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FINAL



CITY OF FORT
SASKATCHEWAN

GOLF & CURING CLUB
FACILITY EVALUATION REPORT

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TABLE OF CONTENTS

1.0	INTRODUCTION	1	7.0	ELECTRICAL	19
1.1	Existing Facility Construction	3	7.1	Introduction	20
2.0	BUILDING AND SAFETY CODE REVIEW	4	7.2	Power Service and Distribution	20
2.1	Specific Code Classification	5	7.3	Telephone Service and Distribution	20
2.2	Noted Non-conformance	5	7.4	Lighting	20
2.3	Recommendations	5	7.5	Emergency Lighting and Exit Lighting	20
2.4	Existing Facility Area Summary	5	7.6	Fire Alarm System	20
3.0	BUILDING ENVELOPE	6	7.7	Security System	20
3.1	Existing Facility Construction	7	7.8	Budget	20
3.2	Observations	7	8.0	EXTERIOR	21
4.0	INTERIOR FINISHES	8	8.1	Concrete Walks and Aprons	22
4.1	Floors	9	8.2	Hard Surface Vehicle Roads and Parking	22
4.2	Walls	9	8.3	Soft Landscaping	22
4.3	Doors and Interior Windows	9	9.0	SUMMARY	23
4.4	Ceilings	9	9.1	Renovations and Future Expansions	24
4.5	Public Washrooms and Change Rooms	9	9.2	Recommendations	24
4.6	Public Entrances	9	9.3	Cost Opinion	24
5.0	STRUCTURAL	10	9.4	Future Action	24
5.1	Overview	11	9.5	Conclusions	24
5.2	Conclusion Summary	11	APPENDICES	25	
6.0	MECHANICAL	14	Appendix A – Building Code Review		
6.1	General	15	Appendix B - Component Data Sheets (Room by Room)		
6.2	System Description	16	Appendix C– Drawings		
6.3	Upgrades to Extend Lifecycle of Facility	18	Appendix D – Photographs		
6.4	Appendices	18			

1.0 INTRODUCTION

In December 2010, Barr Ryder Architects and Planners submitted a facility analysis for the Curling club, identifying the current state of the facility at that time. In May of 2014, BR2 Architecture was commissioned by the City of Fort Saskatchewan to review several of the Cities recreational facilities with the Curling club being identified as one of the facilities requiring another review. BR2 was retained provide a renewed visual analysis of the existing Curling Rink facility, identifying if any new issues or deficiencies have arisen since the 2010 report was published..

Constructed in the early to mid 1960s, this recreation building consists of one covered sheet of ice divided into 6 curling playing surfaces (1,380 m²) constructed on grade. Attached at its north end to a two storey change room and administrative component (704 m²) with associated banquet and rental facilities for a total floor area of 2,084 m² and with a building footprint of 1,742 m².

Pedestrian access to the facility is presented at grade via the main entrance centered on the ground floor of the north façade of the two story component. On the east side of the 2 story component, a steel framed deck has been incorporated and includes a stair that leads down to grade. Vehicle access to the playing surface is via a small attached garage addition with overhead doors leading to the exterior and the interior on the east side of the rink.

The two storey component is comprised on the upper floor of a sub-dividable hall suitable for banquets, and includes a kitchen with cold and dry storage and a bar and lounge. Secondary access to the kitchen storage area is via the balcony stair to grade and a dumb waiter to storage below. Support functions on this level include men's and women's washrooms. A storage room is located at the west end of the banquet hall, directly adjacent to an exit stairs to the exterior.

The lower level is comprised of the main Lobby and public stair, two dressing rooms, men's and women's washroom facilities, two offices and several storage areas. In addition, a mechanical room, a furnace room and the ice making plant are located in the northwest corner of this floor.

Over the past 5 years since the previous report was commissioned, limited upgrades or repairs have been performed. The maintenance of the facility is ongoing and has provided the facility with an extended life but every year more issues are encountered from an aging infrastructure. The exterior of the building was clad with prefinished metal panels, which have been extended across several areas that originally were glazed. This metal cladding is holding up well to the elements, however damage is occurring at the ground level in numerous locations, ie corner trim has been pulled away from the building, numerous dents in the siding around the building. This damage is most notable near the exterior access points. Some elements of the facility are however, beginning to reflect their age. As identified in the previous report, numerous deficiencies that do exist, relate to program area expectations, building envelope quality as well as certain requirements relating to the current Alberta Building Code (2006) in particular for exiting, fire ratings, barrier free access, washroom facilities and requirements relating to fire fighting. These deficiencies have not been addressed in any major fashion and still top the list of current deficiencies today.

The objectives identified for this report are the same as the previous report in 2010, to evaluate the following specific conditions:

- .1 Compliance with current building and safety codes.
- .2 Building structure including visual observations of foundations, floor slabs on grade, supporting structures, suspended floors and roof assemblies.
- .3 Building envelope including exterior walls, doors, windows, parapets, fascia, soffit and roofs.
- .4 Interior surface and finishes.
- .5 Mechanical HVAC, plumbing and fire suppression systems.

.6 Electrical power, lighting, low voltage and fire alarm systems.

.7 Exterior site hard and soft landscaping.

A study team was identified comprised of the following:

.1 Building Science and Architectural Review – BR2 Architecture

.2 Structural Review – Protostatix Engineering Consultants Inc.

.3 Mechanical Review – Rienbold Engineering

.4 Electrical Review – MCW Hemisphere Engineering

Representatives of the consultant team toured the existing facility on May 26,2015. The study team observed the exterior and interior of the facility but did not have access to the roof at the time.

The following report utilizes the findings from the 2010 facility evaluation and incorporates any additional findings or changes observed, options identified and recommendations presented.

Cost opinions reflect current construction practices and market costs observed for the 2015 construction period.

1.1 Existing Facility Construction

The building super structure construction system for the front two storey compartment is of combustible and non-combustible construction, sitting on cast-in-place concrete foundations, a cast-in-place slab on grade, with concrete block construction. The roof and second floor are dimensional wood frame construction supported on glulam beams.

The construction of the exterior and interior partitions of the two storey component and the exterior portion of the remainder is predominantly concrete masonry. These masonry walls are for the majority, exposed internally and painted. The demising wall between the two storey component and curling rink is constructed of concrete masonry units and single pane glazing in wooden frames provided the visual access between the viewing / banquet areas and the curling rink ice sheets.



The roof itself and associated flashings were beyond the scope of this visual review but it should be noted that a significant water leak was seen dripping from the ceiling of the ice plant during a rain event back in 2010. BR2 was informed that the roof of this area was upgraded to resolve this issue, and since this repair was completed no further leakage has been observed. The damage left behind from the leaking roof has never been repaired and compromises the fire resistance rating of the roof structure over the mechanical room. Water staining was also noted in several locations throughout the building, however it is difficult to determine if new leaks or staining has occurred since the 2010 report was issued. If these stained ceilings are in areas where no upgrades to the roofing were performed in the past 5 years, it is recommended that further investigations take place to determine their source.

