ST. ALBERT FIRE HALL #1 FEASIBILITY STUDY

City of St. Albert
Cultivate Life

Prepared by

ACI ARCHITECTS INC

October 20, 2017

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INTRODUCTION

Objectives of the Report

The St. Albert Fire Hall #1 at 18 Sir Winston Churchill Ave, was originally constructed in 1962 and renovated in 1977, 1987 and 2011. These renovations include the expansion of the administrative and operational spaces such as Apparatus bays, and also the upgrades of the residential areas including kitchen and dormitory. While still serviceable from a building systems' perspective, the current facility is still experiencing a significant spatial shortfall and many of the building components have reached the end of their serviceable life.

As explained with more details under the Existing Facility Analysis section in this report, the current facility requires increasing levels of vigilance significantly in terms of repair or replacement and expansion. The current facility is also reaching its maximum capacity to cover its response zone boundary as the City expands.

The methodology of this report is intended to include a subjective evaluation of the existing facility and identify the opportunities and constraints under the current circumstances. The final recommendation is provided to show the most efficient and economical project options from both operational and capital investment perspectives.

Executive Summary

This report examines the present condition of over-capacity utilization at the St. Albert Fire Hall #1, located at 18 Sir Winston Churchill Ave. It concludes with one recommendation (Option 3) from among three (3) options - each of which explores in detail both the service delivery implications as well as the short- and long-term financial costs of implementation.

In June of 2017, ACI Architects Inc. and a consulting team conducted a facility walk through and analysis to review and report its current condition to the City of St. Albert. In July of 2017, ACI Architects Inc. met the City of St. Albert representative and the St. Albert Fire Services to address both strategic and administrative issues of the current Fire Hall #1.

The discussed items covered such topics as:

programs
community involvement
project options
site selection
construction costs
staffing and operational costs
sustainability
image of the building

This report considers three (3) options* as below.

		OPTION 1 Modernization with user groups in	**OPTION 2 Modernization with user groups out**	**OPTION 3 New Construction**
COST	Total Capital Cost**	$11.80M	$10.86M	$12.01M
	Acquisition cost required?	No	No	No
	Operating cost	High	High	Low
EXISTING CONDITIONS	Site owned?	Yes	Yes	Yes
	Re-zoning required?	No	No	Yes
	Temporary building required?	No	Yes	No
CONSTRUCTION	Construction delivery	Multi-Phase	Single stage	Single stage
OPERATION	Response Time satisfied?	Yes	Yes	Yes
	Long-term growth potential?	Low	Low	High
	Two egress?	No	No	Yes
	Enough parking area?	No	No	Yes
	Temporary parking shortage during construction?	Yes	Yes	No
	Training area at rear provided?	No	No	Yes
	Service Delivery Impacts	High	Low	No
SUSTAINABILITY	Energy performance	Low	Low	High
	Hazardous material included?	Not known	Not known	No
	LEED achievable?	Yes (EB:O&M)	Yes (EB:O&M)	Yes (New Construction)

* For further details, please see 'PROJECT OPTIONS'

** Prime consultant fee (8.37% of construction budget) is applicable to all three options

The result of this analysis is a recommendation to the City of St. Albert in support of Option 3.

It is the most strategic and efficient for the delivery of fire services from the operational and capital investment perspective. This option has been determined to accommodate present needs as well as anticipated growth for the following 30 years and it includes design preparation to allow for further cost-efficient growth.

In the context of this study, this report is looking at anticipating requirements to a thirty-year planning horizon. Several sources of population growth projections were reviewed. Analysis has led to about 91,000 total residents in 2050, which is over 40% increase from the current population in 2016.

A practical, long-term solution is recommended for consideration and implementation as soon as possible because of the timeline associated with delivering a public project of this size and complexity: among the steps involved are City of St. Albert approval, selection of a team of professionals, building design and preparation of construction drawings and specifications, public tender (following a recommended pre-qualification period), followed by twenty (20) to twenty-four (24) months of construction depending on the chosen solution (a renovation and expansion can take as long or longer to deliver as a new stand-alone construction because of the detailed investigations required prior to the design stage, coordination during design, and the phasing required during construction).

Inserted between the project phases described above are periods for the Fire Services review and coordination. Reviews include attention to life safety, personal safety and security, operational efficiency, space allocation, response times, materials, as well as the communications and technology backbone.

As mentioned above, the following list of three (3) options represents those physical models identified for further exploration based on their suitability to support the Fire Services in St. Albert.

OPTION 1 - Modernization with user groups in - Total capital cost of $11.80M

* For further details, please see 'PROJECT OPTIONS'.

This option includes the expansion and the modernization of the existing building to meet the requirements for growth to 2050. A significant short-term disruption to operations is to be addressed during construction. In order to lower the impact of Fire Service Delivery as much as possible, well planned construction schedule is necessary. Additional 'soft' cost is required to isolate the operational / administrative areas from the construction site. From experience, we know that there is less critical thinking applied to operational habits and practice improvements when the perception is that a facility is simply being upgraded.

Financial impacts include increased risk associated with the unknowns of renovation project: inefficiencies during construction, higher costs to upgrade and / or tie-into existing systems and possible hazardous material removal.

The total capital cost of $11.80M includes nearly $3M for modernization of the existing facility, which does not cover any structural modification to the building.

In addition to the total capital cost of $11.80M, higher operating costs should be clearly addressed. Public Works has a basic annual maintenance budget at FH #1 of approximately

$30,000 (2017 approved budget). This covers maintenance materials, building maintenance staff wages, and some contracted services. Within the last five (5) years, Public Works has spent on average $32,000 per year on other contracted services, specifically replacing certain failed sections of the roofing membrane. This is **2.6 times more expensive** than the operating costs of other Fire Hall stations in St. Albert.

In general, significant renovation (or 'major renovation') implies the demolition and replacement of approximately 75 to 80 percent of interior non-load-bearing walls and possible replacement of a limited number of load-bearing elements - for example columns are re-positioned or eliminated through the use of transfer beams, such interventions will require temporary shoring. Most finishes are stripped and replaced. New operational zones are created (i.e. several functions may be re-located entirely within the building to optimize adjacencies). Access egress points may be relocated, for example a primary public or secondary entrance, and new emergency exits may be required according to new spatial configurations and corridors. New openings may be created for windows or access. Plumbing lines are re-routed to accommodate possible new washroom and utility locations as well as the addition of barrier-free amenities if required. Mechanical and electrical systems - if still serviceable - are subject to new distribution; some energy efficiency upgrades may be implemented.

These interventions must be deemed reasonable in an otherwise structurally sound building such as the current station.

OPTION 2 - Modernization with user groups out - Total capital cost of $10.86M

* For further details, please see 'PROJECT OPTIONS'.

Similar to option 1 as described above, option 2 also includes the expansion and the modernization of the existing building to meet the requirements for growth to 2050. The difference between these two options is that option 2 requires to lease another building temporarily outside of the property for minimum 18 months to accommodate the users.

This option allows relatively shorter construction schedule with no significant disruption to operations, however, its operational aspects would be much affected by the conditions of the temporary building. All other financial impacts remain same as option 1.

OPTION 3 - New Construction - Total capital cost of $12.01M

* For further details, please see 'PROJECT OPTIONS'.

This option includes constructing a new building, which achieves full build-out to meet the required space increase for growth to 2050. It includes minimal or no disruption to members, staff or public. Financial impacts include the possibility of cross-coverage, comparatively-reduced operational and maintenance costs of a single, high-efficiency, new building. This option is recommended for reasons as listed below.

- Site Ownership - **City owned**, the proposed site (20 Gate Ave)
- Construction Budget - Less than **2%** difference comparing to option 1, 10% to option 2
- Construction Delivery - Single stage construction to **minimize 'soft' costs and unforeseen site conditions**
- Operating costs - **61% lower** operational and maintenance costs

- Energy performance - Minimum **42% more efficient,** if pursued for a LEED Silver
- Service Delivery Impacts - **Minimal or No disruption** to operations
- Response Time - **Improved response coverage** to the south and southeast with no negative impact on other areas.
- Vehicular Access - At least **two (2) egress** provided
- Higher Apparatus bay - Support of having an Aerial
- Parking - Enough secured parking areas with the possibility of sharing 'public' parking with the adjacent mall
- Reuse of existing building - Possibility of **retaining the existing facility** for AHS or storage for Public Works.

EXISTING FACILITY ANALYSIS

Refer to the attached St. Albert Fire Hall Facility Analysis Report, Appendix 1.

CONSIDERATIONS

"St. Albert Fire Services is ready to respond to any emergency 24 hours a day, 365 days a year. The department's dedicated team of professionals saves lives and protects properties by responding quickly and effectively to suppress fires and provide medical and rescue attention in disaster and other emergency situations.

St. Albert Fire Services specialized services include ice/water rescue and dangerous goods intervention. The department assists the community with service calls concerning items such as fire pits and carbon monoxide and smoke detector activations. Fire Services also educates community groups and schools on fire prevention."

In order to determine the rationale driving the need for a new fire hall station, the first step in the investigative process has to involve isolating the key issues that would shape the nature and form of the facility. These issues are dependent on two primary factors as below.

A strategic vision of how the new facility responds to the City's needs.
An urgent need to accommodate a growing administration / operation keeping pace with a rapidly expanding city.

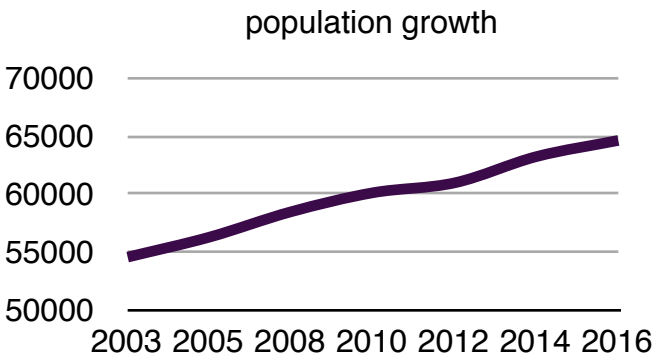
These two inter-dependent issues guided the information gathering process that would be necessary to identify the direction for a new facility.

Growth Projections

According to the 2016 Municipal census report for the City of St. Albert, the city's population has reached 64,645. For our study purpose, this is the figure that will be used as the starting point for this long-term study.

The most recent population projections from the City of St. Albert anticipate 90,927 to a thirty year horizon (2050). This number is the target to which the space analysis is to be extrapolated. The staffing and space requirements are based on the anticipated numbers.

Current	5 years	30 years
64,645	68,510	90,927



Current & Projected Staff Forecasts

Current staffing and future staff projections with estimates of annual percentage growth beyond this date to 2050. The accommodation requirements generated by existing and future staffing.

OCCUPANTS	CURRENT	2050	INCREASED	NOTES
FIRE SERVICES	6	16	10	
Aerial	0	4	4	
Fire engine	4	4	0	
UTV and trailer	0	0	0	2 staff from Aerial when required
Ambulance staffed by FD	2	2	0	
Rescue Vehicle	0	4	4	
Command Vehicle	0	2	2	Initially 2 staff from Aerial when required

OCCUPANTS	CURRENT	2050	INCREASED	NOTES
AHS	4	8	4	
Ambulances	4	8	4	4 vehicles
TOTAL	**10**	**24**	**14**	

Program and Space Analysis

FUNCTION	EXISTING (FH 1) SQ.M.	REQUIRED (NEW) SQ.M.	INCREASED SQ.M.	NOTES
ADMINISTRATION	125.9	186.5	60.6	
Meeting / Workshop	0	30	30	
Offices	76.3	99	22.7	Captain, Lieutenant, Staff reports, Training area (2~3 computers), Administration
Storage	27.5	27.5	0	
Training	22.1	30	7.9	
RESIDENCE	253.9	462.9	209	
Dorms (m)	80.9	105	24.1	
Dorms (f)	11.5	11.5	0	
Entry	0	10	10	
Gym	46	60	14	
Laundry	0	2.4	2.4	
Locker room (f)	0	5	5	
Locker room (m)	0	25	25	
Lounge (AHS)	0	40	40	
Lounge (FS)	45.1	55	9.9	

FUNCTION	EXISTING (FH 1) SQ.M.	REQUIRED (NEW) SQ.M.	INCREASED SQ.M.	NOTES
Kitchen (shared)	45.4	60	14.6	
Patio	0	30	30	
Recreation	0	25	25	
Vestibule	8.1	10	1.9	
Washroom (f)	2.6	4	1.4	
Washroom (m)	14.3	20	5.7	
OPERATION	380.1	820.5	440.4	
Apparatus bay	340	736	396	5 double deep bays (Aerial, Fire Engine, Ambulance, UTV & Trailer, Rescue, Command)
Utility	26	26	0	
Deluge shower	0	1	1	
Storage (gear)	0	40	40	
Storage (medical)	6.1	6.5	0.4	
Washroom	0	3	3	
Hose tower	8	8	0	
BUILDING SUPPORT	34.6	65.1	30.5	
Electrical room	0	6	6	
Generator	19.1	19.1	0	
Janitor	0	4	4	
LAN room	2.4	8	5.6	
Mechanical room	13.1	28	14.9	
TOTAL	**794.5**	**1535**	**740.5**	

AREAS	CURRENT SQ.M.	FUTURE SQ.M.	INCREASED SQ.M.	NOTES
PARKING	75	735	660	35 stalls required
PUBLIC	75	210	135	10 stalls
SECURED	0	525	525	25 stalls
APRON	378	800	422	
APRON	378	800	422	Aerial Exercise / Set-up location
GARDEN	0	30	30	
Community Garden	0	30	30	

Emergency Operations Centre (EOC) and Fire / 9-1-1 Dispatch Centre

These two operational facilities are also considered to be added to the new facility for needs as well. They provide operational supports, coordinate with other agencies, gather and share information for quick response and recovery. Having these facilities in the new fire station allows all necessary activities managed effectively.

If these facilities are included, expected increase of the spaces and staff are shown as below. Please also refer to the Option 3a, 3b and 3c in the Cost Estimate section for the expected cost estimate changes.

Staff Increase

OCCUPANTS	CURRENT	2050	INCREASED	NOTES
EOC	0	0	0	
Fire / 9-1-1 Dispatch Centre	0	3	3	
TOTAL	**0**	**3**	**3**	

Area increase

AREAS	CURRENT SQ.M.	FUTURE SQ.M.	INCREASED SQ.M.	NOTES
EOC	0	226.23	226.23	
EOC	0	113.81	113.81	
Meeting Room	0	26.76	26.76	4 to 5 rooms
Office	0	12.26	12.26	2 to 4 rooms
Media Briefing	0	33.45	33.45	

AREAS	CURRENT SQ.M.	FUTURE SQ.M.	INCREASED SQ.M.	NOTES
Bathrooms	0	6.50	6.50	
Foyer / Hallway	0	33.45	33.45	
Fire / 9-1-1 Dispatch Centre	0	112.37	112.37	
Dispatch Centre	0	83.61	83.61	
Office	0	12.26	12.26	
Bathrooms	0	6.50	6.50	
Foyer	0	10.00	10.00	
TOTAL	**0**	**338.6**	**338.6**	

Site

While site location is primarily considered in terms of response times, many other factors inform this selection. Projected growth of the City, accessible roads, suitability, status, ownership, size, availability and sustainability are important considerations.

Response Time

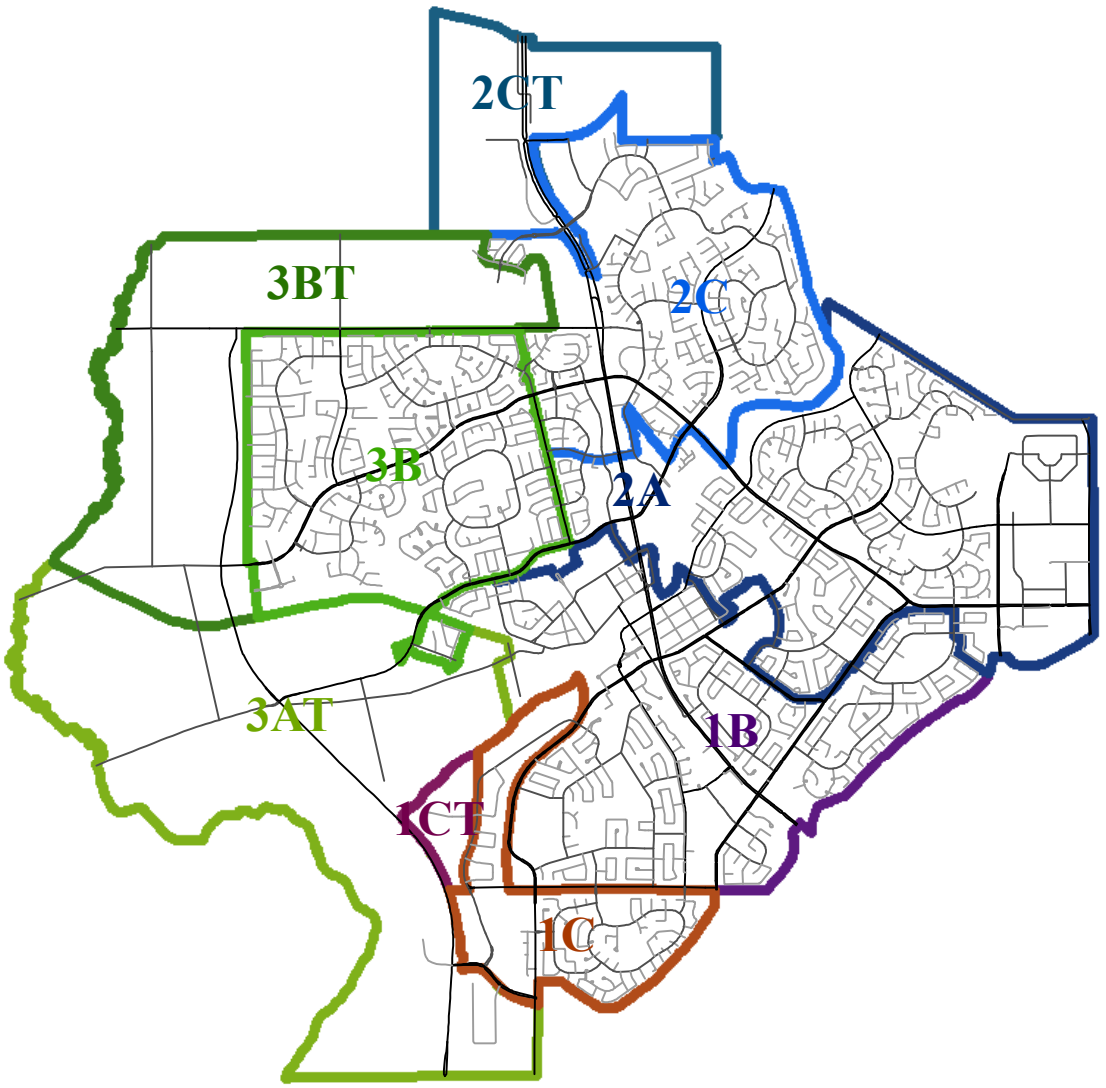
A quick response to fires and emergency situations is the priority. When evaluating a site from the perspective of location relative to the service areas, response times (travel time to reach the site of an incident) for fire services and Emergency Medical Services are more highly ranked than for police.

