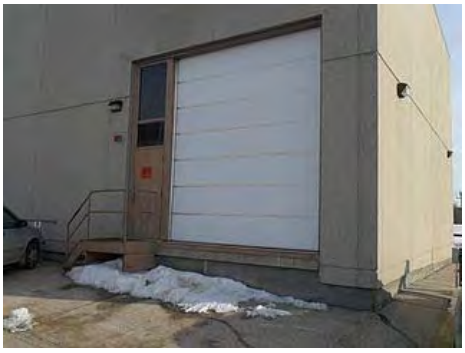
Replace all exterior overhead door assemblies.

Event Justification & Strategy

Poorly functioning and damaged doors would warrant replacement.

Implication of Event Deferral (Risks)

Delaying the door replacement may promote a poor functioning door and safety may be a concern.



Seven panel, sectional overhead door.

01.3-070C01 Aluminum Windows

Details	Values
Expected Life	50
Component Cost	472,050
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	450
Measurement unit/ Metric	m2

Narratives

Component Description

Operable casement stile windows (rendered inoperable) and fixed window units are used.

Window framing: 3mm thick extruded aluminum framing, thermally broken, steel reinforced, dark bronze anodized colour.

Glazing: Hermetically sealed double glazed units consisting of 6mm polished plate glass inboard, 12mm air space, 6mm solar type bronze coloured polished plate glass outboard, complete with steel spacer.

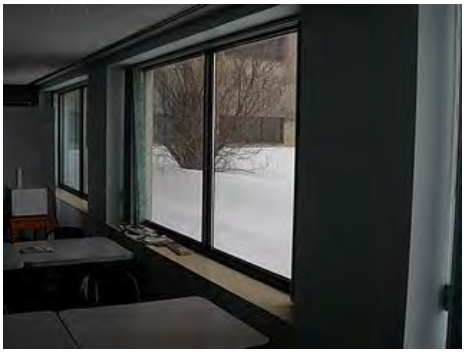
Typical window size: 84" wide x 28" high (2133mm x 710mm). Window divided into 3 sections of 28" wide x 28" high (710mm x 710mm). The centre section was an operable casement window which has been rendered inoperable.

Component Condition & Anticipated Replacement Date

Window frames in good condition. Glazing units in average condition. There were some glazing units with broken seals noted but relatively few. Full window replacement may be warranted in 2022.

Maintenance staff report some staff have complained of drafts at base of window frame. Maintenance staff have installed spray foam at specific windows. Conduct spray foam maintenance task in 2016.

Assessment Criteria	Existence
Air penetration	
Default	Yes
	Staff note drafts at base of windows.



Interior view of typical window.

RF Design Problems and Deficiencies [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Insulate Joints at Window Frames
Current event Year (YYYY)	2016
Estimated Event Cost	$5,245

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$528	m²	$2,640
2	01. Architectural & Structural	5	Construction Contingency	$79	m²	$395
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$182	m²	$910
4		5	LCF - Material & Labour	$174	m2	$870
5		5	LCF - Contingency & Soft Costs	$86	m2	$430
6		0	Quantity of 5 used for windows repairs.	$0	EACH	$0

Narratives

Event Description

Spray foam at base of window frame.

Event Justification & Strategy

Window unit repairs will reduce drafts, heat loss and improve comfort level for staff.

Implication of Event Deferral (Risks)

Event delay will see increased heat loss and possible interior water leaks.

CP Replacement [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Glazing Units
Current event Year (YYYY)	2022
Estimated Event Cost	$472,050

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	450	Base Rate for Material and Labour	$528	m²	$237,600
2	01. Architectural & Structural	450	Construction Contingency	$79	m²	$35,550
3	01. Architectural & Structural	450	Average Total Project Soft Costs	$182	m²	$81,900
4		450	LCF - Material & Labour	$174	m2	$78,300
5		450	LCF - Contingency & Soft Costs	$86	m2	$38,700

Narratives

Event Description

Cyclical Replacement of glazed units.

Event Justification & Strategy

Glazing units will be at the end of their service life. New units will improve enclosure overall thermal performance.

Implication of Event Deferral (Risks)

Replacement delay would promote increased heat loss, poor energy consumption and interior leaks may develop.

Typical exterior windows and ribbed concrete panels.

01.3A-065 Exterior Door Hardware

Details	Values
Expected Life	4
Component Cost	5,784
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	22
Measurement unit/ Metric	ea

Narratives

Component Description

Exterior doors (metal and aluminum) equipped with closers, door stops, weather-stripping and thresholds.

Component Condition & Anticipated Replacement Date

Average condition. Where required, replace worn exterior door hardware every four years starting in 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Exterior door hardware - pill handles, butt hinges, deadbolt locks and interior panic bars.

RP Replacement [01.3A-065 Exterior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Worn Door Hardware
Current event Year (YYYY)	2016
Estimated Event Cost	$5,784

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$727	EACH	$2,908
2	01. Architectural & Structural	4	Construction Contingency	$109	EACH	$436

3	01. Architectural & Structural	4	Average Total Project Soft Costs	$251	EACH	$1,004
4		4	LCF - Material & Labour	$240	EACH	$960
5		4	LCF - Contingency & Soft Costs	$119	EACH	$476
6		0	Quantity of 4 used for budget costing wherever required.	$0	EACH	$0

Narratives

Event Description

Cyclical replacement of exterior door hardware (weather-stripping, closer, threshold, sweeps, hinges and handsets.) Budget for four doors every four years.

Event Justification & Strategy

Cyclical exterior door hardware replacements will reduce drafts, improve energy performance and maintain proper door function.

Implication of Event Deferral (Risks)

Event delay would promote unsafe egress during emergency situations.

01.3A-075 Window Coverings

Details	Values
Expected Life	15
Component Cost	39,150
Last Major Action Year	1995
Component Condition (For BCR use only)	Average
Quantity	450
Measurement unit/ Metric	m2

Narratives

Component Description

Typical blinds are 75mm wide (3") vertical louvre blinds (fabric). Track is an inverted aluminum 'U' channel. Blinds are manually operated by traditional chain and cord system.

Component Condition & Anticipated Replacement Date

Average condition.

Staff having windows with an exposure to the west have noted louvre blinds not effective at blocking direct sunlight. Given age of existing blinds, replacement of blinds facing west is recommended in 2018. All other blinds should be replaced in 2023.

Assessment Criteria	Existence
Ineffective or inoperative	
Default	Yes

Blinds on windows facing west are not effective.

Vertical louvre - fabric blinds.

RP Replacement [01.3A-075 Window Coverings] - West Facing

Details	Values
Brief Description (40 Characters)	Replace Window Coverings - West Elevation
Current event Year (YYYY)	2018
Estimated Event Cost	$13,050

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	150	Base Rate for Material and Labour	$44	m²	$6,600
2	01. Architectural & Structural	150	Construction Contingency	$7	m²	$1,050
3	01. Architectural & Structural	150	Average Total Project Soft Costs	$15	m²	$2,250
4		150	LCF - Material & Labour	$14	m2	$2,100
5		150	LCF - Contingency & Soft Costs	$7	m2	$1,050

Narratives

Event Description

Replace louvre blinds on windows facing west (approximately 150m2) with roller blinds.

Event Justification & Strategy

New window covering will reduce heat load, provide comfortable work environment and prevent glare on monitors.

Implication of Event Deferral (Risks)

Event postponement would promote poor functioning coverings and potential glare on computer monitors.

CP Replacement [01.3A-075 Window Coverings]

Details	Values
Brief Description (40 Characters)	Replace Window Coverings - Not West
Current event Year (YYYY)	2023
Estimated Event Cost	$26,100

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	300	Base Rate for Material and Labour	$44	m²	$13,200
2	01. Architectural & Structural	300	Construction Contingency	$7	m²	$2,100
3	01. Architectural & Structural	300	Average Total Project Soft Costs	$15	m²	$4,500
4		300	LCF - Material & Labour	$14	m2	$4,200
5		300	LCF - Contingency & Soft Costs	$7	m2	$2,100

Narratives

Event Description

Replace all window coverings (approximately 300m2), except West elevation.

Event Justification & Strategy

Current units will have reached their expected service life and damage and function may be issues. Replacement is warranted ensure performance.

Implication of Event Deferral (Risks)

Event postponement would promote poor functioning coverings and potential glare on computer monitors.

01.4-010C05 Built-up Roof, Tar & Gravel Roof

Details	Values
Expected Life	20
Component Cost	1,294,800
Last Major Action Year	1998
Component Condition (For BCR use only)	Fair
Quantity	5,200
Measurement unit/ Metric	m2

Narratives

Component Description

Roof #1 Administration Block:
- 4 ply built-up roof, 13mm fibreboard, 50mm rigid insulation, air vapour barrier, concrete deck. Installed 1998.

Roof #2 Lab Block:
- 4 ply built-up roof, 13mm fibreboard, 50mm rigid insulation, air vapour barrier, concrete deck. Installed 1998.

Roof #3 Service Block:
- 4 ply built-up roof, 13mm fibreboard, 50mm rigid insulation, air vapour barrier, concrete deck. Installed 1998.

Roof #1 Administration Block
Roof #2 Lab Block
Roof #3 Service Block
Roof #4 Water Treatment Addition

Component Condition & Anticipated Replacement Date

All roofs - Due to snow cover, visual inspection not possible.
Insulation values (R10) are relatively low compared to current insulation levels recommended by the national Energy Code (R25).
Maintenance staff report minor roof repairs undertaken within past 2 years to prevent leakage occurring into 5th floor lab. Staff reports the existing roof was installed in January of 1998 and quality of installation is suspect.

Given age and type of roofing, condition is regarded as fair and replacement is recommended in 5-10 years. Replacement slated for 2018. Co-ordinate with replacement of roof on Water Treatment Addition.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Built-up roofing (at Service Block) showing roof repairs and residual water pooling.

CP Replacement [01.4-010C05 Built-up Roof, Tar & Gravel Roof]

Details	Values
Brief Description (40 Characters)	Replace BUR Roofing
Current event Year (YYYY)	2018
Estimated Event Cost	$1,294,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5200	Base Rate for Material and Labour	$126	m²	$655,200
2	01. Architectural & Structural	5200	Construction Contingency	$19	m²	$98,800

3	01. Architectural & Structural	5200	Average Total Project Soft Costs	$43	m²	$223,600
4		5200	LCF - Material & Labour	$41	m2	$213,200
5		5200	LCF - Contingency & Soft Costs	$20	m2	$104,000

Narratives

Event Description

Replace roofing with Modified bitumen roofing.

Event Justification & Strategy

A new roof assembly would improve roof insulation values and mitigate existing roof leakage issues.

Implication of Event Deferral (Risks)

Event delay would promote poor assembly insulating values, increased membrane deterioration and potential interior leaks.

01.4-010C25 Inverted Built-up Roof

Details	Values
Expected Life	20
Component Cost	74,700
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	300
Measurement unit/ Metric	m2

Narratives

Component Description

Roof #4 Water Treatment Addition (inverted roof):
- 100mm Rigid Insulation with factory applied sheathing, cold-applied 4 ply built-up roof, original roof on addition constructed in 1985.

Roof #1 Administration Block
Roof #2 Lab Block
Roof #3 Service Block
Roof #4 Water Treatment Addition

Component Condition & Anticipated Replacement Date

Due to snow cover, visual inspection not possible.

Vegetation growth evident.

Given age of roof, overall condition is considered as average and replacement is recommended in 5-10 years. Currently, event is scheduled for 2022. Co-ordinate with replacement of balance of roofing.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [01.4-010C25 Inverted Built-up Roof]

Details	Values
Brief Description (40 Characters)	Replace Inverted Roofing
Current event Year (YYYY)	2022
Estimated Event Cost	$74,700

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	300	Base Rate for Material and Labour	$126	m²	$37,800
2	01. Architectural & Structural	300	Construction Contingency	$19	m²	$5,700
3	01. Architectural & Structural	300	Average Total Project Soft Costs	$43	m²	$12,900
4		300	LCF - Material & Labour	$41	m2	$12,300
5		300	LCF - Contingency & Soft Costs	$20	m2	$6,000

Narratives

Event Description

Replace roofing with Modified bitumen roofing.

Event Justification & Strategy

A new roof assembly would improve roof insulation values and provide a more serviceable assembly.

Implication of Event Deferral (Risks)

Event delay would promote poor assembly insulating values, increased membrane deterioration and potential interior leaks.

01.5-010C01 Concrete Block Partition

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	2,900
Measurement unit/ Metric	m2

Narratives

Component Description

All levels:
Service room and service shaft partitions (including lab service core) are typically 200mm concrete block.

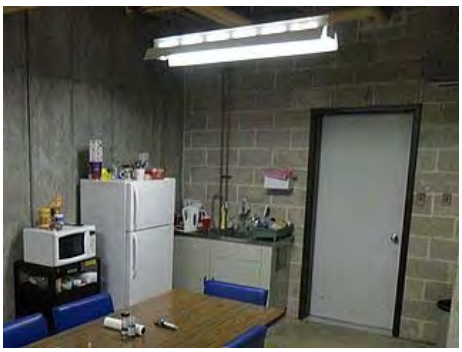
Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Block partitions are considered in average condition. Replacement is not until 2047 and outside this BCR. No event is included. Refer to report section "01.5-060C15 Paint" for refinishing.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Interior concrete block partition.

01.5-010C02 Concrete Partition

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1,900
Measurement unit/ Metric	m2

Narratives

Component Description

All levels:
There is a 200mm concrete wall at following locations:
: main corridor
: elevator shaft
: stairwells
: end wall of each lab compartment

Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Concrete partitions are regarded in average condition. Since replacement is over 50 years away (2082), no event is included. Refer to report section "01.5-060C15 Paint" for refinishing.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-012C01 Gypsum Board Partition with Studs

Details	Values
Expected Life	40
Component Cost	1,177,500
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	7,500
Measurement unit/ Metric	m2

Narratives

Component Description

Partitions are typically gypsum board on steel studs unless noted otherwise.

Partitions at labs are full height constructed with 2 layers 13mm gypsum board both sides 89mm steel stud with batt insulation. Partitions between lab offices are to ceiling height with 2 layers 13mm gypsum board both sides 89mm steel studs.

Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Gypsum board partitions are considered in average overall condition. Their service life is granted another 20 years with replacement scheduled for 2033. Refer to report section "01.5-060C15 Paint" for refinishing.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [01.5-012C01 Gypsum Board Partition with Studs]

Details	Values
Brief Description (40 Characters)	Replace Gypsum Board Partitions
Current event Year (YYYY)	2033
Estimated Event Cost	$1,177,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7500	Base Rate for Material and Labour	$79	m²	$592,500
2	01. Architectural & Structural	7500	Construction Contingency	$12	m²	$90,000
3	01. Architectural & Structural	7500	Average Total Project Soft Costs	$27	m²	$202,500
4		7500	LCF - Material & Labour	$26	m2	$195,000
5		7500	LCF - Contingency & Soft Costs	$13	m2	$97,500

Narratives

Event Description

Where required, replace interior gypsum board partitions having studs.

Event Justification & Strategy

By the indicated year, interior gypsum board partitions may require replacement from weak wall structure and/or damage.

Implication of Event Deferral (Risks)

Event postponement may see walls with unsecured drywall sections. Appearance and safety would become issues.

01.5-012C01 Plywood Partitions with Studs

Details	Values
Expected Life	20
Component Cost	18,840
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	120
Measurement unit/ Metric	m2

Narratives

Component Description

There are 2400mm high painted plywood partitions in the following rooms:
1) B-91 Storage Room (beneath NAAHP)
2) B-90 Storage Room (beneath front entry)

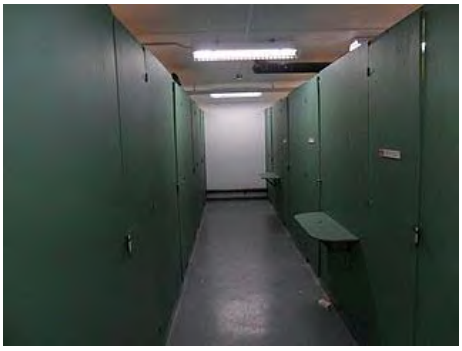
Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Plywood partitions are in average condition. Another 12 service years are granted before replacement may be required in 2025. The plywood surfaces have been recently painted (within past 5 years). Refer to report section "01.5-060C15 Paint" for refinishing.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Painted plywood partitions (basement storage room beneath main entrance).

RP Replacement [01.5-012C01 Plywood Partitions with Studs]

Details	Values
Brief Description (40 Characters)	Replace Plywood Partitions
Current event Year (YYYY)	2025
Estimated Event Cost	$18,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	120	Base Rate for Material and Labour	$79	m²	$9,480
2	01. Architectural & Structural	120	Construction Contingency	$12	m²	$1,440
3	01. Architectural & Structural	120	Average Total Project Soft Costs	$27	m²	$3,240
4		120	LCF - Material & Labour	$26	m2	$3,120
5		120	LCF - Contingency & Soft Costs	$13	m2	$1,560

Narratives

Event Description

Where required, replace plywood clad partitions with same materials.

Event Justification & Strategy

By the indicated year, interior plywood partitions may require replacement from weak wall structure and/or damage.

Implication of Event Deferral (Risks)

Event postponement may see walls with unsecured plywood sections. Appearance and safety would become issues.

01.5-012C10 Chain-link Partition

Details	Values
Expected Life	25
Component Cost	59,760
Last Major Action Year	1990
Component Condition (For BCR use only)	Average
Quantity	240
Measurement unit/ Metric	m2

Narratives

Component Description

There are chain link partitions in following rooms:
1) Second floor storage rooms

Component Condition & Anticipated Replacement Date

Chain-link partitions are in average condition and should serve for another 15 years before replacement may be required in 2028.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Wire mesh partition in basement storage area.

CP Replacement [01.5-012C10 Chain-link Partition]

Details	Values
Brief Description (40 Characters)	Replace Chain-link Partitions
Current event Year (YYYY)	2028
Estimated Event Cost	$59,760

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	240	Base Rate for Material and Labour	$126	m²	$30,240
2	01. Architectural & Structural	240	Construction Contingency	$19	m²	$4,560
3	01. Architectural & Structural	240	Average Total Project Soft Costs	$43	m²	$10,320
4		240	LCF - Material & Labour	$41	m2	$9,840
5		240	LCF - Contingency & Soft Costs	$20	m2	$4,800

Narratives

Event Description

Replace all chain-link partitions and hardware.

Event Justification & Strategy

By the indicated year, chain-link partitions may require replacement due to corrosion and not having the ability to provide proper security.

Implication of Event Deferral (Risks)

Event deferral would promote unsecured and damaged sections. Safety and appearance would be issues.

01.5-013C10 Washroom Partitions

Details	Values
Expected Life	20
Component Cost	57,900
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	30
Measurement unit/ Metric	ea

Narratives

Component Description

All washrooms have floor mounted metal toilet partitions (yellow with yellow doors).

Component Condition & Anticipated Replacement Date

Washroom partitions are in average condition for age. Yellow colour is dated looking. Refinishing is warranted in seven years or 2020. Replacement may be required in 15 years after that, or 2035.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical toilet partition.

RP Life Extension [01.5-013C10 Washroom Partitions]

Details	Values
Brief Description (40 Characters)	Refinish Toilet Partitions
Original Event Year	Unspecified
Current event Year (YYYY)	2020
Estimated Event Cost	$13,510

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$971	EACH	$6,797
2	01. Architectural & Structural	7	Construction Contingency	$146	EACH	$1,022

3	01. Architectural & Structural	7	Average Total Project Soft Costs	$335	EACH	$2,345
4		7	LCF - Material & Labour	$320	EACH	$2,240
5		7	LCF - Contingency & Soft Costs	$158	EACH	$1,106
6		0	Quantity of 7 used for refinishing only.	$0	EACH	$0

Narratives

Event Description

Refinish toilet partitions with new colour scheme.

Event Justification & Strategy

Partition repairs and painting will eliminate the dated appearance.

Implication of Event Deferral (Risks)

Event delay would have a low risk other than a very out dated appearance. Leaving repairs would promote unsecured partitions and safety may be an issue.

CP Replacement [01.5-013C10 Washroom Partitions]

Details	Values
Brief Description (40 Characters)	Replace Washroom Partitions
Current event Year (YYYY)	2035
Estimated Event Cost	$57,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$971	EACH	$29,130
2	01. Architectural & Structural	30	Construction Contingency	$146	EACH	$4,380
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$335	EACH	$10,050
4		30	LCF - Material & Labour	$320	EACH	$9,600
5		30	LCF - Contingency & Soft Costs	$158	EACH	$4,740

Narratives

Event Description

Replace all toilet partitions.

Event Justification & Strategy

By 2035, the partitions will be very dated and proper anchorage may be issues.

Implication of Event Deferral (Risks)

Delaying this event would promote poor partition function and safety.

01.5-050C10 Wood Doors

Details	Values
Expected Life	5
Component Cost	39,375
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	250
Measurement unit/ Metric	ea

Narratives

Component Description

Painted wood doors throughout serving labs and lab offices.

Lab doors have a 300mm wide additional leaf.

Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Interior wood doors are considered in average condition. Since all doors would not require replacement at the same time, starting in 2022, budget for 25 doors to be replaced every 5 years.

Refer to report section "01.5-060C15 Paint" for refinishing. Some lab doors are impact damaged at base - provide kick-plates in 2014.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes

Typical lab door with upper lite.

RP Life Extension [01.5-050C10 Wood Doors]

Details	Values
Brief Description (40 Characters)	Provide Missing Kick-plates
Current event Year (YYYY)	2014
Estimated Event Cost	$12,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	8	Base Rate for Material and Labour	$793	EACH	$6,344
2	01. Architectural & Structural	8	Construction Contingency	$119	EACH	$952
3	01. Architectural & Structural	8	Average Total Project Soft Costs	$273	EACH	$2,184
4		8	LCF - Material & Labour	$261	EACH	$2,088
5		8	LCF - Contingency & Soft Costs	$129	EACH	$1,032
6		0	Quantity of 8 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Provide kickplates at doors (10-20 doors) with impact damage.

Event Justification & Strategy

New kickplates will extend life of doors and maintain appearance.

Implication of Event Deferral (Risks)

Event delay would see further damage to the specific doors and premature replacement may occur.

Impact damage at base of lab door.

CP Replacement [01.5-050C10 Wood Doors] - 25 Doors

Details	Values
Brief Description (40 Characters)	Replace Wood Doors - 25 Doors
Current event Year (YYYY)	2022
Estimated Event Cost	$39,375

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	25	Base Rate for Material and Labour	$793	EACH	$19,825

2	01. Architectural & Structural	25	Construction Contingency	$119	EACH	$2,975
3	01. Architectural & Structural	25	Average Total Project Soft Costs	$273	EACH	$6,825
4		25	LCF - Material & Labour	$261	EACH	$6,525
5		25	LCF - Contingency & Soft Costs	$129	EACH	$3,225

Narratives

Event Description

Where required, replace 25 interior wood doors and reuse related hardware where possible.

Event Justification & Strategy

Cyclical door replacement, where required, is warranted to ensure proper function and safety.

Implication of Event Deferral (Risks)

Event deferral would see the occurrence of numerous damaged and poorly functioning doors. Egress may become an issue.

01.5-050C15 Metal Door - Interior Overhead Door

Details	Values
Expected Life	20
Component Cost	13,788
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Loading Dock to Storage Room/Wet Lab area:
One 3.6m x 4.2m overhead door, electrically operated, steel flush panel, push button controls with 3/4 H.P. The unit includes a safety bottom edge and emergency chain hoist for manual operation and has 76mm heavy duty hardware. This door is operated regularly (several times a day).

Component Condition & Anticipated Replacement Date

Door in average condition and in good working order. Another 15 service years is granted before replacement may be required in 2028.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.5-050C15 Metal Doors - Interior Overhead Door]

Details	Values
Brief Description (40 Characters)	Replace Interior Overhead Door
Current event Year (YYYY)	2028
Estimated Event Cost	$13,788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$6,936	EACH	$6,936
2	01. Architectural & Structural	1	Construction Contingency	$1,040	EACH	$1,040
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$2,393	EACH	$2,393
4		1	LCF - Material & Labour	$2,287	EACH	$2,287
5		1	LCF - Contingency & Soft Costs	$1,132	EACH	$1,132
6		0	Costing is for Exterior overhead door. Actual interior assembly may cost less.	$0	EACH	$0

Narratives

Event Description

Replace interior overhead metal door and related hardware.

Event Justification & Strategy

The interior overhead door will have reached the end of its service life.

Implication of Event Deferral (Risks)

Postponing the interior overhead door replacement would lead to a poor functioning door and safety issues may arise during operation.

01.5-050C15 Metal Doors

Details	Values
Expected Life	60
Component Cost	19,744
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	60
Measurement unit/ Metric	ea

Narratives

Component Description

There are painted hollow metal doors at stairwells, corridors and service rooms.

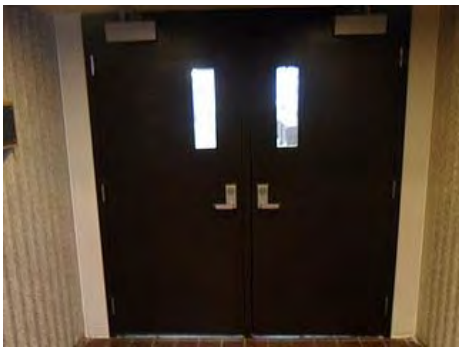
Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

Overall, interior metal doors are in average condition. Budget for 10% (6 doors) replacement, wherever required, starting in 2032 and every 5 years thereafter.

Refer to report section "01.5-060C15 Paint" for refinishing. Doors to loading area are impact damage and should have vision lites for safety. This task should be implemented in 2015.

Assessment Criteria	Existence
Functional defects	
Default	Yes
Physical damage or deterioration	
Default	Yes



Painted metal doors at library entry.

RP Replacement [01.5-050C15 Metal Doors]

Details	Values
Brief Description (40 Characters)	Replace Metal Doors to Loading Area
Current event Year (YYYY)	2015
Estimated Event Cost	$4,936

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$1,242	EACH	$2,484
2	01. Architectural & Structural	2	Construction Contingency	$186	EACH	$372
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$428	EACH	$856
4		2	LCF - Material & Labour	$409	EACH	$818
5		2	LCF - Contingency & Soft Costs	$203	EACH	$406

Narratives

Event Description

Replace metal door assemblies to loading area.

Event Justification & Strategy

Loading dock doors damaged and also lack vision panels for safety. Replacement is warranted to promote proper function.

Implication of Event Deferral (Risks)

Event delay would promote increased poor function for these loading dock doors. Safety would be an issue.

Painted metal doors to loading area showing cart traffic damage and lack of vision lite and power operator.

RP Replacement [01.5-050C15 Metal Doors] - 6 Doors

Details	Values
Brief Description (40 Characters)	Replace Metal Doors - 6 Doors
Current event Year (YYYY)	2032
Estimated Event Cost	$14,808

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	6	Base Rate for Material and Labour	$1,242	EACH	$7,452
2	01. Architectural & Structural	6	Construction Contingency	$186	EACH	$1,116
3	01. Architectural & Structural	6	Average Total Project Soft Costs	$428	EACH	$2,568
4		6	LCF - Material & Labour	$409	EACH	$2,454
5		6	LCF - Contingency & Soft Costs	$203	EACH	$1,218

Narratives

Event Description

Where required, cyclically replace 6 interior metal doors and reuse hardware where possible. Repeat event every 5 years.

Event Justification & Strategy

Cyclical door replacement, where required, will ensure all doors are functioning properly for safe use during normal and emergency situations.

Implication of Event Deferral (Risks)

Event postponement would promote poor door function during normal and emergency use. Life safety issues may occur.

01.5-060C01 Acoustic Wall Treatment - Folding Partitions

Details	Values
Expected Life	20
Component Cost	73,045
Last Major Action Year	2000
Component Condition (For BCR use only)	Fair
Quantity	35
Measurement unit/ Metric	m2

Narratives

Component Description

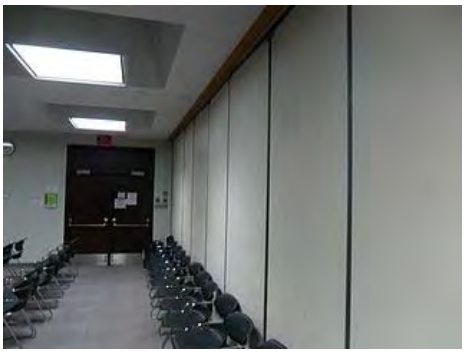
There is one - 11m long x 3m high folding partition separating seminar rooms. Partition has a door in one leaf and is manually operated.

Component Condition & Anticipated Replacement Date

Partition in good operating condition, however, vinyl finish is worn and overall condition is regarded as fair. Refinish partitions in 2014. Full door assembly replacement may be warranted in 2025.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Folding acoustic partition separating seminar rooms.

RP Life Extension [01.5-013C15 Folding Partitions]

Details	Values
Brief Description (40 Characters)	Refinish Folding Partition
Current event Year (YYYY)	2014
Estimated Event Cost	$5,530

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	70	Base Rate for Material and Labour	$40	m²	$2,800
2	01. Architectural & Structural	70	Construction Contingency	$6	m²	$420

3	01. Architectural & Structural	70	Average Total Project Soft Costs	$14	m²	$980
4		70	LCF - Material & Labour	$13	m2	$910
5		70	LCF - Contingency & Soft Costs	$6	m2	$420

Narratives

Event Description

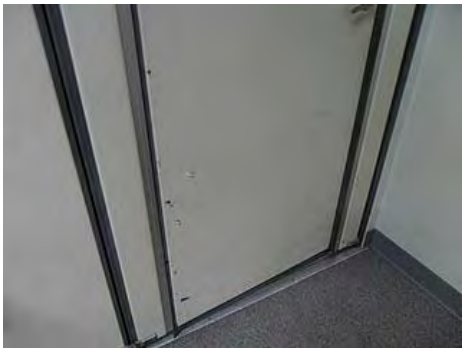
Replace vinyl wall covering on the folding partition.

Event Justification & Strategy

The current wall covering is damaged and at the end of its service life. New covering will improve appearance.

Implication of Event Deferral (Risks)

Delaying the wall covering replacement would be low risk but the professional appearance would be lost.



Damaged wall covering.

CP Replacement [01.5-060C01 Acoustic Wall Treatment - Folding Partitions]

Details	Values
Brief Description (40 Characters)	Replace Folding Acoustic Partitions
Current event Year (YYYY)	2025
Estimated Event Cost	$73,045

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		35	Base Rate Material & Labour	$1,050	m2	$36,750
2		35	Construction Contingency	$158	m2	$5,530
3		35	Project Soft Costs	$362	m2	$12,670
4		35	LCF - Material & Labour	$347	m2	$12,145
5		35	LCF - Contingency & Soft Costs	$170	m2	$5,950
6		0	No AVS costing. Used RSMeans costing.	$0	EACH	$0

Narratives

Event Description

Replace folding acoustic partitions.

Event Justification & Strategy

To promote proper door function, assembly should be replaced at the end of its expected service life.

Implication of Event Deferral (Risks)

Event deferral would promote poor door function. Sound attenuation would be impacted.

01.5-060C05 Ceramic Wall and Floor Tile

Details	Values
Expected Life	40
Component Cost	257,400
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	975
Measurement unit/ Metric	m2

Narratives

Component Description

Ceramic wall and floor tiles are found in all washrooms. Properties include:
: 2"x2" brown or white wall tile
: 2"x2" brown floor tile

Each washroom is estimated to have 1,500 square feet x 10 washrooms = 15,000 square feet or 1,395m2.

Component Condition & Anticipated Replacement Date

Even though the tile colours are dated, they are in average condition. Another 20 service years is granted before replacement in 2033.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Original ceramic wall and floor tile in washroom (typical).

CP Replacement [01.5-060C05 Ceramic Wall and Floor Tile]

Details	Values
Brief Description (40 Characters)	Replace Ceramic Wall and Floor Tile
Current event Year (YYYY)	2033
Estimated Event Cost	$257,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	975	Base Rate for Material and Labour	$132	m²	$128,700
2	01. Architectural & Structural	975	Construction Contingency	$20	m²	$19,500
3	01. Architectural & Structural	975	Average Total Project Soft Costs	$46	m²	$44,850
4		975	LCF - Material & Labour	$44	m2	$42,900
5		975	LCF - Contingency & Soft Costs	$22	m2	$21,450

Narratives

Event Description

Replace ceramic wall and floor tiles in all washrooms.

Event Justification & Strategy

Due to age, appearance and damaged tiles, replacement will be warranted.

Implication of Event Deferral (Risks)

Event delay may promote increased incidences of chipped tiles and the wearing surface would lose its appearance and slip resistant feature.

01.5-060C15 Wall Paint

Details	Values
Expected Life	4
Component Cost	55,000
Last Major Action Year	2010
Component Condition (For BCR use only)	Average
Quantity	10,000
Measurement unit/ Metric	m2

Narratives

Component Description

Painted surfaces include; concrete, block and partition walls, and numerous doors and frames.

Component Condition & Anticipated Replacement Date

Paint on walls, doors and frames generally average condition. Since all surfaces would not require painting at the same time, starting in 2017 budget 25% (2,500m2) every 4 years, wherever required.

Assessment Criteria	Existence
Fading Colours	
Default	Yes

Lab 2-75. Original wall paint (40 years old).

CP Replacement [01.5-060C15 Paint]

Details	Values
Brief Description (40 Characters)	Repaint Vertical Surfaces - 25%
Current event Year (YYYY)	2017
Estimated Event Cost	$55,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2500	Base Rate for Material and Labour	$11	m²	$27,500
2	01. Architectural & Structural	2500	Construction Contingency	$2	m²	$5,000
3	01. Architectural & Structural	2500	Average Total Project Soft Costs	$4	m²	$10,000
4		2500	LCF - Material & Labour	$3	m2	$7,500
5		2500	LCF - Contingency & Soft Costs	$2	m2	$5,000

Narratives

Event Description

Cycling repainting program of walls, doors, frames and all other noted surfaces identified in this report. Repainting cycle will repeat every 16 years.

Event Justification & Strategy

Cyclically repainting the vertical surfaces will maintain appearance of facility.

Implication of Event Deferral (Risks)

Delaying this task would promote dull wall surfaces, unclean conditions and a poor professional appearance.

Dirt and stains on wall (typical).

01.5-060C25 Wood Wall Finish

Details	Values
Expected Life	30
Component Cost	163,000
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	250
Measurement unit/ Metric	m2

Narratives

Component Description

Walls and doors in the executive office area are finished with 3" solid oak horizontal boards (tongue and groove).

Component Condition & Anticipated Replacement Date

Wood finished walls are regarded in good condition. Replacement not anticipated until 2033. Refer to report section "01.5-060C15 Paint" for refinishing.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Wood wall finish in executive office area.

CP Replacement [01.5-060C25 Wood Wall Finish]

Details	Values
Brief Description (40 Characters)	Replace Wood Wall Finish
Current event Year (YYYY)	2033
Estimated Event Cost	$163,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		250	Base Rate Material & Labour	$329	m2	$82,250
2		250	Construction Contingency	$49	m2	$12,250
3		250	Project Soft Costs	$113	m2	$28,250
4		250	LCF - Material & Labour	$109	m2	$27,250
5		250	LCF - Contingency & Soft Costs	$52	m2	$13,000
6		0	No AVS costing. Used RSMeans costing.	$0	EACH	$0

Narratives

Event Description

Replace all interior walls having a wood finish.

Event Justification & Strategy

By the indicated date, the wood clad wall finishes may require replacement due to wear and tear and possible damages.

Implication of Event Deferral (Risks)

Postponing this event would have low risk and the appearance may diminish.

01.5-070C05 Carpeting

Details	Values
Expected Life	4
Component Cost	141,900
Last Major Action Year	2005
Component Condition (For BCR use only)	Average
Quantity	4,300
Measurement unit/ Metric	m2

Narratives

Component Description

Carpeting is found throughout the Administration and Lab blocks as follows:

Administration Block:
Basement: Finance Area, Cafeteria
Main Floor: Office Area, seminar rooms
Second Floor: Library

Lab Block:
All lab offices and lab modules as follows:
Basement Floor: 12 of 27 lab modules
Main Floor: 5 of 36 lab modules
Second Floor: 9 of 36 lab modules
Third Floor: 0 of 36 lab modules
Fourth Floor: 5 of 36 lab modules

Service block: All offices on basement floor.

Component Condition & Anticipated Replacement Date

Carpet in average or better condition except as follows:

Administration Block: Main Floor: Office Area, seminar rooms (fair condition).

Service Block: All offices on basement floor (fair condition).

In 2016, implement a cyclical re-carpeting program to replace approximately 1,100m2 of carpet, every 4 years, wherever required.

Assessment Criteria	Existence
Excessive wear	
Default	Yes In areas indicated.
Stains, tears and poor seam condition	
Default	Yes In areas indicated.

Carpet in library.

CP Replacement [01.5-070C05 Carpeting]

Details	Values
Brief Description (40 Characters)	Replace Carpet - 25%
Current event Year (YYYY)	2016
Estimated Event Cost	$141,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1075	Base Rate for Material and Labour	$66	m²	$70,950
2	01. Architectural & Structural	1075	Construction Contingency	$10	m²	$10,750
3	01. Architectural & Structural	1075	Average Total Project Soft Costs	$23	m²	$24,725
4		1075	LCF - Material & Labour	$22	m2	$23,650
5		1075	LCF - Contingency & Soft Costs	$11	m2	$11,825

Narratives

Event Description

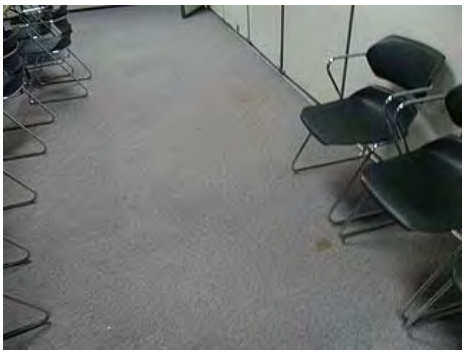
Replace approximately 1,100m2 of carpet, wherever required. Initial areas would include ones in fair condition (high traffic).

Event Justification & Strategy

Cyclical carpet replacement, where required, will promote walking safety and maintain appearance.

Implication of Event Deferral (Risks)

Event delay would promote an unprofessional appearance, frayed locations, wrinkles and tripping hazards. Safety could become an issue.



Carpet in seminar room, worn and stained.

01.5-070C25 Sheet Vinyl Floor

Details	Values
Expected Life	15
Component Cost	391,500
Last Major Action Year	1993
Component Condition (For BCR use only)	Fair
Quantity	2,700
Measurement unit/ Metric	m2

Narratives

Component Description

Sheet vinyl flooring is identified in numerous Lab block areas as follows:
Original Sheet Vinyl
Basement Floor: none
Main Floor: 2 of 36 lab modules
Second Floor: 6 of 36 lab modules
Third Floor: 15 of 36 lab modules
Fourth Floor: none

Replacement Sheet Vinyl
Basement Floor: 10 of 36 lab modules
Main Floor: 17 of 36 lab modules
Second Floor: 14 of 36 lab modules
Third Floor: 14 of 36 lab modules
Fourth Floor: 10 of 36 lab modules

Component Condition & Anticipated Replacement Date

Depending on room or location, sheet vinyl condition averages out to fair. Replace older sheet vinyl floor areas in 2016, while the newer installations should be replaced in 2025.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sheet vinyl in corridor.

CP Replacement [01.5-070C25 Sheet Vinyl Floor] - Older

Details	Values
Brief Description (40 Characters)	Replace Original Sheet Vinyl - Labs
Current event Year (YYYY)	2016
Estimated Event Cost	$274,050

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1890	Base Rate for Material and Labour	$73	m²	$137,970
2	01. Architectural & Structural	1890	Construction Contingency	$11	m²	$20,790
3	01. Architectural & Structural	1890	Average Total Project Soft Costs	$25	m²	$47,250
4		1890	LCF - Material & Labour	$24	m2	$45,360
5		1890	LCF - Contingency & Soft Costs	$12	EACH	$22,680

Narratives

Event Description

Replace original sheet vinyl in labs.

Event Justification & Strategy

Aesthetics, health and safety will be maintained when cyclical replacements are implemented.

Implication of Event Deferral (Risks)

Event delay would risk increased damage and tripping hazards may occur.

Poor sheet vinyl seam in corridor.

CP Replacement [01.5-070C25 Sheet Vinyl Floor] - Newer

Details	Values
Brief Description (40 Characters)	Replace Newer Sheet Vinyl
Current event Year (YYYY)	2025
Estimated Event Cost	$117,450

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	810	Base Rate for Material and Labour	$73	m²	$59,130
2	01. Architectural & Structural	810	Construction Contingency	$11	m²	$8,910
3	01. Architectural & Structural	810	Average Total Project Soft Costs	$25	m²	$20,250
4		810	LCF - Material & Labour	$24	m2	$19,440
5		810	LCF - Contingency & Soft Costs	$12	m2	$9,720

Narratives

Event Description

Cyclical flooring replacement. Replace sheet vinyl in corridors. Replace approximately 30% of sheet vinyl in labs.

Event Justification & Strategy

Sheet vinyl replacement will promote a professional and clean appearance.

Implication of Event Deferral (Risks)

Event delay would risk increased damage and tripping hazards may occur.

01.5-070C35 Painted Concrete Floor

Details	Values
Expected Life	10
Component Cost	24,000
Last Major Action Year	1995
Component Condition (For BCR use only)	Poor
Quantity	1,000
Measurement unit/ Metric	m2

Narratives

Component Description

Painted concrete floors are identified in service rooms/areas and storage rooms including:
- Water treatment addition
- Loading area
- Mechanical penthouse.

Component Condition & Anticipated Replacement Date

Overall painted concrete floors have a poor condition rating. Cyclical repainting should start in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Deteriorated Paint on concrete floor (typical) - electrical / mechanical room.

RP Replacement [01.5-070C35 Painted Concrete Floor]

Details	Values
Brief Description (40 Characters)	Repaint Concrete Floors
Current event Year (YYYY)	2017
Estimated Event Cost	$24,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1000	Base Rate for Material and Labour	$12	m²	$12,000
2	01. Architectural & Structural	1000	Construction Contingency	$2	m²	$2,000
3	01. Architectural & Structural	1000	Average Total Project Soft Costs	$4	m²	$4,000
4		1000	LCF - Material & Labour	$4	m2	$4,000
5		1000	LCF - Contingency & Soft Costs	$2	m2	$2,000

Narratives

Event Description

Cyclical repainting program. Repaint concrete floors in worse condition (service areas).

Event Justification & Strategy

When repainted, appearance and functionality (ease of cleaning) will be maintained.

Implication of Event Deferral (Risks)

Event delay would promote a very poor appearance and dusty situations may increase.

01.5-070C45 Quarry Tile Floor

Details	Values
Expected Life	30
Component Cost	124,650
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	450
Measurement unit/ Metric	m2

Narratives

Component Description

Quarry tile flooring is located in the Administration Block as follows:
- 6"x6" brown tile at Main Entry Lobby including stairs and landings at basement level, Main floor level and Second floor level. These floor areas are original construction.

Component Condition & Anticipated Replacement Date

The quarry tiled areas are in average condition. Their replacement may be warranted in 15 years or 2028.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Porcelain floor tile at entry foyer (lower level).

CP Replacement [01.5-070C45 Quarry Tile Floor]

Details	Values
Brief Description (40 Characters)	Replace Quarry Tile Floor
Current event Year (YYYY)	2028
Estimated Event Cost	$124,650

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	450	Base Rate for Material and Labour	$139	m²	$62,550
2	01. Architectural & Structural	450	Construction Contingency	$21	m²	$9,450
3	01. Architectural & Structural	450	Average Total Project Soft Costs	$48	m²	$21,600
4		450	LCF - Material & Labour	$46	m2	$20,700
5		450	LCF - Contingency & Soft Costs	$23	m2	$10,350

Narratives

Event Description

Replace quarry tile in all main entrance and hallway areas.

Event Justification & Strategy

By the indicated date, this material will out dated and appearance and damages may be issues. Replacement would be warranted.

Implication of Event Deferral (Risks)

By this date, this tile will be very out dated and cracks and durability may be issues. Event delay would only increase these issues and appearance may also be an issue.

01.5-070C55 Epoxy Floor

Details	Values
Expected Life	15
Component Cost	52,020
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	180
Measurement unit/ Metric	m2

Narratives

Component Description

Epoxy (paint) floor at following locations:

Lab block:
Basement Floor: 2 of 27 lab modules
Main Floor: 9 of 36 lab modules
Second Floor: 0 of 36 lab modules
Third Floor: 0 of 36 lab modules
Fourth Floor: 0 of 36 lab modules

Component Condition & Anticipated Replacement Date

Overall epoxy floor coating condition is considered fair. Recoating should be implemented in 2017.

Assessment Criteria	Existence
Discolouration or staining	
Default	Yes

Epoxy flooring - Lab.

CP Replacement [01.5-070C55 Epoxy Floor]

Details	Values
Brief Description (40 Characters)	Recoat Epoxy Finished Floors
Current event Year (YYYY)	2017
Estimated Event Cost	$52,020

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	180	Base Rate for Material and Labour	$145	m²	$26,100
2	01. Architectural & Structural	180	Construction Contingency	$22	m²	$3,960
3	01. Architectural & Structural	180	Average Total Project Soft Costs	$50	m²	$9,000
4		180	LCF - Material & Labour	$48	m2	$8,640
5		180	LCF - Contingency & Soft Costs	$24	m2	$4,320

Narratives

Event Description

Recoat floors having an epoxy finish.

Event Justification & Strategy

Recoating the epoxy floor areas will maintain appearance and functionality (ease of cleaning).

Implication of Event Deferral (Risks)

Event delay would promote a very poor appearance and dusty situations may increase.

01.5-070C60 Vinyl Floor Tile

Details	Values
Expected Life	15
Component Cost	66,700
Last Major Action Year	1985
Component Condition (For BCR use only)	Fair
Quantity	460
Measurement unit/ Metric	m2

Narratives

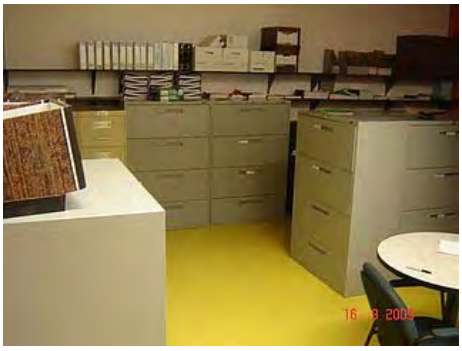
Component Description

The Lab block has original vinyl tile in the following locations:
Basement Floor: 5 of 27 lab modules
Main Floor: 0 of 36 lab modules
Second Floor: 5 of 36 lab modules
Third Floor: 5 of 36 lab modules
Fourth Floor: 5 of 36 lab modules

Component Condition & Anticipated Replacement Date

Original vinyl floor tiles have anomalies and are regarded in fair condition. Replacement is scheduled for 2015.

Assessment Criteria	Existence
Excessive wear	
Default	Yes
Stains and discolouration	
Default	Yes



Original Vinyl tile in room 1-28.

CP Replacement [01.5-070C60 Vinyl Floor Tile]

Details	Values
Brief Description (40 Characters)	Replace Vinyl Floor Tiles
Current event Year (YYYY)	2015
Estimated Event Cost	$66,700

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	460	Base Rate for Material and Labour	$73	m²	$33,580
2	01. Architectural & Structural	460	Construction Contingency	$11	m²	$5,060
3	01. Architectural & Structural	460	Average Total Project Soft Costs	$25	m²	$11,500
4		460	LCF - Material & Labour	$24	m2	$11,040
5		460	LCF - Contingency & Soft Costs	$12	m2	$5,520

Narratives

Event Description

Replace vinyl tile with resilient sheet flooring. Costed as resilient.

Event Justification & Strategy

Vinyl floor tile replacement will maintain appearance and functionality (ease of cleaning).

Implication of Event Deferral (Risks)

Event delay would risk increased damage and tripping hazards may occur.

01.5-080C10 Gypsum Board Ceiling

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	15,000
Measurement unit/ Metric	m2

Narratives

Component Description

Gypsum board ceilings are only found in the Lab Block, on the Basement floor:
- Cafeteria ceiling (stipple finish)
- First Aid Room

Refer to report section "01.5-060C15 Paint" for painting task.

Component Condition & Anticipated Replacement Date

All gypsum board ceilings are considered in good condition and are granted another 30 service years. Since replacement is in 2043 and outside this BCR timeline, no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-080C15 Linear Metal Ceiling

Details	Values
Expected Life	30
Component Cost	635,800
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	2,200
Measurement unit/ Metric	m2

Narratives

Component Description

Linear metal ceilings are found in both blocks as follows:
Lab block: All floors - main corridor within lab block

Administration Block: Main entrance lobby

The ceiling utilizes 3" wide linear metal (dark bronze prefinished aluminum).

Component Condition & Anticipated Replacement Date

All linear metal ceiling locations are considered in good condition. Another 25 service years are granted before full replacement may be warranted in 2038.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Linear metal ceiling in corridor.

CP Replacement [01.5-080C15 Linear Metal Ceiling]

Details	Values
Brief Description (40 Characters)	Replace Linear Metal Ceiling
Current event Year (YYYY)	2038
Estimated Event Cost	$635,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2200	Base Rate for Material and Labour	$145	m²	$319,000

2	01. Architectural & Structural	2200	Construction Contingency	$22	m²	$48,400
3	01. Architectural & Structural	2200	Average Total Project Soft Costs	$50	m²	$110,000
4		2200	LCF - Material & Labour	$48	m2	$105,600
5		2200	LCF - Contingency & Soft Costs	$24	m2	$52,800

Narratives

Event Description

Replace existing linear metal ceilings with same or newly designed materials.

Event Justification & Strategy

By 2038, this ceiling type will be out dated and replacement parts may become an issue.

Implication of Event Deferral (Risks)

Delaying this event would promote an out date appearance and components may be very hard to purchase.

01.5-080C30 Suspended Acoustic Panel Ceiling

Details	Values
Expected Life	10
Component Cost	186,250
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	2,500
Measurement unit/ Metric	m2

Narratives

Component Description

Standard suspended acoustic panel ceilings are found in all blocks as follows:
Administration block:
- Basement: Finance Area
- Main Floor: Office Area
- Second Floor: Library

Lab block: All lab offices and lab corridors (except main corridor).

Service block: All offices on basement floor.

All tiles are 2'x2' white mineral fibre supported by aluminum T-Bar. T-bar is prefinished white except at main floor executive office suite and 2nd floor library (colour: black).

Component Condition & Anticipated Replacement Date

Administration Block:
Basement: Finance Area
Main Floor: Office Area
Second Floor: Library

Lab block: All lab offices and lab corridors (except main corridor).

Service block: All offices on basement floor.

Noted deficiencies reflect an overall condition rating of fair. Replacement is scheduled for 2018.

Assessment Criteria	Existence
Missing panels or suspension elements	
Default	Yes
Stains and discolouration	
Default	Yes

T-bar ceiling system in hallway with different vintage tiles.

CP Replacement [01.5-080C30 Suspended Acoustic Panel Ceiling]

Details	Values
Brief Description (40 Characters)	Replace Ceiling Grid System - 50%
Current event Year (YYYY)	2018
Estimated Event Cost	$186,250

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1250	Base Rate for Material and Labour	$75	m²	$93,750
2	01. Architectural & Structural	1250	Construction Contingency	$11	m²	$13,750
3	01. Architectural & Structural	1250	Average Total Project Soft Costs	$26	m²	$32,500
4		1250	LCF - Material & Labour	$25	m2	$31,250
5		1250	LCF - Contingency & Soft Costs	$12	m2	$15,000

Narratives

Event Description

Replace panels in corridors and high traffic areas - (50% of total area of panels).

Event Justification & Strategy

Cyclical replacement will maintain a professional appearance and ensure functionality.

Implication of Event Deferral (Risks)

Event delay would certainly promote an unprofessional appearance. Damaged grid and tiles may present a safety concern of falling.

01.5A-055 Interior Door Hardware

Details	Values
Expected Life	7
Component Cost	29,520
Last Major Action Year	2005
Component Condition (For BCR use only)	Average
Quantity	310
Measurement unit/ Metric	ea

Narratives

Component Description

Interior door hardware consists of:

Card Access at Vestibule doors. While most other doors have typical lockset: mortise lockset with rose trim and integral keying.

Component Condition & Anticipated Replacement Date

Cyclical replacement of closers, stops, seals, handsets and other hardware. Currently, all hardware is rated in average condition. Since frequency of use plays a major role in replacement timing, certain door hardware may last a very long time. As a result, budget 10% of interior doors to have their hardware replaced, wherever required. This replacement task should start in 2018 end repeat every 7 years.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical brushed aluminum lever handset.

CP Replacement [01.5A-055 Interior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Door Hardware - 10%
Current event Year (YYYY)	2018
Estimated Event Cost	$29,520

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$495	EACH	$14,850
2	01. Architectural & Structural	30	Construction Contingency	$74	EACH	$2,220
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$171	EACH	$5,130
4		30	LCF - Material & Labour	$163	EACH	$4,890
5		30	LCF - Contingency & Soft Costs	$81	EACH	$2,430

Narratives

Event Description

Cyclical replacement of interior door hardware, wherever required - budget for approximately 30 doors.

Event Justification & Strategy

Cyclical interior door hardware replacements will maintain functionality, security, integrity of fire separations and maintain acoustic separation in designated doors.

Implication of Event Deferral (Risks)

Event delay would increase the chance of doors not performing correctly during normal and emergency situations. Life safety issues would arise.

01.5A-110 Interior Stairs - Concrete

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	flts

Narratives

Component Description

1) Entry lobby stair extends from basement to 2nd floor (no exterior exit).

Concrete stair with 6"x6" porcelain tile treads and risers. The side guards and railing consist of: 100mm wide x 450mm glu-lam wood guardrail with stainless steel handrail on top.

2) Stair in mechanical pump room has 400mm wide treads x 3 risers.

Component Condition & Anticipated Replacement Date

All interior concrete stairs are considered in average condition. The next anticipated replacement is in 2047. Since this date is beyond this BCR timing, no event is offered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Concrete stair in main entry foyer.

01.5A-110 Interior Steel Stairs

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	6
Measurement unit/ Metric	flts

Narratives

Component Description

Five Interior Steel Stairs are located as follows:
1) Administration block exit Stair (extends from basement to 2nd floor) exterior exit
2) Lab block East Stair (extend from basement to 4th floor) exterior exit
3) Lab block West Stair (extends from basement to elevator machine room) exterior exit at grade and roof
4) Lab block North Stair (extends from basement to mechanical penthouse) exterior exit at grade
5) Lab block South Stair (extends from basement to mechanical penthouse) exterior exit at grade

Typical Stair construction:
- Concrete tread in steel pan
- Rubber treads with integral non-slip abrasive nosing
- Painted metal risers
- 25mm x 25mm tube handrail on 25mm x 25mm posts at 1500mm o.c.
- Handrail on one side only

Note: Administration block exit stair has a 50mm pipe handrail with vertical 25mm tube posts at 100mm o.c.

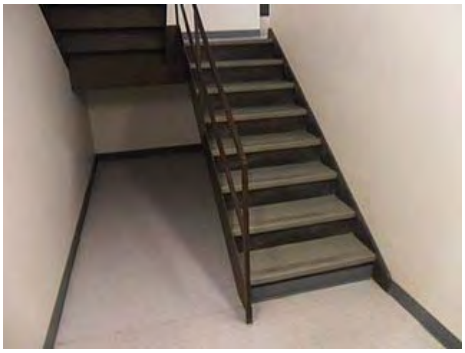
Component Condition & Anticipated Replacement Date

Stairs do not have code compliant handrails. These should be corrected in 2015.

Currently, the rubber treads are rated in good condition. By 2030, these may require replacement.

Overall stair construction is considered good. The overall assemblies are rated in average condition.

Assessment Criteria	Existence
Handrail damaged or non code compliant	
Default	Yes



Typical steel stair with rubber treads and non-compliant handrail.

CF Building Code/Canada Labour Code [01.5A-110 Interior Steel Stairs]

Details	Values
Brief Description (40 Characters)	Modify Stair Handrails & Guardrails
Current event Year (YYYY)	2015
Estimated Event Cost	$115,680

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	80	Base Rate for Material and Labour	$727	m	$58,160
2	01. Architectural & Structural	80	Construction Contingency	$109	m	$8,720
3	01. Architectural & Structural	80	Average Total Project Soft Costs	$251	m	$20,080
4		80	LCF - Material & Labour	$240	m	$19,200
5		80	LCF - Contingency & Soft Costs	$119	m	$9,520

Narratives

Event Description

Modify handrails and guardrails to conform with current code.

Event Justification & Strategy

Correcting interior stair handrails will ensure code conformance and promote safety.

Implication of Event Deferral (Risks)

Not implementing this task when indicated would be against code. Life safety issues may arise.

CP Replacement [01.5A-110 Interior Steel Stairs]

Details	Values
Brief Description (40 Characters)	Replace Rubber Treads
Current event Year (YYYY)	2030
Estimated Event Cost	$30,780

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	90	Base Rate for Material and Labour	$172	m²	$15,480
2	01. Architectural & Structural	90	Construction Contingency	$26	m²	$2,340
3	01. Architectural & Structural	90	Average Total Project Soft Costs	$59	m²	$5,310
4		90	LCF - Material & Labour	$57	m2	$5,130
5		90	LCF - Contingency & Soft Costs	$28	m2	$2,520

Narratives

Event Description

Replace rubber treads on all interior stairs.

Event Justification & Strategy

Cyclical replacement program will ensure stairs are functional during normal and emergency situations.

Implication of Event Deferral (Risks)

Not implementing this task when indicated would risk life safety issues.

01.6A-010 Building Signage (Interior)

Details	Values
Expected Life	10
Component Cost	0
Last Major Action Year	1998
Component Condition (For BCR use only)	Good
Quantity	25
Measurement unit/ Metric	m2

Narratives

Component Description

Signage at stairs and exit stairs complies with federal standards.

Building directory is an LCD/Plasma Monitor.

Component Condition & Anticipated Replacement Date

Current interior signage is considered in good condition. In 10 years (2023), various signs may require updating.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical interior signage.

RP Replacement [01.6A-010 Building Signage (Interior)]

Details	Values
Brief Description (40 Characters)	Replace Interior Building Signage
Current event Year (YYYY)	2023
Estimated Event Cost	$725

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	25	Base Rate for Material and Labour	$15	m²	$375
2	01. Architectural & Structural	25	Construction Contingency	$2	m²	$50
3	01. Architectural & Structural	25	Average Total Project Soft Costs	$5	m²	$125
4		25	LCF - Material & Labour	$5	m2	$125
5		25	LCF - Contingency & Soft Costs	$2	m2	$50

Narratives

Event Description

Update interior signage as required.

Event Justification & Strategy

Cyclical interior signage replacement will ensure signs are always readable.

Implication of Event Deferral (Risks)

Delaying interior signage replacement may only risk wayfinding.

01.6A-025 Fixed or Permanent Furnishing (Millwork)

Details	Values
Expected Life	20
Component Cost	39,920
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	15
Measurement unit/ Metric	m

Narratives

Component Description

Permanent millwork is found at the following locations:
1) Reception Desk at main entry: solid oak construction (6m length x 750mm height; 'u' shape)
2) Reception desk at rear entry: plywood construction wood veneer and laminate work surface
3) Reception desk at B-82: laminate veneer and surface on plywood construction (1050mm high x 3m long)
4) Kitchenette at B-83: laminate veneer and countertop on plywood construction (1500mm x 900mm high)
5) Cabinets and shelving in Cafeteria with Stainless steel countertop

Component Condition & Anticipated Replacement Date

1) Reception Desk at main entry: Crack in top surface - fair condition - replace in 2015.
2) Reception desk at rear entry: Plastic laminate chipped above drawers - average condition - replace in 2023.
3) Reception desk at B-82: Average condition - replace in 2023.
4) Kitchenette at B-83: Average condition - replace in 2023.
5) Cabinets and shelving in Cafeteria with Stainless steel countertop: Average condition - replace in 2023.

Assessment Criteria	Existence
Deterioration of paint finish & surfaces	
Default	Yes

RP Life Extension [01.6A-025 Fixed or Permanent Furnishing (Millwork)] - Main Reception

Details	Values
Brief Description (40 Characters)	Repair Main Reception Desk
Current event Year (YYYY)	2015
Estimated Event Cost	$2,495

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$1,255	m	$1,255
2	01. Architectural & Structural	1	Construction Contingency	$188	m	$188
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$433	m	$433
4		1	LCF - Material & Labour	$414	m	$414
5		1	LCF - Contingency & Soft Costs	$205	m	$205

Narratives

Event Description

Repair countertop on main reception desk.

Event Justification & Strategy

Repairs and refinishing will maintain appearance and functional working conditions.

Implication of Event Deferral (Risks)

Event deferral would risk safe usage for employees.

Crack in Main reception desk's wood counter.

Dated looking laminate in washroom.

CP Life Extension [01.6A-025 Fixed or Permanent Furnishing (Millwork)]

Details	Values
Brief Description (40 Characters)	Replace Deficient Millwork
Current event Year (YYYY)	2023
Estimated Event Cost	$37,425

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	15	Base Rate for Material and Labour	$1,255	m	$18,825
2	01. Architectural & Structural	15	Construction Contingency	$188	m	$2,820
3	01. Architectural & Structural	15	Average Total Project Soft Costs	$433	m	$6,495
4		15	LCF - Material & Labour	$414	m	$6,210
5		15	LCF - Contingency & Soft Costs	$205	m	$3,075

Narratives

Event Description

Replace worn and dated-looking surfaces and worn hardware at all other reception style desks.

Event Justification & Strategy

Ensuring millwork is always safe and useable will promote professional working conditions.

Implication of Event Deferral (Risks)

Event deferral would risk safe usage for employees.

Plastic laminate surface on convenience cabinets in seminar room (typical).

01.6A-035 Kitchen Equipment

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	10
Measurement unit/ Metric	m2

Narratives

Component Description

Kitchen equipment includes: Deep Fryer, Grill, Range, Microwave, Dishwasher, Refrigerators and Exhaust hood.

Component Condition & Anticipated Replacement Date

Equipment in working condition, however, kitchen not currently in use. Due to this situation, there is no anticipated replacement date for this equipment and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Kitchen equipment in cafeteria (cafeteria currently not in use).

01.6A-050 Walk-in Freezer/Cold Storage

Details	Values
Expected Life	7
Component Cost	266,560
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	ea

Narratives

Component Description

Cold rooms (Walk-in refrigeration) as follows:
- Basement floor: 6 rooms (approximately 10'x20' each)
- Main Floor: 3 rooms (approximately 10'x20' each); 5 rooms (approximately 10'x6' each)
- Second Floor: 2 rooms (approximately 10'x20' each)
- Third floor: 6 rooms (approximately 10'x6' each)
- Fourth floor: (approximately 10'x6' each)

Component Condition & Anticipated Replacement Date

All freezers have an overall average condition. They may require replacement in 8 years or 2021.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Walk-in freezer - Lab building.

CP Replacement [01.6A-050 Walk-in Freezer/Cold Storage]

Details	Values
Brief Description (40 Characters)	Replace Walk-in Freezers
Current event Year (YYYY)	2021
Estimated Event Cost	$266,560

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$19,157	EACH	$134,099
2	01. Architectural & Structural	7	Construction Contingency	$2,873	EACH	$20,111
3	01. Architectural & Structural	7	Average Total Project Soft Costs	$6,609	EACH	$46,263
4		7	LCF - Material & Labour	$6,315	EACH	$44,205
5		7	LCF - Contingency & Soft Costs	$3,126	EACH	$21,882

Narratives

Event Description

Replace all walk-in style refrigeration/freezer units. Costing is for budgeting every seven years to replace freezer/coolers wherever required.

Event Justification & Strategy

Cooler and freezer replacements will promote continued performance.

Implication of Event Deferral (Risks)

Delaying this task may promote improper specimen cooling/freezing and increase energy consumption with units using older technology.

01.6A-060 Exterior Building Mounted Signage

Details	Values
Expected Life	40
Component Cost	28,890
Last Major Action Year	1995
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Standard Canada Wordmark signage mounted on Penthouse Wall.

Component Condition & Anticipated Replacement Date

Currently, the exterior wall mounted Canada word mark signage and lighting are in good condition. Replacement may be required in 2035.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Canada Wordmark Signage.

CP Replacement [01.6A-060 Exterior Building Mounted Signage]

Details	Values
Brief Description (40 Characters)	Replace Exterior Building Mounted Signage
Current event Year (YYYY)	2035
Estimated Event Cost	$28,890

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	00. Property	1	Base Rate for Material and Labour	$14,533	EACH	$14,533
2	00. Property	1	Construction Contingency	$2,180	EACH	$2,180
3	00. Property	1	Average Total Project Soft Costs	$5,014	EACH	$5,014
4		1	LCF - Material & Labour	$4,791	EACH	$4,791
5		1	LCF - Contingency & Soft Costs	$2,372	EACH	$2,372

Narratives

Event Description

Replace exterior "Canada" wordmark sign and all lighting. Used costing info for "00.1-010C16 Monuments, Artwork, & Fountains".

Event Justification & Strategy

Properly maintaining the "Canada" wordmark sign would be in accordance with the Federal Identity Program.

Implication of Event Deferral (Risks)

Not ensuring this task is implemented when indicated may compromise the sign's integrity. Falling may present life safety issues.

02. Conveying Systems

02.1A-014 Elevator Modernization (Traction)

Details	Values
Expected Life	35
Component Cost	883,416
Last Major Action Year	1977
Component Condition (For BCR use only)	Fair
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the 2 Traction Elevators located on the south centre core of the laboratory building. The elevators provide service to Levels 1 through 6. The machine room is located on Level 7.

Component Condition & Anticipated Replacement Date

Elevators appears to be in average condition but based on their age, have been given a fair rating in this BCR. There is no history of extensive problems and regular service is provided by a long standing elevator contractor. The mechanical-electrical controls are quite dated but appear to be functioning well. An upgrade to electronic controls may be considered and budgeted for at the time of the next BCR in 2017. The mechanical drive system is also near its projected life expectancy but no reported immediate concerns.

Original electrical-mechanical controls in Elevator Machine Room

CP Replacement [02.1A-014 Elevator Modernization (Traction)]

Details	Values
Brief Description (40 Characters)	Elevator Modernization (Traction)
Current event Year (YYYY)	2018
Estimated Event Cost	$883,416

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	02. Conveying Systems	2	Base Rate for Material and Labour	$222,203	EACH	$444,406
2	02. Conveying Systems	2	Construction Contingency	$33,330	EACH	$66,660
3	02. Conveying Systems	2	Average Total Project Soft Costs	$76,660	EACH	$153,320
4		2	LCF - Material & Labour	$73,254	EACH	$146,508
5		2	LCF - Contingency & Soft Costs	$36,261	EACH	$72,522

Narratives

Event Description

This event would include for refurbishment of the elevator controls which appear to be all original.

Event Justification & Strategy

These elevators are not covered under the PWGSC 25 year National Master Elevator contract. Any costs related to upgrades and repairs will have to be taken out of the O&M budget unless identified for a project. Costs related to elevator repairs can be very expensive and there is not a level of insurance that would be built into a long term contract.

The elevator is at its projected life expectancy of 35 years, but still appears to be working reliably. The details of the current contract terms are unknown, with the age of this equipment perhaps a more in-depth study of the elevators should be taken at the time of the next BCR.

Implication of Event Deferral (Risks)

The elevator must be maintained in a safe working order per Building Code. Should one elevator fail there is a backup.

02.1A-016 Elevator Cab Refit

Details	Values
Expected Life	30
Component Cost	106,064
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the interior of the 2 elevator cabs having stainless steel tubular handrails on all sides, continuous metal kick plating on all sides (900mm height) and rubber tile flooring. There is a dropped ceiling with flow through tiles for the continuous fluorescent lighting. Each cab interior measures approximately - Each are approximately 7'x5' x8' high.

Component Condition & Anticipated Replacement Date

The elevator cabs both appear to be in average condition. One is lined with a protective blanket to cover the walls to protect from damage while moving freight. Considering an upgrade in 1992, the elevator cabs should not require any work until at least 2020.

Note - elevator control panels do not meet accessibility standard. Panels should be replaced in 2014.

Passenger elevator interior

RF Accessibility [02.1A-016 Elevator Cab Refit] - Control Panels

Details	Values
Brief Description (40 Characters)	Replace Elevator Control Panels
Current event Year (YYYY)	2014
Estimated Event Cost	$14,724

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		2	Base Rate Material & Labour	$3,703	EACH	$7,406
2		2	Construction Contingency	$556	EACH	$1,112
3		2	Project Soft Costs	$1,278	EACH	$2,556
4		2	LCF - Material & Labour	$1,221	EACH	$2,442
5		2	LCF - Contingency & Soft Costs	$604	EACH	$1,208

Narratives

Event Description

Replace elevator control panels to meet accessibility standard. AVS costing for cab refit is too high for only replacing the control panel. Manual costing created by taking 1/6th of AVS costing.

Event Justification & Strategy

This event will ensure better usage and be in accordance with the accessibility standard.

Implication of Event Deferral (Risks)

Event delay will infringe on accessibility standard compliance.

Elevator controls - do not conform with current accessibility standard.

CP Replacement [02.1A-016 Elevator Cab Refit]

Details	Values
Brief Description (40 Characters)	Elevator Cab Refit
Current event Year (YYYY)	2020
Estimated Event Cost	$88,340

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	02. Conveying Systems	2	Base Rate for Material and Labour	$22,220	EACH	$44,440
2	02. Conveying Systems	2	Construction Contingency	$3,333	EACH	$6,666
3	02. Conveying Systems	2	Average Total Project Soft Costs	$7,666	EACH	$15,332
4		2	LCF - Material & Labour	$7,325	EACH	$14,650
5		2	LCF - Contingency & Soft Costs	$3,626	EACH	$7,252

Narratives

Event Description

This event is for the replacement of the elevator cab interiors.

Event Justification & Strategy

The cabs should be kept in reasonable condition and periodically refurbished when it makes sense to do so but this is generally a cosmetic item.

Implication of Event Deferral (Risks)

Event deferral may see marred and unsightly surfaces. Aesthetics would become an issue. Prolonged delay may develop unsafe conditions.

