TOWN OF SWAN RIVER

SWAN RIVER CENTENNIAL ARENA ASSESSMENT AND RECOMMENDATIONS

CONFIDENTIAL

October 30, 2018

SWAN RIVER CENTENNIAL ARENA

ASSESSMENT AND RECOMMENDATIONS

TOWN OF SWAN RIVER

CONFIDENTIAL

PROJECT NO.: 181-10207-00
DATE: OCTOBER 30, 2018

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October 30, 2018

CONFIDENTIAL

Patti Henkelman, General Manager
Recreation Department - Town of Swan River
439 Main Street
Swan River, MB
R0L 1Z0
SVRec@townsr.ca

Dear Patti,

Subject: Swan River Centennial Arena
Assessment & Recommendations – Final Report

We are pleased to submit 10 copies of this report regarding the recent assessment at the Swan River Centennial Arena located at 221 9th Ave N in Swan River, Manitoba.

If you should have any questions or concerns, or require any further assistance, please contact our office at your convenience.

We very much appreciated the opportunity to meet with you and assist your Department and the Town with this review.

Yours sincerely,

Lou Anna Roberts, C.E.T,
Project Manager, Building Sciences

WSP ref.: 181-10207-00

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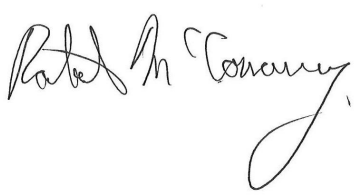
SIGNATURES

PREPARED BY



October 30, 2018

Bob McConomy, P. Eng.
Sr. Director, Mechanical & Electrical MB

Date

APPROVED[1] BY

October 30, 2018

Doug Clark, FCSLA, MCIP, LEED©AP BD+C
Sr. Manager: Building Sciences

Date

1 INTRODUCTION

1.1 AUTHORIZATION

This report was prepared at the request of the Town of Swan River in according with our proposal dated June 28, 2018 to conduct an assessment of the Centennial Arena (Arena)

1.2 SCOPE OF WORK

The purpose of our Assessment and Recommendations report is in response to the RFP issued by the Town of Swan River requesting an assessment of the Arena to identify the condition of mechanical, electrical and structural components and provide recommendations for improvements. This report is to provide Town Council with prioritized recommendations to make informed future capital spending decisions. The assessment focussed on the major building elements of the Building Envelope, Mechanical, Electrical, and Structural components in the arena. As per the RFP – a code review was not included in the scope of work.

1.3 PROJECT TEAM

The Project was undertaken by the Building Sciences group of WSP Canada Inc. managed by Mr. Doug Clark. The multi-discipline project team included Lou Anna Roberts, C.E.T., Project Manager and Bobbi Nicol-Cote C. Tech. (Arch) of the Building Sciences group, Bob McConomy, P. Eng., Mechanical Group Manager, Tim Peters, P. Eng. and Rick Brannan, P. Eng., Structural Group, and Mr. Edwin Sapnu, P. Eng., Electrical Lead.

1.4 METHODOLOGY

1.4.1 PROJECT START-UP

The project included a start-up meeting which was held on site on July 31, 2018 immediately followed by a building walkthrough attended by Patti Henkelman, General Manager of Recreation, Hugh Hunt, Arena Supervisor, John Rooks, former Arena Supervisor and Bobbi Nicol-Cote and Tim Peters of WSP.

1.4.2 AVAILABLE DOCUMENTATION

A review of client-supplied documents was undertaken. This included available building plans, history of major repairs/upgrades provided by the client and contact information for service companies contracted at the Arena.

1.4.3 SITE REVIEW

The WSP team continued their site assessment on August 1, 2018 with visual review, field documentation and photographs of the identified building elements.

1.4.4 ASSESSMENT AND ANALYSIS OF DATA.

The assessment data and results were analyzed to develop the Capital Expenditures Projections – Opinion of Probable Costs table based on the site assessments. (refer to Appendix C) At this time we did not include reference to on-going anticipated Maintenance items that would normally be encountered and dealt with by Swan River staff or outside maintenance providers. The site assessment rating system categorized the specific discipline elements into the following "Current Condition" statuses:

1.4.4.1 PRIORITY 1

A component or element assessed as Current Condition **PRIORITY "1"** was in our opinion a component or element assessed to:

- Appear to be in a condition that requires immediate repair or replacement due to concerns that it is either unsafe, inoperable, or poses an apparent health and/or safety risk to the building operators or occupants or requires further assessment by an outside agency or authority having jurisdiction. In addition, we have included items in Priority 1 that are integral to the vital operations of the facility. (Such as being able to maintain a consistent and functioning ice surface during the Junior Hockey team's practise and scheduled season.)

Component or elements identified as Current Condition **PRIORITY** "**1"** have had budget dollars allotted in the early years of the Capital Expenditures Projections Table.

1.4.4.2 PRIORITY 2

A component or element assessed as Current Condition **PRIORITY "2"** was in our opinion a component or element assessed to:

- Appear to be in a condition that is anticipated to require repair/replacement within the upcoming 2-5 year time period.

Component or elements identified as Current Condition **PRIORITY "2"** have had budget dollars allotted in the Capital Expenditures Projections table.

1.4.4.3 PRIORITY 3

A component or element assessed as Current Condition **PRIORITY "3"** was in our opinion a component or element assessed to have been either:

- Maintained satisfactorily to date but is less than 10 years from the end of its useable life expectancy, or;
- Appears to be in a condition that is anticipated to require repair/replacement within the future 6-10 year time period.

Component or elements identified as Current Condition **PRIORITY "3"** have had budget dollars allotted in the Capital Expenditures Projections table.

1.4.4.4 REMAINING PRIORITIES

Remaining items were in our opinion a component or element assessed to have been maintained satisfactorily to date and appears to be at its present equivalent position in its projected life expectancy. (With the remaining life expectancy anticipated to be greater than 10 years from this date of assessment.) It is not anticipated that this particular component or element will require major repair or replacement within the 10-year project time period of this financial forecasting and have not been included in the funding projects identified.