The majority of interior closures are wooden doors in wooden frames including required exit doors, of these doors it was noted that the doors requiring fire resistance ratings do not have ULC labels to indicate the fire resistance rating of the door. From this observation it is assumed that none of these doors carry the necessary rating and therefore would not meet current code requirements.

Exterior doors and windows for the two storey portion are a combination wooden and aluminum windows (main and second floor) and aluminum doors for the main entrance with the remainder of the doors being a combination of steel and wood. Not all of the existing doors in the path of egress are equipped with exit devices and closers. Also the ground floor exit at the north east corner exits to under the upper stair without direct access to outside.

The building is not protected by a sprinkler system.

During the facility tour, it was noted that the building is now used for seasonal activities, with the building being shut down for the summer months, only being opened up if a rental event was scheduled. During the summer months the water is shut off and the building is considered dormant for the most part. During the winter months the facility is opened up and is available for the curling season and any rental bookings as scheduled.



2.0 BUILDING AND SAFETY CODE REVIEW

Building Code Review – 2006 Alberta Building Code (refer to building code review report in Appendix A for a more detailed breakdown of specific code clauses)

Group A, Division 3

Arena

2.1 Specific Code Classification

ABC 2006, 3.2.2.30, Group A, Division 3, 2 up to 2 Storeys

The building is not more than two floors

The building is not sprinklered

The floor area does not exceed 2500 m² [existing building area = 2084 m²]

The building shall be of non-combustible construction

Floor assemblies shall be fire separations and are constructed as a 1 hour fire separation

Load bearing walls, columns and arches shall have a fire resistance rating of not less than 1 hour

Roof assemblies shall have a fire-resistance rating of 45 minutes or be of heavy timber construction

2.2 Noted Non-Conformance

- .1 The existing rink roof requires a 45 fire-resistance rating. A sprinkler system would eliminate this requirement.
- .2 The floor assembly is required to be constructed as a 1 hour fire separation.
- .3 Separations between exit stairs from the upper floor to grade are not constructed as a fire separation and one of the exits from the rink exits through the entrance lobby instead of exiting directly outside as is required by code.
- .4 Closures in required fire separations require fire test labels.
- .5 Stair railings do not conform to the current code as they are below the required height and do not have the required handrail extensions.
- .6 A review of barrier free path of travel and barrier free building entry requirements is required.
- .7 Barrier free access from the main floor to the second floor level is not provided.
- .8 The number of required washroom fixtures is deficient based on the current code. An additional two fixtures are required based on the current areas.

2.3 Recommendations

- .1 Review the existing roof assembly with regard to modifying it to have a 45 minutes fire resistance rating. Installing a sprinkler system may negate this requirement. The requirements of this arena classification in the building code, stipulates that the building must be of non-combustible construction, however this facility is built of a combination of combustible and non-combustible construction and therefore does not meet the root requirements of this classification. Discussion with the Local inspection authority to determine if a variance to this requirement for non-combustible construction is possible, should be undertaken in advance of any further work. This discussion would identify if providing a sprinkler system and other potential life safety upgrades would suffice to grant the variance..
- .2 Review existing floor assembly and modify to conform to 1 hr fire separation.
- .3 Review existing exiting and continuity of exit fire separations and modify to meet code requirements.
- .4 Site test and verify fire resistance conformance of existing doors and affixing the appropriate door and frame labels or remove and replace existing doors and frames with products that will supply the required fire resistance rating.
- .5 Review barrier free path of travel and building entrances in conjunction with any new additions and/or renovations.

- .6 Provide barrier free compliant washrooms and fixture counts to 2006 ABC based on current occupant loads. An additional two fixtures would be required to meet the current code.
- .7 Install a new hydraulic elevator (minimum 2500 lbs.) as part of any expansion or renovation concepts to provide increased service and barrier free accessibility to the facility.

2.4 Existing Facility Area Summary

.1 Upper Level

Corridors
Lounge
Bar
Kitchen
Preparation
Cooler
Corridor
WC
Cooler
Banquet Hall #1
Banquet Hall #2
Storage
Men's Washroom
Woman's Washroom
Stair #1
Stair #2

.2 Lower Level

Entrance Lobby
Office
Dressing Rooms
Office
Storages
Vestibule
Viewing Area
Men's Washroom
Women's Washroom
Mechanical Room
Furnace Room
Ice Plant
Under Stair (void)
Curling Rink
Hold Room

3.0 BUILDING ENVELOPE

3.1 Existing Facility Construction

.1 Original Construction

The original building construction type is cast-in-place concrete foundations and cast-in-place concrete slab on grade. Second floor construction consists of finish flooring on wood framing on glulam beams. Exterior and interior partitions are predominantly constructed of concrete masonry units, exposed and painted on the inside with metal cladding applied to the exterior. The exterior metal cladding was an upgrade to the original building exterior finish and has provided a good barrier to the exterior elements. The roof assembly consists of wooden roof framing supported on glulam beams. The majority of interior closures are hollow wooden doors in wooden frames. Exterior windows are double glazed in wooden frames and the entrance doors are metal with partial glazing and sidelights.

3.2 Observations

.1 Walls

The majority of exterior concrete masonry wall assemblies are in good condition with no evidence of serious cracking or deterioration. Minor re-pointing of masonry grout joints is recommended in selected areas. Metal cladding was added to the exterior as an upgrade and replacement of the original finish. The metal cladding is in good condition with areas of minor dents and some damage to corner trim pieces. Painted coatings are in reasonable condition and while they appear to not need reapplication for the purposes of protecting their underlying surfaces, they could use a refresh for the sake of aesthetics.

Concrete masonry units may be filled with vermiculite loose fill insulation. In most cases vermiculite loose fill insulation is found to contain minor traces of asbestos and if disturbed must be removed under high risk abatement procedures. This study does not include a hazardous material assessment, and it would be a recommendation to perform a hazardous material assessment in order to determine the magnitude of remediation and the potential remediation costs.

The energy performance of the exterior walls is low by current standards. Immediate replacement and/or upgrades are not required, but may be contemplated should a decision be made to make major upgrades or modifications to the facility..

.2 Doors and Windows

Public entrances appear to be original to the building. The existing entrances are showing signs of significant wear and should be scheduled for replacement. Windows are in good service condition with none of the sealed units showing deterioration. Window frames are wood or aluminum and have been maintained in good service condition. However, the energy efficiency of the window units is extremely poor and could be improved upon. Immediate replacement is not required.

.3 Roofs and Parapets

Roofing reports or roof inspections were not available for review. Visual inspection from grade did not reveal any serious deficiencies. Cap flashings appear to be either new or repainted and most likely completed during the recladding of the building.



