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# BUILDING CONDITION ASSESSMENT & RESERVE FUND STUDY



## **Sunnyhill Housing Co-operative 787 - 3rd Street NW Calgary, AB**

**Prepared for:**

Sunnyhill Housing Co-Operative  
787 3<sup>rd</sup> Street NW  
Calgary, AB  
T2N 1P1



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IRC CB18-037CR-15052



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## Table of Contents

<b>Table of Contents</b> .....	<b>i</b>
<b>1 Introduction</b> .....	<b>1</b>
1.1 Terms of Reference .....	1
1.2 Scope of Work .....	1
1.3 Building Description .....	1
1.4 Key Plan of Sunnyhill Housing Co-op .....	4
<b>2 Methodology</b> .....	<b>5</b>
2.1 General .....	5
2.2 Sampling of Units .....	5
2.3 Limitations .....	5
2.4 Code Compliance .....	5
2.5 Information provided to IRC .....	5
2.6 Documentation Provided to IRC .....	5
2.7 References .....	6
2.8 Condition Ratings .....	6
2.9 Priority Rating .....	6
2.10 Expenditure Type .....	7
2.11 Expected Life Cycle .....	8
2.12 Maintenance .....	8
2.13 Mechanical, Electrical, Elevator, and Fire System Review .....	8
<b>3 Executive Summary</b> .....	<b>10</b>
3.1 Property Condition Assessment .....	10
3.1.1 Component Summary .....	10
3.1.2 Maintenance .....	12
3.2 CMHC – Canadian Mortgage and Housing Corporation – Energy Saving Tips .....	12
<b>4 Property Condition Assessment</b> .....	<b>15</b>
4.1 Structural Components .....	15
4.1.2 Foundations & Structure - Townhouses .....	15
4.2 Building Exterior Components .....	17
4.2.2 Shingle Roofing - Townhouses .....	17
4.2.9 Stucco / EIFS .....	19
4.2.10 Siding .....	22
4.2.15 Windows - Townhouses .....	25
4.2.18 Soffit, Fascia, Eavestroughs & Downspouts .....	27
4.2.22 Exterior Doors - Townhouse Units .....	29
4.2.24 Patio / Balcony Doors - Townhouses .....	31
4.2.32 Wood Decks - Townhouses .....	33
4.2.35 Wood Balconies & Metal Guardrails .....	34
4.2.38 Exterior Painting .....	36
4.2.39 Exterior Sealants .....	37
4.3 Building Interior Components .....	38
4.3.2 Kitchen Upgrades - Townhouses .....	38
4.3.4 Bathroom Upgrades - Townhouses .....	40
4.3.12 Carpets & Flooring - Townhouses .....	42
4.3.22 Appliances - Stoves .....	44
4.3.23 Appliances - Refrigerators .....	46
4.3.34 Small Capital Costs - Townhouses .....	48
4.4 Mechanical & Plumbing Systems .....	54
4.4.4 Furnaces - Townhouses .....	54
4.4.16 Automatic Storage Water Heaters (Annual) .....	56
4.4.24 Plumbing Piping & Related - Townhouses .....	58
4.4.26 Fire and Domestic Water Services .....	60
<b>4.4.27 Storm and Sanitary Sewers and Drainage</b> .....	<b>61</b>
4.5 Electrical Systems .....	63
4.5.1 Power & Distribution - Common .....	63

4.5.3	Power & Distribution - Townhouses .....	65
4.5.12	Common Exterior Lighting.....	67
4.8	Site Components .....	69
4.8.1	Asphalt Pavement.....	69
4.8.4	Concrete Components .....	71
4.8.14	Chain Link Fencing .....	73
4.8.19	Guardrails & Handrails.....	75
4.8.20	Retaining Walls .....	77
4.8.30	Playground Equipment.....	79
4.8.31	Playground Surfacing.....	81
4.9	Organizational Elements.....	83
4.9.12	Building Condition Assessment & Reserve Fund Study Update .....	83
4.10	Miscellaneous Capital Components.....	84
4.10.1	Miscellaneous Capital Allowance.....	84
<b>5</b>	<b>Contingency Reserve Fund Study .....</b>	<b>87</b>
5.1	Reserve Fund Calculations.....	87
5.1.1	Annual Contribution .....	87
5.1.2	Future Cost Method .....	88
5.1.3	Professional Fees .....	88
5.1.4	Predicted Future Costs .....	88
5.1.5	Capital vs. Operating/Maintenance Costs.....	88
5.1.6	Description of Reserve Fund Table Columns .....	89
5.2	Reserve Fund Summary.....	89
5.2.1	Table 1.....	89
5.2.2	Table 2.....	90
<b>6</b>	<b>Water and Energy Saving Tips .....</b>	<b>99</b>
6.1	Water and Energy Savings Tips .....	99
6.1.1	General.....	99
6.1.2	CMHC – Canadian Mortgage and Housing Corporation – Energy Saving Tips .....	99
6.1.3	Building Exterior Components .....	99
6.1.4	Building Interior Components.....	101
6.1.5	Mechanical & Plumbing Systems.....	102
6.1.6	Electrical systems .....	105
<b>7</b>	<b>Limitations .....</b>	<b>107</b>
<b>8</b>	<b>Reference Information.....</b>	<b>109</b>
8.1	Further Reading.....	109
8.2	Project Team .....	111
8.3	Abbreviations .....	112
8.4	Client Notes: .....	113

# 1 Introduction

## 1.1 Terms of Reference

IRC Building Sciences Group (IRC) was authorized by the Sunnyhill Housing Co-Operative to perform an updated Building Condition Assessment & Capital Reserve Fund. The purpose of the assessment was to evaluate the condition of the primary building components, complete with recommendations for repair and/or replacements within the next 30-year period (Building Condition Assessment), including budget estimates for replacement costs and funding requirements (Contingency Reserve Fund Study).

## 1.2 Scope of Work

The work was performed in general accordance with IRC proposal C10257P and the Sunnyhill Housing Co-Operative request for proposal. This work included:

- Review of drawings and documentation made available to IRC for review.
- Performance site review of the buildings' primary components to visually evaluate current physical condition and standard of components.
- Preparation of Building Condition Assessment (BCA) report noting general observations and component conditions, together with recommendations for future repair options and associated budgetary costing.
- Develop a 30-year cash flow projection, listing each of the identified components that will require repair, retrofit or replacement.
- Identify all financial factors and assumptions used in the cash flow projections.

## 1.3 Building Description

Townhouse Information					
Year Constructed	Typical Unit Area	No. of Buildings	Primary Residence	Basement	Common Room
Circa 1977	Approx. 1532 sq. ft.	8	Mixed	No	Yes
Total No. of Units	4-Bedroom	3-Bedroom	2-Bedroom	1-Bedroom	Modified Units
66	0	32	26	8	0
<b>The townhouse units selected by the Housing Provider for review were</b>				#30, 42, 849	

Townhouse Construction	
<b>Foundation &amp; Exterior Wall Components</b>	The exterior wall assembly consists of a cast-in-place, reinforced concrete foundation framing supported by wood piles. At various reviewed areas, the reinforced concrete framed walls were covered with concealed membrane wall assembly with vinyl siding and a stucco bonded to concrete wall. No indirect observations of apparent foundation concerns were noted based on the condition of the above grade wall assemblies. However, future review of the wood piles is recommended once the buildings reach an age of 50 years.
<b>Roof Components</b>	The roofing assembly on the buildings were typically noted to be comprised of cathedral vaulted ceilings with the primary insulation outboard of the primary roof sheathing. The roof assembly was protected from the environment via asphalt shingles. Typically, the roof assembly on each of the 8 building blocks is a pitched roof which is primarily comprised of 4 X 10 spruce wood beams, t&g cedar roof decking with strapped out framing that supports the laminated asphalt shingles over insulation..
<b>Windows &amp; Doors</b>	The windows are pre-finished aluminum with both fixed and operable sliding type combinations. Some of the windows had been replaced which were noted to typically contain double glazed IGUs. The sliding patio doors were pre-finished aluminum. The swing patio doors were typically painted wood core doors that contained partial lite

Townhouse Construction	
	glazing. The exterior entrance doors consist of painted, solid wood core, metal clad doors & factory finished insulated metal with partial lite glazing.
<b>Electrical Systems</b>	125A, 120/240V AC, 1 Phase, 3 wire, 24 circuit Westinghouse NOVA Line NLC 24 surface mounted panel located typically in the basement level.
<b>Mechanical Systems</b>	Mid range Natural gas-fired automatic storage water heaters and gas-fired Carrier furnaces.

Other	
<b>Site Components</b>	Asphalt paving, concrete walkways and carport slab, perimeter & privacy chain link fencing, retaining walls and a playground structure.
<b>Reference Direction</b>	3 <sup>rd</sup> Street NW is located on the East side of the property, running North to South. Sunnyhill Lane & 4 <sup>th</sup> Street NW is located on the West side of the property, running North to South.

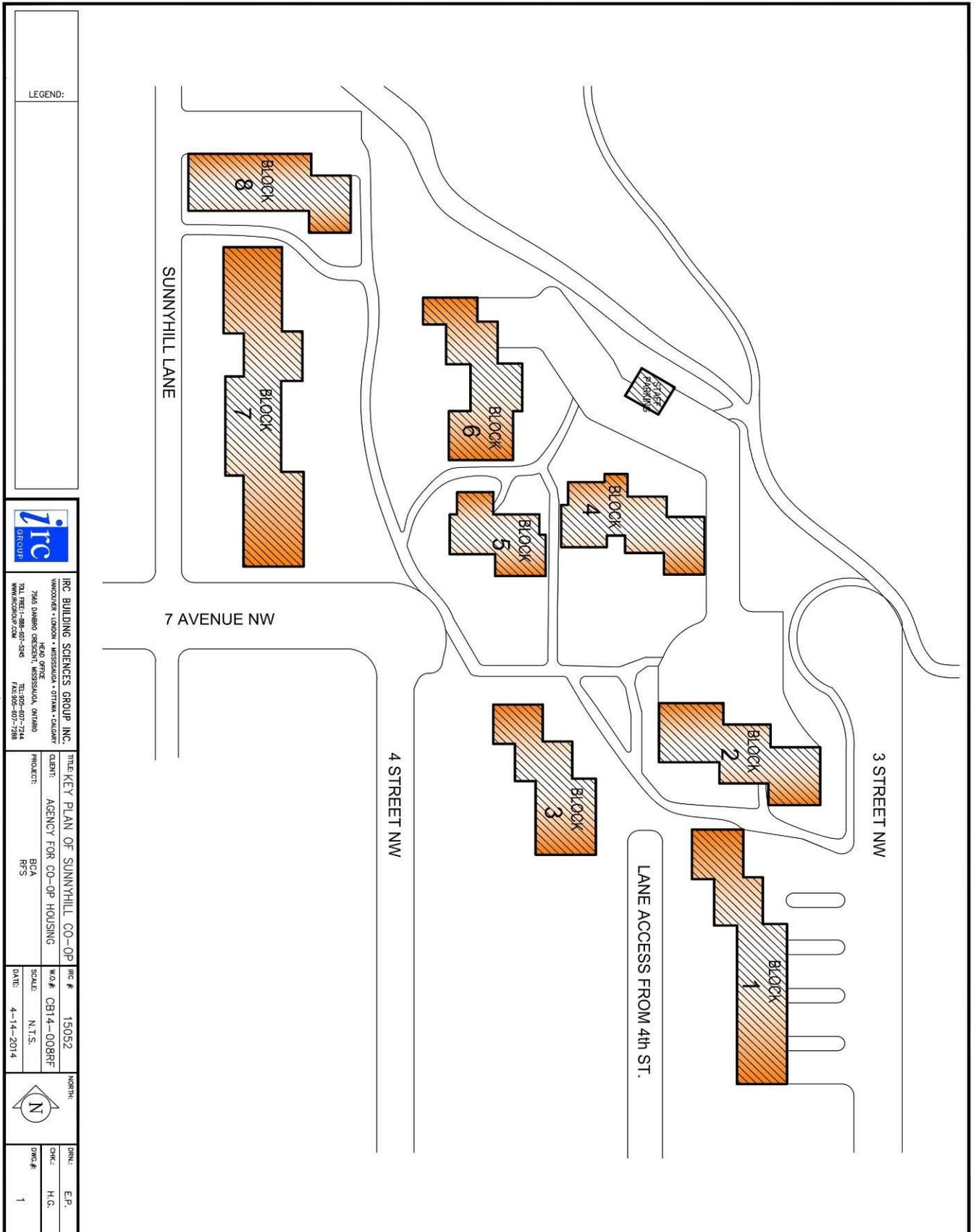
**Photographs**



Photographs



1.4 Key Plan of Sunnyhill Housing Co-op



## 2 Methodology

### 2.1 General

A survey of the building was conducted on May 30 and June 07, 2018, by IRC staff and environmental sub-consultants as listed in *Section 8 – Reference Information*. Observations of the exterior wall assemblies and roofs were made from the ground and upper floor levels.

This report was prepared based on the findings of the visual assessment and includes:

- evaluations of the building components reviewed,
- recommendations for repairs and replacement,
- budget estimates for all rehabilitation work, and
- photographs of typical deficiencies.

### 2.2 Sampling of Units

The site assessment included for a general visual review of the exterior and interior components, unit mechanical and electrical installations and the overall site components. The residential units reviewed were selected by representatives of Sunnyhill Housing Co-Operative.

The review process included:

- A minimum of 5% of the total number of the total residential units,
- A visual review of the building envelope for all buildings,
- A grade level visual review of roofs where possible,
- A review of the common mechanical and electrical equipment and components, and mechanical and electrical components in the residential units reviewed, and
- A review of all site exterior common elements.

### 2.3 Limitations

Only the specific information or locations noted in the report have been reviewed. Although every reasonable effort was taken to identify defects, latent and hidden defects may affect the accuracy of this report. No physical or destructive testing and no design calculations have been performed unless indicated elsewhere in this report.

### 2.4 Code Compliance

During the visual reviews of the buildings and properties, it has been generally determined, “in a global sense”, that compliance with the current laws and regulations governing its operations are correct unless specifically noted. Comments provided are detailed as to the nature of the non-conformance. A full code compliance review was not required as part of the Scope of Work.

### 2.5 Information provided to IRC

Information provided to IRC by Sunnyhill Housing Co-Operative relevant to this project is as follows:

- The Reserve Fund balance as of December 21, 2017 was reported by the board to be an assumed amount of \$751,402. The Housing Providers fiscal year end is December 31.
- Sunnyhill Housing C-Op have indicated that there is no set or defined yearly annual contribution to the Reserve Fund. However, for the purposes of budgeting for anticipated repairs, the Co-Operative indicated that they typically allocate an average of \$1000 per unit per year or for a net total of \$66,000 per annum.

### 2.6 Documentation Provided to IRC

#### Construction Drawings

- Specific Architectural drawings A20, 21 and 22 were made available to IRC for review.

### Documents provided for this Review:

- Twenty Five (25) Year Reserve Fund Report for Replacement of Capital Items and Major Maintenance Elements for Sunnyhill Housing Co-operative by IRC Building Sciences dated: September 2008.

## 2.7 References

References to reports, articles, web sites and other relevant information related to this site have been made throughout the report identified by a reference number, i.e. <sup>(00)</sup>. The references to the further readings have been given under the recommendations for each component and listed in *Section 8 – Reference Information* at the back of the report. Links to web sites are identified by [underlined text](#).

## 2.8 Condition Ratings

The following definitions have been used in the text to describe the condition of each component reviewed:

<b>Good Condition:</b>	No deficiencies or concerns noted. No capital expenditure is anticipated within next 10-years.
<b>Good / Fair Condition:</b>	Reasonable condition as whole; minor deficiencies noted. No capital expenditure is anticipated within next 10-years.
<b>Fair Condition:</b>	Reasonable condition as whole; deterioration and/or damage noted. Capital expenditure is anticipated within 5 – 10 years.
<b>Fair / Poor Condition:</b>	Deterioration and/or damage noted; component is nearing end of service life. Capital expenditure is recommended in 2 – 5 years.
<b>Poor Condition:</b>	Deterioration and/or damage noted; component at end of service life. Capital expenditure is recommended in 0 – 2 years.
<b>Very Poor</b>	Immediate action is recommended to repair or improve the condition and further investigation is recommended.
<b>n/a</b>	Component does not currently exist and installation is recommended for building functionality or as a cost-effective upgrade.

## 2.9 Priority Rating

To assess the priorities of the **short-term** repairs/replacements required **within the next 5 years** for the various components at each property, the following ratings from “A” to “E” have been used:

### Priority A – Health & Safety

Hazardous conditions which could lead to loss of life or critical or extremely severe injury, and the remediation of which cannot be deferred.

#### Guideline:

This priority is for those conditions which are extremely hazardous and which, if not corrected, could lead to critical injury or loss of life. The required scope of work will generally be localized and normally include only a portion of a particular building element or building system.

### Priority B – Structural Integrity

Conditions that lead to the deterioration of structural elements of a property must be investigated and corrected if necessary. Failure to do so may lead to unsafe, life threatening conditions and will eventually render the building structurally unsound and physically obsolete; incapable of performing the task it was designed to do.

#### Guideline:

This priority is to be assigned to the rehabilitation of structural building elements which have deteriorated to such an extent that they are no longer structurally sound and are not capable of performing their intended task. Examples such as cracked columns, severe spalling or cracked shear walls, failing shelf angles, corroded structural steel supporting members and decaying wood support members are characteristic of the priority.

### Priority C – Code Requirement

All buildings and building systems must be upgraded so that they comply with revision to existing legislation or to the requirements of newly adopted legislation.

**Guideline:**

This priority is to be assigned to work that is required to ensure that buildings comply with new requirements brought about by changes to applicable existing legislation, such as the Fire Code, or newly adopted legislation. Building elements that have deteriorated to an extent that they no longer comply with existing codes are not assigned this priority.

**Priority D – Building Functionality**

Replacement required for building components which have a direct and significant impact on the building or operation of the building as a whole – generally limited to the building structure and envelope as well as the primary mechanical and electrical systems. These building components and systems must be maintained in order to protect the value and operational viability of the asset. This work is necessary in order to maintain resident's quality of life and to prevent the building from becoming physically or functionally obsolete.

**Guideline:**

Certain building systems must be maintained in order to protect the “value” and operational viability of the asset. Accordingly, work that directly and significantly affects the overall performance of a primary building system, or a major part thereof, is assigned this priority.

**Priority E – General Upgrades**

Upgrades of components that have surpassed their useful service life, that do not have a direct bearing on the safe operation or functionality of the building, i.e. not building envelope components or primary mechanical and electrical systems. Also includes upgrades with either cost-effective or other initiatives that improve the operational efficiency or marketability of the property and which are considered to have a reasonable payback or add non-tangible value.

**Guideline:**

General replacement of components that have surpassed their useful life but replacement may be deferred without affecting the safe operation and functionality of the property as a whole. Examples include carpets, appliances, asphalt paving and concrete components. This rating is also assigned to components where operating efficiencies and initiatives, and upgrades with a perceived payback may be achieved. Typically energy management, water conservation programs; and/or upgrades to improve non-tangibles such as ‘curb appeal’, aesthetic appearance and marketability of the residential units and buildings as a whole.

**Priority – None**

This priority is assigned to components where no significant repairs or replacement is expected within the next 5-year period, or where the component has no significant bearing on the operation or function of the property as a whole.

**Guideline:**

A projected priority rating of a component beyond a 5-year period cannot be accurately assessed due to the many variables that may affect the condition beyond this period. Variables such as regular maintenance, weather deterioration, general wear and tear, new technologies, changing code requirements etc. Priority ratings should be re-assessed every 3-year period when updates to the property condition assessment are recommended.

Components that are considered to have no significant bearing on the operation or function of the property as a whole, such as furnishings, office equipment, maintenance/storage sheds, benches, general site signage etc. may be assigned this rating.

**2.10 Expenditure Type**

**Recommended**

Costs accounted for in the Table of Expenditures account for the quantifiable cost of replacement recommended within the foreseeable future, i.e. next 5-years, based on the condition assessment and the industry norm for typical service life between replacement/upgrades/restoration.

**Projected**

Costs accounted for in the Table of Expenditures account for the quantifiable cost of replacement or an estimated allowance for components where the replacement date cannot be accurately assessed, i.e. 5-years and beyond, based on the condition assessment and the industry norm for typical service life between replacement/upgrades/restoration.

**Allowance**

A cash allowance is accounted for in the Table of Expenditures as the costs cannot be accurately measured either due to the work being non-cyclical in repair or replacement, or that the ‘quantity’ to account for cannot be calculated as a single entity. Examples include partial restoration of concrete components and foundation leak repairs.

### Discretionary

Costs are accounted for in the Table of Expenditures for upgrades/replacement of components that are considered to be cost effective or worthwhile; however, they are not necessary for the continued operation of the building as it currently is. Costs may be omitted or discounted from budgets if deemed not necessary. Examples include application of concrete balcony waterproofing and installation of roof anchors, upgrade of attic insulation and replacement of older 'standard' flush toilets.

### Operating

Costs are not accounted for in the Table of Expenditures. Expenditures that are considered to be a small capital value under \$5,000 and that may be performed by maintenance staff or contractors by under general work order. Examples include repair of damaged insect screens and singular replacements such as exterior doors that are not part of the planned expenditures.

### Maintenance

Costs are not accounted for in the Table of Expenditures. Minor cost for the day-to-day maintenance of the building that may be completed by maintenance staff. Examples include replacement of bathtub sealants and adjustment of doors.

## 2.11 Expected Life Cycle

Each component has been assessed with an expected life cycle for the component reviewed. The numbers shown indicate the industry 'norm' for that component with the average value bolded. For example, *Roof Shingles: 15 – **20** – 25 +* indicates that the average life expectancy for roof shingles is approximately 20 years, with a deviation of approximately  $\pm 5$  years depending upon variables such as material quality, standard of installation and level of preventative maintenance.

## 2.12 Maintenance

Items that require general maintenance have been identified and outlined within the report. Costs associated with these items are considered to be maintenance costs and have not been accounted for in the Table of Expenditures. **It is recommended that review of all residential units be completed for similar occurrences.** Examples of such items are fixing loose edges of sheet vinyl or carpets, replacing weather-stripping around doors, windows, and attic access hatch, and securing loose eavestroughs connectors.

For further information about maintaining the properties see [CMHC article 63218 - About Your House: Home Maintenance Schedule](#) <sup>(1)</sup>

## 2.13 Mechanical, Electrical, Elevator, and Fire System Review

The estimated service life and basic remaining life of mechanical and electrical systems may be highly variable due to the quality of equipment, local environment and installation as well as the level of maintenance performed during the life of the equipment.

The remaining life expectancy for each component or system is based upon the industry norms for the equipment; including an assessment of any maintenance information provided by the Housing Provider. By using this approach, monies required for replacement or upgrades are identified in the reserve fund at the expected time of replacement. Predicting the exact replacement year is difficult, and actual replacement may be based upon current technologies, energy efficiencies, availability of replacement parts and frequency of repairs rather than failure of the component.

The review process for this building condition assessment does not include for a design review for the adequacy and function of the system for the particular use at this property. It is assumed that the design was to the standards of the day of installation and that the system is considered to meet the needs of the Housing Provider unless identified as deficient during interviews. See specific system Observations for details.

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### 3 Executive Summary

#### 3.1 Property Condition Assessment

##### 3.1.1 Component Summary

<b>Priority A – Health &amp; Safety</b>	Hazardous conditions which cannot be deferred and which could lead to loss of life or critical or extremely severe injury.
<b>Priority B – Structural Integrity</b>	Conditions that lead to the deterioration of structural elements of a property must be investigated and corrected if necessary.
<b>Priority C – Legislative Requirements</b>	Components or systems must be upgraded so that they comply with revision to existing legislation.
<b>Priority D – Building Functionality</b>	Replacement required for building components which have a direct and significant impact on the building as a whole.
<b>Priority E – General Upgrades</b>	Upgrades of components that have surpassed their useful service life, that do not have a direct bearing on the safe operation or functionality of the building.
<b>Priority – None</b>	This priority is assigned to components where no significant repairs or replacement is expected within the next 5-year period.