1.4.5 REPORT

A draft report was submitted for client review and for presentation to the Town Council meeting on September 18, 2018. Edits to the draft report will be incorporated into the final report which is planned to be issued to client in early October 2018.

1.5 FACILITY DESCRIPTION

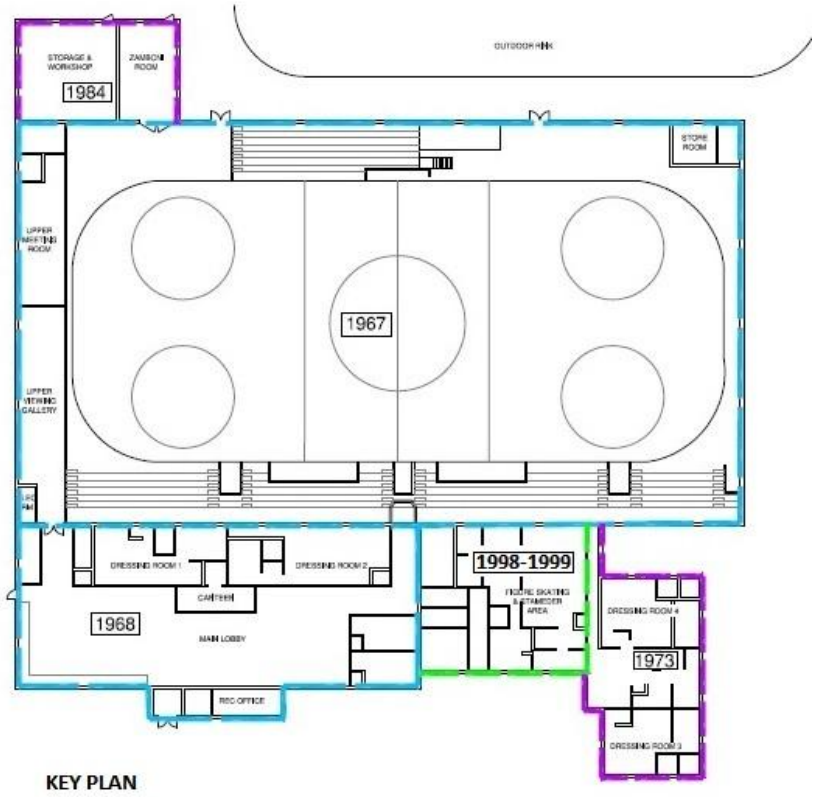
The Arena is located at 221 9th Ave N in Swan River, Manitoba. It was originally constructed a single sheet natural ice facility in 1967. Additions were constructed to the building in 1968, 1973, 1984 and 1998/1999. The Arena is currently home to a Junior A hockey team (Swan Valley Stampeders) as well as minor hockey and figure skating clubs. The Arena is also used by various other groups such as the schools and old-timer hockey teams. The facility is occasionally used in the summer for dances, roller hockey, meetings and banquets. The Swan River Agricultural Society utilizes the Arena for their annual Northwest Roundup and Exhibition usually in July.

The Arena has 4 dressing rooms, a figure skating change room as well as dressing room and office space for the junior hockey team. There is capacity for up to 1400 spectators during ice use and up to 1000 patrons for a social/dance. There is also office space for staff, a heated viewing area and licensed viewing lounge.

A renovation was done in 2005 which included replacing flooring in the lobby and change rooms. The freon ice plant was also replaced at that time.

For general reference we have included a Key Plan of the overall facility in Appendix B and herein.

- The original Arena Building is outlined and referenced as being built in 1967. The other additions are referenced in our report and on the Key Plan as follows:
  - The 1968 Addition
  - The 1973 Addition
  - The 1984 Addition
  - The 1998/99 Addition



1.6 BACKGROUND INFORMATION

As reported by the client in the Request for Proposal document – the Arena ice surface rink slab is the biggest issue at present. The slab has been heaving in the south-west corner and has caused many cracks in the concrete. It is becoming increasingly difficult to install and maintain quality ice due to this situation. At present, there is up to a 3" difference in the ice thickness. Previously, ice was not installed until late September each year, but in 1999 the junior A hockey team was started and ice making now begins in early August and usually runs until the end of March. We have been advised that it usually takes the entire month of August to produce ice and that there are consistent leaks within the in slab refrigerant lines.

It is our understanding that the client has been provided with previous reports and studies from 2001 that have examined the rink slab situation. (We have referenced this information in Section 1.9.1.) This situation is compounded when the ice-making season is extended longer than the original design expectation of the building. The most common situation is when there is frost upheaval and subsequent settlement and thawing as well as swelling/shrinking of soils susceptible to volume changes with moisture variation. Remediation design and suggested details were recommended and documented in a previous Geotechnical Report. We believe this information is still relevant.

1.7 GENERAL COMPONENT DESCRIPTIONS

The following component descriptions are for the general construction and systems of the building. Specific variations and details are discussed under the Priority Ratings sections.

1.7.1 BUILDING ENVELOPE

1.7.1.1 *ARENA BUILDING*

The original Arena building structure was a pre-engineered steel frame structure, built in 1967 with a perimeter concrete slab and arena boards around a natural ice surface. The roof finish is exposed steel roof cladding over steel structure and foil backed blanket insulation serving as a reflective blanket between the purlins. Exterior walls are clad with pre-finished steel sheet metal cladding panels. The interior is primarily drywall and plywood and the level of insulation – if any – is unknown at this time due to the fact that every area was enclosed. The lower portions of the exterior wall construction are comprised of concrete block with steel sheet metal cladding panels on the exterior face. The exterior cladding installation on the exterior surface of the lower walls was completed in 1974. A concrete slab with sub-grade cooling pipes to produce and maintain the ice surface was subsequently installed in 1973.

1.7.1.2 *ADDITIONS (1968 & 1984)*

The lobby and front entry area addition were added to the west side of the existing Arena in 1968. According to information provided, the roof was originally constructed as a flat roof system with a wood deck and steel joists/beams. A sloped wood-framed roof was added at a later unknown date complete with a suspended ceiling composed of either acoustical tile or gypsum board. The exterior walls are clad with steel sheet metal cladding panels on the exterior face and painted gypsum board on the interior. At this time the level of insulation is unknown as no destruction of the walls was undertaken. The floor consists of a concrete slab complete with a variety of floor finishes consisting of resilient sheet flooring, tile or carpet.