4.0 INTERIOR FINISHES

4.1 Floors

The visible floor surfaces throughout the facility vary from good to poor service condition. Carpeted surfaces appear to be in medium good serviceable condition but are showing signs of staining and wear. The hardwood floor in the second floor Banquet halls have been maintained well but is showing signs of Shrinking / swelling and cracking in the joints primarily due to fluctuations in humidity. Vinyl Composite Tile areas are showing their age and wear while some cracking of tiled surfaces is evident in several areas. The existing concrete areas in the rink remain in excellent condition.

A limited replacement program for the vinyl composite tile areas would be recommended and some of the concrete floors such as in certain storage areas, would also require repainting. The carpet should be scheduled for a thorough cleaning and then a determination of replacement should be undertaken based on the results and remaining staining and condition after the cleaning.

4.2 Walls

The wall surfaces throughout the facility are predominantly painted concrete block with some limited areas of painted composite wall panels or gypsum board. The majority of the surfaces appear to be in good condition and while not requiring significant remedial work, some selected areas may require touch ups while for others a new coat of paint may be desired in order to refresh them. With the requirement for upgrading of fire rated walls, ceilings and doors, an opportunity to repaint all or major areas of the facility may present itself.

Painted surfaces may originally have been painted with lead based paints given the age of the building but an analysis of any potential hazardous material content is beyond the scope of this study.

4.3 Doors and Interior Windows

Exterior doors, frames and windows throughout the facility vary from good to poor condition. Interior doors and several exterior doors, frames and door hardware should be replaced, particularly those closures requiring fire labels. Some upgrades to the exterior doors have been made, replacing old original doors with metal doors. These doors do not appear to have been painted and it would be recommended to provide a protective coat of paint to these replaced doors. The balance of the doors and frames require hardware upgrades refinishing and repainting at a minimum. Interior glazing appears to be in good condition.

Frames are wooden and appear to have been maintained in good serviceable condition. The window frames could use a fresh coat of paint on those where the finish is starting to deteriorate.

4.4 Ceilings

The majority of the rink area construction is exposed structure and has a clear tinted stained finish that is standing up well. Some areas of water staining is evident, however it is not clear if this is from roof leakage or frost build up and melting, no recent recorded leaks were noted. The majority of the remaining areas have a spray texture finish on gypsum board or painted gypsum board. The spray texture finish is in good condition while the remaining areas of painted gypsum board require some touch up and repainting. Some water spots were observed throughout the building. Further investigation is recommended to determine their source. The main entrance lobby has portions of suspended acoustic ceilings. These are in fair condition and tiles can be replaced as required.

4.5 Public Washrooms and Change Rooms

The washroom areas are in good service condition. The washrooms appear to have had the flooring , counters and wall finishes updated since the last report in 2010. However it does not appear that any modifications in layout has

occurred to accommodate barrier free accessibility. The Change rooms appears to be consistent with the finishes found in the 2010 facility evaluation and are good , some upgrades to the bench seating finishes appear to have been made.

4.6 Public Entrances

The entry areas are in reasonable to fair service condition. Typical wear and staining on the flooring and walls is evident but the finish materials are not damaged to the point of replacement. Cleaning and touch up would restore the area to an acceptable state. Entry doors are in fair condition and the paint finish appears to be maintained well, however the energy efficiency of the units could be improved upon. Immediate replacement is not required.



5.0 STRUCTURAL

5.1 Over view

Existing Fort Saskatchewan Curling Rink building, in Fort Saskatchewan, Alberta, an overall visual inspection was conducted, in order to evaluate the existing condition of the Building. Existing structural drawings were not available at the time of review and therefore, this report is based on an overall visual inspection only.

The facility can be broadly split into two main areas, the rink area and two-storey back office area, consisting of viewing gallery, rest rooms, customer lounge and maintenance rooms.

The rink area: Consists of wooden roof structure with exposed bottom, consisting of Tongue and Groove wooden planks, wood purlins connected with metal hangers to laminated glued wooden beams. These beams were supported by round HSS Steel Columns and on load bearing masonry walls along the perimeter of the building. As mentioned in the previous report's Structural review observations, dated December 14, 2010, the existing wood purlins exhibit noticeable vertical deflections. This may result in the variation of the flatness of the roofing system, in general, for proper draining system. The glued beams in the rink area generally looked to be in good condition and with no excess deflection. It was also observed that there were white stains on a few interior wood purlins in the rink area. This was also recorded in the previous report, but looks like no further investigation or remedial measures were under taken.

The interiors of the perimeter walls and the central steel columns were also seen, to be in good condition and plumb. The rink floor, which appears to be cast-in-situ concrete slab, also looked to be in good condition.

The back area: A two-storey building with a viewing gallery area, rest rooms & customer lounge, looked to be in good condition. The maintenance room for Mechanical and Electrical room floor and roof areas had water some stain in some areas. The main viewing areas, with exposed interior masonry walls, were finished with paintings. There was one area where a water stain was observed in the ceiling of the lobby area on the second storey. This indicated that there may be a leaky portion in the roof area, as there was no access or opened ceilings for further observation.

Some floor stains were noticed in the Mechanical room, but are of no structural concern here. Also, noticed the roof portion of this room, which showed some stained area, probably due to water leak from a pipe as the area above was not accessible.

An overall observation of the external side of the Building indicates that the Building is still in good condition as very little exposed external surfaces were present, at the time of this review and the Building as such is performing as intended. The foundation for the building couldn't be confirmed as there was no as-built drawing made available at the time of Inspection.



5.2 Conclusion Summary

Based on the visual observations, the Curling Rink is in reasonably good structural condition. As the wood structural work, in the rink area roofing, needs to be addressed with the roof to be verified and confirmed for proper draining, due to permanent deflection of the wood purlins, the cost estimation suggested would be around \$ 175,000.00. A Structural Engineer registered in the province of Alberta should be retained for the Design and to produce working drawings for this roof remedial works.

Rest of the structure of the Building appears to be performing as intended with no signs of any in the perimeter walls and in internal masonry walls.

This report is based on visual review and inspection only and the intent here was to determine the overall quality of the existing building and in need for any immediate repair. This review was carried out on a random basis and with no detailed testing of any portion or individual segment of the building was done. Therefore our review report is based on a visual inspection and does not provide any provision for guarantee or warranty of the existing condition of the building.





6.0 MECHANICAL

6.1 General

Purpose of the Report

This report is a summary of the visual inspection performed by Reinbold Engineering Group for the Curling Rink Building @ the Golf and Curling Club Facility located at 9312 102 Street, Fort Saskatchewan, AB. The curling rink is a facility with six sheets of ice with a spectator area, a lounge, kitchen, and office room component.

The intent of the inspection was to determine areas of the mechanical system that have visually evident deterioration and are in need of repair or replacement. The mandate was also to determine in a general way, the overall condition of the mechanical system and identify potential items or issues inherent in the system for consideration.

Methodology

The report incorporates a visual inspection performed on May 28th, 2015 in conjunction with information provided by the facility operators. There were no available record drawings, operations and maintenance manuals for review.