02.2A-015 Chain Hoists

Details	Values
Expected Life	25
Component Cost	7,879
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the chain hoist located in the Water Treatment room at the back loading dock.

Component Condition & Anticipated Replacement Date

The chain hoist appears to be in good condition and should not have to be replaced before 2025.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Chain Hoist by loading dock in Water Treatment room

RP Replacement [02.2A-015 Chain Hoists]

Details	Values
Brief Description (40 Characters)	Replace Chain Hoist
Current event Year (YYYY)	2025
Estimated Event Cost	$7,879

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	02. Conveying Systems	1	Base Rate for Material and Labour	$3,963	EACH	$3,963
2	02. Conveying Systems	1	Construction Contingency	$595	EACH	$595
3	02. Conveying Systems	1	Average Total Project Soft Costs	$1,367	EACH	$1,367
4		1	LCF - Base Rate Material & Labour	$1,307	EACH	$1,307
5		1	LCF - Conting. & Soft Costs	$647	EACH	$647

Narratives

Event Description

This event is the replacement of the 2 ton chain hoist located in the Water Treatment room at the back loading dock.

Event Justification & Strategy

The chain hoist is required to move large and/or heavy equipment from the mechanical room and water treatment areas basement to and from the loading dock. The chain hoist is necessary to perform this function but it is rarely utilized. It is a fairly low cost and readily available item to replace in a short term urgent need.

Implication of Event Deferral (Risks)

Lack of access to and from the basement could cause havoc in making repairs to critical building systems in the basement area.

03. Mechanical

03.1A-010 CHP Related Heat Exchangers

Details	Values
Expected Life	30
Component Cost	302,020
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	ea

Narratives

Component Description

This item consists of the heat exchangers located in the basement mechanical room and penthouse.

Component Condition & Anticipated Replacement Date

These heat exchangers are assumed to be in average condition with no problems. Based on them being original from 1977, the anticipated life would be 2018. This has been chosen as a replacement date unless there are concerns prior to that time. The penthouse heat exchangers for heating glycol are new and are not included in this assessment.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

New steam-glycol converter in Penthouse

CP Replacement [03.1A-010 CHP Related Heat Exchangers]

Details	Values
Brief Description (40 Characters)	Replace CHP Related Heat Exchangers
Current event Year (YYYY)	2018
Estimated Event Cost	$302,020

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	20	Base Rate for Material and Labour	$7,597	EACH	$151,940
2	03. Mechanical	20	Construction Contingency	$1,139	EACH	$22,780
3	03. Mechanical	20	Average Total Project Soft Costs	$2,621	EACH	$52,420
4		20	LCF - Base Rate Material & Labour	$2,504	EACH	$50,080
5		20	LCF - Conting. & Soft Costs	$1,240	EACH	$24,800
6		0	Quantity adjusted to 20 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

Replace steam - hot water/heating glycol heat exchangers.

Event Justification & Strategy

These steam heat exchangers are the primary heating source for the building. As long as they are providing reliable operation and proper maintenance (chemical treatment) is being done, there is no reason to replace these prior to 2018. Should problems develop prior to the anticipated date then this even can be bumped up.

Implication of Event Deferral (Risks)

Depending on the timing, a failure could have serious consequences if there is extremely cold temperatures. It is likely there would be some warning of a problem before a serious situation, slow deterioration is typical with heat exchangers.

03.1A-020 Duct Systems

Details	Values
Expected Life	40
Component Cost	5,650,000
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	31,300
Measurement unit/ Metric	m2

Narratives

Component Description

This element includes the HVAC ductwork and air mixing boxes, which distributes conditioned air from the central air handling units in the penthouse and 3rd floor mechanical rooms to the occupied spaces.

Component Condition & Anticipated Replacement Date

The ductwork appears to be in average condition considering it's age, it was installed during the 1977 construction. The expected life of 40 years would result in a 2017 replacement which can likely be extended based on an evaluation at the time of the next BCR.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Discharge ductwork typical of AHU-1, -2

CP Replacement [03.1A-020 Duct Systems] - Mixing Boxes

Details	Values
Brief Description (40 Characters)	Replace Mixing Boxes
Current event Year (YYYY)	2018
Estimated Event Cost	$1,130,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5000	Base Rate for Material and Labour	$114	m²	$570,000
2	03. Mechanical	5000	Construction Contingency	$17	m²	$85,000
3	03. Mechanical	5000	Average Total Project Soft Costs	$39	m²	$195,000
4		5000	LCF - Base Rate Material & Labour	$37	m2	$185,000
5		5000	LCF - Conting. & Soft Costs	$19	m2	$95,000
6		0	Quantity adjusted to 5000 to achieve adequate costing for event.	$0	m2	$0

Narratives

Event Description

This event is for the replacement of the HVAC terminal constant volume air boxes.

Event Justification & Strategy

The projected lifespan of terminal boxes is 40 years, which brings the date for this replacement to 2017. This can be re-assessed at the time of the next BCR. It is possible the actuators age begins to result in increased maintenance costs that could justify scheduling an upgrade.

Implication of Event Deferral (Risks)

The mixing boxes blend the right proportions of conditioned air throughout the building to meet ventilation and heating/cooling requirements for all occupied spaces. The likelihood of any IAQ risks is minimal provided the ductwork is maintained in a clean condition to minimize any chance of microbial growth in the ductwork.

CP Replacement [03.1A-020 Duct Systems] - Ductwork

Details	Values
Brief Description (40 Characters)	Replace Ductwork
Current event Year (YYYY)	2022
Estimated Event Cost	$4,520,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	20000	Base Rate for Material and Labour	$114	m²	$2,280,000
2	03. Mechanical	20000	Construction Contingency	$17	m²	$340,000
3	03. Mechanical	20000	Average Total Project Soft Costs	$39	m²	$780,000
4		20000	LCF - Base Rate Material & Labour	$37	m2	$740,000
5		20000	LCF - Conting. & Soft Costs	$19	m2	$380,000
6		0	Quantity adjusted to 20000 to achieve adequate costing for event.	$0	m2	$0

Narratives

Event Description

This event is for the replacement of the HVAC ductwork from the air handling units to the mixing boxes.

Event Justification & Strategy

The projected lifespan of ductwork is 40 years, which brings the date for this replacement to 2017. This is unlikely and can be re-assessed at the time of the next BCR.

Implication of Event Deferral (Risks)

Ductwork provides HVAC throughout the building to meet ventilation and heating/cooling requirements for all occupied spaces. The likelihood of any risks is minimal provided the ductwork is maintained in a clean condition to minimize any chance of microbial growth in the ductwork.

03.1A-023 DX Split AHU - Cool

Details	Values
Expected Life	25
Component Cost	1,518,429
Last Major Action Year	2002
Component Condition (For BCR use only)	Average
Quantity	141
Measurement unit/ Metric	Cool tons

Narratives

Component Description

This item is the cooling condensing units serving the many walk-in coolers and freezers throughout the laboratory areas.

Component Condition & Anticipated Replacement Date

The split systems are in generally average condition overall. Regular servicing is performed and any repairs are addressed quickly to minimize any downtime. Based on an estimated install date of 2002, these should be replaced in ~2027.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

DX Split AHU Cooling Units

CP Replacement [03.1A-023 DX Split AHU - Cool]

Details	Values
Brief Description (40 Characters)	Replace Condensing Units for Freezers & Coolers
Current event Year (YYYY)	2027
Estimated Event Cost	$1,518,429

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	141	Base Rate for Material and Labour	$5,417	Cool tons	$763,797
2	03. Mechanical	141	Construction Contingency	$813	Cool tons	$114,633
3	03. Mechanical	141	Average Total Project Soft Costs	$1,869	Cool tons	$263,529
4		141	LCF - Base Rate Material & Labour	$1,786	Cool tons	$251,826
5		141	LCF - Conting. & Soft Costs	$884	Cool tons	$124,644

Narratives

Event Description

This event is the life cycle replacement of the condensing units and evaporators on the walk-in coolers and freezers for the scientific programs.

Event Justification & Strategy

The split AC units provide 24/7 dedicated cooling to coolers and freezers that are critical to the DFO programs. There will likely be some sporadic failures that will have to be dealt with on a case by case basis prior to the projected replacement date.

Implication of Event Deferral (Risks)

As the equipment serves areas of a critical nature, the reliability of these cooling units is also critical. Should the equipment be unreliable and fail, there could be a disruption to the program.

03.1A-024 Computer Cooling AHU

Details	Values
Expected Life	25
Component Cost	52,002
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	Cool tons

Narratives

Component Description

This element includes the split DX system air conditioning unit installed for the LAN room that provides dedicated 24/7 cooling.

Component Condition & Anticipated Replacement Date

The split system is in average condition. Based on an estimated install date of 2000, it should be replaced in 2025.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Floor/wall mounted computer cooling unit

CP Replacement [03.1A-024 Computer Cooling AHU]

Details	Values
Brief Description (40 Characters)	Replace Computer Cooling AHU
Current event Year (YYYY)	2025
Estimated Event Cost	$52,002

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	3	Base Rate for Material and Labour	$8,720	Cool tons	$26,160

2	03. Mechanical	3	Construction Contingency	$1,308	Cool tons	$3,924
3	03. Mechanical	3	Average Total Project Soft Costs	$3,008	Cool tons	$9,024
4		3	LCF - Base Rate Material & Labour	$2,875	Cool tons	$8,625
5		3	LCF - Conting. & Soft Costs	$1,423	Cool tons	$4,269

Narratives

Event Description

This event is the life cycle replacement of the AC units located in the LAN room on the 3rd floor.

Event Justification & Strategy

The split AC units provide 24/7 dedicated cooling to LAN rooms areas with a higher than normal heat load and operate 24/7.

Implication of Event Deferral (Risks)

As the equipment serves a critical area, the reliability of these cooling units is also critical. Should the equipment be unreliable and fail, there could be a disruption that would impact not only the FWI but other DFO facilities.

03.1A-029 Central Station AHU

Details	Values
Expected Life	25
Component Cost	2,185,040
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	12
Measurement unit/ Metric	ea

Narratives

Component Description

This element consists of the AHU's located in the 3rd floor and penthouse mechanical rooms which collectively supply ventilation to the occupied spaces in laboratories and offices.

Component Condition & Anticipated Replacement Date

AHU's appear to be in average operating condition based on age. The expected life-cycle of 25 years ended in 2002, but based on current condition, replacement has been extended until 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

AH1 - Original 1977 Equipment

CP Replacement [03.1A-029 Central Station AHU]

Details	Values
Brief Description (40 Characters)	Replace Central Station AHUs
Current event Year (YYYY)	2022
Estimated Event Cost	$2,185,040

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	40	Base Rate for Material and Labour	$27,480	EACH	$1,099,200
2	03. Mechanical	40	Construction Contingency	$4,122	EACH	$164,880
3	03. Mechanical	40	Average Total Project Soft Costs	$9,481	EACH	$379,240
4		40	LCF - Base Rate Material & Labour	$9,059	EACH	$362,360
5		40	LCF - Conting. & Soft Costs	$4,484	EACH	$179,360
6		0	Quantity adjusted to 40 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

This event is to replace the AHUs located in the 3rd floor and penthouse mechanical rooms, when they reach the end of their serviceable life.

Event Justification & Strategy

If these units begin to degrade and have costly repairs sooner than 2018, the project should be moved up as they are already well past their projected life expectancy but still have been maintained and are performing reliably.

Implication of Event Deferral (Risks)

If this work is deferred and equipment operation becomes unreliable, the IAQ requirements would not be met, leading to complaints from the building occupants and IAQ related sick leave would result.

03.1A-030 Ventilation Fans

Details	Values
Expected Life	25
Component Cost	1,365,600
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	50
Measurement unit/ Metric	ea

Narratives

Component Description

This element consists of various exhaust fans located throughout the building for the washrooms, electrical rooms and laboratory fume hoods.

Component Condition & Anticipated Replacement Date

The ventilation fans appeal to be in average condition considering age. They should be considered for upgrade or replacement in 2022. They should be looked at more closely for replacement at the time of the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample fumehood directly connected to independent exhaust fan

CP Replacement [03.1A-030 Ventilation Fans]

Details	Values
Brief Description (40 Characters)	Replace Ventilation Fans
Current event Year (YYYY)	2022
Estimated Event Cost	$1,365,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	200	Base Rate for Material and Labour	$3,435	EACH	$687,000
2	03. Mechanical	200	Construction Contingency	$515	EACH	$103,000
3	03. Mechanical	200	Average Total Project Soft Costs	$1,185	EACH	$237,000
4		200	LCF - Base Rate Material & Labour	$1,132	EACH	$226,400
5		200	LCF - Conting. & Soft Costs	$561	EACH	$112,200
6		0	Quantity adjusted to 200 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

This event is for the general replacement of exhaust fans that have become difficult to maintain or are not longer reliable.

Event Justification & Strategy

These fans service small but many critical areas of the facility. The costs and health & safety issues would outweigh deferral of their replacement should they become unreliable or unserviceable. In spite of their age, these units have had few problems. They can be further assessed at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

If these systems become unreliable there could be an impact to the research programs as some of these fans serve laboratories.

03.1A-032 Humidifiers

Details	Values
Expected Life	25
Component Cost	108,330
Last Major Action Year	2002
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the humidifiers located in the discharge supply air ductwork on the 3 main AHU's located in the penthouse.

Component Condition & Anticipated Replacement Date

The humidity grids are in average condition. The humidity boiler is discussed in the CHP Related Heat Exchanger section. The anticipated replacement date is scheduled for 2020.

Assessment Criteria	Existence
Problematic operation	
Default	Yes
Rust and corrosion	
Default	Yes

Disabled Steam Humidification Boiler

CP Replacement [03.1A-032 Humidifiers]

Details	Values
Brief Description (40 Characters)	Replace Humidifier Grids
Current event Year (YYYY)	2027
Estimated Event Cost	$108,330

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	15	Base Rate for Material and Labour	$3,633	EACH	$54,495
2	03. Mechanical	15	Construction Contingency	$545	EACH	$8,175
3	03. Mechanical	15	Average Total Project Soft Costs	$1,253	EACH	$18,795
4		15	LCF - Base Rate Material & Labour	$1,198	EACH	$17,970
5		15	LCF - Conting. & Soft Costs	$593	EACH	$8,895
6		0	Quantity adjusted to 15 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

This event is the replacement of the 3 humidifiers located in the discharge supply air ductwork on the 3 main AHU's located in the penthouse.

Event Justification & Strategy

The humidifier grids will eventually require replacement as they degrade gradually over time and the performance will become less effective. Monitoring the space RH levels on the EMCS under peak load conditions in the winter months will provide information on how well they are performing.

Implication of Event Deferral (Risks)

AH-1 and AH-2 are 100% outside air systems and additive humidity in the winter months will be necessary to maintain 20% RH levels in the occupied spaces which is an ASHRAE recognized minimum acceptable level for IAQ standards.

03.1A-040 Heating & Cooling Piping Systems

Details	Values
Expected Life	30
Component Cost	4,507,200
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	31,300
Measurement unit/ Metric	m2

Narratives

Component Description

This element is composed of the heating and cooling piping that distributes heating and cooling system water from the basement mechanical room to the AHU heating and cooling coils as well as the perimeter heating loop and unit heaters.

Component Condition & Anticipated Replacement Date

The heating and cooling piping systems appeared to be in average condition with no urgent problems. The projected expected life of these systems is 30 years which was in 2007, so this element can be re-assessed at the time of the next BCR in 2017. A project date for replacement has be placed at 2021.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical heating and cooling piping in a service room

CP Replacement [03.1A-040 Heating & Cooling Piping Systems]

Details	Values
Brief Description (40 Characters)	Replace Heating & Cooling Piping Systems - Includes Steam
Current event Year (YYYY)	2021
Estimated Event Cost	$4,507,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	31300	Base Rate for Material and Labour	$79	m²	$2,472,700
2	03. Mechanical	31300	Construction Contingency	$12	m²	$375,600
3	03. Mechanical	31300	Average Total Project Soft Costs	$27	m²	$845,100
4		31300	LCF - Base Rate Material & Labour	$26	m2	$813,800
5		0	LCF - Conting. & Soft Costs	$13	m2	$0

Narratives

Event Description

This event includes replacement of the heating and cooling piping systems from the mechanical room in the basement and to the heating/cooling coils, perimeter radiation, and unit heaters.

Event Justification & Strategy

The heating and cooling piping is presently in average condition and does not require replacement in the near future. The timing of the replacement shall be re-assessed at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

Deferring the eventual replacement of the piping could result in leaks that could range from a nuisance (small leaks) to major problems (should a system have to be taken out of service for repairs). Shutting down a heating or cooling system under peak load conditions could result in further equipment damage, and shutdowns (due to freezing pipes).

03.1A-045 HVAC Pumps

Details	Values
Expected Life	25
Component Cost	577,600
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	200
Measurement unit/ Metric	hp

Narratives

Component Description

This element is for the various HVAC system heating pumps on the AHU heating coils, heat exchanger and perimeter radiation.

Component Condition & Anticipated Replacement Date

Generally, the pumps appear to be in average condition. Assuming these to be original 1977 equipment, they should have been due for replacement in 2012 but this has been pushed out to 2019 to allow another assessment at the next BCR.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Perimeter water heating system pumps in basement mechanical room

CP Replacement [03.1A-045 HVAC Pumps]

Details	Values
Brief Description (40 Characters)	Replace HVAC Pumps
Current event Year (YYYY)	2019
Estimated Event Cost	$577,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	200	Base Rate for Material and Labour	$1,453	Hp	$290,600
2	03. Mechanical	200	Construction Contingency	$218	Hp	$43,600
3	03. Mechanical	200	Average Total Project Soft Costs	$501	Hp	$100,200
4		200	LCF - Base Rate Material & Labour	$479	Hp	$95,800
5		200	LCF - Conting. & Soft Costs	$237	Hp	$47,400

Narratives

Event Description

This event is for the combined life cycle replacement of the HVAC system pumps.

Event Justification & Strategy

This event is based on the assumption these pumps are all original equipment, installed with the original construction in 1977, and will be due for replacement at approximately the same time.

Implication of Event Deferral (Risks)

In many cases, there is no backup pump on these systems so the implication could be a loss of temperature control for the areas served. Depending on the outside temperatures, this could range from a mild inconvenience to an immediate action item.

03.1A-047 Chemical Feed System

Details	Values
Expected Life	25
Component Cost	27,576
Last Major Action Year	1999
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the chemical feed systems (AKA pot feeder) for the Hot Water loops.

Component Condition & Anticipated Replacement Date

The pot feeders were installed at different times. All appear to be in the same average condition, with no reported problems. The estimated lifespan has been extended to end in 2024.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Chemical feed system added to Process Cooling Tower in Penthouse in 2007

CP Replacement [03.1A-047 Chemical Feed System]

Details	Values
Brief Description (40 Characters)	Replace Chemical Feed Systems
Current event Year (YYYY)	2024
Estimated Event Cost	$27,576

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	3	Base Rate for Material and Labour	$4,624	sum	$13,872
2	03. Mechanical	3	Construction Contingency	$694	sum	$2,082
3	03. Mechanical	3	Average Total Project Soft Costs	$1,595	sum	$4,785
4		3	LCF - Base Rate Material & Labour	$1,524	sum	$4,572
5		3	LCF - Conting. & Soft Costs	$755	sum	$2,265

Narratives

Event Description

This event is the life cycle replacement of the chemical feed system for the process, hot water and cooling tower loops.

Event Justification & Strategy

These systems are necessary to allow proper chemical treatment of these loops and need to be in good working order without leaks. They can be further evaluated at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

Failure of this systems would result in the gradual degradation of the piping systems, and potential damage to control valves in these systems. This could incur unnecessary malfunctions that outweigh the costs of replacement.

03.1A-060 Terminal Units

Details	Values
Expected Life	35
Component Cost	508,185
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	45
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the unit heaters and perimeter force flow heaters located throughout the building mechanical spaces and door exits. The units keep these areas warm during the heating season.

Component Condition & Anticipated Replacement Date

The terminal units appear to be in average condition given their age with no reported problems. Based on this, 2021 is the projected replacement year.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical Steam Unit Heater in Water Treatment Area in basement mechanical room

CP Replacement [03.1A-060 Terminal Units]

Details	Values
Brief Description (40 Characters)	Replace Terminal Units
Current event Year (YYYY)	2021
Estimated Event Cost	$508,185

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	45	Base Rate for Material and Labour	$5,681	EACH	$255,645
2	03. Mechanical	45	Construction Contingency	$852	EACH	$38,340
3	03. Mechanical	45	Average Total Project Soft Costs	$1,960	EACH	$88,200
4		45	LCF - Base Rate Material & Labour	$1,873	EACH	$84,285
5		45	LCF - Conting. & Soft Costs	$927	EACH	$41,715

Narratives

Event Description

This event is for the life cycle replacement of the terminal units found throughout the facility.

Event Justification & Strategy

The unit heaters and force flow units will likely provide many more years of reliable service. Should failures occur before replacement, they can be dealt with under the O&M budget on a case by case basis.

Implication of Event Deferral (Risks)

The unit heaters and force flow heats are necessary for tempering cold winter air in these open spaces. If these units are not functioning well, this risks freezing temperatures in these areas and potential damage to equipment and piping.

03.1A-072 Cooling Towers

Details	Values
Expected Life	25
Component Cost	216,300
Last Major Action Year	1999
Component Condition (For BCR use only)	Fair
Quantity	150
Measurement unit/ Metric	Cool tons

Narratives

Component Description

This element is the cooling tower located in the penthouse mechanical room that provides heat rejection for the water cooled condensing units on the walk-in freezers and coolers.

Component Condition & Anticipated Replacement Date

The cooling tower experienced some recent freezing and damage to some tubes. Temporary repairs were made but total amount of damage will not be fully known until summer operation in 2013. Therefore, a projected replacement date of 2016 has been chosen.

Assessment Criteria	Existence
Physical damage	
Default	Yes

Process condenser water loop cooling tower in Penthouse

CP Replacement [03.1A-072 Cooling Towers]

Details	Values
Brief Description (40 Characters)	Replace Cooling Tower
Current event Year (YYYY)	2016
Estimated Event Cost	$216,300

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	300	Base Rate for Material and Labour	$363	Cool tons	$108,900
2	03. Mechanical	300	Construction Contingency	$54	Cool tons	$16,200
3	03. Mechanical	300	Average Total Project Soft Costs	$125	Cool tons	$37,500
4		300	LCF - Base Rate Material & Labour	$120	Cool tons	$36,000
5		300	LCF - Conting. & Soft Costs	$59	Cool tons	$17,700
6		0	Quantity adjusted to 300 to achieve adequate costing for event.	$0	Cool tons	$0

Narratives

Event Description

This event is for the replacement of the cooling tower in approximately 2016.

Event Justification & Strategy

The cooling tower is critical and with no backup, it is necessary it be kept in good working order. This may make this event necessary even sooner than 2016.

Implication of Event Deferral (Risks)

The cooling tower is a critical component for the FWI programs. Deferring the event runs the risk of failure which could result in loss of scientific research.

03.1A-084 Gas Piping System

Details	Values
Expected Life	35
Component Cost	215,200
Last Major Action Year	1977
Component Condition (For BCR use only)	Good
Quantity	400
Measurement unit/ Metric	m

Narratives

Component Description

This component is the natural gas piping running from the municipal service into the main building, through the service splines to the gas spigots in the laboratory rooms. Use of natural gas is minimal as there is no building mechanical gas fired equipment. Metered steam from the U of M is the main heat source.

Component Condition & Anticipated Replacement Date

The gas piping is in good condition and should not require replacement even though it's currently 35 years old which is the projected anticipated life. A further assessment can be done at the next BCR in 5 years time.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Natural gas line (top yellow pipe) in service corridor for laboratory use only

CP Replacement [03.1A-084 Gas Piping System]

Details	Values
Brief Description (40 Characters)	Replace Gas Piping System
Current event Year (YYYY)	2022
Estimated Event Cost	$215,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	400	Base Rate for Material and Labour	$271	m	$108,400
2	03. Mechanical	400	Construction Contingency	$41	m	$16,400
3	03. Mechanical	400	Average Total Project Soft Costs	$93	m	$37,200
4		400	LCF - Base Rate Material & Labour	$89	m	$35,600
5		400	LCF - Conting. & Soft Costs	$44	m	$17,600

Narratives

Event Description

This event is for the life cycle replacement of the natural gas piping system servicing the laboratory spaces only.

Event Justification & Strategy

The gas piping is in good condition with no reported problems and there should be no reason to consider replacement even though it is 35 years old. A further assessment can be done at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

If this event is deferred, and the natural gas piping is degrading, then there is a risk of a gas leak. The potential safety risk to the building and occupants should outweigh financial costs for this project.

03.2A-010 Controls, Electrical or Pneumatic

Details	Values
Expected Life	24
Component Cost	2,298,000
Last Major Action Year	1990
Component Condition (For BCR use only)	Average
Quantity	1,000
Measurement unit/ Metric	pt

Narratives

Component Description

This element includes components of the DDC system that are electric and pneumatic in nature. Typically, this includes items such as AHU damper actuators, and HVAC heating and cooling control valves.

Component Condition & Anticipated Replacement Date

There are few problems with any of these components. Typically, any problems should be dealt with on a case by case basis, as part of the Operations & Maintenance program. A projected replacement date of 2018 has been set, that should be reevaluated on the next BCR in 2017.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical AHU

Typical piping in service room

CP Replacement [03.2A-010 Controls, Electrical or Pneumatic]

Details	Values
Brief Description (40 Characters)	Replace Controls, Electrical & Pneumatic
Current event Year (YYYY)	2018
Estimated Event Cost	$2,298,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1000	Base Rate for Material and Labour	$1,156	pt	$1,156,000
2	03. Mechanical	1000	Construction Contingency	$173	pt	$173,000
3	03. Mechanical	1000	Average Total Project Soft Costs	$399	pt	$399,000
4		1000	LCF - Base Rate Material & Labour	$381	pt	$381,000
5		1000	LCF - Conting. & Soft Costs	$189	pt	$189,000

Narratives

Event Description

This event includes the life cycle replacement of DDC system items, such as the AHU damper actuators and HVAC heating and cooling control valves.

Event Justification & Strategy

These devices are critical to the DDC system's operation, and control of heating, cooling and ventilation. Many controls have been rebuilt over the years as failures have occurred and this likely will continue to be done until such a time parts become harder to come by for quick repairs. At that time a wholesale changeover may be worth considering.

Implication of Event Deferral (Risks)

If this event is deferred, the system should remain sound with case by case maintenance, the risk of many devices failing at the same time is highly unlikely.

03.2A-020 Direct Digital Control

Details	Values
Expected Life	20
Component Cost	2,863,000
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	1,000
Measurement unit/ Metric	pt

Narratives

Component Description

This component is the DDC portion of the HVAC system points (excluding the electric & pneumatic). A Honeywell XL5000 Control System controls the building cooling and heating equipment, VAV boxes, and hot water valves. This includes all of the DDC panels in the Annex. The Head end resides in the main building.

Component Condition & Anticipated Replacement Date

DDC system is in average condition with most of the hardware updated in ~2000. It is well maintained via a Honeywell service contract, programming and graphical interface updates are on-going. The anticipated replacement date has been set at 2020 based on a 20 year expected life. Components for this system are readily available and service needs are met with the Honeywell office.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample DDC panel

CP Replacement [03.2A-020 Direct Digital Control]

Details	Values
Brief Description (40 Characters)	Replace Direct Digital Control System
Current event Year (YYYY)	2020
Estimated Event Cost	$2,863,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1000	Base Rate for Material and Labour	$1,440	pt	$1,440,000
2	03. Mechanical	1000	Construction Contingency	$216	pt	$216,000
3	03. Mechanical	1000	Average Total Project Soft Costs	$497	pt	$497,000
4		1000	LCF - Base Rate Material & Labour	$475	pt	$475,000
5		1000	LCF - Conting. & Soft Costs	$235	pt	$235,000

Narratives

Event Description

This event is for the life cycle replacement of the estimated 2000 points making up DDC components including panels and controllers.

Event Justification & Strategy

This event is dated 2020 in accordance with the expected life of this component. It is possible that prior to this date, technology advances may warrant an earlier replacement or upgrade. This should be a consideration in the next BCR in 2017.

Implication of Event Deferral (Risks)

Failure of DDC equipment could result in major disruption to client programs and general disruption to HVAC equipment operation. This situation could have moderate to severe consequences depending on extent of failure. Availability of parts and service should be a consideration in the next BCR in 2017.

03.3-025C05 Domestic Hot Water Tanks

Details	Values
Expected Life	20
Component Cost	25,000
Last Major Action Year	1977
Component Condition (For BCR use only)	Fair
Quantity	500
Measurement unit/ Metric	ltr

Narratives

Component Description

This component is the steam fired domestic hot water tanks located in the basement mechanical room.

Component Condition & Anticipated Replacement Date

These industrial grade tanks appear to be original yet still seem to be working satisfactorily. Only for the age reason has this item been regarded in fair condition and suggested for replacement in 2015.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

2 steam heated domestic water tanks in basement mechanical room

RP Replacement [03.3-025C05 Domestic Hot Water Tanks]

Details	Values
Brief Description (40 Characters)	Replace Domestic Hot Water Tanks
Current event Year (YYYY)	2015
Estimated Event Cost	$25,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	500	Base Rate for Material and Labour	$25	L	$12,500
2	03. Mechanical	500	Construction Contingency	$4	L	$2,000
3	03. Mechanical	500	Average Total Project Soft Costs	$9	L	$4,500
4		500	LCF - Base Rate Material & Labour	$8	L	$4,000
5		500	LCF - Conting. & Soft Costs	$4	L	$2,000

Narratives

Event Description

Replace the 2 steam heated domestic hot water tanks.

Event Justification & Strategy

The justification for this event is solely based on the uncertainty of the internal condition of these tanks. Based on appearance they are original and approximately 35 years old which is well beyond the projected life expectancy. For this reason delaying any further doesn't appear to be a good strategy.

Implication of Event Deferral (Risks)

These 2 hot water tanks provide domestic hot water service to a large population and disruption to service would be an inconvenience to a large number of people and their research.

03.3A-010 Plumbing Piping

Details	Values
Expected Life	40
Component Cost	1,210,000
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	5,000
Measurement unit/ Metric	m

Narratives

Component Description

This component includes all the domestic hot/cold, and waste water piping throughout the entire facility.

Component Condition & Anticipated Replacement Date

Component condition is average. Even though this element will likely perform beyond 40 years, a 2019 replacement date is scheduled. The next BCR inspection in 2017-18 will reevaluate this component. Plumbing piping is believed to be all from original 1977 construction.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Rack of various plumbing piping in service corridor

CP Replacement [03.3A-010 Plumbing Piping]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Piping
Current event Year (YYYY)	2019
Estimated Event Cost	$1,210,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5000	Base Rate for Material and Labour	$122	m	$610,000
2	03. Mechanical	5000	Construction Contingency	$18	m	$90,000
3	03. Mechanical	5000	Average Total Project Soft Costs	$42	m	$210,000
4		5000	LCF - Base Rate Material & Labour	$40	m	$200,000
5		5000	LCF - Conting. & Soft Costs	$20	m	$100,000

Narratives

Event Description

This event is to replace the domestic hot/cold water, and waste water piping systems throughout the facility.

Event Justification & Strategy

The projected lifespan of this component is 40 years but it could easily surpass this projected lifespan. Due to changes to programs over the years, some of this piping may no longer be required, this could be assessed in future BCRs.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the element may fail. Failure of any of these piping systems could result in ceiling tile damage through a small leak developing in a pipe, or a flooding event should a pipe rupture.

03.3A-015 Plumbing Fixtures and Accessories

Details	Values
Expected Life	30
Component Cost	761,000
Last Major Action Year	1990
Component Condition (For BCR use only)	Average
Quantity	250
Measurement unit/ Metric	ea

Narratives

Component Description

This component is comprised of the plumbing fixtures such as sinks, water closets, urinals, etc. found throughout the facility.

Component Condition & Anticipated Replacement Date

Generally, other than many fixtures being older, there seemed to be no problems. Overall condition seemed to be average. It may be desirable to replace these as part of some larger future renovations. The projected replacement is scheduled for 2020 to allow a further evaluation at the time of the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical water closet, sink, faucet and flush valve

CP Replacement [03.3A-015 Plumbing Fixtures and Accessories]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures and Accessories
Current event Year (YYYY)	2020
Estimated Event Cost	$761,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	250	Base Rate for Material and Labour	$1,531	EACH	$382,750
2	03. Mechanical	250	Construction Contingency	$230	EACH	$57,500

3	03. Mechanical	250	Average Total Project Soft Costs	$528	EACH	$132,000
4		250	LCF - Base Rate Material & Labour	$505	EACH	$126,250
5		250	LCF - Conting. & Soft Costs	$250	EACH	$62,500

Narratives

Event Description

Replace plumbing fixtures throughout the building, such as; water closets, faucets, flush valves and wash basins.

Event Justification & Strategy

If there are any future plans for upgrades or renovations involving plumbing, that would be the time to consider replacement otherwise they could be evaluated at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

If this event is deferred, the fixtures should last for some time past their life expectancy. It is possible that seals will degrade, and serviceable parts may become hard to get over time.

03.3A-020 Plumbing Pumps

Details	Values
Expected Life	20
Component Cost	126,075
Last Major Action Year	1995
Component Condition (For BCR use only)	Fair
Quantity	30
Measurement unit/ Metric	ea

Narratives

Component Description

This component includes the domestic hot water circulating pumps and sump pumps.

Component Condition & Anticipated Replacement Date

Most of these pumps are believed to be original from 1977. With a 20 year expected life, they should have been due for replacement in 1997 but still appear to be in good working order. So, a projected date has been set at 2017 to allow for another evaluation during the next BCR.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sump pumps in basement mechanical room

CP Replacement [03.3A-020 Plumbing Pumps]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Pumps
Current event Year (YYYY)	2017
Estimated Event Cost	$126,075

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	15	Base Rate for Material and Labour	$4,228	EACH	$63,420
2	03. Mechanical	15	Construction Contingency	$634	EACH	$9,510
3	03. Mechanical	15	Average Total Project Soft Costs	$1,459	EACH	$21,885
4		15	LCF - Base Rate Material & Labour	$1,394	EACH	$20,910
5		15	LCF - Conting. & Soft Costs	$690	EACH	$10,350
6		0	Quantity adjusted to 15 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

This is the life cycle replacement of the domestic hot water circulating pumps and sump pumps in the basement mechanical rooms.

Event Justification & Strategy

The domestic HW pumps are necessary to keep the domestic hot water loop temperature within reasonable limits. The sump pumps are necessary to deal with ground water seepage under the building. In the event of any failure there is alarm monitoring. While these pumps are critical, they appear to be meeting the needs and providing reliable service. Should this change, then this event should be bumped up from 2017.

Implication of Event Deferral (Risks)

Should the HW circulating pump prematurely fail, it would have to be immediately replaced as domestic hot water temperatures could not be maintained otherwise. Reliable sump pumps are necessary to prevent potential flood damage.

03.3A-045 Drinking Fountain

Details	Values
Expected Life	25
Component Cost	16,810
Last Major Action Year	1994
Component Condition (For BCR use only)	Good
Quantity	11
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the refrigerated drinking fountains located on all levels.

Component Condition & Anticipated Replacement Date

Six of the 11 drinking fountains were seen to be in poor condition. Mainly because they use R12 refrigerant and were being replaced immediately (early 2013/14 FY). The remaining 5 had been replaced in 1994 and will not require replacement until 2020 or later.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample drinking fountain (accessible model) in corridor

RP Replacement [03.3A-045 Drinking Fountain]

Details	Values
Brief Description (40 Characters)	Replace Drinking Fountains
Current event Year (YYYY)	2020
Estimated Event Cost	$16,810

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$4,228	EACH	$8,456
2	03. Mechanical	2	Construction Contingency	$634	EACH	$1,268
3	03. Mechanical	2	Average Total Project Soft Costs	$1,459	EACH	$2,918
4		2	LCF - Base Rate Material & Labour	$1,394	EACH	$2,788
5		2	LCF - Conting. & Soft Costs	$690	EACH	$1,380
6		0	Quantity adjusted to 2 to achieve adequate costing for event.	$0	EACH	$0

Narratives

Event Description

This event is for the life cycle replacement of the drinking fountains.

Event Justification & Strategy

Drinking fountains contain a small amount of refrigerant and need to be properly managed. The critical units containing R-12 will have been or are in the process of being replaced by the date of this BCR.

Implication of Event Deferral (Risks)

Failure of the drinking fountains may present some minor inconvenience to the tenants. The bigger concern is an R-12 refrigerant leak which has been a target for it's ozone depleting potential and associated paperwork and reporting should a leak occur.

03.4A-015 Compressed Air Systems

Details	Values
Expected Life	75
Component Cost	233,738
Last Major Action Year	2012
Component Condition (For BCR use only)	Excellent
Quantity	2
Measurement unit/ Metric	sum

Narratives

Component Description

This component is the compressed air systems that supply both the pneumatic components on the HVAC systems as well as purified compressed air for aerating fish water and use in laboratories.

Component Condition & Anticipated Replacement Date

Both compressed air systems have been recently replaced and are in excellent condition. Their life cycle is estimated at 35 years. Based on this, a replacement event has been scheduled for 2030.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

New compressed air system installed for laboratory and program use only

CP Replacement [03.4A-015 Compressed Air Systems]

Details	Values
Brief Description (40 Characters)	Replace Compressed Air Systems - Lab & HVAC
Current event Year (YYYY)	2035
Estimated Event Cost	$233,738

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$58,791	sum	$117,582
2	03. Mechanical	2	Construction Contingency	$8,819	sum	$17,638
3	03. Mechanical	2	Average Total Project Soft Costs	$20,283	sum	$40,566
4		2	LCF - Base Rate Material & Labour	$19,382	sum	$38,764
5		2	LCF - Conting. & Soft Costs	$9,594	sum	$19,188

Narratives

Event Description

This event is to replace the compressed air systems with new systems of equivalent capacity.

Event Justification & Strategy

The present air compressors and related components have just been replaced and are in excellent condition. Based on a projected lifespan of 35 years, an event has been scheduled for further evaluation in approximately 2030.

Implication of Event Deferral (Risks)

The HVAC compressed air system is critical for operation of many critical HVAC actuators that enable mechanical systems to function. Should the compressed air system not be reliable, there will be an impact to the overall building operation that outweighs the cost of this event. Also, the purified compressed air system is necessary to support program research on fish. Any significant disruption to service could result in lost research.

03.4A-035 Sterilization System - Dechlorinated Water

Details	Values
Expected Life	30
Component Cost	3,112,090
Last Major Action Year	1977
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

This component has been broken into 2 portions to allow for 2 projects to occur at different times, depending on availability of funding.

1) Dechlorinated Water System piping.
2) Dechlorinated Water System process plant.

Component Condition & Anticipated Replacement Date

This component is considered to be in overall poor condition. This is due to its age and the fact that the capacity of the system is grossly oversized and inefficient in meeting the present DFO program needs. The quality of the water meets the program needs but the system has become very unreliable and costly to maintain for a small group of users. The anticipated replacement date has been scheduled for 2016 to allow for an departmental survey of DFO program requirements.

Assessment Criteria	Existence
Leakage	
Default	Yes
Malfunctioning Units	
Default	Yes
Physical damage	
Default	Yes

Large carbon filter media tanks, grossly oversized equipment based on present system requirements

Decommissioned cooling plant for dechlorinated water loop. Ambient temperature of DCW often exceeds client requirements during summer months.

Ozone treatment tanks, no longer aerated with ozone, now using purified compressed air. Piping very fragile at this location, perhaps from ozone exposure over time.

CP Replacement [03.4A-035 Sterilization System - Dechlorinated Water] - Piping

Details	Values
Brief Description (40 Characters)	Replace Dechlorinated Water System - Piping
Current event Year (YYYY)	2016
Estimated Event Cost	$1,244,836

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$313,110	sum	$626,220
2	03. Mechanical	2	Construction Contingency	$46,967	sum	$93,934
3	03. Mechanical	2	Average Total Project Soft Costs	$108,023	sum	$216,046
4		2	LCF - Base Rate Material & Labour	$103,223	sum	$206,446
5		2	LCF - Conting. & Soft Costs	$51,095	sum	$102,190
6		0	Quantity adjusted to 2 to achieve adequate costing for event.	$0	sum	$0

Narratives

Event Description

This event is the replacement of the existing dechlorinated water system piping from the Water Treatment Room extending through the building service shafts to the various laboratories.

Event Justification & Strategy

The dechlorinated water piping is original from 1985 and has failed on a few occasions, resulting in considerable expense due to flood damage/mitigation as well as program losses with downtime of the system. There is a high risk of future pipe failures and unknown costs and disruption associated with these unforeseen events. Once DFO has a plan for present and future requirements, the existing piping should be decommissioned and replaced with a new piping system properly sized and with suitable distribution.

Implication of Event Deferral (Risks)

This system has failed on a few occasions already, so future failures are very likely. These failures could occur in a number of places and result in considerable damage and present potentially hazardous conditions should a pipe fail in the vicinity of the electrical distribution or equipment. Should a flood occur, there is also a health and safety risk from mould growth should clean-up not be done thoroughly or quickly enough. Besides this, there is the high cost of clean-up and downtime losses to the programs which are difficult to quantify.

CP Replacement [03.4A-035 Sterilization System - Dechlorinated Water] - Components

Details	Values
Brief Description (40 Characters)	Replace Dechlorinated Water System - Components
Current event Year (YYYY)	2016
Estimated Event Cost	$1,867,254

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	3	Base Rate for Material and Labour	$313,110	sum	$939,330
2	03. Mechanical	3	Construction Contingency	$46,967	sum	$140,901
3	03. Mechanical	3	Average Total Project Soft Costs	$108,023	sum	$324,069
4		3	LCF - Base Rate Material & Labour	$103,223	sum	$309,669
5		3	LCF - Conting. & Soft Costs	$51,095	sum	$153,285
6		0	Quantity adjusted to 3 to achieve adequate costing for event.	$0	sum	$0

Narratives

Event Description

This event is the replacement of the existing dechlorinated water system process plant in the Water Treatment Room.

Event Justification & Strategy

The dechlorinated water process plant is original from 1985. Some automated controls have failed and require manual bypass for sequencing tanks. This requires specialized system knowledge and most staff with this knowledge are no longer around. The capacity of the system could be as much as 10X what the program needs are based on present consumption. The labour and electrical costs to operate this system are high and put a strain on a declining operating budget. Once DFO has a plan for present and future requirements, the existing piping should be decommissioned and replaced with a new piping system properly sized and with suitable distribution.

Implication of Event Deferral (Risks)

Many of the components in this 30 year old system are either obsolete or very difficult to source. It is possible that some component failure could result in a complete failure of the system's ability to produce dechlorinated water which could be devastating for the programs that rely on this system. If repairs are possible, the costs would be a huge strain on the present maintenance budget that has been in decline since this system was originally installed.

03.4A-060 Diesel Generator Fuel Supply Systems

Details	Values
Expected Life	30
Component Cost	226,381
Last Major Action Year	2012
Component Condition (For BCR use only)	Excellent
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

This component is the diesel generator fuel supply system which included an inside day tank, an outside above ground storage tank and related controls.

Component Condition & Anticipated Replacement Date

The system is new as of 2012 and as such will not reach its projected end of life cycle until 2042.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Outdoor fuel storage tank for Gensets

CP Replacement [03.4A-060 Diesel Generator Fuel Supply Systems]

Details	Values
Brief Description (40 Characters)	Replace Diesel Generator Fuel Supply System
Current event Year (YYYY)	2042
Estimated Event Cost	$226,381

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$113,882	sum	$113,882
2	03. Mechanical	1	Construction Contingency	$17,082	sum	$17,082

3	03. Mechanical	1	Average Total Project Soft Costs	$39,289	sum	$39,289
4		1	LCF - Base Rate Material & Labour	$37,544	sum	$37,544
5		1	LCF - Conting. & Soft Costs	$18,584	sum	$18,584

Narratives

Event Description

This event is the life cycle replacement of the backup diesel generator fuel supply system including day tank, AST and related controls.

Event Justification & Strategy

This event will not be required for at least 30 years given it was just replaced in 2012.

Implication of Event Deferral (Risks)

The Freshwater Institute has numerous requirements for reliable backup power in the event of a normal power outage. This requirement extends to maintaining operation of life safety support systems for building evacuation and support of the scientific program's freezers and coolers.

03.5A-030 Specialty Fire Protection Systems

Details	Values
Expected Life	40
Component Cost	173,331
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	sum

Narratives

Component Description

This component has been broken down as follows to allow for the different schedule for replacement as necessary:

1) CO2 System for volatile storage room at Loading Dock, room 2-136.
2) Wet Chemical System in Cafeteria kitchen, room 1-14.
3) Halatron System in room 1-16.

Component Condition & Anticipated Replacement Date

The identified special fire protection systems have the following conditions and anticipated replacement dates;

1) CO2 System for volatile storage room at Loading Dock is in working order and no problems noted by service provider. A replacement date of 2020 has been projected.
2) Wet Chemical System in Cafeteria kitchen was in working order but has been temporarily taken out of service since the closure of the cafeteria in summer of 2012. A replacement date of 2025 has been projected.
3) Halatron System in room 1-56 is in good working order and a replacement date of 2030 has been projected.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Kitchen fire suppression, no longer in use and to be decommissioned

CP Replacement [03.5A-030 Specialty Fire Protection Systems] - CO2

Details	Values
Brief Description (40 Characters)	Replace CO2 Fire Suppression System
Current event Year (YYYY)	2020
Estimated Event Cost	$57,777

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$29,065	sum	$29,065
2	03. Mechanical	1	Construction Contingency	$4,360	sum	$4,360
3	03. Mechanical	1	Average Total Project Soft Costs	$10,027	sum	$10,027
4		1	LCF - Base Rate Material & Labour	$9,582	sum	$9,582
5		1	LCF - Conting. & Soft Costs	$4,743	sum	$4,743

Narratives

Event Description

This event is to replace the CO2 fire protection for the volatile storage room adjacent to the loading dock.

Event Justification & Strategy

The system is in good working order but is quite old and possibly due to age some components may be due for replacement. Future inspections by the fire suppression inspection company can be used as information on the next BCR to confirm a replacement date.

Implication of Event Deferral (Risks)

Any functional problems that come up during an inspection will have to be rectified immediately to be compliant with the Canada Fire Code. Lack of serviceable spare parts could dictate an earlier replacement.

CP Replacement [03.5A-030 Specialty Fire Protection Systems] - Kitchen

Details	Values
Brief Description (40 Characters)	Replace Kitchen Wet Chemical Fire Suppression
Current event Year (YYYY)	2025
Estimated Event Cost	$57,777

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$29,065	sum	$29,065
2	03. Mechanical	1	Construction Contingency	$4,360	sum	$4,360
3	03. Mechanical	1	Average Total Project Soft Costs	$10,027	sum	$10,027
4		1	LCF - Base Rate Material & Labour	$9,582	sum	$9,582
5		1	LCF - Conting. & Soft Costs	$4,743	sum	$4,743

Narratives

Event Description

This event is the replacement of the Kitchen Wet Chemical Fire Suppression System.

Event Justification & Strategy

The kitchen fire suppression has been temporarily taken off-line upon the closure of the kitchen operations. The future of the kitchen/cafeteria is unknown. Should operations permanently seize then the existing system should be decommissioned and removed at that time.

Implication of Event Deferral (Risks)

Should the kitchen operation be resumed, this temporary disabled system will have to be put back in service and maintained as it was prior to the closure.

CP Replacement [03.5A-030 Specialty Fire Protection Systems] - Halatron

Details	Values
Brief Description (40 Characters)	Replace Halatron Fire System
Current event Year (YYYY)	2030
Estimated Event Cost	$57,777

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$29,065	sum	$29,065
2	03. Mechanical	1	Construction Contingency	$4,360	sum	$4,360
3	03. Mechanical	1	Average Total Project Soft Costs	$10,027	sum	$10,027
4		1	LCF - Base Rate Material & Labour	$9,582	sum	$9,582
5		1	LCF - Conting. & Soft Costs	$4,743	sum	$4,743

Narratives

Event Description

This event is the replacement of the fire suppression system for the chemical storage rooms in area 1-16.

Event Justification & Strategy

This system is in good working order and should provide many years of reliable service provided the scheduled maintenance plan is maintained.

Implication of Event Deferral (Risks)

Any functional problems that come up during an inspection will have to be rectified immediately to be compliant with the Canada Fire Code. Lack of serviceable spare parts could dictate an earlier replacement.

03.5A-060 Standpipe Systems

Details	Values
Expected Life	26
Component Cost	303,330
Last Major Action Year	1977
Component Condition (For BCR use only)	Good
Quantity	30
Measurement unit/ Metric	sum

Narratives

Component Description

The standpipes are a component of the fire protection system delivering water to fire hose cabinets throughout the facility.

Component Condition & Anticipated Replacement Date

The standpipe systems seemed to be in good condition, considering their age, and there were no noted problems or concerns. They have been set for replacement in 2025.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical standpipe assembly with attached hose

CP Replacement [03.5A-060 Standpipe Systems]

Details	Values
Brief Description (40 Characters)	Replace Standpipe Systems
Current event Year (YYYY)	2025
Estimated Event Cost	$303,330

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	30	Base Rate for Material and Labour	$5,086	sum	$152,580
2	03. Mechanical	30	Construction Contingency	$763	sum	$22,890
3	03. Mechanical	30	Average Total Project Soft Costs	$1,755	sum	$52,650
4		30	LCF - Base Rate Material & Labour	$1,677	sum	$50,310
5		30	LCF - Conting. & Soft Costs	$830	sum	$24,900

Narratives

Event Description

This event is to replace the existing Fire Hose Cabinet Standpipes located throughout the facility.

Event Justification & Strategy

This work should maintain the effectiveness of the standpipe systems which feed water from the fire water supply system on the first level to the hose cabinets.

Implication of Event Deferral (Risks)

The stand pipe system is a core life safety support system, and must be maintained in proper working order for the safety of building occupants by law.

03.5A-070 Portable Fire Extinguishers

Details	Values
Expected Life	3
Component Cost	23,640
Last Major Action Year	2007
Component Condition (For BCR use only)	Excellent
Quantity	203
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the portable fire extinguishers which are a mixture of 5, 10 and 20 pound units. Most are of the ABC chemical variety with some CO2 units in select areas.

Component Condition & Anticipated Replacement Date

The fire extinguishers were mostly replaced in 2010 and with a minimum life of 12 years, the replacement date is scheduled for 2022. However, since mandatory testing results will determine replacement and all units will not require replacement at the same time, budgeting for a 15% (30 units) replacement every three years, starting in 2022, is the recommended approach.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample ABC fire extinguisher in hose cabinet

RP Replacement [03.5A-070 Portable Fire Extinguishers]

Details	Values
Brief Description (40 Characters)	Replace Portable Fire Extinguishers - 30 Units
Current event Year (YYYY)	2022
Estimated Event Cost	$23,640

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	30	Base Rate for Material and Labour	$396	EACH	$11,880
2	03. Mechanical	30	Construction Contingency	$59	EACH	$1,770
3	03. Mechanical	30	Average Total Project Soft Costs	$137	EACH	$4,110
4		30	LCF - Base Rate Material & Labour	$131	EACH	$3,930
5		30	LCF - Conting. & Soft Costs	$65	EACH	$1,950
6		0	Quantity adjusted to 30 for 30 units every three years.	$0	EACH	$0

Narratives

Event Description

This event is to budget replacement of approximately 30 portable fire extinguishers. Which units will be based on their age and ability to pass mandatory testing.

Event Justification & Strategy

The portable fire extinguishers have a minimum 12 year lifespan and then may be either replaced or refurbished.

Implication of Event Deferral (Risks)

Having portable extinguishers in specified design locations based on the floor plan, hazards and other conditions is a Fire Code requirement. Regular inspection and maintenance to keep them in good condition is also a mandatory requirement.

04. Electrical

04.1A-020 Primary Transformer & Vault

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Not Assessed
Quantity	2
Measurement unit/ Metric	sum

Narratives

Component Description

The primary (high voltage) consists of two oil filled utility transformers located to the north of the service building. These two transformers feed the main switchboard located along the north wall on the main floor of the service building which is part of the Lab/Administration building and are fed by two 4000 amp bus ducts. One transformer was replaced in 2002.

Component Condition & Anticipated Replacement Date

The responsibility of the transformers lie with the utility. No event is identified.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Primary transformers.

04.2A-010 Secondary Switchgear

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	2002
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

MAIN SECONDARY DISTRIBUTION:
Switchgear was upgraded in 2002 and is manufactured by Cutler Hammer. The equipment on the main floor of the Service Building is 11 cells wide and contains the major protection breakers for the site. All the breakers are draw out electronic trip air type.
Cells 1 through 4 contain the two main 4000 amp frame 3200 amp trip main breakers from the utility, to a spit distribution with a similar tie breaker in between. Utility meters are in these cells also. The two main breakers and the main generator breaker all have IQ monitoring meters associated with them.
Cell 5 has space for 2 breakers.
Cells 6 and 7 make the common tie to the emergency distribution in the synchronizing switch cell.
Cell 8 contains one spare 1600 amp breaker and two spaces.
Cell 9 feeds MCC 2-1 and 2-2, as well as the Annex Building via the Automatic Transfer switch located on the end of Distribution B.
Cell 10 feeds MCC1 and 4.
Cell 11 feeds Distribution EP and Distribution EE with two breakers.

OTHER FREE STANDING DISTRIBUTION:
There are several varied free standing distributions within the building, manufactured by Westinghouse and are quantified as follows:
Distribution B - 4 sections, 600 volt 3 phase.
Distribution C - 3 sections, 600 volt 3 phase CDP, 200 kVA transformer, 120/240 volt 1 phase CDP.
Distribution DD - 10 sections, 600 volt 3 phase CDP, 6 transformers and 120/240 volt 1 phase CDP.
Distribution EE - 10 sections, 600 volt 3 phase CDP, 5 transformers and 120/240 volt 1 phase CDP.
Distribution N - 5 sections, 600 volt 3 phase CDP, 3 transformers and two 120/240 volt 1 phase CDP's.
Distribution EK - 2 sections, 45 kVA transformer, 120/208 volt 3 phase CDP
Distribution EH - 2 sections, 75 kVA transformer, 120/208 volt 3 phase CDP
Distribution EJ - 2 sections, 150 kVA transformer, 120/208 volt 3 phase CDP

Component Condition & Anticipated Replacement Date

The main switchgear is in good condition and was upgraded in 2002. This item will not require an event as its replacement would be beyond the scope of this report. The other independent switchboards with a total of 38 sections are in average condition. These free standing units have had costing and replacement distributed in the Panel and Transformer sections of this report. These units are now past their expected life, but with maintenance should extend that lifespan. No event was provided see "Secondary Transformer" and "Distribution Panels".

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to “No”, they have been removed from this report.

New 2002 switchboard in Service Wing.

04.2A-011 MCC

Details	Values
Expected Life	45
Component Cost	1,263,522
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	7
Measurement unit/ Metric	sum

Narratives

Component Description

All Motor Control Centres were installed under the original contract in 1972 and are manufactured by Westinghouse unless otherwise noted. Below is a list of the equipment:
MCC #1 (600 volt) - Back to back unit, 4 sections from 1972 and one section (Westinghouse 5 star)from 1994.
MCC #2-1 (600 volt) - 8 sections.
MCC #2-2 (600 volt) - 6 sections from 1972 and 3 VFD (ABB manufacture) section about 2008.
MCC #3-1 (208 volt) - 9 sections.
MCC #3-1 (208 volt) - 7 sections.
MCC #4 (600 volt) - 4 sections.
MCC #5 (600 volt) - 3 sections from 1972 and one section (Westinghouse 5 star) from 1994.

Component Condition & Anticipated Replacement Date

The overall condition of the Motor Control Centres is fair. There are 41 sections from 1972 which are now past their life expectancy. These units are a bit more sensitive to age compared to the switchboards as there are more working components. Although the MCC may last 10 more years it would be better to replace by year 5 in 2018.

Assessment Criteria	Existence
Inadequate labeling	
Default	Yes
	Many labels are only with felt marker.

Typical Westinghouse 1972 MCC. Two new sections added.

CP Replacement [04.2A-011 MCC]

Details	Values
Brief Description (40 Characters)	Replace 1972 Motor Control Centres
Current event Year (YYYY)	2018
Estimated Event Cost	$1,263,522

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	13	Base Rate for Material and Labour	$48,882	sum	$635,466
2	04. Electrical	13	Construction Contingency	$7,332	sum	$95,316
3	04. Electrical	13	Average Total Project Soft Costs	$16,864	sum	$219,232
4		13	Site Factor - Base Cost	$16,131	sum	$209,703
5		13	Site Factor - Contingency and soft cost	$7,985	sum	$103,805
6		0	AVS tools does not define size of MCC - used $15k/section and modified Qty to 13 units.	$0	EACH	$0

Narratives

Event Description

Replace all but two sections of Motor Control Units.

Event Justification & Strategy

All but 2 sections will be in excess of 45 years old and beyond their life expectancy.

Implication of Event Deferral (Risks)

Even now, the availability of parts may be a concern and the longer the units are kept in use, the risk will increase.

MCC #4 - one of 7 units, total of 41 sections.

04.2A-020 Secondary Transformer

Details	Values
Expected Life	30
Component Cost	3,207,446
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	50
Measurement unit/ Metric	sum

Narratives

Component Description

The distribution at the working space is primarily single phase which is borne out by the usage of both 120/240 volt, 1 phase panelboards and the accompanying 600 to 120/240 volt single phase transformers. All transformers are manufactured by Westinghouse unless otherwise noted. There are a total of 50 dry type transformers on site and are quantified as follows:
10 kVA single phase - 1
15 kVA single phase - 1 (Acme transformers)
45 kVA three phase - 1
75 kVA three phase - 2
100 kVA single phase - 27
112.5 kVA three phase - 1
150 kVA single phase - 15
150 kVA three phase - 1
200 kVA single phase – 1

Component Condition & Anticipated Replacement Date

The transformers are all original 1972 vintage and are in average condition and if maintained should be extended to 2023. They could be re-evaluated at this time.

Assessment Criteria	Existence
Dirty coils or radiator fins	
Default	Yes
	Cleaning and retorquing is required.

Typical enclosed free standing distribution with integral transformer.

CP Replacement [04.2A-020 Secondary Transformer]

Details	Values
Brief Description (40 Characters)	Replace Dry Type Transformers
Current event Year (YYYY)	2023
Estimated Event Cost	$3,207,446

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	22	Base Rate for Material and Labour	$73,323	sum	$1,613,106
2	04. Electrical	22	Construction Contingency	$10,999	sum	$241,978

3	04. Electrical	22	Average Total Project Soft Costs	$25,297	sum	$556,534
4		22	Site Factor - Base cost	$24,197	sum	$532,334
5		22	Site Factor - Contingency and soft cost	$11,977	sum	$263,494
6		1	AVS Tools does not define transformer size - used $300/kVA and modified Qty 22 units.	$0	EACH	$0

Narratives

Event Description

Replace the dry type transformers.

Event Justification & Strategy

By this time the transformers will be over 50 years old and past their expected lifespan by several years.

Implication of Event Deferral (Risks)

If the transformers are not replaced or re-evaluated, there is a very high chance of a major outage.

One of 50 dry type transformers on site.

04.2A-030 Electric Power Meter

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	2002
Component Condition (For BCR use only)	Good
Quantity	5
Measurement unit/ Metric	sum

Narratives

Component Description

The metering consists of two Manitoba Utility meters located in cell #2 of the main switchgear and measures both Line 1 and Line 2 from the pad mount transformers. There are also 3 customer meters (Cutler Hammer IQ Analyzer) one at each of the two incoming breakers and a third on the load breaker at the Generator bus.

Component Condition & Anticipated Replacement Date

The utility meters located in the main switchboard are the responsibility of Manitoba Hydro, the IQ monitor meters are new in the board as of 2002 and are in good condition and are beyond the scope of this report and no event is provided.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Utility Meters in 2002 switchboard.

Typical feeder monitor by breaker designation.

04.2A-050 Cabling, Raceways & Bus Ducts

Details	Values
Expected Life	40
Component Cost	11,621,998
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	29,201
Measurement unit/ Metric	m2

Narratives

Component Description

In general, the electrical system are distributed in EMT conduit and wire. The panel feeders and other power distribution feeder are either rigid steel or teck cable. Rigid PVC has been used in locations where moisture occurs and outside. There is abandoned underfloor duct in the Administration wing. There are 6 Westinghouse LoZ bus ducts. Two 4000/3200 amp 600 volt bus ducts from the pad mount transformers to the main switchgear, one 3500/2800 amp 600 volt bus duct between the main switchboard and the Generator control panel and three 1000/850 amp bus ducts between Distribution B and Distributions D1, D2 and D3.

Component Condition & Anticipated Replacement Date

The overall condition of wire and cable, devices and bus ducts is fair only, as all are around 40 years old. Although they are at the edge of their life expectancy, with maintenance, they could be extended another 5 to 10 years. Risk management is the defining factor. The conduit and wire will last 10 years until 2023, devices that are being used regularly will need replacing with maintenance and the bus duct will need cleaning and retorquing to ensure the extension. There are some remedial items to repair in 2014.

Assessment Criteria	**Existence**
Code compliance issues	
Default	Yes
	Some covers missing.

Teck cable in cable tray and grounding.

PVC and EMT conduit and pull boxes.

Abandoned under floor ducts.

CF National Codes [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Remedial Electrical Work
Current event Year (YYYY)	2014
Estimated Event Cost	$67,610

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	AVS tools does not have an estimate schedule for remedial work. Used 2 men for 3 weeks @ $100/hr as base labour and $10k for materials.	$0	each	$0
2		1	Base Rate for Material and Labour	$34,000	sum	$34,000
3		1	Construction Contingency	$5,100	sum	$5,100
4		1	Average Total Project Soft Costs	$11,700	sum	$11,700
5		1	Site Factor - Base cost	$11,200	sum	$11,200
6		1	Site Factor - Contingency and soft cost	$5,610	sum	$5,610

Narratives

Event Description

Provide remedial work project to bring some items up to code and maintenance standards, to included the following:

1) Provide coverplates on junction boxes.
2) Provide compact fluorescent lamp in keyless lamp holders.
3) Update panel directories in as many as 25 panelboards.
4) Receptacle adjacent to sink.
5) Rusting equipment.
6) Fillers missing.
7) Ensure access to panels.
8) Broken devices.
9) Provide lock on device.

Broken lenses were not identified specifically as many fixtures need to be replaced or lamps upgraded to T12, so lens replacement could be added to that budget.

Event Justification & Strategy

Most of this work is code related and must be done as soon as practical.

Implication of Event Deferral (Risks)

If this code work is not done, safety is a concern.

Typical breaker requiring a lock "on" device.

Keyless to change to Compact Fluorescent.

Typical directory to update.

Receptacle near sink.

Rusting pull boxes. Typical for two.

Typical access restriction of panel. Typical of 3 panels in service space.

Broken receptacle.

EMT conduit, AC90, wiring and coveplate loose.

Typical filler missing.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Replace Devices & Branch Wiring
Current event Year (YYYY)	2023
Estimated Event Cost	$11,621,998

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	AVS tools does not have an estimate for device and wiring replacement. Used $200/sq.m. office area.	$0	EACH	$0
2		29201	Base Rate for Material and labour	$200	m2	$5,840,200
3		29201	Construction Contingency	$30	m2	$876,030
4		29201	Average Total Project Soft cost	$69	m2	$2,014,869
5		29201	Site Factor - Base cost	$66	m2	$1,927,266
6		29201	Site Factor - Contingency and soft cost	$33	m2	$963,633

Narratives

Event Description

Replace the wiring, devices and bus duct.

Event Justification & Strategy

The equipment described will be in excess of 50 years old and beyond life expectancy.

Implication of Event Deferral (Risks)

If this work is not initiated, the maintenance and safety of the electrical system will only continue to expand.

Typical bus duct.

04.2A-060 Capacitors

Details	Values
Expected Life	40
Component Cost	89,550
Last Major Action Year	2002
Component Condition (For BCR use only)	Poor
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

There were 4 power factor capacitors located at the west end of the 2002 main switchgear. They are all manufactured by Westinghouse and of two generations. The older is dated 1989, the newer is not identified. The operational personnel indicated there is work being done on the units. It would seem the original design may have been 3 - 75 kVAR 1989 units and 3 - 100 kVAR units.

Component Condition & Anticipated Replacement Date

The condition and operation of the power correction capacitors is identified as poor as their full complement of capacitors is not connected. A review of the necessity of the capacitor banks should be initiated and then replaced or repaired. Three of the units are relatively new compared to the 1989 partial installation. Review and or installations should be done soon. Schedule for 2014.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Newer capacitor units, date not established.

CP Replacement [04.2A-060 Capacitors]

Details	Values
Brief Description (40 Characters)	Review and/or Replace Capacitors
Current event Year (YYYY)	2014
Estimated Event Cost	$89,550

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
4		225	Base Rate material and labour	$200	sum	$45,000
5		225	Contingency	$30	sum	$6,750
6		225	Soft cost	$69	sum	$15,525
7		225	Site Factor - Base cost	$66	sum	$14,850
8		225	Site Factor - Contingency and soft cost	$33	sum	$7,425
9		1	AVS tools does not identify the size of the capacitors - used $200/kVA.	$0	EACH	$0

Narratives

Event Description

Replace 1989 capacitors and ensure power correction capacitors are operational.

Event Justification & Strategy

Some work has been started on the capacitors but a review of the system may be needed to confirm justification of operating the system.

Implication of Event Deferral (Risks)

The risk of an inoperative power factor system could be elevated utility costs.

1989 capacitor units.

04.2A-070 Distribution Panels

Details	Values
Expected Life	30
Component Cost	2,199,945
Last Major Action Year	2000
Component Condition (For BCR use only)	Fair
Quantity	376
Measurement unit/ Metric	ea

Narratives

Component Description

The distribution design of the electrical system utilizes the use of 120/240 volt 1 phase 3 wire panelboards in the laboratory areas and three phase in the utility areas, which makes the majority of the distribution single phase. The panelboards are basically from 2 installations, the original installation in 1972 and an addition to the mechanical equipment that made installation of panels to feed those systems, which appears to be in about 2000. The 1972 panels are all Canadian General Electric (CGE) and the 2000 panels are Square D. Any differences from this are minimal and have not been noted.
Below is the breakdown of panelboard quantities:

1972 - Circuit Breaker Distribution Panels (CDP)[Westinghouse] (41 units)
240 volt single phase - 1
240 volt single phase (with main breaker) - 29
208 volt three phase - 1
600 volt three phase - 10

Panelboards: 1972 (CGE) (287 units)
84 circuit 225 amp 240 volt single phase - 2
42 circuit 225 amp 240 volt single phase - 262
12 circuit 100 amp 240 volt single phase - 2
42 circuit 100 amp 240 volt single phase c/w main breaker - 1
18 circuit 100 amp 240 volt single phase c/w main breaker - 1
42 circuit 225 amp 240 volt single phase (with contactor) - 16
24 circuit 100 amp 240 volt single phase (with contactor) - 3

Panelboards: 2000 (Square D) (48 units)
42 circuit 225 amp 240 volt single phase - 2 (Westinghouse)
30 circuit 225 amp 240 volt single phase - 1 (Eton)
30 circuit 100 amp 240 volt three phase - 9
24 circuit 100 amp 240 volt three phase - 2
12 circuit 100 amp 240 volt three phase – 34

Component Condition & Anticipated Replacement Date

The CDP (circuit breaker distribution panels) and the panelboards have two vintages. The original 1972 panels, about 328 units are 41 years old and in fair condition. These units should last another 10 years with preventive and operational maintenance and then be re-evaluated. These units will not be maintenance free for another 10 years. Schedule for replacement in 2023.

Assessment Criteria	**Existence**
Functional defects	
Default	Yes Fillers missing.
Inadequate labeling	
Default	Yes Panel directories need updating.

Typical panelboards.

CP Replacement [04.2A-070 Distribution Panels] -1972

Details	Values
Brief Description (40 Characters)	Replace1972 Panels
Current event Year (YYYY)	2023
Estimated Event Cost	$1,884,729

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	287	Base Rate for Material and Labour	$3,303	EACH	$947,961
2	04. Electrical	287	Construction Contingency	$495	EACH	$142,065
3	04. Electrical	287	Average Total Project Soft Costs	$1,139	EACH	$326,893
4		287	Site Factor - Base cost	$1,090	EACH	$312,830
5		287	Site Factor - Contingency and soft cost	$540	EACH	$154,980

Narratives

Event Description

Replace 1972 panelboards and CDP panels.

Event Justification & Strategy

The panelboards will be older than 50 years at this point and well past their life expectancy. Maintenance will have to be maintained to get the equipment this far.

Implication of Event Deferral (Risks)

If maintenance is not completed there is a high risk of failure. With maintenance some life can be added, but not forever.

Typical panel contactor for lighting control.

Westinghouse CDP in distribution enclosure.

Panel A5-1 c/w lighting control contactor in lower section.

1972 CGE panelboard, painted red for emergency.

CP Replacement [04.2A-070 Distribution Panels] - 2000

Details	Values
Brief Description (40 Characters)	Replace 2000 Panels
Current event Year (YYYY)	2035
Estimated Event Cost	$315,216

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	48	Base Rate for Material and Labour	$3,303	EACH	$158,544
2	04. Electrical	48	Construction Contingency	$495	EACH	$23,760
3	04. Electrical	48	Average Total Project Soft Costs	$1,139	EACH	$54,672
4		48	Site Factor - Base cost	$1,090	EACH	$52,320
5		48	Site Factor - Contingency and soft cost	$540	EACH	$25,920

Narratives

Event Description

Replace year 2000 panelboards.

Event Justification & Strategy

The panelboards will be older than 35 years at this point and close to their general life expectancy. Lifespan can be re-evaluated at this time or replaced in 2035.

Implication of Event Deferral (Risks)

After 35 years the panels could be a concern of operational integrity.

Typical Square D panel installed for refrigeration upgrade.