The Storage/Workshop and Zamboni addition was completed in 1984. The roof finish is exposed steel cladding over steel structure and non-reflective backed insulation between the purlins. Exterior walls are clad with steel sheet metal cladding panels on the exterior surface and painted gypsum board finish on the exterior. The floor consists of a finished concrete slab.

1.7.1.3 *CLUB HOCKEY TEAM FACILITY – 1998/1998 ADDITION*

The club hockey team facilities were added in 1998/1999. The roof finish is exposed steel cladding over steel structure. The structure could not be verified at the time of the review due to the fact that the entire area was enclosed. The interior finish is complete with a suspended acoustical ceiling tile or gypsum board ceilings. Exterior walls are clad with steel sheet metal cladding panels on the exterior surface and painted gypsum board finish on the interior.- The floor consists of a finished concrete slab.

1.7.1.4 *1973 ADDITION*

The Swimming Pool and Pool Change Building were built in 1973 to service an exterior pool and recreation area. With the official opening of a new aquatic centre in May of 2014, these spaces have since been incorporated and used as part of the Arena facility. We have referenced this building in our report as the 1973 Addition. The roof is a flat roof system consisting of a built-up roof (BUR) system with what is suspected to be a wood deck and steel joists/beams. The interior finish is complete with a suspended acoustical ceiling tile or gypsum board ceilings. The exterior walls are clad with steel sheet metal cladding panels on the exterior face and painted gypsum board on the interior. The floor consists of a suspended concrete slab over steel deck and joists with a crawlspace below.

1.7.2 STRUCTURAL

1.7.2.1 *ARENA BUILDING*

According to the original construction drawings, it would appear that the building foundation of the original Arena consists of drilled concrete spread-bore piles, reinforced concrete perimeter grade beams and slab on grade concrete floor system. Steel rod encased column ties below slab level extend across the building at each building main frame (of the pre-engineering building structure) connecting the column bases. The roof support system consists of the main frames and purlins and cross-bracing.

1.7.2.2 *LOBBY ADDITION*

The addition foundation consists of spread-bore piles, perimeter grade beam and slab on grade main floor. The building structure consists of roof joists spanning to steel perimeters beams bearing on steel building columns. The addition roof bears on the existing arena perimeter wall.

1.7.2.3 *CLUB HOCKEY TEAM FACILITY ADDITION*

The addition construction is a thickened edge slab on grade foundation with wood stud walls and pre-engineered roof trusses.

1.7.2.4 *1973 ADDITION*

The former Kinsmen Pool Building is now considered to be part of the Arena facility. This building has a steel joist roof, slab on steel deck main floor bearing on open web steel joists.

1.7.3 MECHANICAL

The main building mechanical systems include municipal sewer and water services and natural gas. It was reported that an exterior perimeter storm water system was added in 1999. Standard building plumbing fixtures were not reviewed as part of this assessment. We were advised that fixtures are replaced as required. Domestic hot water is supplied from tanks located in the Janitors closets and Zamboni room.

Heating is provided by a combination of electric baseboards, convectors and force-flow heaters. The Arena is heated by a forced-air ducted distribution system with heat recovery from the refrigerant plant. There are supplemental gas-fired Radiant heaters located above spectator stands.

There are exhaust fans installed on the roof of the Arena that are controlled by the building operator. Intakes are located on the walls around the perimeter of the building. The Arena has a number of circulation fans at the upper level of the roof peak.

The current Ice Plant system was installed in 2005. The outdoor ice plant condenser is located on the exterior of the Building at the northeast side on a steel platform. The ice plant consists of the following equipment:

- Condenser
- Heat Exchanger
- Pumps
- Brine Supply Tanks
- Heater Lines Slab Piping

The unit is a CIMCO condenser model number AT c1503. The mechanical systems are reported by the owner to be regularly maintained by the Arena staff with supplemental servicing by Swan River -The Pas Refrigeration and CIMCO, as required.

The Thermal Plus dehumidifier or defogger was installed in 2005 during the ice plant upgrade, no information or equipment tag was located on the equipment. We were advised by the client that the current unit was smaller than the proposed design and has had issues over the years with maintaining proper humidity levels in the space.

A sprinkler system was added in 2005 that serves only the Zamboni area and Parks storage area. The system is regularly maintained by BDR Services Ltd.

We contacted the service providers and we were advised that there were no issues reported as recurring or problematic at this time. The major equipment is performing as expected for its current age and life expectancy.

1.7.4 ELECTRICAL

The building electrical system is via an overhead service from local utilities. (Manitoba Hydro.) At this time we were unable to verify the exact amount of power supply coming to the building (we did note both 300 and 400 amp panels). In conversation with Galbraith Electric, they noted that the power supply is adequate for the current building usage and that there is some capacity for additional services but this would need to be confirmed. Lighting is a combination of incandescent and fluorescent /halogen fixtures throughout the facility. Supplemental electrical heating is located throughout the facility. The electrical systems are reported by the owner to be regularly maintained by the Arena staff with supplemental servicing by Galbraith Electric, as required. There is no standby emergency generator at this facility. The Fire Alarm system was installed in 2005. There are no issues reported.

We contacted the service providers and we were advised that there are no issues reported as recurring or problematic. The major equipment is performing as expected for its current age and life expectancy. No issues have been reported to date with inadequacies in the system panel capacities or availability of replacement parts. When future equipment upgrades, repairs or system changes are implemented the electric service would require assessments for spare capacity and current code system.

1.8 PERFORMANCE AND HISTORY

The following information was reported to us in regards to past repairs and is summarized as follows.

SCOPE OF REPAIR, RESTORATION OR UPGRADE:	YEAR:
New Ice Plant Equipment	2005
New Rink Area Dehumidifier	2005
Main Arena Roof Replacement	1998
Storm sewer system at east/west sides of the Arena	1988
New concrete floor in arena with cooling piping.	1973

1.9 CLIENT-SUPPLIED DOCUMENTS

1.9.1 PREVIOUS REPORTS, PLANS & DOCUMENTS

We were provided with copies of:

- Building evaluation engineering report by Associated Engineering dated 2001.
- Geotechnical Investigation report by P. Machibroda Engineering dated 2001- requested by Associated Engineering
- All available building plans as provided by the Recreation department – Town of Swan River.
- Mechanical Service Work Order records provided at the Startup Meeting.