Limitations

Inspections were performed on a random basis with no attempt to review or inspect every element or portion of the building. Our comments are not a guarantee or warranty of any aspect of the condition of the building whatsoever.

The available mechanical record drawings were limited and certain information related to the base building underground sanitary and storm sizing could not be determined. It should be noted that the City of Fort Saskatchewan Facilities does not report any major issues with the building and site drainage.

Cost estimates in this report are typically based on preliminary information, which are influenced by factors such as market conditions. The opinions of probable costs are based on current dollars and subject to change due to market conditions.

Where available, equipment age was determined from equipment labels, drawings, maintenance manuals or comments from maintenance personnel. Where no information was available assumptions were made based on the equipment's general condition. Equipment ages cannot be guaranteed.

Location and identification of asbestos containing materials is beyond the scope of this report.

Codes and Standards

For the purpose of this report, the following applicable codes and standards will be used for evaluation of the building systems:

Alberta Building Code 2006

Alberta Fire Code 2006

National Plumbing Code 2005

Local Building By-Laws

Workers Compensation Board

Canadian Standards Association (CSA)

Canadian Gas Code B-149.1

Canadian Refrigeration Code B-52

Boiler and pressure vessel Act.

National Fire Protection Association (NFPA)

Underwriters' Laboratories of Canada (ULC)

American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE)

Building Overview

The Curling Rink is a two level building incorporating an indoor ice rink facility, lobby area, concessions, and kitchen/lounge areas. Many of the mechanical systems appear to be original and appear to be past their expected life expectancy. During the visit, the facility staff informed us that the chiller plant was currently not working as it experienced a system failure that was beyond repair.

Equipment Life Expectancy

Appendix A contains an excerpt table of median equipment life expectancy table produced by ASHRAE. Facilities which undergo high levels of operation and maintenance of mechanical systems and equipment can allow for longer equipment service lifespan in comparison the tabulated median life spans indicated in the table. Throughout the reports comments regarding the life expectancy of a piece of equipment will be made with respect to the ASHRAE table.

6.2 System Description

Plumbing Systems

Drainage Systems

Storm Drainage Systems

The roof structure is sloped to the exterior of the building and storm water is splashed to grade and is picked up through area drainage on the site.

Sanitary Drainage Systems

At the time of the site review there was no evidence of any problems with the existing sanitary sewer service.

Gas Service

Facility is serviced with low pressure (7") gas. The gas valve is located inside the facility and appears to be in fair condition and suitable for the function of the facility. The gas service may require upgrade and relocation to the outside when any upgrades or renovations are considered.

Domestic Water Cold Water

The Arena has its own dedicated 50mm diameter water service. There are backflow prevention devices installed on the line to the domestic hot water.

Figure 1: No Backflow Device @ Water service



Domestic Hot Water

Domestic hot water for the facility is generated by a single standard efficiency Commercial hot water storage tanks, Model BT 199 Y00N00L10 gas fired natural draft hot water tanks. The water heater has a storage capacity of 325 liters and an input capacity of 179MBH. The tank is located in the mechanical room with the main furnaces. The existing domestic hot water system appears to be past its service life and should be considered for replacement. A second power vented water heater abandoned was also found on site.

Figure 2: Domestic Hot Water Tank



A domestic hot water re-circulation system is provided to ensure timely delivery of hot water to the plumbing fixtures. The existing recirculation unit to the tank has been disconnected and is currently out of service. It is recommended that the recirculation system be replaced with the domestic hot water system replacement.

Figure 3: Domestic Hot Water Tank Disconnected Recirculation System



Plumbing Fixtures

Flush tank water closets are used in the public washrooms. The water closets are floor mounted and appear to be in good condition. Implementation of converting to a low flow fixtures can be considered.

Manual flush valve floor mount urinals are located in the Men's washroom. The urinals appear to be in good condition. Implementation of converting to a low flow infrared fixtures can be considered.

Lavatories and manual faucets are used in the washrooms and appear to be in good condition. Implementation of converting to a low Infrared flow fixtures can be considered.

Beer Distribution system

An existing beer distribution system was found on site that is no longer operational and has been abandoned.

Heating Ventilation and Air Conditioning (HVAC)

The facility utilizes a total of 4 furnaces to service the building. Three main furnaces are located in the main mechanical room and services the lobby, the main floor spectator area, the upper lounge and kitchen. The fourth furnace resides in the west side of the facility which services the west upper lounge area. The main furnaces are identical (heating only) with a heating input of 150MBH each and the fourth furnace with an input of 115 MBH. Ductwork distribution could not be reviewed to determine the condition however some of the existing distribution was noted to be buried ductwork. Consultation with facilities indicated that no concerns regarding standing water in the ductwork has been overserved over the years. Replacement of the furnaces should include a study to verify that current codes and standards for minimum ventilation rates are satisfied.

The furnaces do not include any cooling fans, however an existing transfer air system that transfers cold ice rink air into the second floor lounge is present. This would allow cooling for the upper lounge area. Discussion with facilities indicates that the unit is currently not in service.

The curling rink also utilizes destratification fans. The operation could not be verified but the units appear to be in fair to good condition.

Figure 4: Main Furnaces



Gas Fired Unit Heaters

The curling rink is serviced with four gas fired unit heaters at each corner of the rink. Nameplate data could not be attained from the units due to accessibility limitations. Two of the four unit appear to have been replaced from original. The units appear to be in fair to good condition.

Figure 7: Infrared Heaters



Kitchen Ventilation

The second floor kitchen utilizes a makeup air unit paired to the exhaust fan. The exhaust and makeup air systems could not be accessed to review the nameplate data and condition however the system was started up and appeared to be functioning.

Arena Ventilation

The curling rink is serviced with two ventilation fans exhaust fans paired to two intake louvers located on the opposite side of the curling rink. Access to the unit was limited and the nameplate data could not be accessed to verify capacity. Any updates to the ventilation units should include a study to confirm that the current code requirements for ventilation are satisfied.

Figure 8: Ventilation Fan



Chiller Plant

The main ammonia chiller plant is located within a dedicated room that has refrigerant monitoring and alarms. The chiller plant utilizes a water cooled system that incorporates original equipment such as: Cooling Tower, water conditioning equipment, CIMCO reciprocating compressors, belt driven with motors, shell and tube heat exchangers and distribution pumping. The chiller plant had recently suffered a catastrophic failure and has been decommissioned at the time of review. Due to the age of the equipment, it is recommended ALL original equipment be demolished and replaced with a new air cooled chiller plant complete with digital controls and refrigeration monitoring system.

Figure 10: Chiller plant



Figure 11: Cooling Tower



Fire Protection

Portable hand held fire extinguishers are provided. The building is not presently equipped with an automatic fire sprinkler system.

The kitchen hood utilizes a hood suppression system that appears to be in fair/good condition.

6.3 Upgrades to Extend Lifecycle of Facility

The following is a list of suggested repairs and upgrades for the building based on the building review. Please note that the approximate cost is to be used as a guide to establish the order of magnitude, and the time frame is a general recommendation to assist in cash flow planning. Actual construction costs may vary due to market conditions. Opinions of probable costs cannot be guaranteed.