04.3A-010 General Lighting

Details	Values
Expected Life	30
Component Cost	2,545,772
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	3,526
Measurement unit/ Metric	ea

Narratives

Component Description

The lighting in the building is varied. Primarily the lighting consists of linear T12 fluorescents, these consist of specific fixtures for specific applications. In T-bar areas there are recessed type with K12A lenses, paracube, deep cell and drop opal installations. In the executive offices there are luminous ceilings. Most of the laboratory corridors have a valance with an acrylic lens along one side. The utility and service areas have a combination of industrial reflectors, strip fixtures, with and without wire guards. As for incandescent fixtures, there are several different track types and recessed and surface pot lights in the public areas. There are a few metal halide fixtures located in public areas in high mounting installations. In the utility areas there are RLM dome, vapour tight and keyless lamp holders. The operator indicated that about 40% of the T12 fixtures have been either replaced or been retrofitted to T8 lamps. There are approximately 2957 fluorescent and 569 incandescent/HID fixtures in the building proper.

Component Condition & Anticipated Replacement Date

The fixtures are mostly from the 1972 installation with the exception of specific operational upgrades and the process of changing over T12 lamps to T8 by retrofitting the original fixtures. Those that have not been brought up to T8 standards will need replacement very soon as lamps are no longer manufactured. About 60% of the fluorescent fixtures are deemed to still have T12 lamps by the operational staff. So the overall condition of the fixture has been classed as only fair until the T8 replacement is complete and should be done in 2014. The rest of the 40% should be replaced in 2038.

Assessment Criteria	**Existence**
Damaged fixtures	
Default	Yes
	Many damaged lenses.
Obsolete fixtures	
Default	Yes
	T12 lamps are obsolete.

Architectural feature lighting in public area.

Office lighting.

Industrial area lighting.

CP Life Extension [04.3A-0 510 General Lighting] T8 conversions

Details	Values
Brief Description (40 Characters)	Upgrade T12 to T8 Lamps
Current event Year (YYYY)	2014
Estimated Event Cost	$1,692,368

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2344	Base Rate for Material and Labour	$363	EACH	$850,872
2	04. Electrical	2344	Construction Contingency	$54	EACH	$126,576
3	04. Electrical	2344	Average Total Project Soft Costs	$125	EACH	$293,000
4		2344	Site Factor - Base cost	$120	EACH	$281,280
5		2344	Site Factor - Contingency and soft cost	$60	EACH	$140,640

Narratives

Event Description

Replace about 60% of the existing fluorescent fixtures to bring all the lighting up to T8 lamps as well as replace all the incandescent fixtures.
60% of 2957 = 1775 plus 569 incandescent.

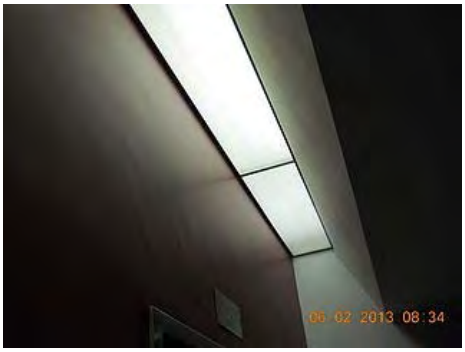
Event Justification & Strategy

T12 lamps are no longer manufactured and the fixtures are beyond their life expectancy.

Implication of Event Deferral (Risks)

There is high risk in operation if fluorescent fixtures are not replaced as lamps are no longer produced.

T12 lamp fluorescent fixture.



Typical valance lighting along one side of the corridors.

Keyless lamp holder.

Luminous ceiling installation.

CP Replacement [04.3A-010 General Lighting]

Details	Values
Brief Description (40 Characters)	Replace T8 Fixtures
Current event Year (YYYY)	2038
Estimated Event Cost	$853,404

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1182	Base Rate for Material and Labour	$363	EACH	$429,066
2	04. Electrical	1182	Construction Contingency	$54	EACH	$63,828
3	04. Electrical	1182	Average Total Project Soft Costs	$125	EACH	$147,750
4		1182	Site Factor - Base cost	$120	EACH	$141,840
5		1182	Site Factor - Contingency and soft cost	$60	EACH	$70,920

Narratives

Event Description

Replace T8 fixtures at end of life.

Event Justification & Strategy

Fixtures that were replaced or upgraded to T8 prior to this inspection will be 30 years older in 2038 and need to be replaced.

Implication of Event Deferral (Risks)

Risk is higher maintenance.

T8 fixture.

04.3A-020 Exit Lighting

Details	Values
Expected Life	30
Component Cost	42,048
Last Major Action Year	2000
Component Condition (For BCR use only)	Poor
Quantity	64
Measurement unit/ Metric	ea

Narratives

Component Description

The exit fixtures are of two installations. The original 1972 units are bilingual but not to Government standard. These units have been retrofitted with LED lighting. The newer units do meet standard and are bilingual.

Component Condition & Anticipated Replacement Date

Most of the exit signs are from the 1972 installation and do not meet Government standards and are therefore classed as poor even though operational. These need to be replaced in 2014.

Assessment Criteria	Existence
Obsolete fixtures	
Default	Yes
	Lettering does not meet Government standard.

Acceptable EXIT signage.

CF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exit Signs
Current event Year (YYYY)	2014
Estimated Event Cost	$42,048

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	64	Base Rate for Material and Labour	$330	EACH	$21,120
2	04. Electrical	64	Construction Contingency	$50	EACH	$3,200
3	04. Electrical	64	Average Total Project Soft Costs	$114	EACH	$7,296
4		64	Site Factor - Base cost	$109	EACH	$6,976
5		64	Site Factor - Contingency and soft cost	$54	EACH	$3,456

Narratives

Event Description

Replace exit signs with bilingual or international symbol type.

Event Justification & Strategy

This is a government standard.

Implication of Event Deferral (Risks)

The risk could be great as safety litigation could result.

Typical exit fixture.

04.3A-030 Exterior Lighting

Details	Values
Expected Life	15
Component Cost	98,215
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	65
Measurement unit/ Metric	ea

Narratives

Component Description

The exterior lighting report is divided into two areas, the first are those that are mounted to the building, the second are those located on the site away from the building as site and parking lot lighting. All fixtures are using High Pressure Sodium lamps. On the building there are 250 watt fixtures mounted high on the walls for security to the building, in the front entrance there are low wattage fixtures in the canopy, on the wall and recessed side lights illuminating the front stairs. In the front of the building and around the walkways there are 3 meter white opal globe type light standards. In the parking area are 5 metre high, single and double head white opal square fixture standards. The breakdown of quantity is as follows: 24 wall packs, 4 canopy fixtures, 4 wall architectural, 14 white opal standards, 10 double parking, 7 single parking and 2 side lights.

Component Condition & Anticipated Replacement Date

The exterior lighting is showing signs of age and although operational appear in only fair condition and should be scheduled for replacement in 5 years in 2018.

Assessment Criteria	Existence
Failed lamps	
Default	Yes
	Some lamps inoperable.

Entrance area architectural lighting.

Typical wall pack around the site.

CP Replacement [04.3A-030 Exterior Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exterior & Site Lighting
Current event Year (YYYY)	2018
Estimated Event Cost	$98,215

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	65	Base Rate for Material and Labour	$760	EACH	$49,400
2	04. Electrical	65	Construction Contingency	$114	EACH	$7,410
3	04. Electrical	65	Average Total Project Soft Costs	$262	EACH	$17,030
4		65	Site Factor - Base cost	$251	EACH	$16,315
5		65	Site Factor - Contingency and soft cost	$124	EACH	$8,060

Narratives

Event Description

Replace exterior fixtures on the side of the building, the landscape and parking lot lighting.

Event Justification & Strategy

The fixtures vary in age somewhat, but all have reached their life expectancy.

Implication of Event Deferral (Risks)

Security is a risk if exterior lighting is not maintained.

White opal standard for site landscape lighting.

Twin head parking standard.

Step lighting at the main entrance.

04.3A-040 Emergency Lighting

Details	Values
Expected Life	18
Component Cost	0
Last Major Action Year	2010
Component Condition (For BCR use only)	Fair
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

Emergency lighting for egress and exit sign connections are primarily general lighting fixtures connected to the emergency generated distribution. Where necessary, there are additional emergency battery packs to back up the generator powered lighting. There are about 5 low voltage battery units located in the distribution areas and are connected to remote heads for distribution of illumination.

Component Condition & Anticipated Replacement Date

The existing emergency battery packs have been maintained over the years and this should continue. However, the old remote heads are not efficient and in fair condition and should be replaced in 2015.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Emergency lighting panel in Service Building.

Typical remote heads.

RP Life Extension [04.3A-040 Emergency Lighting]

Details	Values
Brief Description (40 Characters)	Upgrade Remote Emergency Heads
Current event Year (YYYY)	2015
Estimated Event Cost	$3,610

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	5	Base Rate for Material and Labour	$363	EACH	$1,815
2	04. Electrical	5	Construction Contingency	$54	EACH	$270
3	04. Electrical	5	Average Total Project Soft Costs	$125	EACH	$625
4		5	Site Factor - Base cost	$120	EACH	$600
5		5	Site Factor - Contingency and soft cost	$60	EACH	$300

Narratives

Event Description

Replace remote head.

Event Justification & Strategy

The remote heads have not been replaced since 1972 and are not efficient.

Implication of Event Deferral (Risks)

The fixtures are part of the emergency egress system and a safety issue.

Battery pack in some removed area from the central unit.

04.3A-050 Specialty Lighting Fixtures

Details	Values
Expected Life	30
Component Cost	3,022
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

There are two 400 watt metal halide roof mounted fixtures that are associated with the Government Wordmark logo on the upper portion of the east face of the building.

Component Condition & Anticipated Replacement Date

The fixtures for the Wordmark sign are in good condition and should last another 10 years so that replacement should be about 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Wordmark sign fixtures on third floor roof.

RP Replacement [04.3A-050 Wordmark Fixtures]

Details	Values
Brief Description (40 Characters)	Replace Wordmark Fixtures
Current event Year (YYYY)	2020
Estimated Event Cost	$3,022

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$760	EACH	$1,520
2	04. Electrical	2	Construction Contingency	$114	EACH	$228
3	04. Electrical	2	Average Total Project Soft Costs	$262	EACH	$524
4		2	Site Factor - Base cost	$251	EACH	$502
5		2	Site Factor - Contingency and soft cost	$124	EACH	$248

Narratives

Event Description

Replace Wordmark flood lights.

Event Justification & Strategy

It is assumed the Wordmark sign was installed around 2000. The fixtures would have to be replaced in about 20 years to ensure continued operation.

Implication of Event Deferral (Risks)

There is no risk other than the loss of the Government logo being visible during dark hours.

Metal halide Workmark sign fixture.

04.4A-010 Grounding Systems

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	2002
Component Condition (For BCR use only)	Good
Quantity	31,387
Measurement unit/ Metric	ea

Narratives

Component Description

The service ground is not visible but there are several locations where 3/0 bare ground copper is exposed showing terminations to transformers and cable trays.

Component Condition & Anticipated Replacement Date

With the installation of the new main switchboard in 2002, the integrity of the grounding should have been confirmed or maintained and is identified as good. No event is identified.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Grounding conductors for transformer grounding.

Panel grounding.

04.5A-010 Fire Alarm System

Details	Values
Expected Life	17
Component Cost	2,375,996
Last Major Action Year	1998
Component Condition (For BCR use only)	Fair
Quantity	31,387
Measurement unit/ Metric	ea

Narratives

Component Description

The main fire alarm cabinet is located in the operators office and is a Simplex 4100. The system is a two stage addressable system, there is an annunciator at the rear entry security desk. There is a sub panel Simplex 4009 at the hazardous storage for the Inergen suppression system. There is also an annunciator in the spill response area, room 301-B. There are no visual signals anywhere in the building. This main building system gathers and alarms the other buildings on the site including the Annex, the Small Craft building, the Water Treatment Plan and the Storage building.

Component Condition & Anticipated Replacement Date

The fire alarm system appears to have been upgraded last in about 1998, and is missing any visual signal devices. This would make the system in fair condition overall. Although operational and stable, the fire alarm should be scheduled for replaced by 2018. If replacement is going to be delayed until then, visual devices should be considered in 2014.

Fire alarm cabinet in operators office.

CF National Codes [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Add Visual Signal Devices
Current event Year (YYYY)	2014
Estimated Event Cost	$123,480

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1569	Base Rate for Material and Labour	$38	m²	$59,622
2	04. Electrical	1569	Construction Contingency	$6	m²	$9,414

3	04. Electrical	1569	Average Total Project Soft Costs	$13	m²	$20,397
4		1569	Site Factor - Base cost	$16	m2	$24,320
5		1569	Site Factor - Contingency & Soft Costs	$6	m2	$9,728
6		1	AVS tools does not recognize remedial work - used 5% of area to add visual devices.	$0	EACH	$0

Narratives

Event Description

Add visual signal devices to the existing fire alarm system.

Event Justification & Strategy

The code requires visual devices now, and although the building probably is grand-fathered, it is important for the Government to be proactive for life safety systems.

Implication of Event Deferral (Risks)

Visual signals are a code requirement and mandatory for safety.

Typical 2 stage pull station and alarm bell. (no visual devices)

CP Life Extension [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Upgrade Fire Alarm System
Current event Year (YYYY)	2018
Estimated Event Cost	$2,375,996

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	31387	Base Rate for Material and Labour	$38	m²	$1,192,706
2	04. Electrical	31387	Construction Contingency	$6	m²	$188,322
3	04. Electrical	31387	Average Total Project Soft Costs	$13	m²	$408,031

4	31387	Site Factor - Base cost	$13	m2	$392,338
5	31387	Site Factor - Contingency and soft cost	$6	m2	$194,599

Narratives

Event Description

Upgrade or replace fire alarm to new technology as required.

Event Justification & Strategy

The operation and functionality of the fire alarm systems is essential for the safety of the building and people.

Implication of Event Deferral (Risks)

If the fire alarm system is not maintained, then safety of the building and people would be a concern.

Sub panel for gas suppression system.

04.5A-020 Emergency Power System

Details	Values
Expected Life	35
Component Cost	4,771,200
Last Major Action Year	1972
Component Condition (For BCR use only)	Fair
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The emergency generation system consists of two diesel generators connected to the essential switchboard (cells 5 to 11) through a synchronizing control panel. The generators are the same and are Bemac II 800 kW @ 80% PF (1000 kVA) rated 962 amps at 600 volt 3 phase 3 wire. The diesel engine is a Caterpillar D399 running at 1200 rpm. The synchronizing panel consists of 5 cells, the first two are for each of Generators 1 and 2 respectively and contains the analogue meters, Thompson Technology digital controller and the generator breaker. Cell 3 contains the synchronizing equipment including voltage, amperage, kilowatt meters, the synchronizing dial, the indicator lights and selectors, the protective relays, as well as the generator bus breaker. Cell #4 has the generator breaker status indicators. Cell #5 has the ground fault relay indicators.

Component Condition & Anticipated Replacement Date

The generators and associated controls are now 40 years old and maintenance is becoming a concern. The condition of the equipment is identified as fair and replacement is inevitable and should be in the next 5 years, 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

One of the two diesel generators.

Synchronizing control panel.

CP Replacement [04.5A-020 Emergency Power System]

Details	Values
Brief Description (40 Characters)	Replace Generators & Associated Controls
Current event Year (YYYY)	2018
Estimated Event Cost	$4,771,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
4		0	AVS Tools does not define size of generators - used $1500/kVA.	$0	each	$0
5		1600	Base Rate for Material and Labour	$1,500	sum	$2,400,000
6		1600	Construction Contingency	$225	sum	$360,000

7	1600	Average Total Project Soft Costs	$517	sum	$827,200
8	1600	Site Factor - Base cost	$495	sum	$792,000
9	1600	Site Factor - Contingency & Soft Costs	$245	sum	$392,000

Narratives

Event Description

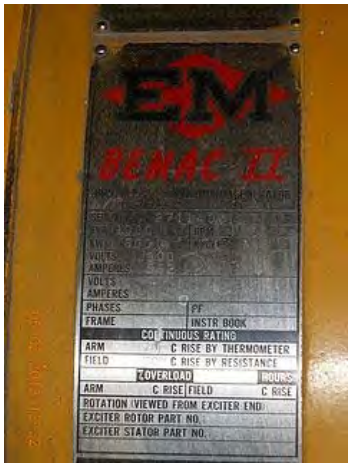
Replace the two generators, the synchronizing control panel and all associated equipment.

Event Justification & Strategy

The equipment is all in the vintage of 50 years and well past their safe usage.

Implication of Event Deferral (Risks)

If these units and system are not maintained all safety and emergency operations are at risk.



Bemac II generator.

Transfer switch for Annex Building service.

04.5A-030 Communication Systems

Details	Values
Expected Life	25
Component Cost	4,397,272
Last Major Action Year	1995
Component Condition (For BCR use only)	Fair
Quantity	31,387
Measurement unit/ Metric	ea

Narratives

Component Description

The main telecommunication room (1-106) is in the basement of the Administration Building. This is the location of the site terminations for the PBX system, and the carrier fibre optics cable. The telephone cabling is category 3. There are data cabinets located around the building for the distribution of category 5 cable and inter-connecting fibre optics backbone cable.

Component Condition & Anticipated Replacement Date

The general telecommunication systems are pretty basic and the telephone distribution has not changed significantly. Telecommunications is in fair condition but should be brought up to industry standard for the future. The system should be replaced in 2020.

Assessment Criteria	Existence
Obsolete	
Default	Yes
	Should be upgraded to Tbits 6.9.

Incoming telephone cable.

CP Life Extension [04.5A-030 Communication Systems]

Details	Values
Brief Description (40 Characters)	Upgrade Telecommunication Infrastructure
Current event Year (YYYY)	2020
Estimated Event Cost	$4,397,272

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	9416	Base Rate for Material and Labour	$235	m²	$2,212,760
2	04. Electrical	9416	Construction Contingency	$35	m²	$329,560
3	04. Electrical	9416	Average Total Project Soft Costs	$81	m²	$762,696
4		9416	Site Factor - Base cost	$78	m2	$734,448
5		9416	Site Factor - Contingency & Soft Costs	$38	m2	$357,808

6	0	AVS Tools appears not to consider building function - used $75/m2 and modified area to 9416 m2.	$0	EACH	$0

Narratives

Event Description

Upgrade telecommunications system to meet Tbits 6.9 and/or EIA/TIA T568B standards.

Event Justification & Strategy

The telecommunication system as found, is quite basic and has little flexibility or future expansion availability.

Implication of Event Deferral (Risks)

The only risk to the site of not initiating this work is operational function which is essential.

Main telephone service termination blocks.

Fibre optics carrier cable.

04.5A-040 Security System

Details	Values
Expected Life	20
Component Cost	272,144
Last Major Action Year	2001
Component Condition (For BCR use only)	Average
Quantity	29,201
Measurement unit/ Metric	m2

Narratives

Component Description

The building access/security system is manufactured by EBI Honeywell. The head end equipment is located at the operators room (1-06). Devices are located throughout the building including exterior doors, specific control concerns and alarms as required. This system provides service to the other buildings on site including the Annex building, Small Craft building, Water Treatment Plant and the Warehouse.

Component Condition & Anticipated Replacement Date

The existing access/security system is in average condition and should maintain operation until at least 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Security head equipment.

CP Replacement [04.5A-040 Security System]

Details	Values
Brief Description (40 Characters)	Upgrade Security System
Current event Year (YYYY)	2022
Estimated Event Cost	$272,144

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2920	Base Rate for Material and Labour	$47	m²	$137,240
2	04. Electrical	2920	Construction Contingency	$7	m²	$20,440
3	04. Electrical	2920	Average Total Project Soft Costs	$16	m²	$46,720
4		2920	Site Factor - Base cost	$16	m2	$45,260
5		2920	Site Factor - Contingency & Soft Costs	$8	m2	$22,484
6		1	AVS Tool does not take into account for building function - used 10% of area at 2920 m2.	$0	EACH	$0

Narratives

Event Description

Upgrade security system to maintain operation.

Event Justification & Strategy

Technology and maintenance of the system requires that the equipment be replaced regularly.

Implication of Event Deferral (Risks)

If the system is not maintained then security could be compromised.

Sub panel.

04.6A-010 Automatic Door Devices

Details	Values
Expected Life	20
Component Cost	13,874
Last Major Action Year	2001
Component Condition (For BCR use only)	Good
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

There is one set of double doors at the front entrance that has electrical door operators installed.

Component Condition & Anticipated Replacement Date

The door operators seem to be in good condition and with continued operational maintenance should not need replacement until about 2021.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Main entrance door operator.

RP Replacement [04.6A-010 Automatic Door Devices]

Details	Values
Brief Description (40 Characters)	Replace Door Operators
Current event Year (YYYY)	2021
Estimated Event Cost	$13,874

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$3,489	EACH	$6,978
2	04. Electrical	2	Construction Contingency	$523	EACH	$1,046
3	04. Electrical	2	Average Total Project Soft Costs	$1,204	EACH	$2,408
4		2	Site Factor - Base cost	$1,151	EACH	$2,302
5		2	Site Factor - Contingency and soft cost	$570	EACH	$1,140

Narratives

Event Description

Replace the double door operators.

Event Justification & Strategy

The door operators are a necessity to maintain the building to meet Accessibility standards.

Implication of Event Deferral (Risks)

Event delay would be in contravention to the Accessibility standard. Undue personal stress may result for those using the doors.

Entrance push button for door operator.

10. Whole Building Expenditures

10.1A-015 Building Condition Report

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	2013
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Main Laboratory and Administration Building is a cast-in-place and precast concrete building with five floor levels and was built in 1972. The 21,725m2 building is laid out with the 3 level Administration block at the east end of the building and a 5 level Laboratory block in the center and the 3 level Service block at the west end of the building. The Basement level of the Lab/Administration block is mostly under grade, however windows do serve offices located on this level.

Component Condition & Anticipated Replacement Date

Currently, the asset and property have elements regarded in fair, average and good condition. This assessment depends on the element in question. The next building condition inspection and report (BCR) is scheduled for 2018.

RP New [10.1A-015 Building Condition Report]

Details	Values
Brief Description (40 Characters)	Produce New Building Condition Report
Current event Year (YYYY)	2018
Estimated Event Cost	$53,955

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	545	Base Rate for Material and Labour	$66	m²	$35,970
2	01. Architectural & Structural	545	Construction Contingency	$10	m²	$5,450
3	01. Architectural & Structural	545	Average Total Project Soft Costs	$23	m²	$12,535
4		0	LCF costs are not applicable. Quantity of 545 used to obtain a Base Rate cost (line 1) and Soft Costs (line 3) totaling $48.5K. Contingency required for inflation estimating.	$0	EACH	$0

Narratives

Event Description

Conduct building condition inspections to evaluate all property and asset components for cyclical replacement. All data and relevant photos are to be entered into the appropriate AVS database. Export all element data from AVS and edit final report in MS Word.

Note, BCR implementation cost is calculated using the Base Rate costs for "01. 5-070C05 Carpeting".

Event Justification & Strategy

Conducting BCRs is a PWGSC mandate for all assets to provide supporting asset condition information for the building Asset Management Plan (AMP) that is produced every five years.

Implication of Event Deferral (Risks)

Event delay would infringe on the cyclical production of the AMP. Timely replacements of numerous base building elements would be hindered and life safety issues may arise.

10.1A-030 Accessibility Audit

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Conduct a comprehensive Accessibility Audit to identify a compliance score with respect to the 2012 CSA standard.

Component Condition & Anticipated Replacement Date

Current condition is average and new audit should be completed in 2013.

RP New [10.1A-030 Accessibility Audit]

Details	Values
Brief Description (40 Characters)	Conduct Accessibility Audit
Current event Year (YYYY)	2013
Estimated Event Cost	$10,360

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	14	Base Rate for Material and Labour	$495	EACH	$6,930

2	01. Architectural & Structural	14	Construction Contingency	$74	EACH	$1,036
3	01. Architectural & Structural	14	Average Total Project Soft Costs	$171	EACH	$2,394
4		0	Quantity of 14 used to obtain appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct accessibility audit of all public spaces for compliance against the 2012 CSA standard.

Note, accessibility audit costing is derived from using AVS costing for "01.5A-055 Interior Door Hardware" to obtain a Base Rate plus Soft Cost totaling approximately $9K. A contingency is added for inflation estimating. The Location Correction Factor costs are not used for this cost estimate.

Event Justification & Strategy

Event will identify which accessibility elements are not compliant. Compliant accessible features maintains an acceptable space for all.

Implication of Event Deferral (Risks)

Delaying the accessible audit would promote non-compliant components and public complaints may arise.

10.1A-056 Serviceability Assessment - Roof Access

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Maintenance staff report that access to the roof (Lab Block) from room P-3 (machine Room) is frequently prevented due to snow accumulation against the door (which swings out).

Component Condition & Anticipated Replacement Date

Current roof access is poor during winter conditions. Implement inspection/report in 2013 to find a solution.

Snow buildup frequently prevents door from opening.

RF Serviceability [10.1A-056 Serviceability Assessment - Roof Access]

Details	Values
Brief Description (40 Characters)	Conduct Roof Access Study
Current event Year (YYYY)	2013
Estimated Event Cost	$5,640

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$126	m²	$3,780
2	01. Architectural & Structural	30	Construction Contingency	$19	m²	$570
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$43	m²	$1,290
4		0	Quantity of 30 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct study to assess roof access options to address problem - i.e. - provide separate access door to roof, build enclosure to prevent snow buildup, etc..

Event costing derived from using base rate costs for AVS element "01.4-010C20 Elastomeric/Modified Bitumen". No location correction factors were used.

Event Justification & Strategy

The study will evaluate current situation and provide viable solutions.

Implication of Event Deferral (Risks)

Event delay would hinder maintenance operations for roof mounted equipment.

10.2A-010 Architectural - Enclosure Thermal Scan

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Asset enclosure evaluation should be conducted every 5 years during the BCR cycle.

Component Condition & Anticipated Replacement Date

The asset enclosure is currently in average condition. The next enclosure thermal scan is scheduled for 2013.

RP New [10.2A-010 Architectural - Enclosure Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Enclosure Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$7,890

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	10	Base Rate for Material and Labour	$528	m²	$5,280
2	01. Architectural & Structural	10	Construction Contingency	$79	m²	$790
3	01. Architectural & Structural	10	Average Total Project Soft Costs	$182	m²	$1,820
4		0	Quantity of 10 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct thermal scan on building envelope from the exterior and interior during winter conditions, while the enclosure in under negative and positive interior pressure scenarios.

Note, event costing is derived from using Base Rate costs for "01.3-070C01 Aluminum Windows" to obtain approximately $6K. A location factor is not applied. However, a contingency cost is included for inflation factor estimating.

Event Justification & Strategy

Enclosure thermal scan will evaluate the building envelope's integrity with respect to air leakage and inner wall moisture presence/accumulation. The scan results will identify anomalies for correction to ensure continued wall performance. Overall energy consumption reduction may be affected.

Implication of Event Deferral (Risks)

Event deferral may risk the accumulation of inner wall moisture which in turn may risk damaging the inner and outer wall components. Delaminations are a possibility with unscheduled repairs.

10.2A-010 Architectural - Roof Thermal Scan

Details	Values
Expected Life	3
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

A 4 ply built-up roof, 13mm fibreboard, 50mm rigid insulation, air vapour barrier, concrete deck was installed in 1998.

Component Condition & Anticipated Replacement Date

Insulation values (R10) are relatively low compared to current insulation levels recommended by the national Energy Code. (R25)

Maintenance staff indicate minor roof repairs were undertaken within past 2 years to prevent leakage occurring into 5th floor lab. Staff reports, the existing roof was installed in January of 1998 and quality of installation is suspect.

RP New [10.2A-010 Architectural - Roof Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Roof Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$7,520

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	40	Base Rate for Material and Labour	$126	m²	$5,040
2	01. Architectural & Structural	40	Construction Contingency	$19	m²	$760
3	01. Architectural & Structural	40	Average Total Project Soft Costs	$43	m²	$1,720
4		0	Quantity of 40 used to obtain appropriate overall cost.	$0	EACH	$0

Narratives

Event Description

Conduct a thermal scan of roof membrane, all levels.

Note, event costing derived from Base Rate costs for "01.4-010C20 Elast./Mod. Bitumen, 1 ply membrane". No location factors are included.

Event Justification & Strategy

Verify integrity of roof membrane, all levels. The thermal scan will identify all underlying component deficiencies such as; damaged and trapped water.

Implication of Event Deferral (Risks)

Event delay will hinder the identification of small problems before they become large. Increased repair costs will be incurred.

10.2A-020 Mechanical - Water Testing

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The asset has numerous copper piping runs carrying domestic cold and hot water.

Component Condition & Anticipated Replacement Date

The existing piping appears to be adequate from the exterior. However, the interior pipe condition is unknown. The current condition can only be rated as average. As per code, the 40+ year old piping needs to be tested via a water quality test in 2013 and every 5 years thereafter.

RF Domestic Water Quality [10.2A-020 Mechanical - Water Testing]

Details	Values
Brief Description (40 Characters)	Conduct Water Quality Testing
Current event Year (YYYY)	2013
Estimated Event Cost	$8,190

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	45	Base Rate for Material and Labour	$122	m	$5,490
2	03. Mechanical	45	Construction Contingency	$18	m	$810
3	03. Mechanical	45	Average Total Project Soft Costs	$42	m	$1,890
4		0	Quantity of 45 used to obtain approximate overall total.	$0	EACH	$0

Narratives

Event Description

Mandatory testing for leached copper and lead levels must be performed on the stagnant domestic water supplies, especially with respect to the domestic hot water. If test results return unacceptably high levels of those metals, an engineering evaluation needs to be undertaken to determine options.

Note, costing is derived from Base Rate costs for "Plumbing Piping". No location factor is included.

Event Justification & Strategy

This testing is a mandatory recommendation.

Implication of Event Deferral (Risks)

Postponing this water quality testing would contravene the code. Potential water contaminates would present life safety issues.

10.2A-030 Electrical - Arc Flash Identification

Details	Values
Expected Life	25
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

MAIN SECONDARY DISTRIBUTION:
Was upgraded in 2002 and is manufactured by Cutler Hammer. The equipment on the main floor of the Service Building is 11 cells wide and contains the major protection breakers for the site. All the breakers are draw out electronic trip air type. Cells 1 through 4 contain the two main 4000 amp frame 3200 amp trip mains breakers off the utility to a spit distribution with a similar tie breaker in between along with the overall metering. The two main breakers and the main generator breaker all have IQ monitoring meters associated with them.
Cells 6 and 7 make the common tie to the emergency distribution in the synchronizing switch.
Cell 8 contains one spare 1600 amp breaker and two spaces.
Cell 9 feeds MCC 2-1 and 2-2, as well as the Annex Building via the Automatic Transfer switch located on the end of Distribution B.
Cell 10 feeds MCC1 and 4.
Cell 11 feeds Distribution EP and Distribution EE with two breakers.

OTHER FREE STANDING DISTRIBUTION:
There are several varied free standing distributions within the building, manufactured by Westinghouse and are quantified as follows:
Distribution B - 4 sections, 600 volt 3 phase.
Distribution C - 3 sections, 600 volt 3 phase CDP, 200 kVA transformer, 120/240 volt 1 phase CDP.
Distribution DD - 10 sections, 600 volt 3 phase CDP, 6 transformers and 120/240 volt 1 phase CDP.
Distribution EE - 10 sections, 600 volt 3 phase CDP, 5 transformers and 120/240 volt 1 phase CDP.
Distribution N - 5 sections, 600 volt 3 phase CDP, 3 transformers and two 120/240 volt 1 phase CDP's.
Distribution EK - 2 sections, 45 kVA transformer, 120/208 volt 3 phase CDP.
Distribution EH - 2 sections, 75 kVA transformer, 120/208 volt 3 phase CDP.
Distribution EJ - 2 sections, 150 kVA transformer, 120/208 volt 3 phase CDP.

The synchronizing panel consists of 5 cells, the first two are for each of Generator 1 and 2 respectively and contains the analogue meters, Thompson Technology digital controller and the generator breaker. Cell 3 contains the synchronizing equipment including voltage, amperage, kilowatt meters, the synchronizing dial, the indicator lights and selectors, the protective relays, as well as the generator bus breaker. Cell #4 has the generator breaker status indicators. Cell #5 has the ground fault relay indicators.

All of the Motor Control Centres were installed under the original contract in 1972 and are manufactured by Westinghouse unless otherwise noted. Below is a list of the equipment:
MCC #1 (600 volt) - Back to back unit, 4 sections from 1972 and one section (Westinghouse 5 star)from 1994.
MCC #2-1 (600 volt) - 8 sections.
MCC #2-2 (600 volt) - 6 sections from 1972 and 3 VFD (ABB manufacture) section about 2008.
MCC #3-1 (208 volt) - 9 sections.
MCC #3-1 (208 volt) - 7 sections.
MCC #4 (600 volt) - 4 sections.
MCC #5 (600 volt) - 3 sections from 1972 and one section (Westinghouse 5 star) from 1994.

The distribution design of the electrical system utilizes the use of 120/240 volt 1 phase 3 wire panelboards in the laboratory areas and three phase in the utility areas, which makes the majority of the distribution single phase. The panelboards are basically from 2 installations, the original installation in 1972 and an addition to the mechanical equipment that made installation of panels to feed those systems, which appears to be in about 2000. The 1972 panels are all Canadian General Electric (CGE) and the 2000 panels are Square D. Any differences from this are minimal and have not been noted.
Below is the breakdown of panelboard quantities:

Circuit Breaker Distribution Panels (CDP)[Westinghouse] (41 units)
240 volt single phase - 1
240 volt single phase (with main breaker) - 29
208 volt three phase - 1
600 volt three phase - 10

Panelboards: 1972 (CGE) (287 units)
84 circuit 225 amp 240 volt single phase - 2
42 circuit 225 amp 240 volt single phase - 262
12 circuit 100 amp 240 volt single phase - 2
42 circuit 100 amp 240 volt single phase c/w main breaker - 1
18 circuit 100 amp 240 volt single phase c/w main breaker - 1
42 circuit 225 amp 240 volt single phase (with contactor) - 16
24 circuit 100 amp 240 volt single phase (with contactor) - 3

Panelboards: 2000 (Square D) (48 units)
42 circuit 225 amp 240 volt single phase - 2 (Westinghouse)
30 circuit 225 amp 240 volt single phase - 1 (Eton)
30 circuit 100 amp 240 volt three phase - 9
24 circuit 100 amp 240 volt three phase - 2
12 circuit 100 amp 240 volt three phase – 34

Component Condition & Anticipated Replacement Date

Once the existing components are labeled, no further action would be necessary unless there are utility system changes. All new equipment added after the study will have to be labeled individually. The process has not been done as of yet and is therefore considered to be in poor condition. Study should be done immediately in 2013.

Main Switchboard in Service Building.

RO Electrical [10.2A-030 - Arc Flash Identification]

Details	Values
Brief Description (40 Characters)	Provide Arc Flash Study & Identification
Current event Year (YYYY)	2013
Estimated Event Cost	$74,055

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	15	Base Rate for Material and Labour	$3,303	EACH	$49,545
2	04. Electrical	15	Construction Contingency	$495	EACH	$7,425
3	04. Electrical	15	Average Total Project Soft Costs	$1,139	EACH	$17,085

Narratives

Event Description

Provide a study to determine the arc flash rating for each piece of electrical equipment and install a label as required.

Event costing is derived from using AVS base rate costs for "04.2A-070 Distribution Panels". No location correction factors are applied.

Event Justification & Strategy

The labeling of electrical equipment with Arc Flash ratings is identified in the Canadian Electrical Code.

Implication of Event Deferral (Risks)

To avoid the implementation of Arc Flash labeling would be to contravene code and put lives at risk during maintenance tasks.

Air Circuit breaker not labeled.

10.2A-030 Electrical - Cleaning and Torque

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

MAIN SECONDARY DISTRIBUTION:
Was upgraded in 2002 and is manufactured by Cutler Hammer. The equipment on the main floor of the Service Building is 11 cells wide and contains the major protection breakers for the site. All the breakers are draw out electronic trip air type. Cells 1 through 4 contain the two main 4000 amp frame 3200 amp trip mains breakers off the utility to a spit distribution with a similar tie breaker in between along with the overall metering. The two main breakers and the main generator breaker all have IQ monitoring meters associated with them.
Cells 6 and 7 make the common tie to the emergency distribution in the synchronizing switch.
Cell 8 contains one spare 1600 amp breaker and two spaces.
Cell 9 feeds MCC 2-1 and 2-2, as well as the Annex Building via the Automatic Transfer switch located on the end of Distribution B.
Cell 10 feeds MCC1 and 4.
Cell 11 feeds Distribution EP and Distribution EE with two breakers.

OTHER FREE STANDING DISTRIBUTION:
There are several varied free standing distributions within the building, manufactured by Westinghouse and are quantified as follows:
Distribution B - 4 sections, 600 volt 3 phase.
Distribution C - 3 sections, 600 volt 3 phase CDP, 200 kVA transformer, 120/240 volt 1 phase CDP.
Distribution DD - 10 sections, 600 volt 3 phase CDP, 6 transformers and 120/240 volt 1 phase CDP.
Distribution EE - 10 sections, 600 volt 3 phase CDP, 5 transformers and 120/240 volt 1 phase CDP.
Distribution N - 5 sections, 600 volt 3 phase CDP, 3 transformers and two 120/240 volt 1 phase CDP's.
Distribution EK - 2 sections, 45 kVA transformer, 120/208 volt 3 phase CDP.
Distribution EH - 2 sections, 75 kVA transformer, 120/208 volt 3 phase CDP.
Distribution EJ - 2 sections, 150 kVA transformer, 120/208 volt 3 phase CDP.

All of the Motor Control Centres were installed under the original contract in 1972 and are manufactured by Westinghouse unless otherwise noted. Below is a list of the equipment:
MCC #1 (600 volt) - Back to back unit, 4 sections from 1972 and one section (Westinghouse 5 star)from 1994.
MCC #2-1 (600 volt) - 8 sections.
MCC #2-2 (600 volt) - 6 sections from 1972 and 3 VFD (ABB manufacture) section about 2008.
MCC #3-1 (208 volt) - 9 sections.
MCC #3-1 (208 volt) - 7 sections.
MCC #4 (600 volt) - 4 sections.
MCC #5 (600 volt) - 3 sections from 1972 and one section (Westinghouse 5 star) from 1994.

The distribution design of the electrical system utilizes the use of 120/240 volt 1 phase 3 wire panelboards in the laboratory areas and three phase in the utility areas, which makes the majority of the distribution single phase. The panelboards are basically from 2 installations, the original installation in 1972 and an addition to the mechanical equipment that made installation of panels to feed those systems, which appears to be in about 2000. The 1972 panels are all Canadian General Electric (CGE) and the 2000 panels are Square D. Any differences from this are minimal and have not been noted.
Below is the breakdown of panelboard quantities:

Circuit Breaker Distribution Panels (CDP)[Westinghouse] (41 units)
240 volt single phase - 1
240 volt single phase (with main breaker) - 29
208 volt three phase - 1
600 volt three phase - 10

Panelboards: 1972 (CGE) (287 units)
84 circuit 225 amp 240 volt single phase - 2
42 circuit 225 amp 240 volt single phase - 262
12 circuit 100 amp 240 volt single phase - 2
42 circuit 100 amp 240 volt single phase c/w main breaker - 1
18 circuit 100 amp 240 volt single phase c/w main breaker - 1
42 circuit 225 amp 240 volt single phase (with contactor) - 16
24 circuit 100 amp 240 volt single phase (with contactor) - 3

Panelboards: 2000 (Square D) (48 units)
42 circuit 225 amp 240 volt single phase - 2 (Westinghouse)
30 circuit 225 amp 240 volt single phase - 1 (Eton)
30 circuit 100 amp 240 volt three phase - 9
24 circuit 100 amp 240 volt three phase - 2
12 circuit 100 amp 240 volt three phase - 34

The distribution at the working space is primarily single phase which is borne out by the usage of both 120/240 volt, 1 phase panelboards and the accompanying 600 to 120/240 volt single phase transformers. All transformers are manufactured by Westinghouse unless otherwise noted. There is a total of 50 dry type transformers on site and are quantified as follows:
10 kVA single phase - 1
15 kVA single phase - 1 (Acme transformers)
45 kVA three phase - 1
75 kVA three phase - 2
100 kVA single phase - 27
112.5 kVA three phase - 1
150 kVA single phase - 15
150 kVA three phase - 1
200 kVA single phase - 1

The emergency generation system consists to two diesel generators connected to the essential switchboard (cells 5 to 11) through an synchronizing control panel. The generators are the same and are Bemac II 800 kW @ 80% PF (1000 kVA) rated 962 amps at 600 volt 3 phase 3 wire. The diesel engine is a Caterpillar D399 running at 1200 rpm. The synchronizing panel consists of 5 cells, the first two are for each of Generator 1 and 2 respectively and contains the analogue meters, Thompson Technology digital controller and the generator breaker. Cell 3 contains the synchronizing equipment including voltage, amperage, kilowatt meters, the synchronizing dial, the indicator lights and selectors, the protective relays, as well as the generator bus breaker. Cell #4 has the generator breaker status indicators. Cell #5 has the ground fault relay indicators.

There are 6 Westinghouse LoZ bus ducts. Two 4000/3200 amp 600 volt bus ducts from the padmount transformers to the main switchgear, one 3500/2800 amp 600 volt bus duct between the main switchboard and the Generator control panel and three 1000/850 amp bus ducts between Distribution B and Distributions D1, D2 and D3.

Component Condition & Anticipated Replacement Date

The equipment is identified as average condition as the majority of the equipment has had little preventive maintenance over the years. Cleaning and torquing should be done every 5 years and start in 2013.

Distribution EE. Typical for several.

CP Life Extension [10.2A-030 Electrical - Cleaning and Torque]

Details	Values
Brief Description (40 Characters)	Clean & Torque All Electrical Terminations
Current event Year (YYYY)	2013
Estimated Event Cost	$197,480

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	40	Base Rate for Material and Labour	$3,303	EACH	$132,120
2	04. Electrical	40	Construction Contingency	$495	EACH	$19,800
3	04. Electrical	40	Average Total Project Soft Costs	$1,139	EACH	$45,560
4		0	Quantity of 40 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Clean and retorque cable lugs and breakers and terminations on all electrical components.

Event costing is derived from AVS base rate costs for "04.2A-070 Distribution Panels". No location correction factors are applied.

Event Justification & Strategy

Preventive maintenance of major equipment in respect to cost and application is expedient for the overall health and operation of the building.

Implication of Event Deferral (Risks)

If this maintenance is not done regularly, the reliability of the system could be in jeopardy.

Horizontal bus duct needing cleaning.

10.2A-030 Electrical - Thermal Scan

Details	Values
Expected Life	2
Component Cost	0
Last Major Action Year	1970
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

MAIN SECONDARY DISTRIBUTION:
Was upgraded in 2002 and is manufactured by Cutler Hammer. The equipment on the main floor of the Service Building is 11 cells wide and contains the major protection breakers for the site. All the breakers are draw out electronic trip air type. Cells 1 through 4 contain the two main 4000 amp frame 3200 amp trip mains breakers off the utility to a spit distribution with a similar tie breaker in between along with the overall metering. The two main breakers and the main generator breaker all have IQ monitoring meters associated with them.
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MCC #3-1 (208 volt) - 7 sections.
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MCC #5 (600 volt) - 3 sections from 1972 and one section (Westinghouse 5 star) from 1994.

The distribution design of the electrical system utilizes the use of 120/240 volt 1 phase 3 wire panelboards in the laboratory areas and three phase in the utility areas, which makes the majority of the distribution single phase. The panelboards are basically from 2 installations, the original installation in 1972 and an addition to the mechanical equipment that made installation of panels to feed those systems, which appears to be in about 2000. The 1972 panels are all Canadian General Electric (CGE) and the 2000 panels are Square D. Any differences from this are minimal and have not been noted.
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Panelboards: 2000 (Square D) (48 units)
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30 circuit 225 amp 240 volt single phase - 1 (Eton)
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15 kVA single phase - 1 (Acme transformers)
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75 kVA three phase - 2
100 kVA single phase - 27
112.5 kVA three phase - 1
150 kVA single phase - 15
150 kVA three phase - 1
200 kVA single phase - 1

The emergency generation system consists to two diesel generators connected to the essential switchboard (cells 5 to 11) through an synchronizing control panel. The generators are the same and are Bemac II 800 kW @ 80% PF (1000 kVA) rated 962 amps at 600 volt 3 phase 3 wire. The diesel engine is a Caterpillar D399 running at 1200 rpm. The synchronizing panel consists of 5 cells, the first two are for each of Generator 1 and 2 respectively and contains the analogue meters, Thompson Technology digital controller and the generator breaker. Cell 3 contains the synchronizing equipment including voltage, amperage, kilowatt meters, the synchronizing dial, the indicator lights and selectors, the protective relays, as well as the generator bus breaker. Cell #4 has the generator breaker status indicators. Cell #5 has the ground fault relay indicators.

There are 6 Westinghouse LoZ bus ducts. Two 4000/3200 amp 600 volt bus ducts from the padmount transformers to the main switchgear, one 3500/2800 amp 600 volt bus duct between the main switchboard and the Generator control panel and three 1000/850 amp bus ducts between Distribution B and Distributions D1, D2 and D3.

Component Condition & Anticipated Replacement Date

Currently, the electrical components are in average condition. The next scan would be completed in 2013.

Visual view of feeder breaker in CDP Distribution Panel EE.

RP Life Extension [10.2A-030 Electrical - Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Electrical Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$19,748

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	4	Base Rate for Material and Labour	$3,303	EACH	$13,212
2	04. Electrical	4	Construction Contingency	$495	EACH	$1,980
3	04. Electrical	4	Average Total Project Soft Costs	$1,139	EACH	$4,556
4		0	Quantity of 4 used to obtain approximate cost of $20K.	$0	EACH	$0

Narratives

Event Description

Provide thermal scan of all terminations and electrically operating devices.

Event costing derived from AVS base rate costs for "04.2A-070 Distribution Panels". No location correction factors were used.

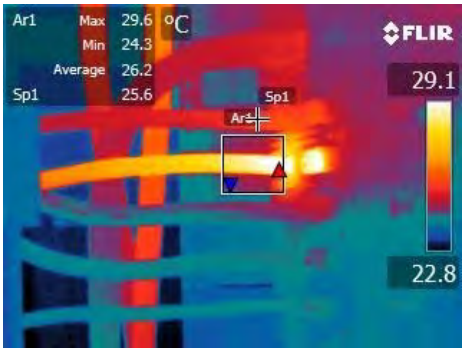
Event Justification & Strategy

By taking responsibility of thermally scanning the electrical equipment, it is possible to catch problems before they become an emergency. Also, equipment can be trended for operation.

Implication of Event Deferral (Risks)

If thermal scanning is not completed when indicated, there is a risk of equipment failure causing operation outage and/or safety concerns.

Visual view of breaker in Distribution EE. See thermographic view below.



Hot spot on one conductor. Example for reasoning of "thermographic" scan.

AVS

Asset Performance Report

DFO-Freshwater Institute - Annex Building

June 2013

Prepared by: PWGSC – A&E CoE
Winnipeg, Manitoba
Edmonton, Alberta
Project - R.060627.001

TABLE OF CONTENTS

Details	Values
Replacement Cost New	0
Construction Year (YYYY)	1979
Gross Area (square meters)	1,700
Date of current BCR	5/27/2013

Narratives

BCR Project Team and Documents

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Reviewed documents included:

- As-built drawings for all disciplines,
- Local and National Codes

Building History

The Annex Building was designed in 1977 by Public Works Canada and constructed in approximately in 1979. Previous reports indicate the building was constructed in 2 phases. However, it is not known what the phases were.

The original building was originally referred to as the BioAssay Laboratory Building. The upper floor is approximately 80% labs, and the balance is offices. The lower level was originally a large mechanical room and unfinished space. The unfinished space in the basement has since been converted to enclosed offices, a large open area and storage rooms (date of renovation unknown).

The building includes: 11 labs (6 @ 40sm, 2 @ 20sm, 3 @ 50sm), 16 enclosed private offices, 1 enclosed office area with 3 student workstations. The working occupancy would be approximately 20-30 staff.

The building is connected to the Lab/Administration building by a tunnel.

The building is a two level structure as follows:
Lower Level: 855 square meters
Upper level: 855 square meters

The lower level of the building is mostly under grade but at the north exposure, grade has been lowered to permit provision of windows and daylight into the lower level offices.

The building has a steel structure and is clad with precast concrete panels and metal siding. There is an exterior loading dock, canopy and overhead door on the south side of the building.

Major Alterations / Additions:
Date unknown: Fit-up of lower level to offices and storage rooms.

BCR Executive Summary

In general, the building is in good condition and has benefited from a very good maintenance program (refer to Lab/Administration Building BCR). For condition report of surrounding property, refer to Lab/Administration Building BCR.

Architectural
The reinforced concrete superstructure (including precast hollow core roof planks and structural steel mechanical penthouse) is robust and there are no apparent structural concerns. The building envelope is similarly robust, clad with a combination of precast concrete panels and metal panels. There are no serious concerns with the building envelope. Based on available information, the built-up roof is the original roof and therefore 33 years old, and overdue for replacement. Roof leakage is reported in a recurring location in recent years.

Interior finishes in the labs include: vinyl floor tile, epoxy flooring and painted gypsum walls. All appear to be original and are deteriorated. Interior finishes in the offices include: carpet, painted gypsum walls and ceiling tile. These finishes are generally in average condition.

There is no elevator in the building.

To ensure continued asset performance and functionality, the following summarized 5 and 25 year architectural element replacement costs are required:

First 5 years: $520K
Following 25 years: $801K

Mechanical
The primary heat source for the building is an extension of the high pressure steam supplied to the Lab/Administration Building from the University of Manitoba Power House. The primary source of cooling is an extension of the chilled water supplied to the Lab/Administration Building from the University of Manitoba Power House. Ventilation is introduced through outside air dampers at each of the air handling units. The Lab area ventilation system is provided by the two multi-zone air handling units AHU-201 & 202. Additional air handlers AHU-203 and 205 serve the Basement Mechanical and Electrical Rooms Air handlers AHU 204 and 206 serve the Main Floor and Basement Offices. Additional heating is provided via the multi-zone systems of air handlers AHU-201 & 202, and an electric heating coil in air handler AHU-206. The majority of mechanical equipment is located in the basement mechanical room.

There is a mechanical penthouse which has abandoned systems from scientific programs that were discontinued 15+ years ago. The bulk of the mechanical systems are in the mechanical room in the lower level. Basic outside air intake and exhaust are functional in the mezzanine.

There are some specialized mechanical systems that have been permanently or partially decommissioned for some time and some of these could be permanently removed. Domestic water distribution is via copper piping. A joint failed and caused serious flood damage in 2006.

To ensure continued mechanical systems performance for the next 30 years, the following summarized element replacement costs are offered:

First 5 years: $9.9K
Following 25 years: $2.96M

Electrical
The Annex building was added to the site in 1979 and all systems are tied back to the Lab Building. The original distribution is 34 years old and should be functional with maintenance until 2023.

The fluorescent lighting is T12 lamps and is in critical need of upgrade as lamps are obsolete.

The low voltage systems are tied to and dependant on what is transpiring with the systems in the Lab building.

It is essential to maintain, and to extend the life of the distribution by initiating cleaning, retorquing and thermographic scanning of the distribution.

To ensure continued electrical systems performance for the next 30 years, the following summarized element replacement costs are offered:

First 5 years: $226K
Following 25 years: $1.47M

In addition, the asset will require numerous cyclical system inspections, over the next 30 years. Their 5 and 25 year breakdown is as follows:

First 5 years: $108K
Following 25 years: $472K

Overview Architectural & Structural Condition

The reinforced concrete superstructure is robust and there are no apparent structural concerns.

The building envelope is similarly robust, clad with a combination of precast concrete panels and metal panels. The building envelope consists of a cavity wall system of precast cladding on masonry or insulated wood stud wall backup. The interior face of the wall is clad with gypsum board. Windows are fixed double glazed units in aluminum frames and are located on the north exposure of the building only. Approximately 25% of the wall area is windows.

Based on available information, the built-up roof is the original roof and therefore 33 years old, and overdue for replacement. Roof leakage is reported in a recurring location in recent years.

Interior finishes in the labs include: vinyl floor tile, epoxy flooring and painted gypsum walls. All appear to be original, and are deteriorated. Interior finishes in the offices include: carpet, painted gypsum walls and ceiling tile. These finishes are generally in average condition. There are no ceilings in labs and storage rooms and suspended acoustic tile ceilings in office and corridor areas.

There is no elevator in the building.

Overview Site Condition

Refer to Lab/Administration Building BCR for the site condition overview.

Overview of Mechanical Systems Condition

The Annex building mechanical equipment consists of heating and air conditioning systems, ventilation fans and pumps. Unique to the building, are a number of dedicated exhaust fans serving fume hoods and laboratory plumbing fixtures and plumbing.

The mechanical systems overall in the building are mostly original from 1985 and have been rated mostly in average condition based on age and site observations. Since the minimum expected life for most mechanical components is 25 years, major replacement expenditures would have been expected to occur around 2015 but this will not be necessary as the equipment appears to be well maintained. Most systems have been forecasted for repair events in 2018 or later based largely on observed conditions and lack of reported problems. In the majority of cases, events will not be necessary until after the completion of the next BCR in 2017.

The only system requiring replacement is the drinking fountain based on its age and being R12 refrigerant. There was a project underway at the time of BCR site visits and this may have already been completed.

Component condition evaluations, in future BCRs, will potentially move some replacements to different years. In order to provide operational mechanical equipment for continued asset performance, the following summarized expenditures are required for the next 30 years;

Short Term (<5 years) = $9.9K
Long Term (>5 years) = $2.96M

Overview of Electrical Systems Condition

The Annex building was added to the site in 1979 and all systems are tied back to the Lab Building. The original distribution is 34 years old and should be functional with maintenance until 2023. The fluorescent lighting is provided with T12 lamps and is in critical need of upgrade as lamps are obsolete. The low voltage systems are tied to and dependant on what is transpiring with the systems in the Lab building. It is essential to maintain, and extend the life of the distribution by initiating cleaning, retorquing and thermographic scanning of the distribution.

To ensure continued electrical systems performance for the next 30 years, the following 5 and 25 year cost summaries are projected;

Short Term (5 years) = $226K
Long Term (25 years) = $1.47M

Note, the "Short Term" cost also includes all costing to address identified electrical code issues. The "Long Term", cost only pertains to component replacement costs.

Compliance with TBS Temp., Humidity & Ventilation Targets

Even though temperature, humidity and ventilation rates were not specifically monitored, logged and compared for compliance to TBS guidelines, there were no IAQ related reports or comments by the building service provider. Therefore, it is presumed all IAQ benchmark targets are satisfied and no remedial action is necessary.

Compliance with Accessibility Standards

The current BCR scope of work did not include an accessibility audit. The facility is reasonably compliant with accessibility codes, however a full accessibility audit is required to accurately ascertain compliance.

The building is served by 1 men's (individual) washroom and 1 woman's individual washroom. These washrooms are relatively large in area (10sm each) and appear to conform with current accessibility codes.

Items in non-compliance include:

- Lower level is not accessible (no elevator),
- Main entry is not equipped with a power door operator,
- Lack of lever handles on door hardware.

Overview of Seismic Screening

Refer to lab/Administration BCR document for Seismic screening overview.

01. Architectural & Structural

01.1A-011 Basement Walls

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	410
Measurement unit/ Metric	m2

Narratives

Component Description

250mm thick (10") concrete wall was site poured on all four perimeter walls.

Maintenance staff report a project was undertaken in 2000 that involved waterproofing basement walls and repair / replacement of weeping tile.

Component Condition & Anticipated Replacement Date

Average condition. No cracks or leaks reported. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-010C05 Frame - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	1,700
Measurement unit/ Metric	m2

Narratives

Component Description

Structure framing is reinforced steel. The following outlines the primary sizes:

Lower Level columns: 16"x16" concrete
Main Floor columns: 12"x12" concrete
Main Floor Primary Beams: 48"wide x 20" deep
Main Floor Secondary Beams: 6" wide x 16" deep

Component Condition & Anticipated Replacement Date

Average condition. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-020C10 Slab on Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	850
Measurement unit/ Metric	m2

Narratives

Component Description

The basement floor is a reinforced concrete slab constructed as follows:

- 450mm (18") reinforced concrete slab on
- 6 mil polyethylene vapour barrier on
- 150mm (6") compacted granular base

Component Condition & Anticipated Replacement Date

Average condition with no visible cracks. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-030C05 Slab Above Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	850
Measurement unit/ Metric	m2

Narratives

Component Description

The slab above grade is constructed as follows:

- 3.5" concrete top slab over 6" wide x 16" deep beams at 3" o.c.

Trench drains set in floor in labs.

Component Condition & Anticipated Replacement Date

Average condition with no visible cracks. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-040C05 Roof Structure - Hollow Core - Concrete Joist + Concrete Deck

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	850
Measurement unit/ Metric	m2

Narratives

Component Description

The roof structure consists of:

- Roof beams 10" wide x 26" deep (typical),
- Roof deck: 8" (200mm) hollow core concrete planks

Component Condition & Anticipated Replacement Date

Average condition. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Hollow core concrete floor planks above.

01.2-040C15 Roof Structure - Penthouse - Steel Joist + Steel Deck

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	40
Measurement unit/ Metric	m2

Narratives

Component Description

Construction consists of:

- 1.5" steel roof deck,
- 12" steel open web steel joists,
- W8 x 17 roof beams,
- W6 x 15 steel columns

Component Condition & Anticipated Replacement Date

Average condition. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-050C10 Entrance/Canopies

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	m2

Narratives

Component Description

Located along the south elevation, over the shipping/receiving area, is a sloped metal framed canopy having the size = 20' long x 4' deep x 4' high. Its construction is as follows:

- Metal panels,
- 1/2" plywood roof sheathing on 2" x 6" strapping,
- 3"x3"x1/4" steel angle framing at 4" o.c.,
- Cement plaster soffit on wire mesh

Component Condition & Anticipated Replacement Date

Average condition. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sloped metal clad Canopy above loading dock.

01.2-050C15 Concrete Exterior Stairs

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Poor
Quantity	2
Measurement unit/ Metric	flts

Narratives

Component Description

Reinforced concrete stairs are associated with the main entrance (east elevation and the loading area along the south. Each stairs has the following general construction:

Main Entry: 1.5m wide x 8 risers,
Loading dock: 1.2m wide x 5 risers

Total overall stair area is approximately 7 square meters.

Component Condition & Anticipated Replacement Date

Deteriorated concrete nosings. Overall condition is poor. Repairs should be implemented in 2014 with full replacement beyond this BCR timeline. No event is offered.

Assessment Criteria	Existence
Hazardous conditions	
Default	Yes
Major surface deterioration	
Default	Yes

Exterior concrete stair at main entry.

RP Life Extension [01.2-050C15 Concrete Exterior Stairs]

Details	Values
Brief Description (40 Characters)	Repair Concrete Exterior Stairs
Current event Year (YYYY)	2014
Estimated Event Cost	$3,066

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		7	Base Rate Material & Labour	$220	m2	$1,540
2		7	Construction Contingency	$33	m2	$231
3		7	Project Soft Costs	$76	m2	$532
4		7	LCF - Material & Labour	$73	m2	$511
5		7	LCF - Contingency & Soft Costs	$36	m2	$252

Narratives

Event Description

Repair exterior concrete stairs. Note, AVS replacement costing is not used. Costing is from 2012 RSMeans.

Event Justification & Strategy

This task will maintain safety and extend life of stair.

Implication of Event Deferral (Risks)

Postponing the exterior stair repairs will promote unsafe footing during use. Safety issues/complaints would arise.

01.2-050C25 Ramps

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	17
Measurement unit/ Metric	m2

Narratives

Component Description

A concrete ramp is associated with the main east entrance and runs in a north-south direction. The ramp has two sloped sections, each 25' long, with a 4' long landing area in between. Both ramps and landings are 3' wide.

Component Condition & Anticipated Replacement Date

The exterior ramp is in average condition. Replacement date is beyond this BCR timeline and no event is included.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Ramp to main entry (east side).

01.3-010C25 Exterior Wall - Concrete, Precast Panels

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	360
Measurement unit/ Metric	m2

Narratives

Component Description

The typical exterior wall construction consists of:

- 15mm gypsum board,
- 38mm x 140mm wood studs at 400 o. c.,
- batt insulation and vapour barrier,
- 12mm gypsum board sheathing,
- 75mm precast concrete panels.

Exterior precast cladding consists of ribbed panels, light to medium exposed aggregate with sealed vertical joints.

Above wall construction is lower 10' of exterior wall (metal siding above).

Component Condition & Anticipated Replacement Date

Precast panels are in average condition. There were no apparent major cracks or misalignments or areas of damage. There are localized areas of spalling, caused by rusting of reinforcing steel in the panels. Spalling is relatively minor; repairs are recommended for cosmetic, not structural reasons. Joint sealant is in average condition.

Panel repairs should take place in 2020. Full panel replacement is beyond this BCR, no event is offered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Ribbed precast concrete panels.

RP Life Extension [01.3-010C25 Exterior Wall - Concrete, Precast Panels]

Details	Values
Brief Description (40 Characters)	Reseal Panel Joints & Patch Spalled Panels
Current event Year (YYYY)	2020
Estimated Event Cost	$5,691

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$410	m²	$2,870
2	01. Architectural & Structural	7	Construction Contingency	$61	m²	$427
3	01. Architectural & Structural	7	Average Total Project Soft Costs	$141	m²	$987
4		7	LCF - Material & Labour	$135	m2	$945
5		7	LCF - Contingency & Soft Costs	$66	m2	$462
6		0	Quantity of 7 used for appropriate costing for repairs only.	$0	EACH	$0

Narratives

Event Description

Reseal panel joints where required. Remove and patch iron spotting in precast panels.

Event Justification & Strategy

This event will prevent water ingress and maintain appearance of panels.

Implication of Event Deferral (Risks)

Event delay would have a low risk. Overall appearance would be impacted.

01.3-040C10 Exterior Wall - Prefinished Metal Siding

Details	Values
Expected Life	35
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	300
Measurement unit/ Metric	m2

Narratives

Component Description

Exterior upper wall construction consists of:

- Vertical metal siding 22ga (dark brown),
- Wood strapping,
- Gypsum board sheathing,
- Wood studs,
- Batt Insulation,
- Vapour barrier.

Above wall construction is top 61.5 inches (1,562mm) of exterior wall and all of mechanical penthouse.

Component Condition & Anticipated Replacement Date

Panel buckling was noticed. Overall condition is average. Conduct repairs in 2015. Panel replacement is not warranted in this BCR timeline. No event is offered

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Buckled prefinished metal siding at southwest corner.

RP Life Extension [01.3-040C10 Exterior Wall - Prefinished Metal Siding]

Details	Values
Brief Description (40 Characters)	Re-secure Exterior Metal Siding
Current event Year (YYYY)	2015
Estimated Event Cost	$3,680

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	8	Base Rate for Material and Labour	$231	m²	$1,848
2	01. Architectural & Structural	8	Construction Contingency	$35	m²	$280
3	01. Architectural & Structural	8	Average Total Project Soft Costs	$80	m²	$640
4		8	LCF - Material & Labour	$76	m2	$608
5		8	LCF - Contingency & Soft Costs	$38	m2	$304
6		0	Quantity of 8 used for appropriate costing for repairs only.	$0	EACH	$0

Narratives

Event Description

Re-secure buckled metal siding panels.

Event Justification & Strategy

This task will maintain integrity of building envelope.

Implication of Event Deferral (Risks)

Delaying the metal siding repairs may promote inner wall water leakage.

01.3-060C01 Exterior Aluminum Doors

Details	Values
Expected Life	50
Component Cost	19,434
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

Main entry (east side) - Fully glazed exterior aluminum door and sidelite serving the office component with electric strike, pull, exit device, closer and weather-stripping.

Main entry (west side) - Fully glazed exterior aluminum door and sidelite serving the office component with no trim on exterior, exit device, closer and weather-stripping.

Component Condition & Anticipated Replacement Date

Overall, doors are in average condition with doors in good working order. Their replacement is tentatively scheduled for 2029.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Aluminum door and sidelite (west elevation).

RP Replacement [01.3-060C01 Exterior Aluminum Doors]

Details	Values
Brief Description (40 Characters)	Replace Exterior Aluminum Doors
Current event Year (YYYY)	2029
Estimated Event Cost	$19,434

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$4,888	EACH	$9,776
2	01. Architectural & Structural	2	Construction Contingency	$733	EACH	$1,466
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$1,686	EACH	$3,372
4		2	LCF - Material & Labour	$1,612	EACH	$3,224
5		2	LCF - Contingency & Soft Costs	$798	EACH	$1,596

Narratives

Event Description

Replace exterior aluminum doors and all related trims.

Event Justification & Strategy

Task implementation will maintain operability and reduce heat loss.

Implication of Event Deferral (Risks)

If doors are still functional, event delay would have a low risk factor. Once door operation is hindered, event delay would impact safety issues during an emergency situation.

01.3-060C10 Exterior Steel Doors

Details	Values
Expected Life	45
Component Cost	5,254
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

Typical exterior steel doors measures 2100 high x 915 wide. Locations are:

1) Door from loading area to exterior loading dock,
2) Door from mechanical penthouse to roof.

Typical hardware includes: Lockset, Closer, Weather-stripping

Component Condition & Anticipated Replacement Date

Doors in average condition. These metal doors are scheduled for replacement in 2024. Hardware in average condition and good working order. Refer to 01. 4-060C15 Paint for Repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Steel door from mechanical penthouse to roof.

RP Replacement [01.3-060C10 Exterior Steel Doors]

Details	Values
Brief Description (40 Characters)	Replace Exterior Steel Doors
Current event Year (YYYY)	2024
Estimated Event Cost	$5,254

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$1,321	EACH	$2,642

2	01. Architectural & Structural	2	Construction Contingency	$198	EACH	$396
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$456	EACH	$912
4		2	LCF - Material & Labour	$436	EACH	$872
5		2	LCF - Contingency & Soft Costs	$216	EACH	$432

Narratives

Event Description

Replace both exterior metal doors and related trims in 2024.

Event Justification & Strategy

Task implementation will maintain operability and reduce heat loss.

Implication of Event Deferral (Risks)

If doors are still functional, event delay would have a low risk factor. Once door operation is hindered, event delay would impact safety issues during an emergency situation.

01.3-060C18 Overhead Door

Details	Values
Expected Life	20
Component Cost	13,788
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The south overhead door for the loading area is: Steel flush panel, insulated, standard sectional overhead type (4 panels) with electrically operated, push button controls with safety bottom edge. 75mm heavy duty hardware, with no vision panels.

Component Condition & Anticipated Replacement Date

Overhead door assembly is considered in average condition and in good working order. Staff report no problems. Full replacement is scheduled for 2030.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Overhead door at loading dock (south exposure).

RP Replacement [01.3-060C18 Overhead Door]

Details	Values
Brief Description (40 Characters)	Replace Overhead Door
Current event Year (YYYY)	2030
Estimated Event Cost	$13,788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$6,936	EACH	$6,936
2	01. Architectural & Structural	1	Construction Contingency	$1,040	EACH	$1,040
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$2,393	EACH	$2,393
4		1	LCF - Material & Labour	$2,287	EACH	$2,287
5		1	LCF - Contingency & Soft Costs	$1,132	EACH	$1,132

Narratives

Event Description

Replace overhead door and all related accessories and hardware.

Event Justification & Strategy

Door/hardware replacement will ensure proper operation during shipping and receiving times.

Implication of Event Deferral (Risks)

Event delay may hinder door operation and difficulties would arise during shipping/receiving operations.

01.3-070C01 Aluminum Windows

Details	Values
Expected Life	50
Component Cost	26,225
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	25
Measurement unit/ Metric	m2

Narratives

Component Description

The following fixed window units are used:

- Windows at upper level: 8 windows (5'-4" high x 4' wide)
- Windows at lower level: 8 windows (2'-6" high x 4' wide)

Window framing: 100m deep extruded aluminum framing, thermally broken, steel reinforced, dark bronze anodized colour.

Glazing: hermetically sealed double glazed units consisting of 6mm plate glass inboard, 12mm air space, 6mm plate glass inboard.

Component Condition & Anticipated Replacement Date

Windows are in average condition. Scheduled replacement is noted to be in 2025.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Fixed aluminum windows (north exposure).

CP Replacement [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Aluminum Windows
Current event Year (YYYY)	2025
Estimated Event Cost	$26,225

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	25	Base Rate for Material and Labour	$528	m²	$13,200
2	01. Architectural & Structural	25	Construction Contingency	$79	m²	$1,975
3	01. Architectural & Structural	25	Average Total Project Soft Costs	$182	m²	$4,550
4		25	LCF - Material & Labour	$174	m2	$4,350
5		25	LCF - Contingency & Soft Costs	$86	m2	$2,150

Narratives

Event Description

Replace all sealed window units. This event may or may not include the framing. Note, event costing includes framing.

Event Justification & Strategy

Full window replacement will ensure proper thermal function and reduce heat loss.

Implication of Event Deferral (Risks)

Except for appearance and heat loss issues, event delay would have low impact. Note, window seals would continue to degrade to a point where water ingress may be an issue. Interior surfaces may become damaged.

01.3A-065 Exterior Door Hardware

Details	Values
Expected Life	15
Component Cost	2,892
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

Main entry (east side) - Fully glazed exterior aluminum door and sidelite serving the office component with electric strike, pull, exit device, closer and weather-stripping.

Main entry (east side) - Fully glazed exterior aluminum door and sidelite serving the office component with no trim on exterior, exit device, closer and weather-stripping.

Typical Steel door 2100 high x 915 wide

1) Door from loading area to exterior loading dock
2) Door from mechanical penthouse to roof

Typical hardware: Lockset, Closer, Threshold and Weather-stripping

Component Condition & Anticipated Replacement Date

All exterior door hardware is in working order and considered in average condition. Replacement is possibly warranted in 2018. Refer to 01.4-060C15 Paint for Repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.3A-065 Exterior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Exterior Door Hardware
Current event Year (YYYY)	2018
Estimated Event Cost	$2,892

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$727	EACH	$1,454
2	01. Architectural & Structural	2	Construction Contingency	$109	EACH	$218
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$251	EACH	$502
4		2	LCF - Material & Labour	$240	EACH	$480
5		2	LCF - Contingency & Soft Costs	$119	EACH	$238
6		0	Quantity of 2 used for budget costing wherever exterior door hardware is required.	$0	EACH	$0

Narratives

Event Description

Replace non-functioning and/or damaged exterior door hardware where required.

