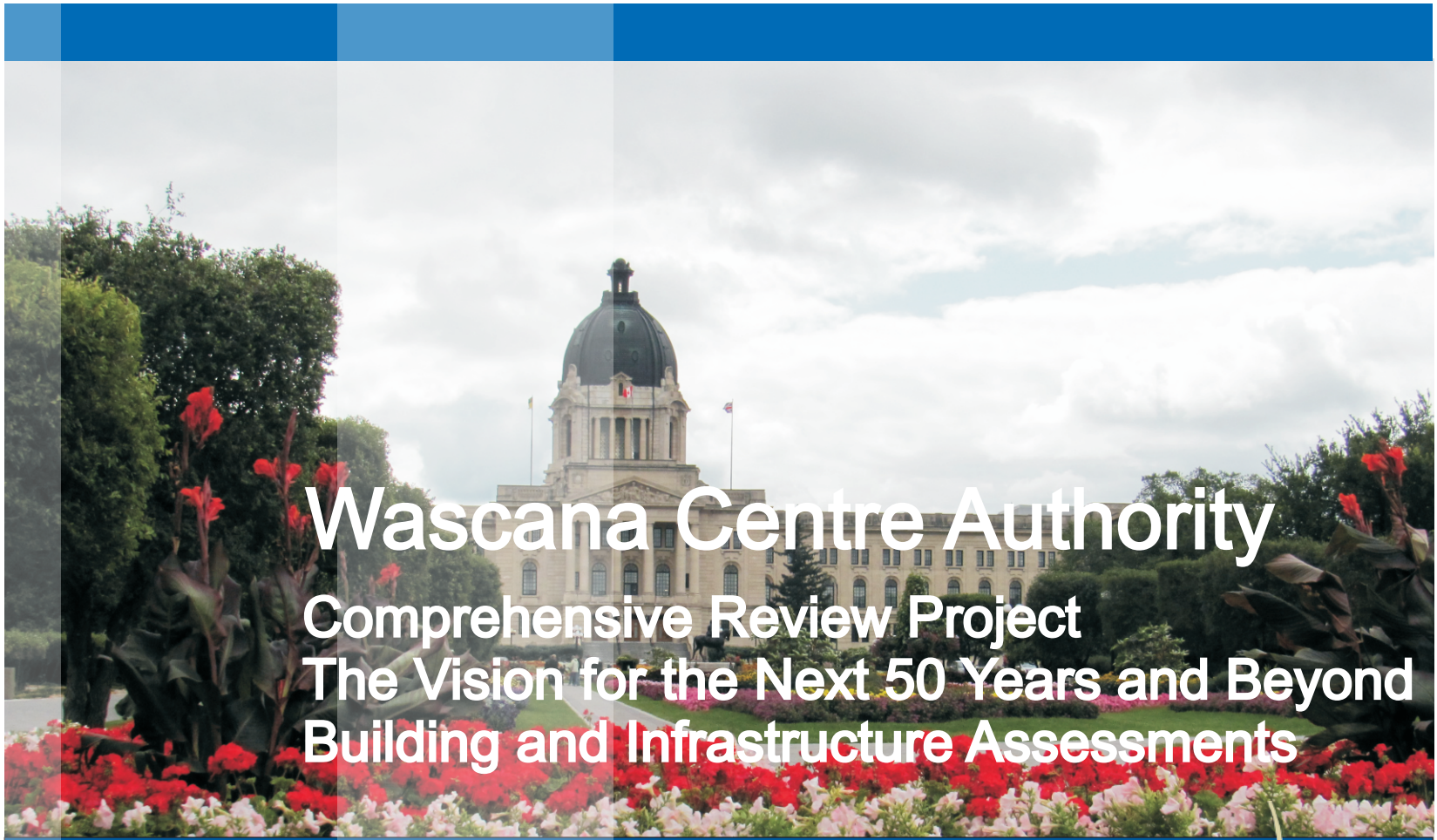
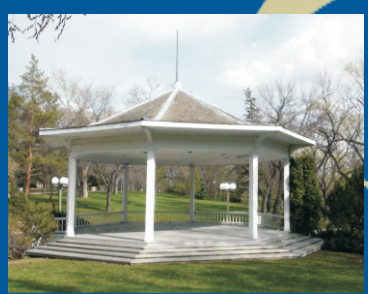


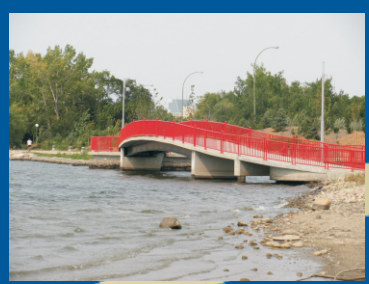
Wascana Centre Authority

Comprehensive Review Project
The Vision for the Next 50 Years and Beyond
Building and Infrastructure Assessments

Report

September 2012





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Executive Summary

Wascana Centre Authority (WCA) is undergoing a comprehensive review entitled “The Vision for the Next 50 Years and Beyond”. In March 2012, WCA contracted Associated Engineering to perform condition assessments of buildings and infrastructure within Wascana Centre.

Wascana Centre is one of the largest urban parks in North America; located in Regina, it surrounds the 120 hectare Wascana Lake and consists of a 930-hectare parkland.

The primary objective of the project was to provide engineering guidance for required repairs and associated costs. Through an assessment of each building and infrastructure element, a prioritized list of items were identified that need to be addressed in the short-term, medium-term and long-term, so WCA can plan for future capital expenditures.

Buildings and infrastructure reviewed included:

- 22 WCA owned or occupied or maintained facilities,
- 27 km of roads,
- 82 parking lots,
- 25 km of concrete pathways,
- 10 km of asphalt pathways,
- 4 pedestrian bridges,
- 4 irrigation pump houses,
- 8 lake overlooks,
- 3 dock systems,
- underground utilities including water, sewer, storm, natural gas, power, and communications, and
- traffic signage and lighting.

The infrastructure within the park is considered to be in fair condition but several groups of assets are approaching, or have exceeded, their anticipated service lives and/or are in need of repair. Looking ahead for the next 20 years and based on the condition of the components identified, approximately $5,089,000 is estimated to be required for repairs or replacements in the short term (1-2 years). Approximately $4,938,000 is estimated to be required for repairs or replacements in the medium term (3-5 years) and approximately $11,370,000 is required for repairs or replacements in the long term (6-10 years). The estimated repairs or replacements required beyond ten years are dependent on maintenance activities and asset management practices.

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1 Introduction

Wascana Centre Authority (WCA) is undergoing a comprehensive review entitled “The Vision for the Next 50 Years and Beyond”. Part of the review project includes assessments of infrastructure that WCA is responsible for. In March 2012, WCA contracted Associated Engineering to perform condition assessments of buildings owned by WCA as well as bridges, roads, sidewalks, underground utilities, pump houses, aeration systems, lighting and signage within Wascana Centre.

The primary objective of the project was to provide engineering guidance for required repairs and associated costs. Through an assessment of each building and infrastructure element, a prioritized list of items were identified that need to be addressed in the both the short-term and long-term, so WCA can plan for future capital expenditures.

This report provides WCA with:

- A record of their building and infrastructure assets and the condition of those assets at a point in time.
- A tool to aid in planning capital upgrades and maintenance activities.
- The basis for a living document to facilitate the transfer of corporate knowledge to new staff.

1.1 BACKGROUND

Located in the heart of Regina, Saskatchewan, Wascana Centre is one of the largest urban parks in North America; it surrounds the 120 hectare Wascana Lake and consists of a 930-hectare parkland. Wascana Centre’s beautiful landscape and its numerous recreational opportunities make it an appealing park to people of all ages, evident by the increasing number and diversity of recreational, cultural and educational activities and community events held. Wascana Centre is celebrating its 50th anniversary in 2012.

Managed by Wascana Centre Authority, their mandate is “to be devoted to the development of the seat of Government, the enlargement of educational, research and development opportunities, the advancement of cultural arts, the improvement of recreational facilities and the conservation of the environment.”

The park is not only home to important buildings such as the Provincial Legislature, University of Regina and Royal Saskatchewan Museum, it also contains a number of service buildings, public facilities as well as 27 km of roads, 35 km of sidewalks and pathways, and associated underground infrastructure.

Buildings owned by WCA include:

- Commercial Buildings
  - 2900 Wascana Drive – Wascana Place
  - 3000 Wascana Drive – Wascana Marina

- Depots and Maintenance Shops
  - 3201 Broad Street – Central Depot
  - 3300 Broad Street – Quonset
  - 221E Assiniboine Ave – Maintenance Shop
  - 551E Assiniboine Ave – Area 4 Service Depot
  - 2860 Wascana Drive – Goosehill Service Depot
  - 1955 College Ave – Area 2 Service Depot
  - Area 1 Service Depot (no Civic Address, by Legislature) – may be owned by Province
  - Campus Service Depot A – owned by University of Regina
- Washrooms
  - 2801 Albert Street – Washroom #1 Legislature
  - 3200 Lakeshore Drive – Washroom #2
  - Washroom #3
  - Washroom #4
  - Willow Island Washroom #5 and Associated Staff Space
  - Washroom #6
  - 2881 Wascana Drive – Washroom #7 Candy Cane Park
  - Douglas Park Washroom – owned by City of Regina
- Miscellaneous
  - 19th Ave & Smith St – Bandshell
  - 217E Assiniboine Ave Greenhouse Complex including the Header House
  - 300E Assiniboine Ave – Overwintering Structure
  - Willow Island Covered Picnic Area

Infrastructure within WCA Governed Areas includes:

- Roadways and Parking Lots
- Concrete and Asphalt Sidewalks and Pathways
- Potable Water Distribution System
- Sanitary Sewer System
- Storm Sewer System
- Retaining Walls and Shoreline Protection
  - North Shore Retaining Wall
  - East Shore Retaining Wall by Willow Island
  - Pine Island Main Shoreline
  - Marina Retaining Walls
  - Trafalgar Pedestrian Bridge Shoreline
- Pedestrian Bridges
  - Broad Street Pedestrian Bridge
  - Albert Street Pedestrian Bridge
  - Pine Island Pedestrian Bridge
  - Trafalgar Pedestrian Bridge

- Irrigation Pump Houses
  - Willow Island Pump House
  - Legislative Pump House
  - Douglas Park Pump House
  - Nursery Pump House
- Aeration Systems and Fountains
  - North Aeration System and North Lake Fountain
  - South Aeration System and Trafalgar Fountain
- Waterfalls
  - Pine Island Water Fall System
- Dock Systems
  - Wascana Marina Dock System
  - Willow Island Dock System
  - Wascana Canoe Club Dock System
- Lake Overlooks
  - Douglas Park Overlook
  - South Shore Overlook
  - Legislative Building Overlook
  - Albert Street Pedestrian Bridge Overlook
  - Willow Island Overlook
  - Trafalgar Overlook
  - Broad Street Pedestrian Bridge Overlook
  - Candy Cane Park Overlook
- Natural Gas Distribution System
- Power Distribution System
- Communications Distribution System
- Street Lighting
- Traffic Signs

Associated Engineering, along with sub-consultants FAME Asset Management Solutions and MacPherson Engineering Ltd., prepared a technical assessment for each infrastructure asset based on visual inspection, review of documents and reports, discussions with WCA Staff and engineering judgement. Data from the individual assessments was compiled in databases provided in Appendix B.