2 KEY FINDINGS

2.1 PRIORITY 1 BUILDING COMPONENTS

2.1.1 BUILDING PERIMETER REGRADING

Currently the south elevations of the original Arena building and the 1973 addition appear to not have consistent positive drainage away from the foundation wall. This appears to have resulted in damage to the south arena wall as well as allow water infiltration into the crawlspace area under the 1973 addition.

Regrading for positive drainage around the perimeter of the south side of the Arena and all sides of the 1973 addition is required to reduce water infiltration into these systems.

It is recommended that an invasive review of the existing wall systems should be completed to assess potential damage to the building envelope.

2.1.2 ROOF REPAIRS

The roof of the original Arena building is surface-fastened sheet metal with visible areas of rusting. As noted in client supplied documentation, the roof was replaced in approximately 1998. The roof is maintained on an ongoing basis by arena staff. Repairs should include the periodic checking, tightening and/or replacement of the gasketed screws for tightness and sealing, replacement of brittle and cracked gaskets and joint sealant, and resealing around exhaust fans and vent stacks in the short term (Priority 1). It is our understanding that the management of roof leaks is being funded by Annual Operating and Maintenance funds and as such we have not allocated dollars in our Capital Expenditures Projections table.

The BUR roof of the 1973 addition is past its expected useful life at 45 years. This roof should be replaced as a Priority 1. At this time there would be the opportunity to explore replacing this roof system with either a Mod-Bit roof or possibly re-designing the system to allow for sloped metal roof – consistent with the complex.

2.1.3 RINK DASHER BOARDS

The rink dasher board system (boards and glass) is in reasonable condition but have been modified in terms of alignment to suit the changing conditions due to the concrete slab concerns. With the replacement allocation of the rink slab it is reasonable to replace the rink dasher board system at the same time. (Priority 1)

2.1.4 OUTDOOR CONDENSOR EQUIPMENT PLATFORM REPAIRS/GUARDRAIL

The ice plant condenser unit platform located on the north side of the building exterior is of steel construction mounted on four concrete piles above grade. Access to the platform is obtained by use of an extension ladder. The current platform is protected by a perimeter tubular metal guardrail that does not appear to conform with the building code. (Reference 4.1.5.14 [National Building Code] Loads on Guard and Handrails). The guardrail support posts currently rest only on the grating and not on the horizontal channel rails. The platform framing appears to be inadequate for structural loading. Refer to 3.1.3 for Additional Recommended Studies and Assessments.

Replacement of this guardrail is recommended to be completed as a Priority 1

- Piles have rebar and ties showing with significant corrosion. Requires repairs and patching.
- Support framing of the platform should be confirmed and upgraded if required.
- Mechanical Equipment Platform repairs would include a new steel platform structure with code compliant guardrail system.

2.1.5 RINK DEHUMIDIFIER UPGRADES/ PLATFORM REPAIRS

The dehumidifier unit platform located on the south side of the ice rink interior is of plywood and steel construction supported from the ceiling structure above a storage room. Access to the platform is obtained by use of a set of open wood stair risers to the roof of the storage room, no structure is provided to access the actual suspended platform. The platform is currently not protected by a perimeter guardrail. This arrangement poses a potential safety risk to personnel accessing and servicing equipment. Consideration should be given to the installation of a “restricted access” chain or lock to prevent unauthorized public access.

Replacement of the platform complete with safety guardrail is recommended to be completed as a Priority 1 at the same time as the replacement of the Rink Dehumidifier unit.

The Thermal Plus dehumidifier or defogger was installed in 2005 during the ice plant upgrade, no information or equipment tag was located on the equipment.

The present unit should be replaced with a higher capacity model. We were advised by the client that the current unit was smaller than the proposed design and has had issues over the years with maintaining proper humidity levels in the space. Without adequate control in an Arena facility that is used year-round – it can be expected that early deterioration will occur in the building envelopes as well as affecting space comfort levels and energy usage.

2.1.6 RINK SLAB + RING SLAB INTEGRATION - FLOOR REPLACEMENT AND NEW REHEAT AND COOLING PIPING

The remedial measure for the rink slab issues involves removal of the entire existing slab, excavating and disposal of the full depth of the frozen soil and replacing it with granular backfill. As per the recommendations of the client- suppled document (Geotechnical Report – December 11,2001) the new system would include a longitudinal weeping tile drainage system, cooling piping and a thermostatically-controlled sub-floor heating system of pipes as well as a new concrete slab with insulation.

As part of planned upgrades, a detailed review of the existing ice plant room would need to be undertaken to access physical space and equipment locations.

- Arena slab floor is heaving. Measured from 2-3" over 15ft. Heave was generally centered in the middle section of the rink with the largest movement observed on the south west side of the slab. The slab movement in this location was up 3", 15-20 feet from the boards.
- Cracks are visible along the edges parallel to the side of the rink, usually 4 rows 36" OC.
- Slab movement was noted to be gradual as reported by client and site personnel.
- The rink slab floor was installed in 1973/74 and included cooling lines for artificial ice.
- Brine lines are typically located within the slab. Exact layout of piping layout was unavailable from the client.
- Structural column ties will be within the expanding soil and may be affected - No signs of this at the column bases was observed during the time of the inspection.
- Arena Slab Repair/Replacement would generally include removal of the rink and ring slabs, complete excavation of all frozen sub base material under the arena slab. This would be replaced with compacted fill and a new rink slab and apron slab floor system.

2.1.7 ARENA RING SLAB

- A 34" ring beam at the sides of the rink is shifting causing issues with the stands
- Worse along the west edge
- Slab is shifting up and crushing plywood along the connection of the bleachers seating and arena boards.
- Remaining foundation of the stadium seating (where visible) does not show any indications of slab movement. However, there is no access for visual assessment to much of the slab below the seating area.
- Concrete is cracking near the added elevated seating on the east side.
- Arena Ring Slab Replacement would be integrated into the Rink slab replacement design.