Event Justification & Strategy

Cyclical door hardware replacement will ensure proper operation and egress from the building during an emergency.

Implication of Event Deferral (Risks)

Event delay would risk improper door function, especially during an emergency. Life safety would be a concern.

01.3A-075 Window Coverings

Details	Values
Expected Life	15
Component Cost	2,175
Last Major Action Year	1979
Component Condition (For BCR use only)	Fair
Quantity	25
Measurement unit/ Metric	m2

Narratives

Component Description

Original window coverings are vertical louvred blinds. Some have been replaced with horizontal aluminum blinds.

Component Condition & Anticipated Replacement Date

Original window coverings (approximately 20m2) are nearly at the end of their service life. Replacement scheduled for 2020. Newer metal blinds (approximately 5m2) should perform for another 15 years when replacement may be required in 2028.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.3A-075 Window Coverings] - Original

Details	Values
Brief Description (40 Characters)	Replace Window Coverings - Original
Current event Year (YYYY)	2020
Estimated Event Cost	$1,740

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	20	Base Rate for Material and Labour	$44	m²	$880
2	01. Architectural & Structural	20	Construction Contingency	$7	m²	$140
3	01. Architectural & Structural	20	Average Total Project Soft Costs	$15	m²	$300
4		20	LCF - Material & Labour	$14	m2	$280
5		20	LCF - Contingency & Soft Costs	$7	m2	$140

Narratives

Event Description

Replace original window coverings - approximately 20m2.

Event Justification & Strategy

Existing original blinds are at the end of their service life.

Implication of Event Deferral (Risks)

Event delay would impact blind function and overall appearance would be diminished.

RP Replacement [01.3A-075 Window Coverings] - Metal

Details	Values
Brief Description (40 Characters)	Replace Window Coverings - Metal
Current event Year (YYYY)	2028
Estimated Event Cost	$435

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$44	m²	$220
2	01. Architectural & Structural	5	Construction Contingency	$7	m²	$35
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$15	m²	$75
4		5	LCF - Material & Labour	$14	m2	$70
5		5	LCF - Contingency & Soft Costs	$7	m2	$35

Narratives

Event Description

Replace newer metal window coverings - approximately 5m2.

Event Justification & Strategy

By the indicated replacement date, these newer metal blinds will be at the end of their service life.

Implication of Event Deferral (Risks)

Event delay would impact blind function and overall appearance would be diminished.

01.4-010C05 Built-up Roof, Tar & Gravel Roof

Details	Values
Expected Life	25
Component Cost	212,895
Last Major Action Year	1990
Component Condition (For BCR use only)	Fair
Quantity	855
Measurement unit/ Metric	m2

Narratives

Component Description

Main Roof construction:

- Precast hollow core planks,
- Roofing membrane (4 ply asphalt saturated asbestos felts),
- 100mm Rigid Insulation,
- 25mm Stone ballast

Roof slope is adequate and drains to 2 internal roof drains.

Mechanical Penthouse roof - as above but on steel roof structure. Roof drains via 2 scuppers to main roof.

TJ Forest report dated 1997 indicates roof was in fair to good condition. It is believed this is the original roof.

Age of roof: This roof is at least 15 years old and is most likely 33 years old.

Component Condition & Anticipated Replacement Date

No visual inspection due to snow cover. Maintenance staff report leaking (usually spring) midway at east corridor. Schedule replacement for 2015.

Assessment Criteria	Existence
Leakage	
Default	Yes
Water penetration	
Default	Yes

CP Replacement [01.4-010C05 Built-up Roof, Tar & Gravel Roof]

Details	Values
Brief Description (40 Characters)	Replace Roof Assemblies
Current event Year (YYYY)	2015
Estimated Event Cost	$212,895

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	855	Base Rate for Material and Labour	$126	m²	$107,730
2	01. Architectural & Structural	855	Construction Contingency	$19	m²	$16,245
3	01. Architectural & Structural	855	Average Total Project Soft Costs	$43	m²	$36,765
4		855	LCF - Material & Labour	$41	m2	$35,055
5		855	LCF - Contingency & Soft Costs	$20	m2	$17,100

Narratives

Event Description

Replace roofing membrane and insulation. Note event costing is for a 2-ply SBS assembly.

Event Justification & Strategy

Roof replacement will ensure the roof's integrity to prevent roof leaks.

Implication of Event Deferral (Risks)

Event postponement will impact the roof assembly's ability to protect the interior spaces.

01.5-010C01 Concrete Block Partition

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	320
Measurement unit/ Metric	m2

Narratives

Component Description

150mm concrete block around internal stair, loading dock and duct chase. All basement interior walls are 200mm concrete block.

Component Condition & Anticipated Replacement Date

Average condition. Replacement date is beyond this BCR timeline and no event is included. Refer to 01.4-060C15 Paint for Repainting.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-012C01 Gypsum Board Partition with Studs

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	900
Measurement unit/ Metric	m2

Narratives

Component Description

15mm (5/8") Gypsum wall board on 38x89 (2x4) wood studs typical interior partition.

Component Condition & Anticipated Replacement Date

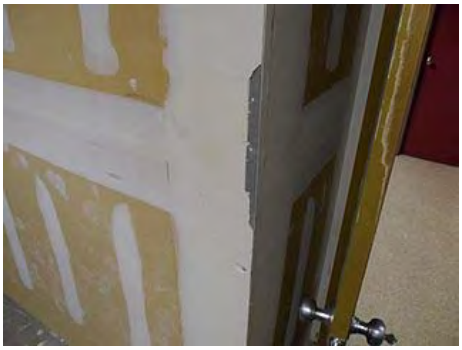
Average condition, except as follows:

- Large storage room (lower level) gypsum board is unfinished and with damaged corners.
- Window jambs in offices are in poor condition.

Refer to 01.4-060C15 Paint for Repainting

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Damaged gypsum board in storage room (lower level). Wall is unfinished.

01.5-050C10 Interior Wood Doors

Details	Values
Expected Life	10
Component Cost	15,750
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	40
Measurement unit/ Metric	ea

Narratives

Component Description

Lab and office doors are painted solid core wood doors in pressed steel frames.

Labs door hardware: Mortise Locksets with rose trim, deadbolt with thumb-turn.

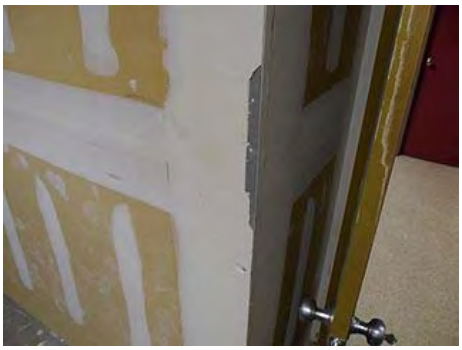
Offices door hardware: Bored lockset, rose trim.

Component Condition & Anticipated Replacement Date

Average condition. Cyclical replacement of approximately 10 doors every 10 years is recommended. This cycle should be implemented in 2029.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Wood door, worn paint indicates door binding.

RP Replacement [01.5-050C10 Interior Wood Doors]

Details	Values
Brief Description (40 Characters)	Replace Interior Wood Doors
Current event Year (YYYY)	2029
Estimated Event Cost	$15,750

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	10	Base Rate for Material and Labour	$793	EACH	$7,930
2	01. Architectural & Structural	10	Construction Contingency	$119	EACH	$1,190
3	01. Architectural & Structural	10	Average Total Project Soft Costs	$273	EACH	$2,730
4		10	LCF - Material & Labour	$261	EACH	$2,610
5		10	LCF - Contingency & Soft Costs	$129	EACH	$1,290

Narratives

Event Description

Replace worn and/or damaged interior wood doors as required. Event costing is for 10 doors every 10 years.

Event Justification & Strategy

This task will ensure all interior wood doors have a professional appearance and are functional.

Implication of Event Deferral (Risks)

Event delay may promote an unsightly appearance and door function may be hindered.

01.5-050C15 Interior Metal Doors

Details	Values
Expected Life	60
Component Cost	12,340
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

Washroom and Service room doors are painted hollow metal doors (2100mm high) in pressed steel frames.

Service Rooms door hardware: Locksets (lever trim), closer.

Washroom door hardware: Lockset.

Component Condition & Anticipated Replacement Date

Average condition. Doors may require replacement in 2033.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical lab metal door with thumb-turn deadbolt and knob handset.

RP Replacement [01.5-050C15 Interior Metal Doors]

Details	Values
Brief Description (40 Characters)	Replace Interior Metal Doors
Current event Year (YYYY)	2033
Estimated Event Cost	$12,340

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$1,242	EACH	$6,210

2	01. Architectural & Structural	5	Construction Contingency	$186	EACH	$930
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$428	EACH	$2,140
4		5	LCF - Material & Labour	$409	EACH	$2,045
5		5	LCF - Contingency & Soft Costs	$203	EACH	$1,015

Narratives

Event Description

Replace worn and/or damaged interior metal doors as required.

Event Justification & Strategy

This event will ensure functionality, security, integrity of fire separation and maintain acoustic separation.

Implication of Event Deferral (Risks)

Event delay may promote an unsightly appearance and door function may be hindered.

01.5-060C15 Paint

Details	Values
Expected Life	10
Component Cost	44,000
Last Major Action Year	1979
Component Condition (For BCR use only)	Poor
Quantity	2,000
Measurement unit/ Metric	m2

Narratives

Component Description

Walls: Colour Off-white
Doors (lower level): colour maroon
Door Frames (lower level): Colour grey

Doors (upper level): colour turquoise
Door Frames (lower level): Colour grey

The open area in the lower level features an art mural depicting images of fish and marine animals in Canada.

Component Condition & Anticipated Replacement Date

Paint on walls is in poor condition. Doors and frames in fair-good condition. Implement a painting schedule in 2015.

Assessment Criteria	Existence
Damaged surface	
Default	Yes
Fading Colours	
Default	Yes

Wall in lab. Paint faded, abandoned wall plugs etc. (typical).

CP Replacement [01.5-060C15 Paint]

Details	Values
Brief Description (40 Characters)	Repaint Interior Surfaces
Current event Year (YYYY)	2015
Estimated Event Cost	$44,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2000	Base Rate for Material and Labour	$11	m²	$22,000
2	01. Architectural & Structural	2000	Construction Contingency	$2	m²	$4,000
3	01. Architectural & Structural	2000	Average Total Project Soft Costs	$4	m²	$8,000
4		2000	LCF - Material & Labour	$3	m2	$6,000
5		2000	LCF - Contingency & Soft Costs	$2	m2	$4,000

Narratives

Event Description

Cyclical repainting program for walls, ceilings, doors and frames.

Event Justification & Strategy

Repainting will maintain a professional appearance.

Implication of Event Deferral (Risks)

Painting deferral will promote an increase in marred and damaged surfaces.

01.5-070C05 Carpeting

Details	Values
Expected Life	10
Component Cost	31,680
Last Major Action Year	2005
Component Condition (For BCR use only)	Average
Quantity	240
Measurement unit/ Metric	m2

Narratives

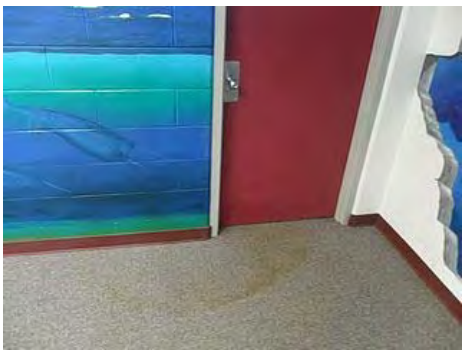
Component Description

Broadloom carpet tile in offices and in open area in lower level.

Component Condition & Anticipated Replacement Date

Average condition. Two square meter stain at door to mechanical room in lower level. Replace all carpeting in 2018.

Assessment Criteria	Existence
Stains, tears and poor seam condition	
Default	Yes



Stained carpet (lower level open area).

CP Replacement [01.5-070C05 Carpeting]

Details	Values
Brief Description (40 Characters)	Replace Carpeting
Current event Year (YYYY)	2018
Estimated Event Cost	$31,680

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	240	Base Rate for Material and Labour	$66	m²	$15,840
2	01. Architectural & Structural	240	Construction Contingency	$10	m²	$2,400

3	01. Architectural & Structural	240	Average Total Project Soft Costs	$23	m²	$5,520
4		240	LCF - Material & Labour	$22	m2	$5,280
5		240	LCF - Contingency & Soft Costs	$11	m2	$2,640

Narratives

Event Description

Replace carpet and all related trims and bases.

Event Justification & Strategy

This task will maintain appearance and will promote a healthy and safe interior environment.

Implication of Event Deferral (Risks)

Postponing carpet replacement may promote tripping hazards due to frayed and damaged carpet. Life safety concerns would be an issue.

01.5-070C25 Sheet Vinyl Floor

Details	Values
Expected Life	15
Component Cost	2,900
Last Major Action Year	2005
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	m2

Narratives

Component Description

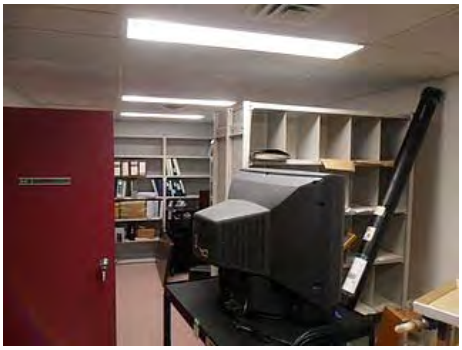
Sheet vinyl flooring is located in lower level storage room.

Component Condition & Anticipated Replacement Date

Average condition. Implement replacement in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Sheet vinyl floor in Storage Room B6-B7.

RP Replacement [01.5-070C25 Sheet Vinyl Floor]

Details	Values
Brief Description (40 Characters)	Replace Sheet Vinyl Floor
Current event Year (YYYY)	2020
Estimated Event Cost	$2,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	20	Base Rate for Material and Labour	$73	m²	$1,460
2	01. Architectural & Structural	20	Construction Contingency	$11	m²	$220
3	01. Architectural & Structural	20	Average Total Project Soft Costs	$25	m²	$500
4		20	LCF - Material & Labour	$24	m2	$480
5		20	LCF - Contingency & Soft Costs	$12	m2	$240

Narratives

Event Description

Replace all areas having sheet vinyl flooring.

Event Justification & Strategy

This event will promote a professional appearance and continue to provide a non-slip walking surface.

Implication of Event Deferral (Risks)

Event delay would see more damaged and deteriorated surfaces. Cleaning would be an issue.

01.5-070C35 Painted Concrete Floor

Details	Values
Expected Life	10
Component Cost	9,600
Last Major Action Year	2003
Component Condition (For BCR use only)	Poor
Quantity	400
Measurement unit/ Metric	m2

Narratives

Component Description

Painted concrete floor in storage rooms and mechanical room in lower level.

Component Condition & Anticipated Replacement Date

Paint in poor condition. Repainting should be implemented in 2013.

Assessment Criteria	Existence
Discolouration or staining	
Default	Yes
Excessive peeling or flaking	
Default	Yes
Excessive wear	
Default	Yes

Deteriorated paint on concrete floor in Mechanical room.

RP Replacement [01.5-070C35 Painted Concrete Floor]

Details	Values
Brief Description (40 Characters)	Repaint Concrete Floor
Current event Year (YYYY)	2013
Estimated Event Cost	$9,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	400	Base Rate for Material and Labour	$12	m²	$4,800
2	01. Architectural & Structural	400	Construction Contingency	$2	m²	$800
3	01. Architectural & Structural	400	Average Total Project Soft Costs	$4	m²	$1,600
4		400	LCF - Material & Labour	$4	m2	$1,600
5		400	LCF - Contingency & Soft Costs	$2	m2	$800

Narratives

Event Description

Repaint concrete floors in all locations.

Event Justification & Strategy

The newly painted floor will maintain appearance, keep dust down and cleaning will be easier.

Implication of Event Deferral (Risks)

Event delay would promote an unsightly appearance. Anti-slip characteristics would be hindered.

01.5-070C55 Sealed - Epoxy Concrete Floor

Details	Values
Expected Life	15
Component Cost	173,400
Last Major Action Year	1999
Component Condition (For BCR use only)	Poor
Quantity	600
Measurement unit/ Metric	m2

Narratives

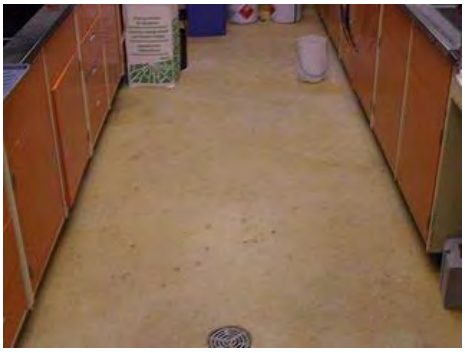
Component Description

Coved Epoxy floor finish is found in labs (tan colour).

Component Condition & Anticipated Replacement Date

The epoxy finish is stained and discoloured throughout. Recoating the various floor areas should be implemented in 2014.

Assessment Criteria	Existence
Discolouration or staining	
Default	Yes
Excessive wear	
Default	Yes



Epoxy coating stained and discoloured in lab.

CP Replacement [01.5-070C55 Sealed - Epoxy Concrete Floor]

Details	Values
Brief Description (40 Characters)	Recoat Epoxy Flooring
Current event Year (YYYY)	2014
Estimated Event Cost	$173,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	600	Base Rate for Material and Labour	$145	m²	$87,000

2	01. Architectural & Structural	600	Construction Contingency	$22	m²	$13,200
3	01. Architectural & Structural	600	Average Total Project Soft Costs	$50	m²	$30,000
4		600	LCF - Material & Labour	$48	m2	$28,800
5		600	LCF - Contingency & Soft Costs	$24	m2	$14,400

Narratives

Event Description

Replace epoxy floor coating in all locations/rooms.

Event Justification & Strategy

The newly coated floor will maintain appearance, keep dust down and cleaning will be easier.

Implication of Event Deferral (Risks)

Event delay would promote an unsealed floor surface and lead to water and chemical leeching into the concrete substrate. Concrete deterioration is a possibility.

01.5-070C60 Vinyl Floor Tile

Details	Values
Expected Life	20
Component Cost	14,500
Last Major Action Year	1994
Component Condition (For BCR use only)	Poor
Quantity	100
Measurement unit/ Metric	m2

Narratives

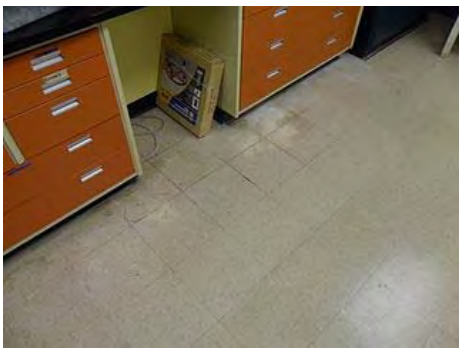
Component Description

Vinyl tile located in corridors and two labs.

Component Condition & Anticipated Replacement Date

Vinyl tile in poor - fair condition. This element should be replaced in 2014.

Assessment Criteria	Existence
Excessive wear	
Default	Yes
Stains and discolouration	
Default	Yes



Vinyl tile - poor condition (typical throughout). At end of service life.

RP Replacement [01.5-070C60 Vinyl Floor Tile]

Details	Values
Brief Description (40 Characters)	Replace Vinyl Floor Tile
Current event Year (YYYY)	2014
Estimated Event Cost	$14,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	100	Base Rate for Material and Labour	$73	m²	$7,300
2	01. Architectural & Structural	100	Construction Contingency	$11	m²	$1,100
3	01. Architectural & Structural	100	Average Total Project Soft Costs	$25	m²	$2,500
4		100	LCF - Material & Labour	$24	m2	$2,400
5		100	LCF - Contingency & Soft Costs	$12	m2	$1,200

Narratives

Event Description

Replace vinyl tile with sheet vinyl flooring. Costing reflects this recommendation.

Event Justification & Strategy

Vinyl tile replacement with sheet vinyl will maintain appearance and cleaning will be easier.

Implication of Event Deferral (Risks)

Delaying this event may lead to chipped, scratched and unadhered tiles. Walking safety would be an issue.

01.5-080C20 Painted Ceiling Structures

Details	Values
Expected Life	15
Component Cost	14,400
Last Major Action Year	2000
Component Condition (For BCR use only)	Fair
Quantity	600
Measurement unit/ Metric	m2

Narratives

Component Description

Painted concrete floor slab is found in upper level labs.

Component Condition & Anticipated Replacement Date

This element is considered in fair condition. Repainting is required in 2015.

Assessment Criteria	Existence
Fading Colours	
Default	Yes

Painted ceiling structure.

RP Replacement [01.5-080C20 Painted Ceiling Structures]

Details	Values
Brief Description (40 Characters)	Repaint Ceiling Structures
Current event Year (YYYY)	2015
Estimated Event Cost	$14,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	600	Base Rate for Material and Labour	$12	m²	$7,200
2	01. Architectural & Structural	600	Construction Contingency	$2	m²	$1,200

3	01. Architectural & Structural	600	Average Total Project Soft Costs	$4	m²	$2,400
4		600	LCF - Material & Labour	$4	m2	$2,400
5		600	LCF - Contingency & Soft Costs	$2	m2	$1,200

Narratives

Event Description

Repaint all existing ceiling type structures.

Event Justification & Strategy

Repainting all ceiling structures will maintain a professional and clean appearance.

Implication of Event Deferral (Risks)

Delaying this event would have a low risk. Dull and dirt surfaces will be promoted.

01.5-080C30 Suspended Acoustic Panel Ceiling

Details	Values
Expected Life	30
Component Cost	44,700
Last Major Action Year	1979
Component Condition (For BCR use only)	Poor
Quantity	300
Measurement unit/ Metric	m2

Narratives

Component Description

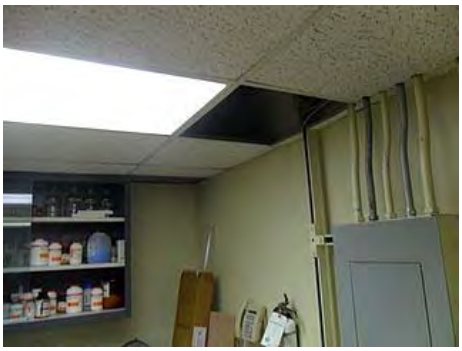
White mineral fibre ceiling tile measuring 610x1220 is supported in a suspended ceiling grid in student area, enclosed offices, corridors, some storage rooms and one lab.

Component Condition & Anticipated Replacement Date

Poor condition - ceiling tiles at end of service life. Replace entire assembly in 2015.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Missing ceiling tile room A-11.

CP Replacement [01.5-080C30 Suspended Acoustic Panel Ceiling]

Details	Values
Brief Description (40 Characters)	Replace Acoustic Ceiling Tile System
Current event Year (YYYY)	2015
Estimated Event Cost	$44,700

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	300	Base Rate for Material and Labour	$75	m²	$22,500
2	01. Architectural & Structural	300	Construction Contingency	$11	m²	$3,300
3	01. Architectural & Structural	300	Average Total Project Soft Costs	$26	m²	$7,800
4		300	LCF - Material & Labour	$25	m2	$7,500
5		300	LCF - Contingency & Soft Costs	$12	m2	$3,600

Narratives

Event Description

Replace ceiling tiles and grid system. Note, costing includes grid system - but may not be required at time of implementation.

Event Justification & Strategy

Ceiling tile and possibly grid replacement will ensure a professional appearance.

Implication of Event Deferral (Risks)

Event deferral will promote a rusted grid system and tiles will become increasingly dirty and damaged. An unprofessional appearance will result.

01.5A-055 Interior Door Hardware

Details	Values
Expected Life	5
Component Cost	9,840
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	45
Measurement unit/ Metric	ea

Narratives

Component Description

Lab and office doors are painted solid core wood doors in pressed steel frames.

Labs door hardware: Mortise Locksets with rose trim, deadbolt with thumb-turn.

Office door hardware: Bored lockset, rose trim.

Washroom and Service room doors are painted hollow metal doors (2100mm high) in pressed steel frames.

Service Rooms door hardware: Locksets (lever trim), closer.

Washroom door hardware: Lockset, pull handles and push plates.

Component Condition & Anticipated Replacement Date

All interior door hardware is functional and appeared in average condition. Starting in 2023, budget to replace 10 units wherever required, and repeat cycle every five years.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.5A-055 Interior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Interior Door Hardware
Current event Year (YYYY)	2023
Estimated Event Cost	$9,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	10	Base Rate for Material and Labour	$495	EACH	$4,950
2	01. Architectural & Structural	10	Construction Contingency	$74	EACH	$740
3	01. Architectural & Structural	10	Average Total Project Soft Costs	$171	EACH	$1,710
4		10	LCF - Material & Labour	$163	EACH	$1,630
5		10	LCF - Contingency & Soft Costs	$81	EACH	$810

Narratives

Event Description

Replace interior door hardware, where required. Event costing allows for 10 units every 5 years.

Event Justification & Strategy

Cyclical hardware replacement will ensure all doors are functioning correctly for all operational instances.

Implication of Event Deferral (Risks)

Cyclical budgeting for hardware replacement, where required, will ensure all interior doors are functioning properly during all situations.

01.5A-110 Interior Stairs

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	flts

Narratives

Component Description

Steel Stairs with rubber tread c/w non-slip nosings. Maintenance staff report treads were replaced in 2001.

Stair #1: Stair serving loading dock and service tunnel to Main Building.
Stair #2: Stair serving exit door on west side of building.

Component Condition & Anticipated Replacement Date

Rubber nosings in average condition. Paint on metal guards and handrails in average condition. Treads may require replacement in 2025. Actual stair assembly replacement is not required during this BCR timeline - no event is offered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Metal stair with rubber nosings.

RP Replacement [01.5A-110 Interior Stairs]

Details	Values
Brief Description (40 Characters)	Replace Interior Stair Treads
Current event Year (YYYY)	2025
Estimated Event Cost	$5,472

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	16	Base Rate for Material and Labour	$172	m²	$2,752

2	01. Architectural & Structural	16	Construction Contingency	$26	m²	$416
3	01. Architectural & Structural	16	Average Total Project Soft Costs	$59	m²	$944
4		16	LCF - Material & Labour	$57	m2	$912
5		16	LCF - Contingency & Soft Costs	$28	m2	$448
6		0	Quantity of 16 used for stair tread and landing areas. Costing is for Rubber Flooring.	$0	EACH	$0

Narratives

Event Description

Replace stair treads.

Event Justification & Strategy

Stair tread replacements will ensure proper footing during normal and emergency use.

Implication of Event Deferral (Risks)

Event delay would promote unsafe footing during all situations. Life safety issues may arise.

01.6A-025 Fixed Furnishing - Washroom Accessories

Details	Values
Expected Life	20
Component Cost	9,980
Last Major Action Year	2002
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	m

Narratives

Component Description

Standard washroom accessories including: counter, paper dispensers and trash bins.

Component Condition & Anticipated Replacement Date

Average condition. Washroom accessories and fixed furnishings may require replacement in 2023.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Men's accessible washroom.

RP Replacement [01.6A-025 Fixed Furnishing - Washroom Accessories]

Details	Values
Brief Description (40 Characters)	Replace Fixed Furnishing - Washroom Accessories
Current event Year (YYYY)	2023
Estimated Event Cost	$9,980

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$1,255	m	$5,020
2	01. Architectural & Structural	4	Construction Contingency	$188	m	$752
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$433	m	$1,732
4		4	LCF - Material & Labour	$414	m	$1,656
5		4	LCF - Contingency & Soft Costs	$205	m	$820
6		0	Quantity of 4 used for appropriate costing for simple accessories.	$0	EACH	$0

Narratives

Event Description

Replace washroom accessories and fixed furnishings.

Event Justification & Strategy

Cyclical replacement will promote proper and safe usage during normal operation.

Implication of Event Deferral (Risks)

Event delay would have a low risk. Prolonged postponement would inhibit use of washroom facilities.

03. Mechanical

03.1A-010 CHP Related Heat Exchangers

Details	Values
Expected Life	30
Component Cost	45,303
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

This item consists of the 3 heat exchangers HE-3, -4, -5 located in the basement mechanical room.

Component Condition & Anticipated Replacement Date

These heat exchangers are presumed to be in average condition with no problems. Based on them being original from 1985, the anticipated life would be 2015 but they can be reevaluated in 2017. A projected date of 2020 has been chosen for replacement unless there are concerns prior to that time.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

HE-3,-4,-5 steam to hot water exchangers

CP Replacement [03.1A-010 CHP Related Heat Exchangers]

Details	Values
Brief Description (40 Characters)	Replace Steam-Hot Water Heat Exchangers
Current event Year (YYYY)	2020
Estimated Event Cost	$45,303

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	3	Base Rate for Material and Labour	$7,597	EACH	$22,791
2	03. Mechanical	3	Construction Contingency	$1,139	EACH	$3,417
3	03. Mechanical	3	Average Total Project Soft Costs	$2,621	EACH	$7,863
4		3	LCF - Base Rate Material & Labour	$2,504	EACH	$7,512
5		3	LCF - Conting. & Soft Costs	$1,240	EACH	$3,720

Narratives

Event Description

Replace 3 steam - hot water heat exchangers.

Event Justification & Strategy

These heat exchangers are the primary heating source for the building. As long as they are providing reliable operation and proper maintenance (chemical treatment) is being done, there is no reason to replace these units. Should problems develop prior to the anticipated date then this even can be bumped up.

Implication of Event Deferral (Risks)

Depending on the timing, a failure could have serious consequences if there is extremely cold temperatures. It is likely there would be some warning of a problem before a serious situation, slow deterioration is typical with heat exchangers.

03.1A-020 Duct Systems

Details	Values
Expected Life	40
Component Cost	198,880
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

This element includes the HVAC ductwork, which distributes conditioned air from the central air handling units in the basement mechanical room to the occupied spaces.

Component Condition & Anticipated Replacement Date

The ductwork appears to be in average condition considering it's age, it was installed during the 1985 construction. The expected life of 40 years would result in a 2025 replacement.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Ductwork from AHU's in Mechanical Room

CP Replacement [03.1A-020 Duct Systems]

Details	Values
Brief Description (40 Characters)	Replace Ductwork
Current event Year (YYYY)	2025
Estimated Event Cost	$198,880

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	880	Base Rate for Material and Labour	$114	m²	$100,320
2	03. Mechanical	880	Construction Contingency	$17	m²	$14,960
3	03. Mechanical	880	Average Total Project Soft Costs	$39	m²	$34,320
4		880	LCF - Base Rate Material & Labour	$37	m2	$32,560
5		880	LCF - Conting. & Soft Costs	$19	m2	$16,720

Narratives

Event Description

This event is for the replacement of the HVAC ductwork.

Event Justification & Strategy

The projected lifespan of ductwork is 40 years, which brings the date for this replacement to 2025. This can be re-assessed at the time of the BCR that falls within 5 years of its projected obsolescence.

Implication of Event Deferral (Risks)

Ductwork provides HVAC throughout the building to meet ventilation and heating/cooling requirements for all occupied spaces. The likelihood of any risks is minimal provided the ductwork is maintained in a clean condition to minimize any chance of microbial growth in the ductwork.

03.1A-029 Central Station AHU

Details	Values
Expected Life	25
Component Cost	382,382
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	7
Measurement unit/ Metric	ea

Narratives

Component Description

This element consists of 6 AHU's located in the basement mechanical room and the heat transfer outside air and exhaust units in the mezzanine which collectively supply ventilation to the occupied spaces on the main floor laboratory and offices and basement offices.

Component Condition & Anticipated Replacement Date

AHU's appear to be in average operating condition based on age (all installed in 1985). The expected life cycle of 25 years ended in 2010. However, based on current condition, replacement has been scheduled for 2018.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

AH202 in basement Mechanical Room

CP Replacement [03.1A-029 Central Station AHU]

Details	Values
Brief Description (40 Characters)	Replace Air Handling Units
Current event Year (YYYY)	2018
Estimated Event Cost	$382,382

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	7	Base Rate for Material and Labour	$27,480	EACH	$192,360

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2	03. Mechanical	7	Construction Contingency	$4,122	EACH	$28,854
3	03. Mechanical	7	Average Total Project Soft Costs	$9,481	EACH	$66,367
4		7	LCF - Base Rate Material & Labour	$9,059	EACH	$63,413
5		7	LCF - Conting. & Soft Costs	$4,484	EACH	$31,388

Narratives

Event Description

This event is to replace AH-201, -202, -203, -204, -205, -206 and heat transfer outside air and exhaust units in the mezzanine when they reach the end of their serviceable life.

Event Justification & Strategy

If these units begin to degrade and have costly repairs sooner than 2018, the project should be moved up as they are already past their projected life expectancy of 2010.

Implication of Event Deferral (Risks)

It this maintenance is deferred, the IAQ requirements would not be met, leading to complaints from the building occupants and IAQ related sick leave.

03.1A-030 Ventilation Fans

Details	Values
Expected Life	25
Component Cost	102,420
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	15
Measurement unit/ Metric	ea

Narratives

Component Description

Fifteen exhaust fans are located throughout the building for the washrooms, electrical rooms and laboratories.

Component Condition & Anticipated Replacement Date

The ventilation fans appear to be in average condition considering age. They should be considered for upgrade or replacement in 2018. They should be looked at more closely for replacement at the time of the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample exhaust fan in basement Mechanical Room

CP Replacement [03.1A-030 Ventilation Fans]

Details	Values
Brief Description (40 Characters)	Replace Ventilation Fans
Current event Year (YYYY)	2018
Estimated Event Cost	$102,420

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	15	Base Rate for Material and Labour	$3,435	EACH	$51,525
2	03. Mechanical	15	Construction Contingency	$515	EACH	$7,725
3	03. Mechanical	15	Average Total Project Soft Costs	$1,185	EACH	$17,775
4		15	LCF - Base Rate Material & Labour	$1,132	EACH	$16,980
5		15	LCF - Conting. & Soft Costs	$561	EACH	$8,415

Narratives

Event Description

This event is for the replacement of the 15 exhaust fans.

Event Justification & Strategy

These fans service small but critical areas of the facility. The costs of disruption outweighs the cost deferral of their replacement as they are taking excessive O&M time to keep in operation. The building operator reports these units to have few problems. They can be further assessed at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

If these systems become unreliable there could be an impact to the research programs as some of these fans serve laboratories.

03.1A-040 Heating & Cooling Piping Systems

Details	Values
Expected Life	30
Component Cost	138,160
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

This element is composed of the heating and cooling piping that distributes heating and cooling system water from the basement mechanical room to the AHU heating and cooling coils as well as the perimeter heating loop and unit heaters.

Component Condition & Anticipated Replacement Date

The heating and cooling piping systems appeared to be in average condition with no urgent problems. The projected expected life of these systems is 30 years (2015). Since the physical condition appears average, the anticipated replacement date is extended to 2022. This will enable this element to be re-assessed at the time of the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Heating and steam piping at heat exchangers

CP Replacement [03.1A-040 Heating & Cooling Piping Systems]

Details	Values
Brief Description (40 Characters)	Replace Heating & Cooling Piping Systems
Current event Year (YYYY)	2022
Estimated Event Cost	$138,160

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	880	Base Rate for Material and Labour	$79	m²	$69,520
2	03. Mechanical	880	Construction Contingency	$12	m²	$10,560
3	03. Mechanical	880	Average Total Project Soft Costs	$27	m²	$23,760
4		880	LCF - Base Rate Material & Labour	$26	m2	$22,880
5		880	LCF - Conting. & Soft Costs	$13	m2	$11,440

Narratives

Event Description

This event includes replacement of the heating and cooling piping systems from the mechanical room in the basement and to the heating/cooling coils, perimeter radiation, and unit heaters.

Event Justification & Strategy

The heating and cooling piping is presently in average condition and does not require replacement in the near future. The timing of the replacement shall be re-assessed at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

Deferring the eventual replacement of the piping could result in leaks that could range from a nuisance (small leaks) to major problems (should a system have to be taken out of service for repairs). Shutting down a heating or cooling system under peak load conditions could result in further equipment damage, and shutdowns (due to freezing pipes).

03.1A-045 HVAC Pumps

Details	Values
Expected Life	25
Component Cost	28,880
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	10
Measurement unit/ Metric	hp

Narratives

Component Description

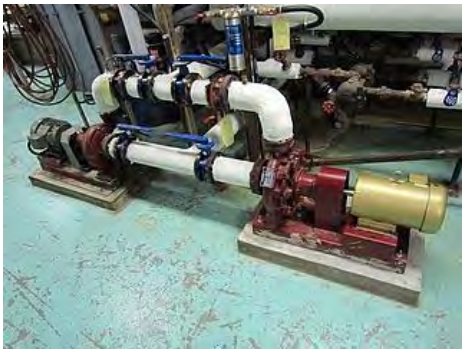
This element is for the various HVAC system heating pumps on the AHU heating coils, heat exchanger and perimeter radiation.

Component Condition & Anticipated Replacement Date

Generally, the pumps appear to be in average condition. Assuming these to be original 1985 equipment, they should have been due for replacement in 2010, but this has been pushed out to 2018 to allow another assessment at the next BCR cycle.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Hot water pumps - note newer right pump

CP Replacement [03.1A-045 HVAC Pumps]

Details	Values
Brief Description (40 Characters)	Replace HVAC Pumps
Current event Year (YYYY)	2018
Estimated Event Cost	$28,880

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	10	Base Rate for Material and Labour	$1,453	Hp	$14,530
2	03. Mechanical	10	Construction Contingency	$218	Hp	$2,180
3	03. Mechanical	10	Average Total Project Soft Costs	$501	Hp	$5,010
4		10	LCF - Base Rate Material & Labour	$479	Hp	$4,790
5		10	LCF - Conting. & Soft Costs	$237	Hp	$2,370

Narratives

Event Description

This event is for the combined life cycle replacement of the HVAC system pumps.

Event Justification & Strategy

This event is based on the assumption these pumps are all original equipment, installed with the original construction in 1985, and will be due for replacement at approximately the same time.

Implication of Event Deferral (Risks)

In all cases there is no backup pump on these systems. So, the implication would be a loss of temperature control for the areas served. Depending on the outside temperatures, this could range from a mild inconvenience to an immediate action item.

03.1A-047 Chemical Feed System

Details	Values
Expected Life	25
Component Cost	9,192
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the chemical feed systems (AKA pot feeder) for the Hot Water loops.

Component Condition & Anticipated Replacement Date

The pot feeder was installed in 1985. It appears to be in average condition, with no reported problems. The estimated lifespan has been extended to end in 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Pot feeder on hot water system loop - lower left green element

RP Replacement [03.1A-047 Chemical Feed System]

Details	Values
Brief Description (40 Characters)	Replace Chemical Feed System
Current event Year (YYYY)	2022
Estimated Event Cost	$9,192

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$4,624	sum	$4,624
2	03. Mechanical	1	Construction Contingency	$694	sum	$694
3	03. Mechanical	1	Average Total Project Soft Costs	$1,595	sum	$1,595
4		1	LCF - Base Rate Material & Labour	$1,524	sum	$1,524
5		1	LCF - Conting. & Soft Costs	$755	sum	$755

Narratives

Event Description

This event is the life cycle replacement of the chemical feed system for the hot water loop.

Event Justification & Strategy

This system was expected to be at the end of their life cycle in 2010 but based on its condition, can be further evaluated at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

Failure of this system would result in the gradual degradation of the piping systems, and potential damage to control valves in these systems. This could incur unnecessary malfunctions that outweigh the costs of replacement.

03.1A-060 Terminal Units

Details	Values
Expected Life	35
Component Cost	45,172
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the unit heaters located throughout the building mechanical spaces and door exits, which keep these areas warm during the heating season.

Component Condition & Anticipated Replacement Date

The terminal boxes appear to be in average condition given their age with no reported problems. Based on this, 2020 is the projected replacement year.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample Unit Heater in Penthouse Mezzanine

CP Replacement [03.1A-060 Terminal Units]

Details	Values
Brief Description (40 Characters)	Replace Terminal Units
Current event Year (YYYY)	2020
Estimated Event Cost	$45,172

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	4	Base Rate for Material and Labour	$5,681	EACH	$22,724
2	03. Mechanical	4	Construction Contingency	$852	EACH	$3,408
3	03. Mechanical	4	Average Total Project Soft Costs	$1,960	EACH	$7,840

4	4	LCF - Base Rate Material & Labour	$1,873	EACH	$7,492
5	4	LCF - Conting. & Soft Costs	$927	EACH	$3,708

Narratives

Event Description

This event is for the life cycle replacement of the 4 terminal units.

Event Justification & Strategy

The unit heaters will likely provide many more years of reliable service and can be reevaluated during the next BCR in 2017-18.

Implication of Event Deferral (Risks)

The unit heaters are necessary for tempering cold winter air in these open spaces. If these units are not functioning well, this will result in a risk of freezing these areas and damaging equipment.

03.1A-084 Gas Piping System

Details	Values
Expected Life	35
Component Cost	215,200
Last Major Action Year	1985
Component Condition (For BCR use only)	Good
Quantity	400
Measurement unit/ Metric	m

Narratives

Component Description

This component is the natural gas piping that is run from the municipal service from the tunnel to the main building, to the gas spigots in the laboratory rooms.

Component Condition & Anticipated Replacement Date

The gas piping is in good condition and should not require replacement until at or beyond it's 35 year anticipated life. Currently, the replacement date is scheduled for 2020. The next BCR in 2017-18 can evaluate whether this date can be extended.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Natural gas and other services passing through tunnel wall into Annex basement Mechanical Room

CP Replacement [03.1A-084 Gas Piping System]

Details	Values
Brief Description (40 Characters)	Replace Gas Piping System
Current event Year (YYYY)	2020
Estimated Event Cost	$215,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	400	Base Rate for Material and Labour	$271	m	$108,400
2	03. Mechanical	400	Construction Contingency	$41	m	$16,400
3	03. Mechanical	400	Average Total Project Soft Costs	$93	m	$37,200
4		400	LCF - Base Rate Material & Labour	$89	m	$35,600
5		400	LCF - Conting. & Soft Costs	$44	m	$17,600

Narratives

Event Description

This event is for the life cycle replacement of the natural gas piping system.

Event Justification & Strategy

The gas piping is in good condition with no reported problems and there should be no reason to consider replacement any sooner than the end of its estimated 35 year life in 2020.

Implication of Event Deferral (Risks)

If this event is deferred, and the natural gas piping is degrading, then there is a risk of a gas leak. The potential safety risk to the building and occupants should outweigh financial costs for this project.

03.2A-010 Controls, Electrical or Pneumatic

Details	Values
Expected Life	24
Component Cost	183,840
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	80
Measurement unit/ Metric	pt

Narratives

Component Description

This element includes components of the DDC system that are electric and pneumatic in nature. Typically, this includes items such as AHU damper actuators, and HVAC heating and cooling control valves.

Component Condition & Anticipated Replacement Date

There were no reported problems with any of these components. Typically, any problems should be dealt with on a case by case basis, as part of an Operations & Maintenance program. A projected replacement date of 2018 has been set, that should be reevaluated during the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sample electric thermostat

CP Replacement [03.2A-010 Controls, Electrical or Pneumatic]

Details	Values
Brief Description (40 Characters)	Replace Controls - Electrical or Pneumatic
Current event Year (YYYY)	2018
Estimated Event Cost	$183,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	80	Base Rate for Material and Labour	$1,156	pt	$92,480
2	03. Mechanical	80	Construction Contingency	$173	pt	$13,840
3	03. Mechanical	80	Average Total Project Soft Costs	$399	pt	$31,920
4		80	LCF - Base Rate Material & Labour	$381	pt	$30,480
5		80	LCF - Conting. & Soft Costs	$189	pt	$15,120

Narratives

Event Description

This event includes the life cycle replacement of DDC system items, such as the AHU damper actuators and HVAC heating and cooling control valves.

Event Justification & Strategy

These devices are critical to the DDC system's operation, and control of heating, cooling and ventilation. The work should keep the system in good working order.

Implication of Event Deferral (Risks)

If this event is deferred, the system should remain sound with case by case maintenance. The risk of many devices failing at the same time is highly unlikely.

03.2A-020 Direct Digital Control

Details	Values
Expected Life	20
Component Cost	343,560
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	100
Measurement unit/ Metric	pt

Narratives

Component Description

This component is the DDC portion of the HVAC system points (excluding the electric & pneumatic). A Honeywell XL5000 Control System controls the building cooling and heating equipment, VAV boxes, and hot water valves. This includes all DDC panels in the Annex. The head end resides in the main building.

Component Condition & Anticipated Replacement Date

DDC system is in average condition, most of the hardware was updated ~2000. It is well maintained via a Honeywell service contract, programming and graphical interface updates are on-going. The anticipated replacement date has been set at 2020 based on a 20 year expected life. Components for this system are readily available and service needs are met with the Honeywell office.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

DDC interface with pneumatic devices

CP Replacement [03.2A-020 Direct Digital Control]

Details	Values
Brief Description (40 Characters)	Replace Direct Digital Control Points
Current event Year (YYYY)	2020
Estimated Event Cost	$343,560

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	120	Base Rate for Material and Labour	$1,440	pt	$172,800

2	03. Mechanical	120	Construction Contingency	$216	pt	$25,920
3	03. Mechanical	120	Average Total Project Soft Costs	$497	pt	$59,640
4		120	LCF - Base Rate Material & Labour	$475	pt	$57,000
5		120	LCF - Conting. & Soft Costs	$235	pt	$28,200

Narratives

Event Description

This event is for the life cycle replacement of the estimated 120 points making up DDC components including panels and controllers.

Event Justification & Strategy

This event is dated 2020 in accordance with the expected life of this component. It is possible that prior to that date, technology advances may warrant an earlier replacement or upgrade. This should be a consideration in the next BCR in 2017.

Implication of Event Deferral (Risks)

This event is dated 2020 in accordance with the expected life of this component. Availability of parts and service should be considerations in the next BCR in 2017. Failures could result in major disruption to client programs.

03.3A-010 Plumbing Piping

Details	Values
Expected Life	40
Component Cost	242,000
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	1,000
Measurement unit/ Metric	m

Narratives

Component Description

This component includes all the domestic hot/cold, and waste water piping throughout the entire facility.

Component Condition & Anticipated Replacement Date

Component condition is average, so a theoretical replacement is scheduled for 2025. However, the replacement may not be necessary until beyond the scope of this BCR but this can be revisited at the time of the next BCR in 2017. Plumbing piping is believed to be all from original 1985 construction.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.3A-010 Plumbing Piping]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Piping
Current event Year (YYYY)	2025
Estimated Event Cost	$242,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1000	Base Rate for Material and Labour	$122	m	$122,000
2	03. Mechanical	1000	Construction Contingency	$18	m	$18,000
3	03. Mechanical	1000	Average Total Project Soft Costs	$42	m	$42,000
4		1000	LCF - Base Rate Material & Labour	$40	m	$40,000
5		1000	LCF - Conting. & Soft Costs	$20	m	$20,000

Narratives

Event Description

This event is to replace the domestic hot/cold water, and waste water piping systems throughout the facility.

Event Justification & Strategy

The projected lifespan of this component is 40 years but it could easily surpass this projected lifespan. Due to changes to programs over the years, some piping may no longer be required, this could be assessed in future BCR's.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the element may fail. Failure of any of these piping systems could result in ceiling tile damage through a small leak developing in a pipe, or a flooding event should a pipe rupture.

03.3A-015 Plumbing Fixtures and Accessories

Details	Values
Expected Life	30
Component Cost	247,900
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	100
Measurement unit/ Metric	ea

Narratives

Component Description

This component is comprised of the plumbing fixtures such as sinks, water closets, urinals, etc. throughout the facility.

Component Condition & Anticipated Replacement Date

Generally, there seemed to be no problems and things seemed to be in average condition. It may be desirable to replace these as part of some larger future renovations. The projected replacement is scheduled for 2018 to allow a further evaluation at the time of the next BCR in 2017.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.3A-015 Plumbing Fixtures and Accessories]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures
Current event Year (YYYY)	2018
Estimated Event Cost	$247,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	100	Base Rate for Material and Labour	$1,531	EACH	$153,100
2	03. Mechanical	100	Construction Contingency	$230	EACH	$23,000
3	03. Mechanical	100	Average Total Project Soft Costs	$528	EACH	$52,800
4		100	LCF - Base Rate Material & Labour	$127	EACH	$12,700
5		100	LCF - Conting. & Soft Costs	$63	EACH	$6,300

Narratives

Event Description

The replacement of plumbing fixtures throughout the building.

Event Justification & Strategy

If there are any future plans for upgrades or renovations involving some plumbing fixtures that would be the time to consider replacement, otherwise they could be evaluated at the time of the next BCR in 2017.

Implication of Event Deferral (Risks)

If this event is deferred, the fixtures should last for some time past their life expectancy. It is possible that seals will degrade, and serviceable parts may become hard to purchase over time.

03.3A-020 Plumbing Pumps

Details	Values
Expected Life	20
Component Cost	117,670
Last Major Action Year	1985
Component Condition (For BCR use only)	Average
Quantity	14
Measurement unit/ Metric	ea

Narratives

Component Description

This component includes the domestic hot water circulating pump and sump pumps.

Component Condition & Anticipated Replacement Date

Most pumps are believed to be original from 1985. With a 20 year expected life, they should have been due for replacement in 2005 but still appear to be in good working order so a projected date has been set at 2018 to allow for another evaluation at the next BCR cycle.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.3A-020 Plumbing Pumps]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Pumps
Current event Year (YYYY)	2018
Estimated Event Cost	$117,670

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	14	Base Rate for Material and Labour	$4,228	EACH	$59,192
2	03. Mechanical	14	Construction Contingency	$634	EACH	$8,876
3	03. Mechanical	14	Average Total Project Soft Costs	$1,459	EACH	$20,426
4		14	LCF - Base Rate Material & Labour	$1,394	EACH	$19,516
5		14	LCF - Conting. & Soft Costs	$690	EACH	$9,660

Narratives

Event Description

This is the life cycle replacement of the domestic hot water circulating pump and sump pumps in the basement mechanical room.

Event Justification & Strategy

The domestic HW pump is necessary to keep the domestic hot water loop temperature within reasonable limits. The sump pumps are necessary to deal with ground water seepage under the building. In the event of any failure there is alarm monitoring. While these pumps are critical, they appear to be meeting the needs and providing reliable service, should this change then this event should be bumped up from 2018.

Implication of Event Deferral (Risks)

Should the HW circulating pump prematurely fail, it would have to be immediately replaced as domestic hot water temperatures could not be maintained otherwise. Reliable sump pumps are necessary to prevent potential flood damage.

03.3A-045 Drinking Fountain

Details	Values
Expected Life	25
Component Cost	8,405
Last Major Action Year	1985
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	ea

Narratives

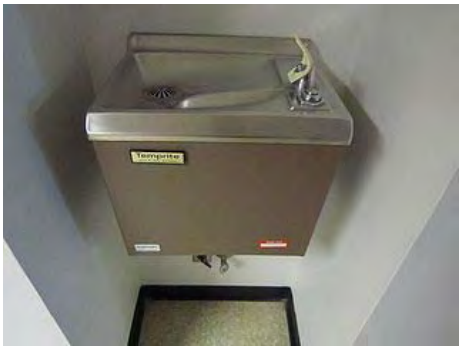
Component Description

This component is the 1 refrigerated drinking fountain in the basement.

Component Condition & Anticipated Replacement Date

The drinking fountain appeared to be in poor condition and because it uses R12 refrigerant, it should be replaced immediately (2013) (if not done so already in 2012/13).

Assessment Criteria	Existence
Outdated	
Default	Yes
	Unit uses R12 refrigerant - an ODS.



R-12 drinking fountain in basement

RP Replacement [03.3A-045 Drinking Fountain]

Details	Values
Brief Description (40 Characters)	Replace Drinking Fountain
Current event Year (YYYY)	2013
Estimated Event Cost	$8,405

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$4,228	EACH	$4,228

2	03. Mechanical	1	Construction Contingency	$634	EACH	$634
3	03. Mechanical	1	Average Total Project Soft Costs	$1,459	EACH	$1,459
4		1	LCF - Base Rate Material & Labour	$1,394	EACH	$1,394
5		1	LCF - Conting. & Soft Costs	$690	EACH	$690

Narratives

Event Description

This event is for the life cycle replacement of the drinking fountain.

Event Justification & Strategy

The drinking fountain uses R12 refrigerant and should be properly decommissioned before a leak occurs.

Implication of Event Deferral (Risks)

Failure of the drinking fountain may present some minor inconvenience to the tenants. The bigger concern is an R-12 leak which has been a target for its ozone depleting potential and associated paperwork and reporting should a leak occur.

03.5A-070 Portable Fire Extinguishers

Details	Values
Expected Life	3
Component Cost	1,576
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	12
Measurement unit/ Metric	ea

Narratives

Component Description

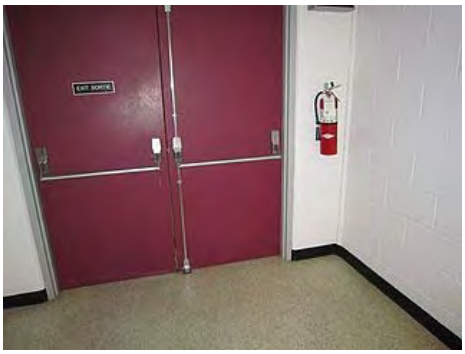
This element consists typically of 5-20 # ABC fire extinguishers. According to the Bison March 2012 report, there are 12 units in the Annex.

Component Condition & Anticipated Replacement Date

The fire extinguishers are in good condition and with continued regular maintenance will not have to be replaced for many years. With a minimum 12 year lifespan and replacement highly dependent on regular testing results, a budget to allow for two units to be replaced every 3 years, should be implemented starting in 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Fire extinguisher by basement exit door

RP Replacement [03.5A-070 Portable Fire Extinguishers]

Details	Values
Brief Description (40 Characters)	Replace Portable Fire Extinguishers
Current event Year (YYYY)	2016
Estimated Event Cost	$1,576

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$396	EACH	$792
2	03. Mechanical	2	Construction Contingency	$59	EACH	$118
3	03. Mechanical	2	Average Total Project Soft Costs	$137	EACH	$274
4		2	LCF - Base Rate Material & Labour	$131	EACH	$262
5		2	LCF - Conting. & Soft Costs	$65	EACH	$130
06		2	Qty adjusted to 2 to achieve a dollar figure adequate for upgrade/replacement for event.	$0	EACH	$0

Narratives

Event Description

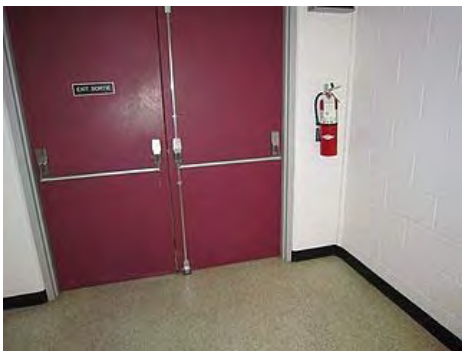
This event is to replace the portable fire extinguishers based on their age and ability to pass mandatory testing.

Event Justification & Strategy

The portable fire extinguishers have a minimum 12 year lifespan and then may be either replaced or refurbished.

Implication of Event Deferral (Risks)

Having portable extinguishers in specified design locations based on the floor plan, hazards and other conditions is a Fire Code requirement. Regular inspection and maintenance to keep them in good condition is a mandatory requirement.



Typical portable fire extinguisher by a building exit

04. Electrical

04.2A-010 Secondary Switchgear

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The electrical service to the Annex Building is fed from Distribution B in the Service Building basement through an Automatic Transfer Switch attached to the end of that distribution. The service in the Annex building consists of a Motor Control Centre with a 500 amp main breaker and customer metering section. The MCC provides distribution to 5 transformers located in the same room. There are three 100 kVA transformers feeding lab panels and one 112.5 kVA feeding lighting panels and one 15 kVA transformer feeding a single phase panel.

Component Condition & Anticipated Replacement Date

The service to the Annex is now 34 years old and still in average condition. As long as it is maintained will last at least another 10 years extending its life to 2023. This includes the Automatic Transfer Switch located on Distribution B in the service building. All the other equipment is tied to the Motor Control Centre element.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Incoming service to the Annex into the MCC.

RP Replacement [04.2A-010 Secondary Switchgear] - ATS

Details	Values
Brief Description (40 Characters)	Replace Automatic Transfer Switch
Current event Year (YYYY)	2023
Estimated Event Cost	$19,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Base Rate for Material and Labour	$10,000	EACH	$10,000
2		1	Construction Contingency	$1,500	EACH	$1,500
3		1	Average Total Project Soft Cost	$3,450	EACH	$3,450
4		1	Site Factor - Base Cost	$3,300	EACH	$3,300
5		1	Site Factor - Contingency & Soft Cost	$1,650	EACH	$1,650

Narratives

Event Description

This event is only the replacement of the Automatic Transfer Switch at Distribution B.

Event Justification & Strategy

The transfer switch will be 44 years old by this time and past reasonable life expectancy.

Implication of Event Deferral (Risks)

If the Automatic Transfer Switch is not replaced or at least evaluated and seen to be stable, the power to the Annex could be jeopardized.

Customer meter in first section of MCC.

04.2A-011 MCC

Details	Values
Expected Life	45
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	12
Measurement unit/ Metric	ea

Narratives

Component Description

The Motor Control Centre is a 600 amp, 600 volt six section back to back unit manufactured by Westinghouse. First section contains space for single phase motor selectors and running indicators, the second is the main breaker and metering section and the rest of the sections contain motor control starters and distribution breakers for the transformers.

Component Condition & Anticipated Replacement Date

The Motor Control Centre is in average condition and if maintained will need replacing in 2024 at 45 years of age, or at least be re-evaluated.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Backside of Motor Control Centre.

CP Replacement [04.2A-011 MCC]

Details	Values
Brief Description (40 Characters)	Replace Motor Control Centre
Current event Year (YYYY)	2024
Estimated Event Cost	$291,510

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$48,882	sum	$146,646
2	04. Electrical	3	Construction Contingency	$7,332	sum	$21,996
3	04. Electrical	3	Average Total Project Soft Costs	$16,864	sum	$50,592
4		3	Site Factor - Base Cost	$16,115	sum	$48,345
5		3	Site Factor - Contingency & Soft Cost	$7,977	sum	$23,931
6		0	AVS tools does not define size of MCC used $15k/section and Qty to 3 units.	$0	EACH	$0

Narratives

Event Description

Replace Motor Control Centre and all related accessories.

Event Justification & Strategy

The main service of the Annex is this MCC and it must be maintained by replacement or reevaluation as it will be 45 years old at this time.

Implication of Event Deferral (Risks)

The risk is, the whole service or portions could be compromised it the MCC is not maintained.

Westinghouse MCC.

04.2A-020 Secondary Transformer

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Good
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

In the electrical room in the basement, there are five Westinghouse dry type transformers, four are 600 volt single phase; three being 100 kVA and one being 15 kVA. These feed laboratory panels at 120/240 volt, 1 phase 3 wire. There is one 112.5 kVA 600 volt delta-wye transformer feeding 120/208 volt 3 phase 4 wire lighting panels.

Component Condition & Anticipated Replacement Date

The transformers are in good condition and with continued maintenance should last until 2023 before replacement may be required.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

One of 5 transformers feeding the Annex building.

CP Replacement [04.2A-020 Secondary Transformer]

Details	Values
Brief Description (40 Characters)	Replace Transformers
Current event Year (YYYY)	2023
Estimated Event Cost	$291,514

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$73,323	sum	$146,646
2	04. Electrical	2	Construction Contingency	$10,999	sum	$21,998
3	04. Electrical	2	Average Total Project Soft Costs	$25,297	sum	$50,594
4		2	Site Factor - Base Cost	$24,173	sum	$48,346
5		2	Site Factor - Contingency & Soft Cost	$11,965	sum	$23,930
6		0	AVS Tools does not define transformer size - used $300/kVA and modified Qty 2 units.	$0	EACH	$0

Narratives

Event Description

Replace the dry type transformers.

Event Justification & Strategy

The transformers are the link to the production of laboratory power and are essential. They will be 45 years old by 2023.

Implication of Event Deferral (Risks)

If the transformers are not maintained or replaced as needed, the building system would be compromised. Unreliable power may become an issue.

Westinghouse transformer identification plate.

Distribution transformers.

04.2A-050 Cabling, Raceways & Bus Ducts

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

Most of the electrical wiring is installed in EMT conduit, but outlets are in both cast and steel. Where cast is used, weathertight connectors are used. A significant number of panels and some other electrical equipment is fed by Teck cable. Teck cable is run in cable trays in many locations. AC90 is used for the connection of light fixtures.

Component Condition & Anticipated Replacement Date

The building devices and wiring are in average condition and should not need major replacement until about 2024. Some general operational maintenance will always be needed. There is some remedial code work to be done in 2014.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical lab layout.

RF National Code [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Remedial Electrical Code Work
Current event Year (YYYY)	2014
Estimated Event Cost	$17,192

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	AVS tools does not have an estimate schedule for remedial work. Used 7 man days @$100/hr + $3k material as base.	$0	EACH	$0
2		56	Base Rate for Material and Labour	$155	sum	$8,680
3		56	Construction Contingency	$23	sum	$1,288
4		56	Average Total Project Soft Cost	$53	sum	$2,968
5		56	Site Factor - Base Cost	$51	sum	$2,856
6		56	Site Factor - Contingency & Soft Cost	$25	sum	$1,400

Narratives

Event Description

Provide remedial work project to bring some items up to code and maintenance standards, to include the following:

1) Provide cover plates on junction boxes.
2) Provide compact fluorescent lamp in keyless lamp holders.
3) Filler plates missing.
4) Ensure access to panels.
5) Fire stopping missing.
6) Breaker tie bar missing.

Event Justification & Strategy

Most of this work is code related and must be done as soon as practical.

Implication of Event Deferral (Risks)

If this code work is not done, safety is a concern.

Fire stop missing on wall penetration.

Filler plate missing.

Typical handwritten panel directory.

Wire used for breaker tie bar. Not code compliant.

Panel access restricted by lab equipment.

Open cover plate.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Replace Devices and Wiring Systems
Current event Year (YYYY)	2024
Estimated Event Cost	$350,240

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not have an estimate for device and wiring replacement. Used $200/sq.m. Office area.	$0	EACH	$0
2		880	Base Rate for Material and Labour	$200	m2	$176,000
3		880	Construction Contingency	$30	m2	$26,400
4		880	Average Total Project Soft Cost	$69	m2	$60,720
5		880	Site Factor - Base Cost	$66	m2	$58,080
6		880	Site Factor - Contingency & Soft Cost	$33	m2	$29,040

Narratives

Event Description

Replace the wiring and devices throughout the Annex.

Event Justification & Strategy

The devices and wiring will be 45 years old and will be struggling at maintaining consistent operation. A reevaluation during the next BCR inspection, may extend the life.

Implication of Event Deferral (Risks)

If the devices are not replaced there could be significant additional maintenance costs and/or disruptions.

Outlet located in tunnel.

04.2A-070 Distribution Panels

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	31
Measurement unit/ Metric	ea

Narratives

Component Description

All the CDPs and panelboards are manufactured by Westinghouse. There are three 600 volt, 600 amp, 120/240 volt, 1 phase, 3 wire CDP panels, one 600 amp, 120/208 volt, 3 phase, 4 wire CDP, nine 225 amp, 120/208 volt, 3 phase, 4 wire panelboards and eighteen 120/240 volt, 1 phase, 3 wire panelboards. There is at least 20% spare capacity in almost all of the panels.

Component Condition & Anticipated Replacement Date

The panelboards are in average condition and are not used harshly. The units should be usable until 2024 and either replaced or re-evaluated.

Assessment Criteria	Existence
Inadequate labeling	
Default	Yes
	Some directories have changes identified to be confirmed and typed.

Panels located in basement electrical room.

CP Replacement [04.2A-070 Distribution Panels]

Details	Values
Brief Description (40 Characters)	Replace Panelboards
Current event Year (YYYY)	2024
Estimated Event Cost	$203,515

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	31	Base Rate for Material and Labour	$3,303	EACH	$102,393
2	04. Electrical	31	Construction Contingency	$495	EACH	$15,345
3	04. Electrical	31	Average Total Project Soft Costs	$1,139	EACH	$35,309
4		31	Site Factor - Base Cost	$1,089	EACH	$33,759
5		31	Site Factor - Contingency & Soft Cost	$539	EACH	$16,709

Narratives

Event Description

Replace panelboards and CDP units.

Event Justification & Strategy

The panels and CDP's will be over 45 years old at this time and past their useful life expectancy. An extension may be reevaluated closer to the proposed replacement date.

Implication of Event Deferral (Risks)

The replacement of panels and CDP's are essential to maintain electrical service both operational and for safety.

CDP in electrical room.

Typical Westinghouse panel.

04.3A-010 General Lighting

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Fair
Quantity	260
Measurement unit/ Metric	ea

Narratives

Component Description

Virtually all of the lighting fixtures in the Annex are F40 - T12 linear fluorescent fixtures. They vary in style from recessed T bar to industrial slotted to acrylic wrap around to white opal lens type. There was a couple of keyless lamp holders in the mechanical mezzanine.

Component Condition & Anticipated Replacement Date

The lighting fixtures, although not beyond their life expectancy, have T12 lamps installed in them. These lamps are no longer manufactured. Lighting is considered fair and should be replaced by 2015.

Assessment Criteria	Existence
Damaged fixtures	
Default	Yes
	Some fixtures have broken lenses.
Obsolete fixtures	
Default	Yes
	T12 lamps are obsolete.

Typical lab light fixture.

CP Replacement [04.3A-010 General Lighting]

Details	Values
Brief Description (40 Characters)	Replace or Upgrade T12 to T8 Lighting
Current event Year (YYYY)	2015
Estimated Event Cost	$187,720

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	260	Base Rate for Material and Labour	$363	EACH	$94,380
2	04. Electrical	260	Construction Contingency	$54	EACH	$14,040
3	04. Electrical	260	Average Total Project Soft Costs	$125	EACH	$32,500
4		260	Site Factor - Base Cost	$120	EACH	$31,200
5		260	Site Factor - Contingency & Soft Cost	$60	EACH	$15,600

Narratives

Event Description

Replace or refit all fixtures from T12 to T8 lamps.

Event Justification & Strategy

The existing T12 fluorescent lamp is now obsolete.

Implication of Event Deferral (Risks)

The risk of not doing the upgrade is that lamps will not be available. Note, even if they are found the lamps will be very costly from a lack of supply.

T12 lab lighting and A-line incandescent.

Industrial style fixtures.

04.3A-020 Exit Lighting

Details	Values
Expected Life	30
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Poor
Quantity	9
Measurement unit/ Metric	ea

Narratives

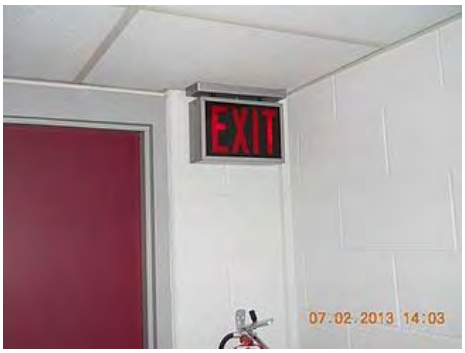
Component Description

There are only a few exit signs and they appear to have been retrofitted with LED lighting kits. All are mostly English only, one is bilingual, but none meet Government bilingual and size standards.

Component Condition & Anticipated Replacement Date

The exit signs are in poor condition because none meet government standard. All should be replaced in 2014.

Assessment Criteria	Existence
Obsolete fixtures	
Default	Yes
	Fixtures do not meet government standards.



Typical exit sign in Annex.

RF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exit Signs
Current event Year (YYYY)	2014
Estimated Event Cost	$5,913

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	9	Base Rate for Material and Labour	$330	EACH	$2,970
2	04. Electrical	9	Construction Contingency	$50	EACH	$450
3	04. Electrical	9	Average Total Project Soft Costs	$114	EACH	$1,026
4		9	Site Factor - Base Cost	$109	EACH	$981
5		9	Site Factor - Contingency & Soft Cost	$54	EACH	$486

Narratives

Event Description

Replace exit signs with either bilingual or international symbol type fixtures.

Event Justification & Strategy

The fixtures, as installed, are not to government standard.

Implication of Event Deferral (Risks)

If not upgraded there could be a safety concern in the event of a fire.

Non-bilingual Exit sign.

04.3A-030 Exterior Lighting

Details	Values
Expected Life	15
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Poor
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

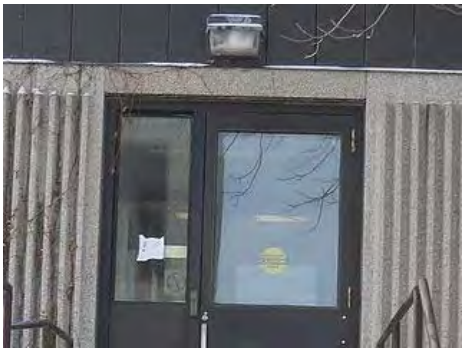
There are 3 recessed HPS pot light fixtures in the south canopy and two 70 watt HPS wall packs located at the door entrances.

Component Condition & Anticipated Replacement Date

The exterior fixtures are in poor condition, the canopy specifically. These fixtures are beyond their life expectancy and should be replaced in 2015.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Wall pack at front entrance of Annex.

RP Replacement [04.3A-030 Exterior Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exterior Lighting
Current event Year (YYYY)	2015
Estimated Event Cost	$7,550

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	5	Base Rate for Material and Labour	$760	EACH	$3,800
2	04. Electrical	5	Construction Contingency	$114	EACH	$570
3	04. Electrical	5	Average Total Project Soft Costs	$262	EACH	$1,310
4		5	Site Factor - Base Cost	$250	EACH	$1,250
5		5	Site Factor - Contingency & Soft Cost	$124	EACH	$620

Narratives

Event Description

Replace the exterior lighting fixtures.

Event Justification & Strategy

The exterior fixtures are beyond their life expectancy.