Structural Components								
Component		Priority Rating					Condition Rating	Expenditure Recommended
4.1.2	Foundations & Structure - Townhouses					None	Fair	5 - 10 Years

Building Exterior Components								
Component		Priority Rating					Condition Rating	Expenditure Recommended
4.2.2	Shingle Roofing - Townhouses					None	Good / Fair	10 – 20 Years
4.2.9	Stucco / EIFS					None	Fair	5 – 10 Years
4.2.10	Siding			D		None	Good / Fair	10 - 20 Years
4.2.15	Windows - Townhouses			D			Fair / Poor	2 - 5 Years
4.2.18	Soffit, Fascia, Eavestroughs & Downspouts					None	Fair	5 - 10 Years
4.2.22	Exterior Doors - Townhouse Units					None	Good / Fair	10 - 20 Years
4.2.24	Patio / Balcony Doors - Townhouses			D			Fair / Poor	2 - 5 Years
4.2.32	Wood Decks - Townhouses					None	Fair / Poor	2 – 5 Years
4.2.35	Wood Balconies & Metal Guardrails		B				Poor	0 Years
4.2.38	Exterior Painting		B				Poor	0 -2 Years
4.2.39	Exterior Sealants		B				Poor	0 - 2 Years

Building Interior Components								
Component		Priority Rating					Condition Rating	Expenditure Recommended
4.3.2	Kitchen Upgrades - Townhouses					None	Various	5 - 10 Years
4.3.4	Bathroom Upgrades - Townhouses					None	Various	+20 Years

Building Interior Components								
Component		Priority Rating				Condition Rating	Expenditure Recommended	
4.3.12	Carpets & Flooring - Townhouses					E	Various	Annually
4.3.22	Appliances - Stoves					E	Various	Annually
4.3.23	Appliances - Refrigerators					E	Various	Annually
4.3.34	Small Capital Costs - Townhouses					E	Various	Annually

Mechanical & Plumbing Systems								
Component		Priority Rating				Condition Rating	Expenditure Recommended	
4.4.4	Furnaces - Townhouses					None	Good / Fair	10 - 15 Years
4.4.16	Automatic Storage Water Heaters (Annual)					D	Various	Annually
4.4.24	Plumbing Piping & Related - Townhouses					None	Good / Fair	10 - 20 Years
4.4.26	Fire and Domestic Watermains					None	Good / Fair	10 - 20 Years
4.4.27	Storm and Sanitary Sewers and Drainage					None	Good / Fair	10 - 20 Years

Electrical Systems								
Component		Priority Rating				Condition Rating	Expenditure Recommended	
4.5.1	Power & Distribution - Common					None	Good / Fair	10 - 20 Years
4.5.3	Power & Distribution - Townhouses					None	Good / Fair	10 - 20 Years
4.5.12	Common Exterior Lighting					None	Fair	5 - 10 Years

Site Components								
Component		Priority Rating				Condition Rating	Expenditure Recommended	
4.8.1	Asphalt Pavement					None	Fair	5 - 10 Years
4.8.4	Concrete Components					None	Various	5 - 10 Years
4.8.14	Chain Link Fencing					None	Various	5 - 10 Years
4.8.19	Guardrails & Handrails					None	Fair	5 - 10 Years
4.8.20	Retaining Walls					None	Fair	5 - 10 Years
4.8.30	Playground Equipment					None	Fair	5 - 10 Years
4.8.31	Playground Surfacing					None	Fair	5 - 10 Years

Organizational Elements								
Component		Priority Rating				Condition Rating	Expenditure Recommended	
4.9.12	Building Condition Assessment & Reserve Fund Study Update					None	Good	5 Years

<b>Miscellaneous Capital Components</b>								
<b>Component</b>		<b>Priority Rating</b>					<b>Condition Rating</b>	<b>Expenditure Recommended</b>
4.10.1	Miscellaneous Capital Allowance				D	E	Various	Annually
4.10.2	Foundation Leaks / Window Wells							As Required
4.10.3	Window IGUs							As Required
4.10.11	Landscaping							As Required
4.10.12	Site Signage							As Required
4.10.16	Garbage Bin Enclosures							As Required

**3.1.2 Maintenance**

Items that require general maintenance were noted during the review and have been listed below. This is not intended to be an exhaustive list of all the repair maintenance items required, rather those noted during general review. Costs associated with these items are considered to be maintenance costs and have not been accounted for in the Table of Expenditures. **It is recommended that review of all residential units be completed for similar occurrences.**

- Repair of sealants around bathtubs and vanities.
- Clogged drains in courtyard and walkways.
- Debris build-up and organic growth in eavestroughs.
- Damaged insect screens to doors and windows (various locations).
- Weather-stripping around doors and windows (various locations).
- Secure all loose eavestroughs fixings and connectors (various locations).

For further information about maintaining the properties see [CMHC article 63218 - About Your House: Home Maintenance Schedule](#) <sup>(1)</sup>

**3.2 CMHC – Canadian Mortgage and Housing Corporation – Energy Saving Tips**

CMHC offer information and advice as to where potential water and energy savings may be made with components and/or systems, including estimated payback periods. Information on these potential savings can be found at [Water and Energy Saving Tips for Multi-Unit Residential Buildings \(MURBs\)](#) <sup>(33)</sup>.



# Sunnyhill Housing Co-operative

787 - 3rd Street NW, Calgary, AB

5-Year Projected Expenditures

Note: 2018 refers to the Corporations' Fiscal Year starting January 1, 2018 and ending December 31, 2018

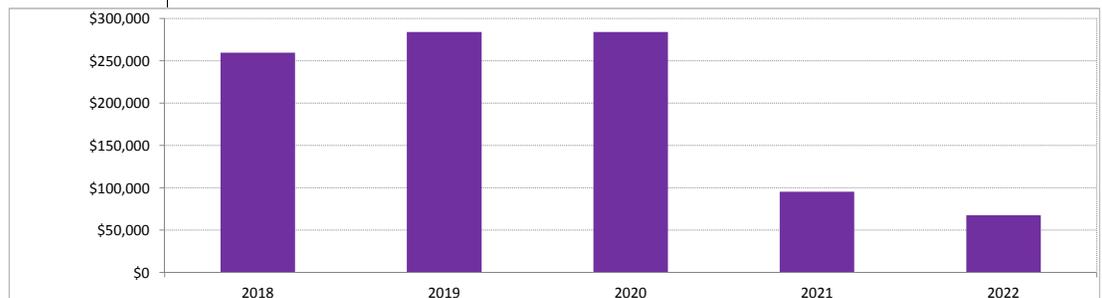
CRF No.	Component	2018	2019	2020	2021	2022
			1	2	3	4
<b>4.1</b>	<b>Structural Components</b>					
4.1.2	Foundations & Structure - Townhouses (**)					
<b>4.2</b>	<b>Building Exterior Components</b>					
4.2.2	Shingle Roofing - Townhouses (*) (**)					
4.2.9	Stucco / EIFS (**)		\$5,000			
4.2.10	Siding (**)					
4.2.15	Windows - Townhouses (**)		\$205,643	\$209,756		
4.2.18	Soffit, Fascia, Eavestroughs & Downspouts					
4.2.22	Exterior Doors - Front and Rear (**)					
4.2.24	Patio / Balcony Doors - Townhouses (**)					
4.2.32	Wood Decks - Townhouses (**)					
4.2.35	Wood Balconies & Metal Guardrails (**)	\$189,000				
4.2.38	Exterior Painting				\$29,417	
4.2.39	Exterior Sealants (**)				\$4,736	\$4,830
<b>4.3</b>	<b>Building Interior Components</b>					
4.3.2	Kitchen Upgrades - Townhouses					
4.3.4	Bathroom Upgrades - Townhouses					
4.3.12	Carpets & Flooring - Townhouses	\$41,580	\$42,412	\$43,260	\$44,125	\$45,008
4.3.22	Appliances - Stoves	\$3,329	\$3,395	\$3,463	\$3,532	\$3,603
4.3.23	Appliances - Refrigerators	\$3,749	\$3,823	\$3,900	\$3,978	\$4,057
4.3.34	Small Capital Costs - Townhouses	\$2,499	\$2,549	\$2,600	\$2,652	\$2,705
<b>4.4</b>	<b>Mechanical &amp; Plumbing Systems</b>					
4.4.4	Furnaces - Townhouses (**)					
4.4.16	Automatic Storage Water Heaters (Annual)	\$3,696	\$3,770	\$3,845	\$3,922	\$4,001
4.4.24	Plumbing Piping & Related - Townhouses (**)					
4.4.26	Fire and Domestic Water Services (*) (**)					
4.4.27	Storm and Sanitary Sewers and Drainage (*) (**)					
<b>4.5</b>	<b>Electrical Systems</b>					
4.5.1	Power & Distribution - Common (*) (**)					
4.5.3	Power & Distribution - Townhouses					
4.5.12	Common Exterior Lighting					
<b>4.8</b>	<b>Site Components</b>					
4.8.1	Asphalt Pavement (**)					
4.8.4	Concrete Components					
4.8.14	Chain Link Fencing					
4.8.19	Guardrails & Handrails					
4.8.20	Retaining Walls					
4.8.30	Playground Equipment					
4.8.31	Playground Surfacing					
<b>4.9</b>	<b>Organizational Elements</b>					
4.9.12	Building Condition Assessment & Reserve Fund Study Update					
<b>4.10</b>	<b>Miscellaneous Capital Components</b>					
4.10.1	Miscellaneous Capital Allowance	\$2,636	\$2,688	\$2,742	\$2,797	\$2,853
4.10.2	Foundation Leaks / Window Wells					
4.10.3	Window IGUs					
4.10.11	Landscaping					
4.10.12	Site Signage					
4.10.16	Garbage Bin Enclosures					

Note: 2018 refers to the Corporations' Fiscal Year starting January 1, 2018 and ending December 31, 2018

		2018	2019	2020	2021	2022
LINE A	EXPENDITURE - PRESENT DAY VALUE	\$246,488	\$264,000	\$259,098	\$89,670	\$61,950
LINE B	INFLATION RATE	0.00%	2.00%	2.00%	2.00%	2.00%
LINE C	COMPOUND INFLATION RATE	1.000000%	1.020000%	1.040400%	1.061208%	1.082432%
LINE D	EXPENDITURE - FUTURE COST VALUE	\$246,488	\$269,280	\$269,566	\$95,159	\$67,057
LINE E	GST @ 5%	incl.	incl.	incl.	incl.	incl.
LINE F	PROFESSIONAL FEES incl. GST (*) & (**)	\$13,230	\$14,745	\$14,683	\$331	\$338
LINE L	TOTAL EXPENDITURE - FUTURE COST VALUE	\$259,718	\$284,025	\$284,248	\$95,490	\$67,395

\* Engineering Design Fees applied to this component @ 8%

\*\* Project Management Fees applied to this component @ 7%



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## 4 Property Condition Assessment

### 4.1 Structural Components

#### 4.1.2 Foundations & Structure - Townhouses

##### General Condition

Installed / Last Major Repairs		1977		Typical Restoration Period		- 20 – 50 – 80 +	
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None	
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor	

##### Summary Budgetary Costs

Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$18,000	Item	5 - 10 Years	Allowance	Contingency for potential repairs
\$10,000	Item	5 - 10 Years	Operating	Contingency for Wood Pile investigation
n/a	Item	As required	Operating	One-off repairs, minor crack injection repairs

Design & Specification Recommended:  Project Management & Quality Control Recommended:

##### Observations & Recommendations

- Based on the architectural drawings, the reinforced concrete walls are supported by below grade #12 Timber Piles
- No timber piles were visible or exposed at reviewed locations.
- The concrete structural components include cast-in-place (C.I.P.) concrete which typically form the unit ground floor unit walls.
- Hairline cracks were noted in various reviewed exposed foundation walls and the carport concrete slab-on-grade (SOG); The observed cracks were typical stress shrinkage cracks and are not considered to be a structural concern.
- Localized areas of exposed & corroded steel reinforcement were observed in the concrete foundation sporadically throughout the building but most typically within the vicinity of the carports.
- Continued review and assessment of the structural components must be completed as part of an annual residential unit review and regular building condition assessment.
- Complete regular inspection and visual review of foundations to be performed by a qualified professional.
- Continued assessment every 5-year period as part of building condition assessment.

##### General Comments

- Budgetary costs, if included in the Table of Expenditures, account for any further structural assessment that may be determined from the site review. The costs do not include for major structural repair or complete installation of waterproofing. Costs associated with any foundation leaks or waterproofing have been accounted for under Miscellaneous Capital Components.
- Observation of the structural components is limited to exposed sections from the interior and exterior.
- No destructive investigation was undertaken to review hidden structural components including the wood piles.
- The building foundations and structure should last the life of the building, i.e. 50+ years and generally should require little or no repair. Structural deficiencies may become evident in the first 5 – 20 years of operation; however it may be longer periods before any deficiencies are evident.
- Further information - [CMHC article 63463 – About Your House: Avoiding Basement Flooding](#) <sup>(2)</sup>
- Further information - [CMHC article 62039 – About Your House: Insulating Your House](#) <sup>(34)</sup>

Photographs



Parging noted to be delaminating from Concrete foundation (non-structural concern).



Evidence of historic parking repairs noted on concrete foundation.



Isolated delaminated concrete section.



Typical end wall elevation view of ground floor reinforce concrete foundation wall.

End of Foundations & Structure - Townhouses Section

## 4.2 Building Exterior Components

4.2.2 Shingle Roofing - Townhouses						
General Condition						
Installed / Replaced		2011		Typical Service Life		
				- 10	- 15	- 20 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$20,000	Item	0 – 2 Years	Operational	Attic space / roof ventilation condition assessment & investigation
\$400,000	42000 sq ft.	8 – 13 Years	Projected	Replace all roof shingles
Design & Specification Recommended:		<input checked="" type="checkbox"/>	Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations				
<b>Curling</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
<b>Degranulation</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
<b>Cracked</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None

- During the last BCA, IRC was informed that the laminated asphalt shingled roofing & eavestroughs were replaced in 2011 through an insurance claim.  
 - The board reported that no further repairs have been made to the roof since the replacement in 2011  
 - Asphalt shingles appear to be in good to fair condition.  
 - It is recommended to consider a two (2) to five (5) year maintenance program to ensure a long service life cycle of the roofing. This includes eavestroughs clean out, organic growth removal and sealant replacement.  
 - Minor curling & buckling of asphalt shingles were observed at localized areas of the roof in all buildings directly above the demising / party walls in between townhouse units.  
 - Review and replacement of the eavestroughs has been accounted for under Soffits, Fascia, Eavestroughs & Downspouts section.  
 - It is recommended that a professional consultant be retained for the future re-roofing projects to ensure correct detailing and quality assurance.

General Comments
<ul style="list-style-type: none"> <li>- No reported water leakage problems were reported by the Co-op since the shingle replacement in 2011</li> <li>- Annual walk around review is recommended by a qualified contractor to ensure the integrity of the roof system and to extend the service life.</li> <li>- The typical service life of a n average asphalt shingles is approximately 2/3<sup>rd</sup> of the shingles stated standard life.</li> <li>- Adequate ventilation of the attic can have a significant impact on the actual lifespan of roof shingles. It is recommended at the time of roof shingle replacement that the adequacy of the roof venting be reviewed</li> <li>- Before undertaking any repairs to roof shingles always check the installers warranty statement so as to avoid invalidating any warranty.</li> <li>- Roofing components such as B-vents, vent covers, metal flashings etc. have a service life expectancy of 30+ years and may not all need to be replaced in one particular year. The costs of the roof shingle replacement have been increased to</li> </ul>

**General Comments**

allow a contingency replacement of these items.

- Further information - [CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings](#) <sup>(33)</sup>
- Further information - [CMHC article 62258 – About Your House Before You Start Repairing or Replacing Roof Finishes](#) <sup>(3)</sup>
- Further information - [CMHC article 620348 – About Your House: Attic Venting, Attic Moisture, and Ice Dams](#) <sup>(11)</sup>

**Photographs**



Typical low to moderately sloped roof area.



Typical Asphalt roof condition on single storey units.



Typical Asphalt condition over balcony areas

**End of Shingle Roofing - Townhouses Section**

4.2.9 Stucco / EIFS						
General Condition						
Installed / Last Major Repairs			1977	Typical Restoration Period		
				- 40 – 50 – 60 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs					
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation	
\$5,000	Item	2 – 5 Years	Recommended	Contingency for temporary repairs to stucco clad walls	
\$900,000	45,000 sq. ft.	10 Years	Allowance	Allowance for Stucco Replacement	
Design & Specification Recommended:			<input type="checkbox"/>	Project Management & Quality Control Recommended:	<input checked="" type="checkbox"/>

Observations & Recommendations				
Cracks	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None
Spalling/De-bonded	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None
<ul style="list-style-type: none"> <li>- Stucco clad wall assemblies are located on end walls &amp; party walls between townhouse units in all of the buildings throughout the property.</li> <li>- IRC was informed by the Housing Provider that the stucco clad walls were partially re-clad / repaired in some areas circa 2000</li> <li>- A damaged section of the stucco clad wall was observed in the East end wall of unit 44, block 8. This was previously noted in the last BCA and no repairs appear to have been conducted.</li> <li>- Other smaller damaged areas were also sporadically noted throughout the complex.</li> <li>- Localized areas of cracks, damaged and sediment build-up on the stucco were observed.</li> <li>- One-off repairs are anticipated prior to complete replacement. This is considered as maintenance expenditure.</li> <li>- Stucco patch repairs were observed at various locations throughout the property.</li> <li>- Evidence of water staining on the stucco clad wall base was observed at localized areas typically coincident with eave trough end areas.</li> <li>- Localized minor cracks &amp; spalling were observed at multiple areas of the stucco wall.</li> <li>- Organic growth should be cleaned under routine maintenance, with localized areas repaired immediately to maintain weather tight exterior along with localized painting of deteriorated finish.</li> <li>- Rain screen principal designs should be incorporated in the future replacement stucco clad walls.</li> <li>- Replacement of the stucco should be coordinated with window, door and sliding balcony door replacement to ensure good detailing water and air seals around the all perimeters are achieved.</li> <li>- A professional consultant is recommended to be retained for wall rehabilitation projects to ensure correct detailing and quality assurance.</li> <li>- Painting of the stucco is not recommended.</li> <li>- Replacement of control joint sealants has been accounted for under Sealants / Caulking.</li> </ul>				

General Comments
<ul style="list-style-type: none"> <li>- The typical life of stucco is 50 years; however it may be expected that localized repairs will be required approximately every 10 – 15 year period assuming that proper water management systems are maintained (i.e. eaves troughs).</li> </ul>

**General Comments**

- Budgetary costs include for general stucco repairs such as patch repairs of spalled or cracked areas and refinishing of the coating. The cost do not account for complete replacement of the stucco unless indicated.
- Further information - [CMHC article 62260 - About Your House: Before You Start Repairing and Materials – Exterior Walls](#) <sup>(4)</sup>
- Further information - [CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings](#) <sup>(33)</sup>

**Photographs**



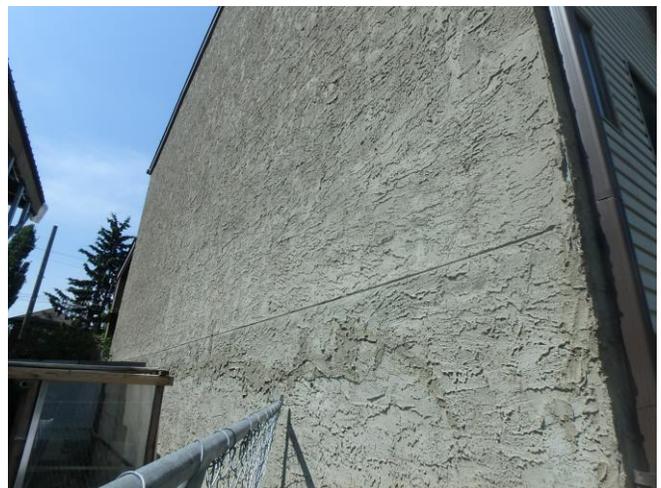
Damaged Stucco located at end wall for unit 44 (or block 8).



Typical patch repairs at end wall areas at concrete to wood frame transitions.



Water staining noted on end wall areas under eaves troughs



Typical Stucco Repair at end wall area.

Photographs



Typical water staining on stucco under balcony areas.



Typical water staining and moisture damage on stucco at balcony to end wall locations

**End of Stucco / EIFS Section**

4.2.10 Siding						
General Condition						
Installed / Replaced		2000		Typical Service Life		- 25 – 30 – 35 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2014)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$675,000	45000 sqft.	10 - 20 Years	Projected	Replace all vinyl siding
n/a	Item	As required	Operating	Fix minor damaged sections, loose siding etc.
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

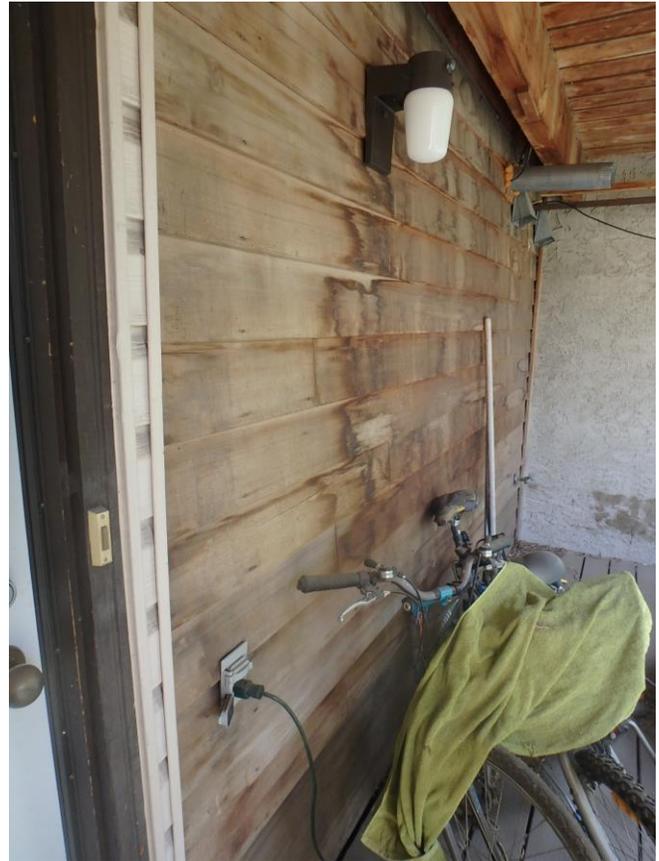
Observations & Recommendations				
Siding Type	<input checked="" type="checkbox"/> Vinyl	<input type="checkbox"/> Aluminum	<input type="checkbox"/> Metal	<input type="checkbox"/> Wood
<ul style="list-style-type: none"> <li>- The vinyl cladding was installed over the original wood siding within the last 15 to 20 years. The general appearance of the vinyl siding is good to fair.</li> <li>- IRC was informed during the last BCA that the siding throughout the property was covered by vinyl siding circa 2000.</li> <li>- Localized areas of damaged vinyl siding were observed throughout the Housing complex.</li> <li>- Replacement of the siding should be coordinated with window, door and balcony sliding door replacement to ensure both effective waterproof detailing and air seals.</li> <li>- Rain screen principal designs should be incorporated in the future replacement of the vinyl cladding.</li> <li>- It recommended that a professional consultant be retained for any major wall rehabilitation projects to ensure correct detailing and quality assurance.</li> <li>- The sealant failure were observed around the siding components; see Sealants/Caulking section for further details.</li> <li>- There are no further observations other than as outlined under General Comments.</li> </ul>				

General Comments
<ul style="list-style-type: none"> <li>- The eventual replacement of the vinyl siding may be coordinated with replacement of similar components such as soffits and fascias for cost efficiency and improved detailing at any joint/interfaces.</li> <li>- Consideration may be given to cleaning the siding every few years to maintain the finish and for appearances. Routine reviews and maintenance is required to prevent more costly future repair. Cleaning of the siding should be done with a soft broom and garden hose with medium pressure nozzle. Do not use high pressure or a power washer that may penetrate water behind the siding.</li> <li>- The typical service life of siding is 30+ years.</li> <li>- Further information - <a href="#">CMHC article 62260 - About Your House: Before You Start Repairing and Materials – Exterior Walls</a> <sup>(4)</sup></li> <li>- Further information - <a href="#">CMHC article 62264 – About Your House: Before You Start an Energy-Efficient Retrofit – The Building Envelope</a> <sup>(5)</sup></li> <li>- Further information - <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Typical siding configuration / Condition.



Close up view of exposed original cedar siding found on Block 1.

Photographs



Typical siding configuration around window penetrations.