As shown below, all areas that start with a 1 are in the Fire Hall #1's primary response district. This includes districts 1B, 1C and 1CT which include the neighborhoods of Grandin, Heritage Lakes, Riel Business Park and Downtown, and portions of Mission, Braeside, Sturgeon Heights and Akinsdale. St. Albert Fire Services confirmed that the current response time from the existing facility to the response district is acceptable, however, it is quickly reaching its maximum capacity to meet the required response time as the City grows fast.

Date: 2017-06-12

Fire Response Zone Boundaries

** Boundaries updated June 2016*



Document Path: P:\GIS\ISIS_Controlled\FireServices\Maps\FireResponseZone_Handout.mxd

Additionally, there is a proposed high rise commercial development planned in zone 1B (on Sir Winston Churchill avenue between Grandin road and St. Louis st.). The response time would still be acceptable, which supports the notion of having an Aerial and an Engine. However, the response time can still be affected by the facility's staff capacity and the traffic in these areas.

Size and Accessibility

Once a site is accepted as viable, its size should allow development of a functional plan in a single storey configuration. While sometimes more of a challenge from an operational perspective, a two storey solution can be considered if all other considerations tip the scales favourably towards a given site. This is usually the case in an urban setting where it is often challenging to find a sufficiently large site at reasonable cost that allows implementation of all functions on one floor.

Other considerations with regard to site size include the efficiency and practicality of vehicular access - not only in day-to-day operations but in case of emergency i.e. a secondary egress route should be available in case the primary path is blocked either intentionally or accidentally. The provision of unencumbered circulation and adequate parking is a driver of site selection.

Notwithstanding the long-term horizon of any planning scenario, needs for future growth should always be considered, as occupancy projections have a way of accelerating. Intelligent site and building planning will consider medium- and long-term growth with regard to circulation, parking, and location adjacent to exterior walls of those services and programs most susceptible to expand.

Cost and Availability

The cost of acquisition is an important consideration, particularly if the site is not yet available for sale and any speculation can quickly cause a price escalation. Furthermore the timeline of a project can often be extended by up to a year as a result of any conditions or negotiations attached to a transaction - financial or otherwise. As legal and topographical surveys as well as geotechnical testing are required before beginning a design in earnest, it is usually necessary for the transfer to be 100% complete before such tests are authorized in order to reduce risk to the contracting parties.

Cost estimates are based on historical data from recent buildings of a similar nature and costs / sq.m. have been provided by Cuthbert Smith Group compiled from Alberta projects. Details are under the Cost Estimate section in this report.

Sustainability

The City of St. Albert takes the environment responsibility by identifying environmental sustainability as an essential component in designing a high performance building. The City originally developed the Environmental Sustainability Policy in 2003 with several updates approved in 2015. This policy and the City's Environmental Master Plan are to be used as guidelines.

The city's Environmental Master Plan (EMP) says that St. Albert will reduce its greenhouse gas emissions in part by adopting at least a LEED Silver standard for all new city buildings.

Whether or not a site contains hazardous materials or deposits of a historical nature can impact cost and schedule in order to accommodate remediation.

DETAILED OPTIONS DESCRIPTION AND ANALYSIS

One of the priorities of this report is to examine the viability of each of the following three (3) options for organization, service delivery and financial implications.

OPTION 1 - Modernization with user groups in - Total capital cost of $11.80M

The existing facility remains operational under construction. It is renovated and expanded to address spatial and functional requirements according to a space analysis. Envelope (i.e. roofing) and infrastructure (i.e. equipment) are upgraded.

OPTION 2 - Modernization with user groups out - Total capital cost of $10.86M

Similar to Option 1, the existing facility is renovated and expanded to address spatial and functional requirements according to a space analysis, while a temporary building is leased near the existing site or a newly proposed site to accommodate members and staff. The existing facility remains closed.

OPTION 3 - New Construction - Total capital cost of $12.01M

The existing facility is entirely vacated with regard to operations. It may then be re-purposed to serve Alberta Health Services or Public Works. A complete new facility that addresses the entirety of service requirements including growth to a thirty-year horizon is built on a new site.

Analysis

Each of these three (3) redevelopment scenarios is evaluated based on:

1 Selection Criteria and Implications

Efficiency of service to the City and of internal operations, and on how these levels may reflect or be impacted by a given scenario. These measures include size of the site required and potential for long-term growth, ease of access to the response area, how services are delivered to the public i.e. how each model supports internal communication and coordination, the level of disruption to services during construction, direct and indirect costs according to the construction model (as opposed to long-term operational costs), schedule-related impacts.

Those project consequences with financial implications that are more difficult to quantify - i.e. ‘soft costs’ such as temporary relocations and moving, disturbances, additional staffing, and loss of productivity are to be addressed.

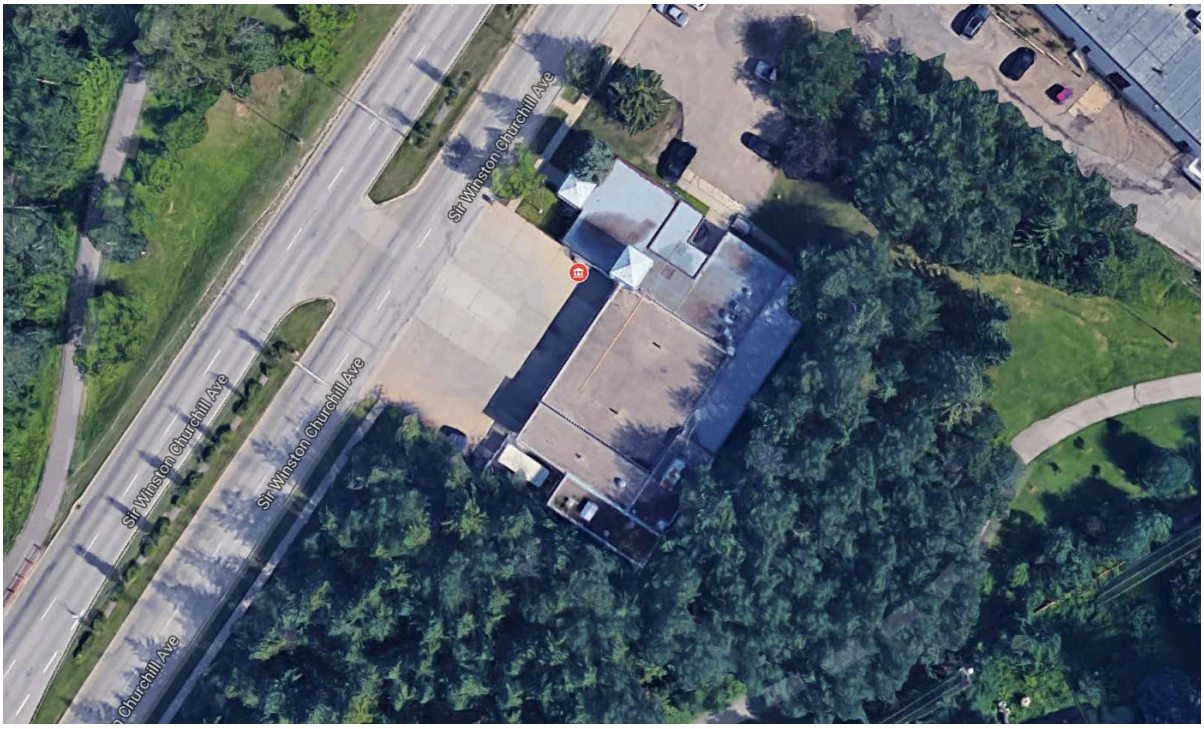
2 Financial Considerations

Considerations include capital costs for construction and renovation on the short and long terms i.e. the investment in shelled space to accommodate future growth is costed and ‘tenant improvement costs’ to fit-up the shelled spaces are factored in year 30.

OPTION 1 - Modernization with user groups in - Total capital cost of $11.80M

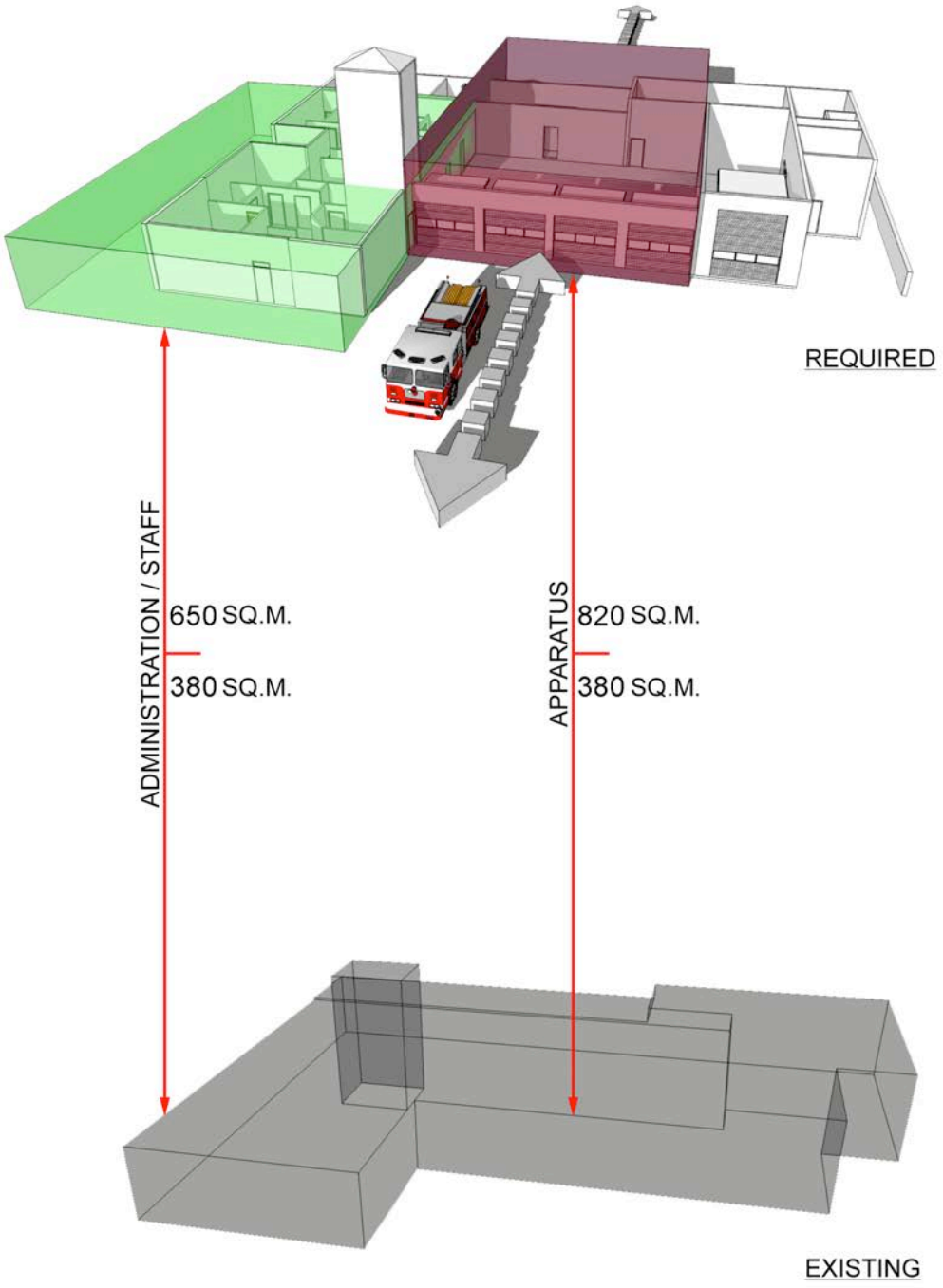
Site

The fire hall #1 is located at 18 Sir Winston Churchill Ave. The most critical condition of the current site is its limited capacity of expanding. The site is surrounded by the heavily treed areas to the west, east and south, which would result in the back in-drive out of apparatus, not enough parking space, and poor visibility to the Sir Winston Churchill ave.



Size

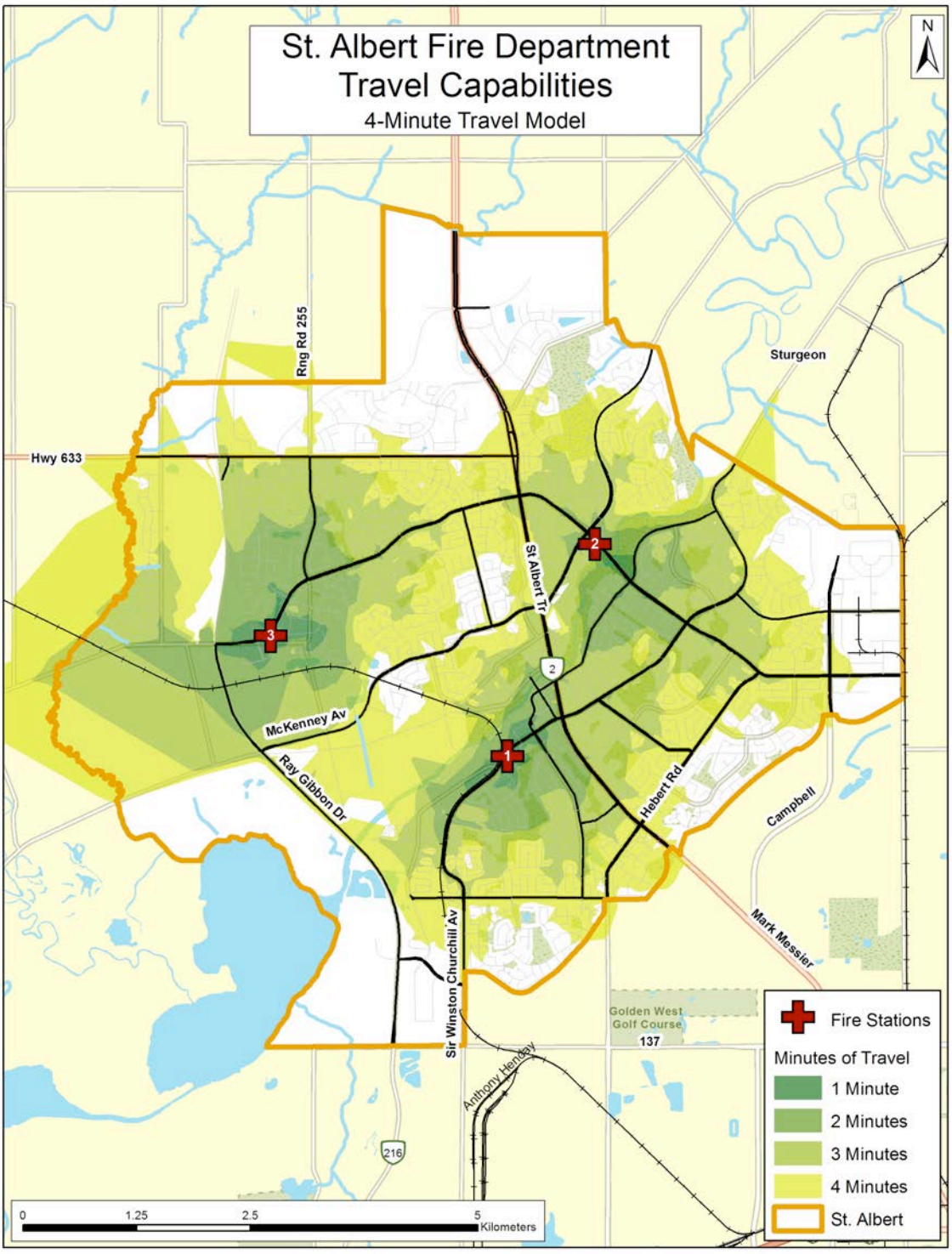
The FH#1 currently occupies approximately 795 sq.m net. An additional 740 sq.m. is a reasonable assumption for growth that will meet the facility's needs up to a thirty (30) year horizon. The existing building would therefore require an expansion of 740 sq.m. to meet the target of 1535 sq.m. While sometimes more of a challenge from an operational perspective, a two- storey solution can be considered if all other considerations tip the scales favourably towards a current site.



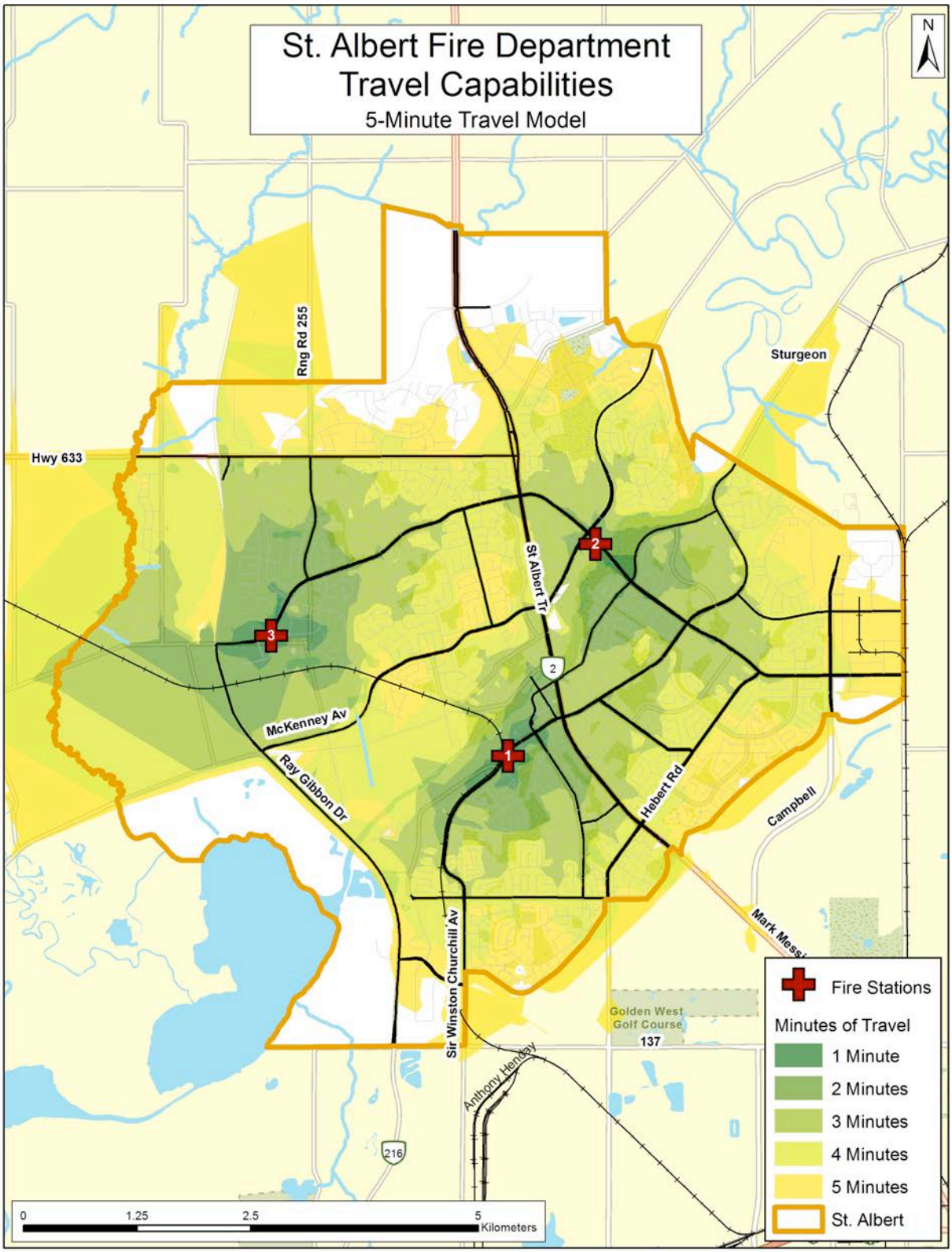
* A space increase 3D diagram

Response Time

The response time of the existing fire hall #1 is acceptable. As shown on the 4-minute and 5-minute travel maps below (source from Emergency Services Consulting International), the current FH#1



reaches to most areas in their response zone in 5 minutes.