Implication of Event Deferral (Risks)

If the fixtures are not maintained on the outside of the building, security of the site could be compromised.

Canopy light fixture.

04.3A-040 Emergency Lighting

Details	Values
Expected Life	18
Component Cost	0
Last Major Action Year	2010
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The main feeder to the Annex is connected to the Emergency Generator via a transfer switch and therefore does have emergency lighting throughout. However, there is a backup system comprising of a central battery bank, Lumacell, located in the electrical room which feeds remote heads throughout the building and into the tunnel.

Component Condition & Anticipated Replacement Date

The central emergency battery unit is in good condition as it was replaced in 2010. The emergency lighting has been maintained and replaced as needed and should continue in this way. No event was made for the upgrade of the battery unit. However, the heads are from the 1979 installation. These units should be replace by 2015 to extend the life of the emergency lighting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Lumacell central battery unit.

RP Life Extension [04.3A-040 Emergency Lighting]

Details	Values
Brief Description (40 Characters)	Replace Remote Emergency Heads
Current event Year (YYYY)	2015
Estimated Event Cost	$5,054

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	7	Base Rate for Material and Labour	$363	EACH	$2,541
2	04. Electrical	7	Construction Contingency	$54	EACH	$378
3	04. Electrical	7	Average Total Project Soft Costs	$125	EACH	$875
4		7	Site Factor - Base Cost	$120	EACH	$840
5		7	Site Factor - Contingency & Soft Cost	$60	EACH	$420
6		1	AVS Tools does not have an item for upgrade of remote heads used $2500 material and labour and modified Qty to 7.	$0	EACH	$0

Narratives

Event Description

Replace remote battery heads.

Event Justification & Strategy

The remote heads will be 36 years old at this time, and although the battery and control have been upgraded the heads are original and should be replaced.

Implication of Event Deferral (Risks)

If remote heads are not replaced, the integrity of the emergency lighting could cause a safety concern during an emergency situation.

Typical remote heads.

04.4A-010 Grounding Systems

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Good
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

The bare copper grounding of the transformers are readily identified. However, the grounding of the service to the building at the main breaker of the MCC is not identified. It might be assumed the grounding could come in from the main building through the service conduit. Confirmation should be verified with the next equipment service.

Component Condition & Anticipated Replacement Date

The grounding is in good condition and should be replaced at the same time as the upgrade of the distribution in 2023.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Grounding of transformer.

RP Replacement [04.4A-010 Grounding Systems]

Details	Values
Brief Description (40 Characters)	Replace or Reestablish Service Ground
Current event Year (YYYY)	2023
Estimated Event Cost	$9,680

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	880	Base Rate for Material and Labour	$5	m²	$4,400
2	04. Electrical	880	Construction Contingency	$1	m²	$880
3	04. Electrical	880	Average Total Project Soft Costs	$2	m²	$1,760
4		880	Site Factor - Base Cost	$2	m2	$1,760
5		880	Site Factor - Contingency & Soft Cost	$1	m2	$880

Narratives

Event Description

Replace the grounding when the distribution is also completed.

Event Justification & Strategy

Grounding is integral with the distribution and is essential to the safety and operation of the electrical system.

Implication of Event Deferral (Risks)

If the grounding maintenance is neglected, both the safety and operation could be compromised.

Bare copper ground conductors.

04.5A-010 Fire Alarm System

Details	Values
Expected Life	17
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Fair
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

The building has a sub system that feeds back to the main building panel. There is a Simplex 4020 panel in the main entrance vestibule, it supports 11 zones in the building. There are no visual alarm devices.

Component Condition & Anticipated Replacement Date

The Annex building Fire Alarm is an extension of the main building and therefore any changes would be dependent on that. The fire alarm system is in fair condition in that there are no visual alarm devices. These should be added in 2014. The system is now 15 years old and should be upgraded in 2018.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Two stage pull station at front entry.

RF Building Code/Canada Labour Code [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Add Visual Fire Alarm Devices
Current event Year (YYYY)	2014
Estimated Event Cost	$3,344

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	44	Base Rate for Material and Labour	$38	m²	$1,672
2	04. Electrical	44	Construction Contingency	$6	m²	$264

3	04. Electrical	44	Average Total Project Soft Costs	$13	m²	$572
4		44	Site Factor - Base Cost	$13	m2	$572
5		44	Site Factor - Contingency & Soft Cost	$6	m2	$264
6		0	AVS tools does not recognize remedial work - used 5% of area to add visual devices.	$0	EACH	$0

Narratives

Event Description

Add visual signal devices to the system.

Event Justification & Strategy

The installation of visual devices are now a code requirement and although the building is probably grandfathered it is essential for government to be an example of code compliance.

Implication of Event Deferral (Risks)

Visual signal devices add value to the building and maintain safety.

No visual signal devices.

CP Replacement [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Replace or Upgrade Fire Alarm System
Current event Year (YYYY)	2018
Estimated Event Cost	$66,880

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	880	Base Rate for Material and Labour	$38	m²	$33,440
2	04. Electrical	880	Construction Contingency	$6	m²	$5,280
3	04. Electrical	880	Average Total Project Soft Costs	$13	m²	$11,440
4		880	Site Factor - Base Cost	$13	m2	$11,440
5		880	Site Factor - Contingency & Soft Cost	$6	m2	$5,280

Narratives

Event Description

Replace or update the fire alarm system when the main system is worked on.

Event Justification & Strategy

The operation and functionality of the fire alarm system is essential for the safety of the building and people.

Implication of Event Deferral (Risks)

If the fire alarm system is not maintained then safety of the building and people would be a concern.

Entry pull station.

04.5A-030 Communication Systems

Details	Values
Expected Life	25
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Fair
Quantity	880
Measurement unit/ Metric	m2

Narratives

Component Description

The telecommunications system consists of a bix punch down, 100 pair, category 3 cable distribution for the telephone, located in the basement electrical room. The data side terminates in a wall mounted cabinet adjacent to the telephone service, with cables run in conduit. Rating of the cable was not identified.

Component Condition & Anticipated Replacement Date

The general telecommunication system is pretty basic and the telephone side has not changed and is in fair condition. To bring the telecommunications up to industry standard for the future, the whole system should be replaced in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Telecom service cable from main building.

CP Replacement [04.5A-030 Communication Systems]

Details	Values
Brief Description (40 Characters)	Replace Telecommunication System
Current event Year (YYYY)	2020
Estimated Event Cost	$130,760

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	280	Base Rate for Material and Labour	$235	m²	$65,800
2	04. Electrical	280	Construction Contingency	$35	m²	$9,800
3	04. Electrical	280	Average Total Project Soft Costs	$81	m²	$22,680
4		280	Site Factor - Base Cost	$78	m2	$21,840
5		280	Site Factor - Contingency & Soft Cost	$38	m2	$10,640
6		0	AVS Tools appears not to consider building function - used $75/m2 and modified area to 280m2.	$0	EACH	$0

Narratives

Event Description

Upgrade telecommunication when the main system is scheduled.

Event Justification & Strategy

As a usable and functional government commercial institution, the installation of a telecommunication system to Tbits 6.9 standard, is recommended.

Implication of Event Deferral (Risks)

Not heeding the standards hinders the usefulness and flexibility of the telecommunication system.

Data cabinet in electrical room.

04.5A-040 Security System

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Average
Quantity	880
Measurement unit/ Metric	ea

Narratives

Component Description

A security system panel was not found but there are access devices on the exterior door and there are also door contacts for forced entry. It is assumed the connection is directly to the Lab/Admin building equipment.

Component Condition & Anticipated Replacement Date

The existing access/security system is an extension of the main building unit and is in average condition and should maintain operation until at least 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Security door contact.

RP Replacement [04.5A-040 Security System]

Details	Values
Brief Description (40 Characters)	Upgrade Security System
Current event Year (YYYY)	2022
Estimated Event Cost	$8,184

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	88	Base Rate for Material and Labour	$47	m²	$4,136
2	04. Electrical	88	Construction Contingency	$7	m²	$616
3	04. Electrical	88	Average Total Project Soft Costs	$16	m²	$1,408
4		88	Site Factor - Base Cost	$15	m2	$1,320
5		88	Site Factor - Contingency & Soft Cost	$8	m2	$704
6		0	AVS Tool does not take in account for building function - used 10% of area at 88 m2.	$0	EACH	$0

Narratives

Event Description

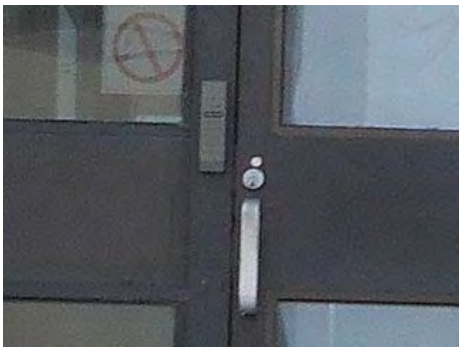
Upgrade the security system at the same time as the main system.

Event Justification & Strategy

Keeping the security system current is essential to maintain the operation of the building.

Implication of Event Deferral (Risks)

If the security system is not maintained, the building security would be compromised.



Access reader in door mullion - main entrance.

04.6A-010 Automatic Door Devices

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1979
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

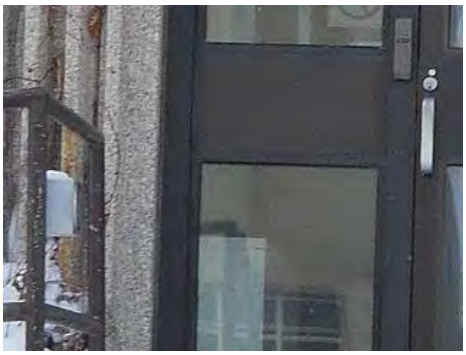
There is one set of two door operators located at the front door.

Component Condition & Anticipated Replacement Date

The door operators seem to be in good condition and with continued operational maintenance, should not need replacement until about 2021.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Door operator push button on left of stair.

RP Replacement [04.6A-010 Automatic Door Devices]

Details	Values
Brief Description (40 Characters)	Replace Automatic Door Devices
Current event Year (YYYY)	2021
Estimated Event Cost	$6,935

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1	Base Rate for Material and Labour	$3,489	EACH	$3,489
2	04. Electrical	1	Construction Contingency	$523	EACH	$523
3	04. Electrical	1	Average Total Project Soft Costs	$1,204	EACH	$1,204
4		1	Site Factor - Base Cost	$1,150	EACH	$1,150
5		1	Site Factor - Contingency & Soft Cost	$569	EACH	$569

Narratives

Event Description

Replace automatic door devices and all related mechanisms including operators.

Event Justification & Strategy

It is a government initiative to maintain the building as Handicap Accessible.

Implication of Event Deferral (Risks)

The Accessibility standard of the building would be lost if operators and related components are not maintained.

10. Whole Building Expenditures

10.1A-015 Building Condition Report

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	2012
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Annex building is connected to the Lab/Admin building by a tunnel.

The building is a two level structure as follows:
Lower Level: 880 square meters
Upper level: 880 square meters

The lower level of the building is mostly under grade but at the north exposure, grade has been lowered to permit provision of windows and daylight into the lower level offices.

The building has a steel structure and is clad with precast panels. There is an exterior loading dock and overhead door on the south side of the building.

Component Condition & Anticipated Replacement Date

Currently, the asset and property have elements regarded in fair, average and good condition. This assessment depends on the element in question. The next building condition inspection and report (BCR) is scheduled for 2017.

RP New [10.1A-015 Building Condition Report]

Details	Values
Brief Description (40 Characters)	Produce New Building Condition Report
Current event Year (YYYY)	2017
Estimated Event Cost	$24,750

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	250	Base Rate for Material and Labour	$66	m²	$16,500
2	01. Architectural & Structural	250	Construction Contingency	$10	m²	$2,500
3	01. Architectural & Structural	250	Average Total Project Soft Costs	$23	m²	$5,750

4	0	LCF costs are not applicable. Quantity of 250 used for approximate $25K total cost.	$0	EACH	$0

Narratives

Event Description

Conduct building condition inspections to evaluate all property and asset components for cyclical replacement. All data and relevant photos are to be entered into the appropriate AVS database. Export all element data from AVS and edit final report in MS Word.

Note, BCR implementation cost is calculated using the Base Rate costs for "01. 5-070C05 Carpeting".

Event Justification & Strategy

Conducting BCRs is a PWGSC mandate for all assets to provide supporting asset condition information for the building Asset Management Plan (AMP) that is produced every five years.

Implication of Event Deferral (Risks)

Event delay would infringe on the cyclical production of the AMP. Timely replacements of numerous base building elements would be hindered and life safety issues may arise.

10.1A-030 Accessibility Audit

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Conduct a comprehensive Accessibility Audit to identify a compliance score with respect to the 2012 CSA standard.

Component Condition & Anticipated Replacement Date

Current condition is average and new audit should be completed in 2013.

RP New [10.1A-030 Accessibility Audit]

Details	Values
Brief Description (40 Characters)	Conduct Accessibility Audit
Current event Year (YYYY)	2013
Estimated Event Cost	$5,180

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$495	EACH	$3,465
2	01. Architectural & Structural	7	Construction Contingency	$74	EACH	$518
3	01. Architectural & Structural	7	Average Total Project Soft Costs	$171	EACH	$1,197
4		0	Quantity of 7 used to obtain appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct accessibility audit of all public spaces for compliance against the 2012 CSA standard.

Note, accessibility audit costing is derived from using AVS costing for "01.5A-055 Interior Door Hardware" to obtain a Base Rate plus Soft Cost totaling approximately $5.5K. A contingency is added for inflation estimating. The Location Correction Factor costs are not used for this cost estimate.

Event Justification & Strategy

Event will identify which accessibility elements are not compliant. Compliant accessible features maintains an acceptable space for all.

Implication of Event Deferral (Risks)

Delaying the accessible audit would promote non compliant components and public complaints may arise.

10.2A-010 Architectural - Enclosure Thermal Scan

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Asset enclosure evaluation should be conducted every 5 years during the BCR cycle.

Component Condition & Anticipated Replacement Date

The asset enclosure is currently in average condition. The next enclosure thermal scan is scheduled for 2013.

RP New [10.2A-010 Architectural - Enclosure Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Enclosure Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$6,120

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	10	Base Rate for Material and Labour	$410	m²	$4,100
2	01. Architectural & Structural	10	Construction Contingency	$61	m²	$610
3	01. Architectural & Structural	10	Average Total Project Soft Costs	$141	m²	$1,410
4		0	Quantity of 10 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct thermal scan on building envelope from the exterior and interior during winter conditions, while the enclosure in under negative and positive interior pressures scenarios.

Note, event costing is derived from using Base Rate costs for "01.3-010C25 Exterior Wall - Concrete, precast panels" to obtain approximately $6K. A location factor is not applied. However, a contingency cost is included for inflation factor estimating.

Event Justification & Strategy

Enclosure thermal scan will evaluate the building envelope's integrity with respect to air leakage and inner wall moisture presence/accumulation. The scan results will identify anomalies for correction to ensure continued wall performance. Overall energy consumption reduction may be affected.

Implication of Event Deferral (Risks)

Event deferral may risk the accumulation of inner wall moisture which in turn may risk damaging the inner and outer wall components. Delaminations are a possibility with unscheduled repairs.

10.2A-010 Architectural - Roof Thermal Scan

Details	Values
Expected Life	3
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Existing roof assembly is original 4 ply built-up roofing.

Component Condition & Anticipated Replacement Date

Currently, the visual and thermal conditions are rated as average with numerous roof corners having granule accumulations. The next thermal/visual inspections are scheduled for 2013.

RP New [10.2A-010 Architectural - Roof Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Roof Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$5,640

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$126	m²	$3,780
2	01. Architectural & Structural	30	Construction Contingency	$19	m²	$570
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$43	m²	$1,290
4		0	Quantity of 30 used to obtain appropriate $5.5K overall cost.	$0	EACH	$0

Narratives

Event Description

Conduct a thermal scan of roof membrane, all levels.

Note, event costing derived from Base Rate costs for "01.4-010C20 Elast./Mod. Bitumen, 1 ply membrane". No location factors are included.

Event Justification & Strategy

Verify integrity of roof membrane, all levels. The thermal scan will identify all underlying component deficiencies such as; damaged and entrapped water.

Implication of Event Deferral (Risks)

Event delay will hinder the identification of small problems before they become large. Increased repair costs will be incurred.

10.2A-020 Mechanical - Water Testing

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The asset has numerous copper piping runs carrying domestic cold and hot water.

Component Condition & Anticipated Replacement Date

The existing piping appears to be adequate from the exterior. However, the interior pipe condition is unknown. The current condition can only be rated as average. As per code, the 34 year old piping needs to be tested via a water quality test in 2013 and every 5 years thereafter.

RF Domestic Water Quality [10.2A-020 Mechanical - Water Testing]

Details	Values
Brief Description (40 Characters)	Conduct Water Quality Testing
Current event Year (YYYY)	2013
Estimated Event Cost	$8,190

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	45	Base Rate for Material and Labour	$122	m	$5,490
2	03. Mechanical	45	Construction Contingency	$18	m	$810
3	03. Mechanical	45	Average Total Project Soft Costs	$42	m	$1,890
4		0	Quantity of 45 used to obtain approximate $8.25K overall total.	$0	EACH	$0

Narratives

Event Description

Mandatory testing for leached copper and lead levels must be performed on the stagnant domestic water supplies, especially with respect to the domestic hot water. If test results return unacceptably high levels of those metals, an engineering evaluation needs to be undertaken to determine options.

Note, costing is derived from Base Rate costs for "Plumbing Piping". No location factor is included.

Event Justification & Strategy

This testing is a mandatory recommendation.

Implication of Event Deferral (Risks)

Postponing this water quality testing would contravene the code. Potential water contaminates would present life safety issues.

10.2A-030 Electrical - Arc Flash Identification

Details	Values
Expected Life	24
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The Motor Control Centre is a 600 amp, 600 volt, six section back to back unit manufactured by Westinghouse. First section contains space for single phase motor selectors and running indicators, the second is the main breaker and metering and the rest of the sections contain motor control starters and distribution breakers for the transformers. All the CDPs and panelboards are manufactured by Westinghouse. There are three 600 volt, 600 amp, 120/240 volt, 1 phase, 3 wire CDP panels, one 600 amp, 120/208 volt, 3 phase, 4 wire CDP, nine 225 amp, 120/208 volt, 3 phase, 4 wire panelboards and eighteen 120/240 volt, 1 phase, 3 wire panelsboards.

Component Condition & Anticipated Replacement Date

Once the existing components are labeled, no further action would be necessary unless there are utility system changes. All new equipment added after the study will have to be labeled individually. The process has not been done as of yet and is therefore considered to be in poor condition. Study should be done immediately in 2013.

Main Service breakers for Annex in MCC.

RO Electrical [10.2A-030 Electrical - Arc Flash Identification]

Details	Values
Brief Description (40 Characters)	Provide Arc Flash Study and Identification
Current event Year (YYYY)	2013
Estimated Event Cost	$13,160

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	There is no AVS estimate for this item. Used 1 man week (40 hours) at $220/hour. No site factor required.	$0	EACH	$0
2		40	Base Rate Material and Labour	$220	EACH	$8,800
3		40	Base Rate Contingency	$33	EACH	$1,320
4		40	Base Rate Soft Cost	$76	EACH	$3,040

Narratives

Event Description

Provide a study to determine the arc flash rating for each piece of electrical equipment and install a label as required.

Event Justification & Strategy

The labeling of electrical equipment with Arc Flash ratings is identified in the Canadian Electrical Code.

Implication of Event Deferral (Risks)

To avoid the implementation of Arc Flash labeling would be to contravene code and put lives at risk during maintenance tasks.

Backside of MCC.

10.2A-030 Electrical - Cleaning and Torque

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Motor Control Centre is a 600 amp, 600 volt, six section back to back unit manufactured by Westinghouse. First section contain space for single phase motor selectors and running indicators, the second is the main breaker and metering and the rest of the sections contain motor control starters and distribution breakers for the transformers. All the CDPs and panelboards are manufactured by Westinghouse. There are three 600 volt, 600 amp, 120/240 volt, 1 phase, 3 wire CDP panels, one 600 amp, 120/208 volt, 3 phase, 4 wire CDP, nine 225 amp, 120/208 volt, 3 phase, 4 wire panelboards and eighteen 120/240 volt, 1 phase, 3 wire panelsboards.

In the electrical room in the basement there are five Westinghouse dry type transformers, four are 600 volt single phase; three being 100 kVA and one being 15 kVA. These feed laboratory panels at 120/240 volt, 1 phase, 3 wire. There is one 112.5 kVA 600 volt delta-wye transformer feeding 120/208 volt 3 phase 4 wire lighting panels.

Component Condition & Anticipated Replacement Date

The equipment is in average condition but has had little preventive maintenance over the years. Cleaning and torquing should be done every 5 years and start in 2013.

Distribution panels and transformers.

RP Life Extension [10.2A-030 Electrical - Cleaning and Torque]

Details	Values
Brief Description (40 Characters)	Clean & Torque All Electrical Terminations
Current event Year (YYYY)	2013
Estimated Event Cost	$26,320

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	No estimate in AVS for this item. Used 80 hours @$220/hour for overall total costing. No site factor costing required.	$0	EACH	$0

2	80	Base Rate Material and Labour	$220	EACH	$17,600
3	80	Base Contingency	$33	EACH	$2,640
4	80	Base Soft Cost	$76	EACH	$6,080

Narratives

Event Description

Clean and torque cable lugs and breakers and terminations on all electrical components.

Event Justification & Strategy

Preventive maintenance of major equipment in respect to cost and application is expedient for the overall health and operation of the building.

Implication of Event Deferral (Risks)

If this maintenance is not done regularly, the reliability of the system could be in jeopardy.

One transformer to clean and torque (typical).

10.2A-030 Electrical - Thermal Scan

Details	Values
Expected Life	2
Component Cost	0
Last Major Action Year	0
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The Motor Control Centre is a 600 amp, 600 volt, six section back to back unit manufactured by Westinghouse. First section contain space for single phase motor selectors and running indicators, the second is the main breaker and metering and the rest of the sections contain motor control starters and distribution breakers for the transformers. All the CDPs and panelboards are manufactured by Westinghouse. There are three 600 volt, 600 amp, 120/240 volt, 1 phase, 3 wire CDP panels, one 600 amp, 120/208 volt, 3 phase, 4 wire CDP, nine 225 amp, 120/208 volt, 3 phase, 4 wire panelboards and eighteen 120/240 volt, 1 phase, 3 wire panelsboards.

In the electrical room in the basement there are five Westinghouse dry type transformers, four are 600 volt single phase; three being 100 kVA and one being 15 kVA. These feed laboratory panels at 120/240 volt, 1 phase, 3 wire. There is one 112.5 kVA 600 volt delta-wye transformer feeding 120/208 volt 3 phase 4 wire lighting panels.

Component Condition & Anticipated Replacement Date

Currently, the electrical components are in good condition. The next scan would be completed in 2013.

Typical panels to be thermal scanned.

RP Life Extension [10.2A-030 Electrical - Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Electrical Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$6,504

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	There is no AVS estimate for this item. Used $5000 main swgr and 30 panels. No soft costs or contingency is required as no project manager is required.	$0	sum	$0
2		1	Base rate site and labour	$5,060	sum	$5,060
3		1	SF base rate.	$1,771	sum	$1,771
1	04. Electrical	12	Base Rate for Material and Labour	$363	EACH	$4,356
2	04. Electrical	12	Construction Contingency	$54	EACH	$648
3	04. Electrical	12	Average Total Project Soft Costs	$125	EACH	$1,500

Narratives

Event Description

Provide thermal scan of all terminations and electrically operating devices. Note, approximate total costing of $6.5K is calculated using "04.3A-010 General Lighting".

Event Justification & Strategy

By taking responsibility of themographically scanning the electrical equipment, it is possible to catch problems before they become an emergency. Also, equipment can be trended for operation.

Implication of Event Deferral (Risks)

If thermal scanning is not completed when indicated, there is a risk of equipment failure causing operational outage and/or safety concerns.

Panel and other equipment to be scanned.

AVS

Asset Performance Report

DFO-Freshwater Institute - Small Craft Harbour Building

July 2013

Prepared by: PWGSC – A&E CoE
Winnipeg, Manitoba
Edmonton, Alberta
Project - R.060627.001

TABLE OF CONTENTS

Details	Values
Construction Year (YYYY)	1972
Gross Area (square meters)	660
Date of current BCR	2/18/2013

Narratives

BCR Project Team and Documents

The BCR inspection and report team consisted of:

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Drawings Provided included;

- Original prints,
- 1992 Renovation Drawings

Building History

The Small Craft Harbour Building was designed in 1971 by GBR Associates Architects and Engineers and constructed in approximately in 1972 (unconfirmed).

The original building (originally referred to as the Workshop Building and Inspections office) was 50% storage space (south half) and 50% workshop (north half). There was a major renovation in 1992, which involved extensive renovations to the north half of the building, wherein the workshop was converted to office space for the Small Craft Harbour group. The renovation included infill of one overhead door along the north elevation.

The office area includes 8 enclosed private offices, an open office area with 4 workstations, an open office area with 3 workstations, meeting room, kitchenette and a file records room with mobile file storage units. The working occupancy would be approximately 15 staff. The storage space (known as the Dive Locker Storage room) includes 5 secure storage compartments, (separated by plywood partitions) and a storage mezzanine (20sm).

The building is a one level structure with an area of 660 square meters. The building has a steel structure and is clad with precast concrete panels. There is a small mezzanine in the office area, above the washrooms, to accommodate the mechanical heating equipment. The main floor is slab on grade (no crawlspace or basement). There is a service tunnel which brings services to the building from the Lab/Admin building. The tunnel is accessed from a floor access hatch in the men's washroom.

There is an overhead door on the south side of the building that is original from 1972.

Alterations / Additions:

1992: Conversion of Woodworking shop to Office Space (included infill of 1 overhead door),
2011: Renovation to Office Space (included provision of 1 new exterior window on west side),
(date unknown): Built-up Roof replaced with modified bitumen roofing.

BCR Executive Summary

In general, the building is in good condition and has benefited from a very good maintenance program (refer to Lab/Admin Building BCR). For site work, refer to Lab/Admin Building BCR.

Architectural:
There are no apparent issues with the structural steel superstructure. The building envelope is robust, clad entirely with precast concrete panels. There are no serious concerns with the building envelope. The original built-up roof has been replaced with a modified bitumen roofing system (date unknown). Roof leakage is not reported by maintenance staff.

Interior finishes in the office area are relatively new and include carpet flooring, painted gypsum walls, doors and frames. These finishes are generally in good/very good condition. Interior finishes in the storage area are minimal, including painted concrete floor, painted steel structure, and painted plywood partitions.

To ensure continued performance, the building architectural and structural elements will require cyclical repairs and replacements over the next 30 years. These projected expenditures are summarized as follows:

First 5 years: $5.7K
Following 25 years: $514K

Mechanical:
The building is divided into an Administrative area and the Dive Locker Storage area. The Dive Locker is an open warehouse with heating only via steam unit heaters. The Administrative side is serviced by a small AHU located in a mezzanine with steam heating and chilled water from the Freshwater Institute building. The mechanical systems are dated as they are mostly from original construction but appear to be in average condition and not requiring urgent repairs or replacement. The domestic water tank is operating well beyond its projected life expectancy and should be considered for replacement in the near future.

Mechanical repairs and replacements for the next 30 years is summarized as:

First 5 years: $180K
Following 25 years: $626K

Electrical:
As part of the major 1992 renovation, the distribution system was upgraded leaving only minimal electrical infrastructure in place of the original 1972 installation. All systems tie back to the Lab building. The power, other than the two 1972 panels should be functional into the mid 2030's with preventive maintenance.

The lighting although only 21 years old still utilizes the obsolete T12 fluorescent lamps and need to be replaced. The low voltage systems are dependent on the status of the head end equipment upgrades located in the Lab building. Continued integrity of the distribution would be advantageous by providing cleaning, retorquing and thermograghic scanning.

During the next 30 years, electrical component repairs and replacements are summarized as follows:

First 5 years: $104K
Following 25 years: $631K

Note, not captured by the main disciplines are the numerous cyclical asset inspections/evaluations recommended during the next 30 years. Such events include; future BCRs, thermal inspections, accessibility audits and electrical equipment cleaning and torquing. Funding for these events is estimated as follows;

First 5 years: $95.5K
Following 25 years: $406K

Overview Architectural & Structural Condition

There are no apparent issues with the structural steel superstructure. The building envelope is robust, clad entirely with precast concrete panels. There are no serious concerns with the building envelope. The original built-up roof has been replaced with a subsequent built-up roofing system (date unknown). Roof leakage is not reported by maintenance staff.

Interior finishes in the water analysis room area are original and are deteriorated, including vinyl tile floor, painted concrete block walls, painted gypsum board ceiling, painted metal doors and frames. The water analysis room includes a plastic laminate work surface complete with sink, lower cabinets/ drawers. Plastic laminate is delaminating and repair is required.

Interior finishes in the treatment and service rooms include: painted concrete block partitions, painted concrete floor, painted doors and frames.

Overview Site Condition

Refer to Lab/Admin Building BCR for all site evaluations.

Overview of Mechanical Systems Condition

The building is divided into an Administrative area and the Dive Locker Storage area. The Dive Locker is an open warehouse with heating only via steam unit heaters. The Administrative side is serviced by a small AHU located in a mezzanine with steam heating and chilled water from the Freshwater Institute building. The mechanical systems are dated as they are mostly from original construction but appear to be in average condition and not requiring urgent repairs or replacement. The domestic water tank is operating well beyond its projected life expectancy and should be considered for replacement in the near future. During the next 5 years, the most costly event is associated with replacing the plumbing piping at $96.8K in 2017. While the 25 out years will see $109K required to replace the central station AHU, in 2020.

Overview of Electrical Systems Condition

The Small Craft Building was established in 1972 and had a major upgrade in 1992 with the renovation of the north side floor plate. With this renovation, the distribution system was upgraded leaving only minimal electrical infrastructure in place of the original 1972 installation. All systems tie back to the Lab building. The power, other than the two 1972 panels should be functional into the mid 2030's with preventive maintenance.

The lighting, although only 21 years old, still utilizes the obsolete T12 fluorescent lamps and will need to be replaced. This upgrade event is estimated to cost $88K and is scheduled to take place in 2015. The low voltage systems are dependent on the status of the head end equipment upgrades located in the Lab building. Continued integrity of the electrical main distribution would be advantageous by providing cleaning, retorquing and thermograghic scanning. The system's replacement (600 volt CDP and transformer) is split between years 2022 and 2027, for a total cost estimated at $96K.

In the near future, the two most important events deal with replacing the outdated T12 general lighting with T8 lamps ($88K in 2015), and replacing all EXIT signs with code compliant fixtures ($2.5K in 2015).

Compliance with TBS Temp., Humidity & Ventilation Targets

Although indoor air quality monitoring was not conducted, there were no reported complaints. Therefore, the temperature, humidity and ventilation conditions are presumed to be in compliance with TBS guidelines.

Compliance with Accessibility Standards

The current BCR scope of work did not include an accessibility audit. The facility is reasonably compliant with accessibility codes, however a full accessibility audit is required.

The building is served by 1 men's (communal) washroom and 1 woman's communal washroom. These washrooms include accessible toilet stalls and generally conform with current accessibility codes.

Items in non-compliance, the following items are in question:
Washroom: Mirror mounting height excessive
Washroom: Grab bars missing at urinal
Washroom: Grab bar missing behind toilet

Code Compliance Summary

The discipline site inspections uncovered only one obvious code infraction. This instance deals with the non-compliant EXIT signs. All units require replacement. Refer to report section "04.3A-020 Exit Lighting" for element and event information.

01. Architectural & Structural

01.1A-010 Footings & Foundations

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

At perimeter wall:
Piles: 510mm (20") diameter x 12.8m (42') long cast in place concrete piles at columns (Typical)
305mm (12") diameter with 600x600mm (2'x2') drop panel at midpoints between columns locations.

Grade Beam 300mm x 600mm (12"x24") (Typical)
The grade beam is exposed to the exterior (i.e. uninsulated).

Component Condition & Anticipated Replacement Date

Although these elements are covered and buried, their overall condition is regarded as average. Note, there is some minor deterioration of the concrete grade beam. Since replacement is far beyond this BCR window, no event is included.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes Grade beam with minor deterioration.

01.2-010C15 Frame - Steel

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

Structure framing is reinforced Steel:

Columns:: 8" Wide flange (Typical)
Beams: 12", 14" and 16" wide flange

Component Condition & Anticipated Replacement Date

The exposed steel framing is considered in average condition. Since replacement is far beyond this BCR window, no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Roof structure - OWSJ and wide flange beams painted blue, steel deck painted white.

01.2-020C10 Slab on Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

150mm (6") concrete structural slab on 150mm (6") void form.

Component Condition & Anticipated Replacement Date

Site visual inspection revealed the slab on grade to be in average condition. Since replacement is far beyond this BCR window, no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-040C15 Roof Structure - Steel Joist + Steel Deck

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

Roof structure consists of:

Beams: 12", 14" and 16" wide flange
Roof Joists: 16" and 24" structural steel joists.

Component Condition & Anticipated Replacement Date

The structural steel roof framing and decking were observed to be in average condition. Since replacement is far beyond this BCR window, no event is included.

There is an opening (approximately .5m2 area) in the steel deck located above the stair to the mezzanine. Insulation falling through. Correction is required and scheduled for 2014.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes
	Small hole in metal decking with insulation falling out.

Roof structure - OWSJ and wide flange beams painted blue, steel deck painted white.

RP Life Extension [01.2-040C15 Roof Structure - Steel Joist + Steel Deck]

Details	Values
Brief Description (40 Characters)	Repair Opening in Steel Deck
Current event Year (YYYY)	2014
Estimated Event Cost	$796

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Base Rate Material & Labour	$400	sum	$400
2		1	Construction Contingency	$60	sum	$60
3		1	Project Soft Costs	$138	sum	$138
4		1	LCF - Material & Labour	$132	sum	$132
5		1	LCF - Contingency & Soft Costs	$66	sum	$66
6		0	No AVS costing. Used RSMeans 2012	$0	EACH	$0

Narratives

Event Description

Repair opening in steel deck.

Event Justification & Strategy

Repair required to ensure roof integrity for thermal protection and water ingress.

Implication of Event Deferral (Risks)

Deferring this event may promote a roof assembly failure and subsequent interior water damage.

Opening in steel roof deck with exposed roof insulation.

01.3-010C25 Exterior Wall - Precast Concrete Panels

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	600
Measurement unit/ Metric	m2

Narratives

Component Description

Typical exterior wall construction is as follows:

19mm particle board
38mm x 38mm wood strapping
38mm batt insulation and vapour barrier
150mm precast concrete panels

Exterior precast cladding consists of ribbed and flat panels, light to medium exposed aggregate. Vertical joints are intended to be caulked, horizontal joints are intended to be left open.

Within the south half of the building, there is only 50mm batt insulation. The wood strapping on the inside of the precast is shadowing through the gypsum board with dark patches as evidence of the minimal thermal insulation and thermal breaks. Within the north half of the building, an additional layer of finish and insulation and vapour barrier were applied in 1992.

Soffit construction is cement board.

Component Condition & Anticipated Replacement Date

Precast Panels are in average condition. There were no apparent major cracks or misalignments or areas of damage. Since replacement is far beyond this BCR window, no event is included.

There are localized areas of spalling, caused by rusting of reinforcing steel in the panels. Spalling is relatively minor Repairs are recommended for cosmetic, not structural reasons. This event is scheduled for 2020.

Joint sealant is in average condition. There is one open joint between two adjacent panels exposed above the window in the west wall. The bottom edge of a precast panel on the north wall is cracked.

Assessment Criteria	Existence
Surface cracking or spalling	
Default	Yes
	Minor spalling.
Surface staining or discoloration	
Default	Yes
	Iron spotting.

Precast concrete panels.

RP Life Extension [01.3-010C25 Exterior Wall - Precast Concrete Panels]

Details	Values
Brief Description (40 Characters)	Repair Precast Concrete Panels
Current event Year (YYYY)	2020
Estimated Event Cost	$16,280

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	20	Base Rate for Material and Labour	$410	m²	$8,200
2	01. Architectural & Structural	20	Construction Contingency	$61	m²	$1,220
3	01. Architectural & Structural	20	Average Total Project Soft Costs	$141	m²	$2,820

4	20	LCF - Material & Labour	$135	m2	$2,700
5	20	LCF - Contingency & Soft Costs	$67	m2	$1,340
6	0	Quantity of 20 used for appropriate repair costing.	$0	EACH	$0

Narratives

Event Description

Reseal panel joints where required. Remove and patch iron spotting (spalled) in precast panels.

Event Justification & Strategy

Precast concrete panel repairs will prevent water ingress and maintain appearance of panels.

Implication of Event Deferral (Risks)

Deferring precast panel repairs may promote further panel deterioration and possible water ingression into the underlying wall assembly.

01.3-060C01 Aluminum Doors and Hardware

Details	Values
Expected Life	50
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

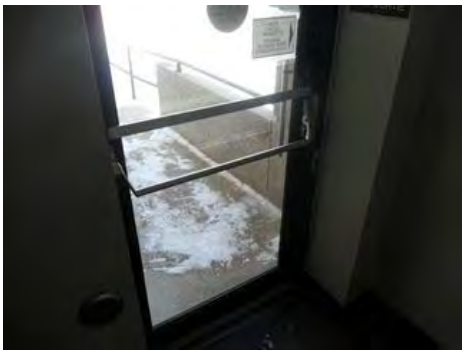
Fully glazed exterior aluminum door serving the office component with electric strike, pull, exit device and weather-stripping.

Component Condition & Anticipated Replacement Date

The aluminum doors and related hardware are regarded in average condition. Currently, door replacement is not recommended. However, weather-stripping and the closure should be replaced in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Fully glazed aluminum entry door.

RP Life Extension [01.3-060C01 Aluminum Doors and Hardware]

Details	Values
Brief Description (40 Characters)	Replace Weather-stripping and Closer
Original Event Year	Unspecified
Estimated Event Cost	$1,446

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$727	EACH	$727
2	01. Architectural & Structural	1	Construction Contingency	$109	EACH	$109
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$251	EACH	$251
4		1	LCF - Material & Labour	$240	EACH	$240
5		1	LCF - Contingency & Soft Costs	$119	EACH	$119

Narratives

Event Description

Replace weather-stripping and closer.

Event Justification & Strategy

This event will help maintain operation and control heat loss.

Implication of Event Deferral (Risks)

Event deferral would promote heat loss issues and poor door operation. Improper building egress may also be an issue.

01.3-060C10 Exterior Metal Doors and Hardware

Details	Values
Expected Life	45
Component Cost	5,254
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

Metal door serving main entry to dive locker consists of:

2400mm high Metal door with electric strike, pull , exit device, closer and weather-stripping.

Metal exit door from dive locker and metal exit door from office side consists of:

2100 high metal door with lockset (rose trim), closer and weather-stripping.

Component Condition & Anticipated Replacement Date

Doors are in fair condition with many dents and scratches. Replacement is scheduled for 2020.

Exit door has cover plate installed on exterior.

Hardware in average condition and good working order.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes
	Paint badly faded.

Exterior steel door (entry door to dive locker storage area). Door requires repainting.

RP Replacement [01.3-060C10 Exterior Metal Doors and Hardware]

Details	Values
Brief Description (40 Characters)	Replace Exterior Metal Doors and Hardware
Current event Year (YYYY)	2020
Estimated Event Cost	$5,254

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$1,321	EACH	$2,642
2	01. Architectural & Structural	2	Construction Contingency	$198	EACH	$396
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$456	EACH	$912
4		2	LCF - Material & Labour	$436	EACH	$872
5		2	LCF - Contingency & Soft Costs	$216	EACH	$432

Narratives

Event Description

Replacement of exterior metal doors and hardware.

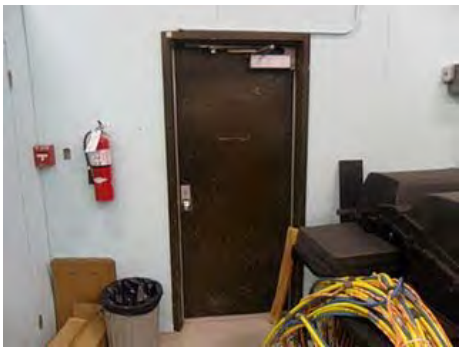
Event Justification & Strategy

This event will ensure proper egress is maintained during an emergency situation.

Implication of Event Deferral (Risks)

Event deferral would promote improper building egress.

Exterior door. Deteriorated paint and makeshift cover plate at lockset.



Interior view of exit door with numerous paint scuffs.

01.3-060C18 Overhead Door

Details	Values
Expected Life	20
Component Cost	13,788
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Overhead door is steel flush panel, insulated, standard sectional overhead type, with chain hoist for manual operation, 50mm heavy duty hardware and 6mm wired glass lites.

Component Condition & Anticipated Replacement Date

Overhead door and accessories are in fair to average condition. All components are in good working order and staff report no problems. Full replacement is scheduled for 2030.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes
	General scrapes and fading.

Interior view of overhead door, showing excessive wear. Bottom seal not tight to slab.

RP Replacement [01.3-060C18 Overhead Door]

Details	Values
Brief Description (40 Characters)	Replace Overhead Door and Operator
Current event Year (YYYY)	2030
Estimated Event Cost	$13,788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$6,936	EACH	$6,936
2	01. Architectural & Structural	1	Construction Contingency	$1,040	EACH	$1,040
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$2,393	EACH	$2,393
4		1	LCF - Material & Labour	$2,287	EACH	$2,287
5		1	LCF - Contingency & Soft Costs	$1,132	EACH	$1,132

Narratives

Event Description

Replace overhead door, operator and all other related accessories.

Event Justification & Strategy

Overhead door replacement will maintain functionality and appearance.

Implication of Event Deferral (Risks)

Postponing this event may promote improper door operation. There may be staff complaints of improper loading and unloading of supplies and equipment.

01.3-070C01 Aluminum Windows

Details	Values
Expected Life	50
Component Cost	20,980
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	m2

Narratives

Component Description

Fixed window units are used.

Window framing: 3mm thick extruded aluminum framing, thermally broken, steel reinforced and dark bronze anodized colour.

Glazing: hermetically sealed double glazed units consisting of 6mm polished plate glass inboard, 12mm air space, 6mm solar type bronze coloured polished plate glass outboard and complete with steel spacer.

Approximate size = 2m w x 2m.

Component Condition & Anticipated Replacement Date

Windows are in average condition. There is no apparent difference between the original windows and new windows installed in 1992 and 2008. Full replacements are scheduled for 2030.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Aluminum Windows
Current event Year (YYYY)	2030
Estimated Event Cost	$20,980

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	20	Base Rate for Material and Labour	$528	m²	$10,560
2	01. Architectural & Structural	20	Construction Contingency	$79	m²	$1,580
3	01. Architectural & Structural	20	Average Total Project Soft Costs	$182	m²	$3,640
4		20	LCF - Material & Labour	$174	m2	$3,480
5		20	LCF - Contingency & Soft Costs	$86	m2	$1,720

Narratives

Event Description

Although aluminum framing may be OK, this event includes frame replacement along with sealed glazed units. Future BCRs will determine if framing should be replaced.

Event Justification & Strategy

This event will ensure proper water tightness of the exterior enclosure along with providing an adequate thermal barrier.

Implication of Event Deferral (Risks)

Event delay may have a low risk factor. However, prolonged delay would see poor window performance (dried out seals) and possible water ingression.

01.3A-075 Window Coverings

Details	Values
Expected Life	15
Component Cost	1,740
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	m2

Narratives

Component Description

Window coverings are horizontal 1"(25mm) aluminum louvre blinds. Blinds are operated by traditional chain and chord system. Blinds were not replaced as part of 2012 interior renovation project. There was one new blind included in the 2012 interior renovation project (at new window).

Quantity: 5 windows @ 4m2 each = 20m2.

Component Condition & Anticipated Replacement Date

All blinds are considered in average condition and in good working order.

The four blinds from 1992 may need replacement in 10 years or 2023. The one new blind assembly from 2012, may require replacement in 20 years or 2032.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical horizontal metal blind assembly.

RP Replacement [01.3A-075 Window Coverings] - 4

Details	Values
Brief Description (40 Characters)	Replace 4 Window Coverings
Current event Year (YYYY)	2023
Estimated Event Cost	$1,392

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	16	Base Rate for Material and Labour	$44	m²	$704
2	01. Architectural & Structural	16	Construction Contingency	$7	m²	$112
3	01. Architectural & Structural	16	Average Total Project Soft Costs	$15	m²	$240
4		16	LCF - Material & Labour	$14	m2	$224
5		16	LCF - Contingency & Soft Costs	$7	m2	$112

Narratives

Event Description

Replace four window covering assemblies from 1992 interior renovation.

Event Justification & Strategy

This event will ensure proper operation and visual appearance.

Implication of Event Deferral (Risks)

Event deferral may promote poor blind operation, unacceptable appearance from damaged assemblies and staff complaints.

RP Replacement [01.3A-075 Window Coverings] - 1

Details	Values
Brief Description (40 Characters)	Replace 1 Window Covering
Current event Year (YYYY)	2032
Estimated Event Cost	$348

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$44	m²	$176
2	01. Architectural & Structural	4	Construction Contingency	$7	m²	$28

3	01. Architectural & Structural	4	Average Total Project Soft Costs	$15	m²	$60
4		4	LCF - Material & Labour	$14	m2	$56
5		4	LCF - Contingency & Soft Costs	$7	m2	$28

Narratives

Event Description

Replace one newer window covering assembly from 2012.

Event Justification & Strategy

This event will ensure proper operation and visual appearance.

Implication of Event Deferral (Risks)

Event deferral may promote poor blind operation, unacceptable appearance from damaged assemblies and staff complaints.

01.4-010C20 Modified Bitumen Membrane Roof

Details	Values
Expected Life	20
Component Cost	164,340
Last Major Action Year	1995
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

TJ Forest report dated 1997 indicates roof was re-roofed with modified bituminous roofing. Date and extent of roof system replacement (i.e. insulation) not determined. This roof is at least 15 years old.

Component Condition & Anticipated Replacement Date

No visual inspection due to snow cover.

The roofing report produced by T.J. Forrest and Co. Ltd in 1997 rated the quality of the roof as good to fair and recommended only minor annual maintenance. Full roof assembly replacement is slated to be implemented in 2022.

Assessment Criteria	Existence
Damaged, deteriorated or inadequate roofing material	
Default	Yes Blisters have occurred in recent years.

Blister of Modified bitumen roofing. Repaired in 2012.

CP Replacement [01.4-010C20 Modified Bitumen Membrane Roof]

Details	Values
Brief Description (40 Characters)	Replace Roof Assembly
Current event Year (YYYY)	2022
Estimated Event Cost	$164,340

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	660	Base Rate for Material and Labour	$126	m²	$83,160
2	01. Architectural & Structural	660	Construction Contingency	$19	m²	$12,540
3	01. Architectural & Structural	660	Average Total Project Soft Costs	$43	m²	$28,380
4		660	LCF - Material & Labour	$41	m2	$27,060
5		660	LCF - Contingency & Soft Costs	$20	m2	$13,200

Narratives

Event Description

Replace entire roof assembly including all flashing, vent stacks and curbing.

Event Justification & Strategy

Roof assembly with have reached its expected life and recent repairs may not be holding their own. Roof water tightness may be a concern.

Implication of Event Deferral (Risks)

Delaying roof replacement would promote unnecessary membrane deficiencies and interior water leaks would be a real possibility.

01.5-010C01 Concrete Block Partition

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	140
Measurement unit/ Metric	m2

Narratives

Component Description

Demising wall between Dive locker and Office area is a standard 200mm (8") concrete block partition.

Component Condition & Anticipated Replacement Date

Currently, all interior block partitions are in average condition. Since replacement is far beyond this BCR window, no event is included.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-012C01 Gypsum Board Partition with Studs

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	100
Measurement unit/ Metric	m2

Narratives

Component Description

Gypsum wall board on wood studs is the primary framing assembly in the 1992 renovated office area.

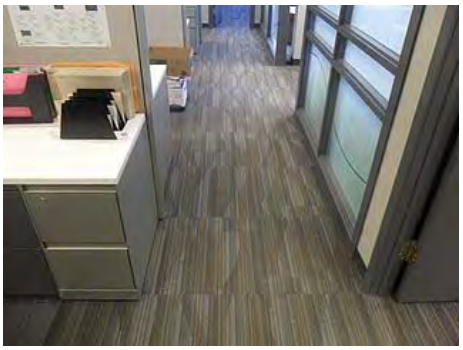
Component Condition & Anticipated Replacement Date

Interior gypsum board and stud partitions are in average condition. Their replacement is not required during this BCR window. No event is included.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Gypsum board partitions with interior glazing in wood frames.

01.5-012C01 Plywood Partition with Studs

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	50
Measurement unit/ Metric	m2

Narratives

Component Description

Storage compartments in Dive Locker are painted plywood partitions.

Component Condition & Anticipated Replacement Date

The plywood partitions with studs are in average condition. Their replacement is not required during this BCR window. No event is included.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical painted plywood partition in dive locker area.

01.5-050C15 Metal Doors and Hardware

Details	Values
Expected Life	60
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

Washroom and Service room doors are painted hollow metal doors (2100mm h) in pressed steel frames.

Washroom: Push, Pull and Closer

Service Rooms: Locksets with lever trim and closer

Component Condition & Anticipated Replacement Date

The interior metal doors and hardware are regarded in average condition. Their replacement is not required during this BCR window. No event is included.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-050C20 Wood Doors and Hardware

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	ea

Narratives

Component Description

Typical doors are painted solid core wood doors (2100mm high) in wood frames. Some interior glass partitions feature painted wood frames and sandblasted glass.

Latch sets, Pull and Closer.

Component Condition & Anticipated Replacement Date

Interior wood doors and related hardware are considered in average condition. Their replacement is not required during this BCR window. No event is included.

Refer to report element "01.5-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.5-060C15 Paint

Details	Values
Expected Life	10
Component Cost	22,000
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	1,000
Measurement unit/ Metric	m2

Narratives

Component Description

Dive Locker Area
Structural steel: Colour blue
Walls: Colour Beige
Doors and frames: colour dark brown
Plywood partitions: colour light blue

Small Craft harbour
Doors, frames and interior glazed partition framing: Colour light grey
Walls and ceiling: off white

Component Condition & Anticipated Replacement Date

Following a recent interior upgrade project, paint is generally good to very good condition. Next painting cycle is scheduled for 2025.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

RP Replacement [01.5-060C15 Paint]

Details	Values
Brief Description (40 Characters)	Repaint Numerous Interior Surfaces
Current event Year (YYYY)	2025
Estimated Event Cost	$22,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1000	Base Rate for Material and Labour	$11	m²	$11,000
2	01. Architectural & Structural	1000	Construction Contingency	$2	m²	$2,000
3	01. Architectural & Structural	1000	Average Total Project Soft Costs	$4	m²	$4,000
4		1000	LCF - Material & Labour	$3	m2	$3,000
5		100	LCF - Contingency & Soft Costs	$2	m2	$2,000

Narratives

Event Description

Cyclical repainting program of: Structural steel, Walls, Doors and frames, Plywood partitions, interior glazed partition framing, Walls and ceiling.

Event Justification & Strategy

Cyclical interior painting of numerous surfaces will maintain appearance and a professional atmosphere.

Implication of Event Deferral (Risks)

Event postponement would have a low risk factor. The highest risk would be related to an unclean and unprofessional appearance.

01.5-070C05 Carpeting

Details	Values
Expected Life	20
Component Cost	41,580
Last Major Action Year	2011
Component Condition (For BCR use only)	Excellent
Quantity	315
Measurement unit/ Metric	m2

Narratives

Component Description

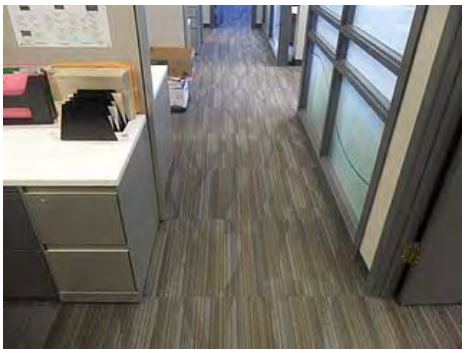
Carpet tile in office area is a textured grey pattern.

Component Condition & Anticipated Replacement Date

All carpeted areas are regarded in very good condition. Since usage and wear are low, the next replacement is scheduled to take place in 2031.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Carpet in office area.

CP Replacement [01.5-070C05 Carpeting]

Details	Values
Brief Description (40 Characters)	Replace Carpeting
Current event Year (YYYY)	2031
Estimated Event Cost	$41,580

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	315	Base Rate for Material and Labour	$66	m²	$20,790
2	01. Architectural & Structural	315	Construction Contingency	$10	m²	$3,150
3	01. Architectural & Structural	315	Average Total Project Soft Costs	$23	m²	$7,245
4		315	LCF - Material & Labour	$22	m2	$6,930
5		315	LCF - Contingency & Soft Costs	$11	m2	$3,465

Narratives

Event Description

Replace carpet tile.

Event Justification & Strategy

Carpet renewal will maintain appearance and ensure tripping hazards are avoided.

Implication of Event Deferral (Risks)

Event delay may promote fraying and possible tripping hazards. An unsightly appearance would also be a reality.

01.5-070C20 Plywood Floor

Details	Values
Expected Life	25
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	55
Measurement unit/ Metric	m2

Narratives

Component Description

Floor in Mechanical Mezzanine is 19mm (3/4") plywood on 2" x 10" wood joists.

Component Condition & Anticipated Replacement Date

Plywood is water stained in many areas and regarded in fair condition. Painting should be implemented in 2014. Full plywood replacement is not warranted during this BCR window and no such event is included.

Assessment Criteria	Existence
Deterioration of surface finish	
Default	Yes
	Select areas are water stained.

Water stained plywood flooring in mechanical mezzanine.

RP New [01.5-070C20 Plywood Floor]

Details	Values
Brief Description (40 Characters)	Paint Mechanical Mezzanine Plywood Floor
Current event Year (YYYY)	2014
Estimated Event Cost	$1,320

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	55	Base Rate for Material and Labour	$12	m²	$660
2	01. Architectural & Structural	55	Construction Contingency	$2	m²	$110
3	01. Architectural & Structural	55	Average Total Project Soft Costs	$4	m²	$220
4		55	LCF - Material & Labour	$4	m2	$220
5		55	LCF - Contingency & Soft Costs	$2	m2	$110

Narratives

Event Description

Paint plywood floor in mechanical mezzanine area.

Event Justification & Strategy

Painting the unpainted plywood floor will extend the service life.

Implication of Event Deferral (Risks)

Deferring this event would have a low risk factor. Deferral would promote an unclean walking surface and increase dust.

01.5-070C25 Sheet Vinyl Floor

Details	Values
Expected Life	15
Component Cost	3,625
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	100
Measurement unit/ Metric	m2

Narratives

Component Description

Sheet vinyl in kitchenette and washrooms. These areas have either grey or brown fleck colouring.

Component Condition & Anticipated Replacement Date

Fair condition in kitchenette (wear damage). Replacement scheduled for 2015.

Good condition in washrooms. Replacement is not identified during this BCR window and no event is included.

Assessment Criteria	Existence
Excessive wear	
Default	Yes
	Areas with wear damage.
Physical damage or deterioration	
Default	Yes
	Scattered scrapes in kitchenette.

Wear damage on sheet vinyl in kitchenette.

RP Replacement [01.5-070C25 Linoleum or Sheet Vinyl Floor]

Details	Values
Brief Description (40 Characters)	Replace Sheet Flooring in Kitchenette
Current event Year (YYYY)	2015
Estimated Event Cost	$3,625

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	25	Base Rate for Material and Labour	$73	m²	$1,825
2	01. Architectural & Structural	25	Construction Contingency	$11	m²	$275
3	01. Architectural & Structural	25	Average Total Project Soft Costs	$25	m²	$625
4		25	LCF - Material & Labour	$24	m2	$600
5		25	LCF - Contingency & Soft Costs	$12	m2	$300

Narratives

Event Description

Replace sheet flooring in kitchenette area only.

Event Justification & Strategy

Replacing the kitchenette vinyl flooring will ensure a professional appearance and avoid further degradation.

Implication of Event Deferral (Risks)

Event delay would risk additional blemishes and a poor appearance.

01.5-070C35 Painted Concrete Floor

Details	Values
Expected Life	10
Component Cost	7,560
Last Major Action Year	2005
Component Condition (For BCR use only)	Good
Quantity	315
Measurement unit/ Metric	m2

Narratives

Component Description

Painted concrete floor in dive locker storage area.

Component Condition & Anticipated Replacement Date

Painted concrete floor areas have an overall average condition. Repainting should take place in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Painted concrete floor in dive locker area.

RP Replacement [01.5-070C35 Painted Concrete Floor]

Details	Values
Brief Description (40 Characters)	Repaint Concrete Floor Areas
Current event Year (YYYY)	2020
Estimated Event Cost	$7,560

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	315	Base Rate for Material and Labour	$12	m²	$3,780
2	01. Architectural & Structural	315	Construction Contingency	$2	m²	$630
3	01. Architectural & Structural	315	Average Total Project Soft Costs	$4	m²	$1,260
4		315	LCF - Material & Labour	$4	m2	$1,260
5		315	LCF - Contingency & Soft Costs	$2	m2	$630

Narratives

Event Description

Cyclical repainting of concrete floor areas in storage and shop locations.

Event Justification & Strategy

Cyclically painting the concrete floor areas will keep dust at bay and promote a clean and professional appearance.

Implication of Event Deferral (Risks)

Event deferral would promote an unclean and unprofessional surface.

01.5-080C30 Suspended Acoustic Panel Ceiling

Details	Values
Expected Life	30
Component Cost	29,800
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	200
Measurement unit/ Metric	m2

Narratives

Component Description

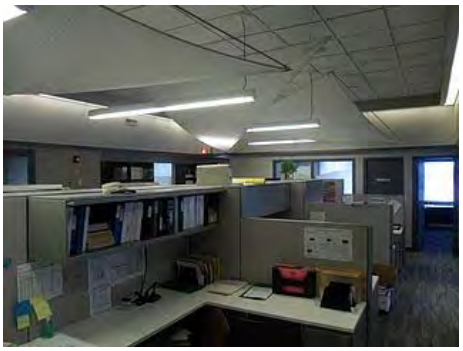
610x610 white mineral fibre ceiling tile (tegular) in suspended ceiling grid is found throughout the office areas.

Component Condition & Anticipated Replacement Date

Currently, the suspended acoustic panel system is a in average condition. Full replacement is schedule for 2030.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Acoustic tile ceiling in office area with decorative suspended sails.

CP Replacement [01.5-080C30 Suspended Acoustic Panel Ceiling]

Details	Values
Brief Description (40 Characters)	Replace Suspended Acoustic Panel Ceiling System
Current event Year (YYYY)	2030
Estimated Event Cost	$29,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	200	Base Rate for Material and Labour	$75	m²	$15,000
2	01. Architectural & Structural	200	Construction Contingency	$11	m²	$2,200
3	01. Architectural & Structural	200	Average Total Project Soft Costs	$26	m²	$5,200
4		200	LCF - Material & Labour	$25	m2	$5,000
5		200	LCF - Contingency & Soft Costs	$12	m2	$2,400

Narratives

Event Description

Note, this event costing includes replacing the entire grid system in addition to ceiling tile replacement. Future BCRs will determine whether the grid is acceptable in 2030.

Event Justification & Strategy

Replacing the suspended acoustic panel ceiling system will promote a professional appearance and continued performance for the staff.

Implication of Event Deferral (Risks)

Postponing this ceiling assembly replacement would promote a deteriorated system, such as; rusted T-bar members, and stained and broken tiles. Appearance would become an issue.

01.5A-110 Interior Stairs

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	flts

Narratives

Component Description

Painted Wood Ships ladder to mechanical penthouse.

Steel stair to mezzanine in Dive Locker area (open riser, steel grating tread).

Both stairs have painted metal railings.

Component Condition & Anticipated Replacement Date

The painted wood ships ladder accessing the mechanical penthouse is in good structural condition.

Steel stair to mezzanine in Dive Locker area - requires repainting in 2020. Refer to report element "01.5-060C15 Paint" for repainting.

Neither access ladder require replacement during this BCR window - no event is included.

Assessment Criteria	Existence
Surface finishes deteriorated	
Default	Yes
	Scraped painted surfaces.

Steel stair to mezzanine - expanded metal treads, open riser.

01.6A-025 Fixed or Permanent Furnishing (Millwork)

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	10
Measurement unit/ Metric	m

Narratives

Component Description

Kitchenette with upper and lower cabinets: plastic laminate covered, 19mm particle board construction typical (10mm backs). Other areas with millwork include:

- Work surface in office equipment/stationary room,
- Free standing coat closet,
- Fish tank cabinets: oak veneer plywood facings, Interiors to be plastic laminate covered 19mm particle board construction.

Component Condition & Anticipated Replacement Date

Kitchenette Cabinets (uppers and lowers): Condition good. Some hinges need adjustment for door alignment. Should be covered under general maintenance. No replacements are required during this BCR window - no event.

Fish tank cabinets: Condition good aside from some minor scratches in the finish and catches on the access panel above the tank are not working. Should be covered under general maintenance. No replacements are required during this BCR window - no event.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Non operable equipment

Default Yes

Catches are not operating.

Work surface and cabinets in office equipment room.

01.6A-030 Washroom Accessories and Lockers

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

Standard washroom accessories and approximately 5 full height metal lockers.

Component Condition & Anticipated Replacement Date

All washroom accessories are considered in good working condition. No replacements are required during this BCR window - no event.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Lockers, accessories in men's washroom.

01.6A-036 Dacron Sails (Suspended from Ceiling)

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	50
Measurement unit/ Metric	m2

Narratives

Component Description

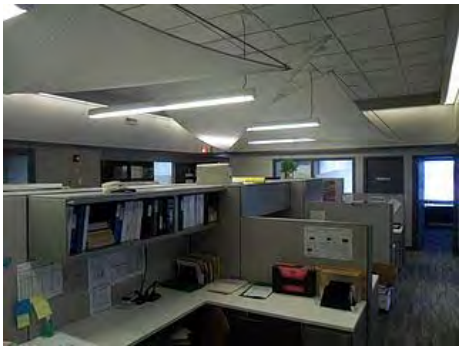
Decorative Dacron Sails are suspended from ceiling in open office area.

Component Condition & Anticipated Replacement Date

The ceiling suspended, Dacron sails are in good condition. No replacement is required during this BCR window and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Dacron sails in open office area.

03. Mechanical

03.1A-020 Duct Systems

Details	Values
Expected Life	40
Component Cost	67,800
Last Major Action Year	1977
Component Condition (For BCR use only)	Good
Quantity	300
Measurement unit/ Metric	m2

Narratives

Component Description

This component is the ductwork from the AHU to the terminal VAV boxes to the ceiling diffusers.

Component Condition & Anticipated Replacement Date

The ductwork is in good condition. Based on age, the projected replacement date would be in 2017 but that is unlikely necessary and can be re-assessed at the time of the next BCR. For now, the replacement event is scheduled for 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.1A-020 Duct Systems]

Details	Values
Brief Description (40 Characters)	Replace HVAC Ductwork
Current event Year (YYYY)	2020
Estimated Event Cost	$67,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	300	Base Rate for Material and Labour	$114	m²	$34,200
2	03. Mechanical	300	Construction Contingency	$17	m²	$5,100
3	03. Mechanical	300	Average Total Project Soft Costs	$39	m²	$11,700
4		300	LCF - Base Rate Material & Labour	$37	m2	$11,100
5		300	LCF - Conting. & Soft Costs	$19	m2	$5,700
6		0	Quantity adjusted to 300 to achieve adequate costing for event.	$0	m2	$0

Narratives

Event Description

This event is for the life cycle replacement of the HVAC ductwork.

Event Justification & Strategy

The ductwork is in good condition considering it is approximately 35 years old. Condition should be reevaluated before any funding is committed to a project.

Implication of Event Deferral (Risks)

Ductwork provides HVAC throughout the building to meet ventilation and heating/cooling requirements for all. The likelihood of any risks is minimal provided the ductwork is maintained in a clean condition to minimize any chance of microbial growth in the ductwork.

03.1A-029 Central Station AHU

Details	Values
Expected Life	25
Component Cost	109,252
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This element consists of AH101 which is located in the mezzanine and supplies conditioned air to the office spaces (not dive locker side).

Component Condition & Anticipated Replacement Date

AH101 appears to be in average operating condition based on age (installed in 1977). The expected life-cycle of 25 years would have been 2002 but replacement has been scheduled for 2020. This can be reevaluated at the time of the next BCR.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

AH101 Small Craft Harbour mezzanine

CP Replacement [03.1A-029 Central Station AHU]

Details	Values
Brief Description (40 Characters)	Replace Central Station AHU
Current event Year (YYYY)	2020
Estimated Event Cost	$109,252

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$27,480	EACH	$54,960
2	03. Mechanical	2	Construction Contingency	$4,122	EACH	$8,244
3	03. Mechanical	2	Average Total Project Soft Costs	$9,481	EACH	$18,962
4		2	LCF - Base Rate Material & Labour	$9,059	EACH	$18,118
5		2	LCF - Conting. & Soft Costs	$4,484	EACH	$8,968
6		0	Quantity adjusted to 2 to achieve adequate costing event.	$0	EACH	$0

Narratives

Event Description

This event is to replace AH101 when it reaches the end of its serviceable life.

Event Justification & Strategy

If the unit has deteriorated and is performing poorly it should be replaced or upgraded.

Implication of Event Deferral (Risks)

It this maintenance is deferred, the IAQ requirements would not be met, leading to complaints from the building occupants and IAQ related sick leave.

03.1A-030 Ventilation Fans

Details	Values
Expected Life	25
Component Cost	6,828
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the washroom exhaust fan EF 101 located in the mezzanine serving the 2 washrooms.

Component Condition & Anticipated Replacement Date

EF 101 appears to be in fair condition. It could be considered for upgrade or replacement in 2017. It could be looked at more closely for replacement at the time of the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Washroom exhaust fan EF 101

RP Replacement [03.1A-030 Ventilation Fans]

Details	Values
Brief Description (40 Characters)	Replace Washroom Exhaust Fan
Current event Year (YYYY)	2017
Estimated Event Cost	$6,828

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$3,435	EACH	$3,435
2	03. Mechanical	1	Construction Contingency	$515	EACH	$515
3	03. Mechanical	1	Average Total Project Soft Costs	$1,185	EACH	$1,185
4		1	LCF - Base Rate Material & Labour	$1,132	EACH	$1,132
5		1	LCF - Conting. & Soft Costs	$561	EACH	$561

Narratives

Event Description

This event is for the replacement of the EF 101 exhaust fan.

Event Justification & Strategy

The fan operation is necessary to meet washroom TB standards but a project for it's replacement could be postponed if funding is an issue.

Implication of Event Deferral (Risks)

This fan is only for washroom exhaust and is not a critical component. So, if failure occurs it could be repaired and considered for replacement at that time.

03.1A-032 Humidifiers

Details	Values
Expected Life	25
Component Cost	7,222
Last Major Action Year	1993
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the steam humidifier adjacent to the main AH101. A steam electrode type humidifier is used to feed a grid in the supply ductwork.

Component Condition & Anticipated Replacement Date

This unit seemed to be in average working condition. The anticipated replacement year is 2018 based on age.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Electric steam humidifier

RP Replacement [03.1A-032 Humidifiers]

Details	Values
Brief Description (40 Characters)	Replace Electric Steam Humidifier
Current event Year (YYYY)	2018
Estimated Event Cost	$7,222

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$3,633	EACH	$3,633
2	03. Mechanical	1	Construction Contingency	$545	EACH	$545
3	03. Mechanical	1	Average Total Project Soft Costs	$1,253	EACH	$1,253

4	1	LCF - Base Rate Material & Labour	$1,198	EACH	$1,198
5	1	LCF - Conting. & Soft Costs	$593	EACH	$593

Narratives

Event Description

Replace electric Steam Humidification unit on AH101.

Event Justification & Strategy

Humidification levels should be maintained above 20% RH in occupied spaces during winter months. If the reliability of this unit comes into question, the replacement date could be moved forward.

Implication of Event Deferral (Risks)

The IAQ of the space could be outside TB requirements during the winter months without proper performance of an additive humidity system. This could result in increases to client discomfort, complaints and absenteeism.

03.1A-040 Heating & Cooling Piping Systems

Details	Values
Expected Life	30
Component Cost	31,400
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	200
Measurement unit/ Metric	m2

Narratives

Component Description

This element is composed of the steam and cooling piping that distributes steam and cooling system water from the main building Mechanical Room to the AH101 heating and cooling coils as well as the perimeter heating loop and unit heaters.

Component Condition & Anticipated Replacement Date

The steam and cooling piping systems appeared to be in average condition with no urgent problems. The projected expected life of these systems is 30 years but could easily provide service well beyond 2019.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Piping services from main building to Small Craft Harbour

CP Replacement [03.1A-040 Heating & Cooling Piping Systems]

Details	Values
Brief Description (40 Characters)	Replace Heating and Cooling Piping Systems
Current event Year (YYYY)	2019
Estimated Event Cost	$31,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	200	Base Rate for Material and Labour	$79	m²	$15,800
2	03. Mechanical	200	Construction Contingency	$12	m²	$2,400
3	03. Mechanical	200	Average Total Project Soft Costs	$27	m²	$5,400
4		200	LCF - Base Rate Material & Labour	$26	m2	$5,200
5		200	LCF - Conting. & Soft Costs	$13	m2	$2,600

Narratives

Event Description

This event includes replacement of the steam and cooling piping systems from the main building Mechanical Room underground to the heating/cooling coils, perimeter radiation, and unit heaters.

Event Justification & Strategy

The heating and cooling piping is presently in average condition and does not require replacement in the near future. The timing of the replacement could be re-assessed at the time of the next BCR in 2018.

Implication of Event Deferral (Risks)

Deferring the eventual replacement of the piping could result in leaks that could range from a nuisance (small leaks) to major problems (should a system have to be taken out of service for repairs). Shutting down a heating or cooling system under peak load conditions could result in further equipment damage, and shutdowns (due to freezing pipes).