Typical Siding Configuration at Balcony Elevations

End of Siding Section

4.2.15 Windows - Townhouses						
General Condition						
Installed / Replaced		1977		Typical Service Life		- 25 – 30 – 35 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input checked="" type="checkbox"/> Function	<input type="checkbox"/> General	<input type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input checked="" type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2014)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$384,010	6982 sq. ft.	2 - 5 Years	Recommended	Replace all windows
n/a	Item	As required	Maintenance	Replace weather-stripping and latches, lubrication, cleaning, repairs of insect screens etc.
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations	
<b>General window construction</b>	The windows are pre-finished aluminum with both fixed and operable sliding type & fixed window configurations with a combination of single & double glazed insulating glass units (IGUs).
<ul style="list-style-type: none"> <li>- The window units appear to be from original construction. The majority of the windows are single glazed double sash units.</li> <li>- The weather-stripping was generally considered to be in poor condition. Much of the woven pile was stiff/brittle and contained dirt accumulations</li> <li>- The operations of the sashes were of varying ease of operation / stiffness.</li> <li>- For safety consideration, the operable window units on the second floor should include a restrictor to prevent the window from being opened greater than 4" or 100mm to mitigate a potential fall hazard to children.</li> <li>- Window replacement should be concurrent with any type of siding replacement to ensure proper water management and air seal detailing is achieved.</li> <li>- AC units were noted to be sporadically installed in some of the windows throughout the complex. Efforts should be taken to ensure that the temporary surround is watertight. These AC units should be removed during winter months for energy conservation.</li> <li>- Replacement of some individual windows may be expected prior to general replacement of the windows – given the isolated scope of this work, this is considered to be an operating expenditure.</li> </ul>	

General Comments
<ul style="list-style-type: none"> <li>- Replacement of weather-stripping, repairs to damaged screens and lubrication and adjustment of windows are considered to be <i>operating</i> expenditure.</li> <li>- Consideration may be given to overhauling the windows during turnover which will provide the end users with the benefit of increased performance over the existing. . This would include steam cleaning of tracks and moving parts, lubricating sashes (if present) with a silicone spray and repairing any damaged insect screens.</li> <li>- The window perimeter sealant has been addressed under the Sealants/Caulking component.</li> <li>- Budgetary costs for window replacement may be highly variable depending upon the style and construction of window selected by the Housing Provider.</li> <li>- Government grants may be available for new window installation as part of the <a href="#">ecoENERGY program</a> <sup>(28)</sup></li> <li>- Further information - <a href="#">CMHC article 62264 – About Your House: Before You Start an Energy-Efficient Retrofit – The Building Envelope</a> <sup>(5)</sup></li> <li>- Further information - <a href="#">CMHC article 62256 – About Your House: Before You Start Window and Door Renovations</a> <sup>(6)</sup></li> </ul>

**General Comments**

- Further information - [CMHC article 63683 – About Your House: The ABC's of Windows](#) <sup>(7)</sup>
- Further information - [CMHC article 62031 – About Your House: Understanding Window Terminology](#) <sup>(8)</sup>
- Further information - [CMHC article 65535 – How to Lock Out Crime: Home Security – Windows](#) <sup>(9)</sup>
- Further information - [CMHC article 61033 – Householders Guide: Moisture and Air](#) <sup>(35)</sup>
- Further information - [CMHC article 62027 – About Your House: Measuring Humidity in Your Home](#) <sup>(21)</sup>
- Further information - [CMHC article 65847 – Research Report: Air Leakage Control for MURBs](#) <sup>(14)</sup>
- Further information - [CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings](#) <sup>(33)</sup>

**Photographs**



Typical overall sliding window configuration.



Typical sliding window track configuration and condition..

**End of Windows - Townhouses Section**

4.2.18 Soffit, Fascia, Eavestroughs & Downspouts						
General Condition						
Installed / Replaced		varies		Typical Service Life		- 30 – 40 – 50 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$69,300	66 No.	8 - 13 Years	Projected	Replace all soffit & fascia
n/a	Item	As required	Operating	Fix loose/missing sections of soffit and fascia
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- <b>Soffits &amp; Fascias</b></li> <li>- Exposed Wood fascias were noted on some of the townhouse units which appeared to be original to the building construction.</li> <li>- Minor organic growth and sediment build-up were observed on the wood fascias.</li> <li>- The main roof soffits throughout the Housing complex were predominately noted to be covered with perforated aluminum.</li> <li>- The roof soffits over the townhouse unit balconies were comprised of tongue &amp; groove rough sawn cedar wood. The wood soffits appeared to be performing with no further repair or maintenance required.</li> <li>- Pre-finished aluminum soffits were typically installed at the main entrance of the townhouse units &amp; carport / parking stall areas.</li> <li>- <b>Eavestroughs &amp; Downspouts</b></li> <li>- The downspouts were prefinished aluminum. The downspouts were connected to the storm water system.</li> <li>- A few minor areas of downspouts found at grade were observed with bent or dented sections. These downspout sections should be repaired – this item is considered maintenance.</li> <li>- IRC was informed by the Housing Provider that eavestroughs &amp; shingled roofs were replaced through an insurance claim in 2011.</li> <li>- Localized areas of clogged roof drain at the scupper due to organic debris were observed.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The eventual replacement of the soffit, fascia, eavestroughs and downspouts may be coordinated with replacement of similar components such as siding or roof shingles for cost efficiency and improved detailing at any joint/interfaces.</li> <li>- The eavestroughs and downspouts should be kept clean from debris and leaves to ensure good rainwater flow. This should be undertaken at least twice per year (before fall and after winter). This is considered to be maintenance.</li> <li>- Consideration may be given to cleaning the soffits every few years to maintain the finish and for appearances.</li> <li>- Damage to the bottom sections of the downspouts often occur as a result of impact damage. Consideration may be given to installing a more durable section (PVC pipe) at the lower level of the downspout.</li> <li>- The typical service life of these components is in excess of 30+ years, and replacement may be more for aesthetic reasons rather than failure of the component.</li> <li>- Further information - <a href="#">CMHC article 62034 - About Your House: Attic Venting, Attic Moisture, and Ice Dams</a> <sup>(11)</sup></li> </ul>

**General Comments**

- Further information - [CMHC article 63463 - About Your House: Avoiding Basement Flooding](#) <sup>(2)</sup>

**Photographs**



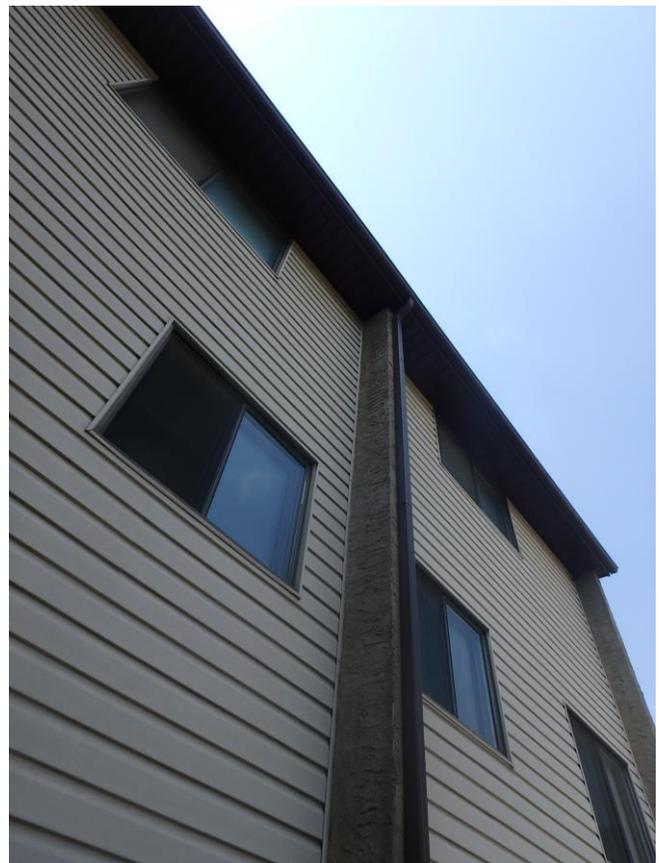
Typical fascias, soffits, eaves troughs and downspouts.



Typical tongue & groove cedar wood soffit above the townhouse unit balcony observed.



Typical pre-finished aluminum soffit at the main entrance & carport area of a townhouse



Typical single point downspout configuration from main roof.

**End of Soffit, Fascia, Eavestroughs & Downspouts Section**

4.2.22 Exterior Doors - Townhouse Units						
General Condition						
Installed / Replaced		2000		Typical Service Life		- 30 – 35 – 40 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$118,800	132 No.	10 - 20 Years	Projected	Replace all exterior doors
n/a	Item	As required	Maintenance	Replace weather-stripping & hardware, lubrication and adjustment etc.
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- A high percentage of the exterior front entrance doors appear to have been replaced with painted, solid wood core, metal clad doors with glass panels. Overall, the front doors appeared to be in good working condition</li> <li>- Although most had been replaced, some of the rear exterior doors appear to be from original construction.</li> <li>- Overall, the front and rear doors were generally found to be in good working order in most instances reviewed, with no sagging or binding noted on the reviewed doors.</li> <li>- Paint coating on the doors were in fair condition (refer to the Exterior Painting section).</li> <li>- Localized areas of dented sections &amp; deteriorated door weather-stripping were observed.</li> <li>- Replacement of individual doors may be expected prior to general replacement of the exterior doors - this is considered to be an operating expenditure.</li> <li>- Door replacement should occur during a period of cladding replacement.</li> <li>- Re-painting should be considered when the paint coating is in poor condition.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Replacement of weather-stripping, replacement hardware, lubrication and adjustment of the doors are all considered to be maintenance.</li> <li>- Painting of the exterior doors had been accounted for in the Exterior Painting component of this report.</li> <li>- A contingency for replacement of failed door hardware has been accounted for in the Small Capital Costs section of this report.</li> <li>- The door perimeter sealant has been addressed under the Sealants/Caulking component.</li> <li>- The service life of exterior doors may be highly variable due to the treatment and care by individual residents.</li> <li>- Further information - <a href="#">CMHC article 62256 – About Your House: Before You Start Window and Door Renovations</a> <sup>(6)</sup></li> <li>- Further information - <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Typical townhouse unit main entrance door.



Enhanced Front Entrance Door with Screen Door and Side lite



Typical replaced rear entrance door.

End of Exterior Doors - Townhouse Units Section

4.2.24 Patio / Balcony Doors - Townhouses						
General Condition						
Installed / Replaced		1977		Typical Service Life		- 20 – 25 – 30 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input checked="" type="checkbox"/> Function	<input type="checkbox"/> General	<input type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input checked="" type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$82,500	66 No.	10 - 20 Years	Recommended	Replace all sliding doors
n/a	Item	As required	Maintenance	Replace weather-stripping & hardware, lubrication and adjustment etc.
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- The patio / balcony sliding doors appear to be original to construction &amp; are pre-finished aluminum, incorporating two doors leaves, with one fixed single glazed leaf and the other slider operable with double glazed panels.</li> <li>- The aluminum frame of the patio sliding doors observed show signs of normal wear. The patio/balcony sliding glass doors are nearing the end of their useful service life and should be replaced in the near future from a standpoint of both operational and energy considerations.</li> <li>- The swing patio doors of the townhouse units are wood framed with partial lite glazing and appear to be circa original construction.</li> <li>- The sliding balcony doors were found to be difficult to operate in some instances, jamming on the glides, and typically had sediment and debris build-up in their tracks. Thorough maintenance and cleaning of the doors and tracks during townhouse unit turnover is recommended.</li> <li>- Replacement of the doors with a vinyl or fibre glass framed door incorporating thermal break, gas filled IGUs with low-e glass coatings is recommended, during the replacement cycle.</li> <li>- Sliding door replacement will result in improved energy efficiency and reduced utility costs and operational benefits to the end user.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Replacement of weather-stripping, repairs to damaged screens, lubrication and adjustment of sliding doors is considered to be <i>operating</i> expenditure.</li> <li>- Given the age of the units, overhauling the sliding/balcony doors on a large scale is not cost effective. However, until replacement can occur, effort can be put towards cleaning tracks and moving parts, lubricating the doors with a silicone spray and repairing any damaged insect screens.</li> <li>- The sliding/balcony door perimeter sealant has been addressed under the Sealants/Caulking component.</li> <li>- Budgetary costs for sliding/balcony door replacement may be highly variable depending upon the style and construction of door selected by the Housing Provider.</li> <li>- Government grants may be available for new sliding doors installation as part of the current <a href="#">ecoENERGY program</a> <sup>(28)</sup></li> <li>- Further information - <a href="#">CMHC article 62264 – About Your House: Before You Start an Energy-Efficient Retrofit – The Building Envelope</a> <sup>(5)</sup></li> <li>- Further information - <a href="#">CMHC article 62256 – About Your House: Before You Start Window and Door Renovations</a> <sup>(6)</sup></li> <li>- Further information - <a href="#">CMHC article 65847 – Research Report: Air Leakage Control for MURBs</a> <sup>(14)</sup></li> <li>- Further information - <a href="#">CMHC article 65537 – How To Lock Out Crime: Patio Doors</a> <sup>(12)</sup></li> </ul>

**General Comments**

- Further information - [CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings](#) <sup>(33)</sup>

**Photographs**



Typical sediment build-up and glider wear on balcony sliding door track

**End of Patio / Balcony Doors - Townhouses Section**

4.2.32 Wood Decks - Townhouses						
General Condition						
Installed / Replaced		2000		Typical Service Life		- 20 – 25 – 30 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$33,000	66 No.	5 - 10 Years	Projected	Replace all wood decks
n/a	Item	As required	Operating	Fix loose / missing boards, secure guards
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- Wood decks are located at the ground level patios of the townhouse buildings.</li> <li>- Not all of the townhouse units have wood decks, some have concrete slab-on-grade or gravel surfacing. Most of the wood decks appear to be circa original construction.</li> <li>- The wood decks appear to be in fair condition.</li> <li>- Localized repairs were observed; however various replaced wood planks do not appear to be pressure treated or stained. At minimum, unprotected wood should be stained or painted. This is considered to be an operating expense.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Consideration may be given to staining the wooden components for added protection to the wood; however this increases the capital costs for exterior painting/staining in future years.</li> <li>- Wooden support members should rest on concrete foundations or pads, not directly on the grade to reduce the possibility of decay of the members.</li> </ul>

Photographs
 <p>Typical ground floor wood deck.</p>

End of Wood Decks - Townhouses Section

4.2.35 Wood Balconies & Metal Guardrails						
General Condition						
Installed / Replaced		varies		Typical Service Life		- 20 – 25 – 30 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input checked="" type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$180,000	6000 sq. ft.	0 - 2 Years	Recommended	Replace all wood balcony decking & guardrails
n/a	Item	As required	Operating	Fix loose / missing boards, secure guards
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- All reviewed Townhouse units have suspended wood framed balconies. No waterproofing membrane exists on the balcony framing. All balconies are sheltered by an overhead asphalt shingled roof assembly.</li> <li>- At the time of replacement it is recommended that all wooden joist and decks be thoroughly reviewed to determine the structural integrity. All balconies have wood planks on top of wooden joists. It is recommended to install wood deck boards and vinyl waterproofing membrane with welded seams at the time of replacement.</li> <li>- Minor rot, damaged sections &amp; large cracks in the wood decking boards was observed.</li> <li>- Unsecured/backed out nails were noted in the wood planks &amp; missing fasteners at aluminum guardrail support were observed at localized areas throughout the property.</li> <li>- A portion of the expenditures carried in this section account for a contingency in regards to the suspected damaged wood framed balconies.</li> <li>- Paint coating deterioration was noted on the wood balcony decks. Painting of the decking has been accounted for under Exterior Painting section.</li> <li>- At the time of replacement, consideration should be given to mounting the guardrail bases to the edge of the balconies rather than the top.</li> <li>- The decking and railing attachment is generally in poor condition. The wood deck should be replaced in the near future.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Consideration may be given to staining the wooden components for added protection to the wood; however this increases the capital costs for exterior painting/staining in future years. Costs accounted for in the tables assume that the decks will not be stained or painted given the recommendation to replace the deck and railing systems.</li> <li>- Wooden support members should rest on concrete foundations or pads, not directly on the grade to reduce the possibility of decay of the members.</li> <li>- Review of the wooden balconies is limited to a visual review only. Assessment does not include for review of structural design and sizing of components.</li> </ul>

Photographs



Exterior view of townhouse unit balcony.



View of weather finishes on deck joist



Typical close up view of the balcony wooden planks & joist underside.



Unsecured/backed out nails observed at the balcony wood planks & cracked & minor rot at townhouse unit 811 of Block 2.

**End of Wood Balconies & Metal Guardrails Section**

4.2.38 Exterior Painting						
General Condition						
Installed / Last Painted		varies		Typical Restoration Period - 6 – 8 – 10 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input checked="" type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs					
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation	
\$26,400	66 No.	2 - 5 Years	Recommended	Paint all exterior painted components	
n/a	Item	As required	Maintenance	Painting of individual components, doors etc.	
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>		

Observations & Recommendations
<ul style="list-style-type: none"> <li>- This item accounts for exterior painting of the townhouse exterior doors, common exterior doors, fascia boards, wood siding, localized areas of exterior metal handrails, etc.</li> <li>- Application of paint to any of the stucco or vinyl finishes is not recommended</li> <li>- Typically, the paint coating on exterior doors observed at the townhouse units was in varying condition.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- It is recommended that qualified contractors be used for this type of work to ensure a consistent standard, and that all painting be completed at the same time.</li> <li>- Further information - Homeowner Protection Office article <a href="#">Maintenance Matters #1 – Paints, Stains and Coatings</a> <sup>(13)</sup></li> <li>- Further information - <a href="#">CMHC article 63134: About Your House: Painting</a> <sup>(36)</sup></li> </ul>

End of Exterior Painting Section

4.2.39 Exterior Sealants						
General Condition						
Installed / Replaced		varies		Typical Service Life		- 8 – 12 – 16 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input checked="" type="checkbox"/> Function	<input type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input checked="" type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$8500	5000 ft.	2 - 5 Years	Recommended	Replace all sealants
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations				
<b>Dry / Cracked</b>	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None
<b>Split / De-bonded</b>	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None
<ul style="list-style-type: none"> <li>- Overall, the sealants observed were in fair to poor condition with deterioration and adhesion failure.</li> <li>- Most of the perimeter sealants appear to be original to the construction. It appears that some of the window sealants of the units may have been replaced since construction however no information was provided on this.</li> <li>- Sealant was missing at many wall penetrations. It is recommended to install sealant at wall penetration such as electrical and mechanical element (wires, lights, hose bib, etc.).</li> <li>- Sealant failure was observed in localized areas of the windows &amp; doors reviewed.</li> <li>- The sealant replacement expenditure takes into account new sealant joints at windows, doors, differing material joint separations, etc. pertaining to the building envelope rehabilitation recommended in Stucco, Siding, Windows and Patio/Balcony Doors sections.</li> <li>- Budgetary costs for replacement of the building sealant coincide with exterior painting.</li> </ul>				

General Comments
<ul style="list-style-type: none"> <li>- The purpose of the perimeter and control joint caulking is to prevent moisture penetration and air infiltration into the building envelope and internal climate.</li> <li>- The service life of sealants/caulking is highly variable depending upon the type of sealant used (silicone or polyurethane), exposure to weather elements, cleanliness of preparation and the standard of installation by the contractor.</li> <li>- Independent 3<sup>rd</sup> party review during the installation may be beneficial.</li> <li>- Replacement of the caulking should be coordinated with similar component upgrades such as exterior painting and large capital replacements associated with the building envelope (repairs).</li> <li>- Careful selection of sealants is required to ensure compatibility and correct adhesion with the adjacent materials.</li> <li>- Pressure testing of the townhouse units as part of the <a href="#">ecoENERGY program</a> <sup>(28)</sup> may be considered before and after replacement of sealants. Government grants for upgrades may be available.</li> <li>- Further information - <a href="#">CMHC article 65847 – Research Report: Air Leakage Control Manual for Existing Multi-Unit Residential Buildings</a> <sup>(14)</sup></li> <li>- Further information - <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

**End of Exterior Sealants Section**

### 4.3 Building Interior Components

4.3.2 Kitchen Upgrades - Townhouses						
General Condition						
Installed / Replaced	varies			Typical Upgrade Period		
				- 20	- 25	- 30 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$297,000	66 No.	5 - 10 Years	Projected	Allowance for upgrades to kitchen cabinetry
n/a	Item	As required	Maintenance	Fix loose handles, adjust doors and drawers etc.
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- Kitchen cabinetry and countertops varied in age, from recently upgraded to original construction. It is not known how many units have been upgraded.</li> <li>- Operation of doors and drawers were typically found to be good, with no sagging or binding elements.</li> <li>- Only minor deficiencies were noted in some townhouse units. Continued routine maintenance and general care will optimize the service life of any given cabinets.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The service life of the kitchen components is highly variable depending upon the treatment and care from individual residents.</li> <li>- Kitchen upgrades include for upgrades/replacement of kitchen cabinetry doors, drawers, cupboards and countertops with that of a similar standard.</li> <li>- Adjustment of doors, drawers and hinges should be completed during turnover and after annual review to extend the service life of the components. This is considered to be an <i>operating</i> expenditure.</li> <li>- Consideration may be given to keeping doors, drawers and hinges from replaced cabinetry for spares and maintenance to extend the service life of the cabinetry in other townhouse units.</li> <li>- Replacement may be phased to minimize financial impact on the reserve fund.</li> <li>- Upgrades to kitchen flooring have been accounted for under Carpets &amp; Flooring.</li> <li>- Upgrades to plumbing fixtures and piping have been accounted for under Small Capital Costs and Plumbing Piping &amp; Related sections respectively.</li> <li>- Replacement of kitchen exhaust fans have been accounted for under Small Capital Costs.</li> <li>- Further information <a href="#">CMHC article 62252 – About Your House: Before You Start Renovating Your Kitchen</a> <sup>(15)</sup></li> <li>- Further information <a href="#">CMHC article 65588 – About Your House: Accessible Design - Kitchens</a> <sup>(37)</sup></li> <li>- Further information <a href="#">CMHC article 62037 – About Your House: Importance of Bathroom and Kitchen Fans</a> <sup>(22)</sup></li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Townhouse kitchen appeared to be in good to fair condition with new cabinetry



Kitchen Counter tops in some units appeared to be upgraded

End of Kitchen Upgrades - Townhouses Section

4.3.4 Bathroom Upgrades - Townhouses						
General Condition						
Installed / Replaced		varies		Typical Upgrade Period		
				- 20 – 25 – 30 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$396,000	66 No.	20 Years	Projected	Allowance for upgrades to bathrooms
n/a	Item	As required	Maintenance	Replace bathtub and vanity sealants
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

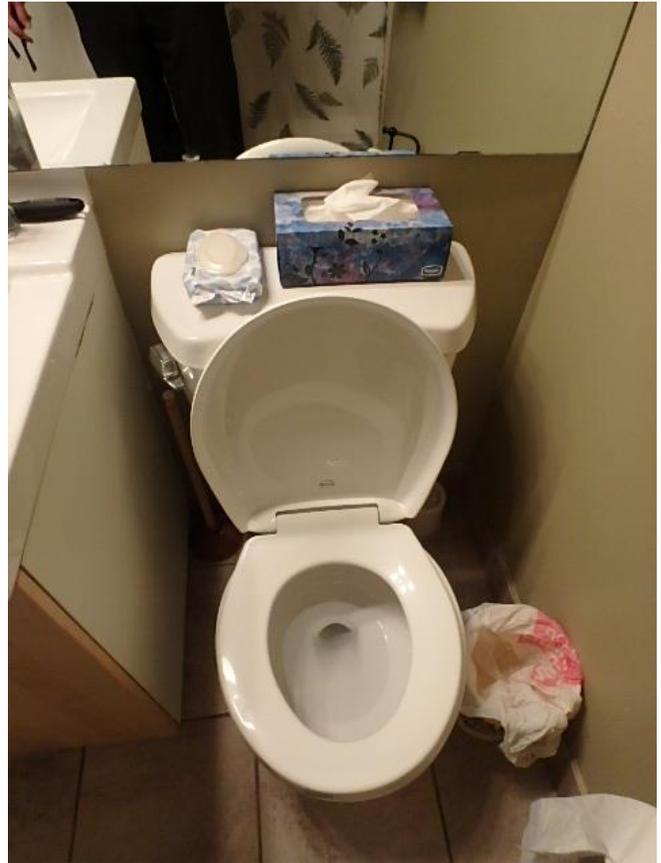
Observations & Recommendations
<ul style="list-style-type: none"> <li>- Bathroom countertops and cabinetry observed in some of the units reviewed appeared to have been recently upgraded. It is not known how many units have been upgraded.</li> <li>- The toilets in the townhouse units are either upgraded dual flush or standard flush type.</li> <li>- The bathtub caulking was noted to be generally in fair condition in all townhouse units reviewed; however signs of moisture exposure/wear was noted.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The service life of the bathroom components is highly variable depending upon the treatment and care from individual residents.</li> <li>- Bathroom upgrades include for replacement of the tub-surrounds (either acrylic or re-grouting of ceramic tiling) and replacement of vanity and wash basins.</li> <li>- Bathtub caulking, shower and basin faucets, shut-off valves, etc. should be reviewed during turnover and after annual review to extend the service life of the components. This is considered to be an <i>operating</i> expenditure.</li> <li>- Replacement may be phased to minimize financial impact on the reserve fund.</li> <li>- Upgrades to bathroom flooring has been accounted for under Carpets &amp; Flooring.</li> <li>- Upgrades to plumbing fixtures and piping have been accounted for under Small Capital Costs and Plumbing Piping &amp; Related sections respectively.</li> <li>- Replacement of bathroom exhaust fans have been accounted for under Small Capital Costs.</li> <li>- Further information <a href="#">CMHC article 62254 – About Your House: Before You Start Renovating Your Bathroom</a> <sup>(16)</sup>.</li> <li>- Further information <a href="#">CMHC article 65686 – About Your House: Accessible Design - Bathrooms</a> <sup>(38)</sup>.</li> <li>- Further information <a href="#">CMHC article 62037 – About Your House: Importance of Bathroom and Kitchen Fans</a> <sup>(22)</sup>.</li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

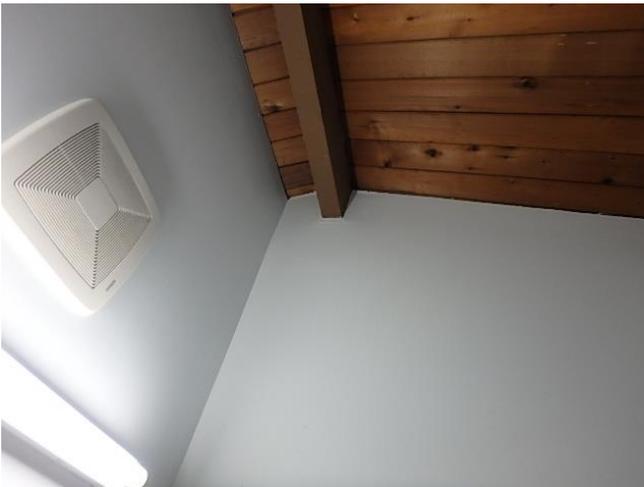
Photographs



Recently upgraded bathroom components included newer counter top and faucet



Typical upgraded low flow toilet.