St. Albert Fire Department
Travel Capabilities
5-Minute Travel Model
N
Rng Rd 255
Sturgeon
Hwy 633
St Albert Tr
2
3
1
McKenney Av
Ray Gibbon Dr
Hebert Rd
Campbell
Sir Winston Churchill Av
Golden West
Golf Course
137
Anthony Henday
216
Fire Stations
Minutes of Travel
1 Minute
2 Minutes
3 Minutes
4 Minutes
5 Minutes
St. Albert
0
1.25
2.5
5
Kilometers

OPTION 2 - Modernization with user groups out - Total capital cost of $10.86M

Most conditions are shared with option 1 except this option requires to lease a building temporarily to accommodate members and staff for approximately 18 months. The level of disruption to operations is lower than option 1 since a single stage construction is allowed. A coordination with the City is necessary to identify a temporary building location.

OPTION 3 - New Construction - Total capital cost of $12.01M

Site

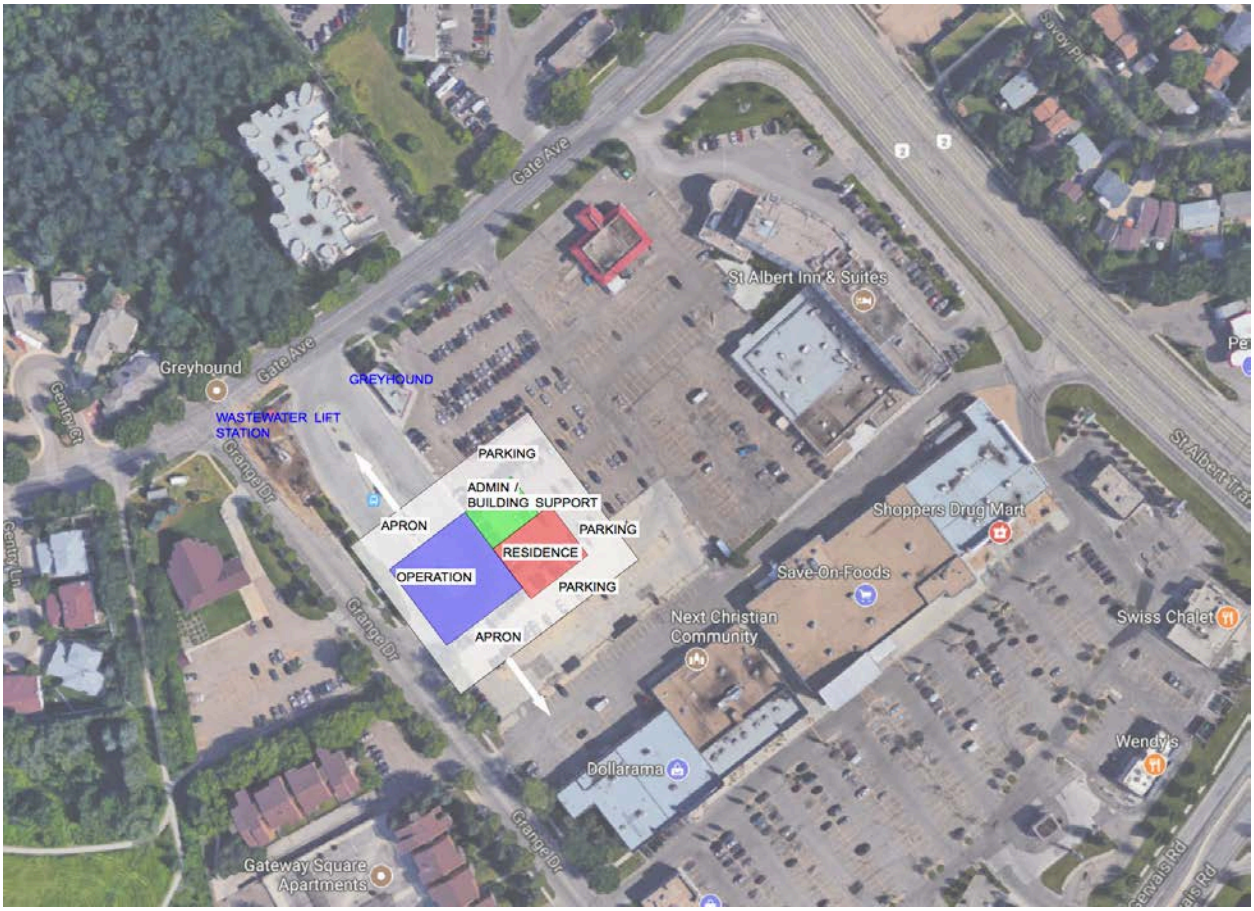
The proposed site (20 Gate Ave) was selected based on several major requirements that had to be satisfied in order to qualify for inclusion in the range of acceptable potential site.

- Close to the centre of the Fire Hall #1's primary response district
- Adequate area to support the Fire Hall #1, parking, and outdoor training space.
- Availability
- Easy access to major roads
- Good vehicular access
- No ecologically sensitive land
- No flood zone

The site that is identified for this development as meeting most of the criteria is the land as shown on the map below, which is currently designated as Corridor Commercial in the Land Use Bylaw. Re-zoning is required to include 'Emergency Protective Service'.

This 'City-Owned' site is located close to the centre of the Fire Hall #1's primary response district, and it has the advantage of being accessible directly to St. Albert Trail and Grandin

Road to satisfy the required response times.



ZONING	Corridor Commercial (CC)
MUNICIPAL ADDRESS	20 Gate ave, St. Albert, AB
SITE AREA (Proposed)	3,700 sq.m.
PROPOSED USE	Emergency Protective Service
PROPOSED BUILDING AREA	1,535 sq.m.
SETBACK	Front - 7.5m, Side - 3.5m, Rear - 0m
PARKING PLACES REQUIRED	35 Stalls (25 secured, 10 public)

The existing waste water lift station on the proposed site will be maintained, while the current Village Transit station will be relocated to the new Campbell Park & Ride site. The timeframe aligns with a 2019 construction. The utility lines are already serviced in this area.

Size

As the details in the required areas are shown on the program analysis above, total minimum 1,535 sq.m. is required in order to meet the facility's needs up to a thirty (30) year horizon. The proposed site should allow development of a functional plan in a single-storey configuration with consideration for future growth.

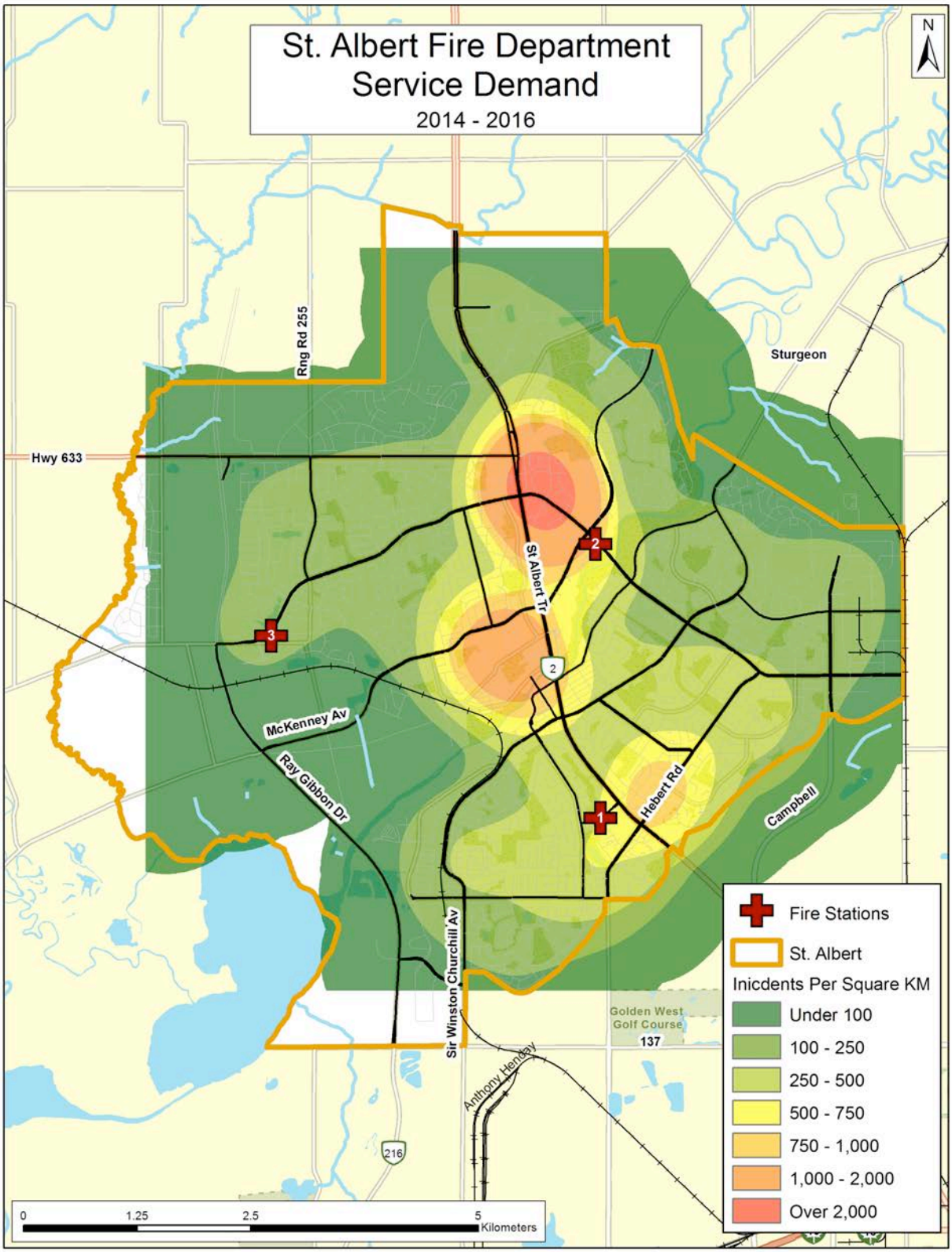
Organization

Factors influencing planning for this site include the following items:

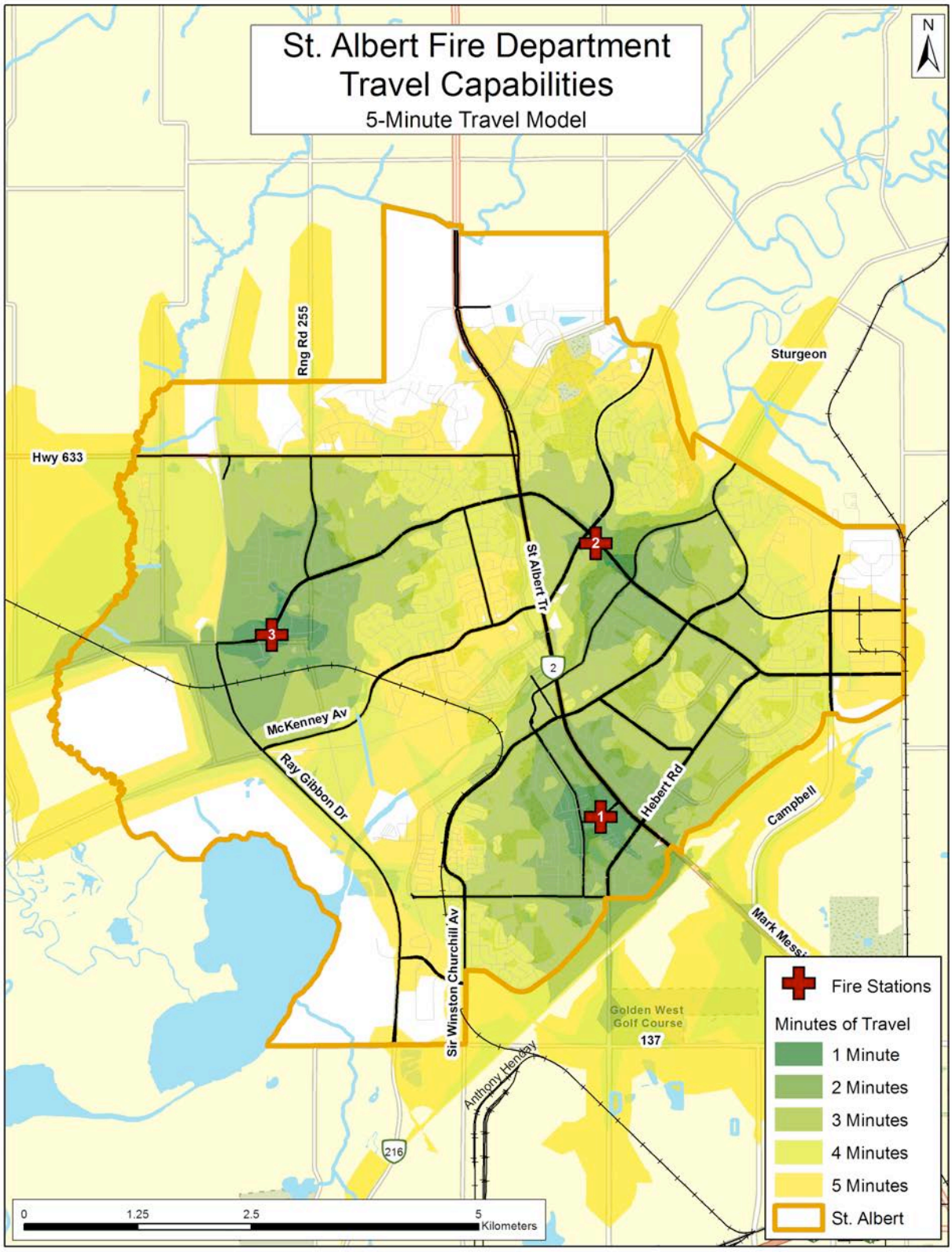
- Relocate the Village Transit Station to a Campbell Park & Ride site
- Review options to relocate the Greyhound Office if necessary
- Review options to maintain available parking areas
- Assess possible vehicular routes into the site and traffic management from/to the site
- Determine relationship to existing roads and buildings from the Fire Services' operational perspective
- Examine the building relationship to the main roads
- Two way egress of apparatus
- Optimize building orientation for accessibility, secured training area, energy performance, daylight, views, and integration with site features such as adjacent mall with parking areas.
- Use of existing heavy duty parking areas
- Confirm the existing utility lines such as gas, water mains, and wastewater pipes, etc.
- Review relationship between the operation and the administration/supporting portion of the building
- Accommodate expansion for future staff growth
- Building image to reflect local culture

Response Time

As shown on the Service Demand map below (source from Emergency Services Consulting International), higher rate of service demand is shown in Sturgeon, Akinsdale, and partially Grandin. The new location allows improved response coverage, especially for these high service demand areas with no negative impact on other areas.


St. Albert Fire Department
Service Demand
2014 - 2016
N
Rng Rd 255
Sturgeon
Hwy 633
St Albert Tr
McKenney Av
Ray Gibbon Dr
Hebert Rd
Campbell
Sir Winston Churchill Av
Golden West Golf Course
137
Anthony Henday
216
2
1
3
Fire Stations
St. Albert
Inicdents Per Square KM
Under 100
100 - 250
250 - 500
500 - 750
750 - 1,000
1,000 - 2,000
Over 2,000
0
1.25
2.5
5
Kilometers

As shown on the 5 minute Response map below (source from Emergency Services Consulting International), a significantly larger area to the south and southeast would see improved response coverage while the response time for other areas is still satisfied.



COST ESTIMATE

Refer to the next pages.

St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 1 - Modernization with user groups in

1	modernization of existing facility	1	sum	$ 2,985,000	$	2,985,000.00
	Sub total - modernization				***$***	***2,985,000.00***
2	Additional administration	60.6	m2	$ 5,450	$	330,270.00
3	Additional residence	209.0	m2	$ 5,700	$	1,191,300.00
4	Additional operations	440.4	m2	$ 6,200	$	2,730,480.00
5	Additional building support	30.5	m2	$ 3,500	$	106,750.00
	Sub total - Addition	***740.5***	***m2***	***$ 5,886***	***$***	***4,358,800.00***
6	Additional parking (LD asphalt)	660.0	m2	$ 100	$	66,000.00
7	Additional apron (concrete)	422.0	m2	$ 250	$	105,500.00
8	Additional garden	30.0	m2	$ 75	$	2,250.00
9	Misc siteworks etc	1.0	sum	$ 15,000	$	15,000.00
	Sub total - site				***$***	***188,750.00***
10	Temporary building - apparatus	340.0	m2	$ 1,800	$	612,000.00
	Sub total - temporary building				***$***	***612,000.00***

Summary	Modernise	$	2,985,000.00
	Addition	$	4,358,800.00
	Site	$	188,750.00
	Temporary building	$	612,000.00
Sub total - construction		***$***	***8,144,550.00***
General requirements @	15%	$	1,221,683.00
Design & Construction contingencies @	20%	$	1,873,247.00
Phasing & temporary operations @	5%	$	561,974.00
Total Construction including allowances		***$***	***11,801,454.00***

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St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 2 - Modernization with user groups out

1	modernization of existing facility	1	sum	$ 2,985,000	$	2,985,000.00
	Sub total - modernization				***$***	***2,985,000.00***
2	Additional administration	60.6	m2	$ 5,450	$	330,270.00
3	Additional residence	209.0	m2	$ 5,700	$	1,191,300.00
4	Additional operations	440.4	m2	$ 6,200	$	2,730,480.00
5	Additional building support	30.5	m2	$ 3,500	$	106,750.00
	Sub total - Addition	***740.5***	***m2***	***$ 5,886***	***$***	***4,358,800.00***
6	Additional parking (LD asphalt)	660.0	m2	$ 100	$	66,000.00
7	Additional apron (concrete)	422.0	m2	$ 250	$	105,500.00
8	Additional garden	30.0	m2	$ 75	$	2,250.00
9	Misc siteworks etc	1.0	sum	$ 15,000	$	15,000.00
	Sub total - Site				***$***	***188,750.00***
10	Temporary building - all (leased 18 months)	794.5	m2	$ 425	$	337,663.00
	Sub total - Temporary building				***$***	***337,663.00***

Summary	Modernise	$	2,985,000.00
	Addition	$	4,358,800.00
	Site	$	188,750.00
	Temporary building	$	337,663.00
Sub total - construction		***$***	***7,870,213.00***
General requirements @	15%	$	1,180,532.00
Design & Construction contingencies @	20%	$	1,810,149.00
Phasing & temporary operations @	0%	$	-
Total Construction including allowances		***$***	***10,860,894.00***

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St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 3 - New construction