03.1A-060 Terminal Units

Details	Values
Expected Life	35
Component Cost	67,758
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the terminal units located throughout the building, which include the unit heaters, to the open spaces.

Component Condition & Anticipated Replacement Date

The unit heaters appeared to be in average condition given their age with no reported problems. Based on this, 2016 is the projected replacement year.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Steam unit heater in dive locker side of Small Craft Harbour

CP Replacement [03.1A-060 Terminal Units]

Details	Values
Brief Description (40 Characters)	Replace Terminal Units
Current event Year (YYYY)	2016
Estimated Event Cost	$67,758

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	6	Base Rate for Material and Labour	$5,681	EACH	$34,086
2	03. Mechanical	6	Construction Contingency	$852	EACH	$5,112
3	03. Mechanical	6	Average Total Project Soft Costs	$1,960	EACH	$11,760
4		6	LCF - Base Rate Material & Labour	$1,873	EACH	$11,238
5		6	LCF - Conting. & Soft Costs	$927	EACH	$5,562

Narratives

Event Description

This event is for the life cycle replacement of approximately 6 terminal units.

Event Justification & Strategy

The unit heaters appear to be original and based on age alone should be replaced. They are operating well but could be considered for replacement in 2016.

Implication of Event Deferral (Risks)

The unit heaters are necessary for the distribution of tempered air in the open spaces such as the mechanical room and dive locker areas. Complete failure of these would result in lower temperatures during cold winter months and if not corrected, there could be a risk of freezing pipes. Complete failure is unlikely.

03.2A-010 Controls, Electrical or Pneumatic

Details	Values
Expected Life	24
Component Cost	91,920
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	40
Measurement unit/ Metric	pt

Narratives

Component Description

This element includes components of the DDC system that are electric and pneumatic in nature. Typically, this includes items such as AHU damper actuators, and HVAC heating and cooling control valves.

Component Condition & Anticipated Replacement Date

There were no reported problems with any of these components. Typically, any problems should be dealt with on a case by case basis, as part of an Operations & Maintenance program. A projected replacement date of 2018 has been set, that should be reevaluated on the next BCR in 2017.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.2A-010 Controls, Electrical or Pneumatic]

Details	Values
Brief Description (40 Characters)	Replace Controls - Electrical & Pneumatic
Current event Year (YYYY)	2018
Estimated Event Cost	$91,920

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	40	Base Rate for Material and Labour	$1,156	pt	$46,240
2	03. Mechanical	40	Construction Contingency	$173	pt	$6,920
3	03. Mechanical	40	Average Total Project Soft Costs	$399	pt	$15,960
4		40	LCF - Base Rate Material & Labour	$381	pt	$15,240
5		40	LCF - Conting. & Soft Costs	$189	pt	$7,560

Narratives

Event Description

This event includes the life cycle replacement of DDC system items, such as the AHU damper actuators and HVAC heating and cooling control valves.

Event Justification & Strategy

These devices are critical to the DDC system's operation, and control of heating, cooling and ventilation. The work should keep the system in good working order.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the system should remain sound with case by case maintenance, the risk of many devices failing at the same time is highly unlikely.

03.2A-020 Direct Digital Control

Details	Values
Expected Life	20
Component Cost	85,890
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	30
Measurement unit/ Metric	pt

Narratives

Component Description

This component is the DDC portion of the HVAC system points (excluding the electric & pneumatic). A Honeywell Direct Digital Control System controls the building cooling and heating equipment, VAV boxes, and hot water valves.

Component Condition & Anticipated Replacement Date

Original DDC system was installed in ~ 2000. The anticipated replacement date has been set at 2020 based on a 20 year expected life. Components for this system are kept in good working order with an on-going Honeywell maintenance contract.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.2A-020 Direct Digital Control]

Details	Values
Brief Description (40 Characters)	Replace DDC Controls
Current event Year (YYYY)	2020
Estimated Event Cost	$85,890

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	30	Base Rate for Material and Labour	$1,440	pt	$43,200
2	03. Mechanical	30	Construction Contingency	$216	pt	$6,480

3	03. Mechanical	30	Average Total Project Soft Costs	$497	pt	$14,910
4		30	LCF - Base Rate Material & Labour	$475	pt	$14,250
5		30	LCF - Conting. & Soft Costs	$235	pt	$7,050

Narratives

Event Description

This event is for the life cycle replacement of the estimated 30 points making up DDC components including panels and controllers.

Event Justification & Strategy

This event is dated 2020 in accordance with the expected life of this component. It is possible that prior to that date, technology advances may warrant an earlier replacement or upgrade.

Implication of Event Deferral (Risks)

The DDC is necessary to control critical building systems to maintain acceptable IAQ in the building. Deferring the event runs the risk of a system failure which could result in a building IAQ that does not meet TB standards. If parts become difficult to source, this event may have to be moved forward.

03.3-025C05 Domestic Hot Water Tanks

Details	Values
Expected Life	20
Component Cost	9,500
Last Major Action Year	1990
Component Condition (For BCR use only)	Fair
Quantity	190
Measurement unit/ Metric	ltr

Narratives

Component Description

This component is the 190 liter domestic hot water tank, located in the mechanical mezzanine.

Component Condition & Anticipated Replacement Date

The hot water tank appears to be in fair condition but is believed to be approximately 1990 vintage. It could develop problems anytime and so a projected replacement date of 2015 has been chosen for budget purposes. If there are no problems by then, deferral could be considered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Electric Domestic Hot Water Tank

Water Heater name/Info plate

RP Replacement [03.3-025C05 Domestic Hot Water Tanks]

Details	Values
Brief Description (40 Characters)	Replace Domestic Hot Water Tank
Current event Year (YYYY)	2015
Estimated Event Cost	$9,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	190	Base Rate for Material and Labour	$25	L	$4,750
2	03. Mechanical	190	Construction Contingency	$4	L	$760
3	03. Mechanical	190	Average Total Project Soft Costs	$9	L	$1,710
4		190	LCF - Base Rate Material & Labour	$8	L	$1,520
5		190	LCF - Conting. & Soft Costs	$4	L	$760

Narratives

Event Description

This event is for the life cycle replacement of the 190 liter domestic hot water tank located in the mezzanine mechanical room.

Event Justification & Strategy

Hot water tank failures are usually quite predictable, and the replacement should be scheduled very close to the end of its expected life assuming there are no earlier problems. Generally, replacement of a hot water tank with a similar model can be coordinated very quickly.

Implication of Event Deferral (Risks)

A hot water tank failure may cause disruption in the provision of potable hot water to the building tenants.

03.3A-010 Plumbing Piping

Details	Values
Expected Life	40
Component Cost	96,800
Last Major Action Year	1977
Component Condition (For BCR use only)	Average
Quantity	400
Measurement unit/ Metric	m2

Narratives

Component Description

This component includes all the domestic hot/cold, and waste water piping throughout the entire facility.

Component Condition & Anticipated Replacement Date

Component condition is average, a portion of original 1977 piping may be considered for replacement in ~ 2017. Some of the building plumbing was replaced in the early 2000s with a washroom renovation project.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Kitchen sink connections

CP Replacement [03.3A-010 Plumbing Piping]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Piping
Current event Year (YYYY)	2017
Estimated Event Cost	$96,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	400	Base Rate for Material and Labour	$122	m	$48,800
2	03. Mechanical	400	Construction Contingency	$18	m	$7,200
3	03. Mechanical	400	Average Total Project Soft Costs	$42	m	$16,800
4		400	LCF - Base Rate Material & Labour	$40	m	$16,000
5		400	LCF - Conting. & Soft Costs	$20	m	$8,000

Narratives

Event Description

This event is to replace the domestic hot/cold water, and waste water piping systems throughout the facility.

Event Justification & Strategy

The projected lifespan of this component is 40 years, some of the piping was replaced in early 2000's so it is possible that all or a portion of this event can be deferred.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the element may fail. Any piping systems failure, could result in ceiling tile damage through a small leak developing in a pipe, or a flooding event should a pipe rupture.

03.3A-015 Plumbing Fixtures and Accessories

Details	Values
Expected Life	30
Component Cost	38,090
Last Major Action Year	2000
Component Condition (For BCR use only)	Good
Quantity	15
Measurement unit/ Metric	ea
Assessment criteria list	ACL 2 - Check List

Narratives

Component Description

This component is comprised of the plumbing fixtures such as sinks, water closets, urinals, etc. throughout the facility.

Component Condition & Anticipated Replacement Date

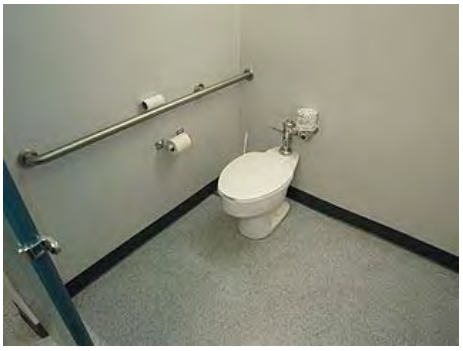
Generally, there seemed to be no problems and items are regarded in good condition. It may be desirable to replace these as part of some larger future renovations. The projected replacement is scheduled for 2030.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Kitchen sink and appliances

Urinal and sink in Men's washroom



Water Closet 1 of 3

RP Replacement [03.3A-015 Plumbing Fixtures and Accessories] - Sinks

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures - Sinks
Current event Year (YYYY)	2030
Estimated Event Cost	$15,220

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5	Base Rate for Material and Labour	$1,531	EACH	$7,655
2	03. Mechanical	5	Construction Contingency	$230	EACH	$1,150
3	03. Mechanical	5	Average Total Project Soft Costs	$528	EACH	$2,640
4		5	LCF - Base Rate Material & Labour	$505	EACH	$2,525
5		5	LCF - Conting. & Soft Costs	$250	EACH	$1,250

Narratives

Event Description

Replace all washroom and kitchen sinks throughout the building.

Event Justification & Strategy

If there are any future plans for upgrades to washrooms and other areas with plumbing fixtures, it should be done during this event for the replacement of plumbing fixtures.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the fixtures should last for some time past their life expectancy. It is possible that seals will degrade, and serviceable parts may become hard to get over time. Worn surfaces will also persist and aesthetics would be an issue.

RP Replacement [03.3A-015 Plumbing Fixtures and Accessories] - Water Closets

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures - Water Closets
Current event Year (YYYY)	2030
Estimated Event Cost	$19,045

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		5	Base Rate Material & Labour	$1,916	EACH	$9,580
2		5	Construction Contingency	$287	EACH	$1,435
3		5	Project Soft Costs	$661	EACH	$3,305
4		5	LCF - Material & Labour	$632	EACH	$3,160
5		5	LCF - Contingency & Soft Costs	$313	EACH	$1,565

Narratives

Event Description

This event will replace all water closets in the facility with water saving units.

Event Justification & Strategy

Water closet replacements may be due to wear, age and minor leaking through material cracks.

Implication of Event Deferral (Risks)

Unless functional deficiencies occur, event deferral would present a low risk.

RP Replacement [03.3A-015 Plumbing Fixtures and Accessories] - Faucets

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures - Faucets
Current event Year (YYYY)	2030
Estimated Event Cost	$3,825

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		5	Base Rate Material & Labour	$384	EACH	$1,920
2		5	Construction Contingency	$58	EACH	$290
3		5	Project Soft Costs	$133	EACH	$665
4		5	LCF - Material & Labour	$127	EACH	$635
5		5	LCF - Contingency & Soft Costs	$63	EACH	$315

Narratives

Event Description

Replace all faucets and flush valves found throughout the facility.

Event Justification & Strategy

Item replacement may be due to unavailable parts and worn finishes.

Implication of Event Deferral (Risks)

Unless functional deficiencies occur, event deferral would present a low risk. Prolonged deferral may see unavailable parts and continued worn finishes.

03.5A-070 Portable Fire Extinguishers

Details	Values
Expected Life	30
Component Cost	788
Last Major Action Year	1993
Component Condition (For BCR use only)	Good
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the portable fire extinguishers which are 10# ABC chemical type.

Component Condition & Anticipated Replacement Date

The fire extinguishers were mostly replaced between 2008-2010 and are in excellent condition. Based on maintenance and mandatory testing results, the minimum lifespan is 12 years. So, budgeting cyclical replacement of one unit every 3 years is the preferred approach. This cycle is scheduled to start in 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

ABC Fire extinguisher (1 of 6)

RP Replacement [03.5A-070 Portable Fire Extinguishers]

Details	Values
Brief Description (40 Characters)	Replace Portable Fire Extinguishers
Current event Year (YYYY)	2022
Estimated Event Cost	$788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$396	EACH	$396
2	03. Mechanical	1	Construction Contingency	$59	EACH	$59

3	03. Mechanical	1	Average Total Project Soft Costs	$137	EACH	$137
4		1	LCF - Base Rate Material & Labour	$131	EACH	$131
5		1	LCF - Conting. & Soft Costs	$65	EACH	$65
6		0	Quantity of 1 used for cyclical budgeting every 3 years.	$0	EACH	$0

Narratives

Event Description

Budget to replace one portable fire extinguisher every three years, wherever required.

Event Justification & Strategy

Cyclical budgeting to replace one extinguisher every three years will ensure all units are operational to provide a required form of fire protection.

Implication of Event Deferral (Risks)

Since replacement is highly dependent on mandatory testing results, event deferral would present a low risk. Replacements will occur to ensure Fire Code requirements are satisfied.

04. Electrical

04.2A-010 Secondary Switchgear

Details	Values
Expected Life	30
Component Cost	6,567
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The main distribution for the Small Craft building is fed from the service building Distribution C with a 300 amp 3 pole breaker. The distribution consists of a 400 amp, 600 volt, 3 phase, 3 wire CDP that feeds a 150 kVA dry type transformer and mechanical supply fan. The transformer feeds a 400 amp, 120/208 volt, 3 phase, 4 wire CDP which feeds 2 panelboards in the warehouse and 3 in the office. All equipment is Westinghouse except the two original panelboards in the warehouse which are CGE.

Component Condition & Anticipated Replacement Date

The building service CDP is in good condition and with maintenance should be replaced or reevaluated in 2022.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Warehouse area where service is located.

RP Replacement [04.2A-010 Secondary Switchgear]

Details	Values
Brief Description (40 Characters)	Replace 600 Volt Service CDP
Current event Year (YYYY)	2022
Estimated Event Cost	$6,567

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1	Base Rate for Material and Labour	$3,303	EACH	$3,303
2	04. Electrical	1	Construction Contingency	$495	EACH	$495
3	04. Electrical	1	Average Total Project Soft Costs	$1,139	EACH	$1,139
4		1	Site Factor - Base Cost	$1,090	EACH	$1,090
5		1	Site Factor - Contingency and Soft Cost	$540	EACH	$540

Narratives

Event Description

Replace the service CDP.

Event Justification & Strategy

The CDP will be 30 years old by this time which is the expected life, but this could be extended if inspections deem so.

Implication of Event Deferral (Risks)

The long term operation of the building depends on the stability of the building service.

Service CDP.

04.2A-020 Secondary Transformer

Details	Values
Expected Life	30
Component Cost	89,850
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The only transformer is a 150 kVA Westinghouse 600 volt delta-wye, 120/208 volt, 3 phase, 4 wire secondary dry type.

Component Condition & Anticipated Replacement Date

The 150 kVA transformer is in good condition and with maintenance will last at least until 2027.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Transformer above CDP in warehouse.

CP Replacement [04.2A-020 Secondary Transformer]

Details	Values
Brief Description (40 Characters)	Replace Transformer
Current event Year (YYYY)	2027
Estimated Event Cost	$89,850

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS Tools does not define transformer size - used $300/kVA	$0	sum	$0
2		150	Base Rate for Material and Labour	$300	sum	$45,000
3		150	Construction Contingency	$45	sum	$6,750
4		150	Average Total Project Soft Cost	$106	sum	$15,900
5		150	Site Factor - Base Cost	$99	sum	$14,850
6		150	Site Factor - Contingency and Soft Cost	$49	sum	$7,350

Narratives

Event Description

Replace transformer.

Event Justification & Strategy

The transformer will be 35 years old and nearing its life expectancy.

Implication of Event Deferral (Risks)

An integral part of the building distribution, the transformer will need to be maintained or power will be lost.

Westinghouse specification for dry type transformer.

04.2A-050 Cabling, Raceways & Bus Ducts

Details	Values
Expected Life	40
Component Cost	197,010
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

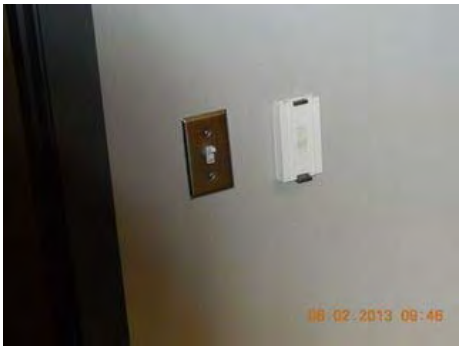
The wiring consists of EMT and conductors throughout. Devices are flush mounted in the front office area and surface in the warehouse.

Component Condition & Anticipated Replacement Date

The office renovation and the distribution were installed in 1992 but the warehouse is the original 1972 construction. The two 1972 panelboards and the devices in the warehouse are in fair condition and should be replaced by 2018 and the office area distribution around 2032.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



PRI lighting control switch.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts] - 1972

Details	Values
Brief Description (40 Characters)	Upgrade 1972 Wiring and Devices
Current event Year (YYYY)	2018
Estimated Event Cost	$65,670

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not have an estimate for device and wiring replacement. Used $100/sq.m. utility area.	$0	EACH	$0
2		330	Base Rate for Material and Labour	$100	m2	$33,000
3		330	Construction Contingency	$15	m2	$4,950
4		330	Average Total Project Soft Costs	$35	m2	$11,550
5		330	Site Factor - Base Cost	$33	m2	$10,890
6		330	Site Factor - Contingency and Soft Cost	$16	m2	$5,280

Narratives

Event Description

Replace devices and wiring in the warehouse area.

Event Justification & Strategy

The 1972 warehouse area will be 46 years old by the time of this event.

Implication of Event Deferral (Risks)

This area has little use and as long as it stays this way the risk is low.

Wiring in warehouse.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts] - 1992

Details	Values
Brief Description (40 Characters)	Replace 1992 Wiring and Devices
Current event Year (YYYY)	2032
Estimated Event Cost	$131,340

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not have an estimate for device and wiring replacement. Used $200/sq.m. office area.	$0	EACH	$0
2		330	Base Rate for Material and Labour	$200	EACH	$66,000
3		330	Construction Contingency	$30	EACH	$9,900
4		330	Average Total Project Soft Costs	$69	EACH	$22,770
5		330	Site Factor - Base Cost	$66	EACH	$21,780
6		330	Site Factor - Contingency and Soft Cost	$33	EACH	$10,890

Narratives

Event Description

Replace wiring and devices of the 1992 office area.

Event Justification & Strategy

The devices and wiring will be 40 years old and will be struggling at maintaining consistent operation. A reevaluation may extend the service life.

Implication of Event Deferral (Risks)

If the devices are not replaced, there could be significant additional maintenance costs and/or disruptions.

EMT conduit and wiring.

04.2A-070 Distribution Panels

Details	Values
Expected Life	30
Component Cost	39,402
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

There is one 120/ 208 volt, 3 phase, 4 wire Westinghouse CDP distribution centre. The 600 volt CDP is identified as the "service" element. There are 5 panelboards, two CGE from the 1972 installation and 3 Westinghouse from the 1992 installation. The panels consist of one 24 circuit, one 30 circuit and three 42 circuit. There is adequate breaker capacity in both the office and warehouse areas as well as in the CDP distributions. The CDP panels are from the 1992 installation also.

Component Condition & Anticipated Replacement Date

The panels are installed in two different years, 1972 when the structure was built and in 1992 with the front office renovation. The 1972 panels are in fair condition and should be replaced in 2018 and the others scheduled for 2032.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Distribution panels in office utility area.

RP Replacement [04.2A-070 Distribution Panels] - 1972

Details	Values
Brief Description (40 Characters)	Replace 1972 Panels
Current event Year (YYYY)	2018
Estimated Event Cost	$19,701

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$3,303	EACH	$9,909
2	04. Electrical	3	Construction Contingency	$495	EACH	$1,485
3	04. Electrical	3	Average Total Project Soft Costs	$1,139	EACH	$3,417
4		3	Site Factor - Base Cost	$1,090	EACH	$3,270
5		3	Site Factor - Contingency and Soft Cost	$540	EACH	$1,620

Narratives

Event Description

Replace the two 1972 panelboards and one CDP(service entry).

Event Justification & Strategy

The panelboards will be over 45 years old and past their life expectancy. Use is low.

Implication of Event Deferral (Risks)

If panels are not replaced there could be loss of electrical integrity.

1972 distribution panel.

RP Replacement [04.2A-070 Distribution Panels] - 1992

Details	Values
Brief Description (40 Characters)	Replace 1992 Panels
Current event Year (YYYY)	2032
Estimated Event Cost	$19,701

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$3,303	EACH	$9,909
2	04. Electrical	3	Construction Contingency	$495	EACH	$1,485
3	04. Electrical	3	Average Total Project Soft Costs	$1,139	EACH	$3,417
4		3	Site Factor - Base Cost	$1,090	EACH	$3,270
5		3	Site Factor - Contingency and Soft Cost	$540	EACH	$1,620

Narratives

Event Description

Replace the 1992 panelboards.

Event Justification & Strategy

The panels will be 40 years old in 2032 and pushing their life expectancy.

Implication of Event Deferral (Risks)

If panels are not replaced power services could be lost.

1992 distribution panel.

04.3A-010 General Lighting

Details	Values
Expected Life	30
Component Cost	88,084
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	122
Measurement unit/ Metric	ea

Narratives

Component Description

The lighting in the Small Craft building is primarily F40 T12 lineal fluorescent fixtures consisting of 610mm x 1200mm recessed T bar, industrial slotted and white opal wrap around lens fixtures. There are incandescent pot lights and track for architectural enhancement.

Component Condition & Anticipated Replacement Date

Because of the 1992 renovation, there are two generations of installation. The fixtures have T12 lamps and are considered in fair condition. All should be replaced in the next couple of years about 2015.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Lighting fixtures in office area.

Interior office deep cell fluorescent.

CP Life Extension [04.3A-010 General Lighting]

Details	Values
Brief Description (40 Characters)	Replace-Upgrade T12 Lamps to T8
Current event Year (YYYY)	2015
Estimated Event Cost	$88,084

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	122	Base Rate for Material and Labour	$363	EACH	$44,286
2	04. Electrical	122	Construction Contingency	$54	EACH	$6,588
3	04. Electrical	122	Average Total Project Soft Costs	$125	EACH	$15,250
4		122	Site Factor - Base Cost	$120	EACH	$14,640
5		122	Site Factor - Contingency and Soft Cost	$60	EACH	$7,320

Narratives

Event Description

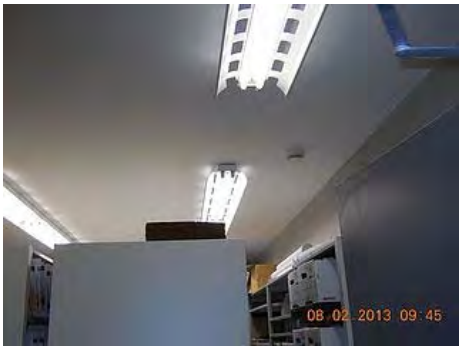
Replace or refit fluorescent fixtures to T8 lamps.

Event Justification & Strategy

The fluorescent T12 lamps are no longer available. Servicing will be an issue.

Implication of Event Deferral (Risks)

If fixtures are not upgraded, the lamps may not be available very soon and if they are, could be expensive.



T12 lamps of fixtures to be upgraded.

04.3A-020 Exit Lighting

Details	Values
Expected Life	30
Component Cost	2,568
Last Major Action Year	1992
Component Condition (For BCR use only)	Poor
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

There are two different types of exit signs in operation and they are all bilingual but not to government standard. There are LED type and in the office area connected to 12 separate low voltage battery packs while in the warehouse the exit fixtures are integral sign and emergency lighting type.

Component Condition & Anticipated Replacement Date

The exit signs do not meet government standard and are considered poor. Units should be replaced in 2015.

Assessment Criteria	Existence
Obsolete fixtures	
Default	Yes
	Exit signs do not meet government standard.

Warehouse self contained exit/emergency lighting.

RF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]

Details	Values
Brief Description (40 Characters)	Upgrade Exit Signs
Current event Year (YYYY)	2015
Estimated Event Cost	$2,568

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	4	Base Rate for Material and Labour	$330	EACH	$1,320
2	04. Electrical	4	Construction Contingency	$50	EACH	$200

3	04. Electrical	4	Average Total Project Soft Costs	$114	EACH	$456
4		4	Site Factor - Base Cost	$99	EACH	$396
5		4	Site Factor - Contingency and Soft Cost	$49	EACH	$196

Narratives

Event Description

Replace exit signs with bilingual signs having the approved dimensions.

Event Justification & Strategy

The exit signs are not to code and need to be brought up to code.

Implication of Event Deferral (Risks)

There is a chance that safely could be effected (during an emergency) by the lack of code standard signs.

Bilingual office exit signs - non-standard letter size.

04.3A-030 Exterior Lighting

Details	Values
Expected Life	15
Component Cost	13,599
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	9
Measurement unit/ Metric	ea

Narratives

Component Description

The exterior fixture are of two types, 70/150 watt wall packs adjacent to doors and 250 watt HPS used as site security illumination.

Component Condition & Anticipated Replacement Date

The exterior fixtures are in fair condition and beyond their life expectancy. Replacement is warranted in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Standard wall pack lighting on Small Craft building.

RP Replacement [04.3A-030 Exterior Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exterior Lighting
Current event Year (YYYY)	2018
Estimated Event Cost	$13,599

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	9	Base Rate for Material and Labour	$760	EACH	$6,840
2	04. Electrical	9	Construction Contingency	$114	EACH	$1,026
3	04. Electrical	9	Average Total Project Soft Costs	$262	EACH	$2,358
4		9	Site Factor - Base Cost	$251	EACH	$2,259
5		9	Site Factor - Contingency and Soft Cost	$124	EACH	$1,116

Narratives

Event Description

Replace exterior fixtures.

Event Justification & Strategy

The fixtures will be over 25 years old by the time of this event and past the life expectancy of the units.

Implication of Event Deferral (Risks)

If exterior lighting is not replaced, security would be lessened.

04.3A-040 Emergency Lighting

Details	Values
Expected Life	18
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

The emergency lighting for the building is accomplished with low voltage battery packs with both integral and remote heads in the office area as well as 3 self contained architectural type integral battery units. In the warehouse, the emergency lighting is integral with the exit signs.

Component Condition & Anticipated Replacement Date

The emergency lighting in the warehouse would be replaced under the exit sign event. The battery units in the office area are in average condition, are being maintained on a regular basis by site personnel and this should continue. No event is identified.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

One of several battery packs.

Integral battery/lighting units.

04.4A-010 Grounding Systems

Details	Values
Expected Life	40
Component Cost	7,260
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

There appears to be a ground conductor connection at the 600 volt CDP but the conductor and termination are not seen.

Component Condition & Anticipated Replacement Date

The grounding would appear to be in good condition but should be replaced when the associated distribution is in 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Location of service ground.

RP Replacement [04.4A-010 Grounding Systems]

Details	Values
Brief Description (40 Characters)	Replace or Reestablish Service Grounding
Current event Year (YYYY)	2022
Estimated Event Cost	$7,260

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	660	Base Rate for Material and Labour	$5	m²	$3,300
2	04. Electrical	660	Construction Contingency	$1	m²	$660
3	04. Electrical	660	Average Total Project Soft Costs	$2	m²	$1,320
4		660	Site Factor - Base Cost	$2	m2	$1,320
5		660	Site Factor - Contingency and Soft Cost	$1	m2	$660

Narratives

Event Description

Replace the grounding when the distribution is also completed.

Event Justification & Strategy

Grounding is integral with the distribution and is essential to the safety and operation of the electrical system.

Implication of Event Deferral (Risks)

If the grounding maintenance is neglected, both the safety and operation could be compromised.

04.5A-010 Fire Alarm System

Details	Values
Expected Life	17
Component Cost	50,160
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

There is no fire alarm panel in the Small Craft building. The fire alarm devices are connected directly to the main building fire alarm.

Component Condition & Anticipated Replacement Date

The fire alarm was installed a few years before the last major change to the main building system. The devices appear to be in average condition but at the same time should be upgraded at the same time as any upgrade of the main system which is in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Two stage pull station.

CP Life Extension [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Upgrade Fire Alarm System
Current event Year (YYYY)	2018
Estimated Event Cost	$50,160

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	660	Base Rate for Material and Labour	$38	m²	$25,080
2	04. Electrical	660	Construction Contingency	$6	m²	$3,960
3	04. Electrical	660	Average Total Project Soft Costs	$13	m²	$8,580
4		660	Site Factor - Base Cost	$13	m2	$8,580
5		660	Site Factor - Contingency and Soft Cost	$6	m2	$3,960

Narratives

Event Description

Upgrade the existing system along with the main building system.

Event Justification & Strategy

The operation and functionality of the fire alarm systems is essential for the safety of the building and people.

Implication of Event Deferral (Risks)

If the fire alarm system is not maintained then safety of the building and people would be a concern.

Ionization detector.

04.5A-030 Communication Systems

Details	Values
Expected Life	25
Component Cost	98,070
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

The service of the Small Craft building comes from the main telephone room in the Administration Building basement. The location and size of the telecommunications service in the building was not identified. There is a data cabinet located in the mail room.

Component Condition & Anticipated Replacement Date

The telecommunication system is in average condition but should be upgraded when the main system is in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Telecommunication cabinet.

CP Replacement [04.5A-030 Communication Systems]

Details	Values
Brief Description (40 Characters)	Upgrade Communication Systems
Current event Year (YYYY)	2020
Estimated Event Cost	$98,070

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	210	Base Rate for Material and Labour	$235	m²	$49,350
2	04. Electrical	210	Construction Contingency	$35	m²	$7,350
3	04. Electrical	210	Average Total Project Soft Costs	$81	m²	$17,010
4		210	Site Factor - Base Cost	$78	m2	$16,380
5		210	Site Factor - Contingency and Soft Cost	$38	m2	$7,980
6		0	AVS Tools appears not to consider building function - used $75/m2 and modified area to 210m2.	$0	EACH	$0

Narratives

Event Description

Upgrade telecommunications when the main system is scheduled.

Event Justification & Strategy

As a usable, functional government commercial institution, the installation of a telecommunication system to Tbits 6.9 standard is suggested.

Implication of Event Deferral (Risks)

Not heeding the standards hinders the usefulness and flexibility of the telecommunication system.

04.5A-040 Security System

Details	Values
Expected Life	20
Component Cost	6,204
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

There is card access and security devices in the building and connected directly to the main building system.

Component Condition & Anticipated Replacement Date

What security there is in the building appears to be in average condition. If replacement is necessary, it would be when the main building system is updated, scheduled in 2022.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Access reader for security system.

RP Life Extension [04.5A-040 Security System]

Details	Values
Brief Description (40 Characters)	Upgrade Security System
Current event Year (YYYY)	2022
Estimated Event Cost	$6,204

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	66	Base Rate for Material and Labour	$47	m²	$3,102

2	04. Electrical	66	Construction Contingency	$7	m²	$462
3	04. Electrical	66	Average Total Project Soft Costs	$16	m²	$1,056
4		66	Site Factor - Base Cost	$16	m2	$1,056
5		66	Site Factor - Contingency and Soft Cost	$8	m2	$528
6		0	AVS Tool does not take in account for building function - used 10% of area at 66m2.	$0	each	$0

Narratives

Event Description

The system is an extension of the main building security and needs to be upgraded.

Event Justification & Strategy

Keeping the security system current is essential to maintain the operation of the building.

Implication of Event Deferral (Risks)

If the system is not maintained, the building security would be compromised.

04.6A-010 Automatic Door Devices

Details	Values
Expected Life	20
Component Cost	13,874
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

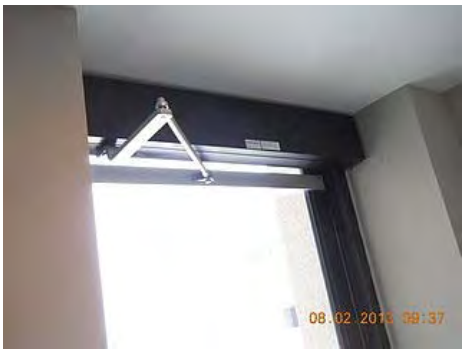
There are two door operators located at the north-east entrance.

Component Condition & Anticipated Replacement Date

The front door operators are in average condition and will need replacement in 2017 which is 5 years beyond their life expectancy.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Door operator.

RP Replacement [04.6A-010 Automatic Door Devices]

Details	Values
Brief Description (40 Characters)	Replace Door Operator Devices
Current event Year (YYYY)	2017
Estimated Event Cost	$13,874

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$3,489	EACH	$6,978
2	04. Electrical	2	Construction Contingency	$523	EACH	$1,046
3	04. Electrical	2	Average Total Project Soft Costs	$1,204	EACH	$2,408
4		2	Site Factor - Base Cost	$1,151	EACH	$2,302
5		2	Site Factor - Contingency and Soft Cost	$570	EACH	$1,140

Narratives

Event Description

Replace two front door operators and all related accessories.

Event Justification & Strategy

It is a government initiative to maintain our building as Handicap Accessible.

Implication of Event Deferral (Risks)

The Accessibility standard of the building would be lost if operators are not maintained.

Exterior door operator switch.

04.7A-010 Electric Baseboard Heaters

Details	Values
Expected Life	20
Component Cost	19,705
Last Major Action Year	1992
Component Condition (For BCR use only)	Fair
Quantity	7
Measurement unit/ Metric	m

Narratives

Component Description

There are several electric baseboard heaters located around the exterior of the office area adjacent to windows.

Component Condition & Anticipated Replacement Date

The baseboard heaters have been in demand for the past 21 years and are considered in fair condition. They are past their life expectancy but could last maybe until 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical electrical baseboard - old vintage.

RP Replacement [04.7A-010 Electric Baseboard Heaters]

Details	Values
Brief Description (40 Characters)	Replace Baseboard Heaters
Current event Year (YYYY)	2018
Estimated Event Cost	$19,705

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	7	Base Rate for Material and Labour	$1,416	m	$9,912
2	04. Electrical	7	Construction Contingency	$212	m	$1,484
3	04. Electrical	7	Average Total Project Soft Costs	$489	m	$3,423
4		7	Site Factor - Base Cost	$467	m	$3,269
5		7	Site Factor - Contingency and Soft Cost	$231	m	$1,617

Narratives

Event Description

Replace all electric baseboard heaters.

Event Justification & Strategy

The heaters are in fair condition and will be working for 26 years and ready for replacement in 2018.

Implication of Event Deferral (Risks)

The risk of not replacing the heaters is the loss of heat and personnel thermal comfort.

Electric baseboard heater.

10. Whole Building Expenditures

10.1A-015 Building Condition Report

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	2013
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Small Craft Harbour Building was designed in 1971 by GBR Associates Architects and Engineers, and constructed in approximately in 1972. (unconfirmed).

The office area includes 8 enclosed private offices, an open office area with 4 workstations, an open office area with 3 workstations, meeting room, kitchenette and file records room with mobile file storage unit. The working occupancy would be approximately 15 staff. The storage space (known as the Dive Locker Storage room) includes 5 secure storage compartments, (separated by plywood partitions) and a storage mezzanine (20sm).

The building is a one level structure with an area of 660 square meters. The building has a steel structure and is clad with precast concrete panels. There is a small mezzanine in the office area above the washrooms to accommodate the mechanical heating equipment. The main floor is slab on grade (no crawlspace or basement). There is a service tunnel which brings services to the building from the lab/Admin building. The tunnel is accessed from a floor access hatch in the men's washroom. There is an overhead door on the south side of the building.

Component Condition & Anticipated Replacement Date

Currently, the asset and property have elements regarded in fair, average and good condition. This assessment depends on the element in question. The next building condition inspection and report (BCR) is scheduled for 2017.

Small Craft Harbour building.

RP New [10.1A-015 Building Condition Report]

Details	Values
Brief Description (40 Characters)	Produce New Building Condition Report
Current event Year (YYYY)	2017
Estimated Event Cost	$24,750

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	250	Base Rate for Material and Labour	$66	m²	$16,500
2	01. Architectural & Structural	250	Construction Contingency	$10	m²	$2,500
3	01. Architectural & Structural	250	Average Total Project Soft Costs	$23	m²	$5,750
4		0	LCF costs are not applicable. Quantity of 250 used to obtain overall total of approximately $25K.	$0	EACH	$0

Narratives

Event Description

Conduct building condition inspections to evaluate all property and asset components for cyclical replacement. All data and relevant photos are to be entered into the appropriate AVS database. Export all element data from AVS and edit final report in MS Word.

Note, BCR implementation cost is calculated using the Base Rate costs for "01. 5-070C05 Carpeting" to achieve an overall total cost of approximately $25K.

Event Justification & Strategy

Conducting BCRs is a PWGSC mandate for all assets to provide supporting asset condition information for the building Asset Management Plan (AMP) that is produced every five years.

Implication of Event Deferral (Risks)

Event delay would infringe on the cyclical production of the AMP. Timely replacements of numerous base building elements would be hindered and life safety issues may arise.

10.1A-030 Accessibility Audit

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

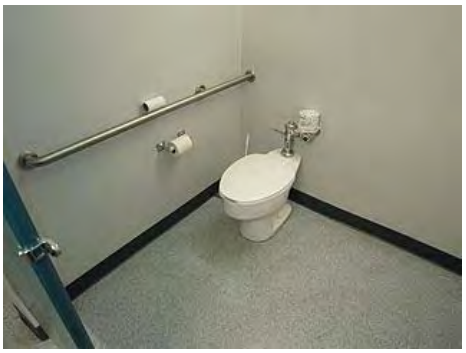
Narratives

Component Description

Conduct a comprehensive Accessibility Audit to identify a compliance score with respect to the 2012 CSA standard.

Component Condition & Anticipated Replacement Date

Current condition is average and new audit should be completed in 2013.



Accessible washroom stall with grab bar.

RP New [10.1A-030 Accessibility Audit]

Details	Values
Brief Description (40 Characters)	Conduct Accessibility Audit
Current event Year (YYYY)	2013
Estimated Event Cost	$5,425

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$495	EACH	$3,465
2	01. Architectural & Structural	8	Construction Contingency	$74	EACH	$592
3	01. Architectural & Structural	8	Average Total Project Soft Costs	$171	EACH	$1,368
4		0	Quantities of 7 and 8 used to obtain appropriate costing.	$0	EACH	$0

Narratives

Event Description

Conduct accessibility audit of all public spaces for compliance against the 2012 CSA standard.

Note, accessibility audit costing is derived from using AVS costing for "01.5A-055 Interior Door Hardware" to obtain a Base Rate plus Soft Cost totaling approximately $5.5K. A contingency is added for inflation estimating. The Location Correction Factor costs are not used for this cost estimate.

Event Justification & Strategy

Event will identify which accessibility elements are not compliant. Compliant accessible features maintains an acceptable space for all.

Implication of Event Deferral (Risks)

Delaying the accessible audit would promote non-compliant components and public complaints may arise.

10.2A-010 Architectural - Enclosure Thermal Scan

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Asset enclosure evaluation should be conducted every 5 years during the BCR cycle.

Component Condition & Anticipated Replacement Date

The asset enclosure is currently in average condition. The next enclosure thermal scan is scheduled for 2013.

Small Craft Harbour building - enclosure.

RP New [10.2A-010 Architectural - Enclosure Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Enclosure Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$6,312

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	8	Base Rate for Material and Labour	$528	m²	$4,224

2	01. Architectural & Structural	8	Construction Contingency	$79	m²	$632
3	01. Architectural & Structural	8	Average Total Project Soft Costs	$182	m²	$1,456
4		0	Quantity of 8 used for appropriate total cost of $6K.	$0	EACH	$0

Narratives

Event Description

Conduct thermal scan on building envelope from the exterior and interior during winter conditions, while the enclosure in under negative and positive interior pressures scenarios.

Note, event costing is derived from using Base Rate costs for "01.3-070C01 Aluminum Windows" to obtain approximately $6K. A location factor is not applied. However, a contingency cost is included for inflation factor estimating.

Event Justification & Strategy

Enclosure thermal scan will evaluate the building envelope's integrity with respect to air leakage and inner wall moisture presence/accumulation. The scan results will identify anomalies for correction to ensure continued wall performance. Overall energy consumption reduction may be affected.

Implication of Event Deferral (Risks)

damaging the inner and outer wall components. Delaminations are a possibility with unscheduled repairs.

10.2A-010 Architectural - Roof Thermal Scan

Details	Values
Expected Life	3
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Existing roof assembly is an insulated SBS covered construction. Age of roof not determined. Minimum 12 years old.

Component Condition & Anticipated Replacement Date

Currently, the visual and thermal conditions are rated as average with numerous roof corners having granule accumulations. The next thermal/visual inspections are scheduled for 2013.

Roof area with deteriorated SBS roof membrane.

RP New [10.2A-010 Architectural - Roof Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Roof Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$5,640

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$126	m²	$3,780
2	01. Architectural & Structural	30	Construction Contingency	$19	m²	$570
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$43	m²	$1,290
4		0	Quantity of 30 used to obtain appropriate $5.6K overall cost.	$0	EACH	$0

Narratives

Event Description

Conduct a thermal scan of roof membrane, all levels and areas.

Note, event costing derived from Base Rate costs for "01.4-010C20 Elast./Mod. Bitumen, 1 ply membrane". No location factors are included.

Event Justification & Strategy

Verify integrity of roof membrane, all levels. The thermal scan will identify all underlying component deficiencies such as; damaged and trapped water.

Implication of Event Deferral (Risks)

Event delay will hinder the identification of small problems before they become large. Increased repair costs will be incurred.

10.2A-020 Mechanical - Water Testing

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The asset has numerous copper piping runs carrying domestic cold and hot water.

Component Condition & Anticipated Replacement Date

The existing piping appears to be adequate from the exterior. However, the interior pipe condition is unknown. The current condition can only be rated as average. As per code, the 40 year old piping needs to be tested via a water quality test in 2013 and every 5 years thereafter.

RF Domestic Water Quality [10.2A-020 Mechanical - Water Testing]

Details	Values
Brief Description (40 Characters)	Conduct Water Quality Testing
Current event Year (YYYY)	2013
Estimated Event Cost	$7,644

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	42	Base Rate for Material and Labour	$122	m	$5,124
2	03. Mechanical	42	Construction Contingency	$18	m	$756
3	03. Mechanical	42	Average Total Project Soft Costs	$42	m	$1,764
4		0	Quantity of 42 used to obtain approximate $7.5K overall total.	$0	EACH	$0

Narratives

Event Description

Mandatory testing for leached copper and lead levels must be performed on the stagnant domestic water supplies, especially with respect to the domestic hot water. If test results return unacceptably high levels of those metals, an engineering evaluation needs to be undertaken to determine options.

Note, costing is derived from Base Rate costs for "Plumbing Piping". No location factor is included.

Event Justification & Strategy

This testing is a mandatory recommendation.

Implication of Event Deferral (Risks)

Postponing this water quality testing would contravene the code. Potential water contaminates would present life safety issues.

10.2A-030 Electrical - Arc Flash Identification

Details	Values
Expected Life	24
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 120/ 208 volt, 3 phase, 4 wire Westinghouse CDP distribution centre. The 600 volt CDP is identified as the "service" element. There are 5 panelboards, two CGE from the 1972 installation and 3 Westinghouse from the 1992 installation. The panels consist of one 24 circuit, one 30 circuit and three 42 circuit. There is adequate breaker capacity in both the office and warehouse areas as well as in the CDP distributions. The CDP panels are from the 1992 installation also.

Component Condition & Anticipated Replacement Date

Once the existing components are labeled, no further action would be necessary unless there are utility system changes. All new equipment added after the study will have to be labeled individually. The process has not been done as of yet and is therefore considered to be in poor condition. Study should be done immediately in 2013.

Main service with two CDPs and transformer.

RO Electrical [10.2A-030 Electrical - Arc Flash Identification]

Details	Values
Brief Description (40 Characters)	Provide Arc Flash Study and Identification
Current event Year (YYYY)	2013
Estimated Event Cost	$15,555

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	15	Base Rate for Material and Labour	$694	m	$10,410
2	04. Electrical	15	Construction Contingency	$104	m	$1,560
3	04. Electrical	15	Average Total Project Soft Costs	$239	m	$3,585
4		0	Costing for Cabling used and a quantity of 15 for an approximate overall cost of $15.5K.	$0	EACH	$0

Narratives

Event Description

Provide a study to determine the arc flash rating for each piece of electrical equipment and install a label as required.

Event Justification & Strategy

The labeling of electrical equipment with Arc Flash ratings is identified in the Canadian Electrical Code.

Implication of Event Deferral (Risks)

To avoid the implementation of Arc Flash labeling would be to contravene code and put lives at risk during maintenance tasks.

CDP nameplate.

10.2A-030 Electrical - Cleaning and Torque

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1992
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

There is one 120/ 208 volt, 3 phase, 4 wire Westinghouse CDP distribution centre. The 600 volt CDP is identified as the "service" element. There are 5 panelboards, two CGE from the 1972 installation and 3 Westinghouse from the 1992 installation. The panels consist of one 24 circuit, one 30 circuit and three 42 circuit. The only transformer is a 150 kVA Westinghouse 600 volt delta-wye 120/208 volt, 3 phase, 4 wire secondary dry type transformer.

Component Condition & Anticipated Replacement Date

The system is in average condition but has not had any preventive maintenance done for some time. The cleaning and torquing should be done every 5 years and start in 2013.

Distribution in storage area of Craft building.

RP Life Extension [10.2A-030 Electrical - Cleaning and Torque]

Details	Values
Brief Description (40 Characters)	Clean & Torque All Electrical Terminations
Current event Year (YYYY)	2013
Estimated Event Cost	$20,887

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	4	Base Rate for Material and Labour	$3,303	EACH	$13,212
2	04. Electrical	4	Construction Contingency	$495	EACH	$1,980
3	04. Electrical	5	Average Total Project Soft Costs	$1,139	EACH	$5,695
4		0	Costing for Distribution Panels used and 4 or 5 for quantity for approximately $20.5K.	$0	EACH	$0

Narratives

Event Description

Clean and torque cable lugs and breakers and terminations on all electrical components.

Event Justification & Strategy

Preventive maintenance of major equipment in respect to cost and application is expedient for the overall health and operation of the building.

Implication of Event Deferral (Risks)

If this maintenance is not done regularly, the reliability of the system could be in jeopardy.

Clean and torque transformer and all electrical connections.

10.2A-030 Electrical - Thermal Scan

Details	Values
Expected Life	2
Component Cost	0
Last Major Action Year	1972
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 120/ 208 volt, 3 phase, 4 wire Westinghouse CDP distribution centre. ,The 600 volt CDP is identified as the "service" element. There are 5 panelboards, two CGE from the 1972 installation and 3 Westinghouse from the 1992 installation. The only transformer is a 150 kVA Westinghouse 600 volt delta-wye 120/208 volt, 3 phase, 4 wire secondary dry type transformer.

Component Condition & Anticipated Replacement Date

Currently, the electrical components are in good condition. The next scan would be completed in 2013.

Panelboards in office storage room.

RP Life Extension [10.2A-030 Electrical - Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Electrical Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$3,111

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$694	m	$2,082
2	04. Electrical	3	Construction Contingency	$104	m	$312
3	04. Electrical	3	Average Total Project Soft Costs	$239	m	$717
4		0	Costing for Cabling used and a quantity of 3 used for an approximate cost of $3K.	$0	EACH	$0

Narratives

Event Description

Provide thermal scan of all terminations and electrically operating devices.

Event Justification & Strategy

By taking responsibility of themographically scanning the electrical equipment, it is possible to catch problems before they become an emergency. Also, equipment can be trended for operation.

Implication of Event Deferral (Risks)

If thermal scanning is not completed when indicated, there is a risk of equipment failure causing operational outage and/or safety concerns.

Panelboard for scanning.

AVS

Asset Performance Report

DFO-FWI - Storage (Solar) Warehouse Building

July 2013

Prepared by: PWGSC – A&E CoE
Winnipeg, Manitoba
Edmonton, Alberta
Project - R.060627.001

TABLE OF CONTENTS

Details	Values
Construction Year (YYYY)	1983
Gross Area (square meters)	725
Date of current BCR	7/24/2013

Narratives

BCR Project Team and Documents

The following BCR team members were instrumental in gathering, writing and compiling this BCR report for the DFO - Freshwater Institute - Storage (Solar) Warehouse Building in Winnipeg, Manitoba;

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Drawings Provided

Original Building:
Architectural: Original drawings (undated) PWGSC Winnipeg
Structural Engineering: Original drawings (dated 1982)) PWGSC Winnipeg
Mechanical Engineering: As-Built drawings (dated 1984) EJ Faraci & Assoc Ltd Winnipeg
Electrical Engineering: As Built drawings (dated 1982) PWGSC Winnipeg

Renovation drawings dated 1988 - Loading dock / exterior stairs and hazardous material storage rooms.

Building History

The Storage Warehouse (now referred to as the Solar Warehouse Building) was designed in 1982 by PWGSC Winnipeg in conjunction with Ed Faraci & Assoc Eng Ltd (mechanical Engineering) and constructed in 1983/84.

The building is a single storey steel framed building, with a rectangular footprint and a gross area of 725sm. The Building has a "monoslope" metal roof, sloping down from south (high point) to north (low point). There is a steel grating mezzanine supported by steel columns covering approximately 25% of the floor area. The mezzanine is accessed by two flights of steel stairs.

The original building featured a solar heating system, comprised of flat plate air solar collectors mounted on the upper portion of the south facing wall, extending across the length of the building.

There is an overhead door on the north side of the building (opens into the vehicle/boat compound). There is another overhead door on the east side of the building.

The building has no washroom facilities.

Alterations / Additions:
(Date unknown) - Solar collectors removed
(Date 1988) - Solvent storage room and acid storage room (each accessed from the exterior including a steel loading dock
(Date unknown) Canopy constructed above the north facing overhead door

BCR Executive Summary

In general, the building is in good condition and has benefited from a very good maintenance program (refer to Lab/Administration Building BCR). For site work, refer to Lab/Administration Building BCR. Note, at the end of each discipline recap narrative, there are 5 and 25 year recommended funding totals to ensure the elements and systems continue to provide adequate performance over the next 30 years.

Architectural:
There are no apparent issues with the structural steel superstructure. The building envelope is robust, clad primarily with ribbed concrete block (stack bond). The north and south elevation also have upper wall regions clad with insulated, vertical ribbed metal panels. There are no serious concerns with the building envelope.
The original 1 in 6 sloped metal clad, insulated roof assembly appears to be in average condition and no roof leaks are reported by maintenance staff.

Interior finishes are minimal and include; unpainted concrete floor, painted steel structures and painted perimeter plywood clad walls. There are no interior offices. In 1988, a hazardous storage area was constructed with unpainted concrete block walls and concrete slab ceiling. All doors and frames are metal with painted surfaces. The two metal overhead doors are sectional and also have painted surfaces. However, their frames are painted wood assemblies. Except for the unpainted concrete block partitions, all other partitions, surrounding storage areas, are prefinished wire mesh. Depending on the item in question, the element condition ranges from fair to good, with most items having an average condition.

First 5 years: $71K
Following 25 years: $716K

Mechanical:
Heating the open spaces is via electric unit heaters. There are small ventilation fans serving 2 storage rooms which appear to be adequate. There is a carbon dioxide extinguishing system serving the Chemical storage room, and a shower/eye wash station in the Acid Storage Room. Both systems are in good condition.

First 5 years: $0
Following 25 years: $122K

Electrical:
The Storage Warehouse is the newest of the 4 out structures on the site. It was built in 1984 and then subsequently upgraded to house hazardous material in 1988. The electrical distribution and other systems are very minimal in structure and are in generally good condition and should maintain operation into the 2030's. The only complex and possibly vulnerable system is the Fire Alarm. The fire alarm has an independent panel to control the gas discharge system for the hazardous room and is standalone but tied to the Lab building system for annunciation. This would have its own specific future maintenance requirements. Cleaning, retorquing, and thermographic scanning is suggested but because of the storage function of the building it is not critical.

First 5 years: $51K
Following 25 years: $353K

In addition to discipline event costing, this report includes recommended inspection events for the next 30 years. The 5 and 25 year summarized funding is as follows;

First 5 years: $24K
Following 25 years: $205K

Overview of Electrical Systems Condition

The Storage Warehouse is the newest of the four out structures on the site. It was built in 1984 and then subsequently upgraded to house hazardous material in 1988. The electrical distribution and other systems are very minimal in structure are in good condition and should maintain operation into the 2030's. The only complex and possibly vulnerable system is the Fire Alarm. The Fire Alarm has an independent panel to control the gas discharge system for the hazardous room and is standalone but is tied to the Lab building system for annunciation. This would have its own specific future maintenance requirements. Cleaning, retorquing, and thermographic scanning is suggested but because of the minimal usage of the building it is not critical.

Code Compliance Summary

Except for an electrical issue, all other discipline site inspections revealed no apparent code violations. The electrical code issue deals with non-bilingual exit lighting. Refer to report section “04.3A-020 Exit Lighting” for details and the recommended event.

01. Architectural & Structural

01.1A-010 Foundations - Concrete Piles and Grade Beams

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	725
Measurement unit/ Metric	m2

Narratives

Component Description

Underlying structural elements along the perimeter wall:
Piles: 550mm dia x 10.5m (34') long cast in place concrete piles at 4.0m o. c. (Typical)
Grade Beam: 300mm x 600mm (Typical)

At Internal columns:
Piles: 400mm dia x 10m (32') long cast in place concrete piles at 4.0m o.c.

Component Condition & Anticipated Replacement Date

The asset's supporting structural elements are consisted in average condition. The replacement date for these elements is far beyond this BCR 30 year timeline. Therefore, no event is included.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-010C15 Frame - Steel

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	725
Measurement unit/ Metric	m2

Narratives

Component Description

Structure framing is reinforced steel with:

Columns: 150mm x 150mm HSS (Typical)

Component Condition & Anticipated Replacement Date

The asset's supporting structural steel elements are consisted in average condition. The replacement date for these elements is far beyond this BCR 30 year timeline. Therefore, no event is included. Refer to report section 01.4-060C15 Paint for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

01.2-020C10 Slab on Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	725
Measurement unit/ Metric	m2

Narratives

Component Description

The Concrete Slab on Grade assembly consists of:

- 150mm Reinforced Concrete Slab,
- .150mm Poly vapour barrier, and
- 150mm Compacted Granular Fill

Component Condition & Anticipated Replacement Date

Average condition. No cracks or differential settlement is evident. The concrete is unpainted. The replacement date for this element is far beyond this BCR 30 year timeline. Therefore, no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Unpainted concrete slab.

01.2-040C15 Roof Structure - Steel Joist + Steel Liner

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	725
Measurement unit/ Metric	m2

Narratives

Component Description

Roof Framing consists of: 229 Purlins on 600 OWSJ on C310 Beams

Component Condition & Anticipated Replacement Date

The asset's supporting structural elements are consisted in average condition. The replacement date for these elements is far beyond this BCR 30 year timeline. Therefore, no event is included. Refer to report section 01.4-060C15 Paint for repainting.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Painted steel roof structure (colour orange).

01.2-050C15 Exterior Stairs

Details	Values
Expected Life	30
Component Cost	7,901
Last Major Action Year	1988
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	flts

Narratives

Component Description

The exterior stair is attached to the loading dock which is serving the hazardous storage room. The stair has "C" channel stringers, metal grating for treads and pipe handrails.

Component Condition & Anticipated Replacement Date

The exterior loading dock stairs have numerous unpainted sections. They are structurally functional and considered in average condition. They may need replacement in 10 years or 2023.

Assessment Criteria	Existence
Minor surface deterioration	
Default	Yes

Loading dock serving Solvent and Chemical Storage Rooms. Dock Bumpers in fair condition. Faded paint on doors, panels and metal stairs.

RP Replacement [01.2-050C15 Exterior Stairs]

Details	Values
Brief Description (40 Characters)	Replace Exterior Stairs
Current event Year (YYYY)	2023
Estimated Event Cost	$7,901

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$5,285	Flts	$5,285
2	01. Architectural & Structural	1	Construction Contingency	$793	Flts	$793
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$1,823	Flts	$1,823
4		0	Due to stair only having 4 risers, the LCF factors were not used.	$0	EACH	$0

Narratives

Event Description

Replace exterior stair assembly associated with the loading dock. This event includes the railing.

Event Justification & Strategy

This event will ensure continued safe performance.

Implication of Event Deferral (Risks)

Not replacing the exterior stairs may lead to rusted members and injury may occur.

01.2-050C35 Loading Dock

Details	Values
Expected Life	20
Component Cost	0
Last Major Action Year	1988
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one exterior Loading Dock serving the hazardous storage room. The dock is a reinforced concrete slab with a 2% slope and has three rubberized bumpers.

Component Condition & Anticipated Replacement Date

The exterior concrete loading dock has some minor surfaces abrasions. Refinishing may be required in seven years or 2020. Full replacement is not required in this 30 year BCR timeline.

Assessment Criteria	Existence
Corrosion	
Default	Yes
Deterioration of paint finish & surfaces	
Default	Yes

Exterior concrete loading dock with rusted steel framing and worn rubber bumpers.

RP Life Extension [01.2-050C35 Loading Dock]

Details	Values
Brief Description (40 Characters)	Refurbish Loading Dock
Current event Year (YYYY)	2020
Estimated Event Cost	$3,940

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$396	m²	$1,980
2	01. Architectural & Structural	5	Construction Contingency	$59	m²	$295
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$137	m²	$685
4		5	LCF - Material & Labour	$131	m2	$655
5		5	LCF - Contingency & Soft Costs	$65	m2	$325
6		0	AVS has not concrete refurbishment costing. Used costing for Granite flooring.	$0	EACH	$0

Narratives

Event Description

Re-surface concrete loading dock platform.

Event Justification & Strategy

This event will ensure continued safe performance.

Implication of Event Deferral (Risks)

Prolonging surface refurbishment may lead to a poor wearing surface and unsure footing for users.

01.3-010C20 Exterior Wall - Concrete Block

Details	Values
Expected Life	60
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	500
Measurement unit/ Metric	m2

Narratives

Component Description

East and West walls, and partial North and South walls:

- 200mm ribbed concrete block (stack bond),
- 12mm air space,
- building paper,
- RSI 1.2 (R7) Rigid Insulation Sheathing,
- 38x89 Studs @ 400 o/c,
- RSI 2.4 (R13) Batt Insulation,
- Poly vapour barrier,
- 12mm plywood (paint finish)

Walls are capped with a 250mm wide x 90 high precast concrete coping stones. Horizontal mortar joints are raked. Vertical joints are struck flush.

Component Condition & Anticipated Replacement Date

Horizontal Mortar joints are struck flush. Vertical joints are raked.

Horizontal mortar joints are deteriorated near the top of the wall. It is because the mortar which follows the profile of the ribbed block is subjected to additional weathering than a typical mortar joint. This mortar failure is due to weathering and not due to structural stress. An event is included for 2015 to address this issue.

The 1998 BCR indicated that masonry on the wall was exhibiting signs of water damage, caused by ineffective sill flashing where the metal siding meets the masonry. The sill flashing slopes back toward the building, resulting in standing water on the flashing as well as likely some ingress to the wall assembly. An event is included for 2015 to address this issue.

Full block replacement is scheduled outside this BCR timeline. As such, no event is included.

Assessment Criteria	**Existence**
Deteriorated finishes	
Default	Yes
	Mortar deterioration near top of wall.

Single wythe of block beneath windows. Mortar joint deteriorated.

CP Life Extension [01.3-010C20 Exterior Wall - Concrete Block]

Details	Values
Brief Description (40 Characters)	Repoint Mortar Joints
Current event Year (YYYY)	2015
Estimated Event Cost	$46,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	110	Base Rate for Material and Labour	$211	m²	$23,210
2	01. Architectural & Structural	110	Construction Contingency	$32	m²	$3,520
3	01. Architectural & Structural	110	Average Total Project Soft Costs	$73	m²	$8,030
4		110	LCF - Material & Labour	$70	m2	$7,700
5		110	LCF - Contingency & Soft Costs	$34	m2	$3,740
6		0	Quantity of 110 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Repoint mortar where required. Approximately top 1.5m of wall.

Event Justification & Strategy

Mortar joint refurbishment will prevent accelerated deterioration.

Implication of Event Deferral (Risks)

Event delay may lead to inner wall degradation and mold issues.

Deteriorated horizontal mortar joints near top of wall (typical).

RP Replacement [01.3-010C20 Exterior Wall - Concrete Block] - Sill Flashing

Details	Values
Brief Description (40 Characters)	Replace Metal Siding Sill Flashing
Current event Year (YYYY)	2015
Estimated Event Cost	$12,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$211	m²	$6,330
2	01. Architectural & Structural	30	Construction Contingency	$32	m²	$960
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$73	m²	$2,190
4		30	LCF - Material & Labour	$70	m2	$2,100
5		30	LCF - Contingency & Soft Costs	$34	m2	$1,020
6		0	Quantity of 30 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Modify sill flashing at base of metal siding on north elevation to provide positive drainage away from the building.

Event Justification & Strategy

This event will minimize water ingress and extend life of wall assembly below.

Implication of Event Deferral (Risks)

Delaying the sill flashing redesign may lead to further inner wall damages.

Lack of drainage at sill flashing causing water / ice buildup.

01.3-030C20 Exterior Wall - Metal Blowout Panel

Details	Values
Expected Life	50
Component Cost	3,744
Last Major Action Year	1988
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	m2

Narratives

Component Description

1.5m x 1.5m blowout panel at Hazardous Material storage room, along East elevation.

Component Condition & Anticipated Replacement Date

The blowout panel appears in average condition. Its replacement may be warranted in 2038. Refer to report section "01.5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Deteriorated finishes	
Default	Yes

Blowout panel, east elevation, at hazardous materials area and loading dock.

RP Replacement [01.3-030C20 Exterior Wall - Metal Blowout Panel]

Details	Values
Brief Description (40 Characters)	Replace Exterior Wall - Metal Blowout Panel
Current event Year (YYYY)	2038
Estimated Event Cost	$3,744

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	3	Base Rate for Material and Labour	$628	m²	$1,884
2	01. Architectural & Structural	3	Construction Contingency	$94	m²	$282
3	01. Architectural & Structural	3	Average Total Project Soft Costs	$217	m²	$651
4		3	LCF - Material & Labour	$207	m2	$621
5		3	LCF - Contingency & Soft Costs	$102	m2	$306

Narratives

Event Description

Replace metal blowout panel assembly associated with Hazardous materials storage area.

Event Justification & Strategy

This element will have come to the end of its service life and proper function may be an issue.

Implication of Event Deferral (Risks)

Postponing this event may lead to an improper panel function during an emergency.

01.3-040C10 Exterior Wall - Metal Panels

Details	Values
Expected Life	35
Component Cost	82,800
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	180
Measurement unit/ Metric	m2

Narratives

Component Description

South (upper portion above windows) and North (upper portion above block) Walls:

- Prefinished metal panels,
- building paper,
- 12mm plywood sheathing,
- 38x89 Studs @ 600 o/c horizontal,
- RSI 1.2 (R7) Rigid Insulation Sheathing,
- 38x89 Studs @ 400 o/c,
- RSI 2.4 (R13) Batt Insulation,
- Poly vapour barrier,
- 12mm plywood (paint finish)

Component Condition & Anticipated Replacement Date

The 1998 BCR indicated that masonry on the wall was exhibiting signs of water damage, caused by ineffective sill flashing where the metal siding meets the masonry. The sill flashing slopes back toward the building, resulting in standing water on the flashing as well as likely some ingress to the wall assembly. Refer to the previous element "01.3-010C20 Exterior Wall - Concrete Block" for the corrective event.

Since the metal panel system and related fasteners appear in average and functional condition, they are expected to perform for another 10 years before replacement may be warranted in 2023.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Metal Cladding at North wall and canopy constructed at overhead door.

CP Replacement [01.3-040C10 Exterior Wall - Metal Panels]

Details	Values
Brief Description (40 Characters)	Replace Exterior Wall - Metal Panels
Current event Year (YYYY)	2023
Estimated Event Cost	$82,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	180	Base Rate for Material and Labour	$231	m²	$41,580
2	01. Architectural & Structural	180	Construction Contingency	$35	m²	$6,300
3	01. Architectural & Structural	180	Average Total Project Soft Costs	$80	m²	$14,400
4		180	LCF - Material & Labour	$76	m2	$13,680
5		180	LCF - Contingency & Soft Costs	$38	m2	$6,840

Narratives

Event Description

Replace metal panels on exterior vertical walls.

Event Justification & Strategy

This element will be at the end of its service life and degradation may become an issue.

Implication of Event Deferral (Risks)

Event delay would have a low risk unless fasteners are rusted and panels become unsecured.

01.3-060C10 Exterior Metal Doors

Details	Values
Expected Life	45
Component Cost	10,508
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

Insulated Hollow metal doors 2150mm h x 900mm w in thermally broken pressed steel frames.

Metal door at main entry (east side):
- 2100mm high x 915mm wide
- Mortised Lockset with deadbolt (rose trim), Closer, weather-stripping

Metal exit door (west side):
- 2100mm high x915mm wide
- Lockset (rose trim), Closer, weather-stripping

Metal door at hazard substance room (east side):
- 2100mm high x915mm wide
- Lockset (rose trim), Closer, weather-stripping

Metal door at hazard substance room (east side):
- 2100mm high x1200mm wide
- Lockset (rose trim), Closer, weather-stripping

Component Condition & Anticipated Replacement Date

All exterior metal doors have a faded paint finish and weather-stripping is in fair condition. Door replacements may be warranted in 2028. Refer to report section “01.5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes
	Faded paint finish.

Typical exterior door with major paint fading.

RP Replacement [01.3-060C10 Exterior Metal Doors]

Details	Values
Brief Description (40 Characters)	Replace Exterior Metal Doors
Current event Year (YYYY)	2028
Estimated Event Cost	$10,508

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$1,321	EACH	$5,284
2	01. Architectural & Structural	4	Construction Contingency	$198	EACH	$792
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$456	EACH	$1,824
4		4	LCF - Material & Labour	$436	EACH	$1,744
5		4	LCF - Contingency & Soft Costs	$216	EACH	$864

Narratives

Event Description

Replace all four exterior metal doors and related framing.

Event Justification & Strategy

This event will maintain operability and reduce heat loss.

Implication of Event Deferral (Risks)

Event deferral would lead to improper functioning doors. This would be an issue (life safety) during an emergency.

01.3-060C18 Overhead Door

Details	Values
Expected Life	20
Component Cost	27,576
Last Major Action Year	1983
Component Condition (For BCR use only)	Fair
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

East Elevation (serving Storage Room):
One 3.05m high x 2.4m wide vertical lift insulated sectional metal door (no vision lites), electrically operated, steel flush panel, push button controls with 3/4 H.P. Jackshaft operator, safety bottom edge and emergency chain hoist for manual operation, 76mm heavy duty hardware. Age of door not confirmed but appears to be original (30yrs old). This door is operated approximately 1-5 times per month.

North Elevation (accessing Storage Compound):
One 2.4m high x 2.7m wide insulated sectional metal door (no vision lites), electrically operated, steel flush panel, push button controls with 3/4 H.P. Jackshaft operator, safety bottom edge and emergency chain hoist for manual operation, 76mm heavy duty hardware. This door is operated frequently during summer months. Age of door not confirmed but appears to be original (30yrs old).

Component Condition & Anticipated Replacement Date

East Elevation (serving Storage Room) - Good operating condition.

North Elevation (accessing Storage Compound) - Good operating condition.

Both doors are scheduled for replacement in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Overhead door (east side of building).

CP Replacement [01.3-060C18 Overhead Door]

Details	Values
Brief Description (40 Characters)	Replace Overhead Doors
Current event Year (YYYY)	2020
Estimated Event Cost	$27,576

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$6,936	EACH	$13,872

2	01. Architectural & Structural	2	Construction Contingency	$1,040	EACH	$2,080
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$2,393	EACH	$4,786
4		2	LCF - Material & Labour	$2,287	EACH	$4,574
5		2	LCF - Contingency & Soft Costs	$1,132	EACH	$2,264

Narratives

Event Description

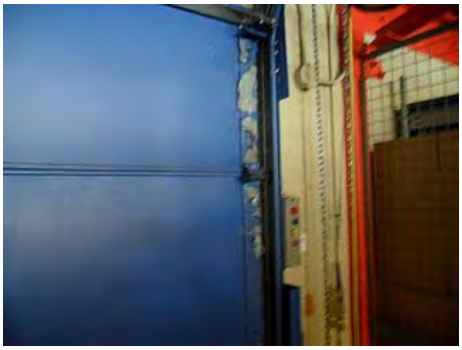
Replace overhead doors and all related accessories.

Event Justification & Strategy

These doors will be at the end of their service life. Renewal will ensure proper operation.

Implication of Event Deferral (Risks)

Event delay would risk proper door function during normal use. Operator injury may result.



Overhead door on north side. Paint flaking off door.

01.3-070C01 Aluminum Windows

Details	Values
Expected Life	50
Component Cost	36,715
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	35
Measurement unit/ Metric	m2

Narratives

Component Description

Fixed Window units are only located along the South elevation.

Window framing: 133mm deep extruded aluminum framing, thermally broken, steel reinforced, dark bronze anodized colour.
Glazing: hermetically sealed triple glazed units (clear).
Typical windows size: 78" w x 60" h (2000mm w x 1500mm h).

Component Condition & Anticipated Replacement Date

Window frames and glazing units in good condition. Their replacement is scheduled for 2033.

Painted wood sills are water damaged. A sill renovation is slated for 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Deteriorated wood sill at windows.

RP New [01.3-070C01 Aluminum Windows] - Metal Sill

Details	Values
Brief Description (40 Characters)	Install New Metal Sill Over Wood Window Sill
Current event Year (YYYY)	2016
Estimated Event Cost	$4,196

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$528	m²	$2,112
2	01. Architectural & Structural	4	Construction Contingency	$79	m²	$316
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$182	m²	$728
4		4	LCF - Material & Labour	$174	m2	$696
5		4	LCF - Contingency & Soft Costs	$86	m2	$344
6		0	Quantity of 4 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Install prefinished metal sill over existing wood window sill.