2.1.8 PRE-ENGINEERED BUILDING STRUCTURE

- Some cross-bracing has been removed on the West wall. West wall cross-bracing should be installed or an investigation completed to confirm the adequacy of the buildings bracing system. In addition, if the wall bracing has not been tightened recently this should be done to ensure efficient load transfer to the bracing system.
- Purlins have developed surface rust. This may develop section loss if not remediated periodically. Efforts to clean and paint these members has been initiated and should continue on an annual basis in order to extend the life of the material.
- Roof cross-bracing lines are in a similar state to the described purlin conditions and should be cleaned and painted to limit the corrosion process. Similar to the wall bracing, roof cross braces should be tightened to ensure an efficient load transfer to the buildings bracing system.
- Missing anchor bolt nut along west side should be replaced by Arena maintenance staff.

- Cracked block wall on North West side of arena near the access door appears to have been caused by some movement in the wall. The crack runs through the masonry block units and requires more investigation to determine cause and severity. This is a former main building exterior wall – and is load bearing, therefore the repairs should be given a level 2 priority.

2.1.9 MECHANICAL - BRINE PIPING LEAK REPAIRS & UPGRADES

The Client reported that there have been several under slab leaks occurring. CIMCO has been consulted periodically. Leaks reported under slab as recently as early September 2018. This item is considered as an ongoing Priority 1 but is currently managed within the annual operating and maintenance funding. We have included in our opinion of probable cost form an allowance for new brine piping system as part of the new rink slab installation.

2.1.10 BRINE SYSTEM & COOLING PIPING CONTROLS

We recommend the installation of a new control system for the brine cooling piping system as a Priority 1.

2.1.11 NEW HEAT EXCHANGER FOR REHEAT LOOP

With the recommended rink slab replacement upgrade – a new heat exchanger would be installed with modifications required to the existing Ice Plant system. Reheat piping loop modifications would also be incorporated to route reheat piping from its present supplemental heating systems adjunct to the sub-slab heating loops.

2.1.12 ARENA - SUPPLEMENTAL HEATING

With the recommended rink slab replacement upgrade – reheat piping loop modifications would also be incorporated to route reheat piping from its present supplemental heating systems adjunct to the sub-slab reheat loop.

2.1.13 ARENA EXHAUST FAN REPLACMENTS

Replacement of the existing arena exhaust fans with new fans and associated controls.

2.1.14 MECHANICAL – CARBON MONOXIDE SYSTEM

A carbon monoxide system with control panel/alarm main unit and sensors throughout the facility should be considered as a Priority 1 item.

2.1.15 ELECTRICAL – IR PANEL SCANS

The electrical panels loading and risks should be assessed with infrared panel scans. Follow-up with a clean and torque servicing of the panels.

2.1.16 ICE PLANT SYSTEM / PHYSICAL SPACE STUDY

The changes recommended to the rink surface piping system and reheat loops would require further study and design of the associated mechanical systems. This may require additional physical space and/or modification to the existing building rooms / layout. We have included this additional study as a Priority 1 in the Capital Expenditures Table (Appendix C).

2.2 PRIORITY 2 BUILDING COMPONENTS

2.2.1 WINDOW REPLACEMENTS

The exterior windows throughout the building are of various types (wood framed, PVC framed, etc.) and vintages. Caulking and seals are in poor condition and signs of leaking were observed in some locations.

Scheduled replacements to the window are suggested.

2.2.1 REFRIGERANT GAS ALARM FOR ICE PLANT ROOM

We recommend the addition of a new refrigerant gas alarm detection system for the Ice Plant Equipment room. However, this could be delayed depending on item 3.1.3.4 – further study of the ice plant system / room.

2.3 PRIORITY 3 BUILDING COMPONENTS

2.3.1 ROOF REPAIRS/REPLACEMENTS

Based on the current age of the main Arena roof (estimated at 20 years) a replacement of the entire roof system should be anticipated near the end of the report term period. (allocated in Priority 3).

The 1968 addition requires leak repairs in the short term as part of ongoing maintenance. Repairs should include screw fastener checking, the replacement of brittle and cracked gaskets and joint sealant, and reseal around the roof openings in the short term (Priority 1).

The 1984 and 1998/1999 should be scheduled as part of Priority 3. Based on the current age of the roof (estimated at 20 years) a replacement of the entire roof system should be anticipated near the end of the report term (allocated in Priority 3).

2.3.2 EXTERIOR CLADDING REPAIRS

A significant replacement of the existing exterior cladding was completed in 1997. Areas of damage (puck and vehicle strike damage, penetrations and rusting) to the lower half of the cladding was noted on all elevations. Repairs to the exterior cladding would include a replacement of the lower sections (approximately 10'-0") and should be allocated for as a Priority 2.

An application of a new finish coat to the existing cladding above 10'-0" could be considered to extend the life of the cladding as a Priority 3. This would be an aesthetic consideration for the client to choose.

2.3.3 REPAIR CRACKED CONCRETE BLOCK WALL

The cracked block wall on west side of arena requires further inspection to determine the cause of the damage and if any repairs would be required.

2.3.4 CRAWLSPACE DECK/JOISTS REPAIRS - 1973 ADDITION BUILDING

Water found in crawl space – concrete floor

High water levels in previous years filling the crawl space and needing to be pumped out was reported by client. Moisture Control, Sump pump, air exhaust and supply required to maintain humidity in space

Deck and joists show visible surface rust and developing areas of corrosion

Crawlspace Deck and Joists repair would include upgrades to the crawl space to repair the water infiltration and a detailed inspection of the crawlspace are to confirm the extent of the joist and decking corrosion.

2.3.5 ARENA CEILING REFLECTIVE INSULATION SURFACE REPAIRS

The foil backed insulation that serves as a reflective blanket on the underside of the roofing system shows some evidence of deterioration and previous repairs. Consideration should be given to extending the protective netting to the underside of the ceiling to help mitigate future damage. It is our understanding that the management of these repairs is being funded by Annual Operating and Maintenance funds and is not allocated dollars in our Capital Expenditures Projections table.