1	modernization of existing facility	1	sum	N/A		$	-
	Sub total - modernization					***$***	***-***
2	Administration	186.5	m2	$	5,450	$	1,016,425.00
3	Residence	462.9	m2	$	5,700	$	2,638,530.00
4	Operations	820.5	m2	$	6,200	$	5,087,100.00
5	Building support	65.1	m2	$	3,500	$	227,850.00
	Sub total - Addition/New	***1535.0***	***m2***	***$***	***5,844***	***$***	***8,969,905.00***
6	Demolish buildings	209.0	m2	$	250	$	52,250.00
7	Site preparation etc	3700.0	m2	$	50	$	185,000.00
8	Parking (LD asphalt)	735.0	m2	$	100	$	73,500.00
9	Apron (concrete)	800.0	m2	$	250	$	200,000.00
10	Garden	30.0	m2	$	75	$	2,250.00
11	Misc siteworks etc	1.0	sum	$	15,000	$	15,000.00
	Sub total - site					***$***	***528,000.00***
12	Temporary building - all	0.0	m2	$	1,800	$	-
	Sub total - Temporary building					***$***	***-***

Summary	Modernise	$	-
	New building	$	8,969,905.00
	Site	$	528,000.00
	Temporary building	$	-
Sub total - construction		***$***	***9,497,905.00***
General requirements @	15%	$	1,424,686.00
Design & Construction contingencies @	10%	$	1,092,259.00
Phasing & temporary operations @	0%	$	-
Total Construction including allowances	***1,535 m2***	***$***	***12,014,850.00***

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St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 3a - New construction with EOC

1	modernization of existing facility	1	sum	N/A		$	-
	Sub total - modernization					***$***	***-***
2	Administration	186.5	m2	$	5,450	$	1,016,425.00
3	Residence	462.9	m2	$	5,700	$	2,638,530.00
4	Meeting, office, media, bathrooms, foyer	112.4	m2	$	5,700	$	640,794.00
5	Operations	820.5	m2	$	6,200	$	5,087,100.00
6	Emergency Operations Centre	113.8	m2	$	6,200	$	705,622.00
7	Building support	65.1	m2	$	3,500	$	227,850.00
	Sub total - Addition/New	***1761.2***	***m2***	***$***	***5,857***	***$***	***10,316,321.00***
1	Demolish buildings	209.0	m2	$	250	$	52,250.00
2	Site preparation etc	3700.0	m2	$	50	$	185,000.00
3	Parking (LD asphalt)	1575.0	m2	$	100	$	157,500.00
4	Apron (concrete)	800.0	m2	$	250	$	200,000.00
5	Garden	30.0	m2	$	75	$	2,250.00
6	Misc siteworks etc	1.0	sum	$	15,000	$	15,000.00
	Sub total - site					***$***	***612,000.00***
7	Temporary building - all	0.0	m2	$	1,800	$	-
	Sub total - Temporary building					***$***	***-***

Summary	Modernise	$	-
	New building	$	10,316,321.00
	Site	$	612,000.00
	Temporary building	$	-
Sub total - construction		***$***	***10,928,321.00***
General requirements @	15%	$	1,639,248.00
Design & Construction contingencies @	10%	$	1,256,757.00
Phasing & temporary operations @	0%	$	-

Total Construction including allowances	***1,535***	***m2***	***$***	***9,006***	***$***	***13,824,326.00***

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St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 3b - New construction with Fire Dispatch

1	modernization of existing facility	1	sum	N/A		$	-
	Sub total - modernization					***$***	***-***
2	Administration	186.5	m2	$	5,450	$	1,016,425.00
3	Residence	462.9	m2	$	5,700	$	2,638,530.00
4	Meeting, office, media, bathrooms, foyer	28.8	m2	$	5,700	$	163,932.00
5	Operations	820.5	m2	$	6,200	$	5,087,100.00
6	Dispatch centre	83.6	m2	$	6,200	$	518,382.00
7	Building support	65.1	m2	$	3,500	$	227,850.00
	Sub total - Addition/New	***1647.4***	***m2***	***$***	***5,859***	***$***	***9,652,219.00***
1	Demolish buildings	209.0	m2	$	250	$	52,250.00
2	Site preparation etc	3700.0	m2	$	50	$	185,000.00
3	Parking (LD asphalt)	861.0	m2	$	100	$	86,100.00
4	Apron (concrete)	800.0	m2	$	250	$	200,000.00
5	Garden	30.0	m2	$	75	$	2,250.00
6	Misc siteworks etc	1.0	sum	$	15,000	$	15,000.00
	Sub total - site					***$***	***540,600.00***
7	Temporary building - all	0.0	m2	$	1,800	$	-
	Sub total - Temporary building					***$***	***-***

Summary	Modernise	$	-
	New building	$	9,652,219.00
	Site	$	540,600.00
	Temporary building	$	-
Sub total - construction		***$***	***10,192,819.00***
General requirements @	15%	$	1,528,923.00
Design & Construction contingencies @	10%	$	1,172,174.00
Phasing & temporary operations @	0%	$	-
Total Construction including allowances	***1,535 m2***	***$***	***12,893,916.00***

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St Albert FH1
St Albert, Alberta

High level conceptual cost

Option 3c - New construction with EOC and Fire Dispatch

1	modernization of existing facility	1	sum	N/A		$	-
	Sub total - modernization					***$***	***-***
2	Administration	186.5	m2	$	5,450	$	1,016,425.00
3	Residence	462.9	m2	$	5,700	$	2,638,530.00
4	Meeting, office, media, bathrooms, foyer	141.2	m2	$	5,700	$	804,726.00
5	Operations	820.5	m2	$	6,200	$	5,087,100.00
6	Emergency Operations Centre	113.8	m2	$	6,200	$	705,622.00
7	Dispatch centre	83.6	m2	$	6,200	$	518,382.00
8	Building support	65.1	m2	$	3,500	$	227,850.00
	Sub total - Addition/New	***1873.6***	***m2***	***$***	***5,870***	***$***	***10,998,635.00***
1	Demolish buildings	209.0	m2	$	250	$	52,250.00
2	Site preparation etc	3700.0	m2	$	50	$	185,000.00
3	Parking (LD asphalt)	1701.0	m2	$	100	$	170,100.00
4	Apron (concrete)	800.0	m2	$	250	$	200,000.00
5	Garden	30.0	m2	$	75	$	2,250.00
6	Misc siteworks etc	1.0	sum	$	15,000	$	15,000.00
	Sub total - site					***$***	***624,600.00***
7	Temporary building - all	0.0	m2	$	1,800	$	-
	Sub total - Temporary building					***$***	***-***

Summary	Modernise	$	-
	New building	$	10,998,635.00
	Site	$	624,600.00
	Temporary building	$	-
Sub total - construction		***$***	***11,623,235.00***
General requirements @	15%	$	1,743,485.00
Design & Construction contingencies @	10%	$	1,336,672.00
Phasing & temporary operations @	0%	$	-
Total Construction including allowances	***1,535 m2***	***$***	***14,703,392.00***

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RECOMMENDATION

Based on the analysis result, Option 3 - New Construction is recommended.

APPENDICES

Appendix 1 - St. Albert Fire Hall Facility Analysis Report

Please refer to the next pages.

City of St. Albert
Facility Analysis Report

St. Albert Fire Hall #1

ACI Architects Inc.
August 30, 2017

Table of Contents:

EXECUTIVE SUMMARY

In June of 2017, ACI Architects Inc., and a consulting team conducted a facility walk through and analysis for the City of St. Albert, Alberta. The building in question was the St. Albert Fire Hall #1.

The purpose was to review and report on the existing facility relative to its current condition, viability and probable short and long-term operational costs. The Facility Analysis Costing Report is attached in Appendix A.

A synopsis of the building is as follows:

1. St. Albert Fire Hall #1 is the first or original fire hall in the City of St. Albert, initially constructed in 1962. It has been expanded and renovated over the course of its life and is currently the responding hall to the St. Albert neighborhoods of Grandin, Heritage Lakes, Riel Business Park and Downtown, and possibly portions of Mission, Braeside, Sturgeon Heights and Akinsdale.

2. The Fire Hall has a “back in – drive out” style of apparatus parking and response; which may not be effective for modern emergency response and the Hall abuts one of the major thoroughfares, Sir Winston Churchill Avenue in the City of St. Albert. This means that the backing in of the vehicles could disrupt local traffic. Also the Hall is not ideally or centrally located for the coverage areas it is responsible for.

3. The existing site for the Fire Hall has currently been built out to its capacity, unless the heavily treed areas to the west and south are reduced or removed, which would likely result in public challenges. Also the rear of the site is heavily sloped and larger (taller) retaining walls may be required if the site is redeveloped. Site drainage at the back (south) and side (west) of the building is not performing and ponds standing water up against the building.

4. Site parking is not structured or marked and appears to be inadequate for the needs of the Fire Hall. Also the existing asphalt areas will likely require major repairs and an overlay in the next few years. Further, the Apparatus Bay concrete apron and some site flatwork (sidewalks) are heavily cracked and require replacement.

5. The building is a combination of combustible and non-combustible construction and is not sprinklered; however many of the building components have reached the end of their serviceable life. Also much of the building envelope either requires significant repairs, component replacements or physical replacement.

6. Building roof areas show significant ponding and the entire SBS area of the building should be re-roofed, also the original Apparatus Bays area has an older technology ballasted 4 or 5 ply roof, which should be replaced. Lastly, the Hose Tower and Entry canopy metal roofs, as well as much of the perimeter metal fascia of the Administration Area is peeling, chalking and discolored and they require replacement.

7. Apparatus Bay doors and the physical height of the Apparatus Bays are too low for today's modern fire fighting apparatuses and therefore this hall is limited in the types and size of apparatuses it can accommodate.

8. Interior spaces within the Fire Hall are small and the Hall has been heavily renovated and retrofitted over the years leaving the layout disconnected. Further, there is a significant amount of surface mounted electrical infrastructure, which is unsightly.

9. The Fire Hall is land locked on the existing site and renovating the Hall would require the Fire Service operations to be relocated temporarily to facilitate the renovation. Renovating a building with the level of work required and described in this report, as well as the temporary operations relocation costs would very likely be a cost-prohibitive undertaking. It is recommended that the Fire Hall remain in operation in its current location, while a new Hall is constructed on a larger alternate site, better located in St. Albert. Once the new Hall is operational, it is further recommended that the existing building be decommissioned and demolished.

10. Due to the age of the Hall, both the original build area and at least one of the renovated areas, are likely to contain hazardous building materials. It is recommended that the City of St. Albert commission a Hazardous Materials Consultant to conduct a detailed investigation, to determine the presence of hazardous materials and provide a report on their findings. This Facilities Analysis Report does not include for the investigation, remediation and abatement, or the cost impact of hazardous materials, if they are found to exist in the facility.

11. The total cost estimate of $2,985,000.00 identified in the Cost Analysis for short, medium and long term costs for the facility; only provides for work associated with maintaining the building in an operational and code complaint state, and to make the building aesthetically pleasing and for the envelope to perform to the level it was originally designed

too. It is also based on available information provided by the City of St. Albert. The Cost Analysis does not factor in costs associated with operational disruption due to extensive renovations, operational relocation due to extensive renovations, or the re-use or demolition of the existing building.

1.0 PROJECT METHODOLOGY

ACI Architects Inc. undertook an on-site visual and photographic review of the St. Albert Fire Hall #1 on Friday June 22, 2017. The firm also interviewed and was accompanied by a Town Representative and specific building operator and/or maintenance staff to acquire subject facility history and desired or anticipated operational needs.

The Facility Analysis was done with the use of photographic and documented observations, as well as direct input and consideration from the Town Personnel and in some cases acquired knowledge of alterations done to the facility over the years.

This Facility Analysis is intended to provide and outline immediate and ongoing maintenance needs and costs for the facility, as well as long-term viability of the building.

2.0 EXISTING FACILITY ANALYSIS

2.1 FACILITY ANALYSIS REPORT OUTLINE

All of the observations and information identified during the site review of the facility is documented in the Facility Analysis Report. (Refer also to Appendix A.)

The Facility Analysis Report includes architectural building system descriptions, as well as mechanical and electrical systems observations and/or comments based on discussions with the City of St. Albert Personnel. The descriptions identify the condition of each system using a rating from 1 to 6, with respect to the observed condition of the system. The information in the report is the basis for the Executive Summary.

2.2 FACILITY ANALYSIS REPORT FORMAT

The Facility Analysis Report is a summary, in chart form, that identifies the condition of the facility and the interior spaces and the probable cost to maintain and / or upgrade. The chart contains the following reviewing format:

1. Facility and/or venue Name

2. Chart Rating Definitions:

1	Critical	Unsafe; high risk of injury or critical system failure.
2	Poor	Does not meet requirements; has significant deficiencies.
3	Marginal	Meets minimum requirements; has significant deficiencies.
4	Acceptable	Meets present requirements; has minor deficiencies.
5	Good	Meets all present requirements; no deficiencies.
6	Excellent	As new / state-of-the-art; meets present / foreseeable needs.
FI		Requires further investigation.
N/A		Not applicable.
CU		Currently being upgraded.

Life Expectancy	Less than 5 years for replacement (<5) 5 to 10 years for replacement (5-10) Greater than 10 years for replacement (>10)
Priority	High (H), Medium (M), Low (L)
*Future Expansion	Can be expanded (Yes); No expansion ability (No)*
Life / Safety Code Infringement	Meets code (No); Does not meet code or endangers life (Yes)

* 3. Building Planning Strategies*

** Denotes a definition or category that is not applicable to this Study.

2.3 FACILITIES ANALYSIS REPORT EXPLANATION

1. A system noted as Further Investigation (FI) denotes a system that information was unavailable, could not be readily determined, and / or could not adequately be reviewed with a visual examination on site.

2. System Priorities have been established in consultation with the City of St. Albert as High (H), Medium (M), Low (L).

3. Future expansion or alterations are not a likely possibility for the purposes of this Study and as such, are not discussed in detail in this Report.

4. Life / Safety Code Infringement are major infringements to the current Alberta Building Code, which would affect life / safety for users and staff. It is anticipated in existing facilities that some requirements of the current Alberta Building Code may not be met. For the purposes of this Study, it is only those infringements which specifically involve fire and / or life / safety and access/egress that are identified.

5. Cost to Upgrade identifies costs to each individual system, accurate to approximately $5,000.00 and this level of accuracy is sufficient for this early stage of costing.

6. Mechanical and Electrical system conditions and costs have been reviewed and provided by the Consultant on a rudimentary basis and with input and needs / performance assessments from operational staff; they are not a detailed review or an engineering based assessment of the systems.

3.0 ST. ALBERT FIRE HALL #1

.1 Facility History:

The original St. Albert Fire Hall #1 was constructed in 1962 consisting of the lower height Apparatus Bays, the Hose Tower and the Administration and Staff Areas. The building was expanded to the south and west in 1977 adding the higher Apparatus Bay and the rear Dormitory, Lounge and Service Rooms off the existing Apparatus Bays. A renovation was conducted in 1987, which further expanded the Fire Hall to the west, adding the Emergency Generator Room and Storage Room, as well as interior layout changes and upgrades to the Administration Area and replacement of the Apparatus Bay overhead doors. The final renovation in 2011 provided Kitchen cabinet replacement, flooring replacement for the primary Staff Entry area, Kitchen and Corridors, as well as Women's Washroom upgrades and other minor cosmetic upgrades in various locations.

.2 Site:

The Fire Hall site is currently fully asphalt paved with direct Apparatus Bay concrete apron access to Sir Winston Churchill Avenue; the asphalt is in fair condition, with repairs required (See

Figures #1, #2, #3, #4 and #5.) The parking area appears inadequate and is not structured or lined, it is also not secure, which is typical of most Emergency Services Buildings. The Apparatus Bay apron and much of the site concrete around the building is heavily cracked or damaged and should be replaced. (See Figures #6, #7, #8 and #9. Site perimeter access and exiting to the rear (south) and (west) of the building is tight to both the building and a site retaining wall and drainage and maintainability of this area is a challenge; standing water and botanical debris is generally always present; water has likely, or will eventually undermine the building. (See Figures #10, #11, #12, #13, #14, and #15). Also there is a roof rainwater leader discharge, which is directly adjacent to the rear exit door and in heavy rain events could direct water into the building (See Figure #16). The Staff Entry area to the east has a concrete plaza that has settled and slopes to the north, directing water to pond against the building (See Figure #17). Staff outdoor areas are small and inadequate for the firefighters and should be upgraded and possibly relocated and fenced to provide some privacy for the firefighter shifts. (See Figures #18 and #19).

.3 General Construction:

Foundations for the original portions of the Fire Hall are reinforced pedestal concrete footing pads, supporting reinforced spanning grade

beams. The foundations for both additions added to the building are continuous reinforced concrete strip footings, supporting continuous reinforced concrete foundation walls.

The Fire Hall walls are currently a mixture of non-load bearing and load bearing concrete block walls, as well as cast-in-place concrete load bearing columns and beams for the Apparatus Bays and some load bearing and non-bearing wood framed interior and exterior walls for the Administration area. The original Apparatus Bays have a precast concrete “T” roof structure, while the added higher bay and Staff Lounge and Storage areas have an open-web steel joist and steel deck roof structure. The roof structure of the remainder of the Fire Hall is a dimensional wood framed roof structure with plywood sheathing. All building floors of the Fire Hall appear to be grade supported cast-in-place concrete, with concrete slabs of varying thicknesses and interior thickenings to support concrete block walls. The building has no basement. The building is not sprinklered. The complete Fire Hall is approximately 850 sq.m. (9,150 sq.ft.)

.4 Building Envelope:

The exterior walls of the non-Apparatus Bay areas of the original Fire Hall are a mixture of concrete block, concrete block with brick veneer or wood framing with brick veneer. (See Figures 17, 19, 20, 21, 22, 23 and 25). Unfortunately, based on the existing drawings, the brick

veneered facades do not appear to have a drainage space between the brick veneer and the backing superstructure, this is a poor detail and these brick veneer areas should be demolished and the brick veneer re-installed with a drainage space and insulation. Also the existing exterior concrete block walls are insulated with loose Zonolite, which after 45 years will have settled to the lower third of the walls, or lower third of the wall areas above bond beams. This poor insulation condition is not correctable without remediation or possible removal of the walls, which are load bearing. The Apparatus Bay walls are cast-in-place concrete and concrete block and would have similar issues to the other existing concrete block walls, related to insulation value and performance (See Figure 24). The 1977 high Apparatus Bay and Dormitory/Storage expansion has concrete block walls with Zonolite fill, which will present similar performance issues to the original Hall. (See Figures 26, 27, 10 and #12). The 1987 expansion areas of the existing Hall and Tower addition are concrete block with Zonolite fill (See Figures 13 and 11), or wood framed walls with stud cavity insulation and interior vapour barrier and exterior air barrier; these framed walls are clad with metal siding. (See Figures 28 and 29). The concrete block walls again have similar performance issues to the original Hall envelope. The wood framed walls would be considered acceptable; however much of the cladding, fascia and soffits of these walls have reached the

end of their serviceable life and require replacement. (See Figures 30, 31, 32).