Wall Mounted Bathroom Fan noted in upstairs bathroom under vaulted ceiling.

End of Bathroom Upgrades - Townhouses Section

4.3.12 Carpets & Flooring - Townhouses						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 10 – 15 – 20 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$39,600	Avg. 4 units per year	Annually	Allowance	Allowance for carpet & flooring replacements
Design & Specification Recommended: <input type="checkbox"/>		Project Management & Quality Control Recommended: <input type="checkbox"/>		

Observations & Recommendations
<ul style="list-style-type: none"> <li>- This item includes for replacement of the sheet vinyl and ceramic tiling in the bathroom, kitchen, main entry, storage rooms and the carpets in the bedrooms, hallways and lounge area.</li> <li>- The carpets have been generally well cared for by the residents and have achieved a long service life. The carpets varied in condition and age.</li> <li>- It appears that the sheet vinyl has been replaced in some of the units since construction. It is not known how many units have been upgraded.</li> <li>- In many units reviewed, the carpets have been replaced with engineered laminate flooring in various locations, such as, the living rooms, bedrooms, dining and hallway floors.</li> <li>- The sheet vinyl appears to be wearing well. The service life of the sheet vinyl may be in excess of 20+ years with pre-replacement repairs.</li> <li>- The ceramic tiling was in good condition throughout. The ceramic floor tiles should last in excess of 35+ years with normal use.</li> <li>- Annual expenditures for replacement carpet and flooring are expected. A 12-year average service life has been assumed – this calculates as an average of 8.33% replacements per year, or 5 - 6 units per year. IRC were informed that the average turnover of townhouse units per year is 1; however not all vacant units would need to have the carpets and flooring replaced.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The service life of carpets and vinyl flooring is very dependent upon the treatment from individual residents and is highly variable.</li> <li>- It is common for a Housing Provider to incur costs for replacing carpets and flooring on an annual basis.</li> <li>- Installation of a pile carpet rather than loop carpet may be considered as loop weave carpets are more prone to damage from snagging and pulled threads from items such as furniture legs and pets.</li> <li>- Consideration may be given to replacing some carpets with engineered laminate floor or vinyl composite tiles in ground floor townhouse units as these types of flooring are more durable, can be easily cleaned and may have a longer service life. This is of particular interest if the residents have cats or dogs or suffer allergies. Townhouse units above the first floor should be carpeted to reduce sound transmission through the floors.</li> <li>- Replacement costs account for replacement with carpet as per the original construction.</li> <li>- Timely repairs to damaged or loose edges and seams of sheet vinyl are recommended to extend the service life of the flooring.</li> <li>- The typical service life of sheet vinyl is 15 – 20 years, and vinyl composite tile (VCT) approximately 20 – 25 years.</li> <li>- Further information <a href="#">CMHC article 63144 – About Your House: Flooring Choices</a> <sup>(17)</sup></li> </ul>

Photographs



New laminate flooring observed in multiple units reviewed.



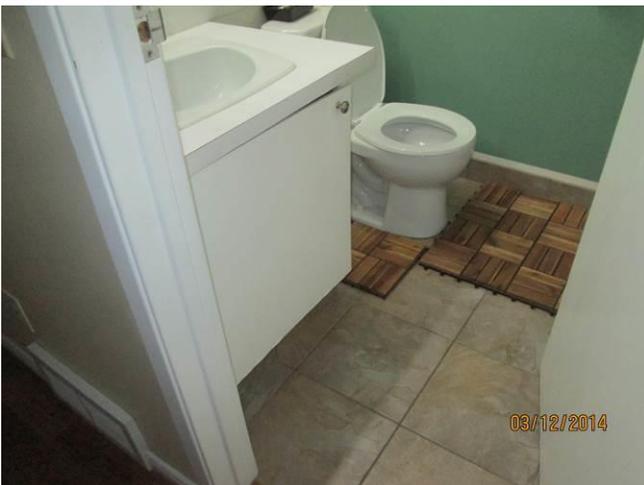
Vinyl sheet flooring in the kitchen of a unit observed.



Typical recently upgraded flooring in a townhouse unit.



Carpet flooring observed in the unit's staircase at Block 6.



Typical ceramic tile flooring observed in a townhouse unit's bathroom at Block 1.



Ceramic floor tiling observed in the bathroom of a townhouse at Block 2.

End of Carpets & Flooring - Townhouses Section

4.3.22 Appliances - Stoves						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 25 – 30 – 35 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$3,200	4 units.	Annually	Recommended	Annual allowance for stove replacement
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- The stoves varied in age and condition and were reported to be replaced on an as needed basis. Most of the stoves observed in the townhouse units reviewed appeared to be within an age of 5 to 15 years..</li> <li>- The stoves are electrically operated. Budgetary costs account for replacement with similar size and style of stove.</li> <li>- Replacement is generally undertaken when the individual components fail rather than by planned cyclical replacement or replacement of all the appliances during the same period.</li> <li>- Due to the varying condition of the stoves, the expenditure has been adjusted to 6% per year or approximately 4 per year to conform to an as needed replacement strategy.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Repairs to appliances are considered to be maintenance. Consideration may be given to keeping parts from old appliances for spares.</li> <li>- Rates used in the Tables account for appliances sold to the general public. Alternate pricing may be available if appliances can be purchased from Appliance Canada.</li> <li>- None of the appliances were tested for operations.</li> <li>- Further information <a href="#">CMHC article 65588 – About Your House: Accessible Design – Kitchens</a> <sup>(37)</sup></li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Typical Replacement electrical stove.

End of Appliances - Stoves Section

4.3.23 Appliances - Refrigerators						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 15 – 20 – 25 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$3600	4 No.	Annually	Recommended	Annual allowance for refrigerator replacement
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- The refrigerators varied in age and condition and appear to be replaced on an as needed basis.</li> <li>- Replacement is generally undertaken when the individual components fail rather than by planned cyclical replacement or replacement of all the appliances during the same period.</li> <li>- Budgetary costs account for replacement with similar size and style of refrigerator.</li> <li>- Due to the varying condition of the refrigerators, the expenditure has been adjusted to 7% per year or 4 - 5 per year to conform to an as needed replacement strategy.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Repairs to appliances are considered to be maintenance. Consideration may be given to keeping parts from old appliances for spares.</li> <li>- Rates used in the Tables account for appliances sold to the general public. Alternate pricing may be available if appliances can be purchased from Appliance Canada.</li> <li>- None of the appliances were tested for operations.</li> <li>- Rebates or savings may be available for <a href="#">EnergyStar®<sup>(29)</sup></a> rated appliances through various programs.</li> <li>- Further information <a href="#">CMHC article 65588 – About Your House: Accessible Design – Kitchens<sup>(37)</sup></a></li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings<sup>(33)</sup></a></li> </ul>

Photographs



Replacement GE model refrigerator.

End of Appliances - Refrigerators Section



Interior Doors & Door Hardware
<b>General Comments</b>
<ul style="list-style-type: none"> <li>- This item accounts for potential replacement of interior doors and door hardware to rooms, bi-fold and/or sliding closet doors and townhouse unit entrance doors (if applicable).</li> <li>- Generally interior doors and hardware should last the life of the building with only minor replacements due to damage.</li> </ul>
<b>Observations &amp; Recommendations</b>
<ul style="list-style-type: none"> <li>- The doors were found to be operating correctly, with no binding, sagging or damaged hardware noted.</li> </ul>

Electrical Devices & Fixtures
<b>General Comments</b>
<ul style="list-style-type: none"> <li>- This item accounts for replacement of electrical switches, receptacles, ceiling and wall mounted light fixtures, ceiling fans, thermostats etc.</li> <li>- GFI (Ground Fault Interrupt) outlets are required in new construction in bathrooms, external outlets and within 3' of kitchen sinks for new construction. Current codes do not require existing receptacles to be retrofitted.</li> <li>- Instances may be present where the outlets are protected by GFIs that are upstream of the reviewed outlets. IRC does not verify the circuits or layouts to determine that required outlets are appropriately grounded.</li> <li>- The GFIs were tested (if present) during the site review by depressing the reset button only. GFIs were tested on a random basis and not all devices were tested during the review. Deficiencies noted relate only to the GFIs tested and visually observed (if present) and the consultants are not liable for any unseen deficiencies with devices not tested.</li> <li>- The typical service life of an electrical device is 6 – 8 – 10 years; however the actual service life is highly variable and dependent upon treatment by the residents and the degree of maintenance undertaken.</li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>
<b>Observations &amp; Recommendations</b>
<ul style="list-style-type: none"> <li>- General maintenance is recommended.</li> <li>- It was noted that many residents have replaced the original ceiling lighting fixture with their own fixture and/or ceiling fan. It is assumed that the resident is responsible to reinstate the original upon vacating the townhouse unit.</li> </ul>

Plumbing Fixtures
<b>General Comments</b>
<ul style="list-style-type: none"> <li>- This item accounts for upgrades and replacement of plumbing fixtures such as sinks, wash-basins, faucets, toilets and shower heads and controls.</li> <li>- The theoretical service life expectancy of the fixtures such as faucets and shower controls is approximately 15-years, and fixtures such as sinks, wash-basins is 30-years; however the actual service life is highly variable and dependent upon treatment by the residents, water quality and the degree of maintenance undertaken.</li> <li>- It is typically not expected that all plumbing fixtures would need to be replaced on a cyclical basis, rather as and when needed. Upgrades are often completed at the time of vacancy or when a failure is reported.</li> <li>- Items such as replacement faucet cartridges, toilet seats, etc are considered to be maintenance expenditure.</li> <li>- Common plumbing fixtures such as those in common washrooms and kitchens are seldom used and thus typical service life replacement cycles are not the norm. Replacement of common plumbing fixtures should be accounted for under this capital component.</li> <li>- Upgrades of some of the fixtures may be considered for water saving measures; these fixtures would include shower-heads, toilets and aerators.</li> </ul>

Plumbing Fixtures
<ul style="list-style-type: none"> <li>- Further information <a href="#">CMHC article 62935 – About Your House: Buying a Toilet</a> <sup>(24)</sup></li> <li>- Further information <a href="#">CMHC article 63511 – Research Highlights: Maximum Performance Testing of Popular Water-Efficient Toilet Models</a> <sup>(25)</sup></li> <li>- Further information <a href="#">CMHC article 62252 – About Your House: Before You Start Renovating Your Kitchen</a> <sup>(15)</sup></li> <li>- Further information <a href="#">CMHC article 62254 – About Your House: Before You Start Renovating Your Bathroom</a> <sup>(16)</sup></li> <li>- Further information <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> <li>- Further information <a href="#">CMHC – Community Housing Water Efficiency Project: Region of Waterloo</a> <sup>(44)</sup></li> </ul>
Observations & Recommendations
<ul style="list-style-type: none"> <li>- The toilets reviewed are either standard flush type or low flush or dual flush systems in other townhouse unit observed.</li> <li>- Deficiencies observed included chipped enamel finishes on tubs and vanity sinks.</li> </ul>

Bathroom Exhaust Fans and Kitchen Range Hoods
General Comments
<ul style="list-style-type: none"> <li>- It is recommended that the bathroom exhaust fan be run for a minimum of 20 minutes after showering or bathing.</li> <li>- Consideration may be given to installing timer switches to control the fans for continued operation after the resident has finished bathing.</li> <li>- Bathroom exhaust fans are required by the Alberta Building Code and must be vented to the exterior.</li> <li>- The typical service life of a bathroom exhaust fan is 10 – 15 – 20 + depending upon the degree of usage, maintenance and the standard of appliance installed.</li> <li>- The typical service life of a kitchen range exhaust fan is 10 – 15 – 20 + depending upon the degree of usage, maintenance and the standard of appliance installed.</li> <li>- Bathroom fans are rated by the amount of air expelled per minute (cfm) and sound levels (Sones) – the lower the Sone rating the quieter the fan. Replace the bathroom fans with a model that is adequately sized for the room and of an acceptable noise level of operation.</li> <li>- Further information <a href="#">CMHC article 62037 - About Your House: The Importance of Bathroom and Kitchen Fans</a> <sup>(23)</sup>.</li> <li>- Further information <a href="#">CMHC article 61033 – Householders Guide: Moisture and Air</a> <sup>(35)</sup>.</li> </ul>
Observations & Recommendations
<ul style="list-style-type: none"> <li>- Bathroom exhaust fans varied in age and condition. Exhaust fans should be reviewed and replaced on an as needed basis during unit turnover.</li> <li>- It is punitive that the fans be replaced with high efficiency, high volume air evacuation fans to restore the mechanical component function and mitigate possible damage to the related building components.</li> <li>- Kitchen range hood fans appeared to vary in condition and age.</li> </ul>

Smoke Alarm Devices
General Comments
<ul style="list-style-type: none"> <li>- Smoke alarms are required one (1) per floor as per the Alberta Building Code.</li> <li>- The Housing Provider should keep accurate records of when the alarms are tested and replaced.</li> <li>- The smoke alarms should be tested on a regular basis. There is no set time period for testing however it is recommended that the devices should be tested at least twice per year (possibly when clocks are changed for daylight savings) and at every turnover.</li> <li>- The typical service life of a smoke alarm is 8 – 10 – 12 years.</li> </ul>

### Smoke Alarm Devices

- The smoke alarms were tested (if present) during the site review by depressing the test button only. Alarms were tested on a random basis and not all alarm devices were tested during the review. Deficiencies noted relate only to the smoke alarms tested and visually observed (if present) and the consultants are not liable for any unseen deficiencies with devices not tested.
- It is recommended that battery and hard wired smoke alarms be installed in each townhouse unit. This is recommended due to residents either removing batteries or lighting candles during power outages; both of which are unsafe practices. With installation of both types, the degree of risk is reduced.
- Further information [CMHC article 65050 – About Your Apartment: Fire Safety](#) <sup>(26)</sup>.

### Observations & Recommendations

- The smoke alarm devices are hard wired device.
- The alarms were not tested to determine if the alarms are interconnected so that if one alarm activates then all alarms activate simultaneously.
- IRC highly recommends that the smoke alarm systems be brought up to today's Building Code standard and be frequently maintain as they are a life safety concern.

### Baseboard Heaters

#### General Comments

- This item accounts for upgrades and replacement of electric baseboard heaters in rooms such as the bedrooms, lounge area, hallway and dining room.
- It is recommended that all heaters be inspected for freedom from obstruction and with fins properly cleaned and combed to improve the heat convection performance. This is considered to be maintenance expenditure.
- The typical service life of baseboard heaters is 20 – **25** – 30 with regular servicing and cleaning. Service life may be dependent upon treatment by the individual residents.
- It is recommended that the residents ensure that any obstructions such as furniture or drapes be kept clear of the baseboard heaters to ensure good air convection or reduce the possibility of fire.
- It is typically not expected that all baseboard heaters would need to be replaced on a cyclical basis, rather as and when needed. Upgrades are often completed at the time of vacancy or when a failure is reported.

### Observations & Recommendations

- Overall, the hydronic baseboard heaters appeared in fair condition.
- It is highly recommended that the baseboard heaters be reviewed and if required, replaced during time of vacancy.

Photographs



Typical battery operated smoke alarm observed in working condition.



Typical wall mounted bathroom exhaust fan observed in working condition.



Close up view of soffit mounted bathroom exhaust fan.



Typical dual flush type toilet observed in a townhouse unit.



Typical standard flush toilet observed.



Typical kitchen range hood and ducting observed at a townhouse unit.

Photographs



Battery operated Kidde smoke alarm in the Sunnyhill Co-op's office at Block 2.



Electric baseboard heater in the office at Block 2 observed.

**End of Small Capital Costs - Townhouses Section**

#### 4.4 Mechanical & Plumbing Systems

4.4.4 Furnaces - Townhouses						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 20 – 25 – 30 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$363,000	66 No.	10 - 15 Years	Projected	Replace all townhouse unit furnaces with High Efficiency Furnaces
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Equipment Data	
Furnaces	Carrier, gas-fired furnace (AFUE 80%)

Observations & Recommendations
<ul style="list-style-type: none"> <li>- Furnaces are manufactured by Carrier. It appeared that the furnaces were replaced in the past 15 to 20 years. Furnaces are 80% energy efficiency gas furnace with galvanized sheet steel ductwork.</li> <li>- For energy considerations and long term savings, High efficiency furnaces should be installed at the time of scheduled replacement.</li> <li>- Appliances are installed on the second floor level. The exhaust flue is ducted to the interior through the roof.</li> <li>- IRC was informed that there are yearly inspections for all the furnaces in the townhouse units with some minor repairs</li> <li>- Replacement is generally undertaken of all the appliances during the same period. Costs savings may be achieved by replacing a large total quantity at once.</li> <li>- Based from the visual review of the furnaces, Alberta Home Services performs service &amp; maintenance inspections.</li> <li>- There are no carbon monoxide detectors installed. See Fire &amp; Life Safety Components – Townhouses section of this report for further information.</li> <li>- Replacement costs for the furnaces can be highly variable depending upon the standard and design features selected.</li> <li>- The costs accounted for in the Table of Expenditures account for a similar type of furnace as that installed.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Regular maintenance of the furnaces is required to achieve or extend the expected design life of the component, i.e. replace filters, clean appliance, annual preventative maintenance (PM). This is considered to be <i>operating</i> expenditure.</li> <li>- For energy saving tips see <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> <li>- Further information <a href="#">CMHC article 63227 – About Your House: Replacing Your Furnace</a> <sup>(18)</sup></li> <li>- Further information <a href="#">CMHC article 62041 – About Your House: Your Furnace Filter</a> <sup>(19)</sup></li> <li>- Further information <a href="#">CMHC article 65329 – About Your House: Setback Thermostats</a> <sup>(20)</sup></li> <li>- Further information <a href="#">CMHC article 62028 – About Your House: Combustion Gases in Your Home – Things You Should Know About Combustion Spillage</a> <sup>(23)</sup></li> <li>- Further information <a href="#">CMHC article 62046 – About Your House: Carbon Monoxide</a> <sup>(27)</sup></li> </ul>

Photographs



Typical gas-fired Carrier furnace observed at the 2<sup>nd</sup> floor level of the townhouse unit.

End of Furnaces - Townhouses Section

4.4.16 Automatic Storage Water Heaters (Annual)						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 10 – 15 – 20 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input checked="" type="checkbox"/> Function	<input type="checkbox"/> General	<input type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2014)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$3,520	Avg. 4 - 5 units per year	Annually	Recommended	Annual cost allowance for partial replacement
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Equipment Data	
<b>Hot Water Heaters</b>	Bradford White HydroJet, Natural Gas, Input: 36000 Btu/hr., 40 US Gallon automatic storage water heaters (HWH). John Wood Pro Series; Natural Gas, Input: 38000 Btu/hr., 40 US Gallon automatic storage water heaters (HWH).

Observations & Recommendations
<ul style="list-style-type: none"> <li>- During the previous BCA review of the units, IRC observed variances of the HWH age (identified by serial number coding), ranging from 1999 to 2010. The Co-Op indicated that they typically replace 1 to 2 a year.</li> <li>- All reviewed HWH were natural gas supplied appliances.</li> <li>- The automatic storage water heaters were either John Wood brand or Bradford White brand.</li> <li>- Annual expenditures for replacement hot water heaters are expected. A 15-year average service life has been assumed – this calculates as an average of 7% replacements per year, or approximately 4 - 5 hot water heaters per year.</li> <li>- Due to the variance in HWH age, the annual reserve allowance for HWH provides a simplistic approach for the replacement of this mechanical component.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- For observations, Comments and Budgetary costing for the piping systems; see Plumbing Piping &amp; Related – Townhouse Units of this report.</li> <li>- For energy saving tips see <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Typical Bradford White Hot water storage tank.

End of Automatic Storage Water Heaters (Annual) Section

4.4.24 Plumbing Piping & Related - Townhouses						
General Condition						
Installed / Last Major Repairs			1977	Typical Service Life		- 45 – 50 – 55 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$132,000	Item	10 - 20 Years	Allowance	Allowance for 25% of potential upgrades to plumbing piping
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- The Housing Co-operative did not report any ongoing issues or problems in relation to the plumbing piping.</li> <li>- There was no visible evidence of water stains from plumbing leaks on ceilings, cabinetry or walls noted during the review in the townhouse units reviewed.</li> <li>- The hot water and cold water supply lines are not insulated in areas where the piping is visible. Consideration may be given to insulating the copper piping to reduce heat loss through the piping and reduce the possibility of condensation forming on the piping. This is considered to be operating expenditure.</li> <li>- Consideration may be given to replacing copper pressure piping with PEX (cross-linked polyethylene) piping at the time of replacement.</li> <li>- A contingency allowance is accounted for in the Table of Expenditures to account for potential upgrades and major repairs to the plumbing piping and related components. It is not expected that all piping will need to be replaced at the same time, therefore costs allocated in the tables account for 25% replacement after an initial 25 years and then every 25 years thereafter.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Abbreviations: DCW – Domestic Cold Water; DHW – Domestic Hot Water; DHWR – Domestic Hot Water Return, DWV – Drain, Waste, Vent</li> <li>- The condition and rating of this component is subjective, as the physical review of the plumbing is limited to that which is exposed – generally in mechanical rooms. The condition rating is based more upon the industry norm service life for plumbing piping and information provided by the Housing Provider.</li> <li>- This item accounts for potential upgrades and major renovation of the plumbing piping and related components such as valves, couplings, controls and re-circulation pumps (if present) etc.</li> <li>- Under normal operating conditions waste and vent piping (ABS &amp; PVC) should last the life of the building.</li> <li>- The service life at which upgrades to the copper piping may be expected can vary greatly depending upon the type of copper piping installed (K, L or M) and the mineral content of the potable water.</li> <li>- Copper piping for DHW, DCW and DHWR may be expected to be replaced as early as 25 years.</li> </ul>

Photographs



Typical piping layout servicing a kitchen sink.



Typical piping layout servicing a bathroom wash basin.



Typical copper pipe connection to an automatic storage water tank.



Typical piping layout servicing a bathroom wash basin.