2.3.6 BUILDING ENVELOPE WATER INFILTRATION ASSESSMENT & UPGRADES

It is recommended that an invasive review of the existing wall systems should be completed to assess potential damage to the building envelope including an assessment of the option of the addition of an upgraded mechanical crawlspace ventilations system in the 1973 addition crawlspace. Based on the finding a Water Infiltration Remediation upgrade will be required.

2.3.7 ELECTRICAL - LIGHTING UPGRADES

Consideration should be scheduled for lighting upgrade projects for the facility. There are Powersmart funding opportunities available. Consider retrofit to LED of the emergency exit signage and testing of the emergency lighting systems.

2.3.8 ELECTRIC – SERVICE/SYSTEM UPGRADES

We contacted the service providers and there were no issues reported as recurring and problematic. The major equipment is performing as expected to its current age and life expectancy. However, when future equipment upgrades, repairs or system changes are implemented the electric service would require assessments for spare capacity and current code system.

2.3.9 EXTERIOR AND FOYER UPGRADES

Exterior and foyer upgrades are recommended as an enhancement project to support the major Priority 1 and 2 upgrades of the Arena. This proposed renovation would also include upgrades to showers and changerooms.

2.4 CAPITAL EXPENDITURES PROJECTIONS TABLE

The Capital Expenditure Projections table including Opinion of Probable Cost is attached to this report as Appendix C. Priorities are identified in the table with associated capital expenditures time periods.

3 MANAGEMENT STRATEGIES & RECOMMENDATIONS

3.1.1 SHORT TERM MEASURES

It is our understanding that the facility currently manages issues that arise with the building components as part of the ongoing annual maintenance program. We support and encourage this program as it is the most efficient practise to extend the lifespan of building equipment and systems. However, there comes a time when the repairs are no longer a feasible option and equipment or systems replacement are necessary. Due to the age of this facility many of the building components are currently at or nearing that stage.

3.1.2 RECOMMENDATIONS

As per the current detailed assessment of building systems contained in this report our recommendations at this point are as detailed in the Key Findings.

The existing usage of this building is anticipated to continue as currently operating and are compatible with the original design intent of the facility. A new recreation facility of this size in 2018 dollars could easily cost $14M-$20M. We believe that this facility can certainly be upgraded and maintained to a level to provide use to the community for many more years based on the upgrades we have detailed herein.

The ongoing brine loss leaks pose a significant risk to the operation of maintaining a useable ice surface. Any leak could potentially escalate the load on the existing mechanical ice plant and cause early deterioration of the lifespan of the system.

3.1.2.1 ASSUMPTIONS

There are some items in our key findings that have been designated as a Priority but do not have funds included in the projects. As indicted in the Expenditures Spreadsheet – these items are currently managed and maintained within the facility's annual operating and maintenance funds. If a time occurs within the projected funding period where annual maintenance funds or procedures change – any particular item may deteriorate at any faster rate than originally predicted. For this reason, it is important that periodic re-assessments similar to the current undertaking be scheduled at 5 year intervals. We have included an amount for an Update Review and Assessment in the Expenditures Table.

3.1.3 ADDITIONAL RECOMMENDED STUDIES AND ASSESSMENTS

3.1.3.1 ELECTRICAL SYSTEM UPGRADES

We contacted the service providers and there were no issues reported as recurring and problematic. The major equipment is performing as expected to its current age and life expectancy. When future equipment upgrades, repairs or system changes are implemented the electric service would require assessments for spare capacity and current code system.

Two items however would be considered as priorities if future work is undertaken to upgrade the Arena facility:

1 Emergency lighting System upgrade and Testing
2 Exit Sign LED upgrade

3.1.3.2 *ELECTRICAL – LIGHTING UPGRADES*

We recommend periodic reviews of the electrical lighting systems and controls to assess whether lighting upgrades would be warranted.

3.1.3.3 *STRUCTURAL DESIGN REVIEW*

Further structural design review would be recommended to verify structural code compliant loading of the Priority 1 condensor equipment platform referenced in clause 2.1.4.

3.1.3.4 *ICE PLANT SYSTEM / ROOM STUDY*

The changes recommended to the rink surface piping system and reheat loops would require further study and design of the associated mechanical systems. This may require additional physical space and/or modification to the existing building rooms / layout. We have included this additional study as a Priority 1 in the Capital Expenditures Table (Appendix C).

3.2 EXECUTIVE SUMMARY

Our opinion of the overall condition and long-term viability of facility as detailed above support the plans of the clients to maintain this facility as a vital and integral part of the community of Swan River and its surrounding area.

Even though the function and performance of this building have changed substantially since it was originally conceived and constructed in 1967 we believe that an investment now in this facility can extend the usability of the complex for a significant number of years.

4 LIMITATIONS

The WSP Canada Inc. is the “Consultant” referenced throughout this document.

- Our scope of work and responsibilities related to this report are defined by the documents that form the agreement and authorization for this work.
- Any user accepts that decisions made or actions taken based upon interpretation of our work are the responsibility of only the parties directly involved in the decisions or actions.
- No party other than the Client shall rely on the Consultant’s work without the express written consent of the Consultant, and then only to the extent of the specific terms in that consent. Any use which a third party makes of this work, or any reliance on or decisions made based on it, are the responsibility of such third parties. Any third-party user of this report specifically denies any right to any claims, whether in contract, tort and/or any other cause of action in law, against the Consultant (including Sub-Consultants, their officers, agents and employees). The work reflects the Consultant’s best judgement in light of the information reviewed by them at the time of preparation. It is not a certification of compliance with past or present regulations. Unless otherwise agreed in writing by the Consultant, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity; it is written to be read in its entirety.
- Only the specific information identified has been reviewed. No physical or destructive testing and no design calculations have been performed unless specifically recorded. Conditions existing but not recorded were not apparent given the level of study undertaken. Only conditions actually seen during examination of representative samples can be said to have been appraised and comments on the balance of the conditions are assumptions based upon extrapolation. Therefore, this work does not eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with a property. We can perform further investigation on items of concern if so required.
- The Consultant is not responsible for, or obligated to identify, mistakes or insufficiencies in the information obtained from the various sources, or to verify the accuracy of the information.
- No statements by the Consultant are given as or shall be interpreted as opinions for legal, environmental or health findings. The Consultant is not investigating or providing advice about pollutants, contaminants or hazardous materials.
- The Client and other users of this report expressly deny any right to any claim against the Consultant, including claims arising from personal injury related to pollutants, contaminants or hazardous materials, including but not limited to asbestos, mould, mildew or other fungus.
- Applicable codes and design standards may have undergone revision since the subject property was designed and constructed. As an example, design loads (such as those for temperature, snow, wind, rain, seismic etc) and the specific methods of calculating the capacity of the systems to resist these loads may have changed significantly. Unless specifically included in our scope, no calculations or evaluations have been completed to verify compliance with current building codes and design standards.
- Budget figures are our opinion of a probable current dollar value of the work and are provided for approximate budget purposes only. Accurate figures can only be obtained by establishing a scope of work and receiving quotes from suitable contractors.