2 Building Assessment

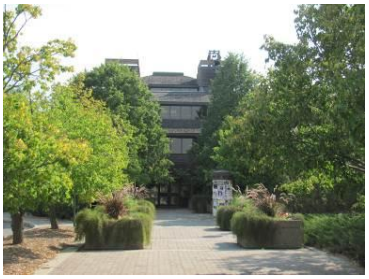
In order to collect information for the report and to provide detailed assessments of the key components of each building, inspections were completed April 30 to May 3, 2012 by Associated Engineering together with FAME Asset Management Solutions. In addition, a detailed review of the mechanical heating and cooling system at 2900 Wascana Drive – Wascana Place was performed on May 30, 2012 by our sub-consultant MacPherson Engineering.

WCA owns occupies and/or maintains several buildings throughout the park, and has divided maintenance into eight areas, which are illustrated in Appendix C. The age, current condition, operating status and individual criticality of components within each building was reviewed. Team members met with WCA staff to solicit their operational knowledge of the facilities and to discuss and clarify data gathered by AE staff during the site assessment. The technical assessments provided in this chapter are intended to supplement the information presented in the database in Appendix B. Detailed photos of the buildings are included in Appendix D. A summary of cost estimates for repairs and replacements of building components in the short, medium and long term is included in Chapter 5 with detailed information included in Appendix A.

Our recommendations are based on our visual reviews of the buildings. The scope of this investigation did not permit the physical examination and confirmation of all of the components of the building. Nevertheless, we have made every effort within the scope of our field programme to visually confirm and verify the condition of primary components. In some instances, it has been necessary to apply some interpretations and engineering judgement. If new information comes to light, which might influence our conclusions, we would request to be informed so that we may reassess our recommendations.

2.1 COMMERCIAL BUILDINGS

2.1.1 2900 Wascana Drive – Wascana Place (Area 2)



Wascana Place was originally built in 1980 and is a four storey office building situated in Wascana Park. Renovations of various interior finishes have recently been completed. The size of the facility is 15,400 ft^2.

Envelope

The facility sits on a concrete foundation complete with concrete slab on grade. Stained cedar walls and a cedar shake roof covering provide the envelope for the facility. Cedar walls and cedar shakes installed on the roof have become damaged and worn and require replacement. One large skylight has been installed. Exterior doors in the facility are aluminum, steel or wood. Exterior steel doors have worn finishes as does the exterior wood door. Exterior windows in the facility are aluminum. Overhead doors in the facility are wood. Overhead wood doors in the facility are sagging and worn and require replacement.

Interior
The facility is composed of interior partition walls of concrete and concrete masonry blocks. You will find various types of flooring in the facility including concrete floors, vinyl composite tiles, sheet vinyl flooring, sheet carpet and carpet tile and ceramic tile flooring. Commercial grade sheet carpet installed on the 4th Floor, 2nd Floor and Office 116, 115.1 and the Information Desk in the facility is worn and damaged and should be replaced. Vinyl composite tile flooring installed in the building is damaged in various areas throughout the facility and should be replaced with sheet vinyl products. Mosaic tile flooring installed in the washrooms and Storage Room 216 the facility is dated and worn and should be replaced. The ceiling finishes include t-bar suspended ceilings with lay-in ceiling tiles, gypsum board ceiling finishes and wood panelled ceiling finishes. Interior doors in the facility are steel, wood or aluminum. Stair construction in the facility consists of concrete complete with rubber stair finishes.

Conveying Systems
One passenger elevator has been installed in the facility.

Plumbing
The Wascana Building contains one domestic water heater which supplies all the necessary hot water. Plumbing fixtures include floor mounted flush toilets and a floor mounted urinal. Replacement of the floor mounted urinal is recommended because it creates an unsanitary condition and maintenance issues. Washroom sinks include enamel sinks set in vanities. Stainless steel sinks complete with supply trim have been installed in various areas of the building. A wall mounted enamel coated cast iron sink has been installed for janitorial activities and should be replaced due to the possibility of lifting related injuries. A stainless steel, wall hung water fountain has been installed in the Lobby of the building.

Heating, Cooling and Ventilation
Wascana Place building controls consist of a pneumatic controls system installed in 1982. The existing controls system is past its design life, and should be replaced with a new DDC system. Pneumatic controls systems require additional maintenance, have less flexibility and are not as accurate as a modern DDC system. Additionally there are mixed zones in the building that are causing comfort issues. The new DDC control system should include full boiler and air handling controls, including cooling staging and boiler warm weather shutdown and remote access.

The boilers are original with primary only pumping. The boilers are past the intended design life, are inefficient and are poorly controlled. The boilers should be replaced with new near condensing boilers, piped in a primary secondary arrangement. VFD’s should be added to the secondary system pumps.

The heating lines are original. The lines appear to be in good condition; however, the insulation should be patched or replaced where sections are falling off or missing.

Perimeter Radiation is original to the building. Bare fin radiation is installed in the millwork. The bare fin radiation should be replaced with new cabinet radiation. The original cabinet radiation should be replaced.

The air handling unit and fans were upgraded in 2010 with new VFD's. The fans and VFD's appear to be in good condition. The damper sections are pneumatic and are original to the building. The damper actuator and controls for economizing as well as the VFD's should be integrated into the new DDC controls.

The Outdoor Condensing units and evaporator coils are original. The condensing units and coils are past their intended design life use R-22 refrigerant which is in the process of being phased out. The condensing units and coils should be replaced with new condensing units that utilize a non-ozone depleting refrigerant.

The ductwork is original it appears to be in good condition. However it should be properly cleaned.

Zone air control is performed by Variable Constant Volume boxes with heating coils are original. The boxes are pressure dependent and are pneumatic. The VCV boxes should be replaced with new pressure independent variable air volume boxes with new heating coils and DDC controls.

Grilles located in the space are past their intended design life. The style of grille can cause comfort issues due to design and should be replaced with adjustable slot grilles or ceiling diffusers.

Condensate drain lines are draining into a floor drain located in the vent unit. The drain lines should be located outside of the vent unit and run to nearest floor drain. The drain inside of the vent unit should be capped.

Fire and Life Safety

One fire alarm heat detector was noted in the facility. Upgrade to an addressable fire alarm system complete with applicable initiating and notification devices. Illuminated exit signs and emergency lighting battery packs with remote light heads have been installed throughout the facility. Portable fire extinguishers can also be found throughout the building. Various extinguishers were noted to be outdated and some extinguishers were not properly mounted. These conditions should be corrected.

Electrical

The Main Switchgear provides a 120/208V, 900 amp, 3 phase, 4 wire electrical service to the facility. Circuit panels in the facility are at approximately 74% capacity. Circuit panels and the motor control centre in the facility have exceeded their forecasted life cycles but are still in serviceable condition. Retain an electrical consultant to analyze and ensure equipment is proper operating condition.

Motor control center installed on the Main Floor Janitor/Electrical Room. 208V, 600A, 3 phase, 4 wire. The unit has exceeded its forecasted life cycle but is still operating as required. Retain electrical personnel to analyze and ensure equipment is operating as intended.

Lighting in the facility is a combination T-8 and CFL fluorescent lighting. LED track lighting was noted in the Lobby of the building. Exterior lighting consists of HPS fixtures installed around the perimeter and at exit points.

2.1.2 3000 Wascana Drive – Wascana Marina (Area 2)

The Wascana Marina building was originally constructed in 1981 and modified to a year round facility in 1986 and is currently a two storey multi-tenant building. The upper level is The Willow on Wascana restaurant, and the lower level is occupied by the Wascana Rowing Club and the Wascana Racing Canoe Club. Major renovations were done in 2005 including the addition of storage and washrooms/change rooms on the lower level and the building was renamed to Canada Games Wascana Lake Centre. The size of the facility is 10,900 ft^2.

Envelope

The facility substructure consists of concrete strip footings, foundation walls, and slab on grade. Exterior walls are cast in place concrete below grade with wood cladding above grade. Exterior windows are sealed units set in wood frames in the original building, and aluminium framed windows in the 2005 addition. The original exterior passage wood windows are deteriorating with localized rot and should be replaced. The solid wood exterior doors have some damage that should be addressed and the 2005 addition steel doors are in good condition. The overhead doors on the lower level are solid wood barn door style. A small portion of the flat roof covered with SBS roofing is retaining some water ponds and the insulation should be re-sloped and roofing replaced.

Interior

Partitions in the building include wood stud with gypsum wall board in the original building, and steel stud with gypsum wall board and concrete block in the 2005 addition. Interior doors are steel. Floor finishes are ceramic tile in the restaurant and rubber flooring in the multipurpose room of the 2005 addition. Ceiling finishes include timber tongue and groove decking in the restaurant and painted gypsum board in the 2005 addition.