End of Plumbing Piping & Related - Townhouses Section

4.4.26 Fire and Domestic Water Services						
General Condition						
Installed / Replaced		1977		Typical Service Life		- 45 – 50 – 55 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> n/a

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$100,000	Item	10 - 20 Years	Allowance	Re-install water service lines or 1 service connection per building block
Design & Specification Recommended: <input checked="" type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- IRC did not receive any report of water service problems on this property. The budgetary cost allowances were estimated based on the overall size and age of the property.</li> <li>- Based on information provided to IRC from the co-operative, the City of Calgary has a utility right of way which passes directly under the complex. Based on the Co-operatives description of the buried water utilities, the water services for each building block are directly connected to the City of Calgary water main. Accordingly, the co-operative indicated that they are responsible for direct connection for each of the 8 single point water services between each of the 8 building blocks and the water main. This fee listed in this section does not cover any repair or replacement of the City of Calgary water main passing through the utility right of way.</li> <li>- This component includes potable water supply piping, related valves, sump, meter chamber assembly. The co-operative reported that there are no, fire hydrants directly located on their property which they are responsible for maintaining.</li> <li>- A contingency allowance is accounted for in the Table of Expenditures to account for potential upgrades and major repairs to the plumbing piping and related components. It is not expected that all piping will need to be replaced at the same time.</li> <li>- There is no allowance is for possible repairs to the watermains given the board has indicated that these are maintained by the City of Calgary.</li> <li>- If applicable, the costs of plumbing work inside buildings (e.g., domestic water pipes running in common areas for distribution to residential units) are considered in section 4.2.24 Plumbing Piping &amp; Related – Townhouses.</li> <li>- No exploratory or destructive method was applied in the assessment, as this was not part of the scope of the report.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- This item accounts for upgrades and major repairs to components such as potable water services only.</li> <li>- The condition and rating of these components is subjective since close review of these components is not possible within the scope of this project. Rating is based more upon the industry norm for service life and information provided by the Housing Provider.</li> <li>- In older construction, the pipe joints may not have been secured with mechanical clamps; piping joints that rely on soil pressure are weaker and may burst when the soil is excavated.</li> <li>- The service life of these components is 50+ years, depending upon the materials used, methods of installation, workmanship, and preventative maintenance to maintain water supply, relating to these components. Refurbishment or replacement is not expected within the first 45 years of operation.</li> </ul>

**End of Fire and Domestic Watermains Section**

4.4.27 Storm and Sanitary Sewers and Drainage						
General Condition						
Installed / Replaced		1979		Typical Service Life		- 45 – 50 – 55 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> n/a

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$100,000	Item	10 - 20 Years	Allowance	Re-install storm and sanitary services between building block and sewer mains
n/a	Item	As required	Operating	Repair storm and sanitary sewers
Design & Specification Recommended:		<input checked="" type="checkbox"/>	Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- During the previous site visit, isolated drainage deficiencies were noted per the photographs provided. Given the time of year during the 2018 field review, there were no discernable drainage concerns. The co-operative reported that there were not serious concerns other than what IRC previously noted in the last BCA in 2014.</li> <li>- IRC did not receive any report of storm and sanitary sewers and drainage problems on this property. The budgetary cost allowances were estimated based on the overall size and age of the property.</li> <li>- Based on information provided to IRC from the co-operative, the City of Calgary has a utility right of way that passes directly under the complex. Based on the Co-operatives description of the buried Sanitary services, each building block is directly connected to the City of Calgary sanitary main. Therefore, the co-operative indicated that they are responsible for direct connection for the single point Sanitary services between each of the 8 building blocks and the sanitary main. This fee listed in this section does not cover any repair or replacement of the City of Calgary sewer or storm main.</li> <li>- The cost in the Table of Expenditures accounts for installation of storm and sanitary sewer piping and connections and their related catch basins, lawn basins, and manholes, as well as building drainage sumps.</li> <li>- Localized areas of ponding water at driveways &amp; concrete walkways around the property were observed during the site review.</li> <li>- The assessment for this item is based only on visual observation and study of the background documents provided by the Housing Provider to IRC. No exploratory or destructive method was applied in the assessment, as this was not part of the scope of the report.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The condition and rating of these components is subjective since close review of these components is not possible within the scope of this project. Rating is based more upon the industry norm for service life and information provided by the Housing Provider.</li> <li>- The service life of these components is 50+ years, depending upon the materials used, methods of installation and preventative maintenance to maintain drainage piping, relating to these components. Refurbishment or replacement is not expected within the first 50 years of operation.</li> <li>- Consideration may be given to upgrading or overhauling these services prior to replacement asphalt paving.</li> <li>- Review of the storm and sanitary lines using video scoping may be considered every 5 – 10 years after an initial 25 year period to determine the condition of the lines and any potential problems such as collapsed piping or tree roots. Scoping of the lines is considered to be <i>operating</i> expenditure.</li> <li>- The storm water interceptor and catch basins should be visually reviewed annually to check sediment levels – usually in the spring. Sediment should be vacuumed out periodically as needed – usually every 3-5 years, but this varies</li> </ul>

**General Comments**

depending on the amount of oil and debris that enters the system.

- The life expectancy of the sump pumps may be highly variable due to the volume of water being pumped as well as the quality of the water.
- Regular inspection and maintenance is recommended to ensure correct operation as failure of this component may have significant impact on the building. This is considered to be an operating expenditure.
- Sumps pumps are not visually inspected as part of this building condition assessment as they are located in sealed pits.

**Photographs**



Ponding water observed at the driveway & concrete walkway between Blocks 1 & 2.



Typical catch basin to storm sewer system observed near Block 4.



Ponding water observed at the concrete walkway between Blocks 6 & 7.



Typical storm sewer system throughout the property.

**End of Storm and Sanitary Sewers and Drainage Section**

## 4.5 Electrical Systems

4.5.1 Power & Distribution - Common						
General Condition						
Installed / Replaced	1977		Typical Service Life			- 40 – 50 – 60 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$5,400	Item	10 - 20 Years	Allowance	Allowance for replacement/re-build of electrical switchgear & common electrical panels
Design & Specification Recommended:		<input checked="" type="checkbox"/>	Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- All electrical components observed appear to be in good to fair condition with no apparent signs of sub-standard work.</li> <li>- The circuits are not verified for accuracy of identification label.</li> <li>- It is considered that under normal conditions the main distribution switchgear should last the life of the building; however replacement or a major re-build may be required due to parts becoming obsolete. An allowance has been accounted for in the Table of Expenditures for potential major repairs during the life of the equipment however this can be re-assessed in later years to determine the requirement, if any, for replacement/re-build.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- This report does not include a review of the adequacy of the original design or a review of the safety aspects of the installation as this falls under the jurisdiction of Electrical Safety Authority (ESA).</li> <li>- This item accounts for potential replacement or major upgrade to the electrical distribution equipment. Wiring is assumed to last the life of the building.</li> <li>- Electrical devices such as switches, receptacles, etc. should be replaced on an as needed basis. A contingency for replacement of these small capital cost items has been accounted for under Small Capital Costs section of this report.</li> <li>- Under normal operating conditions, common area panels will not be changed during the life of the building. Replacement may be required due to spares and parts being obsolete rather than failure of the components.</li> <li>- Preventative maintenance of the electrical service and distribution is recommended. The scope of the work would include verifying the torque on the main terminal lugs and branch breakers, checking loading on circuits to identify hot spots, identifying and correcting evidence of arcing, test breaker trips. This is considered to be <i>operating</i> expenditure.</li> </ul>

**Photographs**



Typical electric meters & electrical panel observed.

**End of Power & Distribution - Common Section**

4.5.3 Power & Distribution - Townhouses						
General Condition						
Installed / Replaced		1977		Typical Service Life		- 40 – 50 – 60 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input checked="" type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

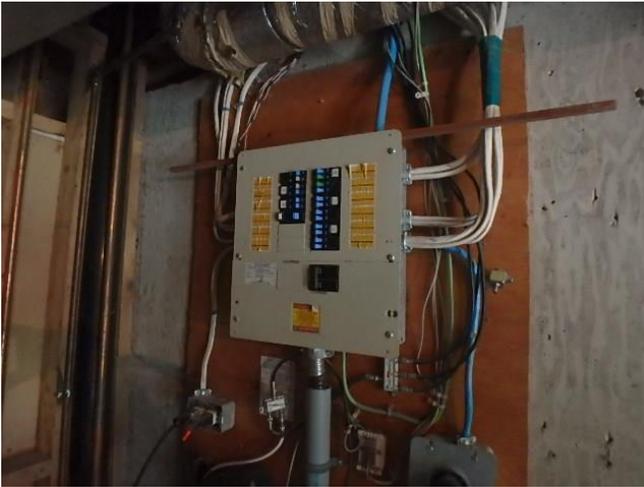
Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$59,400	66 No.	10 - 10 Years	Projected	Replace all townhouse unit electrical panels
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Equipment Data	
Panel & Breakers	125A, 120/240V AC, 1 Phase, 3 wire, 24 circuit Westinghouse NOVA Line NLC 24 surface mounted panel located typically in the ground level of the townhouse units.

Observations & Recommendations
<ul style="list-style-type: none"> <li>- All electrical panels observed appear to be in good to fair condition with no apparent signs of sub-standard work or maintenance.</li> <li>- Typically, the service panels are located at the ground floor level of each unit reviewed near the patio area.</li> <li>- The electrical circuits are identified and labelled on the electrical panel door. The circuits are not verified for accuracy.</li> <li>- It is considered that under normal conditions the electrical panels should last the life of the building; however replacement may be required due to parts becoming obsolete. Costs have been accounted for in the Table of Expenditures for replacement however this can be re-assessed in later years to determine the requirement, if any, for replacement.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Electrical devices such as switches, receptacles, light fixtures etc. should be replaced on an as needed basis. A contingency for replacement of these small capital cost items has been accounted for under Small Capital Costs section of this report.</li> <li>- Under normal operating conditions, the electrical panels and electrical wiring will not be changed during the life of the building. Replacement may be required due to replacement parts being obsolete rather than failure of the components.</li> <li>- Replacement of individual electrical panels due to failure is considered to be <i>operating</i> expenditure.</li> </ul>

Photographs



Typical circuit breaker in the townhouse unit reviewed.



Typical NOVA Line NLC 24 circuit breaker observed.



Typical surface mounted Westinghouse NOVA Line circuit breaker observed.



Manufacturer's label observed.

End of Power & Distribution - Townhouses Section

4.5.12 Common Exterior Lighting						
General Condition						
Installed / Replaced		varies		Typical Service Life		- 45 – 50 – 55 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$10,000	Item	5 - 10 Years	Allowance	Replace exterior pole mounted, wall mounted & soffit mounted light fixtures
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- This item accounts for replacement/upgrades to the common site lighting, the wall / soffit mounted common lighting at each townhouse entry, wood decks and patio areas of the townhouse units, wall mounted building lighting and common office area ceiling mounted / surface mounted lighting.</li> <li>- Main entry &amp; balconies of the townhouse units are lit by wall &amp; soffit mounted fixtures.</li> <li>- Replace existing incandescent lamps with higher efficiency CFL or LED lamps for energy savings. Upgrades may be deferred depending upon reserve fund balances.</li> <li>- There are no further observations or recommendations other than as outlined under General Comments.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The lighting was not examined to determine adequate levels of lighting other than areas where it is inherently apparent that the lighting levels are below that what would be expected to be the norm.</li> <li>- Replacement of individual failed lighting fixtures is considered to be an <i>operating</i> expenditure.</li> <li>- Lighting fixtures may be replaced for energy efficiency reasons rather than failure of the component.</li> <li>- The spun aluminum light poles (if present) and concrete foundation should last the life of the building under normal conditions.</li> <li>- For energy saving tips see <a href="#">CMHC – Water and Energy Saving Tips for Multi-Unit Residential Buildings</a> <sup>(33)</sup></li> </ul>

Photographs



Typical wall mounted light fixture at unit 762 observed.



Soffit mounted incandescent light fixture observed at unit 22.



Typical lamp pole with concrete base observed between Block 6 & 7.



Wall mounted light fixture at with motion sensor observed at the common office at Block 2 observed.



Typical wall mounted building light fixtures with motion sensors observed at Block 6.



Typical incandescent light fixture at Unit 42 observed.

End of Common Exterior Lighting Section

## 4.8 Site Components

4.8.1 Asphalt Pavement						
General Condition						
Installed / Replaced	varies			Typical Service Life		
				- 20	- 25	- 30 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$132,480	45000 sq ft.	5 - 10 Years	Projected	Upgrade Remaining asphalt paved areas
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input checked="" type="checkbox"/>	

Observations & Recommendations					
<b>Settled</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None	
<b>Cracked</b>	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None	
<b>Rutting</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None	
<b>Oil Spills</b>	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None	
<ul style="list-style-type: none"> <li>- Asphalt paving includes the general access road, driveways &amp; parking stalls throughout the property.</li> <li>- The cooperative indicated that approximately 50% of the parking lot areas had been previously replaced in 2011</li> <li>- Minor settlement was noted at localized areas of the asphalt paving.</li> <li>- Localized areas of cracked asphalt pavement were observed throughout the housing complex.</li> <li>- Settlement around the catch basins covers and other services covers was noted at localized areas throughout the property.</li> <li>- Most of the driveways were noted to have adequate drainage.</li> <li>- Evidence of surface scouring was noted on some of the driveways, possibly from oil patches. It is recommended to clean oil spills as soon as possible to prevent deterioration of the asphalt.</li> <li>- Asphalt pavement appears to be in fair condition.</li> </ul>					

General Comments
<ul style="list-style-type: none"> <li>- Petroleum products such as gasoline and oil will increase the deterioration of asphalt paving, breaking down the bond between asphalt and aggregate. This will shorten the service life of the paving; hence cleaning of oil stains is recommended as part of the regular maintenance.</li> <li>- Settlement and rutting of asphalt paving may shorten the service life of the paving as moisture can seep into the paving and base course, causing soft spots and erosion, and also spalling of the asphalt during freeze/thaw cycles. Cut and patch repairs will extend the service life of the paving as a whole.</li> <li>- Thermal expansion and contraction may cause longitudinal cracks in the paving, allowing moisture to seep in causing spalling of the asphalt during freeze/thaw cycles and shortening the service life. Routing and sealing of the asphalt will extend the service life of the paving as a whole.</li> <li>- The service life of asphalt paving is highly variable depending upon the quality of installation, amount of vehicle usage and weight of vehicles and correct design for such vehicles.</li> <li>- Budgetary costs include for milling and overlay of the existing asphalt paving. Increased cost may be expected for</li> </ul>

**General Comments**

repairs to any soft spots in the base course.

**Photographs**



Overview of asphalt paving adjacent Common Garage.



Typical Asphalt Driveway configuration.



Typical Asphalt condition of main drive lane 6.



Drive way condition adjacent back city lane way

**End of Asphalt Pavement Section**

4.8.4 Concrete Components						
General Condition						
Installed / Last Major Repairs			varies	Typical Restoration Period		
				- 10 – 15 – 20 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$25,490	Item	5 - 10 Years	Allowance	Replace/repair of damaged concrete components
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations					
Settled	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None	
Cracked	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None	
Vegetation	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None	
<ul style="list-style-type: none"> <li>- The concrete components at the site include ground floor patio &amp; entrance slabs, concrete pavers, curbs, walkways, carport slabs, etc.</li> <li>- Cracks were observed in the ground floor unit entrance slabs, concrete walkways and carport slabs.</li> <li>- The concrete components reviewed are generally in varying condition.</li> <li>- Minor vegetation growth was observed in walkway control joints – this is considered a maintenance item.</li> <li>- Localized areas of minor cracked curbs were observed at various locations.</li> <li>- An allowance of 20% of the total concrete costs have been accounted for every 15 years based upon the degree of concrete damage noted during the site review.</li> </ul>					

General Comments
<ul style="list-style-type: none"> <li>- The typical life of concrete components is 50+ years, and complete replacement of concrete components would not be expected in any one period.</li> <li>- The degree of concrete damage is highly variable and factors such as concrete strength, correct design of concrete mix and quality of sub-base preparation will affect the potential for concrete failures.</li> <li>- Budgetary costs account for a replacement of a portion of the total concrete replacement costs. The cost allocated is a contingency and is not actual calculated costs based upon the deficiencies noted on site.</li> </ul>

Photographs



Typical concrete slab at the carport.



Typical concrete walkways & curbs near Block 2 observed.



Ponding water on concrete walkway observed between Blocks 6 & 7.



Concrete steps & walkways with localized cracks.

End of Concrete Components Section

4.8.14 Chain Link Fencing						
General Condition						
Installed / Replaced		varies		Typical Service Life		
				- 25 – 30 – 35 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$40,180	2435 ft.	5 - 10 Years	Projected	Replace all chain link fencing
n/a	Item	As required	Operating	Fix minor sections of damaged fence, small repairs under \$2,000
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations				
Leaning	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
Damaged / Broken	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
Corroding	<input type="checkbox"/> Severe	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input type="checkbox"/> None
<ul style="list-style-type: none"> <li>- The chain link fencing is used as perimeter fencing near Block 8 &amp; playground area near Block 6 and as privacy fencing &amp; gates in all of the patio area of the townhouse units.</li> <li>- The galvanized chain link fencing varies in height.</li> <li>- The chain link fencing is generally in varying condition with only minor corrosion at localized areas.</li> <li>- It is not known if the fence is the responsibility of the Housing Provider or if the local Municipality own or contribute. For purposes of this report it is assumed that the Housing Provider is responsible for replacement.</li> </ul>				

General Comments
<ul style="list-style-type: none"> <li>- The service life of chain link fencing can be highly variable, and is generally more dependent upon damage from vandalism or mistreatment rather than failure of the fencing.</li> <li>- Minor repairs to damaged sections of chain fencing and re-setting of posts is considered to be <i>operating</i> expenditure.</li> <li>- Timely repair and maintenance is recommended for overall curb-appeal of the property.</li> </ul>

Photographs



Chain link fencing & gate forming the back yard.



Typical chain link fencing

End of Chain Link Fencing Section

4.8.19 Guardrails & Handrails						
General Condition						
Installed / Replaced		1977		Typical Service Life		
				- 25 – 35 – 45 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$7,800	195 ft.	5 - 10 Years	Projected	Replace guardrails and handrails
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- Metal guardrails and handrails have been installed around concrete entry to townhouse units, courtyard steps &amp; on top of retaining walls.</li> <li>- The metal guardrails &amp; handrails appear to be circa original construction.</li> <li>- Replacement guards would need to be as per design requirements of the Building Code at the time of replacement.</li> <li>- The steel guards exhibit corrosion and need painting; this is covered under the Exterior Painting section.</li> <li>- There are no further recommendations other than as outlined under General Comments.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- The typical service life for guardrails and handrails varies depending upon the material of construction and also method of anchoring.</li> <li>- The typical service life for wood guardrails is 20-years, for painted steel and vinyl guardrails 30-years, for aluminum and galvanized steel 40 years.</li> <li>- Regular painting of wooden and steel guardrails and handrails is required to achieve the expected design life.</li> <li>- It is recommended that replacement guardrails and handrails be aluminum or galvanized steel.</li> <li>- Original guardrail and handrail installations that do not meet current code requirements for height, openings in guards, anchoring etc. do not have to be replaced to conform; however the replacement installation must be in accordance with the current Alberta Building Code regulations at the time of replacement.</li> </ul>

Photographs



Metal guardrail exhibit corrosion at a townhouse unit entry steps.



Metal guardrails on top of retaining wall & concrete entry steps at Block 4 observed.



Close up view of metal guardrail on top retaining wall at Block 4.



Typical metal guardrail on top retaining wall at Block 6 observed.



End of Guardrails & Handrails Section

4.8.20 Retaining Walls						
General Condition						
Installed / Last Major Repairs			varies	Typical Restoration Period		
				- 20 – 25 – 30 +		
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$10,000	Item	5 - 10 Years	Allowance	Rebuild concrete & interlocking block retaining walls
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations				
Construction	<input type="checkbox"/> Wood	<input checked="" type="checkbox"/> Concrete	<input checked="" type="checkbox"/> Interlocking Block	<input type="checkbox"/> Brick Masonry
Settled	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
Cracked (if applicable)	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
Rotting (if applicable)	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input type="checkbox"/> Minor	<input checked="" type="checkbox"/> None
Leaning	<input type="checkbox"/> Severe	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Minor	<input type="checkbox"/> None
<ul style="list-style-type: none"> <li>- Concrete retaining walls have been constructed for planters, privacy walls, entry steps, etc.</li> <li>- Interlocking block retaining walls have been constructed for planters.</li> <li>- The concrete and interlocking block retaining walls are generally in fair condition.</li> <li>- There are no further recommendations other than as outlined under General Comments.</li> </ul>				

General Comments
<ul style="list-style-type: none"> <li>- The typical service life of wooden retaining walls is 25-years.</li> <li>- The typical service life of interlocking-block and/or brick masonry retaining walls is 25+years before rebuilding is generally required. It is expected that the wall can be rebuilt using the existing retaining wall sections.</li> <li>- The typical life of concrete retaining walls is 50+ years, and complete replacement of concrete components would not be expected in any one period; however it may be expected that major repairs to the concrete will be required at some period.</li> <li>- Budgetary costs account for replacement of wood retaining walls, rebuilding of interlocking walls and major repair of concrete walls, whichever is applicable to the property.</li> </ul>

Photographs



Concrete retaining walls at Block 4 between townhouse units.



Interlocking block retaining wall around planters at Block 4 observed.



Concrete retaining wall with metal guardrails at Block 6.



Interlocking block retaining wall around planters at Block 8 observed.



Retaining wall around planter at West end of Block 8 observed.

End of Retaining Walls Section

4.8.30 Playground Equipment						
General Condition						
Installed / Replaced		2006		Typical Service Life		
				- 15 – 20 – 25 +		
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> Very Poor

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$10,000	Item	5 - 10 Years	Allowance	Replace playground equipment
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- IRC did not review any safety certification or the inspection log book regarding the equipment. A monthly visual inspection as well as an annual certified inspection is required by Playground Standard.</li> <li>- The playground is located at the North end of Block 6 near the East end of Block 8.</li> <li>- The playground equipment includes one (1) slide, two (2) multi-activity climbers, one (1) mini slide and one (1) miniature rock climbing wall. It appears that the playground equipment was recently installed.</li> <li>- The budgetary cost includes labour, equipment cost, taxes etc. as per Housing Provider's information about playground equipment and surfacing.</li> <li>- It is a requirement to complete monthly visual reviews and undertake annual inspections of the equipment. Aside from being a standard, this is recommended for safety and also liability concerns. The cost of the annual inspection is considered to be an operating expenditure under \$2,000.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Generally the service life of these components may be affected by legislative and safety requirements rather than deterioration of the component.</li> <li>- The review of the playground equipment was completed in a global sense with respect to general code requirements; a detailed review was not required as part of the Scope of Work for this project. The review was not conducted with regard to the applicable codes pertaining to <a href="#">playground equipment – CAN/CSA Z614-07<sup>(39)</sup></a></li> <li>- The replacement cost may be highly variable due to the amount and type of replacement equipment selected.</li> <li>- Monthly and annual reviews, including log book entry are required.</li> <li>- It is possible that insurance liability could be declined for properties with older sets of playground equipment due to liability issues.</li> </ul>

Photographs



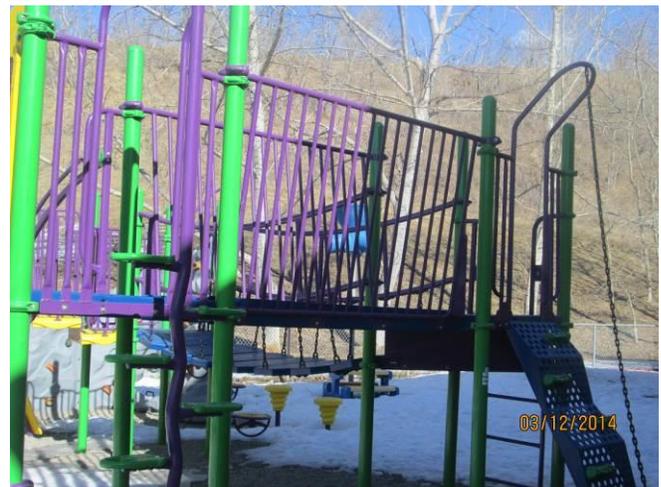
Overall view of playground area with Block 6 in the background.



Playground equipment observed.



Multi-activity climber at the playground area observed.



Close up view of playground equipment.