- Any costs for repair in this report are the Consultant's opinion of probable construction cost and quantities, based on current year dollars. These estimates do not include any unforeseen conditions that require repair at the time the repair work is being completed. Any cost estimates provided are subject to confirmation or adjustment at the time competitive bids are obtained from contractors who specialize in the various items of repair work required.
- The Consultant makes no representation or warranty expressed or implied as to the reliability of these cost estimates.

APPENDIX

A PHOTOS

Photo 1: Main Arena Roof (1967)

Photo 2: Exterior Cladding

Photo 3: Outdoor Condenser Platform Support Piles

Photo 4: Indoor Dehumidifier Platform

Photo 5: General Site Grading around Building

Photo 6: Re-Grading – South side

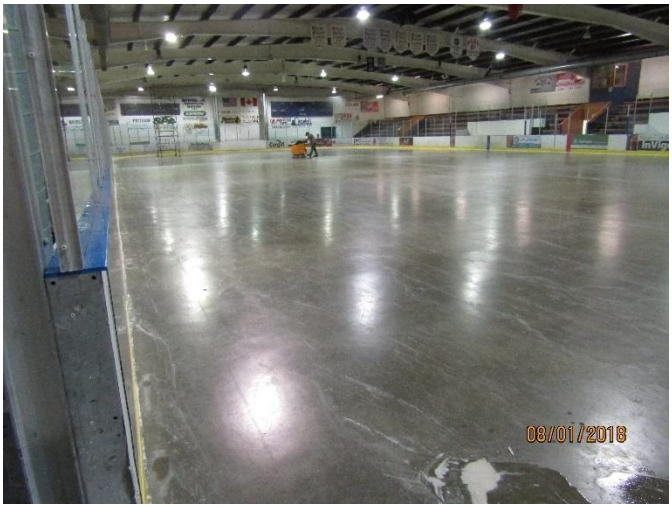


Photo 7: Arena Slab

Photo 8: Arena Slab - cracks

Photo 9: Arena Ring Slab

Photo 10: Boards

Photo 11: Concrete Block Crack

Photo 12: 1973 Addition Crawlspace – Joists and Deck

Photo 13: Windows

Photo 14: Roof Leak Repairs

Photo 15: Pre-Engineered Roof/Wall Support System – West Wall Cross-Bracing

Photo 16: Pre-Engineered Roof Support System – Purlins

Photo 17: Pre-Engineered Roof Support System – Roof Cross Bracing

Photo 18: Missing Cross-Bracing – West Side

Photo 19: Missing Anchor Bolt Nut

Photo 20: Ice Plant Room

Photo 21: Ceiling Reflective Surface

Photo 22: Arena Furnace with re-heat loop

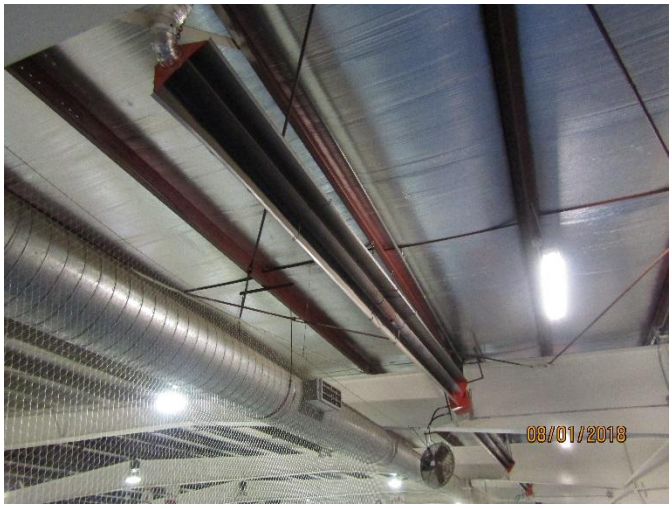


Photo 23: Grandstand Heating

Photo 24: Brine Piping Loops in Header Trench

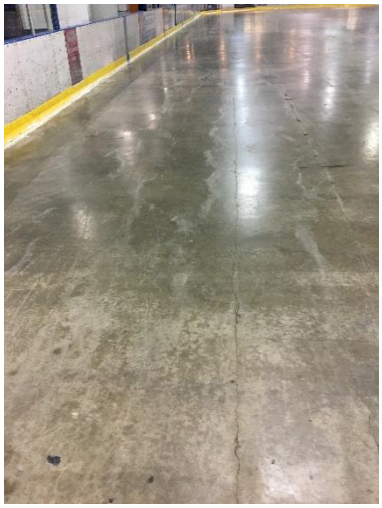


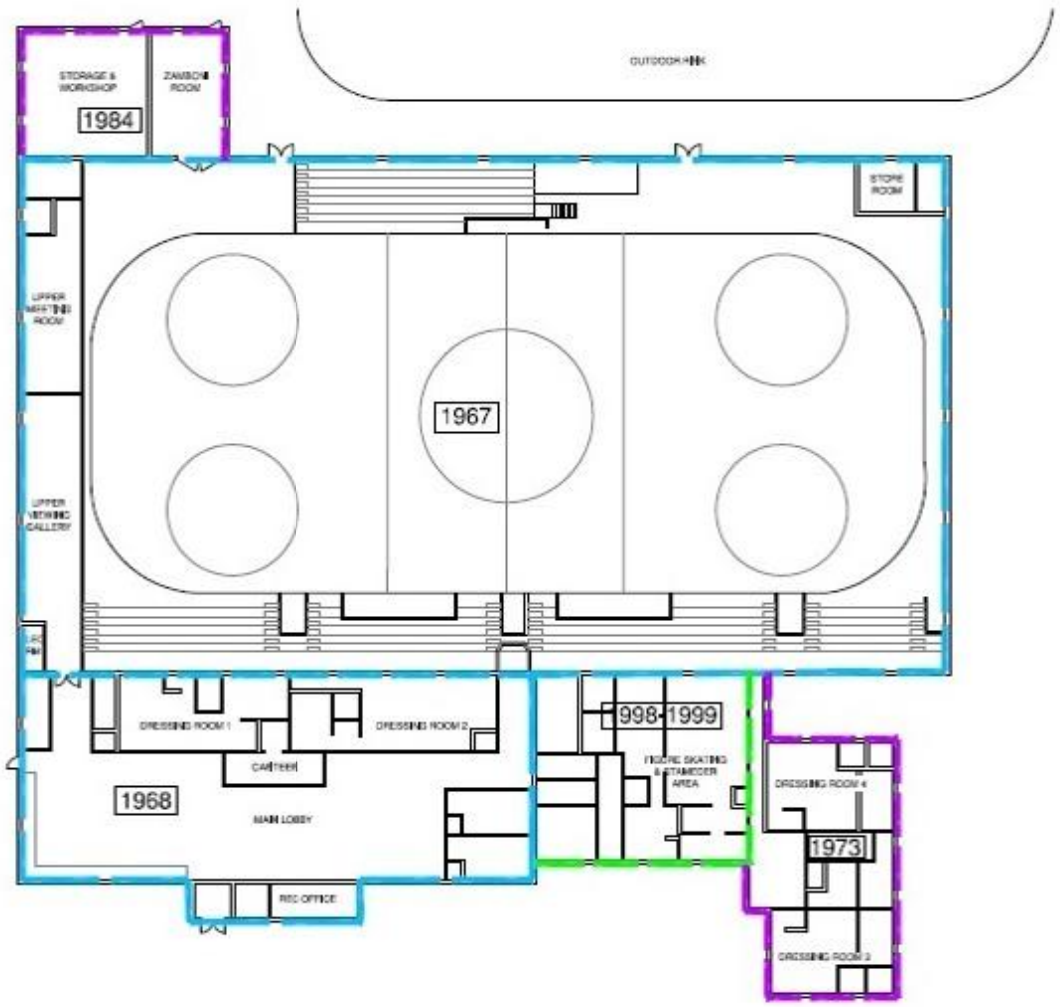
Photo 25: Typical Rink Slab Cracks

Photo 26: Poor Slab Surface Condition

Photo 27: Ring Slab Cracks

APPENDIX

B KEY PLAN



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SWAN RIVER CENTENNIAL ARENA

TITLE:

KEY PLAN

DRAWN BY:	DATE:
SL	2018/09/12

APPENDIX

C CAPITAL EXPENDITURES PROJECTIONS

Swan River Centennial Arena - Capital Expenditures Projections - Opinion of Probable Costs

	Building Element or Component	Priority	Annual Capital Expenditures Periods		