Plumbing

Plumbing fixtures inside the building are in good condition. One roof drain requires replacement on the west side of restaurant.

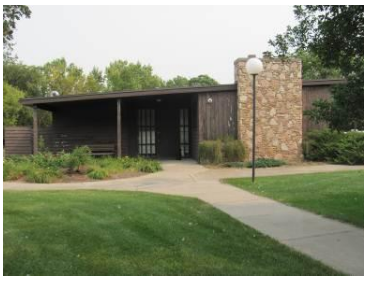
Heating, Cooling and Ventilation
Furnaces and air conditioners serving the various tenant spaces have been installed within the last 5 years and are in good condition. The ductwork original to the building is rusted and needs cleaning, and insulation is damaged. Programmable thermostats are installed and in operation.

Fire and Life Safety
The restaurant range hood fire suppression system appears to be in good condition. Two fire extinguishers were located, one in the restaurant kitchen, the other in a mechanical room below. Inspections were current.

Electrical
The building is energized by a 400 amp electrical service. Fluorescent lighting and incandescent lighting are utilized in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires. Emergency lighting equipment are in operation. One fire alarm heat detector was noted in the facility located in the mechanical room below the restaurant.

2.2 DEPOTS AND MAINTENANCE SHOPS

2.2.1 3201 Broad Street – Central Depot (Area 3)



The Wascana Central Depot (also referred to as “Lecture Hall” or “Development Office”) is located at 3201 Broad Street. The building was constructed in 1965 and was renovated in 1971. The structure encompasses 2650 ft^2.

Envelope
The facility substructure consists of concrete strip footings, foundation walls, and slab on grade. An extreme amount of water was noted in the basement of the facility and corrosion was noted on structural teleposts. Retain a foundation consultant to analyze and make recommendations for remediation. Exterior walls are clad with wood siding which is damaged and requires attention. Exterior windows are sealed units set in wood frames. Exterior passage doors include both solid core wood and insulated steel units. Other doors include a 10’ x 7’ sliding wood door that is damaged and an 8’ x 8’ overhead door. The roof covering is a rolled bituminous membrane (SBS) that was installed in 2008.

Interior
Partitions in the building include chain-link fencing. Interior doors are wood and require refinishing. Wall finishes are taped gypsum wallboard as well as ceramic tile, wood wall panels, and vinyl. Floor finishes include resilient flooring, sheet carpet, and plywood flooring. Asbestos tile resilient flooring in the building requires attention as some areas are worn and damaged, creating potential health risks. Retain a hazardous materials consultant to analyze and make recommendations for remediation. Ceiling finishes include gypsum board, fixed ceiling tile, and painted plywood. The fixed ceiling tile is worn, stained, and requires attention.

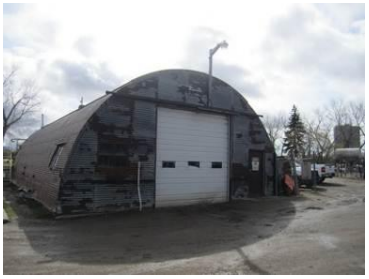
Plumbing
Plumbing fixtures inside the building were installed in 1985 and are serviceable. A 32,000 BTU/HR gas fired water heater is in service that has exceeded its forecasted serviceable lifespan.

Heating Cooling and Ventilation
Two newer Lennox furnaces are in operation and provide heat that is supplemented by a unit heater in the staff lounge. This unit heater has exceeded its forecasted serviceable lifespan and should be replaced. Distribution equipment in the building includes exhaust fans and an air filtration unit installed in the garage. Programmable thermostats are in operation.

Fire and Life Safety
ABC fire extinguishers have been installed throughout the facility. Inspections were current.

Electrical
The building is energized by 100 amp electrical service that is supplied to the facility. The circuit panels were operating at an approximate load of 77% but are dated and should be analysed further by an electrical consultant to ensure proper operation. Fluorescent lighting, both T-8 and compact fluorescent, was employed in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires. Smoke alarms have been installed and emergency lighting equipment is in operation. These system components are dated and replacement is recommended.

2.2.2 3300 Broad Street – Quonset (Area 3)



The Broad Street Quonset Hut is located at 3300 Broad Street. The building was constructed in 1994. The structure encompasses 1800 ft^2.

Envelope
The facility substructure consists of concrete strip footings, foundation walls, and slab on grade. Exterior walls and roof are constructed of painted galvanized ribbed steel. The paint finish is worn and exterior walls are damaged on north side. Exterior windows are single glazed units set in steel frames. These windows do not provide proper heat and energy management. Exterior passage doors include insulated steel units. Other doors include a 12’ x 12’ overhead door complete with motorized operation.

Interior
Partitions in the building are gypsum wallboard construction. Interior doors are wood. Wall finishes are taped gypsum wallboard which is damaged. Floor finishes include the concrete slab which contains minor cracks and 12” vinyl composite tile flooring in the washroom which is damaged. Ceiling finishes include gypsum board.

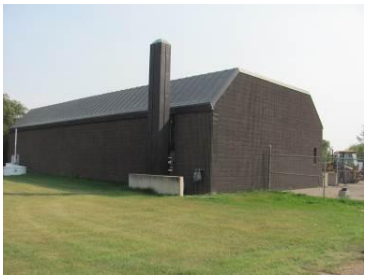
Plumbing
Plumbing fixtures include a tank flush toilet, an enamel sink and an enamel shop sink. All washroom fixtures require replacement. A 38,000 BTU/HR gas fired water heater is in service.

Heating Cooling and Ventilation
A Lennox furnace and a gas fired unit heater are in operation and provide heat that is supplemented by a baseboard electric heater in the washroom. Distribution equipment in the building includes exhaust fans and a ceiling fan. Programmable thermostats are in operation.

Fire and Life Safety
ABC fire extinguishers have been installed throughout the facility. Inspections were current. There is a emergency shower station installed on the exterior of the building on the East side. The shower unit is worn and corroded and should be replaced.

Electrical
The building is energized by 100 amp electrical service that is supplied to the facility. The circuit panel is operating at 100% capacity. Fluorescent lighting, both T-8 and compact fluorescent, was employed in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires.

2.2.3 221E Assiniboine Ave – Maintenance Shop (Area 6)



The Maintenance Shop located at 221E Assiniboine Avenue was constructed in 1969 and has a total floor area of 2650 ft^2.

Envelope
The copper roof covering is set upon a 2' x 10' joist frame that rests on masonry walls with a fluted face. The exterior windows are a mixture sealed and unsealed units. The unsealed units should be replaced to increase the efficiency of the building. The exterior passage doors are metal clad and the three overhead doors are wood. The overhead doors are damaged and require replacement.

Interior
Interior doors are wood. The wood pocket doors were difficult to operate and had a worn appearance. The stairs in the building are constructed from wood. Wall finishes include pre-fabricated gypsum wallboard as well as wood panelling. The noted floor finish in the building was sheet vinyl flooring. Ceilings were either gypsum wallboard or faux wood panelling.

Plumbing
The Maintenance Shop has a standard flush toilet that is in good condition, and kitchen and washroom sinks that are damaged, requiring replacement. One "John Wood" gas fired water heater is in use.

Heating Cooling and Ventilation
Two newer gas fired furnaces (135,000 BTU/HR each) serve as the sole heat sources for the building. Exhaust systems suitable for vehicle, shop, welding, and washroom functions are in place.

Fire and Life Safety
Fire extinguishers in the building have current inspection tags.

Electrical
The building is energized by 230 volt, 400 amp power delivered to the main switch. Circuit panels are at approximately 95% capacity. Interior lighting requirements are addressed by fluorescent (T8, T5, CFL) fixtures while wall mounted HID fixtures are in place on the exterior. The three wire fire alarm system installed is obsolete and requires replacement. A newer security system is in place including motion sensors and access keypad.

2.2.4 551E Assiniboine Ave – Area 4 Service Depot (Area 6)

The Area 4 Service Depot is located adjacent to the Maintenance Shop, Greenhouse Complex and Overwintering Structure on Assiniboine Avenue. It was constructed in 1986 and has a total floor area of 2200 ft^2.

Envelope
The facility substructure consists of concrete strip footings, foundation walls, and slab on grade. Exterior walls are clad with cadenza concrete masonry units. Exterior windows are single glazed units set in wood frames. These windows are worn and energy inefficient and require replacement. Exterior passage doors include insulated steel units. Other doors include three 10' x 11' overhead doors that are worn and are approaching the end of their serviceable life. The roof covering is a BUR roofing with sheet metal flashing. BUR roofing contains soft spots and has approximately 5 years remaining.

Interior
Interior doors are wood and require refinishing. Wall finishes are taped gypsum wallboard as well as plywood panels. Paint finish is required on all walls. Floor finishes include concrete and vinyl composite tile flooring. The vinyl composite tile flooring is worn and damaged and requires replacement. Ceiling finishes include gypsum board. Gypsum board ceiling finished is worn and damaged in certain locations.

Plumbing
Plumbing fixtures include vitreous china sinks in the washrooms, a stainless steel sink in the kitchen and tank flush toilets. A 3000 watt electric water heater is in service.

Heating Cooling and Ventilation
Two Lennox furnaces are in operation. Distribution equipment in the building includes two exhaust fans. Programmable thermostats are in operation.

Life Safety
ABC fire extinguishers have been installed throughout the facility. Inspections were current.

Electrical
The building is energized by a 100 amp electrical service. The circuit panel is operating at 100% capacity. Fluorescent lighting, both T-8 and compact fluorescent, was employed in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires.

2.2.5 2860 Wascana Drive – Goosehill Service Depot (Area 4)

The Goosehill Service Depot was constructed in 1982 and has a floor area of 1450 ft^2 in a unique circular footprint.

Envelope
The facility substructure consists of a concrete foundation and slab on grade. Exterior walls are clad with wood siding which is damaged and requires attention. Two exterior passage doors are insulated steel. The door at the fuel storage shed has a damaged frame and the paint has deteriorated on both the fuel storage room door and the main entrance door. There are two overhead coiling doors – one to the garbage storage and the other to the main shop area. Both are in good condition however the jambs require replacement. The flat roof covering appeared to be in good condition and was recently replaced. The building has no windows but instead has eight acrylic skylights.