The roof membranes for the majority of the building roof areas appear to not be original and re-roofed, with a two-ply SBS roofing membrane with a granular cap sheet. Ages of these roof areas could not be confirmed. (See Figures 33, 34, 35, 36, 37 and 38). These roof areas appear to be in adequate condition, but some degradation and soft spots were observed. However, of greater concern is the amount of ponding and standing water on the SBS roof areas. (See Figures 39, 40 and 41). In the case of the Apparatus Bay roof, this area has a 4 or 5-ply built-up roof with gravel ballast. This roof has reached the end of its serviceable life and should be completely re-roofed. (See Figures 42, 43 and 44). The public Entry canopy and the Tower roofs are both standing seam metal roofing and this roofing and related flashings and fascia are heavily peeled and chalked and likely original to the 1987 renovation. (See Figures 45 and 46). These roofs and related components should be completely re-roofed and replaced.

Exterior windows on the building are a mixture of PVC and non-thermally broken antiquated aluminum technology and generally are at the end of their serviceable life and replacement is warranted. (See Figures 25, 30, 47, 48 and 49).

.5 Interior Finishes:

Finishes within the existing Fire Hall staff areas, offices, dormitories and shared spaces are generally in acceptable condition. (See Figures 50, 51, 52, 53, 54, 55, 56, 5, 58, 59, 60, 61 and 62. Change Rooms and Washrooms have some materials and finishes that are somewhat tired or outdated and the countertop millwork, lockers and toilet partitions of these spaces should be considered for replacement in the next few years. (See Figures) 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74 and 75. The exception to the washroom finishes would be the generally good condition of the female washroom, which was part of a renovation in 2011; it does not however have design continuity with the rest of the Hall. (See Figure 76).

The larger concern in conjunction with the finishes is the considerable amount of surface mounted conduit, boxes and exposed electrical infrastructure as a result of on-going retro-fits and renovations over the years. As well, exposed loose wiring was observed. (See Figures 53, 64, 77, 78, 79, 80, 81, 82, 83 and 84).

Apparatus Bay and adjacent work areas, have finishes that are somewhat more degraded and in need of re-painting, replacement or maintenance. (See Figures 83, 85, 86, 87, 88, 89, 90, 91). However

much of the re-finishing requirements of these areas is a result of poor exterior wall construction and insulation values.

The building as a whole appears to be very well maintained, based on the building's vintage. The recommended replacement of finishes is just typical of the physical wear-out of materials and the inadequate construction technology of the exterior walls.

.6 General:

The Fire Hall has locations where required fire rated walls are not in fact rated; wall penetrations are not rated; or the fire caulking seal to the structure or adjacent wall or roof assembly is not present. (See Figures 92, 93, 94).

Some exterior doors for the building are showing significant signs of degradation and rusting and the paint finish has failed. These doors and possibly the frames will require replacement. (See Figure 95).

The mezzanine floor assembly and the access stair to the mezzanine are both constructed of combustible construction, which is not permitted under todays Code for this building classification. (See Figures 98, 99, 100, 101 and 102).

There appears to be an ongoing roof leak, which has affected the concrete block wall below the leak location. The block finish has failed and the block itself may be degraded by water ingress or flow. (See Figures 87, 96 and 97).

An exterior concrete block joint between the original building and the 1977 expansion at the higher Apparatus Bay appears to be constantly moving. This condition should be monitored to ensure continuity of the envelope as well structural integrity of the joint. (See Figures 26, 103 and 86).

APPENDIX A

PROJECT NAME: City St. Albert Fire Hall #1 Facility Analysis

CHART RATING DEFINITIONS:

Existing Facility Analysis

(1) Critical: Unsafe, high risk of injury or critical system failure.

(2) Poor: Does not meet requirements, has significant deficiencies. May have high operating / maintenance costs.

(3) Marginal: Meets minimum requirements, has significant deficiencies. May have above average operating maintenance costs.

(4) Acceptable: Meets present requirements, minor deficiencies. Average operating / maintenance costs.

(5) Good: Meets all present requirements. No deficiencies noted.

(6) Excellent: As new / state-of-the-art, meets present and foreseeable requirements.

(FI) Requires further investigation

(N/A) Not applicable

(CU) Currently being upgraded

Life Expectancy: Less than 5 years for replacement (<5); 5 to 10 years (5-10); greater than 10 years (>10)

Priority: High (H); Medium (M); Low (L)

Future Expansion: Can be expanded (Yes); No capacity for expansion (No)

Life / Safety Code Infringement: Meets code (No); Does not meet code or endangers life (Yes)

Building Planning Strategies

(a) Location Strategy: Is the building located strategically to capture market.

(b) Reinvestment Strategy: Minor upgrades to the building required to maintain facility.

(c) Revitalize Strategy: Renovations and additions that are required to meet current standards for facilities.

(d) Build New Strategy: Due to the current facility conditions, recommendation is to rebuild facility.

BUILDING VENUE: St. Albert Fire Hall #1

ARCHITECTURAL / STRUCTURAL

Component Reference	Rating (1-6)	FI FI	fe Expectan< Priority <5, 5-10, >1((H, M, L)		Life Safety Code Infringe- NO/YES	Cost to Upgrade (+/- $5,000)
1 SITE						
1.1 Apron replacement, sidewalks	2/3	N/A	<5	H	NO	$ 150,000.00
					SUBTOTAL	**$ 150,000.00**
1.2 Asphalt repairs and overlay	3/4	N/A	5-10	M	NO	$ 125,000.00
					SUBTOTAL	**$ 125,000.00**
1.3 Site drainage correction & re-slope	2	FI	<5	H	NO	$ 200,000.00
					SUBTOTAL	**$ 200,000.00**
1.4 Miscellaneous site improvements	3/4	N/A	5-10	L	NO	$ 75,000.00
					SUBTOTAL	**$ 75,000.00**
2 GENERAL CONSTRUCTION						
2.1 Post disaster upgrades See RJC Structural Report	2	FI	<5	H	NO	$ 450,000.00
					SUBTOTAL	**$ 450,000.00**
2.2 Sprinklering (recommended but grandfathered condition)	3	FI	<5	H	NO	$ 100,000.00
					SUBTOTAL	**$ 100,000.00**
2.3 Mezzanine Floor re-construction (grandfathered condition)	2	FI	<5	H	NO	$ 150,000.00
					SUBTOTAL	**$ 150,000.00**
3 BUILDING ENVELOPE						

BUILDING VENUE: St. Albert Fire Hall #1

ARCHITECTURAL / STRUCTURAL

Component Reference	Rating (1-6)	FI FI	fe Expectan< Priority <5, 5-10, >1((H, M, L)		Life Safety Code Infringe- NO/YES	Cost to Upgrade (+/- $5,000)
3.1 Brick veneer re-construction	2/3	N/A	<5	H	NO	$ 250,000.00
					SUBTOTAL	**$ 250,000.00**
3.2 Exterior cladding, soffits, fascia replacement	2	N/A	<5	H	NO	$ 150,000.00
					SUBTOTAL	**$ 150,000.00**
3.3 Roof membrane replacement	2/3	N/A	<5	H	NO	$ 225,000.00
					SUBTOTAL	**$ 225,000.00**
3.4 Metal roof replacement	2	N/A	<5	H	NO	$ 60,000.00
					SUBTOTAL	**$ 60,000.00**
3.5 Exterior window replacement	2/3	N/A	<5	H	NO	$ 90,000.00
					SUBTOTAL	**$ 90,000.00**
4 INTERIOR FINISHES						
4.1 Changeroom/Washroom upgrades	3/4	N/A	5-10	M	NO	$ 80,000.00
					SUBTOTAL	**$ 80,000.00**
4.2 App Bay re-painting	2	N/A	<5	H	NO	$ 50,000.00
					SUBTOTAL	**$ 50,000.00**
5 GENERAL						
5.1 Fire rating corrections	1	N/A	<5	H	YES	$ 40,000.00
					SUBTOTAL	**$ 40,000.00**
5.2 Exterior man door replacement	2	N/A	<5	H	NO	$ 15,000.00
					SUBTOTAL	**$ 15,000.00**
5.3 Roof leak, block repair	2	FI	<5	H	NO	$ 10,000.00
					SUBTOTAL	**$ 10,000.00**
5.4 Exterior block repair/monitoring	2	FI	<5	H	NO	$ 20,000.00
					SUBTOTAL	**$ 20,000.00**
					ARCH/STRUC SUBTOTAL	**$ 2,240,000.00**
6 MECHANICAL						
6.1 Apparratus Bay Makeup Air	2	No	<5	H	NO	$ 25,000.00
					SUBTOTAL	**$ 25,000.00**
6.2 Heat/cool air furnaces	4	No	5 - 10	M	NO	$ 35,000.00
					SUBTOTAL	**$ 35,000.00**
6.3 Unit heaters/venting	4	No	<5	H	NO	$ 15,000.00
					SUBTOTAL	**$ 15,000.00**
6.4 Building Exhaust Fans	3	No	<5	H	NO	$ 30,000.00
					SUBTOTAL	**$ 30,000.00**
6.5 Ductwork/Ventilation	3	No	5 - 10	H	Yes	$ 100,000.00
					SUBTOTAL	**$ 100,000.00**
6.6 Plumbing Fixtures	2	No	5 - 10	M	NO	$ 50,000.00
					SUBTOTAL	**$ 50,000.00**
6.7 Domestic Water Heater	4	No	5 - 10	M	NO	$ 5,000.00

BUILDING VENUE: St. Albert Fire Hall #1

ARCHITECTURAL / STRUCTURAL

Component Reference	Rating (1-6)	FI FI	fe Expectan(<5, 5-10, >1(	Priority ((H, M, L)	Life Safety Code Infringe- NO/YES		Cost to Upgrade (+/- $5,000)
					SUBTOTAL	**$**	**5,000.00**
6.8 Fire Protection	3	No	5 - 10	M	NO	$	75,000.00
					SUBTOTAL	**$**	**75,000.00**
6.9 Controls	3	No	<5	M	NO	$	100,000.00
					SUBTOTAL	**$**	**100,000.00**
					MECHANICAL SUBTOTAL	**$**	**435,000.00**
7 ELECTRICAL							
7.1 Incoming Electrical Service	2	n/a	<5	H	Yes	$	50,000.00
					SUBTOTAL	**$**	**50,000.00**
7.2 Main Distribution panel	2	n/a	<5	H	Yes	$	15,000.00
					SUBTOTAL	**$**	**15,000.00**
7.3 Branch Panelboards	3	n/a	5-10	M	No	$	25,000.00
					SUBTOTAL	**$**	**25,000.00**
7.4 Emergency Generator	3	FI	5-10	M	No	$	50,000.00
					SUBTOTAL	**$**	**50,000.00**
7.5 Branch Wiring	3	n/a	5-10	L	Yes	$	75,000.00
					SUBTOTAL	**$**	**75,000.00**
7.6 Lighting and control	3	n/a	<5	M	No	$	50,000.00
					SUBTOTAL	**$**	**50,000.00**
7.7 Fire Alarm	4	n/a	<5	M	No	$	15,000.00
					SUBTOTAL	**$**	**15,000.00**
7.8 Emergency and Exit Lighting	4	n/a	<5	H	No	$	10,000.00
					SUBTOTAL	**$**	**10,000.00**
7.9 Voice & Data, Communications	3	na/	5-10	H	No	$	20,000.00
					SUBTOTAL	**$**	**20,000.00**
					ELECTRICAL SUBTOTAL	**$**	**310,000.00**
					ANALYSIS TOTAL	**$**	**2,985,000.00**