End of Playground Equipment Section

4.8.31 Playground Surfacing						
General Condition						
Installed / Replaced		unknown		Typical Service Life		- 12 – 15 – 18 +
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input checked="" type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input type="checkbox"/> n/a

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$13,190	1507 sq. ft.	5 - 10 Years	Projected	Install rubber mat playground surfacing
n/a	Item	As required	Operating	Replace rotting wooden edge containment
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations
<ul style="list-style-type: none"> <li>- IRC did not review any safety certification or the inspection log book regarding the equipment. A monthly visual inspection as well as an annual certified inspection is required by Playground Standard.</li> <li>- The current playground surface is pea gravel.</li> <li>- The playground surface should be regularly reviewed to ensure that the gravels are of sufficient depth so as to provide a safe and soft surfacing.</li> <li>- The surfacing and edge containment, although appearing to be in good to fair condition, may be considered to be in poor condition for current standards. Hard surfaces increase the risk of injury should a child fall on the gravel surfacing. New playground surfacing generally includes for a more resilient edging that would minimize injury.</li> <li>- Loose fill material bases such as gravel, sand or wood chips may pose a hazard should sharp objects or animal feces become buried. These types of surfacing are prone to vegetation growth and require regular maintenance. The playground surface should be regularly reviewed to ensure that the wood chips are of sufficient depth and that the wood chips have been loosened after winter compaction so as to provide a safe and soft surfacing.</li> <li>- It is a requirement to complete monthly visual reviews and undertake annual inspections of the play area. As per playground standard, this is recommended for safety and also liability concerns. The cost of the annual inspection is considered to be an operating expenditure under \$2,000.</li> <li>- Costs accounted for in the tables include for installation of rubber matting as is frequently being used in modern installations. Use of wood chips, sand or other would be significantly less costs should the Housing Provider choose these types of materials.</li> </ul>

General Comments
<ul style="list-style-type: none"> <li>- Generally the service life of these components may be affected by legislative and safety requirements rather than deterioration of the component.</li> <li>- The review of the playground equipment was completed in a global sense with respect to general code requirements; a detailed review was not required as part of the Scope of Work for this project. The review was not conducted with regard to the applicable codes pertaining to <a href="#">playground equipment – CAN/CSA Z614-07</a> <sup>(39)</sup></li> <li>- The costs accounted for allow for replacement with a surfacing as would be expected at similar properties of new construction; i.e. resilient rubber flooring, either poured-in-place or rubber mats.</li> <li>- Monthly and annual reviews, including log book entry are required.</li> <li>- It is possible insurance liability could be declined for properties with older sets of playground equipment due to liability issues.</li> </ul>

Photographs



Overall view of playground area with pea gravel surfacing.



Playground pea gravel surfacing observed.

End of Playground Surfacing Section

## 4.9 Organizational Elements

4.9.12 Building Condition Assessment & Reserve Fund Study Update						
General Condition						
Previous Assessment			1977	Survey Period		3 – 4 – 5 +
<b>Priority</b>	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input type="checkbox"/> Function	<input type="checkbox"/> General	<input checked="" type="checkbox"/> None
<b>Condition</b>	<input checked="" type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$6,000	Item	5 Years	Allowance	Complete BCA & CRF
Design & Specification Recommended:		<input type="checkbox"/>	Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations	
Existing report provided to IRC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>- The Building Condition Assessment &amp; Reserve Fund Study was completed by:</p> <div style="display: flex; align-items: flex-start;">  <div> <p><b>IRC Building Sciences Group</b>            6227 2<sup>nd</sup> Street S.E., Suite 108            Calgary, Alberta, T2H 1J5            Tel: (403) 452-5831            Fax: (403) 452-5833</p> </div> </div> <p>Email: <a href="mailto:calgary@ircgroup.com">calgary@ircgroup.com</a>      Contact: Robin Wynd – Building Science Engineer</p> <p>- The Building Condition Assessment &amp; Reserve Fund Study was completed in accordance with IRC Proposal number IRC-L-0958P dated Nov 20, 2013 and the Request for Proposal as issued by the Agency for Co-operative Housing.</p> <p>- A brief scope of work for the project included</p> <ul style="list-style-type: none"> <li>• Review of all drawings and documentation made available to IRC for review.</li> <li>• Performance of a site review of the buildings' primary components to evaluate the physical condition and standard of components.</li> <li>• Preparation of Building Condition Assessment report noting general observations and component conditions, together with recommendations for future repair options and associated budgetary costing.</li> <li>• Develop a 30-year cash flow projection, listing each of the identified components that will require repair, retrofit or replacement.</li> <li>• Identify all financial factors and assumptions used in the cash flow projections.</li> </ul>	

**End of Building Condition Assessment & Reserve Fund Study Update Section**

#### 4.10 Miscellaneous Capital Components

4.10.1 Miscellaneous Capital Allowance						
General Condition						
Installed / Replaced / Upgraded			varies	Averaged Service Life		10-years
Priority	<input type="checkbox"/> Safety	<input type="checkbox"/> Structural	<input type="checkbox"/> Code	<input checked="" type="checkbox"/> Function	<input checked="" type="checkbox"/> General	<input type="checkbox"/> None
Condition	<input type="checkbox"/> Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Fair	<input type="checkbox"/> Fair / Poor	<input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Various

Summary Budgetary Costs				
Budgetary Cost (2018)	Quantity	Expenditure Recommended	Expenditure Type	Summary Recommendation
\$2,510	Item	0 - 2 Years	Allowance	Allowance for miscellaneous replacements / upgrades
Design & Specification Recommended: <input type="checkbox"/>			Project Management & Quality Control Recommended: <input type="checkbox"/>	

Observations & Recommendations		
<ul style="list-style-type: none"> <li>- There may be many miscellaneous capital components at the property that as individual expenditures are considered to be small capital expenditures.</li> <li>- Predicting the year of replacement/upgrade or replacement cycles of these small capital expenditures is highly variable based on the maintenance, treatment by staff and residents and typical service life.</li> <li>- The miscellaneous capital components considered at this property have been outlined below, as well as a brief summary of comments or recommendations relating to the component.</li> </ul>		
Component	Rating	Comments
- Foundation Leaks / Window Wells	Fair / Poor	IRC was informed that flood repairs are ongoing since 2013 till 2014. Refer to Foundation and Structure section.
- Glazing Replacement	Fair / Poor	The townhouses' glazing appeared to be circa original construction. A few instances were noted during the site review.
- Landscaping	Good	The landscaping includes many medium and large trees. The landscaping is well kept and provides good curb appeal.
- Site Signage	Fair	The site signage was noted to be faded and damaged in some instances.
- Garbage Bin Enclosures	Fair	There are wooden garbage bin enclosures located at the North end of Block 4 and near the South side of Block 3, housing the garbage bins for the property.

Recommendations
<ul style="list-style-type: none"> <li>- Replacement of many of the component listed is subjective; and often replacement will vary greatly between Housing Providers. Due to the high variation in service life and subjective replacement cycles; a weighted allowance has been accounted for in the Table of Expenditures.</li> <li>- It is considered that the Housing Provider should fund replacement of these components from this category, and under/over funding in any particular year will average out over the 30-year study period.</li> </ul>

Foundation Leaks: General Comments
<ul style="list-style-type: none"> <li>- Observation of the structural components is limited to exposed sections from the interior and exterior and the reported occurrences and frequency of foundation leaks.</li> </ul>

**Foundation Leaks: General Comments**

- Budgetary costs do not include for major structural repair or complete installation of waterproofing.
- Further information - [CMHC article 63463 – About Your House: Avoiding Basement Flooding](#) <sup>(2)</sup>
- Further information - [CMHC article 62039 – About Your House: Insulating Your House](#) <sup>(34)</sup>

**Window IGU Replacement: General Comments**

- Failures of the insulating glass units occur when the seal of the windows fail and air enters between the two panes of glass. Condensation and fogging may occur between the two panes and the insulating value of the unit will reduce.
- Further information - [CMHC article 64911 – Technical Series: Predicting Time to Fogging of Insulated Glass Units](#) <sup>(10)</sup>
- Further information - [CMHC article 63683 – About Your House: The ABC's of Windows](#) <sup>(7)</sup>
- Further information - [CMHC article 62031 – About Your House: Understanding Window Terminology](#) <sup>(8)</sup>

**Landscaping: General Comments**

- This item accounts for potential upgrades to the landscaping elements of the property including major tree and limb pruning, stump removal, re-sodding, replacement shrubs etc.
- The cost accounted for are for major upkeep of the current landscaping and do not include for improvements or extension of any current landscaping.

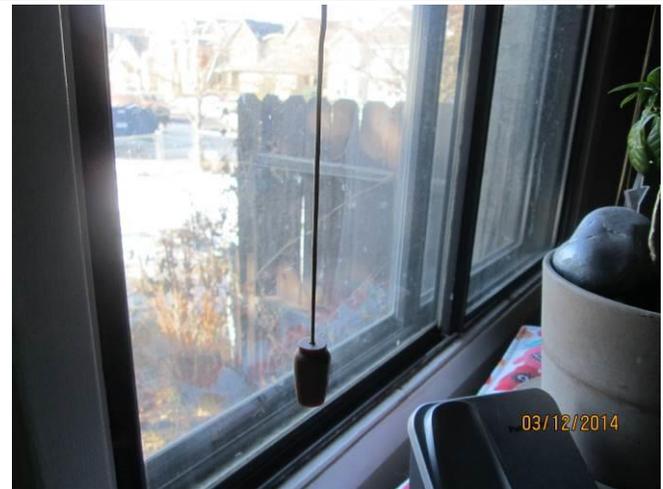
**Site Signage: General Comments**

- This item accounts for potential upgrades to the typical site signage generally found around the parking lots, at the main entrance and building entrance signage.

**Photographs**



Landscaping at the courtyard of the property observed.



Typical Glazing observed in a townhouse unit.

Photographs



Typical landscaping observed near Block 4.



Garbage bin enclosure at the North end of Block 4 observed.



Garbage bin enclosure near Block 3.



Site signage near Blocks 1 & 2.



Signage showing site plan of the property near Block 7.



Typical foundation walls of a townhouse unit reviewed.

End of Miscellaneous Capital Allowance Section

## 5 Contingency Reserve Fund Study

### 5.1 Reserve Fund Calculations

Based on the site review, various repairs are required at the building. Budget costs have been prepared to a Class 5 Estimate as outlined by [Association for the Advancement of Cost Engineering](#) and [ASTM E2516-06 Standard Classification for Cost Estimate Classification System](#). Class 5 estimates are generally prepared to form the basis for budget authorization, appropriation, and/or funding. As such, they typically form the initial control estimate against which all actual costs and resources will be monitored.

Typically, the preparation methodology includes:

- (i) *Prepared from measured and priced quantities, all obtained from the project information that is available.*
- (ii) *A significant portion of the estimate may be in the form of allowances.*

For an inclusive budget estimate, a +50/-30% variance should be allocated to costs provided in the Table of Expenditures of the Reserve Fund Study for the recommended replacements and upgrades. It must be noted that in preparing the budgets for individual items, it has been assumed that a group of repairs will be completed at the same time. If individual repairs are completed increases should be expected.

The cost of repairs is based upon the deterioration present at the time of the investigation and average unit prices obtained from our experience on similar projects and from estimates using [RS Means CostWorks](#)<sup>(30)</sup> data. It is important to realize that the prices are not based on tendered specifications, but instead on general approaches and assumed quantities. The actual repair costs will depend on the prices received at the time of tendering and/or the actual quantities removed during the repair contract. Please note that the listed prices do not include GST.

According to information provided to IRC, the current reserve balance is as follows:

- The Reserve Fund balance is \$751,402 as of June 30, 2018. The Housing Providers fiscal year end is December 31, 2018.
- The reported estimated 2018 fiscal year annual contribution to the Reserve Fund account is \$66,000; an average of \$1,000.00 per unit per year (or \$83.33 per month).

The following assumptions have been made with regard to reserve fund calculations:

#### **GST Rate:**

GST rate is 5%, and it has been included in the capital expenditures shown in the Capital Expenditure Tables. GST Rebates may be applicable for the Housing Provider for capital replacement projects; however it has not been taken into consideration in the Tables.

#### **Inflation Rate: 2.00% for the study period.**

The inflation rate used for the 30-year study period is 2.00%. This number has been derived using historical construction cost indexes of [RS Means CostWorks](#)<sup>(30)</sup> and assessment of variables such as economic conditions and interest rates. Due to the reserved fund dependency on building activities and construction costs, the Bank of Canada Consumer Price Index (CPI) was not used to interpret inflation rate data.

#### **Interest Rate: 2.00% for the study period.**

The interest rate used for the 30-year study period is 2.00%. The interest rate used is an average rate derived from the [Bank of Canada - Canadian interest rates and monetary policy variables: 10-year lookup](#)<sup>(32)</sup> over the past 10 year period (2007 – 2017) and the most current interest rate of return reported by the Housing Provider.

#### **Minimum Balance:**

The minimum balance recommended to be kept in the reserve fund is calculated at \$1,000 per unit; \$66,000 for this property inflated at 2.00% per annum.

#### **5.1.1 Annual Contribution**

The future cost method was used to estimate the annual contribution to the reserve fund. The building components included in the Reserve Fund Study are outlined in Table 1 of the Reserve Fund Study.

Within the study period all components requiring some form of remedial work have been accounted for by determining both the years in which repair/replacement is expected to occur and the future value of the remedial work.

Replacement costs, interest/ inflation rates, are estimated based on current data and assumed future trends. As such, these values cannot be expected to be completely accurate over the life of the study. It is recommended that this study be reviewed every year, and updated every three (3) years to ensure cost data, building deterioration and repair/replacement records are kept current and relevant.

### 5.1.2 Future Cost Method

The future cost method was also used to illustrate the significance of interest rates and inflation on the sufficiency of funds. In this method, the future cost of each element is estimated using the future value formula and estimated interest and inflation rates. It has been assumed that an average construction cost rate of inflation will be in effect over the remaining life of the building. The value used for inflation rates and interest rates has been outlined in section 5.1 – *Reserve Fund Calculations* above. The assumption is that the inflation and interest rates used are conservative figures that will not result in underfunding of reserves.

Once the costs are determined and totalled for each year of the life span of the building, the required annual contribution to offset these costs is found through iteration. This means that an annual contribution is first assumed and then lowered, or increased, depending on the cash flow, until the minimum annual contribution that will result in a positive cash flow is determined, i.e., no deficit, is maintained for the life of the project. The iterative process takes into account the existing Reserve Fund balance. However, reserves are not maintained at or near a "zero" balance to account for unforeseen repairs requiring emergency expenditures. The balance is generally not allowed to extend below a sum of \$1,000 per unit or a total of \$66,000.

### 5.1.3 Professional Fees

Professional fees for the recommended capital replacement and repairs have been accounted for in the Tables on the components where engineering and/or third party review is recommended. The degree of engineering and project management that may be involved make it difficult to determine a standard rate for each component. Engineering fees typically range between 3% - 20% depending upon the project and complexity of engineering and also the professional discipline.

Professional fees for components noted with (\*) (\*\*) in the Tables have been included in the total expenditures at 8% for design and specification, and 7% for review and contract administration – a total addition of 15% on the budget costs..

Professional fees for components noted **only** with (\*\*) in the Tables have been included in the total expenditures at 7% for review and contract administration only. It is considered that these components are of a less technical nature where design and specification is not essential; however third party review to ensure an adequate standard of installation/replacement is recommended.

Review and contract administration for general projects for licensed trades such as electricians and plumbers has not been included as this type of work is generally subject to review by other parties such as local authorities.

### 5.1.4 Predicted Future Costs

The replacement cost for each component identified has been estimated with respect to current day replacement prices, and inflation rates. Variances may be expected in periods of high workload by contractors.

The costs allowed in the reserve fund tables can be highly variable depending upon factors such as:

- Market costs at the time of replacement
- Materials shortages
- Standard of replacement components
- 'Volume' discounts offered by contractors
- Seasonal prices on projects
- Warranties offered, and
- Contractors' workloads

### 5.1.5 Capital vs. Operating/Maintenance Costs

The following items are NOT considered to be capital expenditure items. Costs associated with these items are considered to be an *operating* expenditure.

- Minor expenditures under a specified reasonable dollar limit established from similar project undertakings (e.g., \$5,000).
- Cost of replacing building components or mechanical services that are still operating and performing satisfactorily and meet all regulatory requirements, even if they are now obsolete and would not meet building regulations and codes for new construction.

- Normal cyclical repairs and maintenance such as bathtub caulking, rectifying deficiencies from annual reviews or move-outs, replacements of drapes and blinds, replacement of plumbing fittings and controls during regular routine maintenance, repairing fences and re-sod parts of the grounds and other general grounds maintenance.
- Regular preventative maintenance (for example, replacement of equipment parts, furnace filters, torqing of electrical panel connections, replacement of faucet cartridges etc) to restore the component to an efficient operating condition.
- Costs of replacing capital items that have been damaged or destroyed as a result of deliberate abuse of vandalism. In these cases the Housing Provider should try to recover the cost of replacement from the occupant(s) or from other persons who caused the damage, or through the Housing Provider's insurance policy. Where recovery is not possible, these types of replacement expenditures may be charged to the reserve.
- Typical items not included as capital expenditure include lawn care, door hardware, unit mail boxes, galvanized window wells, unit door bells, laundry tubs, replacement floor registers, weather-stripping, screen repairs, handrail securement, blocked drains, termite control, furnace thermocouples, stove elements, interior painting, carpet cleaning etc.

### 5.1.6 Description of Reserve Fund Table Columns

#### Date of Installation

The year at which the building components are known or estimated to have been installed, received substantial repair, overhaul or partial replacement, or were commissioned for use. It is assumed that the item is as new at the time of acquisition.

#### Percent Total Cost

For some items it is not expected that full replacement will be required, only a partial repair or replacement. In such situations a percentage factor has been used to estimate the value of replacement costs to be included in the reserve.

#### Estimated Life Span

This column provides the estimated normal expected life span of the building component in years. The life expectancies are based on recorded past performance of similar items and may vary based on the severity and type of use and the maintenance measures implemented to keep items in good serviceable condition.

#### Present Age

The present age of the item is generally the chronological age from the date of installation.

#### Basic Remaining Life

This column provides the useful life, in years, of the building component remaining from the date of visual condition assessment and assuming a normal level of maintenance. Due to extenuating circumstances such as routine maintenance or misuse by residents, the remaining life is sometimes adjusted to reflect an anticipated extended or reduced life.

## 5.2 Reserve Fund Summary

According to information provided to IRC, the current reserve balance is \$751,402 as of June 30, 2018, and the current annual was reported to fluctuate but that the contribution could be considered to be approximately \$66,000 per year. The averaged calculated annual expenditure for the 30-year period is \$273,973.

The estimates in the tables, based on an engineered approach, provide a conservative plan for accumulating a reserve for future repairs and replacement. It relies on costs based on the work performed to date, the current state of knowledge of performance of building systems, present technology and on commonly used economic factors.

The actual economic conditions experienced during the cash flow period will vary. Therefore the cash flow tables must only be used for planning purposes. It is also possible that some work may be postponed due to extended service life of any given system component. Postponing replacement will tend to lower the required annual contribution. An attempt should be made to postpone replacements that will not effect the overall integrity of the building that may result building damage.

The annual contributions formulated in this report were based on information required to keep the components of the building in a good state of repair. It is recommended that the reserve fund study be reviewed each year and updated every three (3) to five (5) years to ensure that the current contribution is sufficient and meets the planning needs of Sunnyhill Housing Co-operative.

### 5.2.1 Table 1

This table shows the date of install of components, typical service life ranges, projected annual contribution to the reserve and basic remaining life of each component.

From the Reserve Fund to Date column (G) total, it has been estimated that the balance of the reserve fund should be approximately \$2,363,530 and that from the Yearly Contribution column (F) total, an annual contribution to the reserve fund account should be approximately \$153.410 averaged throughout the 30 year study period.

### 5.2.2 Table 2

**Table 2** indicates the projected expenditures for the 30-year study period and Contingency Reserve Fund plan based on possible modifications to the current funding amounts. Should no change occur to the current annual contribution using a standard 2% increase, the reserve fund will remain in a decreasing negative position throughout the 30 year study. However, should the annual contributions be increased by the percentages within the table, the minimum balance of \$66,000 will be maintained which occurs once within the 30 year study period in the year 2028 or approximately 10 years from now. The expenditure totals show Future Cost Value, and the averaged calculated annual expenditure for the 30-year study period is \$273,973.

In order to achieve the a minimum balance of \$66,000 in the study period, the current 2018 contributions would need to be doubled for 2019 and increased annually by 14.78% for the subsequent 10 years until the fiscal year of 2029. Following 2029, to avoid over contributing to the reserve fund, the possible annual contribution could be modified based on the future anticipated expenditures. Between the years 2029 and 2035, the annual contributions would experience little increase. However, following the year 2035, the annual contributions could be reduced from the future annual contribution of \$474,969 (in 2035) to \$169,831 and the annual contribution minimally increased for the duration of the study period. Within this possible funding strategy, the reserves would remain above the recommended \$66,000 minimum balance both within and beyond the study period.