Interior
Partitions in the building are wood framed with plywood cladding. Interior doors are wood.

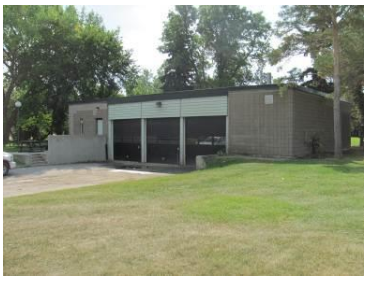
Plumbing
Plumbing fixtures inside the building were installed in 1982 and are serviceable. A 10 gallon electric water heater is in service that has exceeded its forecasted serviceable lifespan.

Heating Cooling and Ventilation
Electric baseboard heaters are located in the washroom and office space. An electric unit heater in located in the lunchroom and an electric radiant heater in installed in the shop area that has exceeded its forecasted lifespan.

Fire and Life Safety
ABC fire extinguisher is installed in the lunchroom. Inspections were current.

Electrical
The building is energized by 100 amp electrical service that is supplied to the facility. Compact fluorescent lighting is used throughout the facility while the exterior illumination is provided with HID (high intensity discharge) luminaires.

2.2.6 1955 College Ave – Area 2 Service Depot (Area 1)



The Area 2 Service Depot was constructed in 1967 and is approximately 2350 ft^2.

Envelope
The building is founded on cast in place concrete strip footings and slab on grade. The glulam timber roof beams with tongue and groove fir decking are supported on load bearing interior and exterior concrete masonry with fluted 'Cadenza' exterior finish. The mechanical mezzanine floor is constructed of 2 x 6 joists at 12" on centre. The span of the joists is of concern and may require additional support. Retain a structural engineer to analyze and make recommendations for remediation. This issue should be repaired as soon as possible. The exterior windows are double glazed sealed wood units with localized rot and should be replaced. The exterior passage doors are metal clad and the three overhead doors are wood. The BUR roofing requires replacement.

Interior
Interior doors are a combination of steel and wood. The stairs in the building are constructed from wood and as required by code, a handrail should be installed. Wall finishes include wood panelling. The noted floor finish in the building was sheet vinyl flooring. Ceilings are exposed wood tongue and groove decking.

Plumbing
The service depot is equipped with one standard flush toilet and kitchen and washroom sinks that are in good condition but have exceeded their serviceable lives. One "John Wood" electric water heater was recently installed.

Heating Cooling and Ventilation
Two newer gas fired furnaces serve as the sole heat sources for the building.

Fire and Life Safety
Three fire extinguishers are located in the building. One has expired near the shop entrance and requires replacement or recertification.

Electrical
The building is energized by 400 amp power delivered to the main switch. Interior lighting requirements are addressed by fluorescent T8 fixtures while wall mounted HID fixtures are in place on the exterior.

2.2.7 Area 1 Service Depot (no Civic Address, by Legislature) (Area 3)

The Area 1 Service Depot is located by the Legislature Building. The structure was constructed in 1955 and has a total area of 2800 ft^2. The washroom in the building was modified in 2011. The depot may be owned by the Province of Saskatchewan.

Envelope
Substructure components noted during the assessment include a cast concrete floor that had significant damage and requires replacement. It was noted that a concrete basement (104' x 32') is located nearby and is deemed a liability. The wood stairs leading into the building are deteriorating and require attention. Exterior walls are clad with a brick veneer and were noted with extreme cracking that requires further analysis. Due to the extreme cracking and shifting of the concrete foundation, exterior brick walls and interior concrete masonry units, a structural consultant should be retained to analyze the condition of the building and makes recommendations for correction. Exterior windows include sealed aluminum framed units as well as single glazed wood framed units that should be replaced. Exterior doors include a steel clad door with a worn paint finish and solid core wood doors that are dated and worn. Three overhead doors were in place. The roof covering consists of both tar and gravel (BUR), and a bituminous sheet membrane (BUR).

Interior
Interior partitions include concrete masonry block. Significant cracking was noted to concrete masonry block on the interior of the building. A structural consultant should be retained as noted above. Interior doors include solid and hollow core wood types. The interior wood stairs are uneven because of the shifting of the building. Wall finishes include painted plywood applications. Floor finishes include peel and stick vinyl tiles that are damaged. A sheet vinyl flooring upgrade is recommended. Ceiling finishes include painted plywood and fixed ceiling tile.

Plumbing
Plumbing fixtures in the building are in fair to good condition. A water filtration system is installed in the washroom. Rainwater is drained through the building and exits at its base. It would appear that this system requires attention as ponding was noted around a drain.

Heating Cooling and Ventilation
The building has an exhaust fan and a fume hood in service. Heating for the building is supplied with the unit heaters that require replacement. The unit heaters are controlled with manual thermostats.

Fire and Life Safety
ABC fire extinguishers are installed in the building and have current inspection tags.

Electrical
A 70 amp electrical panel was being installed at the time of the assessment. Circuit panels installed in the garage are being removed. Interior lighting consists of T8, compact fluorescent, and high intensity discharge (HID) units. Exterior lighting is provided by HID lighting units.

2.2.8 Campus Service Depot A (Area 7)

The Campus Service Depot A is located at the University of Regina campus and shares its facility with the University of Regina. The building was constructed in 1972. The structure encompasses 2800 ft^2. The depot is owned by the University of Regina.

Envelope
The facility substructure consists of concrete strip footings, foundation walls, and slab on grade. Exterior walls are concrete masonry units with wood soffits. The pointing is damaged on the CMU wall. Exterior passage door include an exterior aluminum door. Other doors include two 12' x 12' overhead doors. One unit is constructed of a vinyl/plastic material while the other is wood constructions. Both overhead doors are damaged and worn. Access to the roof was not permitted.

Interior
Partitions in the building concrete masonry units (CMU) and framed gypsum wallboard. Cracking was noted in CMU walls in the Locker Room area of the building. If condition worsens, retain a structural consultant to analyze. Gypsum wallboard contains some damage. Interior doors are wood and require refinishing. Floor finishes include vinyl composite flooring and mastic flooring. All flooring is worn and requires replacement. Ceiling finishes include suspended acoustic ceiling tile. Steel stair construction is installed.

Plumbing
Plumbing fixtures include both tank flush and commercial grade toilets, a pedestal urinal and both stainless steel kitchen sinks and wall mounted vitreous china washroom sinks.

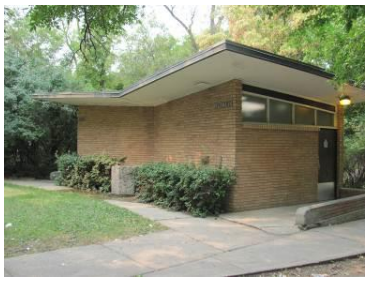
Heating Cooling and Ventilation
The facility shares its HVAC system with the University of Regina. Visible components of this system include two make-up air units (MAU) and exhaust fans. Manual thermostats are in operation.

Fire and Life Safety
A sprinkler system is installed as well as ABC fire extinguishers have been installed throughout the facility. Inspections were current.

Electrical
One electrical panel was visible and was operating at 100% capacity. Fluorescent lighting, both T-8 and compact fluorescent, was employed in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires. Incandescent lighting was installed in certain location and requires upgrading. Smoke alarms have been installed and emergency lighting equipment is in operation.

2.3 WASHROOMS

2.3.1 2801 Albert Street – Washroom #1 Legislature (Area 3)



Washroom #1 is located on the south side of Wascana Lake east of Albert Street. The year of construction is not known and the approximate footprint is 640 ft^2.

Envelope
The facility is supported on a concrete slab on grade. The ground should be re-graded to slope away from the building. The walls are wood stud construction with brick on the exterior. Some graffiti was noted during the site visit and caulking at the masonry joints requires replacement. The roof is wood framed with built up roofing and is in fair condition however the plaster coating at the soffits needs repair. Wired glazing set in wood frames is cracked in at least three panels and the paint is worn. The three steel passage doors require repainting. There are two skylights in the building and they are in good condition.

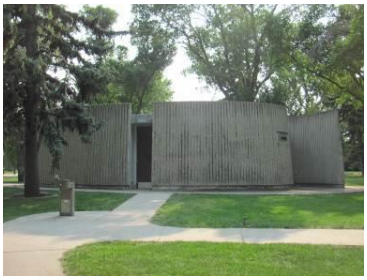
Interior
The interior finish consists of painted plaster walls with gypsum plaster ceilings and ceramic tile flooring. Toilet partitions are painted metal. A damaged toilet partition in the Women's washroom requires replacement.

Plumbing
There are five toilets and three urinals in the facility. They seem to be in good condition, however the year of installation is not known. The two tile vanities and four sinks are in poor condition and require replacement in each washroom. The cast iron mop sink is wall mounted and could be replaced with a floor mounted unit to reduce potential back injuries.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A six circuit lighting panel services the building. Interior lighting consists of compact fluorescent bulbs in incandescent fixtures. Exterior lighting is provided by HID lighting units.

2.3.2 3200 Lakeshore Drive – Washroom #2 (Area 3)



Washroom #2 was constructed in 1965 and is 710 ft^2. It is an oval structure and is typical in appearance of the majority of the washrooms in Wascana Park.

Envelope
The facility is supported on a concrete slab on grade. The walls are cast in place concrete construction with a bush hammered fluted face. The roof is also cast in place concrete. The paint on the three steel passage doors is worn and the wooden transoms are rotting and will soon require replacement. There are two 36" diameter skylights in the building and they are in fair condition. The BUR roofing is in poor condition and should be replaced along with the associated flashing and trim.

Interior
The interior partition walls are wood framed with painted plywood and gypsum board. Some of the wood has rotted and the gypsum board is damaged requiring replacement and repair. Toilet partitions are painted metal and exhibit localized corrosion. The interior walls and ceiling should be repainted, and the tile flooring has exceeded its forecasted service life and should be replaced.