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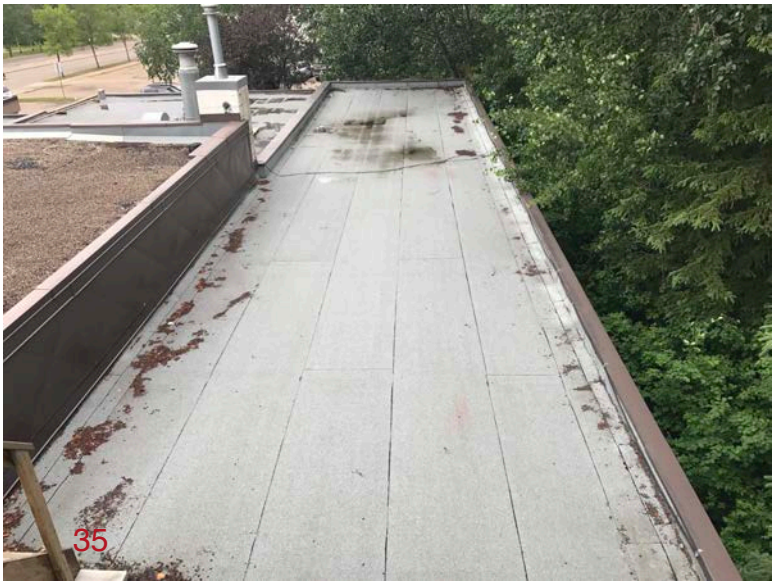
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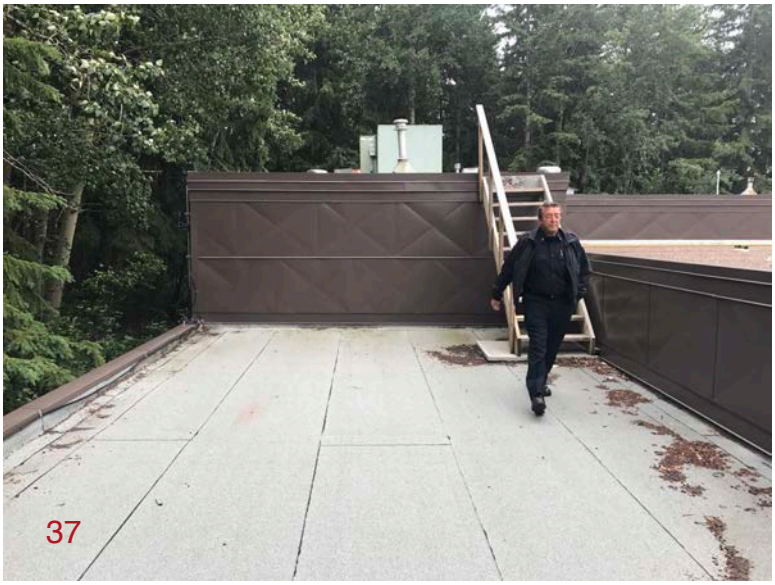
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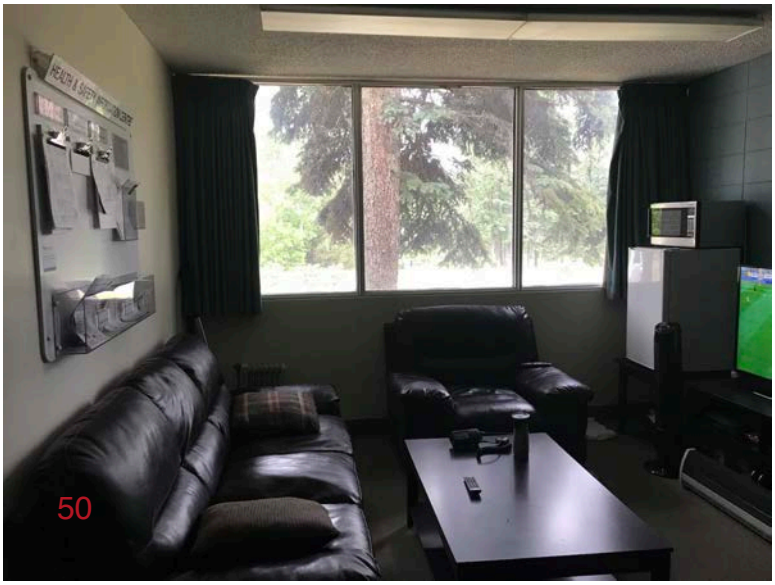
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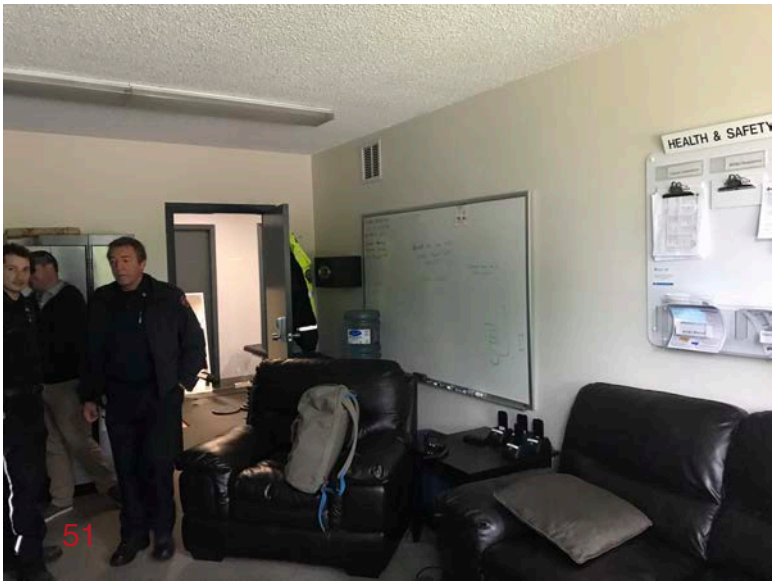
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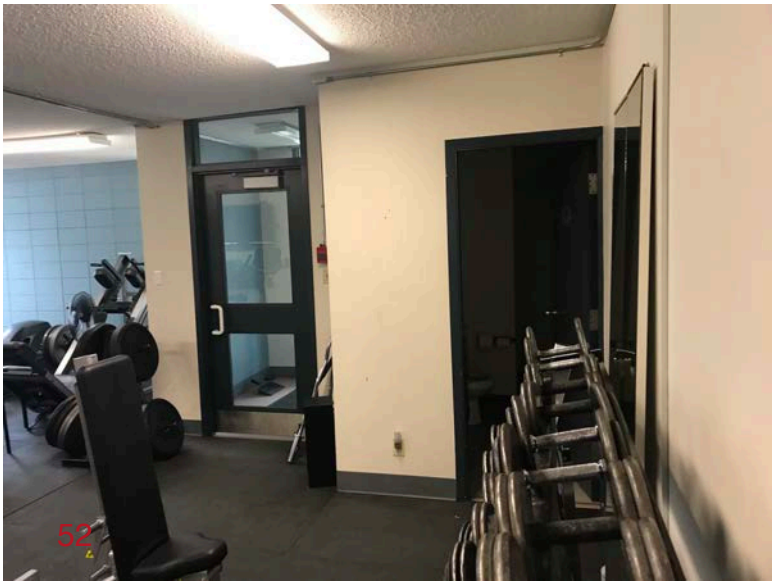
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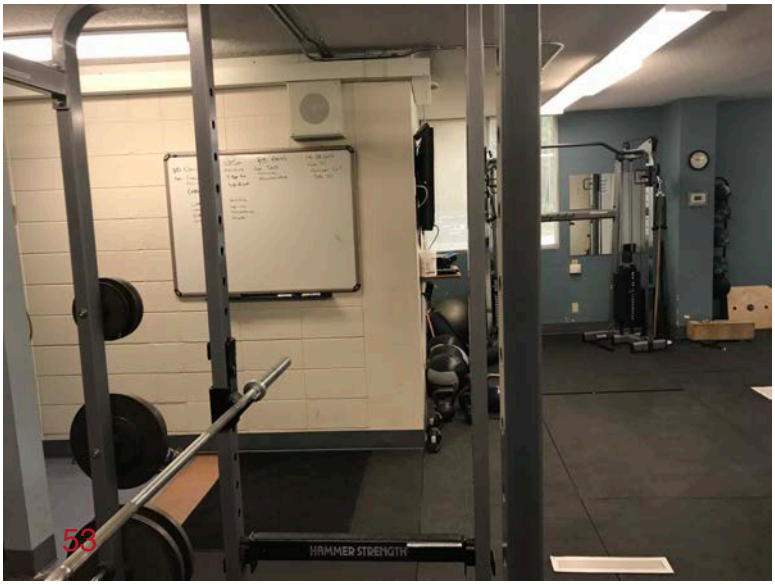
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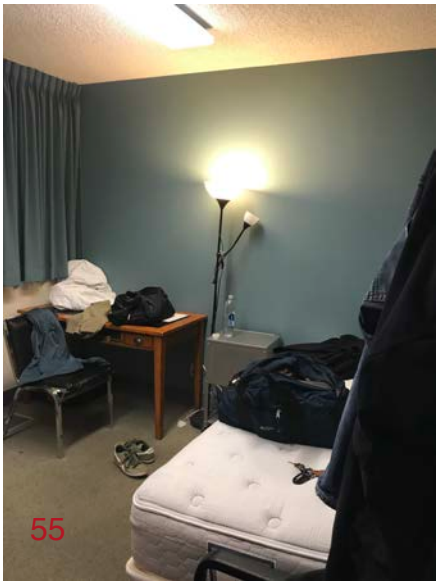
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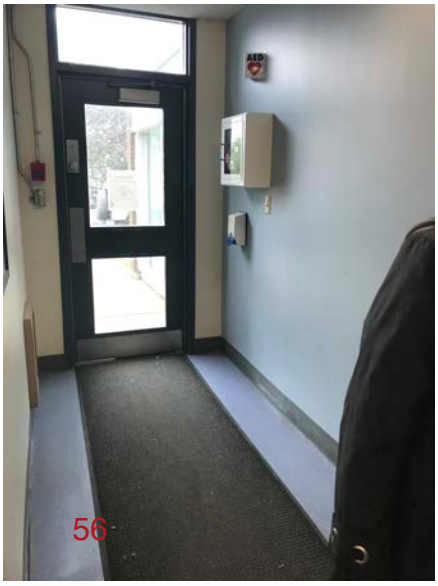
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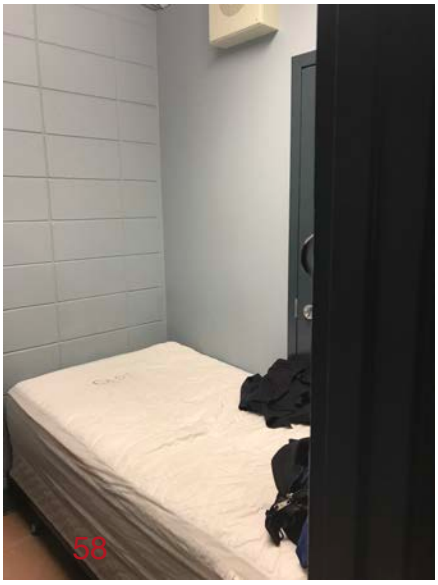
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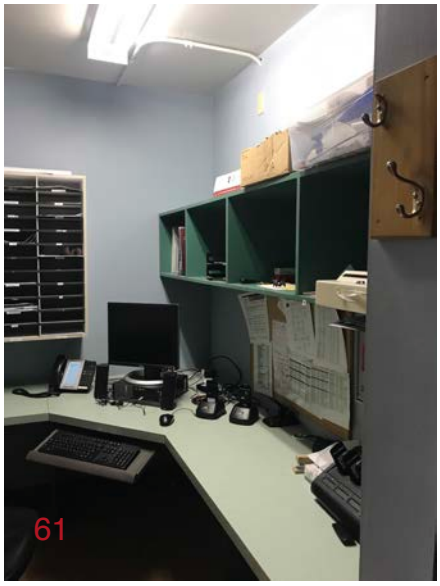
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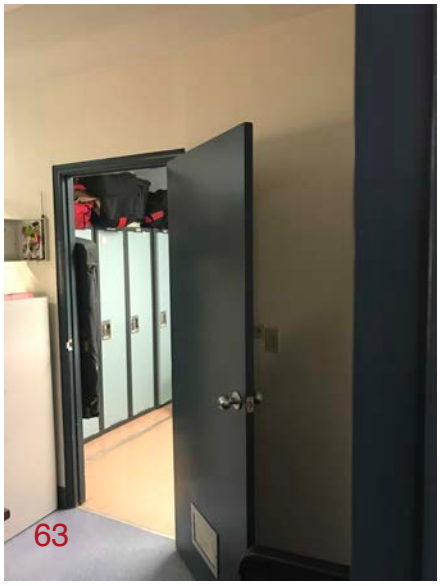
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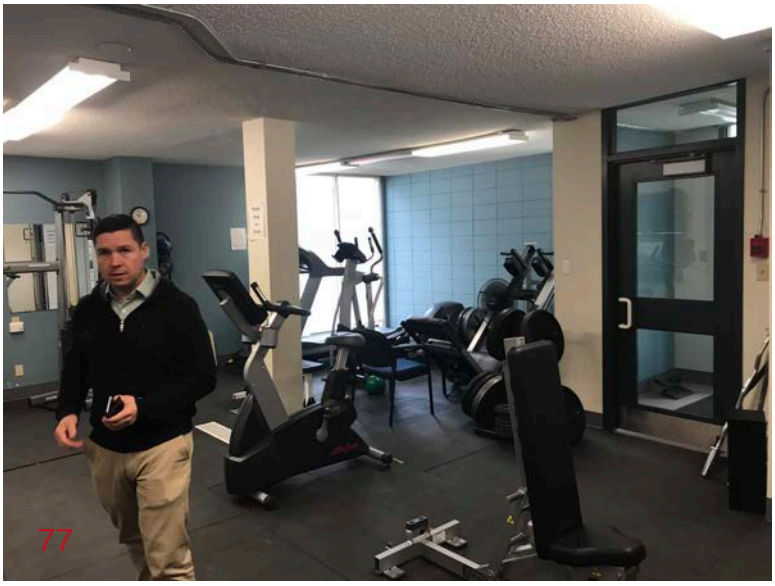
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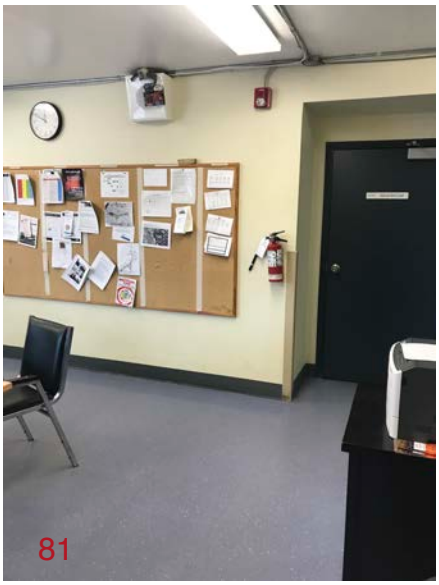
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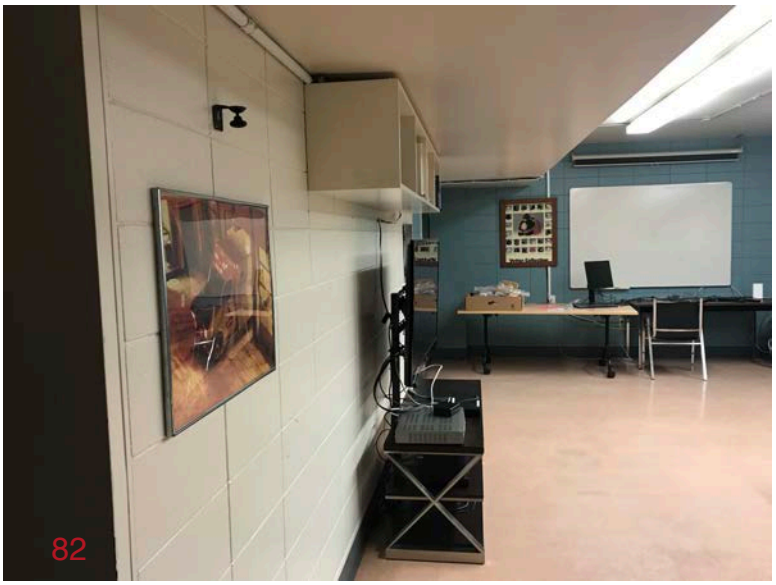
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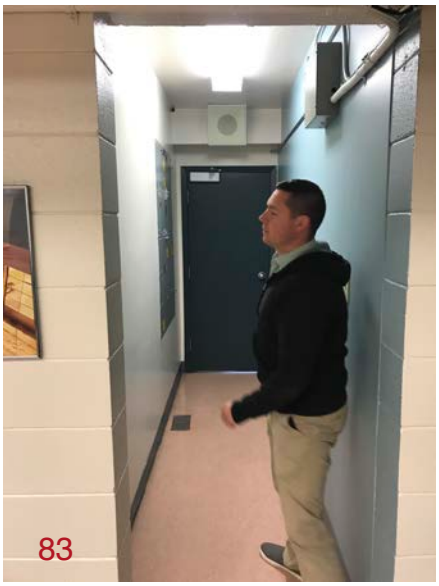
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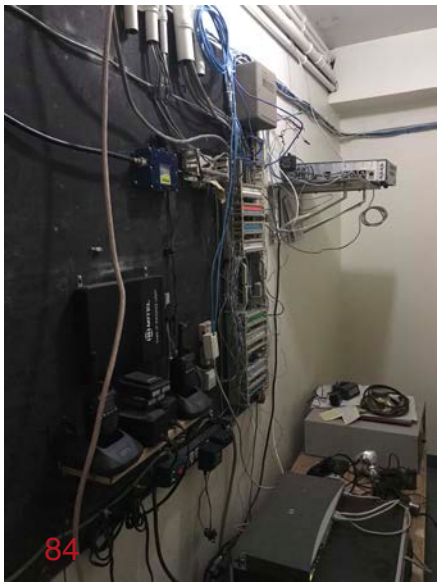
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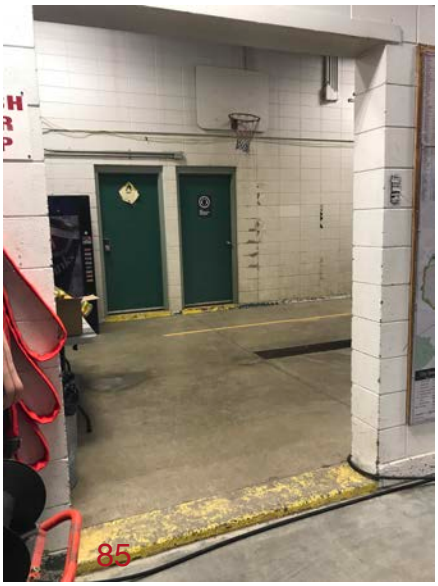
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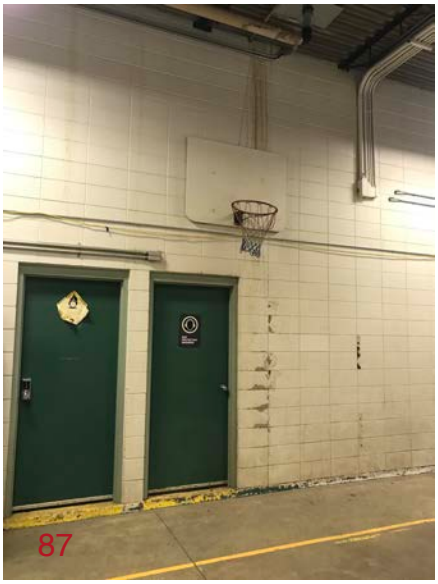
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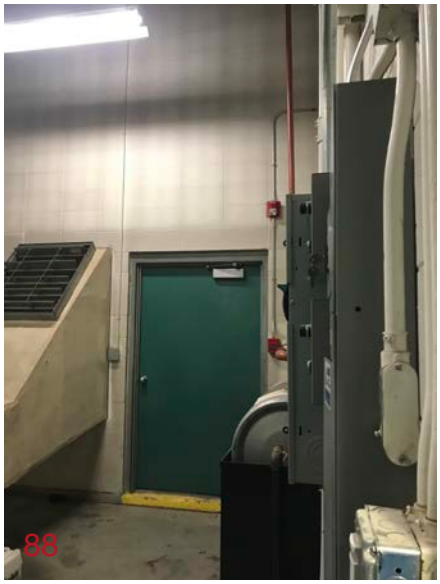
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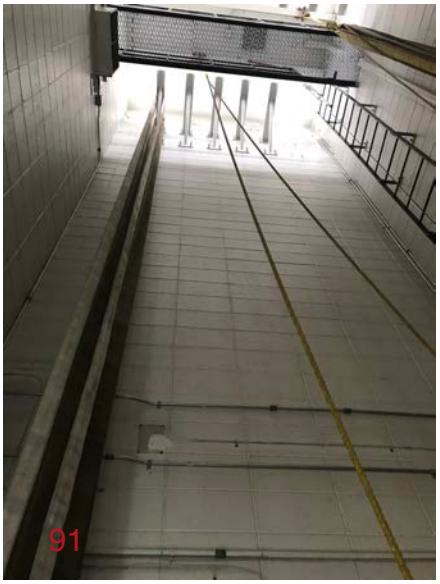
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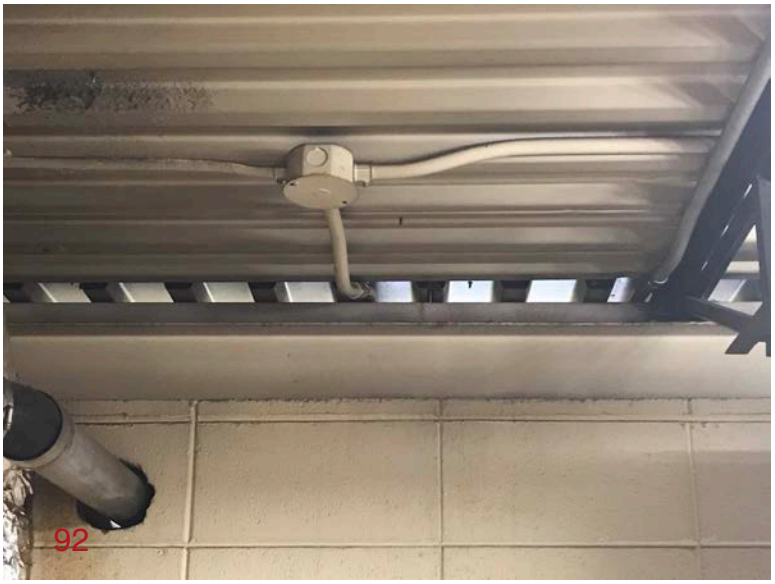
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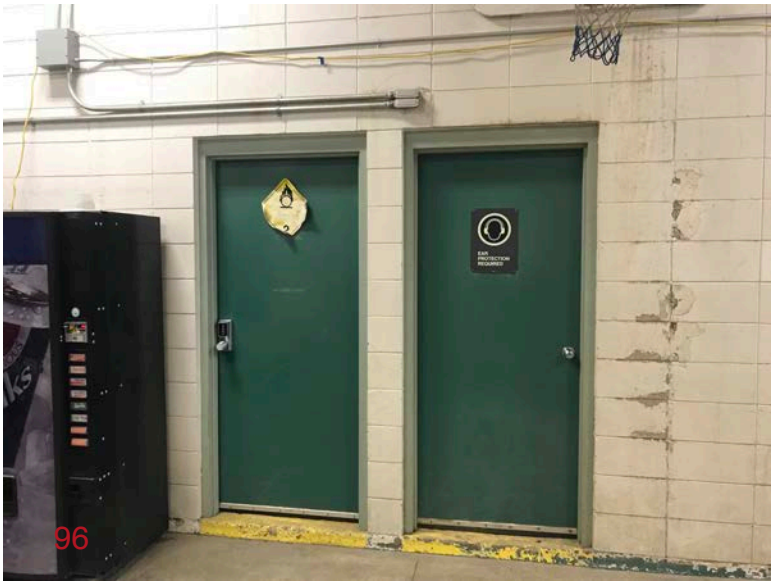
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4.0 STRUCTURAL FACILITY ANALYSIS REPORT

RE: St. Albert Fire Hall #1
Structural Condition Assessment RJC No. EDM.118274.0001

As requested, we have conducted a structural condition assessment of the above noted building. A site visit was conducted on June 22, 2017. Mr. John Reid, with the City of St. Albert, was present during our review.

The purpose of this review was to assess the general condition of the structure. The review was limited to visual observations of accessible areas. No testing or dismantling of any finishes or coverings occurred during our review. A design review was beyond the scope of this project and no calculations were performed. Structural drawings were available and provided to RJC for review.

4.1 STRUCTURAL DESCRIPTION

The original building was constructed in 1962. An addition to the south and west was completed in 1977 and addition to the west was completed in 1987.

The original building construction consists of wood deck and joists on concrete masonry load-bearing walls and built-up wood columns in the office and living areas. The apparatus bay is constructed of pre-cast double-tee beams supported on concrete masonry load-bearing walls. The drawings indicated the foundation consist of cast-in-place concrete foundation walls supported on concrete footings. The floor is a grade supported concrete slab.

The 1977 addition included living quarters to the south and a new apparatus bay to the west. The construction of the living quarters is similar to the 1962 living quarters and office area. The apparatus bay is constructed of steel deck on open web steel joists supported on concrete masonry load-bearing walls. The 1987 addition construction consists of steel deck on open web steel joists supported on load-bearing masonry walls. The foundation systems for both additions consists of concrete foundation walls on concrete footings with concrete slab-on-grade throughout.

4.2 OBSERVATIONS AND RECOMMENDATIONS

Based on our visual review of random areas throughout the building, the structure appears to be performing as intended. The following observations were noted:

- The roof structure in general appears to be performing as intended. A roof leak was noted in the generator room (Photo 1). While this is not currently a structural issue, continued moisture could lead to deterioration of the structural components.

Photo 1: Roof leakage in generator room

- The roof structure was not directly observable in the living and office areas due to architectural finishes. No damage or cracking was observed in the finishes indicating the structure is performing adequately.
- The load-bearing masonry walls appear to be performing adequately. No significant cracking was observed in the blocks, and no significant cracking was observed in the architectural finishes where the walls were covered.
- Some cracking was observed at wall intersections (Photos 2 and 3).

Photos 2 and 3: Typical cracks at masonry wall intersection

- Some cracking was noted in the hose tower masonry walls (Photo 4).

Photo 4: Cracking observed in hose tower masonry walls

- The foundations are buried and not able to be directly observed; however, they appear to be performing adequately. No excessive settlement or significant differential settlement was observed in the floor slab. Significant cracks were not observed in the walls, which can indicate foundation movement.
- The concrete slab-on-grade was generally in good condition and performing as intended. Minor cracking was observed (Photos 5 and 6).