Event Justification & Strategy

The new metal sill covers will improve appearance and reduce water damage to sills.

Implication of Event Deferral (Risks)

Postponing this event would risk further underlying damage to the exterior wall.

CP Replacement [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Aluminum Windows
Current event Year (YYYY)	2033
Estimated Event Cost	$36,715

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	35	Base Rate for Material and Labour	$528	m²	$18,480
2	01. Architectural & Structural	35	Construction Contingency	$79	m²	$2,765
3	01. Architectural & Structural	35	Average Total Project Soft Costs	$182	m²	$6,370
4		35	LCF - Material & Labour	$174	m2	$6,090
5		35	LCF - Contingency & Soft Costs	$86	m2	$3,010

Narratives

Event Description

Replace all aluminum framed window units along south elevation.

Event Justification & Strategy

The window service life will have been reached. Deficient glazing seals will become an issue and heat loss will increase.

Implication of Event Deferral (Risks)

Event delay would risk unnecessary heat loss from poor glazing seals.

Aluminum framed windows along south elevation.

01.3A-065 Exterior Door Hardware

Details	Values
Expected Life	15
Component Cost	5,784
Last Major Action Year	1983
Component Condition (For BCR use only)	Fair
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

Insulated Hollow metal exterior doors have the following hardware;

Metal door at main entry (east side): Mortised Lockset with deadbolt (rose trim), Closer, weather-stripping.

Metal exit door (west side): Lockset (rose trim), Closer, weather-stripping.

Metal door at hazard substance room (east side): Lockset (rose trim), Closer, weather-stripping.

Metal door at hazard substance room (east side), wider door: Lockset (rose trim), Closer, weather-stripping.

Component Condition & Anticipated Replacement Date

All exterior metal doors have a faded paint finish and weather-stripping is in fair condition. Hardware replacement is scheduled for 2016 and every 15 years thereafter.

Assessment Criteria	Existence
Hardware damage	
Default	Yes
	Damaged weather-stripping.

Typical exterior door hardware elements.

RP Replacement [01.3A-065 Exterior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Exterior Door Hardware
Current event Year (YYYY)	2016
Estimated Event Cost	$5,784

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$727	EACH	$2,908
2	01. Architectural & Structural	4	Construction Contingency	$109	EACH	$436
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$251	EACH	$1,004
4		4	LCF - Material & Labour	$240	EACH	$960
5		4	LCF - Contingency & Soft Costs	$119	EACH	$476

Narratives

Event Description

Replace weather-stripping, closures, thresholds and locking latch sets on all exterior doors.

Event Justification & Strategy

This event will maintain operability and reduce heat loss.

Implication of Event Deferral (Risks)

Event delay would risk poor door operation during normal and emergency use. Life safety would be an issue.

Knob lockset with deadbolt, at main entry door.

01.4-010C01 Metal Roof

Details	Values
Expected Life	30
Component Cost	155,400
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	740
Measurement unit/ Metric	m2

Narratives

Component Description

The asset utilizes a prefinished metal roof panel system having a 1 in 6 slope. The underlying components consist of:

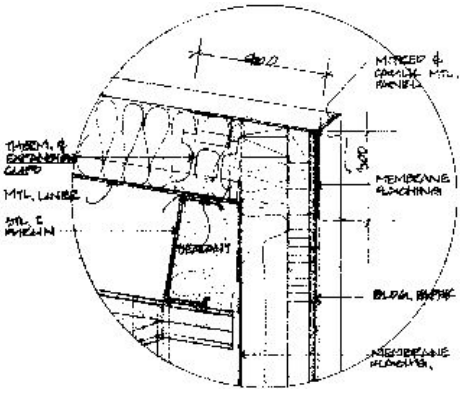
- RSI 4.02 (R22) Batt Insulation
- Zinc Coated Metal Liner

Component Condition & Anticipated Replacement Date

Currently, the metal roof assembly appears in average condition. Maintenance staff report no leakage. An additional 10 service years is granted when replacement may be warranted in 2023.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Roof section.

CP Replacement [01.4-010C01 Metal Roof]

Details	Values
Brief Description (40 Characters)	Replace Metal Roof
Current event Year (YYYY)	2023
Estimated Event Cost	$155,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	740	Base Rate for Material and Labour	$106	m²	$78,440

2	01. Architectural & Structural	740	Construction Contingency	$16	m²	$11,840
3	01. Architectural & Structural	740	Average Total Project Soft Costs	$36	m²	$26,640
4		740	LCF - Material & Labour	$35	m2	$25,900
5		740	LCF - Contingency & Soft Costs	$17	m2	$12,580

Narratives

Event Description

Replace metal roof system.

Event Justification & Strategy

This roof replacement will ensure dry interior conditions continue.

Implication of Event Deferral (Risks)

Deferring the metal roof replacement would risk the development of roof leaks after the assembly's life expectancy.

01.5-010C01 Concrete Block Partition

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1988
Component Condition (For BCR use only)	Good
Quantity	45
Measurement unit/ Metric	m2

Narratives

Component Description

Interior concrete partitions are only found around the 1988 addition designated to house hazardous solvents and acids. The walls are constructed of:

- 140 concrete block
- Each core is filled with grout
- 10M dowels are at 400mm o/c to tie into the concrete slab roof.

Component Condition & Anticipated Replacement Date

The reinforced concrete block partitions surrounding the hazardous storage areas are in good condition. Their replacement is beyond this BCR 30 year cycle, and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Concrete block partition in hazardous materials storage area.

01.5-012C10 Steel Mesh Partition

Details	Values
Expected Life	25
Component Cost	134,460
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	540
Measurement unit/ Metric	m2

Narratives

Component Description

2400mm high steel mesh connected to 50x50 HSS posts. This interior wall system is solely utilized for partitioning off numerous storage areas.

Component Condition & Anticipated Replacement Date

Currently, the interior wire mesh partitions are regarded in average condition. Another 15 service years is granted before replacement may be warranted in 2028.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical Steel mesh partitions.

CP Replacement [01.5-012C10 Steel Mesh Partition]

Details	Values
Brief Description (40 Characters)	Replace Steel Mesh Partitions
Current event Year (YYYY)	2028
Estimated Event Cost	$134,460

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	540	Base Rate for Material and Labour	$126	m²	$68,040
2	01. Architectural & Structural	540	Construction Contingency	$19	m²	$10,260
3	01. Architectural & Structural	540	Average Total Project Soft Costs	$43	m²	$23,220
4		540	LCF - Material & Labour	$41	m2	$22,140
5		540	LCF - Contingency & Soft Costs	$20	m2	$10,800

Narratives

Event Description

Replace all steel mesh partitions for interior storage areas.

Event Justification & Strategy

Renewed steel mesh partitions will ensure proper and safe demarcation for interior storage spaces.

Implication of Event Deferral (Risks)

Unless major rusting occurs and the partitions become poorly fastened, event delay would be low risk.

01.5-060C15 Paint

Details	Values
Expected Life	10
Component Cost	0
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Interior painted surfaces include:

- Structural steel, metal guardrails (colour orange)
- Metal doors and frames (colour blue)
- Plywood wall finish (colour beige)
- Wood jambs/head at overhead doors

Component Condition & Anticipated Replacement Date

All elements: Paint in fair - good condition.

Wood jambs/head at overhead doors in poor condition.

Repaint all doors and jambs in 2015, and all structural steel elements in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Paint flaked off at overhead wood door jamb.

RP Replacement [01.5-060C15 Paint] - Doors & Frames

Details	Values
Brief Description (40 Characters)	Repaint Metal Doors & Framing
Current event Year (YYYY)	2015
Estimated Event Cost	$2,530

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	115	Base Rate for Material and Labour	$11	m²	$1,265
2	01. Architectural & Structural	115	Construction Contingency	$2	m²	$230
3	01. Architectural & Structural	115	Average Total Project Soft Costs	$4	m²	$460
4		115	LCF - Material & Labour	$3	m2	$345
5		115	LCF - Contingency & Soft Costs	$2	m2	$230
6		0	Quantity of 115 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Repaint metal doors, framing and blowout panel.

Event Justification & Strategy

This repainting event will promote a clean and professional appearance for the asset.

Implication of Event Deferral (Risks)

Event deferral would promote an unprofessional appearance. Since the overhead doors have a painted wood jamb, the risk would be moderate. Not allowing the jambs to be exposed to the elements is preferred.

RP Replacement [01.5-060C15 Paint] - Structural Metal

Details	Values
Brief Description (40 Characters)	Repaint Structural Metals
Current event Year (YYYY)	2020
Estimated Event Cost	$22,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1000	Base Rate for Material and Labour	$11	m²	$11,000
2	01. Architectural & Structural	1000	Construction Contingency	$2	m²	$2,000
3	01. Architectural & Structural	1000	Average Total Project Soft Costs	$4	m²	$4,000
4		1000	LCF - Material & Labour	$3	m2	$3,000
5		1000	LCF - Contingency & Soft Costs	$2	m2	$2,000
6		0	Quantity of 1000 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Repaint structural steel and miscellaneous metal.

Event Justification & Strategy

This event will ensure a proper and professional appearance for all structural and miscellaneous metals.

Implication of Event Deferral (Risks)

Event deferral would promote an unprofessional appearance. The risk would be low.

01.5-060C25 Plywood Wall Finish

Details	Values
Expected Life	30
Component Cost	91,200
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	600
Measurement unit/ Metric	m2

Narratives

Component Description

Interior face of exterior wall is finished with painted plywood.

Component Condition & Anticipated Replacement Date

All interior plywood wall assemblies appear in average condition. Another 20 service years is granted before replacement is scheduled in 2033. Refer to report section "01.4-060C15 Paint" for repainting.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Painted plywood exterior walls.

CP Replacement [01.5-060C25 Plywood Wall Finish]

Details	Values
Brief Description (40 Characters)	Replace Plywood Wall Finish
Current event Year (YYYY)	2033
Estimated Event Cost	$91,200

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	600	Base Rate for Material and Labour	$77	m²	$46,200
2	01. Architectural & Structural	600	Construction Contingency	$11	m²	$6,600

3	01. Architectural & Structural	600	Average Total Project Soft Costs	$26	m²	$15,600
4		600	LCF - Material & Labour	$25	m2	$15,000
5		600	LCF - Contingency & Soft Costs	$13	m2	$7,800

Narratives

Event Description

Replace all exterior walls having a plywood finish.

Event Justification & Strategy

This event will ensure a smooth and sound exterior wall finish.

Implication of Event Deferral (Risks)

Event delay may see plywood sections become unfastened. Appearance and functionality would be issues.

01.5A-110 Interior Stairs - Mezzanine

Details	Values
Expected Life	60
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	2
Measurement unit/ Metric	flts

Narratives

Component Description

There are two steel stairs associated with the interior mezzanine structure. The stair assembly consists of;

- 250 "C" stringers
- Steel grating treads (14) and landing
- Open risers
- Stairs are 1m wide and each flight has a 1900mm run
- Pipe railing is 900mm above treads and 1070mm at landing and mezzanine level.

Component Condition & Anticipated Replacement Date

Even though both steel stairs accessing the mezzanine painted surface issues, they are structurally sound and considered in good functional condition. Their replacement is beyond this BCR 30 year cycle and no event is included.

Assessment Criteria	Existence
Surface finishes deteriorated	
Default	Yes
	Minor worn painted surfaces.

One of two interior stairs to mezzanine.

01.6A-011 Metal Floor Grating - Mezzanine

Details	Values
Expected Life	60
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	210
Measurement unit/ Metric	m2

Narratives

Component Description

Mezzanine Surface: 19mm Steel grating
Mezzanine Floor Framing: C200x17 and 300 OWSJ
Mezzanine served by 2 Steel stairs (steel grating treads and landings; open risers)

Component Condition & Anticipated Replacement Date

The mezzanine's metal floor grating is considered in good functional and wear condition. Replacement is scheduled for 2043. This date is outside this BCR 30 year cycle and no event is offered.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Mezzanine - steel grating.

01.6A-038 Railing - Mezzanine

Details	Values
Expected Life	40
Component Cost	57,840
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	40
Measurement unit/ Metric	m

Narratives

Component Description

Mezzanine perimeter railing is 32mm in diameter, 1070mm above grate flooring and is painted orange.

Component Condition & Anticipated Replacement Date

Currently, all mezzanine railing is functionally sound and in good condition. Unless damage occurs, another 20 service years is probable before replacement may be warranted in 2033.

Assessment Criteria	Existence
Deterioration of paint finish & surfaces	
Default	Yes
	Scattered worn surfaces.

Painted railing around mezzanine level.

CP Replacement [01.6A-038 Railing - Mezzanine]

Details	Values
Brief Description (40 Characters)	Replace Mezzanine Railing
Current event Year (YYYY)	2033
Estimated Event Cost	$57,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	40	Base Rate for Material and Labour	$727	m	$29,080

2	01. Architectural & Structural	40	Construction Contingency	$109	m	$4,360
3	01. Architectural & Structural	40	Average Total Project Soft Costs	$251	m	$10,040
4		40	LCF - Material & Labour	$240	m	$9,600
5		40	LCF - Contingency & Soft Costs	$119	m	$4,760

Narratives

Event Description

Replace all railing associated with the mezzanine and the mechanical area over the hazardous material storage rooms.

Event Justification & Strategy

This event will ensure a safe condition is promoted for the mezzanine railings.

Implication of Event Deferral (Risks)

Railing replacement delay may lead to unsecured railings as a result of fastener rusting. Life safety issues would be an issue.

03. Mechanical

03.1A-030 Ventilation Fans

Details	Values
Expected Life	25
Component Cost	13,656
Last Major Action Year	1988
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

There are 2 exhaust fans that independently serve 2 adjacent hazardous storage rooms 2-16 & 2-17.

Component Condition & Anticipated Replacement Date

These fans appear to be in average condition and look to be operating well. A projected replacement date has been set at 2018 when the next BCR occurs.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Exhaust fan for organic storage room 2-17

RP Replacement [03.1A-030 Ventilation Fans]

Details	Values
Brief Description (40 Characters)	Replace Solvent Storage Room Exhaust Fans
Current event Year (YYYY)	2018
Estimated Event Cost	$13,656

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$3,435	EACH	$6,870

2	03. Mechanical	2	Construction Contingency	$515	EACH	$1,030
3	03. Mechanical	2	Average Total Project Soft Costs	$1,185	EACH	$2,370
4		2	LCF - Base Rate Material & Labour	$1,132	EACH	$2,264
5		2	LCF - Conting. & Soft Costs	$561	EACH	$1,122

Narratives

Event Description

This event is the life cycle replacement of the 2 exhaust fans that serve the 2 hazardous storage rooms (2-17 organic and 2-16 inorganic).

Event Justification & Strategy

These fans are necessary to maintain an environment suitable for people occasionally in the space to drop-off or pick up materials. If they were installed in 1977 they would have been at the end of their projected life in 2002. They still seem to be operating without issue so it appears the replacement can be postponed further and re-assessed at the time of the next BCR in 2018.

Implication of Event Deferral (Risks)

These fans are critical for 2 reasons:
- to maintaining a negative pressure in these 2 storage rooms such that fumes in the spaces are diluted and
- fumes do not migrate into the main building.

03.2A-010 Controls, Electrical or Pneumatic

Details	Values
Expected Life	24
Component Cost	45,960
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	pt

Narratives

Component Description

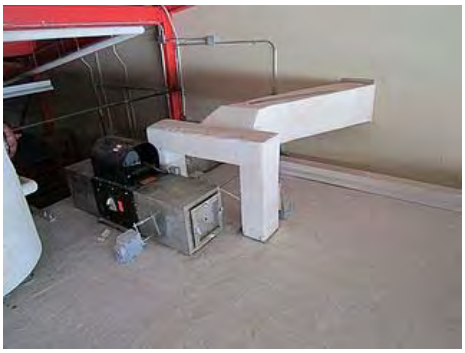
This element would include components of the DDC system that are electric and pneumatic in nature. Typically, this includes items such as AHU damper actuators and HVAC heating and cooling control valves.

Component Condition & Anticipated Replacement Date

There were no reported problems with any of these components. Typically, any problems are dealt with on a case by case basis as part of an Operations & Maintenance program. Even though the projected lifespan would have been 2007 a projected replacement date of 2020 has been arbitrarily picked to be reevaluated on the future BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Exhaust fan and damper controls for Inorganic storage room 2-16

CP Replacement [03.2A-010 Controls, Electrical or Pneumatic]

Details	Values
Brief Description (40 Characters)	Replace Controls - Electrical or Pneumatic
Current event Year (YYYY)	2020
Estimated Event Cost	$45,960

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	20	Base Rate for Material and Labour	$1,156	pt	$23,120
2	03. Mechanical	20	Construction Contingency	$173	pt	$3,460
3	03. Mechanical	20	Average Total Project Soft Costs	$399	pt	$7,980
4		20	LCF - Base Rate Material & Labour	$381	pt	$7,620
5		20	LCF - Conting. & Soft Costs	$189	pt	$3,780

Narratives

Event Description

This event would include the life cycle replacement of heating and ventilating system items such as AHU damper actuators and HVAC heating control valves.

Event Justification & Strategy

These devices collectively are critical to the DDC system's operation and control of heating and ventilation. They appear to be in good working order and therefore this is not an urgent item. In the event there were frequent problems it would make this event a higher priority.

Implication of Event Deferral (Risks)

This event could be deferred as the risk of many devices failing at the same time is highly unlikely. Individual failures can be dealt with on a case-by-case basis under building maintenance.

03.5A-030 Specialty Fire Protection Systems

Details	Values
Expected Life	40
Component Cost	57,777
Last Major Action Year	1988
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

This component is the CO2 extinguisher system serving the organic and inorganic solvent storage rooms.

Component Condition & Anticipated Replacement Date

This system appears to be in good condition based on age and no reported problems. The system is believed to have been installed at the time of construction of the hazardous storage rooms in 1988 but it may be newer. It is unlikely it will have to be replaced in 2028 but this can be determined at the time of the next BCR in 2018. For this reason the replacement date has been forecasted in 2028.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CO2 fire suppression system

CP Replacement [03.5A-030 Specialty Fire Protection Systems]

Details	Values
Brief Description (40 Characters)	Replace CO2 Fire Suppression System
Current event Year (YYYY)	2028
Estimated Event Cost	$57,777

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$29,065	sum	$29,065

2	03. Mechanical	1	Construction Contingency	$4,360	sum	$4,360
3	03. Mechanical	1	Average Total Project Soft Costs	$10,027	sum	$10,027
4		1	LCF - Base Rate Material & Labour	$9,582	sum	$9,582
5		1	LCF - Conting. & Soft Costs	$4,743	sum	$4,743

Narratives

Event Description

This event is for the life cycle replacement of the CO2 fire suppression system.

Event Justification & Strategy

This system is necessary per the Fire Code for the nature of the products stored in these two rooms. The existing system appears to have no issues, is in good condition and should not require replacement for several years.

Implication of Event Deferral (Risks)

Fire Code requirement for hazardous material storage.

03.5A-070 Portable Fire Extinguishers

Details	Values
Expected Life	3
Component Cost	788
Last Major Action Year	2007
Component Condition (For BCR use only)	Excellent
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the typical 5-20 # ABC fire extinguisher but can sometimes be CO2 depending on the nature of the hazard where they are located. Per the Bison annual survey report there are 5 in total. There is 1-5 lb and 4-10 lb in the Storage Warehouse Building.

Component Condition & Anticipated Replacement Date

The fire extinguishers are in excellent condition and with continued regular maintenance will not have to be replaced for many years. A further assessment can be done on the next BCR in 2018. Currently, the scheduled replacement is for one unit every three years, starting in 2022.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

10 lb ABC fire extinguisher by exit

RP Replacement [03.5A-070 Portable Fire Extinguishers]

Details	Values
Brief Description (40 Characters)	Replace Portable Fire Extinguishers
Current event Year (YYYY)	2022
Estimated Event Cost	$788

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$396	EACH	$396
2	03. Mechanical	1	Construction Contingency	$59	EACH	$59
3	03. Mechanical	1	Average Total Project Soft Costs	$137	EACH	$137
4		1	LCF - Base Rate Material & Labour	$131	EACH	$131
5		1	LCF - Conting. & Soft Costs	$65	EACH	$65
6		0	Quantity of 1 used for cyclical replacement of one unit every three years, wherever required.	$0	EACH	$0

Narratives

Event Description

This event is to replace the portable fire extinguishers based on their age and ability to pass mandatory testing. Budget one unit when required.

Event Justification & Strategy

The portable fire extinguishers have a minimum 12 year life span and then may be either replaced or refurbished.

Implication of Event Deferral (Risks)

Having portable extinguishers in specified design locations based on the floor plan, hazards and other conditions is a Fire Code requirement. Regular inspection and maintenance to keep them in good condition is a mandatory requirement

04. Electrical

04.2A-010 Secondary Switchgear

Details	Values
Expected Life	30
Component Cost	1,493
Last Major Action Year	1984
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The building is fed from a 50 amp, 3 pole breaker in the emergency distribution of the Water Treatment Plant. The main service to the building consists of one 45 kVA, 600 volt, 3 phase delta-wye Federal Pioneer transformer located on east wall of the storage room. The transformer is protected by a 60 amp fused disconnect with 45 amp fuses located adjacent.

Component Condition & Anticipated Replacement Date

The service to the building, not including the transformer and panel, is really only the feeder and the disconnect switch. This part of the service is in good condition and should not need replacement until at least 2024.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Service entrance.

RP Replacement [04.2A-010 Secondary Switchgear]

Details	Values
Brief Description (40 Characters)	Replace Service Distribution
Current event Year (YYYY)	2024
Estimated Event Cost	$1,493

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not take in account for just a service disconnect - used $750.	$0	EACH	$0
2		1	Base Rate for Material and labour	$750	EACH	$750
3		1	Construction Contingency	$113	EACH	$113
4		1	Average Total Project Soft cost	$259	EACH	$259
5		1	Site Factor - Base cost	$248	EACH	$248
6		1	Site Factor - Contingency and soft cost	$123	EACH	$123

Narratives

Event Description

Replace the main disconnect and feeder.

Event Justification & Strategy

To extend the life of the building the service is essential.

Implication of Event Deferral (Risks)

Without a new service at this time, there would be no power.

Service disconnect.

04.2A-020 Secondary Transformer

Details	Values
Expected Life	30
Component Cost	26,820
Last Major Action Year	1984
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 45 kVA, 600 volt, 3 phase delta-wye Federal Pioneer transformer located on east wall of the storage room.

Component Condition & Anticipated Replacement Date

The transformer is in good condition and not stressed and with maintenance should not need replacement before 2024.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Service transformer.

CP Replacement [04.2A-020 Secondary Transformer]

Details	Values
Brief Description (40 Characters)	Replace Transformer
Current event Year (YYYY)	2024
Estimated Event Cost	$26,820

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS Tools does not define transformer size - used $300/kVA	$0	sum	$0
2		45	Base Rate for Material and labour	$300	sum	$13,500
3		45	Construction Contingency	$45	sum	$2,025
4		45	Average Total Project Soft cost	$103	sum	$4,635
5		45	Site Factor - Material & Labour	$99	sum	$4,455
6		45	Site Factor - Contingency and soft cost	$49	sum	$2,205

Narratives

Event Description

Replace transformer.

Event Justification & Strategy

The transformer will be 40 years old and nearing its life expectancy.

Implication of Event Deferral (Risks)

As an integral part of the building distribution, the transformer will need to be maintained or power will be lost.

Transformer specification plate.

04.2A-050 Cabling, Raceways & Bus Ducts

Details	Values
Expected Life	40
Component Cost	71,018
Last Major Action Year	1984
Component Condition (For BCR use only)	Good
Quantity	721
Measurement unit/ Metric	m2

Narratives

Component Description

Devices and wiring in the warehouse proper are in EMT and wire in the hazardous area is in rigid steel and installed to code. There are specific connections to equipment in flexible conduit.

Component Condition & Anticipated Replacement Date

The cable, conduit and devices are in good condition and should not need replacement until 2029.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Explosion proof light switch.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Replace Devices and Wiring
Current event Year (YYYY)	2029
Estimated Event Cost	$71,018

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not have an estimate for device and wiring replacement. Used $50/sq.m utility.	$0	m2	$0
2		721	Base Rate for Material and labour	$50	m2	$36,050
3		721	Construction Contingency	$8	m2	$5,408
4		721	Average Total Project Soft cost	$17	m2	$12,257
5		721	Site Factor - Base cost	$16	m2	$11,536
6		721	Site Factor - Contingency and soft cost	$8	m2	$5,768

Narratives

Event Description

Replace wiring and devices.

Event Justification & Strategy

The devices and wiring will be 45 years old and should be replaced. Reevaluation could extend the life, maybe.

Implication of Event Deferral (Risks)

If the devices are not replaced, there could be significant additional maintenance costs and/or disruptions.

Explosion proof wiring in hazardous storage rooms.

04.2A-070 Distribution Panels

Details	Values
Expected Life	30
Component Cost	6,567
Last Major Action Year	1984
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

There is one 84 circuit, 120/208 volt, 3 phase, 4 wire, 225 amp FPE panelboard c/w a 125 amp, 3 pole main breaker.

Component Condition & Anticipated Replacement Date

The panelboard is in good condition and because of the minimal use should be useable until at least 2030.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Double tub panel.

RP Replacement [04.2A-070 Distribution Panels]

Details	Values
Brief Description (40 Characters)	Replace Distribution Panel
Current event Year (YYYY)	2030
Estimated Event Cost	$6,567

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1	Base Rate for Material and Labour	$3,303	EACH	$3,303
2	04. Electrical	1	Construction Contingency	$495	EACH	$495
3	04. Electrical	1	Average Total Project Soft Costs	$1,139	EACH	$1,139
4		1	Site Factor - Base cost	$1,090	EACH	$1,090
5		1	Site Factor - Contingency & Soft Costs	$540	EACH	$540

Narratives

Event Description

Replace the panelboards.

Event Justification & Strategy

The panelboards will be over 45 years old and past their life expectancy. Use is low.

Implication of Event Deferral (Risks)

If panels are not replaced there could be loss of electrical integrity.

Main service breaker.

04.3A-010 General Lighting

Details	Values
Expected Life	30
Component Cost	37,544
Last Major Action Year	1984
Component Condition (For BCR use only)	Fair
Quantity	52
Measurement unit/ Metric	ea

Narratives

Component Description

Within the building the lighting consists of 400mm RLM dome incandescent fixtures above and below the mezzanine area. In the lower storage area there are T12 fluorescent fixtures and in the hazardous areas are Killarc explosion proof fixtures. There are 20 fluorescent fixtures and 32 incandescent.

Component Condition & Anticipated Replacement Date

The operation of this building is very limited and the demand on the electrical systems is very low. The fixtures are in fair condition but another 10 years would not be out of the question if lamps could be found. However, the fact that the lamps are T12 makes replacement somewhat mandatory. Therefore, schedule the replacement of fluorescent fixtures by 2016.

Assessment Criteria	Existence
Obsolete fixtures	
Default	Yes
	The T12 lamps are not readily available.

RML dome incandescent fixture.

CP Replacement [04.3A-010 General Lighting]

Details	Values
Brief Description (40 Characters)	Replace or Retrofit T12 Fixtures to T8
Current event Year (YYYY)	2016
Estimated Event Cost	$37,544

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	52	Base Rate for Material and Labour	$363	EACH	$18,876
2	04. Electrical	52	Construction Contingency	$54	EACH	$2,808
3	04. Electrical	52	Average Total Project Soft Costs	$125	EACH	$6,500
4		52	Site Factor - Base cost	$120	EACH	$6,240
5		52	Site Factor - Contingency and soft cost	$60	EACH	$3,120

Narratives

Event Description

Replace or refit fluorescent fixtures to T8 lamps.

Event Justification & Strategy

The fluorescent T12 lamps are no longer available. Replacement is advised.

Implication of Event Deferral (Risks)

If fixtures are not upgraded the lamps may not be available very soon and if they are, could be expensive.

Incandescent lamps and fixtures for mezzanine storage area.

04.3A-020 Exit Lighting

Details	Values
Expected Life	30
Component Cost	2,286
Last Major Action Year	1984
Component Condition (For BCR use only)	Poor
Quantity	2
Measurement unit/ Metric	ea

Narratives

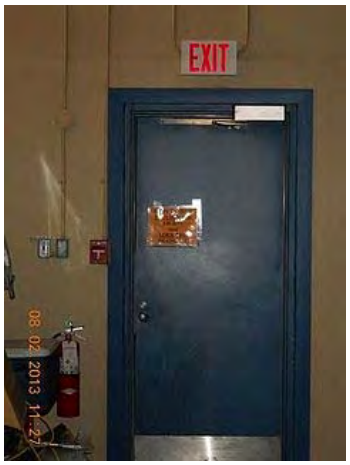
Component Description

The exit signs are extruded aluminum, English only LED type fixtures. They are connected to both 120 volt and the emergency battery packs.

Component Condition & Anticipated Replacement Date

The exit signs are in good physical condition but because they do not meet government standard for bilingualism, they are considered poor. Replace in 2014.

Assessment Criteria	Existence
Obsolete fixtures	
Default	Yes
	Fixtures do not meet government standards.



Exit sign.

RF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exit Signs
Current event Year (YYYY)	2014
Estimated Event Cost	$2,286

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$330	EACH	$660
2	04. Electrical	2	Construction Contingency	$50	EACH	$100
3	04. Electrical	2	Average Total Project Soft Costs	$114	EACH	$228
4		2	Site Factor - Base cost	$109	EACH	$218
5		2	Site Factor - Contingency & Soft Costs	$540	EACH	$1,080

Narratives

Event Description

Replace exit signs.

Event Justification & Strategy

The exit signs do not meet government standards for being bilingual.

Implication of Event Deferral (Risks)

Deferring this replacement event could promote safety concerns if there was a fire.

04.3A-030 Exterior Lighting

Details	Values
Expected Life	15
Component Cost	12,088
Last Major Action Year	1984
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	ea

Narratives

Component Description

There are 8 HPS fixtures mounted on the exterior of the building. Four are 250 watt mounted high on the building for yard security. The other four are low wattage and mounted adjacent to doorways.

Component Condition & Anticipated Replacement Date

Exterior wall fixtures are in average condition but have exceeded their life expectancy. Units should be replaced by 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Wall packs at front side of building.

RP Replacement [04.3A-030 Exterior Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exterior Lighting
Current event Year (YYYY)	2016
Estimated Event Cost	$12,088

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	8	Base Rate for Material and Labour	$760	EACH	$6,080
2	04. Electrical	8	Construction Contingency	$114	EACH	$912
3	04. Electrical	8	Average Total Project Soft Costs	$262	EACH	$2,096
4		8	Site Factor - Base cost	$251	EACH	$2,008
5		8	Site Factor - Contingency & Soft Costs	$124	EACH	$992

Narratives

Event Description

Replace exterior fixtures.

Event Justification & Strategy

The fixtures will be over 30 years old by the proposed event date. The units will also be past their life expectancy.

Implication of Event Deferral (Risks)

If exterior lighting is not replaced, security could be compromised.

Exterior site lighting.

04.3A-040 Emergency Lighting

Details	Values
Expected Life	18
Component Cost	0
Last Major Action Year	1984
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

There is one 12 volt emergency battery pack located in the central aisle. The integral heads illuminate between the two exits. Both exit signs are connected to the battery pack.

Component Condition & Anticipated Replacement Date

The emergency battery pack has been a part of the building operational maintenance program and should be maintained as so. The unit is in average condition, and an event has not been identified.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Battery pack.

04.4A-010 Grounding Systems

Details	Values
Expected Life	40
Component Cost	7,931
Last Major Action Year	1984
Component Condition (For BCR use only)	Good
Quantity	721
Measurement unit/ Metric	m

Narratives

Component Description

The grounding to the building distribution seems to be at the transformer but the conductor and ground rod are not visible.

Component Condition & Anticipated Replacement Date

The grounding is associated with the building distribution and therefore need not be replaced on its own but along with the distribution in 2024. The grounding would appear to be in good condition.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Grounding below transformer.

RP Replacement [04.4A-010 Grounding Systems]

Details	Values
Brief Description (40 Characters)	Replace or Reestablish Ground
Current event Year (YYYY)	2024
Estimated Event Cost	$7,931

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	721	Base Rate for Material and Labour	$5	m²	$3,605
2	04. Electrical	721	Construction Contingency	$1	m²	$721
3	04. Electrical	721	Average Total Project Soft Costs	$2	m²	$1,442

4	721	Site Factor - Base cost	$2	m2	$1,442
5	721	Site Factor - Contingency and soft cost	$1	m2	$721

Narratives

Event Description

Replace the grounding when the distribution is also completed.

Event Justification & Strategy

Grounding is integral with the distribution and is essential to the safety and operation of the electrical system.

Implication of Event Deferral (Risks)

If the grounding maintenance is neglected, both the safety and electrical operation could be compromised.

04.5A-010 Fire Alarm System

Details	Values
Expected Life	17
Component Cost	54,796
Last Major Action Year	1984
Component Condition (For BCR use only)	Average
Quantity	721
Measurement unit/ Metric	m2

Narratives

Component Description

There are two fire alarm control panels in the building. The Simplex 4009 is an extension of the Main Building alarm system, and the second is a two stage Simplex 4010 for a Carbon Dioxide fire suppression system to protect the two hazardous storage rooms. The fire alarm devices in the hazardous room are rated as such.

Component Condition & Anticipated Replacement Date

The fire alarm system in average condition and is tied to the main building system. Upgrading should be coordinated with the upgrade tentatively scheduled for 2018.

Expansion panel for local Fire Alarm system.

CP Replacement [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Upgrade Fire Alarm System
Current event Year (YYYY)	2018
Estimated Event Cost	$54,796

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	721	Base Rate for Material and Labour	$38	m²	$27,398
2	04. Electrical	721	Construction Contingency	$6	m²	$4,326
3	04. Electrical	721	Average Total Project Soft Costs	$13	m²	$9,373
4		721	Site Factor - Base cost	$13	m2	$9,373
5		721	Site Factor - Contingency and soft cost	$6	m2	$4,326

Narratives

Event Description

Replace or upgrade the fire alarm system when the main system is.

Event Justification & Strategy

It is essential the entire system is to code and operational.

Implication of Event Deferral (Risks)

If system is not kept up, safety could be compromised.

Gas cylinders for a Carbon Dioxide fire suppression system.

Explosion proof detector,

04.7A-070 Fan Powered Unit Electric Heaters

Details	Values
Expected Life	10
Component Cost	39,174
Last Major Action Year	1984
Component Condition (For BCR use only)	Average
Quantity	6
Measurement unit/ Metric	ea

Narratives

Component Description

There are six, 208 volt, 3 phase electric unit heaters. Four located in the open warehouse area and two in the hazardous storage areas.

Component Condition & Anticipated Replacement Date

The unit heaters are in average condition and because they have limited use should not need replacement or reevaluation until 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Electric Unit heater.

CP Replacement [04.7A-070 Fan Powered Unit Electric Heaters]

Details	Values
Brief Description (40 Characters)	Replace Electric Unit Heaters
Current event Year (YYYY)	2018
Estimated Event Cost	$39,174

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	6	Base Rate for Material and Labour	$3,284	EACH	$19,704
2	04. Electrical	6	Construction Contingency	$493	EACH	$2,958
3	04. Electrical	6	Average Total Project Soft Costs	$1,133	EACH	$6,798

4	6	Site Factor - Base cost	$1,083	EACH	$6,498
5	6	Site Factor - Contingency and soft cost	$536	EACH	$3,216

Narratives

Event Description

Replace the electrical unit heaters.

Event Justification & Strategy

The unit heaters are minimally used and maintain the basic heat to the structure. Parts may be an issue when the event date occurs.

Implication of Event Deferral (Risks)

If unit heaters are not maintained, there is little risk. However, improper space heating may be an issue during colder exterior temperatures.

Electric unit heater specification.

10. Whole Building Expenditures

10.1A-015 Building Condition Report

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	2013
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This asset was constructed 1984 and has the following characteristics;

- a single storey steel framed building, with a rectangular footprint and a gross area of 725sm.
- monoslope (1 in 6) metal roof, sloping down from south (high point) to north (low point).
- steel grating mezzanine supported by steel columns covering approximately 25% of the floor area. The mezzanine is accessed by two flights of steel stairs.
- overhead door with electrical operator on north side of the building (opens into the vehicle/boat compound).
- overhead door with electrical operator on east side of the building.

Component Condition & Anticipated Replacement Date

Currently, the asset and property have elements regarded in fair, average and good condition. This assessment depends on the element in question. The next building condition inspection and report (BCR) is scheduled for 2018.

RP New [10.1A-015 Building Condition Report]

Details	Values
Brief Description (40 Characters)	Produce New Building Condition Report
Current event Year (YYYY)	2018
Estimated Event Cost	$22,120

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	140	Base Rate for Material and Labour	$106	m²	$14,840
2	01. Architectural & Structural	140	Construction Contingency	$16	m²	$2,240
3	01. Architectural & Structural	140	Average Total Project Soft Costs	$36	m²	$5,040
4		0	Quantity of 140 used for appropriate total cost.	$0	EACH	$0

Narratives

Event Description

Conduct building condition inspections to evaluate all asset components for cyclical replacement. All data and relevant photos are to be entered into the appropriate AVS database. Export all element data from AVS and edit final report in MS Word.

Note, BCR implementation cost is calculated using the Base Rate costs for "Metal Roofing". Site correction factors are not used.

Event Justification & Strategy

Conducting BCRs is a PWGSC mandate for all assets to provide supporting asset condition information for the building Asset Management Plan (AMP) that is produced every five years.

Implication of Event Deferral (Risks)

Event delay would infringe on the cyclical production of the AMP. Timely replacements of numerous base building elements would be hindered and life safety issues may arise.

10.2A-010 Architectural - Enclosure Thermal Scan

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Asset enclosure evaluation for thermal performance pertaining to; thermal bridging, misplaced/missing insulation and air leakage, should be conducted every 5 years during the BCR cycle.

Component Condition & Anticipated Replacement Date

The asset enclosure is currently in average condition. The next enclosure thermal scan is scheduled for 2013.

RP New [10.2A-010 Architectural - Enclosure Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Enclosure Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$3,156

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$528	m²	$2,112

2	01. Architectural & Structural	4	Construction Contingency	$79	m²	$316
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$182	m²	$728
4		0	Quantity of 4 used for appropriate total cost.	$0	EACH	$0

Narratives

Event Description

Conduct thermal scan on building envelope from the exterior and interior during winter conditions, while the enclosure is under negative and positive interior pressures scenarios.

Note, event costing is derived from using Base Rate costs for "01.3-070C01 Aluminum Windows" to obtain approximately $3K. A location factor is not applied.

Event Justification & Strategy

Enclosure thermal scan will evaluate the building envelope's integrity with respect to air leakage and inner wall moisture presence/accumulation. The scan results will identify anomalies for correction to ensure continued wall performance. Overall energy consumption reduction may be affected.

Implication of Event Deferral (Risks)

Event deferral may risk the accumulation of inner wall moisture which in turn may risk damaging the inner and outer wall components. Delaminations are a possibility with unscheduled repairs.

10.2A-020 Mechanical - Water Testing

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The asset has numerous copper piping runs carrying domestic cold and hot water. Their integrity should be tested.

Component Condition & Anticipated Replacement Date

The existing piping appears to be adequate from the exterior. However, the interior pipe condition is unknown. The current condition can only be rated as average. As per code, the 30 year old piping needs to be tested via a water quality test in 2013 and every 5 years thereafter.

RF Domestic Water Quality [10.2A-020 Mechanical - Water Testing]

Details	Values
Brief Description (40 Characters)	Conduct Water Quality Testing
Current event Year (YYYY)	2013
Estimated Event Cost	$7,644

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	42	Base Rate for Material and Labour	$122	m	$5,124
2	03. Mechanical	42	Construction Contingency	$18	m	$756
3	03. Mechanical	42	Average Total Project Soft Costs	$42	m	$1,764
4		0	Quantity 42 used to obtain approximate $7.5K overall total.	$0	EACH	$0

Narratives

Event Description

Mandatory testing for leached copper and lead levels must be performed on the stagnant domestic water supplies, especially with respect to the domestic hot water. If test results return unacceptably high levels of those metals, an engineering evaluation needs to be undertaken to determine options.

Note, costing is derived from Base Rate costs for "Plumbing Piping". No location factor is included.

Event Justification & Strategy

This testing is a mandatory recommendation.

Implication of Event Deferral (Risks)

Postponing this water quality testing would contravene the code. Potential water contaminates would present life safety issues.

10.2A-030 Electrical - Arc Flash Identification

Details	Values
Expected Life	24
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 84 circuit 120/208 volt, 3 phase, 4 wire, 225 amp FPE panelboard c/w a 125 amp, 3 pole main breaker.

Component Condition & Anticipated Replacement Date

Once the existing components are labeled, no further action would be necessary unless there are utility system changes. All new equipment added after the study will have to be labeled individually. The process has not been done as of yet and is therefore considered to be in poor condition. Study should be done immediately in 2013.

Distribution for storage building.

RO Electrical [10.2A-030 Electrical - Arc Flash Identification]

Details	Values
Brief Description (40 Characters)	Provide Arc Flash Study and Identification
Current event Year (YYYY)	2013
Estimated Event Cost	$4,336

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	8	Base Rate for Material and Labour	$363	EACH	$2,904
2	04. Electrical	8	Construction Contingency	$54	EACH	$432
3	04. Electrical	8	Average Total Project Soft Costs	$125	EACH	$1,000
4		0	Quantity of 8 used for appropriate total costing.	$0	EACH	$0

Narratives

Event Description

Provide a study to determine the arc flash rating for each piece of electrical equipment and install a label as required.

Note, event costing is derived from using costing for "General Lighting" fixtures and no site correction factors.

Event Justification & Strategy

The labeling of electrical equipment with Arc Flash ratings is identified in the Canadian Electrical Code.

Implication of Event Deferral (Risks)

To avoid the implementation of Arc Flash labeling would be to contravene code and put lives at risk during maintenance tasks.

Main breaker in distribution panel.

10.2A-030 Electrical - Cleaning and Torque

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 84 circuit, 120/208 volt, 3 phase, 4 wire, 225 amp FPE panelboard c/w a 125 amp, 3 pole main breaker and one 45 kVA, 600 volt, 3 phase delta-wye Federal Pioneer transformer located on east wall of the storage room.

Component Condition & Anticipated Replacement Date

The equipment is in average condition but has had little preventive maintenance over the years. Cleaning and torquing should be done every 5 years and start in 2013.

Main distribution.

RP Life Extension [10.2A-030 Electrical - Cleaning and Torque]

Details	Values
Brief Description (40 Characters)	Clean & Torque All Electrical Terminations
Current event Year (YYYY)	2013
Estimated Event Cost	$1,482

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$330	EACH	$990
2	04. Electrical	3	Construction Contingency	$50	EACH	$150
3	04. Electrical	3	Average Total Project Soft Costs	$114	EACH	$342
4		0	Quantity of 3 used for appropriate total event costing.	$0	EACH	$0

Narratives

Event Description

Clean and retorque cable lugs and breakers and terminations on all electrical components.

Note, event costing is derived from "Exit Lighting" and no site correction factors.

Event Justification & Strategy

Preventive maintenance of major equipment in respect to cost and application is expedient for the overall health and operation of the building.

Implication of Event Deferral (Risks)

If this maintenance is not done regularly, the reliability of the system could be in jeopardy.

Clean and retorque transformer and other equipment.

10.2A-030 Electrical - Thermal Scan

Details	Values
Expected Life	2
Component Cost	0
Last Major Action Year	1983
Component Condition (For BCR use only)	Good
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

There is one 84 circuit, 120/208 volt, 3 phase, 4 wire, 225 amp FPE panelboard c/w a 125 amp, 3 pole main breaker and one 45 kVA, 600 volt, 3 phase delta-wye Federal Pioneer transformer located on east wall of the storage room.

Component Condition & Anticipated Replacement Date

Currently, the electrical components are considered in good condition. The next scan would be completed in 2013.

Main distribution.

RP Life Extension [10.2A-030 Electrical - Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Electrical Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$2,470

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	5	Base Rate for Material and Labour	$330	EACH	$1,650
2	04. Electrical	5	Construction Contingency	$50	EACH	$250
3	04. Electrical	5	Average Total Project Soft Costs	$114	EACH	$570
4		0	Quantity of 5 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Provide thermal scan of all terminations and electrically operating devices.

Note, event costing derived from using "Exit Lighting" base costs and no site correction factors.

Event Justification & Strategy

By taking responsibility of themographically scanning the electrical equipment, it is possible to catch problems before they become an emergency. Also, equipment can be trended for operation.

Implication of Event Deferral (Risks)

If thermal scanning is not completed when indicated, there is a risk of equipment failure causing operation outage and/or safety concerns.

Panelboard to be scanned.

AVS

Asset Performance Report

DFO-FWI - Wastewater Treatment Plant

August 2013

Prepared by: PWGSC – A&E CoE
Winnipeg, Manitoba
Edmonton, Alberta
Project - R.060627.001

TABLE OF CONTENTS

Details	Values
Construction Year (YYYY)	1974
Gross Area (square meters)	150
Date of current BCR	8/02/2013

Narratives

BCR Project Team and Documents

The BCR project team consists of:

Architectural:
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Drawings provided:

- As-built 1974 drawings (Arch., Civil, Mech., and Elec., note - Structural not available).

Building History

The Wastewater Treatment Building was designed and constructed in 1974. The building is a single storey steel framed building, with a rectangular footprint and a gross area of 150sm. The building includes a full height central wastewater treatment room. Ancillary rooms include: an ozonator room, enclosed office, workshop and hazardous material storage room. There is a small storage room which includes a hand sink. The building has no washroom facility. However, the original drawings did include one. Ceilings for ancillary rooms serve as mezzanines (north and south) for mechanical equipment, accessed from service ladders in the central full height room.

The steel structure is clad with precast concrete panels, is relatively high 6m (20') and has a flat roof.

There is a pair of 2.4m high exterior doors which serve the central wastewater treatment room.

There have been no major alterations / additions identified.

BCR Executive Summary

In general, the building is in good condition and has benefited from a very good maintenance program (refer to Lab/Administration Building BCR). For site work, refer to Lab/Administration Building BCR.

ARCHITECTURAL
There are no apparent issues with the structural steel superstructure. The building envelope is robust, clad entirely with precast concrete panels. There are no serious concerns with the building envelope. The original built-up roof has been replaced with a subsequent built-up roof. Roof leakage is not reported by maintenance staff.

Interior finishes in the water treatment and ancillary rooms are minimal, predominately painted block partitions, painted concrete floor and painted metal handrails and guards. Interior finishes in the water analysis room include vinyl tile floor and painted gypsum board ceiling, and built-in benching. These elements are in fair condition only.

To provide continued asset performance for the next 30 years, certain elements will require replacement and general maintenance. The estimated required funds have been categorized into the first 5 years and following 25 years for the major disciplines as followings;

First 5 years: $55K
Following 25 years: $475K

MECHANICAL
Heating of the open spaces is via electric unit heaters. There are small ventilation fans serving 2 storage rooms which appear to be adequate. There is a carbon dioxide extinguishing system serving the Chemical storage room, and a shower/eyewash station in the Acid Storage Room. Both systems are in good condition.

First 5 years: $30K
Following 25 years: $416K

ELECTRICAL
The Water Treatment Plant (WTP) was built in 1974. All the equipment is original and services are tied to the Lab building. Now 40 years old, and under the industrial function of the building, the equipment has an increased risk of breakdown. The risk of maintaining continued operation is quite high without initiating a functional analysis and design to upgrade or replace the equipment and systems.

Cleaning, retorquing, and thermographic scanning are suggested to ensure the electrical systems continue to perform for the next 30 years.

First 5 years: $22K
Following 25 years: $214K

In addition to the element replacement cost summaries above, the asset will also require cyclical inspections be carried out on several building systems, over the next 30 years. The summarized costs are as follows;

First 5 years: $37K
Following 25 years: $273K

Overview Architectural & Structural Condition

There are no apparent issues with the structural steel superstructure. The building envelope is robust, clad entirely with precast concrete panels. There are no serious concerns with the building envelope. The original built-up roof has been replaced with a subsequent built-up roofing system in 1995. Roof leakage is not reported by maintenance staff.

Interior finishes in the water analysis room area are original and are deteriorated, including vinyl tile floor, painted concrete block walls, painted gypsum board ceiling, painted metal doors and frames. The water analysis room includes a plastic laminate work surface complete with sink, lower cabinets/ drawers. Plastic laminate is delaminating and repair is required. Interior finishes in the treatment and service rooms include: painted concrete block partitions, painted concrete floor, painted doors and frames.

Overall architectural elements and finishes have a condition ranging from poor to average.

The asset's structural components are considered to be in good condition.

Overview Site Condition

Refer to Lab/Administration Building BCR for all site related elements and the overall condition information.

Overview of Electrical Systems Condition

The Water Treatment Plant (WTP) was built in 1974. All the equipment is original and services are tied to the Lab building. Now 40 years old, and under the industrial function of the building, the equipment has an increased risk of breakdown. The risk of maintaining continued operation is quite high without initiating a functional analysis and design to upgrade or replace the equipment and systems.

Compliance with Accessibility Standards

Not applicable. This building is accessed on an intermittent basis by maintenance staff, who are required to be able-bodied.

Code Compliance Summary

All Architectural, Structural, Mechanical and Electrical site inspections only revealed one obvious code violation. The infraction deals with the EXIT signs. Refer to report section "04.3A-020 Exit Lighting" for complete details.

01. Architectural & Structural

01.1A-010 Footings & Foundations

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

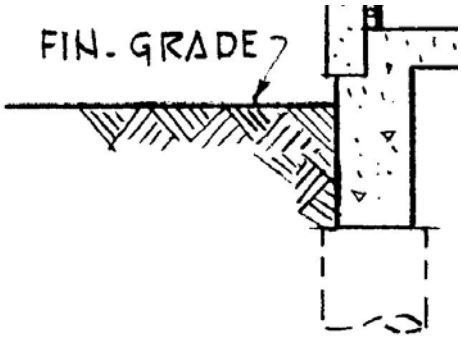
Although structural drawings were not available, the supporting structure is expected to be similar to other buildings in the facility, cast in place concrete piles supporting a perimeter grade beam and steel superstructure. Note, architectural drawings do indicate piles and a perimeter concrete grade beam. A large service pit for mechanical equipment is situated in the asset's northwest corner. Pit walls are reinforced concrete.

Component Condition & Anticipated Replacement Date

Since no reported settlements or visual deficiencies were evident, the underlying piles and concrete grade beam are presumed to be in good condition. Their replacement is not expected until 2084. This date is beyond this BCR timeline and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Foundation elements from architectural drawings - pile and perimeter concrete grade beam.

01.2-010C15 Frame - Steel

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Structure framing consists of 11 wide flange steel columns positioned only along the perimeter walls. There are no interior, midspan columns. At roof level, all columns are connected with "I" beams.

Component Condition & Anticipated Replacement Date

All interior painted steel framing appeared to be in good functional condition. These members may need replacement in 2084. This is far beyond this BCR event window and no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Painted steel structure - columns and upper beam.

01.2-020C10 Slab on Grade - Concrete

Details	Values
Expected Life	110
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Although unconfirmed, (structural drawings unavailable) the architectural drawings indicate a 150mm slab on grade that is a monolithic pour with the perimeter concrete grade beam.

Component Condition & Anticipated Replacement Date

No cracks or differential settlement is evident. The concrete is painted and paint is in poor condition. The actual slab on grade is considered in good structural condition and will not require replacement during the next 30 years (anticipated in 2084) - no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Slab on grade with painted wearing surface - worn.

01.2-030C10 Slab above Grade - Wood

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	75
Measurement unit/ Metric	m2

Narratives

Component Description

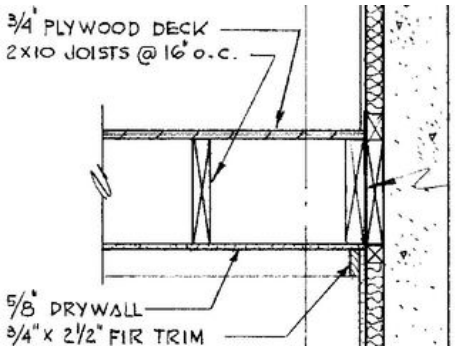
The above grade mezzanine floor structure is a wood assembly, consisting of; 38mm x 235mm (2 x 10) floor joists spaced every 406mm (16"), 19mm (3/4") plywood deck and 16mm (5/8") drywall underside. Note, the solvent storage room has 2 layers of 16mm fire rated drywall on the ceiling.

Component Condition & Anticipated Replacement Date

The actual wood floor framing is considered to be in average condition. With a potential replacement date of 2049, an event is not included in this BCR document.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Mezzanine floor structure - wood assembly.

01.2-040C15 Roof Structure - Steel Joist + Steel Deck

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Roof Framing consists of: 38mm steel deck on 600 OWSJ at 1500mm o.c. on wide flange steel beams. All joists run north-south and are approximately 10.9m (36') long. The structural steel elements are all painted yellow.

Component Condition & Anticipated Replacement Date

All interior structural steel framing is regarded in good functional condition. The replacement date is estimated for 2049. Being outside the BCR 30 year window, no event is included.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Painted roof structure - OWSJ and metal decking.

01.2-050C10 Entrance Soffit

Details	Values
Expected Life	40
Component Cost	2,098
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	m2

Narratives

Component Description

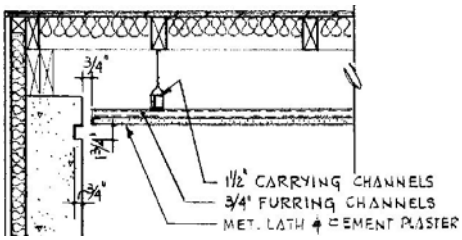
A rectangular cement plaster soffit is located over main entrance. The metal lath and plaster are supported by 38mm carrying channels and 19mm furring channels.

Component Condition & Anticipated Replacement Date

The assembly is considered to be in average condition and may need replacement in eight years or 2021.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Cement plaster soffit over main east entrance.

RP Replacement [01.2-050C10 Entrance Soffit]

Details	Values
Brief Description (40 Characters)	Replace Entrance Soffit
Current event Year (YYYY)	2021
Estimated Event Cost	$2,098

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$528	m²	$1,056
2	01. Architectural & Structural	2	Construction Contingency	$79	m²	$158

3	01. Architectural & Structural	2	Average Total Project Soft Costs	$182	m²	$364
4		2	LCF - Material & Labour	$174	m2	$348
5		2	LCF - Contingency & Soft Costs	$86	m2	$172
6		0	Quantity of 2 used for plaster soffit, not a full canopy assembly.	$0	EACH	$0

Narratives

Event Description

Replace cement plaster soffit over main entrance.

Used costing for interior ceiling - Lath & Plaster Ceiling.

Event Justification & Strategy

Replacement will ensure plaster soffit is free from cracks. New material will inhibit possible delamination.

Implication of Event Deferral (Risks)

Event delay may promote falling plaster. Safety may be an issue.

Plaster soffit over main entrance. Also note, iron spotting on concrete panels.

01.3-010C25 Exterior Wall - Concrete, Precast Panels

Details	Values
Expected Life	50
Component Cost	240,130
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	295
Measurement unit/ Metric	m2

Narratives

Component Description

The exterior wall system consists of;

- 150mm thick precast concrete panels,
- 50mm batt insulation and vapour barrier,
- 38mm x 38mm wood strapping at 406mm o.c.,
- 10mm particle board

Exterior precast cladding consists of ribbed and flat panels with light to medium exposed aggregate. Vertical joints are intended to be caulked, horizontal joints are intended to be left open.

Component Condition & Anticipated Replacement Date

Exterior precast panels are in average condition. There were no apparent major cracks, misalignments or areas of damage. There are localized areas of spalling, caused by rusting of reinforcing steel in the panels. Spalling is relatively minor with repairs recommended in 2016 for cosmetic, not structural reasons. Joint sealant is in average condition. Note, the anticipated replacement date is 2024. However, future BCR inspections may push this date back if panels remain functional.

Assessment Criteria	Existence
Surface cracking or spalling	
Default	Yes
Surface staining or discoloration	
Default	Yes

Precast concrete wall panels.

RP Life Extension [01.3-010C25 Exterior Wall - Concrete, Precast Panels]

Details	Values
Brief Description (40 Characters)	Refurbish Precast Concrete Panels
Current event Year (YYYY)	2016
Estimated Event Cost	$8,140

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	10	Base Rate for Material and Labour	$410	m²	$4,100
2	01. Architectural & Structural	10	Construction Contingency	$61	m²	$610
3	01. Architectural & Structural	10	Average Total Project Soft Costs	$141	m²	$1,410
4		10	LCF - Material & Labour	$135	m2	$1,350
5		10	LCF - Contingency & Soft Costs	$67	m2	$670
6		0	Quantity of 10 used for refurbishment tasks only.	$0	EACH	$0

Narratives

Event Description

Reseal precast panel joints where required, and remove and patch iron spotting in precast panels.

Event Justification & Strategy

Panel refurbishment will prevent water ingress and maintain appearance.

Implication of Event Deferral (Risks)

Event deferral may lead to enhanced panel decay from continued spalling and rusting. Appearance and panel anchorage would be issues.

Iron spotting on west wall near southwest corner.

CP Replacement [01.3-010C25 Exterior Wall - Concrete, Precast Panels]

Details	Values
Brief Description (40 Characters)	Replace Precast Concrete Panels
Current event Year (YYYY)	2024
Estimated Event Cost	$240,130

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	295	Base Rate for Material and Labour	$410	m²	$120,950
2	01. Architectural & Structural	295	Construction Contingency	$61	m²	$17,995
3	01. Architectural & Structural	295	Average Total Project Soft Costs	$141	m²	$41,595
4		295	LCF - Material & Labour	$135	m2	$39,825
5		295	LCF - Contingency & Soft Costs	$67	m2	$19,765

Narratives

Event Description

Replace exterior precast concrete panels.

Event Justification & Strategy

Panel replacement will promote proper panel appearance.

Implication of Event Deferral (Risks)

Unless individual panel movement occurs from rusted anchors, event delay would have a low risk.

01.3-030C20 Exterior Wall - Blowout Panel

Details	Values
Expected Life	50
Component Cost	3,744
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	m2

Narratives

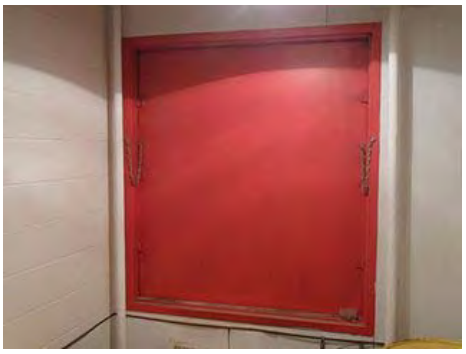
Component Description

The Solvent Storage room (original drawings) has a 1.5m x 1.5m insulated blowout metal panel.

Component Condition & Anticipated Replacement Date

The insulated blowout panel is considered in average condition and may not require replacement until 2024. The faded exterior requires painting and is covered under report section "01.5-060C15 Paint".

Assessment Criteria	Existence
Deteriorated finishes	
Default	Yes



Blowout panel at hazardous substance storage room.

RP Replacement [01.3-030C20 Exterior Wall - Blowout Panel]

Details	Values
Brief Description (40 Characters)	Replace Blowout Panel
Current event Year (YYYY)	2024
Estimated Event Cost	$3,744

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	3	Base Rate for Material and Labour	$628	m²	$1,884
2	01. Architectural & Structural	3	Construction Contingency	$94	m²	$282

3	01. Architectural & Structural	3	Average Total Project Soft Costs	$217	m²	$651
4		3	LCF - Material & Labour	$207	m2	$621
5		3	LCF - Contingency & Soft Costs	$102	m2	$306

Narratives

Event Description

Replace blowout panel.

Event Justification & Strategy

By event date, panel damage and corrosion may be an issue. New panel will promote proper function during an emergency.

Implication of Event Deferral (Risks)

Event deferral may lead to improper blowout panel operation during an emergency.

Blowout panel - exterior view.

01.3-060C01 Aluminum Doors

Details	Values
Expected Life	50
Component Cost	9,717
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Main entrance door is dark brown anodized aluminum door in a matching aluminum frame. The vision panel is nearly full height and width. Nominal opening is 1m wide by 2.14m high.

Component Condition & Anticipated Replacement Date

The main entrance door is regarded in average condition. Replacement may be required in 2024.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Fully glazed aluminum entry door with panic bar hardware.

RP Replacement [01.3-060C01 Aluminum Doors]

Details	Values
Brief Description (40 Characters)	Replace Aluminum Entrance Door
Current event Year (YYYY)	2024
Estimated Event Cost	$9,717

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$4,888	EACH	$4,888
2	01. Architectural & Structural	1	Construction Contingency	$733	EACH	$733
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$1,686	EACH	$1,686
4		1	LCF - Material & Labour	$1,612	EACH	$1,612
5		1	LCF - Contingency & Soft Costs	$798	EACH	$798

Narratives

Event Description

Replace main entrance aluminum/glazed door and all related trims.

Event Justification & Strategy

A new door will ensure proper alignment and function.

Implication of Event Deferral (Risks)

Event postponement may promote improper door operation during normal and emergency conditions.

Main entrance with aluminum framed door having nearly full glazing.

01.3-060C10 Exterior Metal Doors

Details	Values
Expected Life	45
Component Cost	7,881
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

West entry (west side of building). Total opening is 2.14m wide by 2.74m high with double metal doors.

East exit (east side of building). Total opening is 1m wide by 2.4m high with single door.

All exterior doors are mounted in a painted press steel frame.

Component Condition & Anticipated Replacement Date

The metal doors and frames have some rust and paint fading evident on the outside. Doors are in average condition with many dents and scratches. Depending on usage, their replacement may be required in 2019. Refer to report section "01. 5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes
	Dents, scratches and faded exterior paint.

Painted metal door on east exposure.

RP Replacement [01.3-060C10 Exterior Metal Doors]

Details	Values
Brief Description (40 Characters)	Replace Exterior Metal Doors
Current event Year (YYYY)	2019
Estimated Event Cost	$7,881

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	3	Base Rate for Material and Labour	$1,321	EACH	$3,963
2	01. Architectural & Structural	3	Construction Contingency	$198	EACH	$594
3	01. Architectural & Structural	3	Average Total Project Soft Costs	$456	EACH	$1,368
4		3	LCF - Material & Labour	$436	EACH	$1,308
5		3	LCF - Contingency & Soft Costs	$216	EACH	$648

Narratives

Event Description

Replace all exterior metal doors, excluding the main entrance aluminum door.

Event Justification & Strategy

Element will have reached its life expectancy.

Implication of Event Deferral (Risks)

Event deferral may promote further damage and inhibit proper egress during an emergency situation.

Exterior metal door with dents, scratches and faded surface.

01.3-070C01 Aluminum Windows

Details	Values
Expected Life	50
Component Cost	4,196
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	4
Measurement unit/ Metric	m2

Narratives

Component Description

The office window utilizes a double panel fixed window unit. Window framing: 3mm thick extruded aluminum framing, thermally broken, steel reinforced, dark bronze anodized colour. Glazing: hermetically sealed double glazed units consisting of 6mm polished plate glass inboard, 12mm air space, 6mm solar type bronze coloured polished plate glass outboard, complete with steel spacer. Sill is preformed, colour matched, extruded aluminum.

Component Condition & Anticipated Replacement Date

The aluminum frame and sash are both in good condition. The caulk joint between the glass and the sash is deteriorated and should be replaced. Also, it is noted the caulk joint at the top of the window (between the frame and the precast concrete) is not continuous. Fix caulking issues in 2013 and full assembly replacement may be required in 2024.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Aluminum window.

RP Life Extension [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Window Caulking
Current event Year (YYYY)	2013
Estimated Event Cost	$789

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$528	m²	$528
2	01. Architectural & Structural	1	Construction Contingency	$79	m²	$79
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$182	m²	$182
4		0	LCF costs not used for minor maintenance.	$0	EACH	$0

Narratives

Event Description

Replace all caulking associated with window glazing and framing. Repeat event every 15 years.

Event Justification & Strategy

Refurbishing all caulking will promote a proper thermal and water barrier.

Implication of Event Deferral (Risks)

Delaying this refurbishment event would promote increased heat loss and possible water ingression into the wall system and interior space.

RP Replacement [01.3-070C01 Aluminum Windows]

Details	Values
Brief Description (40 Characters)	Replace Glazed Window Units
Current event Year (YYYY)	2025
Estimated Event Cost	$4,196

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	4	Base Rate for Material and Labour	$528	m²	$2,112
2	01. Architectural & Structural	4	Construction Contingency	$79	m²	$316
3	01. Architectural & Structural	4	Average Total Project Soft Costs	$182	m²	$728
4		4	LCF - Material & Labour	$174	m2	$696
5		4	LCF - Contingency & Soft Costs	$86	m2	$344

Narratives

Event Description

Replace glazed sealed units. This task may not include framing. Costing includes framing but may not be required at event date.

Event Justification & Strategy

Over time, the glazing seals dry out and increased heat loss would be an issue. New glazing units and possibly framing would ensure proper performance.

Implication of Event Deferral (Risks)

Event deferral may lead to increased heat loss and water damage to surrounding surfaces and enclosure systems.

Aluminum framed window in office/lab.

01.3A-065 Exterior Door Hardware

Details	Values
Expected Life	15
Component Cost	1,446
Last Major Action Year	1999
Component Condition (For BCR use only)	Fair
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

West entry (west side of building). Total opening is 2.14m wide by 2.74m high with double metal doors. Hardware includes pull, lockset on active leaf, no closer, weather-stripping.

East exit (east side of building). Total opening is 1m wide by 2.4m high with single door. Hardware includes no exterior trim, lockset, no closer, weather-stripping.

Main entrance hardware includes = hinges, closer, exit device (panic bar), weather-stripping and aluminum threshold.

Component Condition & Anticipated Replacement Date

Main entrance door = hardware in average condition and good working order.

East and West metal doors hardware = hardware in average condition and good working order.

Implement hardware replacement in 2014, wherever required to ensure proper operation and seals.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Exterior door hardware - panic bar, aluminum threshold and weather-stripping.

RP Replacement [01.3A-065 Exterior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Exterior Door Hardware
Current event Year (YYYY)	2014
Estimated Event Cost	$1,446

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$727	EACH	$727
2	01. Architectural & Structural	1	Construction Contingency	$109	EACH	$109
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$251	EACH	$251
4		1	LCF - Material & Labour	$240	EACH	$240
5		1	LCF - Contingency & Soft Costs	$119	EACH	$119

Narratives

Event Description

Replace exterior door hardware where required. Since doors have limited use, costing is for one door only.

Event Justification & Strategy

New exterior door hardware will maintain proper operability and reduce heat loss.

Implication of Event Deferral (Risks)

Delaying this task will promote life safety concerns during an emergency situation.

Damaged hinge at east door.

Worn weather-stripping at Doors on west side.

01.4-010C05 Built-up Roof, Tar & Gravel Roof

Details	Values
Expected Life	20
Component Cost	37,350
Last Major Action Year	1995
Component Condition (For BCR use only)	Fair
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Visual Inspection was not possible due to snow cover. Records indicate the original built-up roof was replaced with another built-up roof in 1995.

Component Condition & Anticipated Replacement Date

There are no roof inspection reports. Maintenance staff have no reports of leakage. As such, based on an in service date of 1995, this roof is considered in fair condition. Replacement may be warranted in 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [01.4-010C05 Built-up Roof, Tar & Gravel Roof]

Details	Values
Brief Description (40 Characters)	Replace Roof Assembly
Current event Year (YYYY)	2020
Estimated Event Cost	$37,350

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	150	Base Rate for Material and Labour	$126	m²	$18,900
2	01. Architectural & Structural	150	Construction Contingency	$19	m²	$2,850
3	01. Architectural & Structural	150	Average Total Project Soft Costs	$43	m²	$6,450
4		150	LCF - Material & Labour	$41	m2	$6,150
5		150	LCF - Contingency & Soft Costs	$20	m2	$3,000
6		0	Costing is for 2-ply SBS assembly.	$0	EACH	$0

Narratives

Event Description

Replace roof assembly with 2-ply SBS roofing system.

Event Justification & Strategy

The existing roof assembly will have reached its expected service life. Roof replacement will promote continued and proper thermal and moisture barriers.

Implication of Event Deferral (Risks)

Unless the roof system develops leaks, event delay would have low to moderate risks. Even if the roof system does not leak, the insulation may be wet and increased heat loss would be an issue.

01.5-010C01 Concrete Block Partition

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	150
Measurement unit/ Metric	m2

Narratives

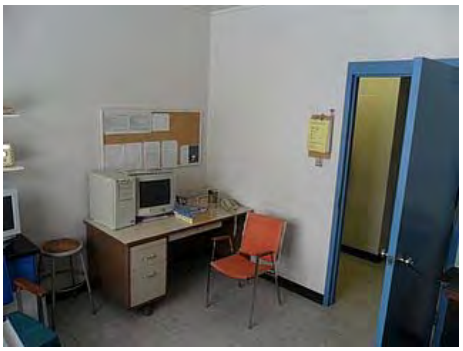
Component Description

All interior partitions are constructed with 150mm concrete block. Note, the Solvent Storage room has 200mm thick partition walls. Most block walls are painted while some are clad with painted drywall or wood.

Component Condition & Anticipated Replacement Date

The interior block wall are at midlife and considered in average condition. Note there is a 25mm diameter hole in the partition between the work room and workshop. Since replacement is scheduled for 2049, no event is included in this BCR. Refer to report section "01.5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Physical damage or deterioration	
Default	Yes



Typical interior concrete block partition.

RP Life Extension [01.5-010C01 Concrete Block Partition]

Details	Values
Brief Description (40 Characters)	Patch Concrete Block Walls
Current event Year (YYYY)	2014
Estimated Event Cost	$604

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$152	m²	$304
2	01. Architectural & Structural	2	Construction Contingency	$23	m²	$46
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$52	m²	$104
4		2	LCF - Material & Labour	$50	m2	$100
5		2	LCF - Contingency & Soft Costs	$25	m2	$50
6		0	Quantity of 2 used for maintenance tasks only.	$0	EACH	$0

Narratives

Event Description

Patch opening in wall and modify / replace access cover.