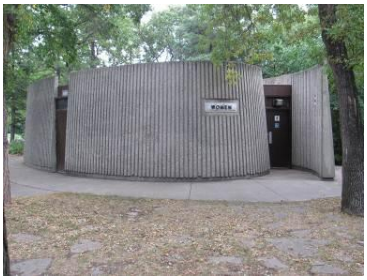
Plumbing
There are seven toilets and three urinals in the facility. They seem to be in fair condition. The two tile vanities and five sinks are in poor condition and require replacement in each washroom. Grab bars are missing from a stall in the Men's washroom. The cast iron mop sink is wall mounted and could be replaced with a floor mounted unit to reduce potential back injuries. An Amtrol water pressure booster tank is installed to increase water pressure. The sewage pump as part of the packaged lift station below the washroom requires repair.

Heating Cooling and Ventilation
An electric baseboard heater located within the storage space provides a source of heat. The exhaust fan that is located in the caretaker space has exceeded the forecasted service life and requires replacement.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A 100 amp main breaker energizes the building. Interior lighting consists of compact fluorescent bulbs in incandescent fixtures. Exterior lighting is provided by HID lighting units. A junction box at an abandoned exterior light requires a cover.

2.3.3 Washroom #3 (Area 1)



Washroom #3 was constructed in 1965 and is 710 ft^2. It is an oval structure and is typical in appearance of the majority of the washrooms in Wascana Park.

Envelope
The facility is supported on a concrete slab on grade. The walls are cast in place concrete construction with a bush hammered fluted face. The roof is also cast in place concrete. The three steel passage doors are in good condition. There are two 36" diameter skylights in the building and they are in fair condition. The BUR roofing is in poor condition and should be replaced along with the associated flashing and trim.

Interior
The interior partition walls are wood framed with painted plywood and gypsum board. Some of the wood has rotted and the gypsum board is damaged requiring replacement and repair. Toilet partitions are painted metal and exhibit localized corrosion. The interior walls and ceiling should be repainted, and the tile flooring has exceeded its forecasted service life and should be replaced.

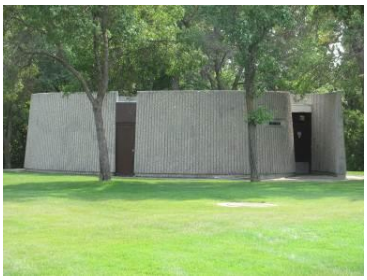
Plumbing
There are seven toilets and three urinals in the facility. They seem to be in fair condition. The two tile vanities and five sinks are in poor condition and require replacement in each washroom. Grab bars are missing from a stall in the Men's washroom. The cast iron mop sink is wall mounted and could be replaced with a floor mounted unit to reduce potential back injuries.

Heating Cooling and Ventilation
An electric baseboard heater located within the storage space provides a source of heat. The exhaust fan that is located in the caretaker space has exceeded the forecasted service life and requires replacement.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A 40 amp service energizes the building. Interior lighting consists of compact fluorescent bulbs in incandescent fixtures. Exterior lighting is provided by HID lighting units.

2.3.4 Washroom #4 (Area 4)



Washroom #4 was constructed in 1965 and is 710 ft^2. It is an oval structure and is typical in appearance of the majority of the washrooms in Wascana Park.

Envelope
The facility is supported on a concrete slab on grade. The walls are cast in place concrete construction with a bush hammered fluted face. The roof is also cast in place concrete. The three steel passage doors are in good condition. There are two 36" diameter skylights in the building and they are in fair condition. The BUR roofing is in poor condition and should be replaced along with the associated flashing and trim.

Interior
The interior partition walls are wood framed with painted plywood and gypsum board. Some of the wood has rotted and the gypsum board is damaged requiring replacement and repair. Toilet partitions are painted metal and exhibit localized corrosion. The interior walls and ceiling should be repainted, and the tile flooring has exceeded its forecasted service life and should be replaced.

Plumbing
There are seven toilets and three urinals in the facility. They seem to be in fair condition. The two tile vanities and five sinks are in poor condition and require replacement in each washroom. Grab bars are missing from a stall in the Men's washroom. The cast iron mop sink is wall mounted and could be replaced with a floor mounted unit to reduce potential back injuries. There is a packaged lift station below the washroom and appears to be in fair condition. There is a drinking fountain mounted on the exterior of the washroom. The roof drain is missing its leaf guard.

Heating Cooling and Ventilation
An electric baseboard heater located in the storage space provides a source of heat. The exhaust fan that is located in the caretaker space has exceeded the forecasted service life and requires replacement.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A 100 amp service energizes the building. A junction box in the caretaker space is missing a cover. Interior lighting consists of compact fluorescent bulbs in incandescent fixtures. Some lenses are cracked or missing and require replacement. Exterior lighting is provided by HID lighting units.

2.3.5 Willow Island Washroom #5 and Associated Staff Space (Area 1)

The Willow Island Washroom was constructed circa 1965 and is similar to the other oval washrooms in Wascana Park. The size of the facility is approximately 700 ft2.

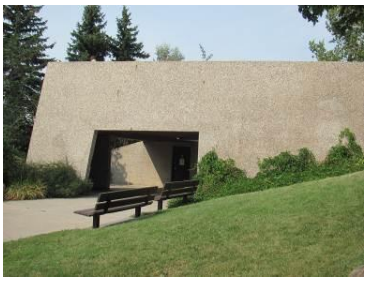
Envelope:
The building is situated on a concrete slab on grade and comes with a precast concrete roof structure. Exterior doors are standard hollow core steel units. Skylights are installed in the washrooms and are in fair condition.

Interior:
The primary floor finish in the building is tile. Interior doors are steel units in steel frames. The tile flooring in the staff space is damaged and requires repair.

Plumbing:
Wall mounted toilets are installed in the washrooms along with pedestal urinals. Washroom vanity countertops have a tile finish. One of the urinals is badly cracked at the base and requires replacement.

Heating, Cooling and Ventilation:
Washrooms come equipped with exhaust fans.

2.3.6 Washroom #6 (Area 6)



Washroom #6 is located in Douglas Park. It was constructed in 1974 and is approximately 6840 ft^2.

Envelope
The facility is supported on a concrete foundation. The walls are cast in place concrete construction with an exposed aggregate finish. Some localized spalls and cracks require repair. The roof is precast concrete and is supported on the exterior walls and the interior concrete masonry block load bearing walls. The roof is partially buried and a membrane system is exposed and damaged in places. Exterior doors are painted steel and the finish has deteriorated.

Interior

Partition walls are constructed of concrete masonry block. In general the interior fittings including 80 lockers and 30 benches are in good condition. The finishes of painted block, wood siding, and ceramic tile are in good condition.

Plumbing
There are five toilets and three urinals in the facility. One of the toilets is out of service and requires repair or replacement. Sinks and showers are in good condition. The two cast iron mop sinks are wall mounted and could be replaced with floor mounted units to reduce potential back injuries. Two drinking fountains are in good condition. The hot water storage tank and hot water heater are in good condition.

Heating Cooling and Ventilation
Two Lennox furnaces were recently installed in 2006 and are in good operating condition.

Fire and Life Safety
There are two recessed cabinets; one in each washroom. The women's washroom fire extinguisher is missing and needs to be replaced. There is a fire extinguisher located in the mechanical room.

Electrical
A 600V 75 kVA Power Transformer is located outside of the building. The main disconnect and panels appear to be in good condition. Interior lighting consists of indirect fluorescent tube lighting and compact fluorescent bulbs in incandescent fixtures. Some lenses are cracked or missing and require replacement. Incandescent pot light fixtures located in the canopy outside have been abandoned and were replaced with recessed HID lighting units. Incandescent exit light fixtures are located at main exits from change rooms.

2.3.7 2881 Wascana Drive – Washroom #7 Candy Cane Park (Area 4)

Washroom #7 was constructed in 1973 and is 710 ft2. It is an oval structure and is typical in appearance of the majority of the washrooms in Wascana Park.

Envelope
The facility is supported on a concrete slab on grade. The walls are cast in place concrete construction with a bush hammered fluted face. The roof is also cast in place concrete. The three steel passage doors are in good condition. There are two 36" diameter skylights in the building and they are in fair condition. The BUR roofing is in good condition.

Interior
The interior partition walls are wood framed with painted plywood and gypsum board. Some of the wood has rotted and the gypsum board is damaged requiring replacement and repair. Toilet

partitions are painted metal and exhibit localized corrosion. The interior walls should be repainted, and the tile flooring has exceeded its forecasted service life and should be replaced.

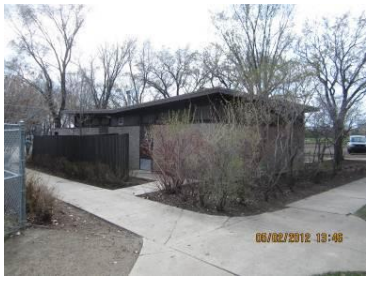
Plumbing
There are seven toilets and three urinals in the facility. They seem to be in fair condition. The two tile vanities and five sinks are in poor condition and require replacement in each washroom. The cast iron mop sink is wall mounted and could be replaced with a floor mounted unit to reduce potential back injuries. A drinking fountain is installed on the exterior of the facility. The roof drain is missing its leaf guard.

Heating Cooling and Ventilation
The exhaust fan that is located in the caretaker space has exceeded the forecasted service life and requires replacement.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A 100 amp service energizes the building. The panel is rusty and requires repair. Interior lighting consists of compact fluorescent bulbs in incandescent fixtures. Some lenses are cracked or missing and require replacement. Exterior lighting is provided by HID lighting units.

2.3.8 Douglas Park Washroom (Area 6)



The Douglas Park Washroom is located near Washroom #6 and was constructed in 1974. It is approximately 1250 ft^2. The washroom is owned by the City of Regina.