**Sunnyhill Housing Co-operative**  
787 - 3rd Street NW, Calgary, AB

TABLE 1: Component List

CRF No.	Component	Date of Installation / Last major upgrade	Current Replacement Costs	Percent of Total Cost	Corrected Cost	Typical Life Span Range	Yearly Contribution	Required Reserve Fund to Date	Present Age	IRC Estimated Basic Remaining Life
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(J)
<b>4.1</b>	<b>Structural Components</b>									
4.1.2	Foundations & Structure - Townhouses (**)	1977	\$18,000	100%	\$18,000	- 20 - 50 - 80 +	\$360	\$14,760	41	9
<b>4.2</b>	<b>Building Exterior Components</b>									
4.2.2	Shingle Roofing - Townhouses (*) (**)	2011	\$400,050	100%	\$400,050	- 12 - 15 - 18 +	\$26,670	\$186,690	7	8
4.2.9	Stucco / EIFS (**)	1977	\$900,000	20%	\$180,000	- 47 - 50 - 53 +	\$3,600	\$147,600	41	9
4.2.10	Siding (**)	2000	\$675,000	100%	\$675,000	- 30 - 30 - 30 +	\$22,500	\$405,000	18	12
4.2.15	Windows - Townhouses (**)	1977	\$384,010	100%	\$384,010	- 26 - 30 - 34 +	\$12,810	\$384,010	41	1
4.2.18	Soffit, Fascia, Eavestroughs & Downspouts	2011	\$69,300	100%	\$69,300	- 34 - 40 - 46 +	\$1,740	\$12,180	7	33
4.2.22	Exterior Doors - Front and Rear (**)	2000	\$118,800	100%	\$118,800	- 30 - 35 - 40 +	\$3,400	\$61,200	18	17
4.2.24	Patio / Balcony Doors - Townhouses (**)	2000	\$82,500	100%	\$82,500	- 20 - 25 - 30 +	\$3,300	\$59,400	18	7
4.2.32	Wood Decks - Townhouses (**)	varies	\$33,000	100%	\$33,000	- 22 - 25 - 28 +	\$1,320	\$26,400	varies	5
4.2.35	Wood Balconies & Metal Guardrails (**)	1977	\$180,000	100%	\$180,000	- 27 - 30 - 33 +	\$6,000	\$180,000	41	0
4.2.38	Exterior Painting	varies	\$26,400	100%	\$26,400	- 10 - 12 - 14 +	\$2,200	\$19,800	varies	3
4.2.39	Exterior Sealants (**)	varies	\$8,500	100%	\$8,500	- 9 - 12 - 15 +	\$710	\$6,390	varies	3
<b>4.3</b>	<b>Building Interior Components</b>									
4.3.2	Kitchen Upgrades - Townhouses	varies	\$297,000	100%	\$297,000	- 20 - 25 - 30 +	\$11,880	\$213,840	varies	7
4.3.4	Bathroom Upgrades - Townhouses	varies	\$396,000	100%	\$396,000	- 20 - 25 - 30 +	\$15,840	\$0	varies	25
4.3.12	Carpets & Flooring - Townhouses	varies	\$594,000	7%	\$39,600	- 13 - 15 - 17 +	\$2,640	\$39,600	varies	0
4.3.22	Appliances - Stoves	2010	\$52,800	6%	\$3,170	- 28 - 30 - 32 +	\$110	\$880	8	0
4.3.23	Appliances - Refrigerators	2010	\$59,400	6%	\$3,570	- 17 - 20 - 23 +	\$180	\$1,440	8	0
4.3.34	Small Capital Costs - Townhouses	varies	\$47,520	5%	\$2,380	Annually	\$2,380	\$2,380	varies	0
<b>4.4</b>	<b>Mechanical &amp; Plumbing Systems</b>									
4.4.4	Furnaces - Townhouses (**)	2007	\$363,000	100%	\$363,000	- 22 - 25 - 28 +	\$14,520	\$159,720	11	10
4.4.16	Automatic Storage Water Heaters (Annual)	2008	\$52,800	7%	\$3,520	Annually	\$240	\$2,400	10	0
4.4.24	Plumbing Piping & Related - Townhouses (**)	1977	\$528,000	25%	\$132,000	- 50 - 100 - 70 +	\$2,640	\$108,240	41	9
4.4.26	Fire and Domestic Water Services (*) (**)	1977	\$100,000	100%	\$100,000	- 45 - 50 - 55 +	\$2,000	\$82,000	41	16
4.4.27	Storm and Sanitary Sewers and Drainage (*) (**)	1979	\$100,000	100%	\$100,000	- 45 - 50 - 55 +	\$2,000	\$78,000	39	12
<b>4.5</b>	<b>Electrical Systems</b>									
4.5.1	Power & Distribution - Common (*) (**)	1977	\$5,400	100%	\$5,400	- 45 - 50 - 55 +	\$110	\$4,510	41	9
4.5.3	Power & Distribution - Townhouses	1977	\$59,400	100%	\$59,400	- 45 - 50 - 55 +	\$1,190	\$48,790	41	9
4.5.12	Common Exterior Lighting	varies	\$10,000	100%	\$10,000	- 45 - 50 - 55 +	\$200	\$8,400	varies	8
<b>4.8</b>	<b>Site Components</b>									
4.8.1	Asphalt Pavement (**)	2011	\$264,960	50%	\$132,480	- 21 - 25 - 29 +	\$5,300	\$37,100	7	7
4.8.4	Concrete Components	varies	\$127,450	20%	\$25,490	- 50 - 100 - 80 +	\$510	\$20,910	varies	9
4.8.14	Chain Link Fencing	varies	\$40,180	100%	\$40,180	- 25 - 30 - 35 +	\$1,340	\$29,480	varies	8
4.8.19	Guardrails & Handrails	2016	\$7,800	100%	\$7,800	- 30 - 35 - 40 +	\$230	\$460	2	40
4.8.20	Retaining Walls	varies	\$10,000	100%	\$10,000	- 25 - 25 - 25 +	\$400	\$6,400	varies	9
4.8.30	Playground Equipment	2006	\$10,000	100%	\$10,000	- 17 - 20 - 23 +	\$500	\$6,000	12	8
4.8.31	Playground Surfacing	unknown	\$13,190	100%	\$13,190	- 12 - 15 - 18 +	\$880	\$7,040	unknown	7
<b>4.9</b>	<b>Organizational Elements</b>									
4.9.12	Building Condition Assessment & Reserve Fund Study Update	2018	\$6,000	100%	\$6,000	- 3 - 5 - 7 +	\$1,200	\$0	0	5
<b>4.10</b>	<b>Miscellaneous Capital Components</b>									
<b>4.10.1</b>	<b>Miscellaneous Capital Allowance</b>	<b>varies</b>	<b>\$232,580</b>	<b>1%</b>	<b>\$2,510</b>	<b>- 15 - 25 - 35 +</b>	<b>\$2,510</b>	<b>\$2,510</b>	<b>varies</b>	<b>0</b>
4.10.2	Foundation Leaks / Window Wells	1977				- 5 - 10 - 15 +				
4.10.3	Window IGUs	varies				- 11 - 15 - 19 +				
4.10.11	Landscaping	varies				- 3 - 5 - 7 +				
4.10.12	Site Signage	varies				- 15 - 18 - 21 +				
4.10.16	Garbage Bin Enclosures	varies				- 20 - 25 - 30 +				
<b>TOTALS</b>			<b>\$6,273,040</b>		<b>\$3,938,250</b>		<b>\$153,410</b>	<b>\$2,363,530</b>		

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Sunnyhill Housing Co-operative  
787 - 3rd Street NW, Calgary, AB

Table 2: Expenditures and Contingency Reserve Fund Plan

Note: 2018 refers to the Corporations' Fiscal Year starting January 1, 2018 and ending December 31, 2018

CRF No.	Component	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
							1	2	3	4	5	6	7	8	9	10	11	
<b>4.1</b>	<b>Structural Components</b>																	
4.1.2	Foundations & Structure - Townhouses (**)															\$22,587		
<b>4.2</b>	<b>Building Exterior Components</b>																	
4.2.2	Shingle Roofing - Townhouses (**)														\$492,158			
4.2.9	Stucco / EIFS (**)							\$5,000								\$112,936	\$115,195	
4.2.10	Siding (**)																	
4.2.15	Windows - Townhouses (**)							\$205,643	\$209,756									
4.2.18	Soffit, Fascia, Eavestroughs & Downspouts																	
4.2.22	Exterior Doors - Front and Rear (**)																	
4.2.24	Patio / Balcony Doors - Townhouses (**)													\$99,505				
4.2.32	Wood Decks - Townhouses (**)											\$38,256						
4.2.35	Wood Balconies & Metal Guardrails (**)						\$189,000											
4.2.38	Exterior Painting									\$29,417								
4.2.39	Exterior Sealants (**)								\$4,736	\$4,830								
<b>4.3</b>	<b>Building Interior Components</b>																	
4.3.2	Kitchen Upgrades - Townhouses													\$29,851	\$30,448	\$31,057	\$31,679	\$32,312
4.3.4	Bathroom Upgrades - Townhouses																	
4.3.12	Carpets & Flooring - Townhouses						\$41,580	\$42,412	\$43,260	\$44,125	\$45,008	\$45,908	\$46,826	\$47,762	\$48,718	\$49,692	\$50,686	\$51,700
4.3.22	Appliances - Stoves						\$3,329	\$3,395	\$3,463	\$3,532	\$3,603	\$3,675	\$3,748	\$3,823	\$3,900	\$3,978	\$4,057	\$4,139
4.3.23	Appliances - Refrigerators						\$3,749	\$3,823	\$3,900	\$3,978	\$4,057	\$4,139	\$4,221	\$4,306	\$4,392	\$4,480	\$4,569	\$4,661
4.3.34	Small Capital Costs - Townhouses						\$2,499	\$2,549	\$2,600	\$2,652	\$2,705	\$2,759	\$2,814	\$2,871	\$2,928	\$2,987	\$3,046	\$3,107
<b>4.4</b>	<b>Mechanical &amp; Plumbing Systems</b>																	
4.4.4	Furnaces - Townhouses (**)																	
4.4.16	Automatic Storage Water Heaters (Annual)						\$3,696	\$3,770	\$3,845	\$3,922	\$4,001	\$4,081	\$4,162	\$4,246	\$4,330	\$4,417	\$4,505	\$4,596
4.4.24	Plumbing Piping & Related - Townhouses (**)															\$55,213	\$56,318	\$57,444
4.4.26	Fire and Domestic Water Services (**)																	
4.4.27	Storm and Sanitary Sewers and Drainage (**)																	
<b>4.5</b>	<b>Electrical Systems</b>																	
4.5.1	Power & Distribution - Common (**)																	
4.5.3	Power & Distribution - Townhouses																	
4.5.12	Common Exterior Lighting														\$12,302			
<b>4.8</b>	<b>Site Components</b>																	
4.8.1	Asphalt Pavement (**)													\$159,787				
4.8.4	Concrete Components																	
4.8.14	Chain Link Fencing														\$49,431			
4.8.19	Guardrails & Handrails																	
4.8.20	Retaining Walls																	
4.8.30	Playground Equipment														\$12,302			
4.8.31	Playground Surfacing														\$15,909			
<b>4.9</b>	<b>Organizational Elements</b>																	
4.9.12	Building Condition Assessment & Reserve Fund Study Update											\$6,956						\$7,680
<b>4.10</b>	<b>Miscellaneous Capital Components</b>																	
4.10.1	Miscellaneous Capital Allowance						\$2,636	\$2,688	\$2,742	\$2,797	\$2,853	\$2,910	\$2,968	\$3,027	\$3,088	\$3,150	\$3,213	\$3,277
4.10.2	Foundation Leaks / Window Wells																	
4.10.3	Window IGUs																	
4.10.11	Landscaping																	
4.10.12	Site Signage																	
4.10.16	Garbage Bin Enclosures																	

Note: 2018 refers to the Corporations' Fiscal Year starting January 1, 2018 and ending December 31, 2018

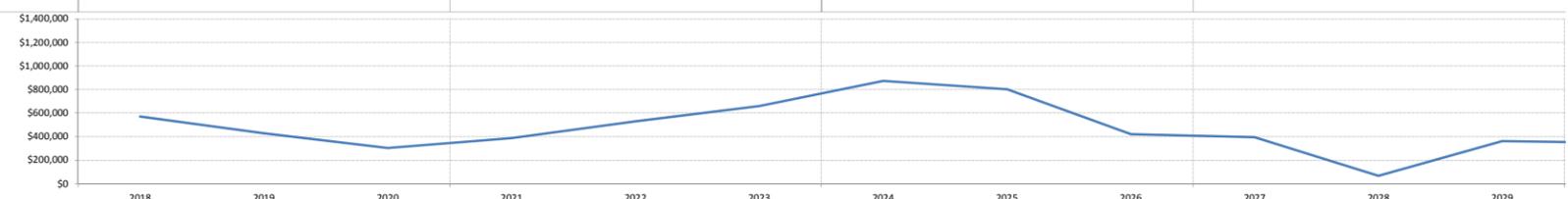
LINE	Component	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
LINE A	EXPENDITURE - PRESENT DAY VALUE						\$246,488	\$264,000	\$259,098	\$89,670	\$61,950	\$98,438	\$57,488	\$323,054	\$566,717	\$348,380	\$611,625	\$129,675
LINE B	INFLATION RATE	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
LINE C	COMPOUND INFLATION RATE	1.000000%	1.000000%	1.000000%	1.000000%	1.000000%	1.000000%	1.020000%	1.040400%	1.061208%	1.082432%	1.104081%	1.126162%	1.148686%	1.171659%	1.195093%	1.218994%	1.243374%
LINE D	EXPENDITURE - FUTURE COST VALUE						\$246,488	\$269,280	\$269,566	\$95,159	\$67,057	\$108,683	\$64,740	\$371,087	\$663,999	\$416,346	\$745,567	\$161,235
LINE E	GST @ 5%						incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
LINE F	PROFESSIONAL FEES incl. GST (*) & (**)						\$13,230	\$14,745	\$14,683	\$331	\$338	\$2,678		\$18,150	\$73,824	\$14,368	\$44,529	\$4,021
LINE L	TOTAL EXPENDITURE - FUTURE COST VALUE						\$259,718	\$284,025	\$284,248	\$95,490	\$67,395	\$111,361	\$64,740	\$389,237	\$737,822	\$430,714	\$790,097	\$165,256
LINE M	PROJECTED ANNUAL CONTRIBUTION						\$66,000	\$132,000	\$151,509	\$173,902	\$199,605	\$229,106	\$262,967	\$301,833	\$346,444	\$397,647	\$456,419	\$456,464
LINE R	OTHER - SPECIAL LEVY																	
LINE X	INTEREST RATE						2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
LINE Y	INTEREST EARNED						\$13,034	\$9,780	\$7,111	\$6,690	\$8,908	\$11,560	\$14,922	\$16,295	\$17,794	\$7,741	\$4,178	\$4,169
LINE Z	PROJECTED TOTAL REVENUE						\$79,034	\$141,780	\$158,620	\$180,593	\$208,513	\$240,666	\$277,889	\$318,128	\$358,238	\$405,389	\$460,597	\$460,634
LINE AA	BEGINNING BALANCE						\$751,402	\$570,718	\$428,473	\$302,845	\$387,947	\$529,065	\$658,370	\$871,519	\$800,410	\$420,825	\$395,500	\$66,000
LINE AB	ENDING BALANCE						\$570,718	\$428,473	\$302,845	\$387,947	\$529,065	\$658,370	\$871,519	\$800,410	\$420,825	\$395,500	\$66,000	\$361,378
LINE AC	INCREASE PER UNIT PER ANNUM						\$1,000.00	\$1,000.00	\$295.60	\$339.28	\$389.43	\$446.99	\$513.05	\$588.88	\$675.91	\$775.81	\$890.48	\$0.69
LINE AD	ANNUAL CONTRIBUTION % INCREASE							14.78%	14.78%	14.78%	14.78%	14.78%	14.78%	14.78%	14.78%	14.78%	14.78%	0.01%

Chart 1  
Table of Annual Expenditures

\* Engineering Design Fees applied to this component @ 8%  
\*\* Project Management Fees applied to this component @ 7%



Chart 2  
Reserve Fund Cash-Flow





Sunnyhill Housing Co-operative  
787 - 3rd Street NW, Calgary, AB

Table 2: Expenditures and Contingency Reserve Fund Plan

CRF No.	Component	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
<b>4.1</b>	<b>Structural Components</b>																		
4.1.2	Foundations & Structure - Townhouses (**)																		
<b>4.2</b>	<b>Building Exterior Components</b>																		
4.2.2	Shingle Roofing - Townhouses (*) (**)												\$662,380						
4.2.9	Stucco / EIFS (**)																		
4.2.10	Siding (**)	\$299,622	\$305,615	\$311,727															
4.2.15	Windows - Townhouses (**)																		
4.2.18	Soffit, Fascia, Eavestroughs & Downspouts																		
4.2.22	Exterior Doors - Front and Rear (**)						\$174,666												
4.2.24	Patio / Balcony Doors - Townhouses (**)																		
4.2.32	Wood Decks - Townhouses (**)																		
4.2.35	Wood Balconies & Metal Guardrails (**)																		
4.2.38	Exterior Painting				\$37,307												\$47,315		
4.2.39	Exterior Sealants (**)				\$6,006	\$6,126											\$7,617	\$7,769	
<b>4.3</b>	<b>Building Interior Components</b>																		
4.3.2	Kitchen Upgrades - Townhouses	\$32,958	\$33,618	\$34,290	\$34,976	\$35,675	\$36,389	\$37,117											
4.3.4	Bathroom Upgrades - Townhouses																		
4.3.12	Carpets & Flooring - Townhouses	\$52,733	\$53,788	\$54,864	\$55,961	\$57,080	\$58,222	\$59,386	\$60,574	\$61,786	\$63,021	\$64,282	\$65,567	\$66,879	\$68,216	\$69,581	\$70,972	\$72,392	\$73,840
4.3.22	Appliances - Stoves	\$4,221	\$4,306	\$4,392	\$4,480	\$4,569	\$4,661	\$4,754	\$4,849	\$4,946	\$5,045	\$5,146	\$5,249	\$5,354	\$5,461	\$5,570	\$5,681	\$5,795	\$5,911
4.3.23	Appliances - Refrigerators	\$4,754	\$4,849	\$4,946	\$5,045	\$5,146	\$5,249	\$5,354	\$5,461	\$5,570	\$5,681	\$5,795	\$5,911	\$6,029	\$6,150	\$6,273	\$6,398	\$6,526	\$6,657
4.3.34	Small Capital Costs - Townhouses	\$3,169	\$3,233	\$3,297	\$3,363	\$3,431	\$3,499	\$3,569	\$3,641	\$3,713	\$3,788	\$3,863	\$3,941	\$4,019	\$4,100	\$4,182	\$4,266	\$4,351	\$4,438
<b>4.4</b>	<b>Mechanical &amp; Plumbing Systems</b>																		
4.4.4	Furnaces - Townhouses (**)																		
4.4.16	Automatic Storage Water Heaters (Annual)	\$4,687	\$4,781	\$4,877	\$4,974	\$5,074	\$5,175	\$5,279	\$5,384	\$5,492	\$5,602	\$5,714	\$5,828	\$5,945	\$6,064	\$6,185	\$6,309	\$6,435	\$6,564
4.4.24	Plumbing Piping & Related - Townhouses (**)																		
4.4.26	Fire and Domestic Water Services (*) (**)					\$48,057	\$49,018	\$49,999											
4.4.27	Storm and Sanitary Sewers and Drainage (*) (**)	\$44,397	\$45,285	\$46,191															
<b>4.5</b>	<b>Electrical Systems</b>																		
4.5.1	Power & Distribution - Common (*) (**)																		
4.5.3	Power & Distribution - Townhouses																		
4.5.12	Common Exterior Lighting																		
<b>4.8</b>	<b>Site Components</b>																		
4.8.1	Asphalt Pavement (**)																		
4.8.4	Concrete Components																		
4.8.14	Chain Link Fencing																		
4.8.19	Guardrails & Handrails																		
4.8.20	Retaining Walls																		
4.8.30	Playground Equipment																		\$18,281
4.8.31	Playground Surfacing											\$21,411							
<b>4.9</b>	<b>Organizational Elements</b>																		
4.9.12	Building Condition Assessment & Reserve Fund Study Update				\$8,479					\$9,361					\$10,336				
<b>4.10</b>	<b>Miscellaneous Capital Components</b>																		
4.10.1	Miscellaneous Capital Allowance	\$3,342	\$3,409	\$3,477	\$3,547	\$3,618	\$3,690	\$3,764	\$3,839	\$3,916	\$3,995	\$4,074	\$4,156	\$4,239	\$4,324	\$4,410	\$4,498	\$4,588	\$4,680
4.10.2	Foundation Leaks / Window Wells																		
4.10.3	Window IGUs																		
4.10.11	Landscaping																		
4.10.12	Site Signage																		
4.10.16	Garbage Bin Enclosures																		

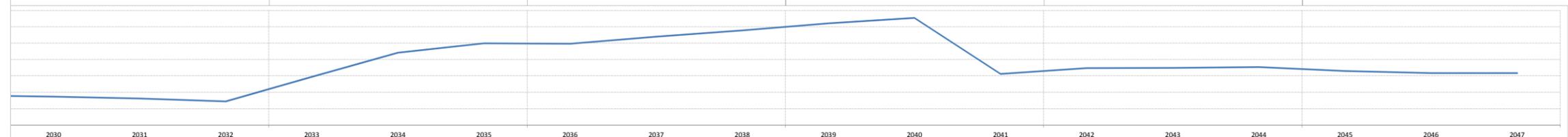
		2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
LINE A	EXPENDITURE - PRESENT DAY VALUE	\$354,732	\$354,732	\$354,732	\$121,958	\$122,945	\$243,222	\$118,482	\$57,488	\$63,788	\$57,488	\$71,337	\$477,540	\$57,488	\$98,438	\$92,138	\$124,320	\$107,100	\$92,138
LINE B	INFLATION RATE	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
LINE C	COMPOUND INFLATION RATE	1.268242%	1.293607%	1.319479%	1.345868%	1.372786%	1.400241%	1.428246%	1.456811%	1.485947%	1.515666%	1.545980%	1.576899%	1.608437%	1.640606%	1.673418%	1.706886%	1.741024%	1.775845%
LINE D	EXPENDITURE - FUTURE COST VALUE	\$449,886	\$458,884	\$468,061	\$164,139	\$168,776	\$340,570	\$169,221	\$83,748	\$94,785	\$87,132	\$110,286	\$753,032	\$92,465	\$161,497	\$154,185	\$212,200	\$186,464	\$163,622
LINE E	GST @ 5%	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.						
LINE F	PROFESSIONAL FEES incl. GST (*) & (**)	\$27,633	\$28,186	\$28,750	\$420	\$7,637	\$19,579	\$7,500					\$99,357				\$533	\$544	
LINE L	TOTAL EXPENDITURE - FUTURE COST VALUE	\$477,519	\$487,069	\$496,811	\$164,559	\$176,414	\$360,149	\$176,721	\$83,748	\$94,785	\$87,132	\$110,286	\$852,390	\$92,465	\$161,497	\$154,185	\$212,733	\$187,008	\$163,622
LINE M	PROJECTED ANNUAL CONTRIBUTION	\$456,510	\$456,556	\$456,601	\$456,647	\$456,693	\$456,738	\$150,269	\$150,284	\$150,299	\$150,314	\$150,329	\$150,344	\$150,359	\$150,374	\$150,389	\$150,404	\$150,419	\$150,435
LINE R	OTHER - SPECIAL LEVY																		
LINE X	INTEREST RATE	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
LINE Y	INTEREST EARNED	\$6,622	\$6,239	\$5,657	\$8,289	\$14,178	\$18,230	\$19,562	\$20,354	\$21,981	\$23,608	\$25,112	\$18,994	\$12,933	\$13,659	\$13,783	\$13,398	\$12,676	\$12,432
LINE Z	PROJECTED TOTAL REVENUE	\$463,132	\$462,795	\$462,258	\$464,936	\$470,871	\$474,969	\$169,831	\$170,638	\$172,280	\$173,922	\$175,442	\$169,339	\$163,292	\$164,034	\$164,173	\$163,802	\$163,096	\$162,867
LINE AA	BEGINNING BALANCE	\$361,378	\$346,991	\$322,716	\$288,164	\$588,540	\$882,997	\$997,816	\$990,926	\$1,077,815	\$1,155,311	\$1,242,101	\$1,307,257	\$624,207	\$695,034	\$697,570	\$707,558	\$658,627	\$634,715
LINE AB	ENDING BALANCE	\$346,991	\$322,716	\$288,164	\$588,540	\$882,997	\$997,816	\$990,926	\$1,077,815	\$1,155,311	\$1,242,101	\$1,307,257	\$624,207	\$695,034	\$697,570	\$707,558	\$658,627	\$634,715	\$633,960
LINE AC	INCREASE PER UNIT PER ANNUM	\$0.69	\$0.69	\$0.69	\$0.69	\$0.69	\$0.69	-\$4,643.47	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23	\$0.23
LINE AD	ANNUAL CONTRIBUTION % INCREASE	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%

Chart 1  
Table of Annual Expenditures

\* Engineering Design Fees applied to this component @ 8%  
\*\* Project Management Fees applied to this component @ 7%



Chart 2  
Reserve Fund Cash-Flow



## 6 Water and Energy Saving Tips

### 6.1 Water and Energy Savings Tips

#### 6.1.1 General

There are a number of measures and upgrades that may be implemented to reduce the energy and water consumption of the property. There is a great deal of information available today with regard potential energy savings, all with varying degrees of effectiveness and calculated payback periods. In reality there are too many variables to consider when trying to evaluate the true energy savings of implementing a system or upgrades/replacement of components; even in a detailed energy audit for the particular site. The types of variables may include:

- Hours of operation of common appliances (light fixtures, exhaust fans etc.)
- Hours of operation of residential appliances (light fixtures, exhaust fans etc.)
- Utility rates gas, hydro and water for the local area
- Occupancy hours for residential units (i.e. units vacated for the working day expect to use less energy)
- The energy consumption habits of residents (i.e. time to shower, turning of lights in unoccupied rooms, desired temperature setting for heating and cooling etc.)
- Levels of insulation in walls, attics and floors and to mechanical pipes and ducts
- Degree of air leakage from the building and residential units
- Level of maintenance and fine tuning of mechanical and electrical equipment
- Physical location of property and number of degree days for heating and cooling seasons
- Standard of actual equipment and components in relation to current modern equipment, components and technologies.

There are many means to conserve energy with minimal investment or changes to procedures. One of the biggest ways to conserve is to educate the end-users; that is the building operators and residents to minimise energy consumption. In efforts to help the Housing Provider understand the various measures that may be implemented, IRC has provided a summary of water and energy saving tips that are suggested by the Canadian Mortgage and Housing Corporation, an independent organisation that provides detailed research and development for housing projects such as this property. Implementation of some of these recommendations may be completed at minimal cost with valuable cost savings.

#### 6.1.2 CMHC – Canadian Mortgage and Housing Corporation – Energy Saving Tips

CMHC offer information and advice as to where potential water and energy savings may be made with components and/or systems, including estimated payback periods. Information on these potential savings can be found at [Water and Energy Saving Tips for Multi-Unit Residential Buildings \(MURBs\)](#) <sup>(33)</sup>.

The information provided in these CMHC articles are general recommendations and not specific to this site; however many are still valid in this application. The information and calculations contained in the energy saving tips are those as presented by CMHC; however this reference has been provided for information purposes only. By providing this reference, it is not intended to imply that IRC endorses or verifies the accuracy of the information.

Below is a list of the potential energy saving tips that may be applicable to this site. It is recommended that the professional services of mechanical and/or electrical engineering consultants or qualified contractors be utilized before implementing the more complex related energy saving strategies. The simple payback calculations offered by CMHC may vary greatly depending upon the actual conditions and systems at the property.