Photos 5 and 6: Typical cracks in slab-on-grade

- Deterioration of the apron slab at the west overhead door was noted (Photos 7 and 8). The reinforcing is exposed and corrosion and deterioration will continue. The concrete in this area should be repaired to prevent further damage.
- Sitting water was observed on the south side of the building between the retaining wall and the foundation wall (Photo 9). The water appeared below the main floor level and was not in contact with the masonry walls. Over time, the water could drain into the soils supporting the foundation and cause the foundations to move. Drainage of this area should be considered to prevent potential structural issues.

Photos 7 and 8: Apron slab deterioration at west overhead door

Photo 9: Sitting water on south side between retaining and foundation walls

- Deterioration of the exterior finishes was observed around the window of the hose tower (Photo 10). While not a current structural issue, moisture ingress into the structure may occur and lead to deterioration of the members supporting the tower roof.

Photo 10: Deterioration of tower exterior finishes

4.3 POST-DISASTER BUILDING CODE REVIEW

The 2005 National Building Code of Canada (of which the 2006 Alberta Building Code was based on) and the subsequent code releases since introduced the post-disaster building category. These building types are to remain operational after a significant disaster, and include hospitals, police stations, and fire. The structural requirements of the post-disaster building category are more stringent, including higher roof snow loads, wind loads, and seismic detailing.

A complete structural assessment of this building is not part of the scope of this project and has not been completed. However, previous experience with older buildings in the post-disaster category has shown that they generally do not meet the post-disaster requirements of the current building codes. Should a significant renovation of this building occur, the authority having jurisdiction may require the structural systems to be upgraded to current building code standards. The cost of upgrading existing structures is substantial and may not be economically feasible.

4.4 SUMMARY AND LIMITATIONS

Based on our review, the structure appears to be performing satisfactorily. Our review was limited to a visual review of the structure and no assessment was made of the building envelope or any other system.

We trust the above report addresses your immediate requirements. Following your review of this report, RJC would be pleased to discuss and assist you with implementing the above recommendations.

St Albert Fire Hall #1

5.0 MECHANICAL FACILITY ASSESSMENT
5.1 INTRODUCTION

The following report outlines the mechanical assessment of the St Albert Fire Hall #1 building mechanical systems and provides comments on the existing mechanical systems for upgrades or replacements as required to maintain current operations.

The building was originally constructed in 1962, expanded to the south and west in 1977, renovated in 1987 and again in 2011. The building consists of Apparatus Bays, Hose Tower, Administration and Staff Areas, Dormitory, Lounge and Mechanical and Electrical Service Rooms.

The site review conducted was not a detailed review of the mechanical systems and the operation of the mechanical equipment and was only a visual review of the installed mechanical systems. As part of the site review, the building staff was also of assistance in outlining upgrades and deficiencies in the mechanical systems to date.

The mechanical systems currently installed, while adequate for the building and the expansions that have occurred over the life span of the building, they are not suitable for the latest type of fire halls designed today, especially with the new sustainable design and energy standards in place and vehicle exhaust rail systems to limit exhaust fumes build up in the Apparatus Bays.

As indicated in the report, the existing mechanical systems were not designed to handle any future expansion to the building. Depending on the level of expansions or upgrades planned, mechanical services will be required to be upgraded.

5.2 MECHANICAL SYSTEM SUMMARY

From the onsite review, it would appear that the majority of the existing building mechanical HVAC systems are operating satisfactorily with some equipment close to the life cycle and others with an estimated lifecycle of at least another ten years. From maintenance logs located in the mechanical rooms, it would appear that the mechanical systems are regularly serviced and maintained by the City.

While some of the mechanical systems may have met the minimum mechanical requirements for this type of structure when it was originally constructed, there are some major upgrades that are recommended to be done to meet the latest Alberta Building Code requirements, as well as to provide more energy efficient mechanical systems that will comply with the 2014 National Energy Code. The following are some recommendations:

- Low water consumption plumbing fixtures
- Upgrade to HVAC systems with more individual room temperature control
- Minimum occupancy fresh air requirements as per ASHRAE Std 62.1
- Free cooling option on air systems
- Upgrade fire protection by installing a wet sprinkler fire protection system
- Digital building management controls systems to monitor mechanical systems and optimize energy usage.
- Vehicle exhaust/makeup air systems specifically designed for fire department vehicle Apparatus Bays

The type of mechanical systems currently used in the building contributes to a higher than average maintenance and operating costs. The existing mechanical systems as currently installed also have no capacity for handling future expansions or upgrades.

5.3 BUILDING UTILITY SERVICES

The sanitary drainage system installed collects waste from washrooms and other plumbing fixtures throughout the facility and is gravity drained to a main sanitary sewer line north in the street adjacent to the property.

A two inch water service enters from the north side of the building into the mechanical room to the building water meter. The water service is of adequate size for the current structure, but will need to be increased in size to a minimum of four inches if a wet fire protection sprinkler system is installed. There is an existing ten inch water main located north of the facility that will adequately supply water for a future building fire sprinkler system.

The natural gas service to the building enters into the Exercise room on the south side of the building with the gas meter located inside the building. A low pressure gas piping distribution system is utilized after the meter to the equipment.

5.4 PLUMBING

On the existing flat roofs, the roof storm water is collected by roof drains and is splashed to grade level, refer to Photo 6. There appears to be no storm sewer service to the building and all water splashed to grade is directed away from the building. Refer to Photo 3 for damaged or missing pipe insulation on the storm drains. This can lead to the pipe condensation and dripping during the cold winter months.

Most of the plumbing fixtures appear to be in fair condition. The toilets have been upgraded to a water saving dual flush tank type of toilet. The remainder of the plumbing fixtures currently installed would meet today's requirements for low water usage fixtures. Depending on the final building code analysis done by the architect for this type structure, there may be a requirement for the installation of additional plumbing fixtures to meet the occupancy loads.

In general, it would appear that the existing plumbing domestic water and low pressure natural gas piping and drainage water piping installation is in fair condition and no upgrades are required.

There is no future expansion capacity in the existing plumbing system. The domestic hot water heater is a natural gas fired unit and appears to be in good condition. Expected life expectancy for the domestic hot water heater is another 5 – 10 years.

The emergency generator room has a diesel fuel oil tank and piping to service the generator. There does not appear to be any. The fuel oil tank has fuel oil spill protection provided as required by current codes.

There is damaged insulation on the refrigerant piping to the a/c coils on the furnaces that will need to be repaired. Refer to Photo 4.

5.5 BUILDING HEATING, VENTILATION AND AIRCONDITIONING (HVAC)

The installed ventilation and air conditioning systems for the various areas of the building are in fair operating condition and has been regularly maintained by the City. While the current installation does not meet the requirements of the 2014 National Energy Code, there are no requirements to upgrade the systems to meet the new standards, unless major building renovations and additions are contemplated.

The Administration, Lounge, Dormitories, Kitchen areas of the building is heated and cooled with four natural gas fired furnaces located in two mechanical rooms in the building. With the building undergone several additions over the years, the furnaces have also been upgraded, with the latest furnaces indicating a manufacture date in 2003 & 2004. Based on this information the expected life cycle for the furnaces can be up to another 10 years.

Air conditioning is provided by direct expansion refrigerant cooling coils mounted in the furnace with refrigerant lines running from the coil to roof mounted air cooled condensers.

The building heating and ventilation controls operating the mechanical equipment are a mixture of wall mounted programmable electronic thermostats and simple manual operated electric thermostats which start and stop the furnaces as required to maintain the space temperature. There is no overall integrated building controls system monitored at a central location.

Ductwork from the furnaces for the original 1962 construction are routed underslab to various floor supply grilles, mostly along the perimeter walls. This method of underground ductwork has been problematic in that ground moisture can seep into the ductwork over the years creating deterioration and odor issues. Further detailed investigation with video cameras is recommended to determine the condition of the underground ductwork. The later building additions are heated and cooled with furnaces that utilize above ceiling duct distribution to ceiling grilles and diffusers.

There is some damaged duct insulation in the furnace mechanical rooms that will need to be repaired, refer to Photo 5.

Entrance vestibules are heated with wall mounted electric forced air units with individual temperature control.

Washroom exhaust is ducted through the ceiling space to roof mounted exhaust fans. Fans appear to be in good condition with an expected life expectancy of 5 years.

The kitchen has a small residential kitchen exhaust fan located above the stove and vented up through the east wall.

The Apparatus Bays are heated with ceiling hang gas fired unit heaters. The units appear to be in fair condition with an expected life expectancy of another 5 years. There is a central roof mounted exhaust fan ducted to grilles at various locations in the Apparatus Bay to provide exhaust for the fire and ambulance vehicles.

A dual volume, roof mounted, 100% outdoor makeup air handling unit, interlocked with the three exhaust fans, provides tempered air into the space to replace the exhausted air. This unit was installed in 1982 and is at the end of its life cycle and showing signs of rusting, refer to Photo 1. There did not appear to be a carbon monoxide/nitrous oxide emissions detector located in the Apparatus Bays. This is a requirement in the latest building codes.

The Hose Tower is ventilated with a sidewall mounted exhaust air fan and the makeup air transferred into the Tower from the Apparatus Bay.

The emergency generator room is ventilated with roof hood fresh air intake and motorized damper interlocked with the generator return air and exhaust air motorized dampers controlled by a room thermostat. The exhaust muffler is mounted on the roof and is rusting and will require replacement with a new weatherproof style muffler. Refer to Photo 2

5.6 FIRE PROTECTION

The fire protection currently installed for the building are wall mounted portable fire extinguishers. The extinguishers appear to be serviced properly and no further requirements are necessary.

Depending on the final building code analysis for this type structure, there may be a requirement for the installation of a wet sprinkler fire suppression system as per the NFPA 13 requirements. A new four inch water service would be required to be installed to the building for the wet sprinkler system.

5.7 FUTURE EXPANSION OF BUILDING

The existing mechanical systems were not designed to handle any future expansion to the building. Depending on the level of expansions or upgrades planned, the following mechanical services will be required to be upgraded:

- Upgrade natural gas service for heating, ventilation and domestic hot water usage
- Upgrade water service to handle both fire sprinkler system and domestic water loads
- New rooftop ventilation systems with economizer, including supply air, return air and exhaust air ductwork fans grilles and diffusers.
- Upgrade controls to a building integrated system for better monitoring and energy efficiencies.
- Upgrade existing building mechanical systems as required to meet the latest Alberta Building Code and National Energy Code requirements.

Mechanical Photos

Photo 1 - Apparatus Bay Makeup Air Unit

Photo 2 – Emergency Generator Exhaust Muffler

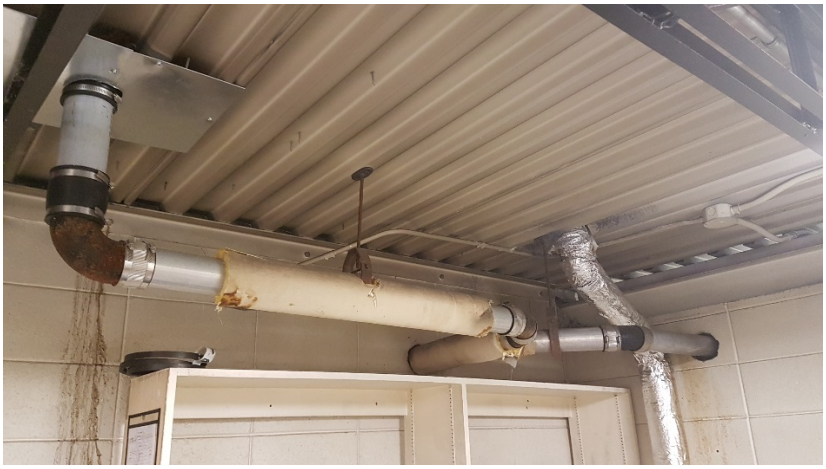

Photo 3 – Damaged & missing insulation on storm drains

Photo 4 – Damaged refrigerant pipe insulation

Photo 5 – Damaged duct insulation

Photo 6 – Roof drains splashing to grade

6.0 St Albert Fire Hall #1
6.1 ELECTRICAL FACILITY ASSESSMENT

INTRODUCTION

The St. Albert Fire Hall was originally constructed in 1962, expanded to the south and west in 1977, renovated in 1987 and again in 2011. The building consists of Administration and Staff Areas, a Dormitory, a Lounge, Apparatus Bays, a Hose Tower, and Mechanical and Electrical Service Rooms.

The following report outlines the condition of the St Albert Fire Hall #1 building electrical systems and provides recommendations for upgrade or replacement of equipment as required to maintain current operations.

The site review conducted was not a detailed review of the electrical systems or of the operation of the electrical equipment and is based solely on a visual review of the installed systems.

The electrical system currently installed, while adequate for the building as it exists today, has reached the end of its serviceable life span and is not sufficient to support the more modern equipment and systems installed in more current fire halls.

6.2 ELECTRICAL SYSTEM SUMMARY

From the onsite review, it would appear that the majority of the existing building electrical systems are operating satisfactorily, however the existing infrastructure within the building is aged, poorly documented and in some cases poorly installed or maintained.

6.3 INCOMING SERVICE

The incoming existing service appears to be 225A, 120/208V, 3 phase, however the service entry point could not be validated. Any future mechanical system upgrades will require the complete replacement of the incoming electrical service to the firehall. The overall service layout is poorly documented and the interconnection between power distribution equipment is poorly understood. Visual inspection can not provide adequate or reliable assessment of exactly how the equipment is powered. This is a safety concern as proper lock out or tagging procedures would by very difficult on this system.

6.4 MAIN DISTRIBUTION PANEL

The majority of the equipment is original and has exceeded the expected lifecycle. The newer equipment has an estimated lifecycle of at least another ten years. The main distribution equipment is no longer manufactured in its current configuration and obtaining spare parts may not be possible. Because distribution equipment has a several week delivery from the time ordered, a failure could put the fire hall out of operation for several months. The main distribution cabinet did not have the kAIC rating marked on the enclosure or the arc flash hazard stickers required by the newer codes.

When the equipment is replaced, an arc flash hazard analysis in accordance with CSA Z462 for the power distribution system will need to be completed and all distribution equipment will need to be labeled with the appropriate markings based on the results of the study.

6.5 SUB DISTRIBUTION PANELS

Over the course of various expansions, some of the older panels have not had enough circuits to provide protection for added equipment, and the full size breakers were replaced with mini-breakers to allow more circuits to be utilized. It is recommended to replace these panels with larger panels to allow spare capacity for the future. All panels should have suitable spare capacity with respect to both service ampacity as well as circuit spaces.

6.6 STAND BY GENERATOR

From maintenance logs located in the generator room, it would appear that the generator is regularly serviced and maintained by the City. The generator is marked as 90 kVA, 3 phase, 480V. The transfer switch is marked as 225A, 120/240V, single phase. A transformer was not observed within the building.

6.7 MOTOR CONTROL

The majority of the motor control equipment appears to be original and has reached the end of its serviceable life. It is recommended to replace the equipment as part of a life cycle maintenance program. Should the mechanical systems be scheduled for upgrade, this work should be scheduled to occur at the same time to ensure proper coordination.

6.8 FEEDERS

The major feeders for panels and mechanical equipment are original and have reached the end of their service life. These should be replaced as part of a life cycle maintenance program.

6.9 BRANCH WIRING

The feeders to the electrical equipment are of varying vintages. Some of the conduit and wire are original. In many locations, surface conduit and wire has been added. In some locations, cables are tie wrapped to conduit and have no mechanical protection. BX wire is also installed surface without mechanical protection. Exterior conduit and junction boxes are showing rust and should be replaced.

6.10 RECEPTACLES

Receptacles installed are of varying vintages. The receptacles in the apparatus bay have weatherproof covers, however the covers do not meet the new code for “in service” weatherproof covers. The receptacle in the kitchen area is installed within 1 meter of the sink, but is not GFIC rated as required by code. Although surface mounted receptacles have been added, the use of extension cords in several areas indicates that more are required.

6.11 EXTERIOR PARKING SERVICES

There are energized parking provisions on site; however the receptacles do not meet the new code requirements for weatherproof “in service” covers and some stalls are missing the weatherproof cover plate on the receptacles.

6.12 LIGHTING AND LIGHTING CONTROL

The interior lighting consists of T8 fluorescent fixtures and incandescent fixtures. Some of the fixtures are missing lenses. The lighting levels appear to be adequate. Consideration should be given to replacing light fixtures with new energy efficient LED fixtures. LED fixtures also require less maintenance.

Although occupancy sensors have been added in some areas, the majority of the lighting control is from line voltage switching. This method is outdated and a non-energy efficient method of control. Occupancy sensors should be installed for lighting controls in washrooms, service rooms, janitor rooms and storage areas. Line voltage switching should be integrated with occupancy sensors in the fitness area and in all office areas.

6.13 SITE LIGHTING

Site lighting is provided by wall mounted incandescent light fixtures and a single HPS flood light mounted to a pipe mast supported by the building structure. Consideration should be given to replacing light fixtures with new energy efficient LED fixtures. LED fixtures also require less maintenance. Based on experience, it does not appear the existing fixtures and the mounting locations will meet the lighting levels recommended by IES for this type of installation. As the inspection was completed during the day, this was not possible to confirm.

6.14 FIRE ALARM SYSTEM

The non-addressable Notifier AFP-200 fire alarm system installed at the fire station was discontinued in 2007. The system is complete with detection devices, manual pull stations and horn strobe devices. Because the control system was discontinued 10 years ago, obtaining parts could be an issue. Life cycle replacement is recommended to ensure a reliable system is in place.

6.15 EXIT SIGNS AND EMERGENCY LIGHTING

Exit signs are not required for this building as it is not a public space, however paper exit signs have been installed. It is suggested that proper exit signage be installed throughout the building to replace the paper signs and provide exiting were required.

6.16 PUBLIC ADDRESS, STATION ALERTING SYSTEM, AND SECURITY

The public address system consists of old technology and aged speakers. While this system does function, it has reached the end of its lifecycle and should be replaced.

The station alerting system is a Zetron Model 6203 IP Station Unit, which is consistent with the other fire stations in St. Albert. While this is older technology, it is serving the required purpose.

The security for the building consists of one exterior camera, which is currently not operational.

6.17 VOICE AND DATA CABLING INFRASTRUCTURE

Infrastructure is located in a small room added within the fitness room and in the telephone backboard room. The server is sitting on the floor in the data rack with a monitor sitting on top of it. Cable management in this area is non-existent and could lead to problems when servicing the equipment.

6.18 CABLE TELEVISION SYSTEM

Minimum coaxial cable was observed in the building.

6.19 GROUNDING

The building ground system was not inspected as the system is not accessible, however it is assumed to be original to the building. It is recommended to have the ground system meggered to ensure it is operating as required to provide safety from electrical shock and to protect electrical equipment.

6.20 FUTURE EXPANSION OF BUILDING

The existing electrical systems appear to have been designed for future expansion of the building, however with the renovations that have already taken place, the system may not be able to handle any additional expansion to the building. Depending on the level of expansions or upgrades planned, the following services will be required to be upgraded:

- Main incoming service.

- Main Distribution System
- Sub Distribution System.
- Motor Control equipment.
- Upgrade existing lighting systems as required to meet the latest Alberta Building Code and National Energy Code requirements.