Envelope
The concrete slab is cracked and requires repair or replacement. The roof structure is supported by concrete masonry block walls which exhibit several cracks. In one location, a steel telepost that supports the timber roof framing has been removed. It is unknown whether the steel post removal had been reviewed by a structural engineer. A engineer should be retained to analyze the facility's structural components and make recommendations for remediation. The membrane on the roof has failed and is leaking and fascia and soffit require repainting. Some of the 20 single glazed wood framed windows have cracked and should be replaced. Two steel doors are in fair condition, and one solid wood door is worn and should be replaced with a steel door.

Interior
Partitions are concrete masonry block and wood framing. The gypsum board ceiling has been

damaged in several locations due to roof leaks.

Plumbing
There are 15 toilets and five urinals in the facility. They seem to be in good condition. The 11 sinks are in good condition. The water heater was recently installed.

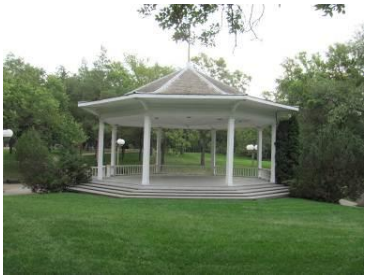
Heating Cooling and Ventilation
A gas fired furnace was installed in 1996 and is in fair condition. The chimney does not appear to sit plumb and may leak at the joint. It should be inspected.

Fire and Life Safety
No fire extinguishers were installed at the facility. All facilities are required to have fire extinguishers in accordance with the National Fire Code. This requirement should be confirmed with the City's bylaw officer.

Electrical
A 100 amp service energizes the building. Interior lighting consists of surface mounted fluorescent and recessed incandescent fixtures. One lens is missing and requires replacement. Exterior lighting is provided by HID lighting units.

2.4 MISCELLANEOUS

2.4.1 19th Ave & Smith St – Bandshell (Area 1)



The open air Bandshell is located north of Wascana Lake east of Albert Street. The original date of construction is not known. A major rehabilitation was done in 1982.

Structure
The flooring of the bandshell consists of 2x6 timber decking on 2x10 timber joists. Some of the boards are rotting and require replacement. The aluminum stairs are in good condition. The cedar shake roofing, galvanized ride caps, galvanized flashing, and the timber framing supporting the roof appears to be in good condition. An attic hatch is framed through the 4" tongue and groove timber ceiling cladding.

Electrical
The electrical service panel was unable to be located during the site visit. Four weatherproof exterior outlets are provided at the Bandshell. Two outlets are missing weatherproof covers and need replacing. Eight recessed incandescent pot light fixtures are provided with compact fluorescent lamps.

2.4.2 217E Assiniboine Ave Greenhouse Complex including the Header House (Area 6)

The Greenhouse Complex including the Header House is located at 217E Assiniboine Ave. The complex was constructed in approximately 1986. The structure encompasses 15,800 ft^2 and includes two distinct greenhouses and a garage/house building.

Envelope

Exterior walls are clad with numerous types of construction including CMU, metal siding, cementious stucco, wood siding and glass and polycarbonate material for the greenhouses. The CMU, wood siding and glass exterior walls are all worn or damaged. A significant amount of water was noted in the concrete bunker area of the facility. A structural consultant should be retained to analyze the foundation of the building and make recommendations for remediation. Exterior windows are primarily sealed units set in wood frames with some upgraded PVC units installed. Exterior passage doors include both solid core wood and insulated steel units. The large wood exterior doors should be replaced by a steel overhead door. Other doors include a 9'x7' steel overhead door and 11' x 9' wood overhead door. The wood overhead door is worn and requires replacement. The roof covering is a rolled bituminous membrane (SBS), an inverted roofing system, asphalt shingles, sheet metal and glass/polycarbonate panels for greenhouse. The inverted roof section requires replacement.

Interior

Interior doors are both steel and wood units and the wood doors require refinishing or replacement. Wall finishes are taped gypsum wallboard as well wood wall panels, and vinyl. Floor finishes include vinyl asbestos tile, sheet carpet, sheet vinyl and plywood flooring. Vinyl Asbestos tile resilient flooring in the building requires attention as some areas are scratched, worn and damaged, creating potential health risks. Replace VAT flooring with sheet vinyl products abiding by proper asbestos abatement procedures. Ceiling finishes include gypsum board and painted plywood.

Plumbing

Plumbing fixtures include tank flush toilets, pedestal urinal, wall mounted vitreous china washrooms sinks, and stainless steel kitchen and shop sinks. Pedestal urinal requires replacement. A 78,000 BTU/HR gas fired water heater and a 1500 watt electric water heater are in service. As well, a sump pump is installed on site.

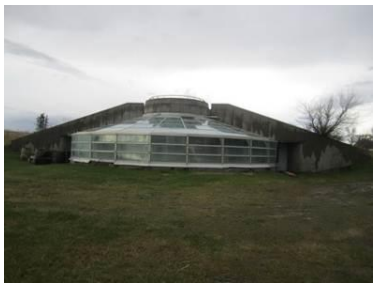
Mechanical

Heat generation is provided primarily through a boiler unit and perimeter finned tubed panels. Additional heat is provided through fan heaters and seven gas fired unit heaters and an electric heater. The unit heaters all require upgrading. Cooling is provided through a split AC unit. Distribution equipment in the building includes ceiling fans and exhaust fans.

Fire and Life Safety
ABC fire extinguishers have been installed throughout the facility. Inspections were current.

Electrical
There are 7 circuit panels operating at an approximate load of 80% but are dated. Circuit panels installed in the greenhouse corridor are extremely weathered and worn. Electrical circuit panels should be analysed further by an electrical consultant and replaced or repaired as required. Fluorescent lighting, both T-8 and compact fluorescent, was employed in the building while the exterior illumination is provided with HID (high intensity discharge) luminaires. Emergency lighting system is installed.

2.4.3 300E Assiniboine Ave – Overwintering Structure (Area 6)



The Overwintering Structure is located at 300E Assiniboine Avenue and was constructed in 1978. The total floor area available to occupants is 1600 ft^2.

Envelope
Substructure components noted during the assessment include cast concrete foundation walls and a slab on grade. The exterior windows are sealed units in fixed frames that were installed in 1979. Many come with failed seals and require replacement. Exterior doors are steel clad and have worn paint finishes.

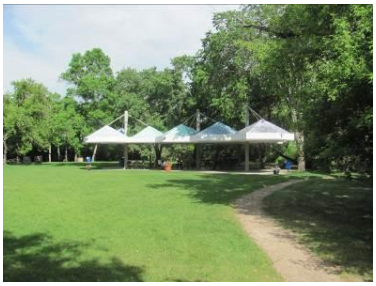
Interior
Interior hollow steel doors and aluminum doors are in service. Floor finishes include mosaic tile that requires attention. Seamless glazing is installed in the viewing area.

Plumbing
The water pump that serves to fill the bird area is damaged and should be replaced prior to winter.

Heating Cooling and Ventilation
The heat for the building is provided by three electric unit heaters that have exceeded their forecasted serviceable lifespan. Manual thermostats control the temperature set-point for these units.

Electrical
The building is energized by 480/600 volt, 400 amp service to the main switch. Circuit panels are at approximately 63% capacity. Circuit panels have exceeded their forecasted life cycle and breaker operation may be compromised. This system should receive further analysis by an electrical consultant to ensure proper operation. Interior lighting is provided by compact fluorescent and wall mounted HID fixtures.

2.4.4 Willow Island Covered Picnic Area (Area 1)



The Willow Island Picnic Shelter was originally built in 1965 and is approximately 1440 square feet.

Envelope
The structure sits on a concrete foundation. The concrete foundation was noted to have minor cracking. Patch cracks and monitor. Four triangular steel columns hold up 12 fibreglass hexagon shaped canopies. Connections between the top of the columns and the roof panels are provided by steel rods with turnbuckles. The columns, rods and roof panels are all in good condition.
The fibreglass roofing units are painted. Paint finishes on the roof are worn and require painting.

Electrical
Exterior HID lighting was noted in the facility. Several units are damaged and require replacement with units with wire cages.

2.5 ASSESSMENT RESULTS

As summarized above, over 750 individual building systems or assets were identified, reviewed and valuated. Approximately 35% of the building assets reviewed have met or exceeded their theoretical life cycle. Additionally, 13% of the building assets have less than ten years of remaining life and 15% of the identified building assets have less than 20 years of remaining life. However it is reasonable to assume that many of the assets will remain functional beyond their anticipated service life due to environmental factors or operation and maintenance practices.

One method of prioritizing the buildings that need attention for purposes of future planning is use of a Facility Condition Index (FCI). The FCI is a comparative indicator of the relative condition of facilities. The FCI is expressed as a ratio of the cost of repairing or replacing deficient assets to the current replacement value of the facility. The FCI provides a metric to analyze the relative condition index of a single facility or group of facilities. **It is important to note that the FCI is limited because it does not account for assets that are functional beyond their service life; it is only based on theoretical lifecycles for each asset in a facility**.

An FCI of less than 5% is good, 5-10% is adequate, 10-60% is poor, and above 60% is fail. The FCI changes throughout the life of the building. As an asset deteriorates beyond its anticipated life, the FCI will increase. As an asset is replaced, the FCI can reduce.

A summary of the current FCI's for each facility is found in Table 2-1. Replacement costs for each facility are based on per square foot costs for buildings of comparable use (ie. Commercial Buildings, Maintenance Facilities, Washrooms, and Miscellaneous). The calculated replacement costs are included in Appendix A.