#### 6.1.3 Building Exterior Components

##### - [Seal Air Leakage Paths](#)

**The Measure:** Air seal vertical chases in buildings to prevent cold air from entering at the lower levels and warm air from escaping at the higher levels.

**Application:** Vertical chases in buildings.

**Simple Payback:** Less than 8 years for electrically heated buildings.  
10 years or more for gas heated buildings.

- [Retrofitting High-Performance Windows](#)

**The Measure:** When original windows are beyond repair or are difficult to maintain, install double- or triple-glazed high-performance windows. A double-glazed window with low-E coating can perform as well as a triple-glazed window; with exception of sound transmission.

**Application:** Buildings implementing a window replacement project.

**Simple Payback:** Based upon incremental cost of high-performance windows over standard replacement windows; less than 3 years for electrically heated buildings, 5 years for gas heated buildings.

- [Add Storm Windows to Single-Glazed Units](#)

**The Measure:** Install storm windows to existing single-glazed units as an alternative to complete window replacement.

**Application:** Buildings where complete window replacement cannot be justified.

**Simple Payback:** Periods range from 7 years for electrically heated buildings, to 10 years for gas heated buildings.

**Note:** On the basis of improved comfort and reduced potential for condensation damage, this measure is more than justified.

- [Upgrade Weather-stripping on Doors](#)

**The Measure:** Seal joints around doors in the building envelope.

**Application:** Apartment building doors.

**Simple Payback:** Less than 5 years.

- [Upgrade Weather-stripping on Windows](#)

**The Measure:** Upgrade weather-stripping on windows for more effective sealing at operable joints.

**Application:** High-rise residential buildings.

**Simple Payback:** 3 to 5 years.

- [Seal Exterior Cracks](#)

**The Measure:** Caulk all cracks in the building envelope around doors, windows and other exterior joints, or other areas where air infiltrates in cold weather.

**Application:** All apartment buildings with unsealed cracks in the building envelope.

**Simple Payback:** 7 years + additional cost savings from reduced water leakage and resultant damage to interior finishes.

- [Seal Air Leakage Paths in Outside Walls of Apartments](#)

**The Measure:** Use a foam or sealant to seal air leakage paths around electrical receptacles, window frames, floor junctions, and baseboard heaters on exterior walls.

**Application:** All buildings.

**Simple Payback:** 6 to 8 years for electrically heated buildings, 10+ years for gas heated buildings.

- [Insulate and Seal Air Conditioner Sleeves](#)

**The Measure:** Minimize air infiltration and reduce condensation by insulating air conditioner sleeves and sleeve joints.

**Application:** Buildings with air conditioners and incremental through wall HVAC units.

**Simple Payback:** 2 – 3 years.

- [Insulate Walls During Exterior Repairs and Renovations](#)

**The Measure:** Insulate and air seal walls and install an effective air barrier during exterior wall repair and/or refinishing activities.  
**Application:** Buildings implementing wall replacement and/or repair measures.  
**Simple Payback:** Variable depending upon current construction.

- [Insulate When Replacing Roofing](#)

**The Measure:** Insulate or re-insulate roofs as part of roof membrane replacement.  
**Application:** All buildings in process of replacing roofing.  
**Simple Payback:** (assuming no insulation currently in place) 1 year for electrically heated buildings, 2 years for gas heated buildings.

#### 6.1.4 Building Interior Components

- [Install Setback Thermostats in Individual Suites](#)

**The Measure:** Replace in-suite thermostats with programmable electronic thermostats with setback capability.  
**Application:** In-suite heating systems with thermostats.  
**Simple Payback:** Less than 7 years.

- [Install Time Switches on Local Exhaust Fans](#)

**The Measure:** Use 24-hour or 7-day automatic timers to turn off local exhaust fans at times when they are not required, rather than running them continuously.  
**Application:** All apartment buildings with local exhaust fans in areas such as laundry, recreation and storage rooms.  
**Simple Payback:** 1 to 3 years for exhaust systems that previously operated continuously.

- [Insulate When Repairing Interior Walls](#)

**The Measure:** Insulate and air seal empty wall cavities as part of interior repair or refinishing work.  
**Application:** Any multi-unit building undergoing interior repair and refinishing.  
**Simple Payback:** 3 years for electrically heated buildings, 6 years or more for gas heated buildings.

- [Insulate Accessible Attic Space](#)

**The Measure:** Add insulation into the attic of buildings.  
**Application:** Low-rise, multi-unit buildings with accessible attics.  
**Simple Payback:** Variable depending upon current conditions.

- [Modify Laundry Machine for Cold Rinse Only](#)

**The Measure:** Modify the washing machine control cycle to allow cold rinses only on all cycles.  
**Application:** Laundry equipment owned or rented by the Housing Provider.  
**Simple Payback:** 6 to 12 months (depending on usage patterns).

- [Upgrade Common Area Washing Machines](#)

**The Measure:** Replace existing top loading vertical axis (V-axis) washing machines in apartment laundry rooms with front loading horizontal axis (H-axis) units.  
**Application:** Any multi-unit facility with laundry facilities.  
**Simple Payback:** Less than 2 years (can be improved considerably when energy savings associated with water heating are taken into account).

- [Are Dirty Vents a Fire Hazard?](#)

- The Measure:** Dirty vents can become a fire hazard.
- Application:** A plugged dryer duct system will certainly cause a dryer to run hotter and increase the chance that something could catch fire. Dryer lint can accumulate at the outdoor hood bird screen, along the length of the duct, at duct fittings and at the dryer lint screen itself.
- Simple Payback:** N/A.

### 6.1.5 Mechanical & Plumbing Systems

- [Fuel Conversion](#)

- The Measure:** Switch from a higher- to a lower-cost fuel for heating equipment. This conversion is often performed when replacing or upgrading existing equipment. The usual conversion is from electricity to oil or natural gas. Some cities can provide steam or hot water from a district heating system.
- Application:** Any building.
- Simple Payback:** Conversion cost divided by the heating cost saving. See CMHC article for more information on calculations.

- [Replace Gas-Fired Boilers with Higher Efficiency Models](#)

- The Measure:** At the end of their useful lifetimes, replace existing boilers with higher efficiency models. This measure is most often applied at the end of the useful lifetime of the existing equipment.
- Application:** Buildings with gas-fired boilers.
- Simple Payback:** 3 to 7 years

- [Seal and Insulate Warm Air Ducts in Unheated Spaces](#)

- The Measure:** Reduce energy costs by sealing and insulating warm air ducts in unheated spaces.
- Application:** Ducting in unheated spaces, including warm air supply ducting on the roof, rooftop penthouse, or in unheated garages.
- Simple Payback:** Immediate for simple jobs; 5 to 10 years for complex work.

- [Insulate Boiler and Heating Piping](#)

- The Measure:** Repair or add insulation to heating system piping and boilers in buildings with central hot water space heating and domestic hot water systems.
- Application:** Apartment buildings with central hot space and domestic water heating systems.
- Simple Payback:** 5 to 10 years.

- [Improve Air Flow Through Boiler Make-Up Air Grilles](#)

- The Measure:** Replace or service grilles that are inadequately sized and/or obstructed to provide the required combustion and dilution air for boilers.
- Application:** Boiler rooms with fuel fired space and domestic hot water heating systems.
- Simple Payback:** Immediate.

- [Balance Air Flows](#)

- The Measure:** Rebalance or adjust corridor air supply and/or central exhaust systems to ensure air is evenly supplied and/or removed from each area of the building at rates required to maintain good air quality.
- Application:** Corridor air supply systems and/or central exhaust systems.
- Simple Payback:** Variable – savings will result if the corridor air supply or exhaust air systems are excessive and could be reduced.

- [Reduce Operating Period of Central Exhaust fans and Corridor Air Supply Fans](#)

**The Measure:** Install a time-clock control to shut down the operation of the central air supply and/or exhaust fans during periods where ventilation requirements are minimal.

**Application:** Buildings where heated air is supplied by a make-up air unit to pressurize corridors, and where bathrooms and kitchens are exhausted by central exhaust fans.

**Simple Payback:** Less than 1 year (electric heat); 1 to 3 years (natural gas) in cases where the systems previously operated continuously.
  
- [Calibrate Hot Water Reset Temperature Controller](#)

**The Measure:** Calibrate the boiler's hot water reset temperature controller to ensure the system temperature is just hot enough to meet the building's space heating needs.

**Application:** Buildings with hot water space heating with controllers that adjust or "reset" the system water temperature as the outdoor temperature changes.

**Simple Payback:** Immediate or variable depending on the calibration of the control before adjustment.
  
- [Check and Maintain Boiler Efficiency](#)

**The Measure:** Test boiler combustion efficiency and perform required adjustments on a regular basis to ensure peak operating performance. Optimum efficiencies range between 75% to 80%; boiler efficiency can fall to 50% or less without proper maintenance and adjustment.

**Application:** Buildings with central fuel-fired hot water or steam heating systems.

**Simple Payback:** Typical for atmospherically vented gas boiler – 5 to 7 years (based upon typical improvements).  
For gas boilers with power venting systems or oil fired boilers – 4 to 6 years.
  
- [Replace Defective Taps with "Washerless" Fixtures](#)

**The Measure:** Replace fixtures with washerless taps to eliminate part failure and leakage.

**Application:** Fixtures with conventional compression taps.

**Simple Payback:** 1 to 4 years (including labour savings).
  
- [DHW Tank and Pipe Insulation](#)

**The Measure:** Add insulation to domestic hot water (DHW) tanks and accessible distribution piping where absent or to existing insulation that is damaged.

**Application:** DHW tanks and accessible distributing piping.

**Simple Payback:** 2 to 3 years.
  
- [Test and Improve Boiler Efficiency](#)

**The Measure:** Use flue gas analysis to test the combustion efficiency of boilers and storage heaters used for domestic water heating.

**Application:** Boilers and storage hot water heaters.

**Simple Payback:** If combustion efficiency below normal and corrective action taken – 6 months to 3 years.
  
- [Reduce Short Cycling](#)

**The Measure:** Adjust or modify controls so that each domestic hot water boiler fires in a set sequence. The lead boiler must be fully loaded before the next boiler fires.

**Application:** Multiple hot water supply boilers.

**Simple Payback:** Less than 6 months

- [Recirculation Pump Shutdown](#)

**The Measure:** Install a time-clock to shut down the DHW recirculation pump during periods when there is little demand for hot water.

**Application:** All buildings with centralized domestic hot water systems with pumped recirculation lines.

**Simple Payback:** Within 3 months assuming the imposition of an 8 hour shutdown period on a system that previously operated continuously.
  
- [Add Setback Feature to DHW Temperature Control](#)

**The Measure:** Reduce domestic hot water temperatures at night by adding a setback feature to the central temperature controller.

**Application:** Buildings with central DHW systems where DHW3 cannot be implemented due to varying tenant schedules.

**Simple Payback:** Less than 2 years.
  
- [Reduce DHW Temperature](#)

**The Measure:** Reduce the temperature of the DHW to the lowest safe level that will provide a satisfactory supply of hot water to all residents. See CMHC article and consult with local authority and health unit as to the lowest safe levels for heating water.

**Application:** Any hot water supply system.

**Simple Payback:** Immediate.
  
- [Repair Leaking Taps](#)

**The Measure:** Regularly maintain water supply taps that have replaceable washers to prevent leaks.

**Application:** Bathroom and kitchen fixtures with replaceable washers.

**Simple Payback:** Less than 1 year (including water and DHW savings).
  
- [Install Shower and Tap Flow Restrictions](#)

**The Measure:** Install low flow showerheads and faucets.

**Application:** Suites, kitchens, bathrooms, recreation rooms, etc.

**Simple Payback:** (based on water and energy savings) Less than 1 year.
  
- [Adjust DHW Pressure](#)

**The Measure:** Adjust the water pressure at the top floor so that it will not fall below 170 kPa (25 psi) during times of maximum demand, nor rise above 240 kPa (35 psi) during times of minimal demand.

**Application:** Buildings with domestic hot and cold water booster pumps.

**Simple Payback:** 1 to 3 years.
  
- [Install Water Conserving Fixtures](#)

**The Measure:** Replace existing showerheads and kitchen and bathroom faucet aerators with low flow models.

**Application:** Any multi-unit facility bathrooms and kitchens.

**Simple Payback:** Less than 3 months.
  
- [Replace Toilets with Ultra Low Flush \(ULF\) Models](#)

**The Measure:** Replace existing toilet fixtures with ultra low flush (ULF) 6 Litre/flush (L/f) models.

**Application:** Any multi-unit facility bathrooms.

**Simple Payback:** Less than 3 years (will be less where suites have two toilets serving the same occupancy).

- [Install Controls for Booster Pump Operation](#)

- The Measure:** Install controls to match booster pump operation with actual demand experienced in the building.
- Application:** Many high-rise apartment buildings have booster pumps to maintain hot and cold water pressure on the higher floors. The energy used by these continuously operating pumps can be substantial. The pumps can cause pipes and plumbing fixtures to leak resulting in increased water costs.
- Simple Payback:** Less than 1-½ years.

6.1.6 Electrical systems

- [Replace Electric Motors With High Efficiency Models](#)

- The Measure:** Replace failed electric drive motors for fans and pumps with high efficiency models.
- Application:** Large motors (1 hp and greater)
- Simple Payback:** 6 months to 1-<sup>1</sup>/<sub>4</sub> years

- [Install Electric Demand Controls](#)

- The Measure:** Install electric demand controls on large electrical loads to prevent their operation during periods of high electrical demand.
- Application:** For buildings with large electrical load, such as space heating, ramp heating, domestic hot water (DHW) heating, ventilation air heating and pool heating.
- Simple Payback:** Payback will vary considerably. A careful study of potential cost savings must be made to understand the relationship between costs for demand and energy as defined by the rate structure.

- [Replace Incandescent Lamps in Exit Signs with LED Lamps](#)

- The Measure:** Reduce energy use by replacing incandescent lamps with light emitting diode (LED) lamps in Exit signs.
- Application:** Exit signs.
- Simple Payback:** 3.7 years for 15 watt Exit signs, 2.5 years for 25 watt Exit signs.

- [Reduce Common Area Incandescent Lighting](#)

- The Measure:** Reduce the number and/or wattage of incandescent lamps in common areas.
- Application:** Common area lighting such as lobbies, corridors, garages, stairwells, mechanical/elevator rooms, and locker/storage rooms.
- Simple Payback:** Results can be influenced by cost of electricity, type of electric utility rate structure, initial and final number of operating hours and initial and final connected lighting.

- [Replace Outdoor Incandescent Lighting with HP Sodium Fixtures](#)

- The Measure:** Replace existing incandescent wall mounted/canopy mounted lighting fixtures and post-top luminaires with new, high pressure sodium fixtures.
- Application:** Buildings where incandescent lamps are used for outdoor and garage lighting.
- Simple Payback:** 1 to 3 years.

- [Time-clock and/or Photocell Control on Outdoor Lighting](#)

- The Measure:** Install a time-clock or photocell control to turn outdoor lights off during daylight hours.
- Application:** Apartment buildings with outdoor lights.
- Simple Payback:** 4 years if high quality replacement time-clock controls a circuit with 10 lamps; 2 years if lamps are controlled by 10 individual photocells.

- [Replace Incandescent Lighting in Kitchens and Bathrooms with Fluorescent Lighting](#)

**The Measure:** Replace incandescent lighting in the kitchens and bathrooms of rental units with fluorescent lighting.

**Application:** Kitchens and bathrooms in rental units.

**Simple Payback:** 3 – 4 years.
  
- [Replace Existing Lighting Fixtures with High Efficiency Fluorescent Lamps, Ballasts and Fixtures](#)

**The Measure:** Replace existing incandescent or older technology fluorescent lamps, ballasts and fixtures with high efficiency fluorescent lamps and ballasts.

**Application:** All apartment buildings where fluorescent lighting is installed or where conversion from incandescent to fluorescent lighting is planned.

**Simple Payback:** Results can be influenced by cost of electricity, type of electric utility rate structure, initial and final number of operating hours and initial and final connected lighting; 1 to 2 years.
  
- [Replace Indoor Incandescent Lamps with Compact Fluorescent Lamps](#)

**The Measure:** Replace indoor incandescent lamps in common areas with compact fluorescent lamps.

**Application:** All apartment buildings where incandescent lighting is used in common areas (corridors, lobbies, stairwells, laundry rooms, etc.), and where incandescent light bulbs can be replaced by screw-in compact fluorescent lamps (CFL) without replacing the fixture. This can include lighting in dwelling unit fixtures.

**Simple Payback:** 1-<sup>1</sup>/<sub>4</sub> years (24 hours/day operation) to 2-<sup>1</sup>/<sub>2</sub> years (8 hours/day operation).

## 7 Limitations

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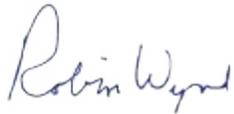
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We trust that the above is satisfactory for your purposes. If you have any questions or comments concerning the above please do not hesitate to contact our office.

Yours very truly,  
IRC Building Sciences Group

Prepared by:

A handwritten signature in blue ink that reads 'Robin Wynd'.

**Mr. Robin Wynd, B.A.Sc., P.Eng.**  
*Senior Building Science Engineer*

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## 8 Reference Information

### 8.1 Further Reading

- (1) About Your House: Home Maintenance Schedule.  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63218.pdf>
- (2) About Your House: Avoiding Basement Flooding.  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63436.pdf>
- (3) About Your House: Before you start repairing or replacing roof finishes.  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62258.pdf>
- (4) About Your House: Before You Start Repairing and Materials – Exterior Walls  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62260.pdf>
- (5) About Your House: Before You Start an Energy-Efficient Retrofit – The Building Envelope  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62264.pdf>
- (6) About Your House: Before You Start Window and Door Renovations  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62256.pdf>
- (7) About Your House: The ABC's of Windows  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63683.pdf>
- (8) About Your House: Understanding Window Terminology  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62031.pdf>
- (9) How to Lock Out Crime: Home Security – Windows  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65535.pdf>
- (10) Technical Series: Predicting Time to Fogging of Insulated Glass Units  
<http://www.cmhc-schl.gc.ca/odpub/pdf/64911.pdf>
- (11) About Your House: Attic Venting, Attic Moisture, and Ice Dams  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62034.pdf>
- (12) How to Lock Out Crime: Home Security–Patio Doors  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65537.pdf>
- (13) Maintenance Matters #1 – Paints, Stains and Coatings  
<http://www.hpo.bc.ca/PDF/MaintenanceMatters/MM1.pdf>
- (14) Research Report: Air Leakage Control Manual for Existing Multi-Unit Residential Buildings  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65847.pdf>
- (15) About Your House: Before You Start Renovating Your Kitchen  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62252.pdf>
- (16) About Your House: Before You Start Renovating Your Bathroom  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62254.pdf>
- (17) About Your House: Flooring Choices  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63144.pdf>

- (18) About Your House: Replacing Your Furnace  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63227.pdf>
- (19) About Your House: Your Furnace Filter  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62041.pdf>
- (20) About Your House: Setback Thermostats  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65329.pdf>
- (21) About Your House: Measuring Humidity in Your Home  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62027.pdf>
- (22) About Your House: The Importance of Bathroom and Kitchen Fans  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62037.pdf>
- (23) About Your House: Combustion Gases in Your Home – Things You Should Know About Combustion Spillage  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62028.pdf>
- (24) About Your House: Buying a Toilet  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62935.pdf>
- (25) Research Highlights: Maximum Performance Testing of Popular Water-Efficient Toilet Models  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63511.pdf>
- (26) About Your Apartment: Fire Safety  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65050.pdf>
- (27) About Your House: Carbon Monoxide  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62046.pdf>
- (28) Retrofit Your Home and Qualify for a Grant!  
<http://oee.nrcan.gc.ca/publications/infosource/pub/ecoenergy-retrofit-homes/retrofit-qualify-grant.pdf>
- (29) Details on Rebates and Incentives for Selected EnergyStar® Qualified Products in Canada  
<http://oee.nrcan.gc.ca/energystar/>  
<http://oee.nrcan.gc.ca/energystar/english/consumers/rebate.cfm?PrintView=N&Text=N>
- (30) RS Means CostWorks® 2010: Repair & Remodelling; Residential Repair & Remodelling  
<http://www.meanscostworks.com/>  
<http://www.rsmeans.com/costdata/index.asp>
- (31) Bank of Canada: – Canadian interest rates and monetary policy variables: 10-year lookup  
<http://www.bankofcanada.ca/en/rates/interest-look.html>
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[http://www.bankofcanada.ca/cgi-bin/famecqi\\_fdps](http://www.bankofcanada.ca/cgi-bin/famecqi_fdps)
- (33) Water and Energy Saving Tips for Multi-Unit Residential Buildings  
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- (34) About Your House: Insulating Your House  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62039.pdf>
- (35) Household Guide: Moisture and Air  
<http://www.cmhc-schl.gc.ca/odpub/pdf/61033.pdf>

- (36) About Your House: Painting  
<http://www.cmhc-schl.gc.ca/odpub/pdf/63134.pdf>
- (37) About Your House: Accessible Design – Kitchens  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65588.pdf>
- (38) About Your House: Accessible Design – Bathrooms  
<http://www.cmhc-schl.gc.ca/odpub/pdf/65686.pdf>
- (39) CAN/CSA Z614-07 – Children’s Playspaces and Equipment  
<http://www.csa.ca/Default.asp?language=english>
- (40) Better Buildings - Community Housing Water Efficiency Project: Region of Waterloo  
<http://cmpgmr.com/app/campaigner/trk/trk3.jsp?cid=1403355&rid=1402014&ctd=424895177&lt=1&lid=90556766&gmu=http%3a%2f%2fwww%2ecmhc%2dschl%2eqc%2eca%2fen%2finpr%2fbude%2fhimu%2fbebu%2fupload%2f65640%2dw%2epdf&gen=0&flinkid=90556779>
- (41) About Your House: Asbestos  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62029.pdf>
- (42) About Your House: After the Flood – A Homeowners Checklist  
<http://www.cmhc-schl.gc.ca/odpub/pdf/60515.pdf>
- (43) About Your House: Fighting Mould – The Homeowners Guide  
<http://www.cmhc-schl.gc.ca/odpub/pdf/60516.pdf>
- (44) About Your House: Maintaining Your HRV  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62043.pdf>
- (45) About Your House: Water softeners  
<http://www.cmhc-schl.gc.ca/odpub/pdf/62946.pdf>

## 8.2 Project Team

### IRC Building Sciences Group

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The investigation team consisted of the following IRC staff members:

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- Alexander White, B. Tech.

IRC was responsible for review of the building exterior, interior and site components; as well as production and coordination of the report.

### 8.3 Abbreviations

A	Amps or Amperes
ABS	Acrylonitrile- butadiene-styrene plastic pipe, which is resistant to heat, impact, and chemicals.
A/C	Air Conditioning
ACM	Asbestos Containing Material
ACT	Acoustic Ceiling Tile (Suspended grid tile ceiling)
BCA	Building Condition Assessment
BUR	Built-up Roofing
CATV	Cable Television
CDP	Central Distribution Panel
CO	Carbon Monoxide
C/T's & P/T's	Current transducers and Potential Transformers
DCW	Domestic Cold Water
DHW	Domestic Hot Water
DHWR	Domestic Hot Water Return
DWV	Drain Waste and Vent
DVR	Digital Video Recorder
EPDM	Ethylene Propylene Diene Monomer (rubber roof membrane)
FHP	Fractional Horse Power
GFCI or GFI	Ground Fault Circuit Interrupt
HID	High intensity discharge
HVAC	Heating, Ventilation & Air Conditioning
HID	High Intensity Discharge
HP	Horsepower
HPS	High Pressure Sodium
HWH	Hot Water Heater
KVA	Kilo Volt Amperes
KW	Kilowatt
M&E	Mechanical and Electrical
MUA	Make-Up Air
OSB	Orientated Strand Board (A type of wood sheathing)
OWSJ	Open Web Steel Joist (A structural steel member)
P	Pole(s)
PH	Phase(s)
PM	Periodic / Preventative Maintenance
PCA	Property Condition Assessment
PSD	Private Sewage Disposal
PT	Pressure Treated
PVC	Polyvinyl Chloride
RFP	Request for Proposal
RFS	Reserve Fund Study
RWL	Rainwater Leader
TPS	Trap Seal Primer
TTW	Through-the-wall (load bearing brickwork)
VCT	Vinyl Composite Tile (12" x 12" floor tile)
V or VAC	Volts, Alternating Current
W	wire
w	watts

**8.4 Client Notes:**

These blank pages have been provided for your convenience for notes/comments etc.