Item	Time Frame (Years)	Approximate Cost, Installed
Replace Chiller Plant	0 (Immediately)	\$250,000
Add Backflow Prevention Device on Water Service	0-5	\$12,000
Replace Domestic Hot Water Heater	0-5	\$3,000
Replace Recirculation system	0-5	\$2,000
Convert Fixtures to low flow (IR)	3-5	\$8,000
Replace Furnaces and Kitchen Makeup Air	3-5	\$25,000
Replace Gas fired Unit heaters	5-10	\$10,000

6.4 Appendices

**APPENDIX A
ASHRAE – Estimates of Expected Service Lives of Various System Components**

Owning and Operating Costs 37.3

Table 4 Comparison of Service Life Estimates

Equipment Item	Median Service Life, Years		Equipment Item	Median Service Life, Years		Equipment Item	Median Service Life, Years	
	Abramson et al. (2005)	Akalin (1978)		Abramson et al. (2005)	Akalin (1978)		Abramson et al. (2005)	Akalin (1978)
Air Conditioners			Air Terminals			Condensers		
Window unit	N/A*	10	Diffusers, grilles, and registers	N/A*	27	Air-cooled	N/A*	20
Residential single or split package	N/A*	15	Induction and fan-coil units	N/A*	20	Evaporative	N/A*	20
Commercial through-the-wall	N/A*	15	VAV and double-duct boxes	N/A*	20	Insulation		
Water-cooled package	>24	15	Air washers	N/A*	17	Molded	N/A*	20
Heat pumps			Ductwork	N/A*	30	Blanket	N/A*	24
Residential air-to-air	N/A*	15 ^b	Dampers	N/A*	20	Pumps		
Commercial air-to-air	N/A*	15	Fans	N/A*		Base-mounted	N/A*	20
Commercial water-to-air	>24	19	Centrifugal	N/A*	25	Pipe-mounted	N/A*	10
Roof-top air conditioners			Axial	N/A*	20	Sump and well	N/A*	10
Single-zone	N/A*	15	Propeller	N/A*	15	Condensate	N/A*	15
Multizone	N/A*	15	Ventilating roof-mounted	N/A*	20	Reciprocating engines	N/A*	20
Boilers, Hot-Water (Steam)			Coils			Steam turbines	N/A*	30
Steel water-tube	>22	24 (30)	DX, water, or steam	N/A*	20	Electric motors	N/A*	18
Steel fire-tube		25 (25)	Electric	N/A*	15	Motor starters	N/A*	17
Cast iron	N/A*	35 (30)	Heat Exchangers			Electric transformers	N/A*	30
Electric	N/A*	15	Shell-and-tube	N/A*	24	Controls		
Burners	N/A*	21	Reciprocating compressors	N/A*	20	Pneumatic	N/A*	20
Furnaces			Packaged Chillers			Electric	N/A*	16
Gas- or oil-fired	N/A*	18	Reciprocating	N/A*	20	Electronic	N/A*	15
Unit heaters			Centrifugal	>25	23	Valve actuators		
Gas or electric	N/A*	13	Absorption	N/A*	23	Hydraulic	N/A*	15
Hot-water or steam	N/A*	20	Cooling Towers			Pneumatic	N/A*	20
Radiant heaters			Galvanized metal	>22	20	Self-contained		10
Electric	N/A*	10	Wood	N/A*	20			
Hot-water or steam	N/A*	25	Ceramic	N/A*	34			

*N/A: Not enough data yet in Abramson et al. (2005). Note that data from Akalin (1978) for these categories may be outdated and not statistically relevant. Use these data with caution until enough updated data are accumulated in Abramson et al.

7.0 ELECTRICAL

7.1 Introduction

A building walk-through was carried out on May 26, 2015 and the following report outlines briefly the extent of the various electrical systems in the facility, and outlines where deficiencies exist.

7.2 Power Service and Distribution

The existing power service to the building is rated at 400 amps, 120/208Volt, 3 phase, 4 wire, and is serviced from the west lane from a service pole underground to the facility.

The main distribution consists of a main switch and gutter arrangement consisting of many different manufacturers.

Within this arrangement are two utility meters of which we assume are for the main building and the Ice Plant. On the east side of the building is another utility meter with a small square D branch circuit panel mounted on the exterior of the building. Branch circuit panels within the facility are full and have no spare breaker space.

All of the above electrical distribution is original 1960 equipment. Replacement parts are not longer available.

Recommendation:

Provide a switchgear complete with moulded case main breaker, distribution section complete with moulded case breakers and TVSS unit. Provide all new 42 circuit branch panels throughout.

7.3 Telephone Service and Distribution

The existing telephone service enters the building overhead from the west lane, and runs to a telephone terminal board in the Electrical Room.

7.4 Lighting

Lighting throughout the facility consists of T12 2 lamp tandem strip lights for the curling rink and surface mounted 2 lamp T12 fixtures in common areas.

Second floor lounge area consists of incandescent fixtures. The exterior of the building has two lamp incandescent fixtures controlled by motion sensors of which are not working. Without further investigation we are assuming the branch wiring to all the lighting throughout the facility is original and is rated at 75 degrees. To meet current codes, all lighting branch wiring should be rated at 90 degrees X-link.

Recommendation:

Replace all existing fixtures with new T8 lamps in common areas and T5HO in the curling rink, and replace all branch wiring for lighting.

7.5 Emergency Lighting and Exit Lighting

The emergency lighting and exit lights appear to be original. Some areas of the building fall short in reference to emergency lighting levels and building exit signage.

Recommendation:

Replace all emergency lighting units and remove heads with new LED self-test units. Replace all exit lights with new LED type tied into the emergency battery packs.

7.6 Fire Alarm System

Fire alarm system is present within the facility is manufactured by Edwards and appears to be a single zone system utilizing pull stations and 10' bells.

The curling rink area does not have any bells or pull stations located at the exits. Other areas on the second floor are lacking in fire alarm devices.

Recommendation:

Replace the entire fire alarm system with a new addressable system complete with horn, strobes, pull stations, and heat detectors.

7.7 Security System

A security system is present in the facility as manufactured by NOMA, and consists of motion sensors and three key pads.

Recommendation:

System to be reviewed by Owner.

7.8 Budget

Power Service and Distribution	\$25,000
Telephone Service and Distribution	Owner
Lighting and Branch Wiring	\$75,000
Emergency Lighting and Exit Lighting	\$6,500
Fire Alarm System Including Testing and Verification	\$25,000
Miscellaneous New Mechanical Loads	<u>\$15,000</u>
Total	\$146,500

8.0 EXTERIOR

8.1 Concrete Walks and Aprons

Hard landscaped surfaces are generally in fair to good condition. Concrete sidewalks and aprons at major building entrances in a few instances have settled slightly and need to be reviewed with respect to being a tripping hazard. The paver stones leading from the parking lot to the main entrance are in good condition and are not posing any hazards at this time.