Table 2-1
Facility Condition Index (FCI) Summary

Facility Category	Facility Name	FCI (%)
Commercial Buildings	2900 Wascana Drive - Wascana Place	26.8%
Commercial Buildings	3000 Wascana Drive - Wascana Marina	0.2%
Depots and Maintenance Facilities	3201 Broad Street - Central Depot	12.9%
Depots and Maintenance Facilities	3300 Broad Street - Quonset	3.2%
Depots and Maintenance Facilities	221E Assiniboine Avenue - Maintenance Shop	9.0%
Depots and Maintenance Facilities	551E Assiniboine Avenue - Area 4 Service Depot	6.5%
Depots and Maintenance Facilities	2860 Wascana Drive - Goosehill Service Depot	20.9%
Depots and Maintenance Facilities	1955 College Ave - Area 2 Service Depot	16.6%
Depots and Maintenance Facilities	Area 1 Service Depot (no Civic Address, by Legislature)	8.9%
Depots and Maintenance Facilities	Campus Service Depot A	8.7%
Washrooms	2801 Albert Street - Washroom #1 Legislature	40.0%
Washrooms	3200 Lakeshore Drive - Washroom #2	24.1%
Washrooms	Washroom #3	19.4%
Washrooms	Washroom #4	24.7%
Washrooms	Willow Island Washroom #5 and Associated Staff Space	11.7%
Washrooms	Washroom #6	15.7%
Washrooms	2881 Wascana Drive - Washroom #7 Candy Cane Park	24.5%
Washrooms	Douglas Park Washroom	13.9%
Miscellaneous	19th Ave & Smith St - Bandshell	15.0%
Miscellaneous	217E Assiniboine Avenue Greenhouse Complex including the Header House	0.8%
Miscellaneous	300E Assiniboine Ave - Overwintering Structure	3.1%
Miscellaneous	Willow Island Covered Picnic Area	14.9%

As shown in Table 2-1, four facilities are considered to be in good condition (less than 5%), four are in adequate condition (less than 10%), and 14 are in poor condition (less than 60%). The Washrooms are the poorest building category with an average FCI of 21.7%, and Depots and Maintenance Facilities have an average FCI of 10.8%.

The FCI for Wascana Place was calculated including the investment required for the HVAC system replacement. When the HVAC system is replaced, the FCI for Wascana Place could be reduced to 5.9%.

3 Infrastructure Assessments

Condition assessments were completed on a majority of the municipal infrastructure assets in which WCA is responsible for operating and maintaining. In particular, Associated Engineering completed visual inspections in June 2012 on the following infrastructure assets:

- Roadways & Parking Lots,
- Concrete and Asphalt Sidewalks and Pathways,
- Retaining Walls and Shoreline Protection,
- Pedestrian Bridges,
- Irrigation Pump Houses,
- Aeration Systems and Fountains,
- Waterfalls,
- Dock Systems, and
- Lake Overlooks.

Desktop reviews were completed for the following infrastructure assets:

- Potable Water Distribution System,
- Sanitary Sewer System,
- Storm Sewer System,
- Natural Gas Distribution System,
- Power Distribution System,
- Communications Distribution System,
- Street Lighting and
- Traffic Signs.

The inspections collected pertinent information in order to assess key components of each infrastructure asset, and prioritize the capital and operational improvements needed immediately and over the long term. Team members met with WCA staff to solicit their operational knowledge of the facilities and to discuss and clarify data gathered by AE staff during the site assessment. The technical assessments provided in this chapter are intended to supplement the information presented in the database in Appendix B. Detailed photos of the surface infrastructure are included in Appendix D. A summary of cost estimates for repairs and replacements of infrastructure components in the short, medium and long term is included in Chapter 5 with detailed information included in Appendix A.

Our recommendations are based on our visual reviews of the roadways, parking lots, concrete and asphalt sidewalks, retaining walls and shoreline protection, pedestrian bridges, pump houses, aeration systems, waterfalls and fountains, docks systems, and lake overlooks. Desktop reviews were performed on the water distribution system, sanitary sewer system, storm sewer system, natural gas distribution system, power distribution system, communications distribution system, lighting and traffic signs. The scope of this

investigation did not permit the physical examination and confirmation of all of the components. Nevertheless, we have made every effort within the scope of our field programme to visually confirm and verify the condition of primary components. In some instances, it has been necessary to apply some interpretations and engineering judgement. If new information comes to light, which might influence our conclusions, we would request to be informed so that we may reassess our recommendations.

3.1 ROADWAYS AND PARKING LOTS

3.1.1 Existing Roadway and Parking Lot Network

Wascana Centre covers approximately 930 hectares in the centre of the City of Regina, and contains approximately 26.7 km of roads and 82 parking lots to accommodate the flow of traffic throughout the park. The road and parking lot network is highly variable in age and condition. WCA has divided maintenance into eight areas, which can be seen in Appendix C. As such, inventory and condition assessments will be divided into each area to provide a comparative analysis.

Note that major arterial roads including Wascana Parkway, Albert Street, College Avenue and Broad Street are maintained by the City of Regina and were not included within the scope of this review.

The extent of the existing road and parking lot network across each maintenance area can be seen in Table 3-1. A majority of the roads and parking lots are located in Area 3 (Legislature/ Rehabilitation Centre), Area 7 (University/ Innovation Place) and Area 8 (SIAST). These areas account for approximately 70% of the roadway and parking lot infrastructure. While approximately 30% of the roads and parking lots are within the five remaining areas.

Table 3-1
WCA Road and Parking Lot Network

	Road			Parking Lot	
	Length (m)	**Area (m^2)**	**Percent of Road Area (%)**	**Area (m^2)**	**Percent of Parking Lot Area (%)**
Area 1	2444	20,877	8	22,731	6
Area 2	800	6764	3	,876	2
Area 3	7103	69,808	27	56,647	14
Area 4	2245	22,218	9	7728	2
Area 5	1485	16,507	6	61,293	15
Area 6	1935	14,012	5	18,835	5
Area 7	6530	60,385	24	156,626	38
Area 8	4160	42,844	17	74,952	18
Total	**26,701**	**253,413**	**100**	**408,688**	**100**

As seen in Table 3-2, over 90 percent of the roads and parking lots are surfaced (asphalt concrete surfacing). The remaining areas are gravel surfaced. Some of the gravelled roads and parking lots have RAP (recycled asphalt pavement) spread over the surface. This is primarily used to reduce dust, tracks less dirt/mud, and does not shift as much as gravel. With multiple road surfaces, WCA employs different procedures and equipment to maintain each surface.

Table 3-2
WCA Road and Parking Lot Network – Surface Type

	Surfaced		Gravel		Total	
	Area (m^2)	Percent of Surfaced Area (%)	Area (m^2)	Percent of Gravel Area (%)	Area (m^2)	Percent of Total Area (%)
Area 1	41,912	7	1696	3	43,608	6
Area 2	14,928	2	1712	3	16,640	3
Area 3	118,851	20	7603	12	126,454	19
Area 4	29,946	5	0	0	29,946	5
Area 5	77,800	13	0	0	77,800	12
Area 6	11,887	2	20,960	34	32,847	5
Area 7	213,873	36	3138	5	217,011	32
Area 8	91,426	15	26,370	43	117,796	18
Total	**600,623**	**100**	**61,479**	**100**	**662,102**	**100**

The road networks throughout the park are divided into three classes of roads. **1) Arterials** (traffic movement is the primary consideration, land access is second), **2) collectors** (traffic movement and land access are equal), and **3) local** (traffic movement is secondary and land access is primarily). The road classifications were taken from previous studies. Where no information was found, engineering judgement was used to classify the road. As seen in Table 3-3, there is only one arterial roadway approximately 2.1 km long, which is located in Area 8 (SIAST). This is an extension of Wascana Parkway east of Ring Road. A majority of the roads in the park are collectors (15.8 km), and the remaining road segments are local (8.8 km).

Table 3-3
WCA Road Network – Road Classification

	Arterial	Collector	Local	Total
	Length (m)	Length (m)	Length (m)	
Area 1		1274	1170	**2444**
Area 2		560	240	**800**
Area 3		4003	3100	**7103**
Area 4		1725	520	**2245**
Area 5		1305	180	**1485**
Area 6		1585	350	**1935**
Area 7		4125	2405	**6530**
Area 8	2085	1215	860	**4160**
Total	**2085**	**15,791**	**8825**	**26,701**

3.1.2 Field Assessment Results

In order to assess the road and parking lot network within WCA Governed Area, a field evaluation was completed on June 4 to 6, 2012. The field evaluation involved completing a visual pavement distresses survey, as well as commenting on any additional pavement anomalies.

The survey was based on the ASTM International 6433-99 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys. This process involves two people using a vehicle, and visually assessing the condition of the pavement surface. This method required survey personnel to be trained so that the results would be accurate, consistent and repeatable in future years. The survey rates the condition of a surface of a road network by evaluating the type, extent and severity of pavement surface distresses, as well as the smoothness and ride comfort of the road. At the end of the assessment, a Pavement Condition Index (PCI) value is determined. The PCI value provides a numerical rating for the condition of the road segment, where 0 is the worst possible condition and 100 is the best. Table 3-4 provides a general description of the PCI ranges. Appendix D contains photographs of roadways in Wascana Park that represent each range.

Table 3-4
PCI General Description of Condition Ranges

PCI	Condition	General Description
90-100	Very Good	Sound physical condition. Asset likely to perform adequately without major work well into the long-term.
80-90	Good	Acceptable physical condition. Minimal short-term failure risk. Only minor work required.
70-80	Fair	Deterioration evident. Failure unlikely in the short-term but further deterioration may start to accelerate. Minor components or isolated sections need replacement. The asset still functions safely at an adequate level of service. Work required, but asset is still serviceable.
55-70	Poor	Failure likely in the near-term. Likely need to replace most of the asset. Substantial maintenance work require in the short-term.
<55	Very Poor	Failure imminent or failed. Immediate need to replace most of the asset. Major work or replacement required.

As part of the report, the PCI will provide WCA a comparative analysis of the current condition of each segment in its road network. As WCA develops its asset management system, collecting the PCI ratings of the roads at regular intervals (i.e. every 1, 2, 3, 4, 5 years), the rate of deterioration of the road network can be evaluated. This can help evaluate pavement materials and designs, as well as the effectiveness of maintenance strategies.

Prior to completing the road assessment, the road and parking lot network was divided into manageable segments, which are detailed in the database in Appendix B. This created approximately 157 segments within WCA's road and parking lot network as illustrated in Appendix C. The segments were based on pavements with similar structures, design and traffic volumes, as well as similar performance characteristics. Each road and parking lot section was given a unique identifier, so that information for each segment can be maintained in a database.