			Year 1	Years 2-5	Years 6-10
1	Building Perimeter Re-grading	1	$25,000.00		
2	Rink Slab + Ring Slab Integration - Replacement (including new reheat + cooling piping)	1		$1,600,000.00	
3	Dasher Boards, Glazing & End Guards Replacements	1		$320,000.00	
4	Outdoor Condensor Platform Repair/Guardrail	1	$15,000.00		
5	Roof - Leak Repairs	1	$3,000.00	$12,000.00	
6	1973 Addition Roof Replacement	1		$65,000.00	
7	Pre-Eng Roof Support Systems Repairs - West Wall Cross-Bracing	1	$3,000.00		
8	Rink Dehumidifier Upgrades/New Platform	1	$105,000.00		
9	Brine System & Cooling Piping Controls	1		$110,000.00	
10	New Heat Exchanger For Reheat Loop + Modifications to Ice Plant	1		$45,000.00	
11	New Arena Ventilation/Reheat Furnace	1		$50,000.00	
12	Arena - Supplemental Heating	1		$30,000.00	
13	Arena Exhaust Fans Replacement + Controls	1		$28,000.00	
14	Carbon Monoxide Systems with Detectors/Alarms	1	$6,000.00		
15	Infrared Panel Scans	1	$10,000.00		
16	Ice Plant System/Physical Space Study	1	$7,500.00		
17	Refrigerant gas alarm for ice plant room	2		$5,000.00	
18	Window Replacements	2		$20,000.00	
19	1967 + 1968 Arena Roof Replacements in Sections (50%)	3			$240,000.00
20	1967 + 1968 Arena Roof Replacements in Sections (50%)	3			$240,000.00
21	Repair Cracked Concrete Block - West side of Arena	3			$5,000.00
22	Exterior Cladding Repairs	3			$50,000.00
23	1984 + 1998/99 Addition Roof Replacement	3			$70,000.00
24	1973 Addition Building Water Infiltration Remediation	3			$35,000.00
25	1973 Addition Crawlspace Deck/Joists Repair	3			$10,000.00
26	Emergency Lighting System Testing/Upgrades	3			$11,600.00
27	Exterior Foyer Upgrades & Showers/Change Rooms Upgrades	3			$350,000.00
	Period Projections of capital expenditures - Opinion of Probable Cost		$174,500.00	$2,285,000.00	$1,011,600.00
					$3,471,100.00

NOTES: Items referenced are repairs/replacements and upgrades that are not normally included in the current annual maintenance and service projects. Pricing estimates include an amount for General Contractor costs, design contingency allowances and engineering consultants fees allowance and a location factor multiplier.