8.2 Hard Surface Vehicle Roads and Parking

Hard landscaped surfaces are generally in fair to good condition. Slight undulations of parking lot surfaces is evident. Wet weather conditions could result in some ponding. Some of the concrete curbs have incurred minor damage due to snow clearing operations but are generally in serviceable condition.

8.3 Soft Landscaping

Soft landscaped areas, including sod, planting and trees are mature in condition. It is evident that this site has not received attention thru the summer months for watering, restoration or adequate maintenance. At the time of review, the front landscape beds along the building did not have many plants and landscape fabric was showing thru the soil in numerous areas. The grass areas in front of the building are patchy and over grown with weeds and would need complete restoration in order to bring them up to an acceptable level. The remainder of the planting beds and shrubbery have not been pruned or weeded for sometime and are now overgrown. A complete removal and replanting would be recommended in order to bring these areas back to acceptable standards. Future expansions of building areas and fire access lanes may disrupt existing mature landscaping. Therefore if plans for addition / expansion are contemplated, it would be recommended to review the overall landscape design at that time and perform the restoration then. In the mean time, pruning, cleaning, addition of topsoil and some new plantings and ground cover would suffice to revitalize the landscaped portions of the site.

The roof of the facility is drained via rain water leaders splashing to grade level concrete splash pads. There are numerous down spouts that are disconnected and missing parts and do not have concrete splash pads. The missing parts are impairing the ability of system to direct the rain water away from the building, thereby creating the potential for water infiltration and damage to the building. It is recommended that the rain water down spouts and splash pads be repaired and placed in order to protect the facility from the effects of water migrating back towards the building.



9.0 SUMMARY

9.1 Renovations and Future Expansions

The Curling rink is currently part of a larger investigation in to the master recreational plan for the City of Fort Saskatchewan. The impact of any work and its interface to existing systems should be considered in the light of any requirement for future expansions at this or adjacent sites. Some work will require modifications of existing building structure, finishes and systems that have been recommended for replacement, service or upgrading. Consideration should be given to incorporating into any new construction budget the cost opinions identified in the data sheets for those areas scheduled for rework or interface as the result of any potential future upgrades / additions.

In order to meet the barrier free accessibility requirements of the 2006 Alberta Building Code, modifications to the washrooms would be required. Without providing additional space to the facility for these revisions, current floor/program area would need to be reallocated and rededicated to the new enlarged washrooms, potentially impacting public areas and operations. The second part of providing barrier free accessibility, would be the requirement for access to the 2nd floor. This access strategy would most likely include the requirement to add an elevator to the building in some form, and will impact the circulation and programming of certain spaces depending on the location chosen.

Should it be decided to perform a major renovation to this facility, it would be expected that the building could be out of commission for approximately 1 year, possibly longer depending on the abatement of hazardous materials and the scope of the renovation and or additions. If this was the desired go forward plan, the City would need to review the operations of the curling rink and determine if and how they would service the needs of the community and the curling patrons while this facility is closed.

9.2 Recommendations

A clear direction on the proposed future of the curling rink should be identified and mapped out so that more accurate budgets could be established for all components identified as code deficient and/or in need of replacement. A schedule of upgrades and replacements of components not directly impacted by potential new construction can be identified at the owner’s discretion and an implementation plan identified. Code upgrades should take precedence.

9.3 Cost Opinion

•	Building Exterior Upgrades		
-	Doors and Hardware	\$	10,000.00
-	Landscaping	\$	45,000.00
•	Building Interior Upgrades (priority and code required)		
-	Doors and Hardware	\$	45,000.00
-	Elevator	\$	225,000.00
-	Washrooms	\$	135,000.00
-	Stairs/Circulation/Floor assembly fire separation	\$	350,000.00
-	New ice plant enclosure (incl. demolition)	\$	265,000.00
•	Building Structural Systems Upgrade	\$	175,000.00
•	Building Mechanical Systems Upgrade	\$	310,000.00
-	Automated Sprinkler System.	\$	210,000.00

•	Building Electrical Upgrade	\$	146,500.00
	Design contingency (10%)		\$191,650.00
	Construction Contingency (15%)		\$287,475.00
	Total Building Upgrade Cost Opinion	\$	<u>2,395,625.00</u>

9.4 Future Action

- .1 Once a go forward plan has been decided upon, an focused review of the existing building structural, mechanical and electrical systems is recommended dedicated to the anticipated modifications contemplated. With the decision to upgrade or modify certain parts of the facility, an in depth and concentrated review of these specific areas can be performed.
- .2 A review of possible future building expansions and associated potential schedules is recommended.
- .3 A Hazardous Materials Assessment is recommended to identify any sources of hazardous materials present in the existing building.

9.5 Conclusions

Overall, the facility has been maintained in serviceable condition and continues to be looked at as an asset. However the current attention paid to the facility is meant to examine and deal with issues as they arise, and would not be considered preventative maintenance that looks forward to preserving this building for the long term future, While some elements of the facility are beginning to reflect their age and are not up to the current building code, unless a major changes are contemplated, building code upgrades are not required at the present time other than those relating to exiting. Those deficiencies that do exist are those relating to Community universal access, program area expectations and current technologies. For example, the change rooms lack proper ventilation, the building envelope does not achieve current energy efficiencies and the second floor level and public washrooms are not barrier free accessible.

Should the building be renovated to bring the facility up to current standards and codes, the facility would also see a result in service improvements. An elevator would provide convenient access between floors and the required washroom facilities and barrier free design would provide additional opportunities and ease of access throughout. The opportunity exists to realize energy savings through building envelope upgrades including, energy efficient windows, increased wall and roof insulation values and insulated doors.

It is recommended that this facility be reviewed in conjunction with the overall recreation master plan for the City and take into account all that is potentially planned for this and other facilities in the City of Fort Saskatchewan. Once the Curling Rink has been placed into the overall thoughts and vision for the City of Fort Saskatchewan recreation fabric, a detailed and comprehensive review can be made directly related to the improvements desired and budgeted.

Building Code Review

Project: Curling Club facility

Date: June 02, 2015

Applicable Building Code: 2006 Alberta Building Code

Occupancy Classification:

Classification:

3.2.2.30, Group A, Division 3, 2 up to 2 Storeys

A building classified as Group A, Division 3, is permitted to conform to sentence (2) provided

- a. It is not more than 2 storeys in building height.
Building conforms as it is 2 storey in height
 - b. Has a building area not more than found in table 3.2.2.30(1) –
Building conforms to floor area 2084m² < 2500m²
 - i. 4000m² one storey, facing 1 street
 - ii. 5000m², one storey, facing 2 streets
 - iii. 6000m², one storey, facing 3 streets.
 - iv. 2000m², 2 storeys, facing 1 street
 - v. 2500m², 2 storeys, facing 2 streets
 - vi. 3000m², 2 storeys, facing 3 streets.
- 2) The building referred to in sentence (1) is permitted to be of or non-combustible construction and
(building does not conform as it is of combustible and non combustible construction)
- a. Floor assemblies shall be Fire Separations with a fire-resistance rating not less than 1 hr,
Building does not conform as there appears to be numerous locations of unprotected floor structure.
 - b. Mezzanines shall have a Fire-resistance rating not less than 1 hr.
 - c. Roof assemblies shall
 - i. Have a fire resistance rating not less than 45 mins, or
 - ii. be of heavy timber construction and
Does not conform, main structure is of heavy timber but the infill structure is standard conventional framing sections.
 - d. Loadbearing walls, columns and arches supporting an assembly required to have a fire resistance rating not less than that required for the supported assembly, except that arches and structural members within the storey

immediately below a roof assembly are permitted to be of heavy timber.