6.21 ELECTRICAL PHOTOS

Photo 1 – Main Service Distribution

Photo 2 – Transfer Switch

Photo 3 – Emergency Generator

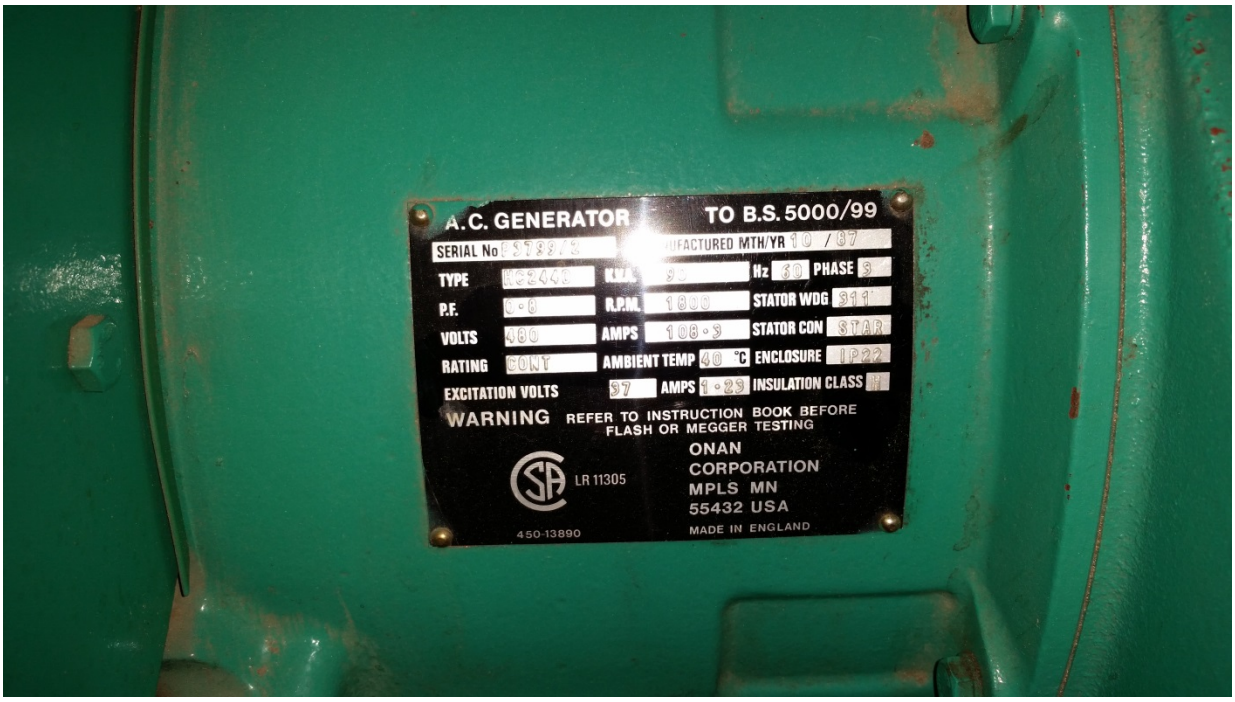

Photo 4 – Generator Rating

Photo 5 – Sub Distribution Panels and Motor Controls

Photo 6 – Corroded exterior conduit

Photo 7 – Apparatus Bay Receptacle

Photo 8 – Exterior Parking Receptacle

Photo 9 – Exterior Incandescent Fixture and Speaker

Photo 10 – Exterior Incandescent Fixture

Photo 11 – Exterior HPS Fixture and Security Camera

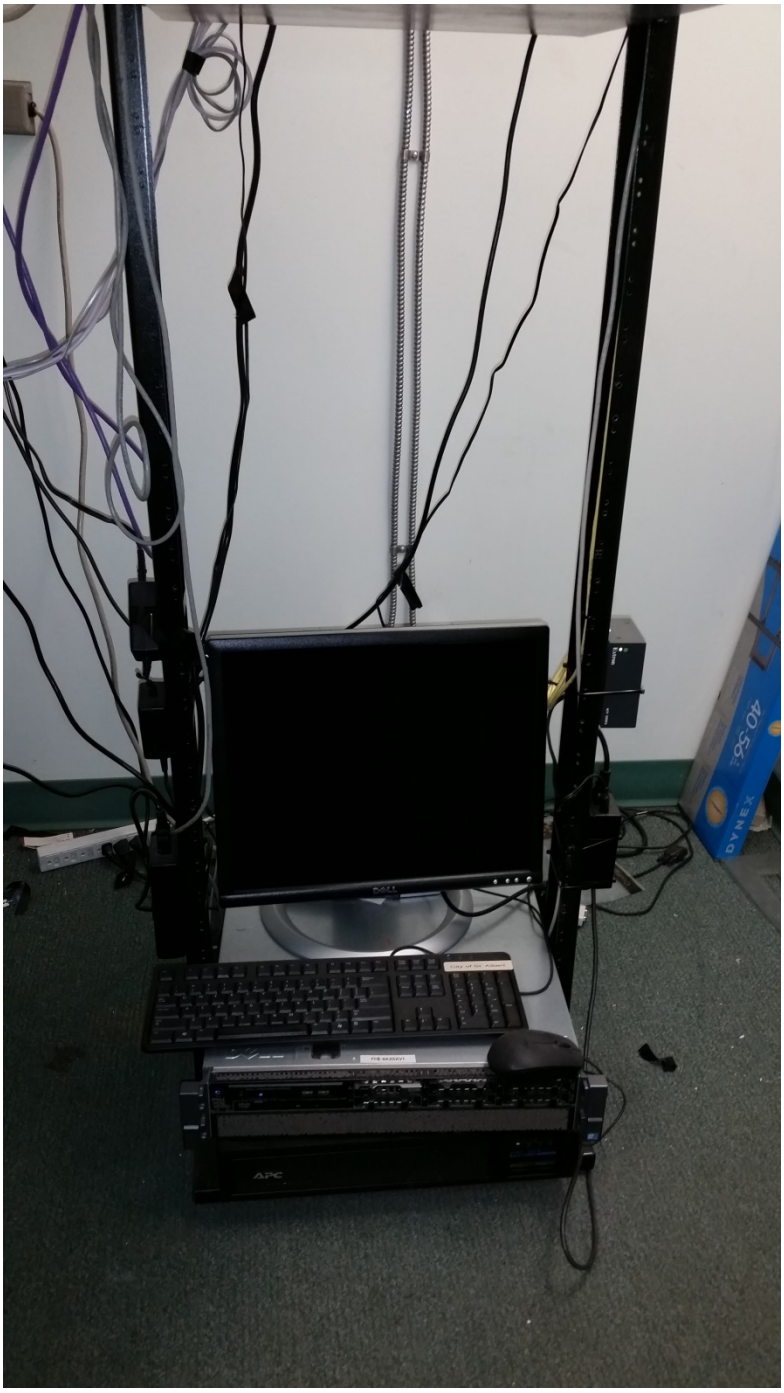

Photo 12 – Server Equipment

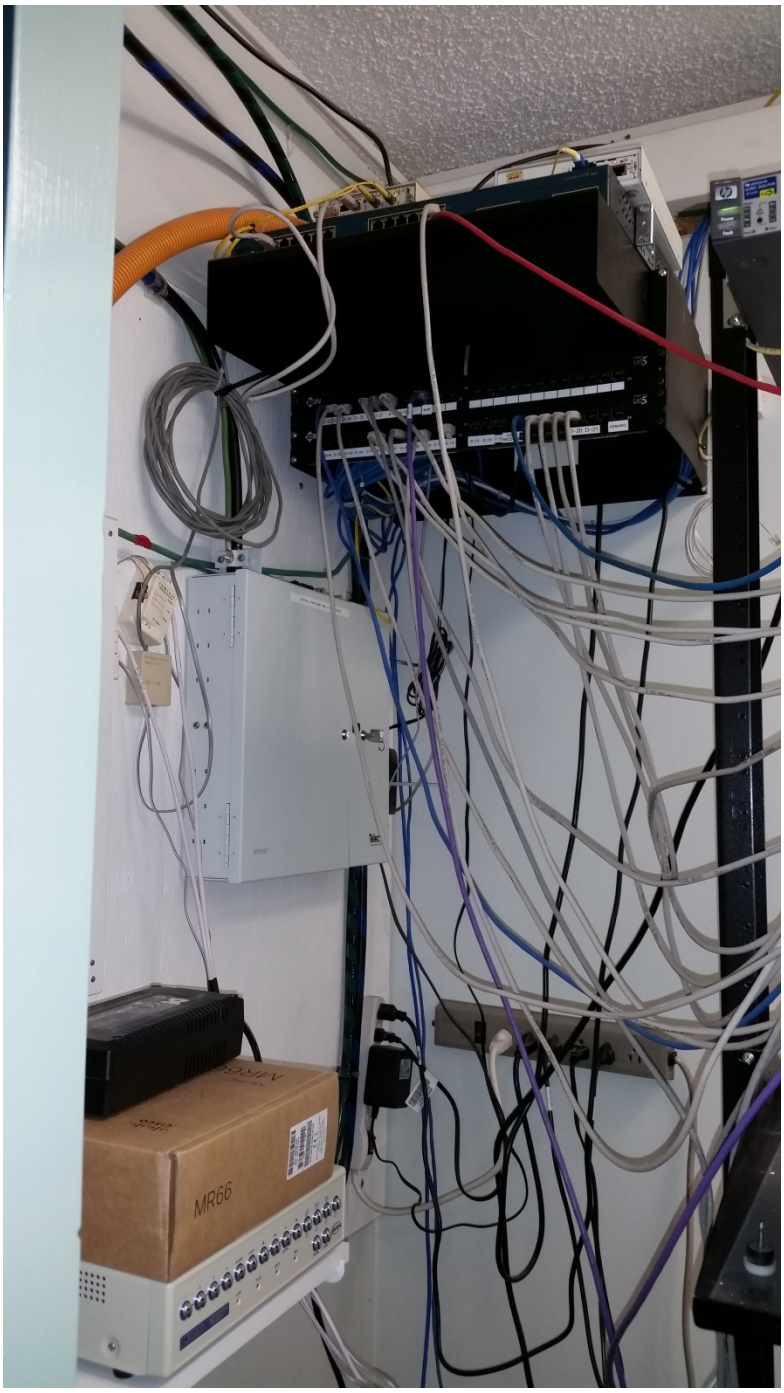

Photo 13 – IT Equipment and Data Cables

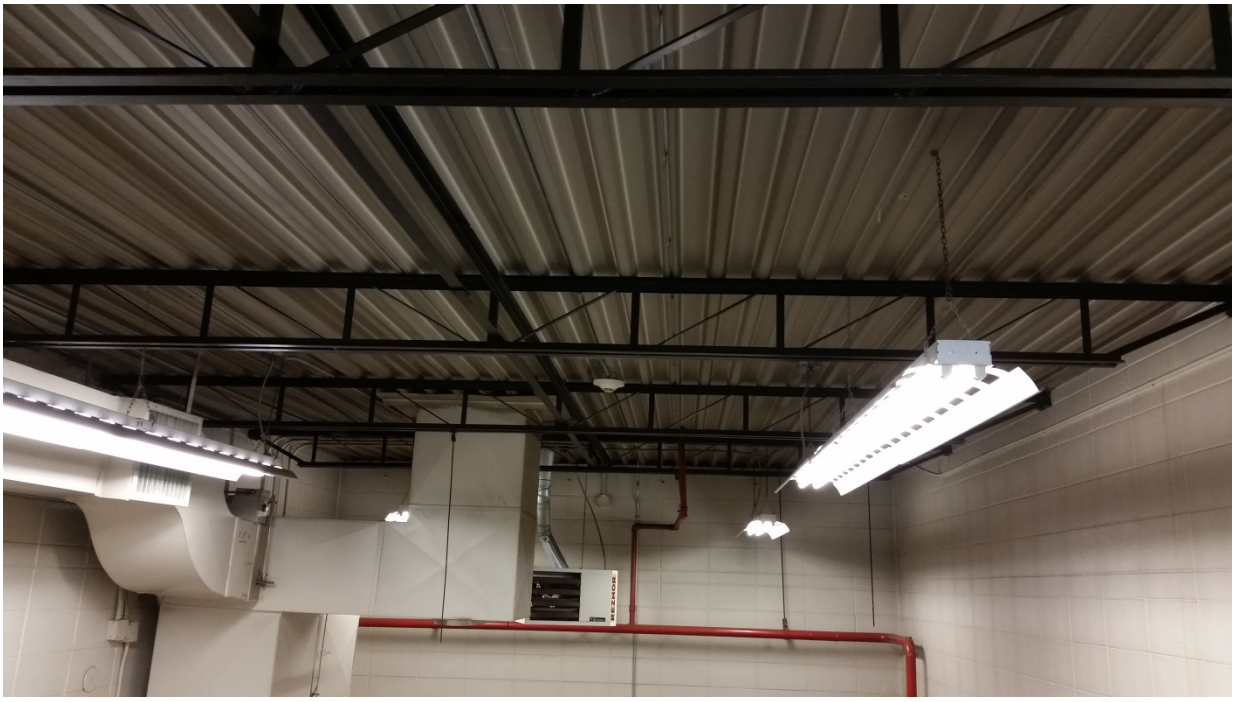

Photo 14 – Apparatus Bay Lighting

Photo 15 – Gear Room Lighting

Photo 16 – Incandescent Lighting

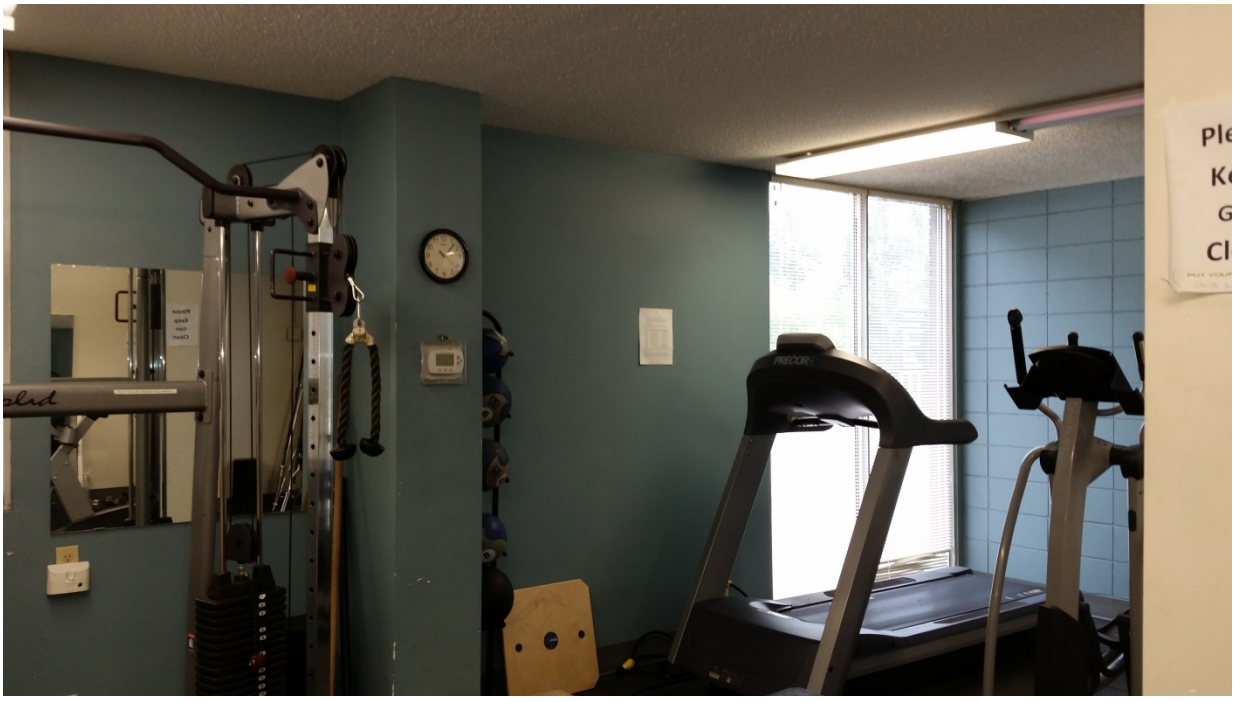

Photo 17 – Fitness Room Lighting

Photo 18 – Conduit Installation

Photo 19 – Conduit Installation and Poorly Installed Data Cabling

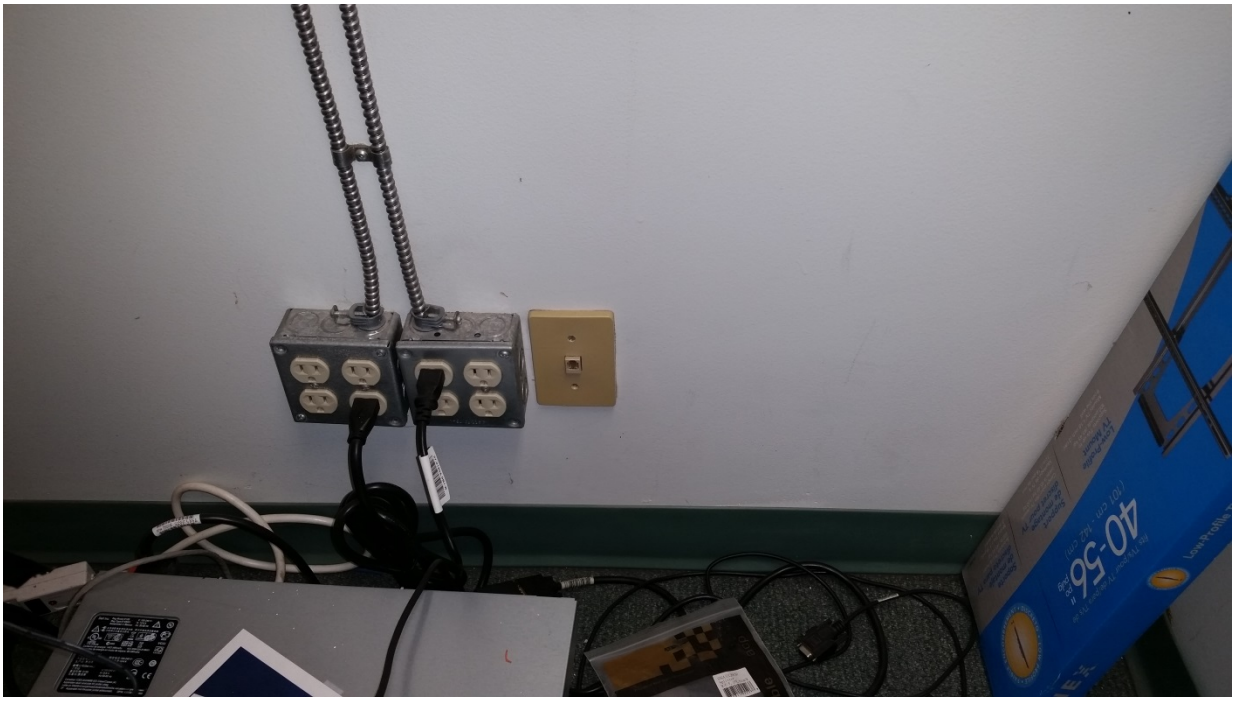

Photo 20 – New Surface Mounted Receptacles Fed From BX

Photo 21 – Old Rusted Speaker

Photo 22 – Telephone Board

Photo 23 – Paper Exit Signs