Event Justification & Strategy

This event will maintain facility aesthetics.

Implication of Event Deferral (Risks)

Event delay would only risk appearance issue.

Cover Plate removed and lying on floor.

Hole in concrete block.

01.5-050C15 Interior Metal Doors

Details	Values
Expected Life	60
Component Cost	17,276
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	7
Measurement unit/ Metric	ea

Narratives

Component Description

Typical interior doors are painted metal and range from 710mm to 1524mm wide and are typically 2130mm high. The narrow doorway is for the washroom while the widest door is two slabs servicing the Ozonator room. The office, entrance vestibule and washroom doors/frames are painted medium blue, while the remaining interior doors/frames are painted a red-orange.

Component Condition & Anticipated Replacement Date

Doors in average condition. Hardware in average condition and good working order. Refer to report section "01.5-060C15 Paint" for repainting. Note, office door does not stay in open position. Complete door replacements may be warranted in 2034.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical interior painted metal doors.

RP Replacement [01.5-050C15 Interior Metal Doors]

Details	Values
Brief Description (40 Characters)	Replace Interior Metal Doors
Current event Year (YYYY)	2034
Estimated Event Cost	$17,276

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	7	Base Rate for Material and Labour	$1,242	EACH	$8,694

2	01. Architectural & Structural	7	Construction Contingency	$186	EACH	$1,302
3	01. Architectural & Structural	7	Average Total Project Soft Costs	$428	EACH	$2,996
4		7	LCF - Material & Labour	$409	EACH	$2,863
5		7	LCF - Contingency & Soft Costs	$203	EACH	$1,421

Narratives

Event Description

Replace all seven interior doors and frames.

Event Justification & Strategy

By 2034, doors may have significant damage and proper operation may be an issue.

Implication of Event Deferral (Risks)

Delaying this event may promote improper operation during an emergency. Life safety would be an issue.

01.5-060C15 Paint

Details	Values
Expected Life	10
Component Cost	17,600
Last Major Action Year	2006
Component Condition (For BCR use only)	Fair
Quantity	800
Measurement unit/ Metric	m2

Narratives

Component Description

Walls, partitions, doors and frames, ladders, handrails and concrete floors are painted various colours.

Component Condition & Anticipated Replacement Date

All painted surfaces (doors, frames, walls, ceilings, railing, ladders and walls) are in fair condition. Repaint all surfaces in 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical painted block wall and ceiling.

RP Replacement [01.5-060C15 Paint]

Details	Values
Brief Description (40 Characters)	Repaint Interior Surfaces
Current event Year (YYYY)	2016
Estimated Event Cost	$17,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	800	Base Rate for Material and Labour	$11	m²	$8,800
2	01. Architectural & Structural	800	Construction Contingency	$2	m²	$1,600
3	01. Architectural & Structural	800	Average Total Project Soft Costs	$4	m²	$3,200
4		800	LCF - Material & Labour	$3	m2	$2,400
5		800	LCF - Contingency & Soft Costs	$2	m2	$1,600

Narratives

Event Description

Implement cyclical repainting program for walls, ceilings, doors and frames and structural elements.

Event Justification & Strategy

This event will maintain facility aesthetics.

Implication of Event Deferral (Risks)

Event postponement would risk promoting a dull and unprofessional appearance.

01.5-060C25 Board Sheathing Wall Finish

Details	Values
Expected Life	10
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	280
Measurement unit/ Metric	m2

Narratives

Component Description

Interior face of exterior wall is painted particle board sheathing.

Component Condition & Anticipated Replacement Date

Sheathing boards are stained at studs, caused by condensation due to lack of insulation. Particle board finish is generally in good condition. However, fasteners beginning to rust due to moist environment. Some damage where pneumatic lines were attached to the walls. Overall element condition is regarded as fair. Starting in 2014, budget to replace approximately 100m2 every 10 years.

Assessment Criteria	Existence
Stains and discolouration	
Default	Yes

Painted wall sheathing.

RP Life Extension [01.5-060C25 Wood Sheathing Wall Finish]

Details	Values
Brief Description (40 Characters)	Replace Damaged Sheathing Boards
Current event Year (YYYY)	2014
Estimated Event Cost	$6,840

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	45	Base Rate for Material and Labour	$77	m²	$3,465
2	01. Architectural & Structural	45	Construction Contingency	$11	m²	$495
3	01. Architectural & Structural	45	Average Total Project Soft Costs	$26	m²	$1,170
4		45	LCF - Material & Labour	$25	m2	$1,125
5		45	LCF - Contingency & Soft Costs	$13	m2	$585
6		0	Quantity of 45 used for selective sheathing replacement.	$0	EACH	$0

Narratives

Event Description

Replace damaged sheathing boards, where required.

Event Justification & Strategy

A professional appearance will be maintained. Health and safety issues would be inhibited (prevent damaged boards from falling).

Implication of Event Deferral (Risks)

Event delay may risk improper equipment fastening to walls.

01.5-070C20 Plywood Floor

Details	Values
Expected Life	25
Component Cost	6,750
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	75
Measurement unit/ Metric	m2

Narratives

Component Description

Mezzanine floors are unpainted 19mm plywood.

Component Condition & Anticipated Replacement Date

Mezzanine plywood walking surfaces are unpainted and water stained throughout. Overall, condition is viewed as fair. To prolong usage, painting is recommended in 2014. Plywood element may need to be replaced in eight years or 2021.

Assessment Criteria	Existence
Deterioration of surface finish	
Default	Yes
	Water stains throughout.

Typical mezzanine floor - water stained plywood.

RP New [01.5-070C20 Plywood Floor] - Painting

Details	Values
Brief Description (40 Characters)	Paint Mezzanine Plywood Floors
Current event Year (YYYY)	2014
Estimated Event Cost	$3,600

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	150	Base Rate for Material and Labour	$12	m²	$1,800

2	01. Architectural & Structural	150	Construction Contingency	$2	m²	$300
3	01. Architectural & Structural	150	Average Total Project Soft Costs	$4	m²	$600
4		150	LCF - Material & Labour	$4	m2	$600
5		150	LCF - Contingency & Soft Costs	$2	m2	$300

Narratives

Event Description

Paint plywood mezzanine floors with durable or epoxy paint. Note, event costing is for durable paint and quantity is increased to 150 for floor prepping and painting around mechanical equipment. Repaint plywood floors every 12 years.

Event Justification & Strategy

Event will provide a protective costing to prevent water leakage and damage to gypsum ceilings below.

Implication of Event Deferral (Risks)

Not painting the existing plywood floors would promote increased wear and accelerated deterioration.

RP Replacement [01.5-070C20 Plywood Floor]

Details	Values
Brief Description (40 Characters)	Replace Plywood Floor
Current event Year (YYYY)	2021
Estimated Event Cost	$6,750

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		75	Base Rate Material & Labour	$45	m2	$3,375
2		75	Project Contingency	$7	m2	$525
3		75	Project Soft Costs	$16	m2	$1,200
4		75	LCF - Material & Labour	$15	m2	$1,125
5		75	LCF - Contingency & Soft Costs	$7	m2	$525

Narratives

Event Description

Replace plywood wearing surface on mezzanine floors.

Note, there is no AVS costing for plywood floor replacement. Costing derived from RSMeans 2012 Maintenance and Repair Cost.

Event Justification & Strategy

Even with new paint, the plywood flooring will be very worn and warrant replacement. New plywood would provide a safe walking surface.

Implication of Event Deferral (Risks)

Event delay would inhibit proper footing for service personnel.

Mezzanine flooring with deteriorated plywood finish.

01.5-070C35 Painted Concrete Floor

Details	Values
Expected Life	10
Component Cost	4,800
Last Major Action Year	1974
Component Condition (For BCR use only)	Poor
Quantity	100
Measurement unit/ Metric	m2

Narratives

Component Description

Floors in the service rooms are painted concrete.

Component Condition & Anticipated Replacement Date

Painted concrete floor areas are very flaked and worn. Condition is regarded as poor. All painted floor regions should be cleaned and repainted in 2014.

Assessment Criteria	Existence
Discolouration or staining	
Default	Yes
Excessive peeling or flaking	
Default	Yes
Excessive wear	
Default	Yes

Paint finish at floor drain damaged and worn.

RP Replacement [01.5-070C35 Painted Concrete Floor]

Details	Values
Brief Description (40 Characters)	Repaint Concrete Floors
Current event Year (YYYY)	2014
Estimated Event Cost	$4,800

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	200	Base Rate for Material and Labour	$12	m²	$2,400
2	01. Architectural & Structural	200	Construction Contingency	$2	m²	$400
3	01. Architectural & Structural	200	Average Total Project Soft Costs	$4	m²	$800
4		200	LCF - Material & Labour	$4	m2	$800
5		200	LCF - Contingency & Soft Costs	$2	m2	$400
6		0	Quantity of 200 used due to extra floor prepping required.	$0	EACH	$0

Narratives

Event Description

Properly prepare and repaint concrete floor areas.

Event Justification & Strategy

This repainting event will improve maintenance and appearance.

Implication of Event Deferral (Risks)

Event delay would have low risks. Appearance factor would be poor.

Worn and chipped paint finish on concrete floor.

01.5-070C60 Vinyl Floor Tile

Details	Values
Expected Life	20
Component Cost	2,910
Last Major Action Year	1994
Component Condition (For BCR use only)	Poor
Quantity	30
Measurement unit/ Metric	m2

Narratives

Component Description

Vinyl tile is located in the following rooms; entrance vestibule, hall, office/lab and washroom. All tiles are: 305mm x 305mm x 3mm thick with a marbleized pattern. These rooms have the following resilient base: 3mm thick x 100mm high, vinyl, top set, cove bottom with preformed corners.

Component Condition & Anticipated Replacement Date

The floor tile is in poor condition throughout, lifting, chipped and the base is peeling away from the walls in many places. Replacement is recommended to occur in 2014.

Assessment Criteria	Existence
Cracks	
Default	Yes
Loose tiles or debonded areas	
Default	Yes
Stains and discolouration	
Default	Yes

Vinyl floor tile in office and hall areas.

RP Replacement [01.5-070C60 Vinyl Floor Tile]

Details	Values
Brief Description (40 Characters)	Replace Vinyl Floor Tile
Current event Year (YYYY)	2014
Estimated Event Cost	$2,910

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	30	Base Rate for Material and Labour	$49	m²	$1,470
2	01. Architectural & Structural	30	Construction Contingency	$7	m²	$210
3	01. Architectural & Structural	30	Average Total Project Soft Costs	$17	m²	$510
4		30	LCF - Material & Labour	$16	m2	$480
5		30	LCF - Contingency & Soft Costs	$8	m2	$240

Narratives

Event Description

Replace vinyl tile flooring and related base coves.

Event Justification & Strategy

New vinyl tiles will improve maintenance and promote a professional appearance.

Implication of Event Deferral (Risks)

Event delay would promote an increased poor appearance and tripping hazards would be a reality.

Chipped and lifted vinyl tile. Also note, worn paint finish on concrete floor.

01.5-080C10 Gypsum Board Ceiling

Details	Values
Expected Life	40
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Poor
Quantity	70
Measurement unit/ Metric	m2

Narratives

Component Description

Gypsum board ceilings (16mm) applied to main runners and cross furring, are provided for all rooms except the Waste Treatment room and the Ozonator room (which have the steel deck exposed). Note, the Solvent Storage room (currently the PCB storage room) has two layers of 10mm fire rated gypsum board.

Component Condition & Anticipated Replacement Date

There is evidence of recurring moisture damage on the ceilings. It is not known whether the water is internal (from the mechanical systems within the building) or external (roof leak). In places, the ceilings have been patched more than once. The top of the mezzanine floor also has evidence of water damage. Repair and paint ceilings in 2015. Refer to element "01.5-060C15 Paint" for repainting.

Assessment Criteria	Existence
Stains and discolouration	
Default	Yes

Gypsum ceiling in workshop room, unpainted, water stained and hole.

RP Life Extension [01.5-080C10 Gypsum Board Ceiling]

Details	Values
Brief Description (40 Characters)	Repair and Paint Ceilings
Current event Year (YYYY)	2015
Estimated Event Cost	$5,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	25	Base Rate for Material and Labour	$119	m²	$2,975
2	01. Architectural & Structural	25	Construction Contingency	$18	m²	$450
3	01. Architectural & Structural	25	Average Total Project Soft Costs	$41	m²	$1,025
4		25	LCF - Material & Labour	$39	m2	$975
5		25	LCF - Contingency & Soft Costs	$19	m2	$475

6	0	Quantity of 25 used for appropriate maintenance costing.	$0	EACH	$0

Narratives

Event Description

Repair and paint damaged ceilings.

Event Justification & Strategy

Refurbishing the drywall ceilings will extend their life and maintain a professional appearance.

Implication of Event Deferral (Risks)

Event delay would promote increased damage and reduced functionality. Life safety issues may arise from falling gypsum board.

Water stained and unfinished gypsum board ceiling.

01.5A-055 Interior Door Hardware

Details	Values
Expected Life	20
Component Cost	1,968
Last Major Action Year	2000
Component Condition (For BCR use only)	Average
Quantity	7
Measurement unit/ Metric	ea

Narratives

Component Description

Typical interior door hardware includes: Bored Lockset (knob), rose trim, no closer (office door has one) and butt hinges. Note, some rooms have knob passage sets.

Component Condition & Anticipated Replacement Date

Hardware in average condition and good working order. Note, office door does not stay in open position - may not be plumb. Hardware replacements may not be necessary until 2023.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Typical interior metal doors with knob handsets, butt hinges, air transfer grille and slab lockset.

RP Replacement [01.5A-055 Interior Door Hardware]

Details	Values
Brief Description (40 Characters)	Replace Interior Door Hardware
Current event Year (YYYY)	2023
Estimated Event Cost	$1,968

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	2	Base Rate for Material and Labour	$495	EACH	$990
2	01. Architectural & Structural	2	Construction Contingency	$74	EACH	$148
3	01. Architectural & Structural	2	Average Total Project Soft Costs	$171	EACH	$342
4		2	LCF - Material & Labour	$163	EACH	$326
5		2	LCF - Contingency & Soft Costs	$81	EACH	$162

Narratives

Event Description

Replace interior door hardware where required. Since doors have limited use, costing is for two doors.

Event Justification & Strategy

Replacing interior door hardware will maintain functionality during normal and emergency situations.

Implication of Event Deferral (Risks)

Deferring this event would hinder safe egress and maneuverability during normal and emergency situations.

Office door with knob lockset. Door held open with makeshift wire.

01.5A-110 Interior Stairs - Steel

Details	Values
Expected Life	75
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	flts

Narratives

Component Description

A four riser steel stair is located at the mezzanine level over the pit room. The steel stringer and grate treads, provide access to the mechanical equipment over the motor control/electrical room.

Component Condition & Anticipated Replacement Date

The mezzanine's structural steel stairs appear to be in sound, functional and average condition. Continued surface maintenance (painting) will ensure functionality until 2049 when the unit may need replacement. No replacement event is offered in this BCR document.

Assessment Criteria	Existence
Surface finishes deteriorated	
Default	Yes

Mezzanine painted steel stair over Pit room.

01.6A-025 Fixed or Permanent Furnishing (Millwork)

Details	Values
Expected Life	20
Component Cost	12,475
Last Major Action Year	1974
Component Condition (For BCR use only)	Poor
Quantity	5
Measurement unit/ Metric	m

Narratives

Component Description

Approximately five meters of "L" shaped casework, complete with a laminate surface and stainless steel sink is installed in the office/lab room.

Component Condition & Anticipated Replacement Date

Laminate surface is peeled off and damaged. Casework's overall condition is considered fair. Repairs should be implemented in 2015 and full replacement may be warranted in 2023.

Assessment Criteria	Existence
Deterioration of paint finish & surfaces	
Default	Yes
Excessive wear	
Default	Yes

Built-in casework in Office, with delaminated laminate countertop.

RP Life Extension [01.6A-025 Fixed or Permanent Furnishing (Millwork)]

Details	Values
Brief Description (40 Characters)	Refurbish Casework
Current event Year (YYYY)	2015
Estimated Event Cost	$2,495

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	1	Base Rate for Material and Labour	$1,255	m	$1,255

2	01. Architectural & Structural	1	Construction Contingency	$188	m	$188
3	01. Architectural & Structural	1	Average Total Project Soft Costs	$433	m	$433
4		1	LCF - Material & Labour	$414	m	$414
5		1	LCF - Contingency & Soft Costs	$205	m	$205

Narratives

Event Description

Refurbish casework elements, especially laminate.

Costing quantity is only "1", to reflect refurbishment tasks only.

Event Justification & Strategy

Casework refurbishment will maintain functionality, appearance until replacement is warranted.

Implication of Event Deferral (Risks)

Event delay would risk safe casework use for personnel.

Countertop with unfastened laminate trim.

RP Replacement [01.6A-025 Fixed or Permanent Furnishing (Millwork)]

Details	Values
Brief Description (40 Characters)	Replace Casework
Current event Year (YYYY)	2023
Estimated Event Cost	$12,475

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$1,255	m	$6,275
2	01. Architectural & Structural	5	Construction Contingency	$188	m	$940
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$433	m	$2,165

4	5	LCF - Material & Labour	$414	m	$2,070
5	5	LCF - Contingency & Soft Costs	$205	m	$1,025

Narratives

Event Description

Replace entire casework assembly.

Event Justification & Strategy

All casework will have reached their expected life. Refurbishment may not be adequate to continue use - replacement would be the only option.

Implication of Event Deferral (Risks)

Delaying this event would promote unsafe usage for all.

01.6A-037 Ladders

Details	Values
Expected Life	50
Component Cost	6,824
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	8
Measurement unit/ Metric	m

Narratives

Component Description

The north and south mezzanine levels are individually accessed by a four meter high standard pipe ladder fastened to the wall. The pit area is accessed by wall mounted 19mm rungs and two pipe rails along both door jambs. If drawings are correct, all piping is 32mm (1.25") diameter. All ladder components are painted.

Component Condition & Anticipated Replacement Date

Currently, the ladders appear to be in sound structural condition. Only the surfaces have marred regions. Overall condition is regarded as average. Continued cyclical painting and fastener refurbishment, where required, will ensure safe performance until replacement may be required in 2024.

Assessment Criteria	Existence
Deterioration of paint finish & surfaces	
Default	Yes

Wall mounted pipe ladder for accessing south mezzanine.

RP Replacement [01.6A-037 Ladders]

Details	Values
Brief Description (40 Characters)	Replace Ladders
Current event Year (YYYY)	2024
Estimated Event Cost	$6,824

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	8	Base Rate for Material and Labour	$429	m	$3,432
2	01. Architectural & Structural	8	Construction Contingency	$64	m	$512
3	01. Architectural & Structural	8	Average Total Project Soft Costs	$148	m	$1,184
4		8	LCF - Material & Labour	$142	m	$1,136
5		8	LCF - Contingency & Soft Costs	$70	m	$560

Narratives

Event Description

Replace ladders accessing both mezzanines.

Event Justification & Strategy

Rusted and worn elements may be an issue and safe use would be a concern. Replacement would be the preferred action.

Implication of Event Deferral (Risks)

Event delay may promote unsafe ladder anchorage and there would be life/safety issues for service personnel.

Wall mounted pipe ladder for accessing north mezzanine.

01.6A-038 Railing

Details	Values
Expected Life	50
Component Cost	17,352
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	20
Measurement unit/ Metric	m

Narratives

Component Description

All pipe railing is associated with either the north or south mezzanine areas. The painted black railing is presumed to be either 32mm or 38mm in diameter. Both railings have an intermediate rail. The railing is anchored to the wood floor assembly and butting walls.

Component Condition & Anticipated Replacement Date

With only marred surfaces, the railings are functionally in average condition. Continued maintenance will ensure this element performs until 2024, when replacement may be warranted.

Assessment Criteria	Existence
Deterioration of paint finish & surfaces	
Default	Yes

Painted pipe railing associated with north mezzanine.

RP Replacement [01.6A-038 Railing]

Details	Values
Brief Description (40 Characters)	Replace Railings
Current event Year (YYYY)	2024
Estimated Event Cost	$17,352

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	12	Base Rate for Material and Labour	$727	m	$8,724
2	01. Architectural & Structural	12	Construction Contingency	$109	m	$1,308
3	01. Architectural & Structural	12	Average Total Project Soft Costs	$251	m	$3,012
4		12	LCF - Material & Labour	$240	m	$2,880
5		12	LCF - Contingency & Soft Costs	$119	m	$1,428
6		0	Quantity reduced to 12 for simple pipe railing and anchoring.	$0	EACH	$0

Narratives

Event Description

Replace pipe railing associated with mezzanines.

Event Justification & Strategy

Rusted and worn elements may be an issue and safe use would be a concern. Replacement would be the preferred action.

Implication of Event Deferral (Risks)

Event delay may promote unsafe railing anchorage and there would be life/safety issues for service personnel.

Painted pipe railing associated with south mezzanine.

03. Mechanical

03.1A-029 Central Station AHU

Details	Values
Expected Life	25
Component Cost	54,626
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This element consists of AHU-401 which supplies tempered air throughout the Wastewater Treatment building.

Component Condition & Anticipated Replacement Date

AHU-401 appears to be in average operating condition based on age (installed in 1974). The expected life-cycle of 25 years ended in 1999, but replacement has been scheduled for 2018 when it can be reevaluated at the time of the next BCR.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

AHU 401 in mezzanine

CP Replacement [03.1A-029 Central Station AHU]

Details	Values
Brief Description (40 Characters)	Replace AHU 401
Current event Year (YYYY)	2018
Estimated Event Cost	$54,626

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$27,480	EACH	$27,480
2	03. Mechanical	1	Construction Contingency	$4,122	EACH	$4,122
3	03. Mechanical	1	Average Total Project Soft Costs	$9,481	EACH	$9,481
4		1	LCF - Base Rate Material & Labour	$9,059	EACH	$9,059
5		1	LCF - Conting. & Soft Costs	$4,484	EACH	$4,484

Narratives

Event Description

This event is to replace AHU-401 when it has reached the end of its serviceable life.

Event Justification & Strategy

If the unit is performing poorly in the year of its expected replacement, they should be replaced.

Implication of Event Deferral (Risks)

If this replacement is deferred, there is a risk the IAQ requirements would not be met. Since this fan is also necessary to provide ventilation to this building with the ozone generator this could create a hazardous condition.

03.1A-030 Ventilation Fans

Details	Values
Expected Life	25
Component Cost	5,135
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	5
Measurement unit/ Metric	ea

Narratives

Component Description

Five exhaust fans are located throughout the building for the ozone mixing tank room, electrical room, and storage room.

Component Condition & Anticipated Replacement Date

The ventilation fans appear to be in average condition with no reported issues. The life cycle replacement would have fallen on 1999. They could be considered for upgrade or replacement at the time of the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

EF 88 Ozone Mixer Fan

RP Replacement [03.1A-030 Ventilation Fans]

Details	Values
Brief Description (40 Characters)	Replace Exhaust Fans
Current event Year (YYYY)	2018
Estimated Event Cost	$5,135

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$3,435	EACH	$3,435
2	03. Mechanical	1	Construction Contingency	$515	EACH	$515
3	03. Mechanical	1	Average Total Project Soft Costs	$1,185	EACH	$1,185
4		0	LCF - Not used due to smaller fan system.	$0	EACH	$0

Narratives

Event Description

This event is for the replacement of the 5 exhaust fans.

Event Justification & Strategy

These fans service critical rooms in this building which has an ozone generating system. The building operator reports these units to have few problems so they can be further assessed at the time of the next BCR in 2018.

Implication of Event Deferral (Risks)

The safety risks associated with potentially elevated ozone levels outweighs the cost deferral of replacement.

03.1A-040 Heating & Cooling Piping Systems

Details	Values
Expected Life	30
Component Cost	78,500
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	660
Measurement unit/ Metric	m2

Narratives

Component Description

This element is composed of the heating piping that distributes heating system water from the mezzanine electric boiler to the adjacent AHU heating coil as well as the unit heaters.

Component Condition & Anticipated Replacement Date

The heating piping system appeared to be in average condition with no urgent problems. The projected expected life of these systems is 30 years (2004) but this could be deferred until after the next BCR so has been scheduled for 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Heating water loop

CP Replacement [03.1A-040 Heating & Cooling Piping Systems]

Details	Values
Brief Description (40 Characters)	Replace Heating Piping System
Current event Year (YYYY)	2020
Estimated Event Cost	$78,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	500	Base Rate for Material and Labour	$79	m²	$39,500

2	03. Mechanical	500	Construction Contingency	$12	m²	$6,000
3	03. Mechanical	500	Average Total Project Soft Costs	$27	m²	$13,500
4		500	LCF - Base Rate Material & Labour	$26	m2	$13,000
5		500	LCF - Conting. & Soft Costs	$13	m2	$6,500
6		0	Quantity adjusted to 500 to achieve adequate event costing.	$0	EACH	$0

Narratives

Event Description

This event includes replacement of the heating piping system from the Mechanical Room in the mezzanine to the AHU and unit heaters.

Event Justification & Strategy

The heating piping is presently in average condition and does not require replacement in the near future. The timing of the replacement shall be re-assessed at the time of the next BCR in 2018.

Implication of Event Deferral (Risks)

Event deferral may lead to pipe leaks and damage to interior offices and related equipment.

03.1A-045 HVAC Pumps

Details	Values
Expected Life	25
Component Cost	5,776
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	2
Measurement unit/ Metric	hp

Narratives

Component Description

This element is for the HVAC system heating water circulation pumps.

Component Condition & Anticipated Replacement Date

The pumps appear to be in average condition. Assuming these to be original 1974 equipment, they should have been due for replacement in approximately 2004 but can wait and be re-assessed on the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Hot water circulating pump

RP Replacement [03.1A-045 HVAC Pumps]

Details	Values
Brief Description (40 Characters)	Replace HVAC Pumps
Current event Year (YYYY)	2020
Estimated Event Cost	$5,776

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$1,453	Hp	$2,906
2	03. Mechanical	2	Construction Contingency	$218	Hp	$436
3	03. Mechanical	2	Average Total Project Soft Costs	$501	Hp	$1,002
4		2	LCF - Base Rate Material & Labour	$479	Hp	$958
5		2	LCF - Conting. & Soft Costs	$237	Hp	$474

Narratives

Event Description

This event is for the combined life cycle replacement of HVAC system pumps.

Event Justification & Strategy

This event is based on the assumption these pumps are original equipment but are still performing well so can be monitored and replacement postponed for now.

Implication of Event Deferral (Risks)

Should a pump fail an alarm would be generated on the DDC system. The pumps are small and repair parts are readily available. Should the pump need immediate replacement it would probably be available locally. The implication would be a loss of heating control for the building and quick action to rectify would be necessary.

03.1A-047 Chemical Feed System

Details	Values
Expected Life	25
Component Cost	9,192
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

This component is the chemical feed systems (AKA pot feeders) for the Hot Water loop.

Component Condition & Anticipated Replacement Date

The pot feeders were installed in 1974. They appear to be in average condition, with no reported problems. The estimated lifespan has been set to end in 1999, but replacement has been set for 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Boiler hot water loop pot feeder

RP Replacement [03.1A-047 Chemical Feed System]

Details	Values
Brief Description (40 Characters)	Replace Chemical Feed System
Current event Year (YYYY)	2020
Estimated Event Cost	$9,192

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$4,624	sum	$4,624

2	03. Mechanical	1	Construction Contingency	$694	sum	$694
3	03. Mechanical	1	Average Total Project Soft Costs	$1,595	sum	$1,595
4		1	LCF - Base Rate Material & Labour	$1,524	sum	$1,524
5		1	LCF - Conting. & Soft Costs	$755	sum	$755

Narratives

Event Description

This event is the life cycle replacement of the chemical feed system for the heating water loop.

Event Justification & Strategy

This system was expected to be replaced at the end of its life cycle in 2010, but appears to be reliable and can be further evaluated at the time of the next BCR in 2018.

Implication of Event Deferral (Risks)

Failure of this system will result in the gradual degradation of the piping system, and potential damage to control valves in the system. This could incur unnecessary malfunctions that outweigh the costs of replacement.

03.1A-050 Boilers

Details	Values
Expected Life	30
Component Cost	9,900
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	90
Measurement unit/ Metric	KW

Narratives

Component Description

A gas-fired 90 kW hot water boiler located in the mezzanine provides the heating water to the unit heaters and AHU heating coil.

Component Condition & Anticipated Replacement Date

The boiler was installed in the 1974 construction and appears to have been well maintained. Building Operations Technicians did not report significant problems, so the new projected life expectancy is to end approximately in 2020. This can be reevaluated at the time of the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Electric Boiler

RP Replacement [03.1A-050 Boilers]

Details	Values
Brief Description (40 Characters)	Replace Electric Boiler
Current event Year (YYYY)	2020
Estimated Event Cost	$9,900

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	90	Base Rate for Material and Labour	$56	Bhp	$5,040
2	03. Mechanical	90	Construction Contingency	$8	Bhp	$720
3	03. Mechanical	90	Average Total Project Soft Costs	$19	Bhp	$1,710
4		90	LCF - Base Rate Material & Labour	$18	kW	$1,620
5		90	LCF - Conting. & Soft Costs	$9	kW	$810
6		0	Change Bhp to kW in Word doc and remove this line.	$0	EACH	$0

Narratives

Event Description

This event is to replace the electric boiler with a new similar unit of equivalent capacity.

Event Justification & Strategy

The boiler life expectancy is 30 years under normal operating conditions. This unit appears to still be functioning well with few problems and meeting building heating demand requirements.

Implication of Event Deferral (Risks)

The boiler is necessary to maintain acceptable temperatures in the building during the winter months. Because there is only the 1 unit, failure would result in immediate risk to freezing the building. Deferring the event too long runs the risk of increasing this likelihood and potential damage to equipment.

03.1A-060 Terminal Units

Details	Values
Expected Life	35
Component Cost	56,465
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the unit heaters and vestibule heater.

Component Condition & Anticipated Replacement Date

The terminal units appear to be in average condition given their age with no reported problems. The life cycle replacement date is projected to be 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Unit Heater - Mezzanine level

CP Replacement [03.1A-060 Terminal Units]

Details	Values
Brief Description (40 Characters)	Replace Terminal Units
Current event Year (YYYY)	2020
Estimated Event Cost	$56,465

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5	Base Rate for Material and Labour	$5,681	EACH	$28,405

2	03. Mechanical	5	Construction Contingency	$852	EACH	$4,260
3	03. Mechanical	5	Average Total Project Soft Costs	$1,960	EACH	$9,800
4		5	LCF - Base Rate Material & Labour	$1,873	EACH	$9,365
5		5	LCF - Conting. & Soft Costs	$927	EACH	$4,635

Narratives

Event Description

This event is for the life cycle replacement of the 4 unit heaters and a vestibule heater.

Event Justification & Strategy

The terminal units are necessary to keep isolated areas not served by the AHU at acceptable temperatures during the winter so this project would be planned during the summer months at a time when they are at the end of their lifespan.

Implication of Event Deferral (Risks)

The terminal units individually are not critical so should failures begin to occur then replacing them can be considered.

03.2A-010 Controls, Electrical or Pneumatic

Details	Values
Expected Life	24
Component Cost	34,470
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	30
Measurement unit/ Metric	pt

Narratives

Component Description

This element includes components of the DDC system that are electric and pneumatic in nature. Typically, this includes items such as AHU damper actuators, and HVAC heating and cooling control valves.

Component Condition & Anticipated Replacement Date

There were no reported problems with any of these components. Typically, any problems should be dealt with on a case by case basis, as part of an Operations & Maintenance program. Life cycle replacement fell on 1998 but these components are still reliable. A projected replacement date of 2018 has been set, that should be reevaluated on the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Thermostat control for heating valve on AHU

CP Replacement [03.2A-010 Controls, Electrical or Pneumatic]

Details	Values
Brief Description (40 Characters)	Replace Controls - Electrical & Pneumatic
Current event Year (YYYY)	2018
Estimated Event Cost	$34,470

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	15	Base Rate for Material and Labour	$1,156	pt	$17,340
2	03. Mechanical	15	Construction Contingency	$173	pt	$2,595
3	03. Mechanical	15	Average Total Project Soft Costs	$399	pt	$5,985
4		15	LCF - Base Rate Material & Labour	$381	pt	$5,715
5		15	LCF - Conting. & Soft Costs	$189	pt	$2,835
6		0	Quantity of 15 used for appropriate event costing.	$0	EACH	$0

Narratives

Event Description

This event includes the life cycle replacement of DDC system items, such as the AHU damper actuators and HVAC heating control valves.

Event Justification & Strategy

These devices are critical to the DDC system's operation, and control of heating and ventilation. As long as there are no maintenance issues this event can be delayed.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the system should remain sound with case by case maintenance. The risk of many devices failing at the same time is highly unlikely.

03.2A-020 Direct Digital Control

Details	Values
Expected Life	20
Component Cost	57,260
Last Major Action Year	1974
Component Condition (For BCR use only)	Good
Quantity	20
Measurement unit/ Metric	pt

Narratives

Component Description

This component is the DDC portion of the HVAC system points (excluding the electric & pneumatic). A Honeywell Control System remotely monitors the key building equipment from the main building.

Component Condition & Anticipated Replacement Date

DDC system head end was upgraded in 2005. The anticipated replacement date has been set at 2025 based on a 20 year expected life. Components for this system are still readily available and will be supported by Honeywell for some time.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.2A-020 Direct Digital Control]

Details	Values
Brief Description (40 Characters)	Replace DDC Points
Current event Year (YYYY)	2025
Estimated Event Cost	$57,260

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	20	Base Rate for Material and Labour	$1,440	pt	$28,800
2	03. Mechanical	20	Construction Contingency	$216	pt	$4,320
3	03. Mechanical	20	Average Total Project Soft Costs	$497	pt	$9,940
4		20	LCF - Base Rate Material & Labour	$475	pt	$9,500
5		20	LCF - Conting. & Soft Costs	$235	pt	$4,700

Narratives

Event Description

This event is for the life cycle replacement of the estimated 20 points making up DDC components including panels and sensors.

Event Justification & Strategy

This event is dated 2025 in accordance with the expected life of this component. It is possible that prior to that date, technology advances may warrant an earlier replacement or upgrade. This should be a consideration in the next BCR in 2018.

Implication of Event Deferral (Risks)

This event is dated 2025 in accordance with the expected life of this component. It is possible that prior to this date technology advances may warrant an earlier replacement or upgrade. This should be a consideration in the next BCR in 2017.

03.3-025C05 Domestic Hot Water Tanks

Details	Values
Expected Life	20
Component Cost	5,000
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	190
Measurement unit/ Metric	ltr

Narratives

Component Description

This component is the 190 liter domestic hot water tank, located in the mezzanine.

Component Condition & Anticipated Replacement Date

The hot water tank is in fair condition and looks to be original equipment. Based on a projected 20 year lifespan, it should have been up for replacement in 1994. It could be considered for replacement as soon as budgeting permits. A date of 2015 has been selected.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

190 litre hot water tank on mezzanine level

RP Replacement [03.3-025C05 Domestic Hot Water Tanks]

Details	Values
Brief Description (40 Characters)	Replace Domestic Hot Water Tank
Current event Year (YYYY)	2015
Estimated Event Cost	$5,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	100	Base Rate for Material and Labour	$25	L	$2,500
2	03. Mechanical	100	Construction Contingency	$4	L	$400
3	03. Mechanical	100	Average Total Project Soft Costs	$9	L	$900
4		100	LCF - Base Rate Material & Labour	$8	L	$800
5		100	LCF - Conting. & Soft Costs	$4	L	$400
6		0	Quantity of 100 used for appropriate event costing.	$0	EACH	$0

Narratives

Event Description

This event is for the life cycle replacement of the 190 liter domestic hot water tank located in the mezzanine.

Event Justification & Strategy

Hot water tank failures are generally within 20 years, and the replacement should be scheduled soon. Generally, replacement of a hot water tank with a similar model can be coordinated very quickly.

Implication of Event Deferral (Risks)

A hot water tank failure would cause disruption in the provision of potable hot water which is not critical in the Wastewater Treatment Building. In the event of a leak, the tank can be quickly isolated and replacement coordinated.

03.3A-010 Plumbing Piping

Details	Values
Expected Life	40
Component Cost	36,300
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	150
Measurement unit/ Metric	m

Narratives

Component Description

This component includes all the domestic hot/cold, and waste water piping throughout the entire facility.

Component Condition & Anticipated Replacement Date

Component condition is average and another seven service years are granted. Replacement is scheduled for 2020. This element will reevaluated at the time of the next BCR in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

CP Replacement [03.3A-010 Plumbing Piping]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Piping
Current event Year (YYYY)	2020
Estimated Event Cost	$36,300

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	150	Base Rate for Material and Labour	$122	m	$18,300
2	03. Mechanical	150	Construction Contingency	$18	m	$2,700
3	03. Mechanical	150	Average Total Project Soft Costs	$42	m	$6,300
4		150	LCF - Base Rate Material & Labour	$40	m	$6,000
5		150	LCF - Conting. & Soft Costs	$20	m	$3,000

Narratives

Event Description

This event is to replace the domestic hot/cold water, and waste water piping systems throughout the facility.

Event Justification & Strategy

The projected lifespan of this component is 40 years, or sooner if problems develop.

Implication of Event Deferral (Risks)

If this event is deferred too long, some leakage may appear at some joints. Any piping systems failure could result in damage through a small leak developing in a pipe, or a flooding event should a pipe rupture.

03.3A-015 Plumbing Fixtures and Accessories

Details	Values
Expected Life	30
Component Cost	3,044
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

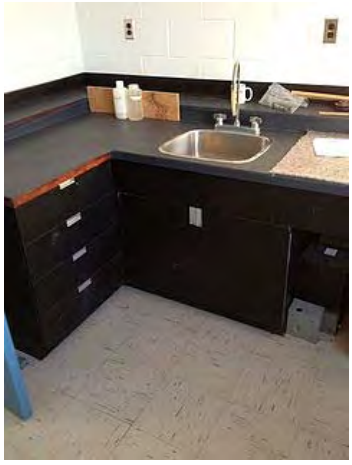
This component is comprised of the plumbing fixtures such as sinks in this building.

Component Condition & Anticipated Replacement Date

There seemed to be no problems. The sinks are barely used so this element is not a high priority so it can easily be postponed to 2020 or beyond.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.



Lab sink no longer used but still functional

RP Replacement [03.3A-015 Plumbing Fixtures and Accessories]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Fixtures
Current event Year (YYYY)	2020
Estimated Event Cost	$3,044

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$1,531	EACH	$1,531

2	03. Mechanical	1	Construction Contingency	$230	EACH	$230
3	03. Mechanical	1	Average Total Project Soft Costs	$528	EACH	$528
4		1	LCF - Base Rate Material & Labour	$505	EACH	$505
5		1	LCF - Conting. & Soft Costs	$250	EACH	$250
6		0	Quantity of 1 used for appropriate event costing.	$0	EACH	$0

Narratives

Event Description

Replace all plumbing fixtures found throughout the building.

Event Justification & Strategy

This event is not critical at this time but should there be a major project in the future it may make sense to change (or remove) these fixtures.

Implication of Event Deferral (Risks)

If this maintenance is deferred, the fixtures should last for some time past their life expectancy. Continued event postponement would increase worn surfaces - appearance would be an issue.

03.3A-020 Plumbing Pumps

Details	Values
Expected Life	20
Component Cost	25,215
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	4
Measurement unit/ Metric	ea

Narratives

Component Description

This component includes the ozone mixing tank circulating pumps and sump pump.

Component Condition & Anticipated Replacement Date

The pumps are believed to be from 1974. With a 20 year expected life, it should have been due for replacement in 1994. The ozone mixing pumps could be considered for replacement at the time of the project to replace the temporary ozone generator in the near future (2015 projected). The sump pump sees little use and could be either done at the same time or deferred to 2020.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Sump pump

CP Replacement [03.3A-020 Plumbing Pumps]

Details	Values
Brief Description (40 Characters)	Replace Plumbing Pumps
Current event Year (YYYY)	2015
Estimated Event Cost	$25,215

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	3	Base Rate for Material and Labour	$4,228	EACH	$12,684
2	03. Mechanical	3	Construction Contingency	$634	EACH	$1,902
3	03. Mechanical	3	Average Total Project Soft Costs	$1,459	EACH	$4,377
4		3	LCF - Base Rate Material & Labour	$1,394	EACH	$4,182
5		3	LCF - Conting. & Soft Costs	$690	EACH	$2,070
6		0	Quantity of 3 used for appropriate event costing.	$0	EACH	$0

Narratives

Event Description

This is the life cycle replacement of the ozone mixing pumps and the sump pump.

Event Justification & Strategy

The ozone mixing pumps are at their anticipated lifespan and due to the nature of the service could be in some state of deterioration. Replacement may not be necessary but the pumps could be thoroughly inspected and if necessary repaired. The sump pump sees little use and should provide many more years of service provided it is being regularly operated.

Implication of Event Deferral (Risks)

Should the ozone mixing pumps fail, this could result in incomplete killing of organisms in the discharge fish wastewater to the Red River. This due diligence would outweigh the cost of the project to ensure they remain in good working order.

03.5A-070 Portable Fire Extinguishers

Details	Values
Expected Life	30
Component Cost	1,576
Last Major Action Year	1992
Component Condition (For BCR use only)	Good
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

This element is the 2-20 # ABC fire extinguishers.

Component Condition & Anticipated Replacement Date

The fire extinguishers are in good condition and with continued regular maintenance will not have to be replaced for many years. The scheduled replacement is for 2022.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Fire extinguisher by exit

RP Replacement [03.5A-070 Portable Fire Extinguishers]

Details	Values
Brief Description (40 Characters)	Replace Portable Fire Extinguishers
Current event Year (YYYY)	2022
Estimated Event Cost	$1,576

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$396	EACH	$792
2	03. Mechanical	2	Construction Contingency	$59	EACH	$118
3	03. Mechanical	2	Average Total Project Soft Costs	$137	EACH	$274
4		2	LCF - Base Rate Material & Labour	$131	EACH	$262
5		2	LCF - Conting. & Soft Costs	$65	EACH	$130

Narratives

Event Description

This event is to replace the portable fire extinguishers based on their age and ability to pass mandatory testing.

Event Justification & Strategy

The portable fire extinguishers have a minimum 12 year life span and then may be either replaced or refurbished.

Implication of Event Deferral (Risks)

Having portable extinguishers in specified design locations based on the floor plan, hazards and other conditions is a Fire Code requirement. Regular inspection and maintenance to keep them in good condition is a mandatory requirement. Event postponement is not advised.

04. Electrical

04.2A-010 Secondary Switchgear

Details	Values
Expected Life	30
Component Cost	6,567
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The service to the building is a 150 amp feed from MCC#4 in the service building. It feeds a Westinghouse 250 amp, 600 volt CDP located in the electrical room. The CDP feeds a 112.5 kVA, 600 to 120/208 volt transformer which feeds the MCC, which feed panels B and C. This CDP feeds a second 600 volt CDP labeled "A-B" which fed the now abandoned Ozone generators and the Storage Building just west of the Water Treatment Plant.

Component Condition & Anticipated Replacement Date

The service panel is now 39 years old and the building has gone through several operational changes. If the plant is to be maintained in the future, the equipment that is in only fair condition, should be replaced in the next 5 years or so (2018).

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Main service distribution.

RP Replacement [04.2A-010 Secondary Switchgear]

Details	Values
Brief Description (40 Characters)	Replace Service CDP
Current event Year (YYYY)	2018
Estimated Event Cost	$6,567

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	1	Base Rate for Material and Labour	$3,303	EACH	$3,303
2	04. Electrical	1	Construction Contingency	$495	EACH	$495
3	04. Electrical	1	Average Total Project Soft Costs	$1,139	EACH	$1,139
4		1	Site Factor - Material & Labour	$1,090	EACH	$1,090
5		1	Site Factor - Contingency and soft cost	$540	EACH	$540

Narratives

Event Description

This event only includes the replacement of the service 600 volt CDP.

Event Justification & Strategy

The service to the Water Treatment Plant will be 44 years old in 2018 and past its life expectancy.

Implication of Event Deferral (Risks)

To maintain the operation of the plant the service must be replaced and not deferred.

Main service CDP.

04.2A-011 MCC

Details	Values
Expected Life	45
Component Cost	59,650
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The Motor Control Center is vintage 1974, manufactured by Westinghouse, rated 208 volts, is 2 sections and has two spaces.

Component Condition & Anticipated Replacement Date

The Motor Control Centre is in fair condition and should be replaced in 2018.

Assessment Criteria	Existence
Inadequate labeling	
Default	Yes
	Confusing labeling.

Motor Control Centre.

CP Replacement [04.2A-011 MCC]

Details	Values
Brief Description (40 Characters)	Replace Motor Control Centre
Current event Year (YYYY)	2018
Estimated Event Cost	$59,650

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		0	AVS tools does not define size of MCC - used $15k/section	$0	sum	$0
2		2	Base Rate for Material and Labour	$15,000	sum	$30,000
3		2	Construction Contingency	$2,250	sum	$4,500
4		2	Average Total Project Soft Costs	$5,175	sum	$10,350
5		2	Site Factor - Material & Labour	$4,950	sum	$9,900
6		2	Site Factor - Contingency and Soft Cost	$2,450	sum	$4,900

Narratives

Event Description

Replace the Motor Control Center.

Event Justification & Strategy

The MCC is the major distribution of the WTP but is past its life expectancy.

Implication of Event Deferral (Risks)

Both the 120/208 volt distribution as well as the control of the motors would be lost if the MCC is not maintained.

MCC cubicle and space.

04.2A-020 Secondary Transformer

Details	Values
Expected Life	30
Component Cost	66,752
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The transformer is a Westinghouse dry type 112.5 kVA, 600 volt, 3 phase delta-wye, 120/208 volt secondary transformer.

Component Condition & Anticipated Replacement Date

The 112.5 kVA transformer is in average condition but should be replaced with the rest of the distribution equipment in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Transformer at service entry.

CP Replacement [04.2A-020 Secondary Transformer]

Details	Values
Brief Description (40 Characters)	Replace Transformer
Current event Year (YYYY)	2018
Estimated Event Cost	$66,752

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	AVS Tools does not define transformer size - used $300/kVA	$0	sum	$0
2		112	Base Rate for Material and Labour	$300	kVA	$33,600
3		112	Construction Contingency	$45	kVA	$5,040
4		112	Average Total Project Soft Cost	$103	kVA	$11,536
5		112	Site Factor - Material & Labour	$99	kVA	$11,088
6		112	Site Factor - Contingency and Soft Cost	$49	kVA	$5,488

Narratives

Event Description

Replace secondary transformer and related accessories.

Event Justification & Strategy

The transformer will be 44 years old and nearing its life expectancy.

Implication of Event Deferral (Risks)

The transformer is an integral part of the building distribution, will need to be maintained or power will be lost.

Transformer specification.

04.2A-050 Cabling, Raceways & Bus Ducts

Details	Values
Expected Life	40
Component Cost	26,775
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

There is a combination of EMT and rigid conduit installed in the WTP facility. Where there is corrosion, the rigid steel has rusted and the associated lighting fixture are showing signs of deterioration.

Component Condition & Anticipated Replacement Date

The overall facility is near 40 years old. To maintain the operation, all systems including conduit and wiring which is now in only fair condition should be replace in 2018.

Assessment Criteria	Existence
Corrosion	
Default	Yes
	Corrosion appearing.

EMT and wiring.

CP Replacement [04.2A-050 Cabling, Raceways & Bus Ducts]

Details	Values
Brief Description (40 Characters)	Replace Cabling Raceways and Devices
Current event Year (YYYY)	2018
Estimated Event Cost	$29,775

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	AVS does not have an estimate for device and wiring replacement. Used $100/sq.m.	$0	EACH	$0
2		150	Base Rate for Material and Labour	$100	m2	$15,000
3		150	Construction Contingency	$15	m2	$2,250
4		150	Average Total Project Soft Cost	$35	m2	$5,175
5		150	Site Factor - Material & Labour	$33	m2	$4,950
6		150	Site Factor - Contingency and Soft Cost	$16	m2	$2,400

Narratives

Event Description

Replace wiring and devices.

Event Justification & Strategy

The devices are in excess of 40 years old and need to be replaced.

Implication of Event Deferral (Risks)

If wiring is not upgraded, the building will not be operational or at least cause functional disruptions.

Corroding equipment.

Handwritten panel directory to be upgraded.

04.2A-070 Distribution Panels

Details	Values
Expected Life	30
Component Cost	19,701
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

There are two Westinghouse 600 volt CDP panels, one for the main service and one for ozone equipment. There are two 120/208 volt, 3 phase, 4 wire panelboads both appear to be fed from the MCC but labels seem to conflict. The 42 circuit panel is full and the second panel B or C? has 5 spaces.

Component Condition & Anticipated Replacement Date

There is one CDP (a second CDP is identified under the Service Switchboard) and two panelboards. The main CDP is not included in this event. The equipment is in fair condition and should be replaced with the rest of the electrical distribution in 2018.

Assessment Criteria	Existence
Inadequate labeling	
Default	Yes
	Directories are not up to date.

Panelboard in electrical room area.

RP Replacement [04.2A-070 Distribution Panels]

Details	Values
Brief Description (40 Characters)	Replace Distribution Panels
Current event Year (YYYY)	2018
Estimated Event Cost	$19,701

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$3,303	EACH	$9,909
2	04. Electrical	3	Construction Contingency	$495	EACH	$1,485
3	04. Electrical	3	Average Total Project Soft Costs	$1,139	EACH	$3,417
4		3	Site Factor - Material & Labour	$1,090	EACH	$3,270
5		3	Site Factor - Contingency and Soft Cost	$540	EACH	$1,620

Narratives

Event Description

Replace panelboards.

Event Justification & Strategy

The panelboards will be over 40 years old and past their life expectancy. Use is low.

Implication of Event Deferral (Risks)

If panels are not replaced there could be loss of electrical integrity.

CDP in Ozone generator room.

04.3A-010 General Lighting

Details	Values
Expected Life	30
Component Cost	16,583
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	23
Measurement unit/ Metric	ea

Narratives

Component Description

The lighting in the none corrosive areas are T12 linear fluorescents and in the other areas are Rabb cast vapour tight domed fixtures. There are 15 fluorescent fixtures and 8 incandescent types.

Component Condition & Anticipated Replacement Date

The fixtures are in fair condition showing signs of corrosion and age. The T12 fluorescent fixtures are obsolete. Replace all in 2015.

Assessment Criteria	Existence
Damaged fixtures	
Default	Yes
	Several damaged fixtures.
Obsolete fixtures	
Default	Yes
	T12 lamps are obsolete.

T12 wrap around fixture.

RP Replacement [04.3A-010 General Lighting]

Details	Values
Brief Description (40 Characters)	Replace General Lighting
Current event Year (YYYY)	2015
Estimated Event Cost	$16,583

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	23	Base Rate for Material and Labour	$363	EACH	$8,349
2	04. Electrical	23	Construction Contingency	$54	EACH	$1,242
3	04. Electrical	23	Average Total Project Soft Costs	$125	EACH	$2,875
4		23	Site Factor - Material & Labour	$120	EACH	$2,760
5		23	Site Factor - Contingency and Soft Cost	$59	EACH	$1,357

Narratives

Event Description

Replace or refit fluorescent fixtures to T8 lamps.

Event Justification & Strategy

The fluorescent T12 lamps are no longer available.

Implication of Event Deferral (Risks)

If fixtures are not upgraded, the lamps may not be available very soon and if they are, they could be expensive.

Office fixture.

Incandescent fixture without globe.

04.3A-020 Exit Lighting

Details	Values
Expected Life	30
Component Cost	1,314
Last Major Action Year	1974
Component Condition (For BCR use only)	Poor
Quantity	2
Measurement unit/ Metric	ea

Narratives

Component Description

There are two bilingual exit signs that appear to have been retrofitted to LED. The lettering does not meet Government standards of 150mm high.

Component Condition & Anticipated Replacement Date

The existing exit signs do not meet Government standard (150mm high) and are considered in poor condition. They should be replaced in 2014.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Obsolete fixtures

Default Yes

Fixtures do not meet Government standard.

Exit sign at front egress.

RF Building Code/Canada Labour Code [04.3A-020 Exit Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exit Signs
Current event Year (YYYY)	2014
Estimated Event Cost	$1,314

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	2	Base Rate for Material and Labour	$330	EACH	$660
2	04. Electrical	2	Construction Contingency	$50	EACH	$100
3	04. Electrical	2	Average Total Project Soft Costs	$114	EACH	$228
4		2	Site Factor - Material & Labour	$109	EACH	$218
5		2	Site Factor - Contingency and Soft Cost	$54	EACH	$108

Narratives

Event Description

Replace exit signs with approved units.

Event Justification & Strategy

The exit signs are not to code and need to be brought up to code.

Implication of Event Deferral (Risks)

There is a chance that safely could be effected by the lack of code standard signs.

Non-compliant exit sign over loading doors.

04.3A-030 Exterior Lighting

Details	Values
Expected Life	15
Component Cost	4,554
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	3
Measurement unit/ Metric	ea

Narratives

Component Description

There is one 250 watt HPS located on the west side of the building for compound lighting and one canopy light fixture that has been converted to LED lamps. There is a 150 watt HPS wall pack at the loading doors.

Component Condition & Anticipated Replacement Date

The exterior lighting is in fair condition and the compound fixture ballast seemed to be not operating correctly. The units should be replaced by 2016.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Exterior canopy fixture.

RP Replacement [04.3A-030 Exterior Lighting]

Details	Values
Brief Description (40 Characters)	Replace Exterior Lighting
Current event Year (YYYY)	2016
Estimated Event Cost	$4,554

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	3	Base Rate for Material and Labour	$760	EACH	$2,280
2	04. Electrical	3	Construction Contingency	$114	EACH	$342
3	04. Electrical	3	Average Total Project Soft Costs	$262	EACH	$786
4		3	Site Factor - Material & Labour	$250	EACH	$750
5		3	Site Factor - Contingency and Soft Cost	$132	EACH	$396

Narratives

Event Description

Replace exterior fixtures.

Event Justification & Strategy

The fixtures will be over 40 years old by the time of event and past the life expectancy of the units.

Implication of Event Deferral (Risks)

If this event were delayed, improper exterior lighting would lessen security.

HPS light fixture over west loading doors.

04.3A-040 Emergency Lighting

Details	Values
Expected Life	18
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The whole building service is fed from the main building's emergency generator but there is also one 12 volt DC battery pack c/w integral heads. There are no remote heads fed from this unit.

Component Condition & Anticipated Replacement Date

The one emergency battery pack appears to be in fair condition but could not confirm operation as it was too high. The unit has been maintained under a regular process. This should by adequate and an event is not produced.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Battery pack with integral heads.

04.4A-010 Grounding Systems

Details	Values
Expected Life	40
Component Cost	1,650
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

Service grounding appears to be by an independent conductor and ground rod but installation and termination were not seen.

Component Condition & Anticipated Replacement Date

The grounding is integral with the distribution and although in average condition, the grounding should be re-instituted in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Grounding at service entry, below panel.

RP Replacement [04.4A-010 Grounding Systems]

Details	Values
Brief Description (40 Characters)	Replace Ground System
Current event Year (YYYY)	2018
Estimated Event Cost	$1,650

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	150	Base Rate for Material and Labour	$5	m²	$750
2	04. Electrical	150	Construction Contingency	$1	m²	$150

3	04. Electrical	150	Average Total Project Soft Costs	$2	m²	$300
4		150	Site Factor - Material & Labour	$2	m2	$300
5		150	Site Factor - Contingency and Soft Cost	$1	m2	$150

Narratives

Event Description

Replace the grounding system when the distribution is also completed.

Event Justification & Strategy

Grounding is integral with the distribution and is essential to the safety and operation of the electrical system.

Implication of Event Deferral (Risks)

If the grounding maintenance is neglected, both the building safety and operation could be compromised.

04.5A-010 Fire Alarm System

Details	Values
Expected Life	17
Component Cost	11,400
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

There is a fire alarm cabinet located in the electrical room. It appears to be a junction point for the existing system from the main building.

Component Condition & Anticipated Replacement Date

The fire alarm system piggy backs to the main building Simplex system and the condition of the devices in this building are fair. Any changes should be tied to the upgrade of the main system in 2018.

Fire alarm panel in electrical room.

RP Replacement [04.5A-010 Fire Alarm System]

Details	Values
Brief Description (40 Characters)	Upgrade Fire Alarm Devices and Wiring
Current event Year (YYYY)	2018
Estimated Event Cost	$11,400

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	150	Base Rate for Material and Labour	$38	m²	$5,700
2	04. Electrical	150	Construction Contingency	$6	m²	$900
3	04. Electrical	150	Average Total Project Soft Costs	$13	m²	$1,950
4		150	Site Factor - Material & Labour	$13	m2	$1,950
5		150	Site Factor - Contingency and Soft Costs	$6	m2	$900

Narratives

Event Description

Upgrade the existing fire alarm system along with the main building system.

Event Justification & Strategy

The operation and functionality of the fire alarm systems is essential for the safety of the building and people.

Implication of Event Deferral (Risks)

If the fire alarm system is not maintained, then safety of the building and people would be a concern.

04.5A-030 Communication Systems

Details	Values
Expected Life	25
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Not Assessed
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

There is a phone system brought into the building. An outlet is located in the front office area but does not seem to be used.

Component Condition & Anticipated Replacement Date

Telecommunication system is very basic and the location of the incoming is not readily identifiable. There really is no need to provide an event at this time.

Assessment Criteria	Existence

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

04.5A-040 Security System

Details	Values
Expected Life	20
Component Cost	1,395
Last Major Action Year	1974
Component Condition (For BCR use only)	Fair
Quantity	150
Measurement unit/ Metric	m2

Narratives

Component Description

There is no building access/security system. However, there is an audible alarm related to the process operation.

Component Condition & Anticipated Replacement Date

The security does not appear to tie to the main building for access but there are alarms that are both local and tied to the Building Management System. The condition of these alarms are operational and in fair condition and should be replaced with all mayor upgrades in 2018.

Assessment Criteria **Existence**

Since all Assessment Criteria questions were defaulted to "No", they have been removed from this report.

Alarm signal device.

RP Replacement [04.5A-040 Security System]

Details	Values
Brief Description (40 Characters)	Replace Security Alarm Devices and Wiring
Current event Year (YYYY)	2018
Estimated Event Cost	$1,395

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	15	Base Rate for Material and Labour	$47	m²	$705
2	04. Electrical	15	Construction Contingency	$7	m²	$105
3	04. Electrical	15	Average Total Project Soft Costs	$16	m²	$240
4		15	Site Factor - Material & Labour	$15	m2	$225
5		15	Site Factor - Contingency and Soft Costs	$8	m2	$120
6		1	AVS Tool does not take in account for building function - used 10% of area at 15 m2.	$0	EACH	$0

Narratives

Event Description

The security system is an extension of the main building security and needs to be upgraded.

Event Justification & Strategy

Keeping the security system current is essential to maintain the operation of the building.

Implication of Event Deferral (Risks)

If the system is not maintained the building security would be compromised.

Alarm beacon over door.

10. Whole Building Expenditures

10.1A-015 Building Condition Report

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	2013
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Wastewater Treatment Building was designed and constructed in 1974. The building is a single storey steel framed building, with a rectangular footprint and a gross area of 150sm. The building includes a full height central wastewater treatment room. Ancillary rooms include: an ozonator room, enclosed office, workshop, and hazardous material storage room. There is a small storage room which includes a hand sink. The building has no toilet facilities. Ceilings for ancillary rooms serve as mezzanines for mechanical equipment, accessed from service ladders in the central full height room.

The steel structure is clad with precast concrete panels, is relatively high 6m (20') and has a flat roof. There is a pair of 2.4m high exterior doors which serve the central wastewater treatment room.

Component Condition & Anticipated Replacement Date

Currently, the asset and property have elements regarded in fair, average and good condition. This assessment depends on the element in question. The next building condition inspection and report (BCR) is scheduled for 2018.

RP New [10.1A-015 Building Condition Report]

Details	Values
Brief Description (40 Characters)	Produce New Building Condition Report
Current event Year (YYYY)	2018
Estimated Event Cost	$24,970

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	110	Base Rate for Material and Labour	$152	m²	$16,720

2	01. Architectural & Structural	110	Construction Contingency	$23	m²	$2,530
3	01. Architectural & Structural	110	Average Total Project Soft Costs	$52	m²	$5,720
4		0	Quantity of XX used for appropriate BCR cost. No LCF costs are used.	$0	EACH	$0

Narratives

Event Description

Conduct building condition inspections to evaluate all property and asset components for cyclical replacement. All data and relevant photos are to be entered into the appropriate AVS database. Export all element data from AVS and edit final report in MS Word.

Note, BCR implementation cost is calculated using the Base Rate costs for "01. 5-010C01 Concrete Block Partition".

Event Justification & Strategy

Conducting BCRs is a PWGSC mandate for all assets to provide supporting asset condition information for the building Asset Management Plan (AMP) that is produced every five years.

Implication of Event Deferral (Risks)

Event delay would infringe on the cyclical production of the AMP. Timely replacements of numerous base building elements would be hindered and life safety issues may arise.

10.2A-010 Architectural - Enclosure Thermal Scan

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Asset enclosure evaluation should be conducted every 5 years during the BCR cycle.

Component Condition & Anticipated Replacement Date

The asset enclosure is currently in average condition. The next enclosure thermal scan is scheduled for 2013.

RP New [10.2A-010 Architectural - Enclosure Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Enclosure Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$3,945

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	5	Base Rate for Material and Labour	$528	m²	$2,640
2	01. Architectural & Structural	5	Construction Contingency	$79	m²	$395
3	01. Architectural & Structural	5	Average Total Project Soft Costs	$182	m²	$910
4		0	Quantity of 5 used for appropriate IR scan cost.	$0	EACH	$0

Narratives

Event Description

Conduct thermal scan on building envelope from the exterior and interior during winter conditions, while the enclosure in under negative and positive interior pressures scenarios.

Note, event costing is derived from using Base Rate costs for "01.3-070C01 Aluminum Windows" to obtain approximately $4K. A location factor is not applied. However, a contingency cost is included for inflation factor estimating.

Event Justification & Strategy

Enclosure thermal scan will evaluate the building envelope's integrity with respect to air leakage and inner wall moisture presence/accumulation. The scan results will identify anomalies for correction to ensure continued wall performance. Overall energy consumption reduction may be affected.

Implication of Event Deferral (Risks)

Event deferral may risk the accumulation of inner wall moisture which in turn may risk damaging the inner and outer wall components. Delaminations are a possibility with unscheduled repairs.

10.2A-010 Architectural - Roof Thermal Scan

Details	Values
Expected Life	3
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

Existing roof assembly is a 4 ply built up roof.

Component Condition & Anticipated Replacement Date

Since visual and thermal inspections have never been completed, the conditions can only be rated as average. The thermal/visual inspections are scheduled for 2013.

RP New [10.2A-010 Architectural - Roof Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Roof Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$3,384

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	01. Architectural & Structural	18	Base Rate for Material and Labour	$126	m²	$2,268
2	01. Architectural & Structural	18	Construction Contingency	$19	m²	$342
3	01. Architectural & Structural	18	Average Total Project Soft Costs	$43	m²	$774
4		0	Quantity of 18 used to obtain appropriate IR scan cost.	$0	EACH	$0

Narratives

Event Description

Conduct a thermal scan and visual inspection of roof assembly, all areas.

Note, event costing derived from Base Rate costs for "01.4-010C20 Elast./Mod. Bitumen, 1 ply membrane". No location factors are included.

Event Justification & Strategy

Verify integrity of roof membrane, all levels. The thermal scan will identify all underlying component deficiencies such as; damaged and entrapped water.

Implication of Event Deferral (Risks)

Event delay will hinder the identification of small problems before they become large. Increased repair costs will be incurred.

10.2A-020 Mechanical - Water Testing

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The asset has numerous copper piping runs carrying domestic cold and hot water.

Component Condition & Anticipated Replacement Date

The existing piping appears to be adequate from the exterior. However, the interior pipe condition is unknown. The current condition can only be rated as average. As per code, the 40 year old piping needs to be tested via a water quality test in 2013 and every 5 years thereafter.

RF Domestic Water Quality [10.2A-020 Mechanical - Water Testing]

Details	Values
Brief Description (40 Characters)	Conduct Water Quality Testing
Current event Year (YYYY)	2013
Estimated Event Cost	$8,190

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	45	Base Rate for Material and Labour	$122	m	$5,490
2	03. Mechanical	45	Construction Contingency	$18	m	$810
3	03. Mechanical	45	Average Total Project Soft Costs	$42	m	$1,890
4		0	Quantity of 45 used to obtain appropriate cost.	$0	EACH	$0

Narratives

Event Description

Mandatory testing for leached copper and lead levels must be performed on the stagnant domestic water supplies, especially with respect to the domestic hot water. If test results return unacceptably high levels of those metals, an engineering evaluation needs to be undertaken to determine options.

Note, costing is derived from Base Rate costs for "03.3A-010 Plumbing Piping". No location factor is included.

Event Justification & Strategy

This testing is a mandatory recommendation.

Implication of Event Deferral (Risks)

Postponing this water quality testing would contravene the code. Potential water contaminates would present life safety issues.

10.2A-030 Electrical - Arc Flash Identification

Details	Values
Expected Life	24
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Poor
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The Motor Control Center is vintage 1974, manufactured by Westinghouse, rated 208 volts, has 2 sections and there are two spaces. There are two Westinghouse 600 volt CDP panels, one for the main service and one for the ozone equipment. In addition, there are two 120/208 volt, 3 phase, 4 wire circuit breaker panelboads.

Component Condition & Anticipated Replacement Date

The equipment is in poor condition from its usage and operation with the corrosive product in the vicinity. Arc flash identification, evaluation and labeling should be done in 2013.

Main service CDP.

RO Electrical [10.2A-030 Electrical - Arc Flash Identification]

Details	Values
Brief Description (40 Characters)	Provide Arc Flash Study and Identification
Current event Year (YYYY)	2013
Estimated Event Cost	$5,420

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	10	Base Rate for Material and Labour	$363	EACH	$3,630
2	04. Electrical	10	Construction Contingency	$54	EACH	$540
3	04. Electrical	10	Average Total Project Soft Costs	$125	EACH	$1,250
4		0	Quantity 10 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Provide a study to determine the arc flash rating for each piece of electrical equipment and install a label as required.

Costing is derived from Base Rate cost for "04.3A-010 General Lighting". No site factor unit costs are used.

Event Justification & Strategy

The labeling of electrical equipment with Arc Flash ratings in identified in the Canadian Electrical Code.

Implication of Event Deferral (Risks)

To avoid the implementation of Arc Flash labeling would be to contravene code and put lives at risk during maintenance tasks.

MCC Motor Control Centre.

10.2A-030 Electrical - Cleaning and Torque

Details	Values
Expected Life	5
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	ea

Narratives

Component Description

The Motor Control Center is vintage 1974, manufactured by Westinghouse, rated 208 volts, has 2 sections and includes two spaces. There are two Westinghouse 600 volt CDP panels, one for the main service and one for ozone equipment. There are two 120/208 volt, 3 phase, 4 wire panelboads. The transformer is a Westinghouse dry type 112.5 kVA 600 volt, 3 phase delta-wye 120/208 volt secondary transformer.

Component Condition & Anticipated Replacement Date

The equipment is in average condition but has not been cleaned and retorqued, and should be done every 5 years starting in 2013.

One of two CDP's.

RP Life Extension [10.2A-030 Electrical - Cleaning and Torque]

Details	Values
Brief Description (40 Characters)	Clean & Torque All Electrical Terminations
Current event Year (YYYY)	2013
Estimated Event Cost	$3,252

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	6	Base Rate for Material and Labour	$363	EACH	$2,178
2	04. Electrical	6	Construction Contingency	$54	EACH	$324
3	04. Electrical	6	Average Total Project Soft Costs	$125	EACH	$750
4		0	Quantity of 6 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Clean and retorque cable lugs, breakers and terminations on all electrical components.

Event costing is derived from Base Rate costs for "04.3A-010 General Lighting". No site factor costs are used.

Event Justification & Strategy

Preventive maintenance of major equipment in respect to cost and application is expedient for the overall health and operation of the building.

Implication of Event Deferral (Risks)

If this maintenance is not done regularly, the reliability of the system could be in jeopardy.

Transformer to be cleaned and torqued.

10.2A-030 Electrical - Thermal Scan

Details	Values
Expected Life	2
Component Cost	0
Last Major Action Year	1974
Component Condition (For BCR use only)	Average
Quantity	1
Measurement unit/ Metric	sum

Narratives

Component Description

The building has the following electrical equipment to be thermally scanned;

- 1974 Motor Control Center,
- Two 600 volt CDP panels,
- Two 120/208 volt, circuit breaker panelboads and,
- One dry type 112.5 kVA secondary transformer.

Component Condition & Anticipated Replacement Date

Currently, the electrical components are in average condition. Since thermal scanning has never been implemented, the initial scan should be completed in 2013.

Panels in Ozone Generation Room.

RP New [10.2A-030 Electrical - Thermal Scan]

Details	Values
Brief Description (40 Characters)	Conduct Electrical Thermal Scan
Current event Year (YYYY)	2013
Estimated Event Cost	$3,252

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	04. Electrical	6	Base Rate for Material and Labour	$363	EACH	$2,178
2	04. Electrical	6	Construction Contingency	$54	EACH	$324
3	04. Electrical	6	Average Total Project Soft Costs	$125	EACH	$750
4		0	Quantity of 6 used for appropriate costing.	$0	EACH	$0

Narratives

Event Description

Provide thermal scan of all terminations and electrically operating devices. This includes all pumps.

Event costing is derived from Base Rate costs for "04.3A-010 General Lighting" and no site factor costs are used.

Event Justification & Strategy

By taking responsibility of themographically scanning the electrical equipment, it is possible to catch problems before they become an emergency. Also, equipment can be trended for operation.

Implication of Event Deferral (Risks)

If thermal scanning is not completed when indicated, there is a risk of equipment failure causing operation outage and/or safety concerns.

Panel to be scanned.