Does not conform – columns appear to be unrated.

- 3) If intended for occasional use of trade shows and similar exhibition purposes, a building referred to in sentence (1) that is more than 1500m² in building area shall be sprinklered throughout.

Would not conform as the area is more than 1500m² and is not sprinklered.

Number of Storeys:	2 (Above grade)
Building Area	2084 m ² total 1742 m ² main 342 m ² second
Type of Construction:	combustible & non-combustible
Sprinklers:	No
Floor Assembly Separation:	Not rated

Interconnected floor requirements: Per article 3.2.8. – Not applicable

Number of Streets Facing: Per article 3.2.2.10(1) – Facing 2 streets

Sprinklers: Per article 3.2.2.30 – not required

Spatial separation and exposure protection: Per article 3.2.3.1 – Building is set back from property lines more than 9m (the limiting distance for 100% openings)

Component Fire Separation:

<i>Stairs and Exits:</i>	Per article 3.4.4.1.(1) – 1 hr rating required Does not Conform – ratings are not in place
<i>Janitors' Rooms:</i>	Per article 3.3.1.21.(3) - 1 hr rating required Does not Conform – ratings are not in place
<i>Storage Rooms:</i>	Per article 3.3.1.26 – 1 hr rating required

Does not Conform – ratings are not in place

Fuel Fired Appliance

Service room:

Per article 3.6.2.1.(1) – 1 hr fire rating required

Does not Conform – ratings are not in place

Access for Firefighting:

Per article 3.2.5.1. – building is not sprinklered – Appears to conform

Per article 3.2.5.2. – Not applicable – building has no basement

Per article 3.2.5.3. – not applicable – building is not more than 3 storeys in height

Per article 3.2.5.4. – Access route required – appears to conform

Per article 3.2.5.5.

(a) Access required to principal entrance within 3m and 15m. – appears to conform

(b) A Fire Department connection, & a hydrant located in conformance with article 3.2.5.5.(2) shall be provided.

(c) Unobstructed path of travel for the fire fighter from the vehicle to the building is not more than 45 m. – appears to conform

Fire alarm and Detection Systems: Per article 3.2.4.1.(1) -

a fire alarm system shall be installed in a *building* in which an automatic *sprinkler* system is installed. **Would be required if a sprinkler system was added.**

Exiting and Means of Egress:

Number of Exits:

Per articles 3.3.1.5. and 3.4.2.1.(1) every *floor area*

Intended for occupancy shall be served by at least two exits where:

a) *Occupant load* more than 60 or

b) *Area travel distance* exceeds 25m or

c) *Area of room or suite* is greater than 200 sq.m.

- exits conform for travel distance and capacity, however the lack of fire ratings and adjacency of storage rooms makes the fire exits non conforming to the code.

Service Room Exit:

Per article 3.3.1.3.7 Two points of egress shall be provided for a *service space* referred to in Sentence 3.2.1.1.(8) if

a) the area is more than 200sq.m, or

b) the travel distance measured from any point in the *service space* is more than 25m.

not applicable.

Exit Width:

doorways: 6.1mm/person based on posted occupancy. 3.4.3.4.(1)(a)

Travel Distance to Exit:

Per article 3.4.2.5.(1)(c) – 45 m in a floor area that contains an occupancy other than high hazard industrial occupancy, provided it is sprinklered throughout

- appears to conform

Corridors:

Corridor Width:

Per article 3.3.1.9.(1) – minimum corridor width – 1100 mm - appears to conform

Dead End Corridor:

Per article 3.3.1.9.(7) – 3m max. dead end corridor length appears to conform

Washroom Requirements:

Current washroom fixture counts do not meet the required number of fixtures are designated in the current building code. An additional 2 fixtures would need to be added to meet Building code requirements.

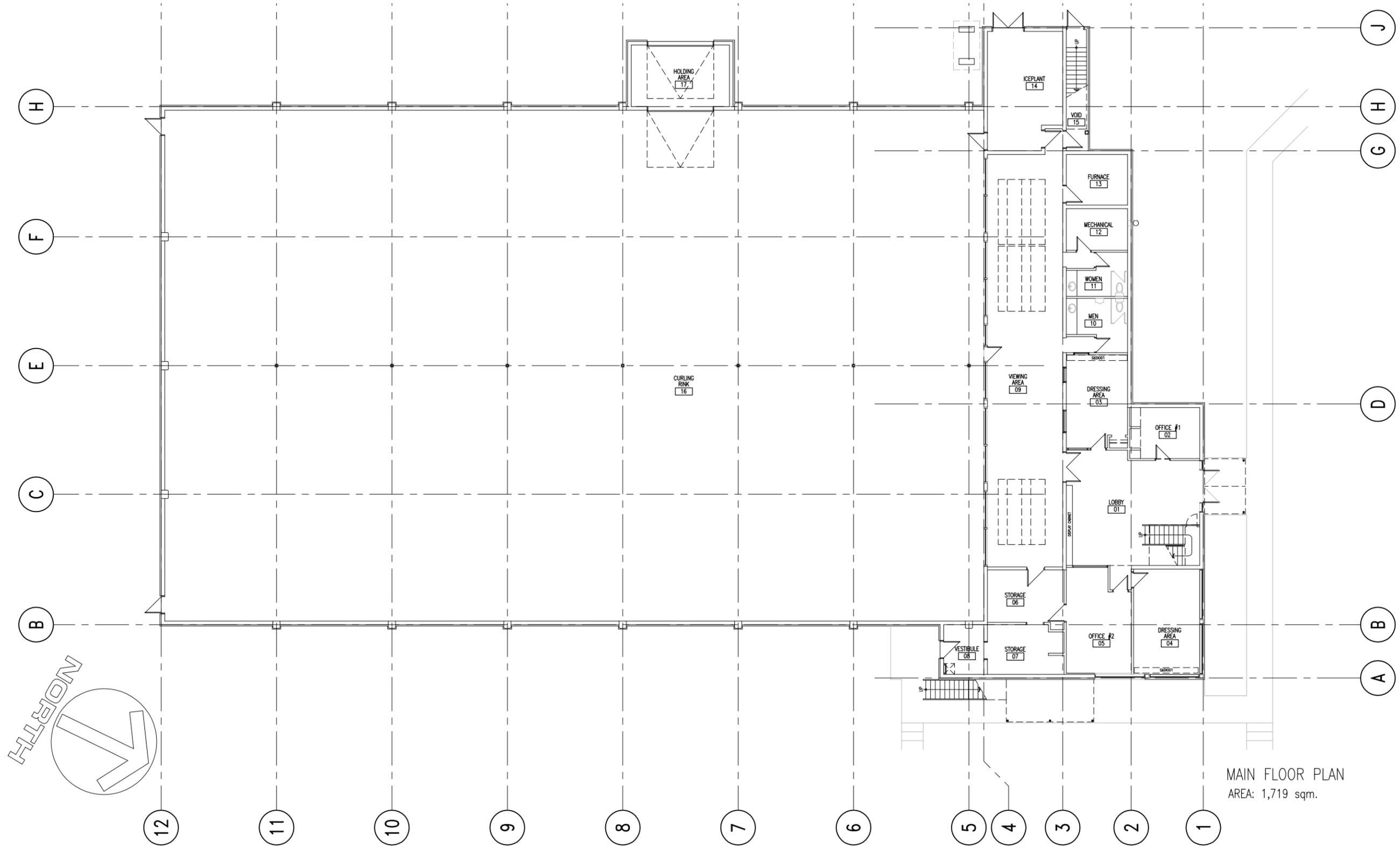
Barrier Free Requirements:

The *building* is subject to the requirements of Section 3.8.

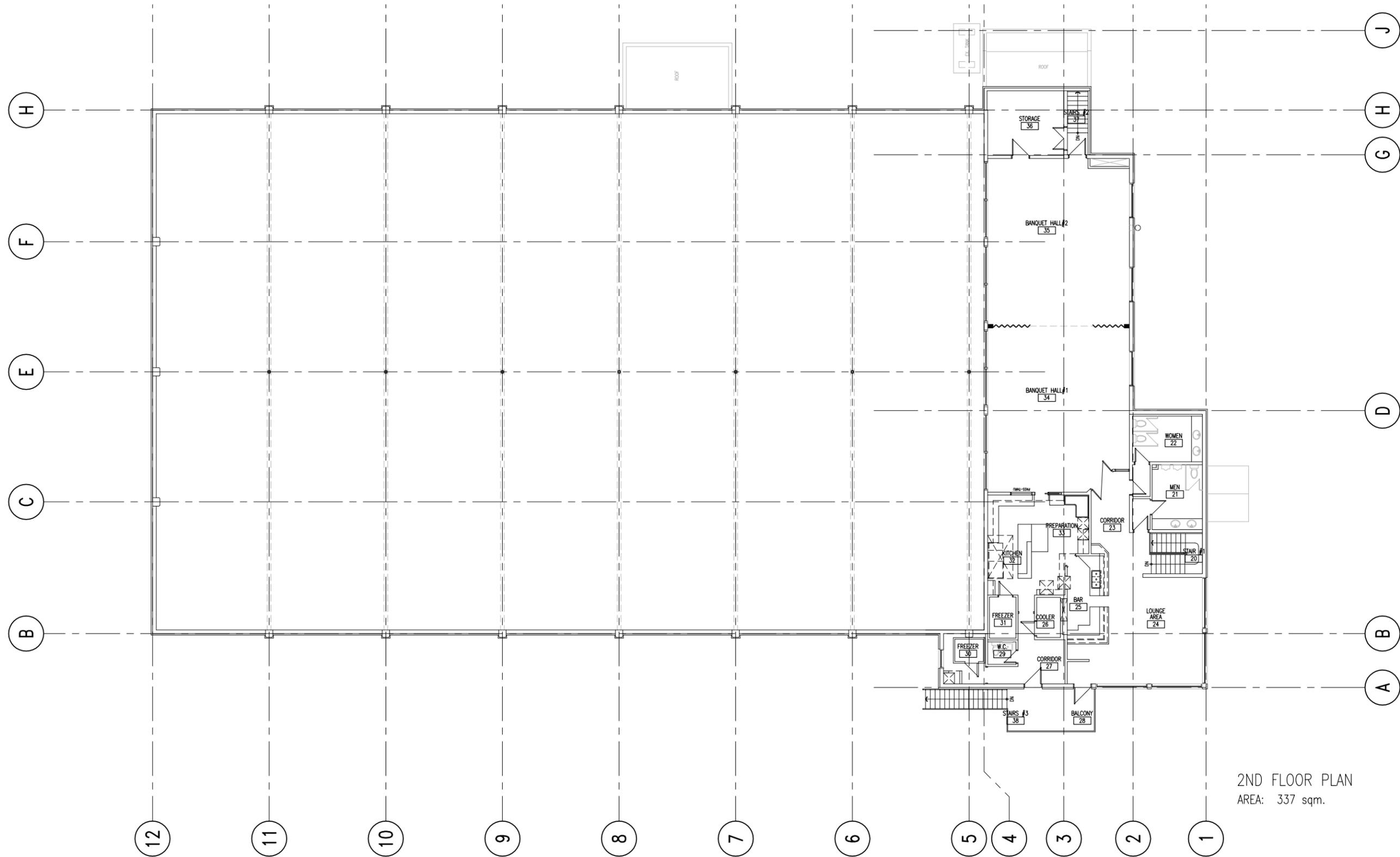
Does not Conform

- Barrier free access is not provided to the 2nd floor.

- Washrooms are not barrier free



MAIN FLOOR PLAN
AREA: 1,719 sqm.



2ND FLOOR PLAN
AREA: 337 sqm.



North Elevation



Northeast Elevation



South Elevation



East Elevation



West Elevation

APPENDIX D – PHOTOGRAPHS



Dressing Room #3



Dressing Room #4



Storage Room #7



Viewing Area #9



Women's Washroom #11

APPENDIX D – PHOTOGRAPHS



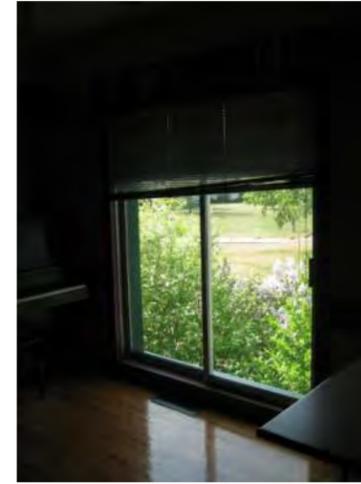
Mechanical Room #12



Ice Plant #14



Curling Rink #16



Curling Rink #16



Men's Washroom #21



Women's Washroom #22



Corridor #23



Lounge Area #24



Barr #25



Freezer #30



Freezer #31



Kitchen #32

APPENDIX D – PHOTOGRAPHS



Preparation #33



Banquet Halls #33 and #34



Storage #36



Exterior Landscape





Holding Area