3.1.3 Road Condition Assessment

Each road segment in each maintenance area was categorized into the PCI ranges listed in Table 3-4. Table 3-5 summaries the length of road in each PCI range in each of the maintenance areas. These results are illustrated in the maps in Appendix C. The detailed distress observations for each road segment can be found in the database in Appendix B.

Table 3-5
Length of Road (m) per PCI Range in each Area

	Length (m)				
PCI Range	**90-100**	**80-90**	**70-80**	**55-70**	**<55**
Area 1	500	0	1134	810	0
Area 2	240	0	385	175	0
Area 3	2338	1260	2690	815	0
Area 4	0	330	470	1445	0
Area 5	645	0	0	660	180
Area 6	0	0	1040	895	0
Area 7	3355	1705	1320	150	0
Area 8	1425	2735	0	0	0
Total	**8503**	**6030**	**7039**	**4950**	**180**
Percent of Total Length	**32%**	**23%**	**26%**	**18%**	**1%**

Overall, it can be seen that 8.5 km (32%) of the road network was rated from PCI 90-100 (very good). These roads are primarily located in the newer areas (like Innovation Place), as well as general locations that have been recently resurfaced or reconstructed (in areas such as SIAST, Conexus Arts Centre, First Nation University and Lakeshore Drive). Only basic preventative maintenance is required on these roads since these roads are in very good condition.

As seen in Table 3-5, 6.0 km (23%) of the road network was rated from PCI 80-90 (good). These roads are in good condition; however, pavement distresses are becoming evident. Despite the fact they are in good condition, these roads still require general preventative maintenance. Preventative maintenance is performed to prevent water from entering the pavement structure and decrease the rate of deterioration of the pavement quality. Performing relatively inexpensive preventative maintenance procedures, such as crack sealing, can extend the service life of the road and provide a cost effective maintenance solution.

In total, 7.0 km (26%) of the road network in the park was rated from PCI 70-80 (fair). These roads have slightly more advanced distresses than those observed in the PCI range 80-90. These roads are starting to show signs of structural weakening with more cracking throughout the road surface. In some cases, it may be the road is handling heavier traffic than it was originally designed for, and in some cases, it may be material related. A majority of the distresses are primarily climatic distresses resulting in the slow disintegration of the road that occurred over the life of the road. Disintegration usually involves the loss/separation of the individual components of the hot mix surface, and takes place in the form of ravelling, wear loss, and potholes. Basically, the surface is old and tired. These roads will require basic preventative maintenance, as well as some more extensive corrective maintenance measures to correct isolated pavement failures. WCA should start to consider resurfacing treatments to rejuvenate the worst PCI 70-80 roads.

The results of the pavement condition survey indicate that 4.9 km (18%) of the roads are in poor condition with PCI range of 55-70. There are a small number of these roads throughout each Area, which the exception of Innovation Place. These roads exhibit more extensive structural cracking and surface deformations. As a result of the more extensive surface distresses, the ride is typically more uncomfortable with frequent bumps or depressions. In the short-term, these roads will require major resurfacing or reconstruction (depending on the competency of the pavement structure), as well as consistent maintenance measures to reduce the deterioration of the road as much as possible.

There are only 180 m (1%) of the road network with a PCI less than 55. It is the road that leads to the Lots 3 and 4 at the Conexus Art Centre. This road has reached the end of its service life. Significant structural failures were found throughout; as such reconstruction of the road is required.

A further breakdown of the condition of the roads in each segment can be seen in Table 3-6. The table provides a breakdown of the PCI conditions ranges for each class of road in each area. In general, it can be seen that in most cases, the collector network is in better condition that the local network. An example of this would be that Lakeshore Drive, which is a collector, is primarily in better condition than Avenue D which is a local road. This is typical, as higher class roads are typically given a higher priority level for maintenance and capital projects.

Table 3-6
Length of Road (m) per PCI Range for each Road Class in each Area

		90-100	80-90	70-80	55-70	<55
Area 1	Collector	100	0	734	440	0
	Local	400	0	400	370	0
	Total	500	0	1133.5	810	0
		21%	0%	46%	33%	0%
Area 2	Collector	0	0	385	175	0
	Local	240	0	0	0	0
	Total	240	0	385	175	0
		30%	0%	48%	22%	0%
Area 3	Collector	2148	905	950	0	0
	Local	190	355	1740	815	0
	Total	2337.5	1260	2690	815	0
		33%	18%	38%	11%	0%
Area 4	Collector	0	0	470	1,255	0
	Local	0	330	0	190	0
	Total	0	330	470	1445	0
		0%	15%	21%	64%	0%
Area 5	Collector	645	0	0	660	0
	Local	0	0	0	0	180
	Total	645	0	0	660	180
		43%	0%	0%	44%	13%
Area 6	Collector	0	0	690	895	0
	Local	0	0	350	0	0
	Total	0	0	1040	895	0
		0%	0%	54%	46%	0%
Area 7	Collector	2,050	915	1,160	0	0
	Local	1,305	790	160	150	0
	Total	3355	1705	1320	150	0
		51%	26%	20%	2%	0%
Area 8	Arterial	0	2,085	0	0	0
	Collector	1,215	0	0	0	0
	Local	210	650	0	0	0
	Total	1,425	2,735	0	0	0
		34%	66%	0%	0%	0%

3.1.4 Parking Lot Condition Assessment

Similar to the road network, each parking lot was categorized into the PCI ranges listed in Table 3-4. Table 3-7 summaries the area of parking lot in each PCI range in each of the maintenance areas. These results are illustrated in the same maps as the roads, which can be

seen in Appendix C. The detailed distress observations for each road segment can be found in the database in Appendix B.

Table 3-7
Area of Parking Lot (m^2) per PCI Range in each Area

	Area (m^2)				
PCI Range	**90-100**	**80-90**	**70-80**	**55-70**	**<55**
Area 1	3684	7605	8051	2921	470
Area 2	0	0	1712	8164	0
Area 3	27,350	2938	6271	17,453	2635
Area 4	2236	0	0	5492	0
Area 5	39,000	0	0	0	22,293
Area 6	0	13,655	5180	0	0
Area 7	82,813	23,608	25,188	25,018	0
Area 8	50,475	24,477	0	0	0
Total	**205,559**	**72,282**	**46,402**	**59,048**	**25,398**
Percent of Total Area	**50%**	**18%**	**11%**	**15%**	**6%**

Approximately 205,000 m^2 (50%) of the parking lots throughout WCA are in very good condition, which has a PCI range between 90-100. This high percentage is primarily a result of several newly constructed parking lots throughout the park, such as at the Walter Scott building and Lloyd Place. There has been a significant number of new lots installed at Innovation Place, First Nations University, SIAST and Conexus Art Centre. In addition, several parking lots throughout the park have been resurfaced. With a large number of parking lots recently constructed, WCA should be aware that a wave of reconstruction projects will be required as the service life of the parking lots come to an end in 20-30 years.

There are approximately 72,000 m^2 (18%) of the parking lots in the PCI range of 80-90 and are in good condition. Just the same as the roads, these lots are starting to show basic pavement distresses. These lots still require general preventative maintenance in to extend the service life of the road.

As seen in Table 3-7, 46,000 m^2 (11%) of the parking lots were rated from PCI 70-80. These lots have slightly more advanced distresses and are starting to show signs of structural weakening. Similar to the roads, these lots will require basic preventative maintenance, as well as some more extensive corrective maintenance measures to correct isolated pavement failures.

The results of the survey show that 59,000 m^2 (15%) of the lots are in poor condition with PCI range of 55-70. A majority of the lots are in Area 3 and Area 7, with the remainder scattered throughout Wascana Centre. Some of the poor areas can be found behind the Legislative Building, Marina parking lot and the SaskPower parking lot adjacent to the Science Centre. These lots exhibit more extensive structural cracking and surface deformations. In the short-term, these roads will require

major resurfacing or reconstruction (depending on the competency of the pavement structure), as well as consistent maintenance measures.

Finally, it was observed that approximately 25,000 m^2 (6%) of the lots are in very poor condition. These lots include the remaining two lots at the Conexus Art Centre (lots 3 and 4) which are currently in the progress of being replaced, Wascana Pool, and the Central Depot at 3201 Broad Street. These lots have shown significant structural failures and will require complete reconstruction in the short-term.

3.2 CONCRETE AND ASPHALT SIDEWALKS AND PATHWAYS

As part of the overall condition assessment, all concrete and asphalt sidewalks and pathways were assessed.

3.2.1 Existing Sidewalk and Pathway Network

Wascana Centre is a showcase for the City of Regina, and major destination for outside recreational activities for the City. As such, there is an extensive network of pedestrian sidewalks and pathways throughout the park. The park has a long path system where pedestrians can walk along the entire parameter of Wascana Lake, as well as a vast network of paths to each facility and tourist destination. As seen in Table 3-8, there are approximately 25.2 km of concrete pathways, and 10.2 km of asphalt pathways, providing the park a network of paths ranging over 35 km. Appendix C contains maps of the sidewalk and pathway network in each of the eight maintenance areas.

Table 3-8
Length of Sidewalks and Pathways in each Area

	Length (m)		
	Concrete	**Asphalt**	**Total**
Area 1	2277	2429	4706
Area 2	1129	0	1129
Area 3	7537	1970	9507
Area 4	1923	1420	3343
Area 5	0	1220	1220
Area 6	530	440	970
Area 7	10,750	2364	13,114
Area 8	1005	312	1317
Total	**25,151**	**10,155**	**35,306**

The majority of the sidewalks and pathways in the park are located in and around the University Campus in Area 7. Second to that there is also an extensive network in Area 3, which provides paths along Wascana Lake, as well as connecting buildings from the Legislature to the Wascana Rehabilitation Centre. The remaining pathways are distributed across the remaining areas.

3.2.2 Field Assessment Results

A field evaluation was completed on June 6 to 8, 2012 to assess the sidewalk and pathway network lot network within Wascana Centre. Similar to the roads, the field evaluation involved completing a visual distresses survey of the sidewalk surface, as well as commenting on any additional anomalies.

The condition rating was completed using a similar process as the road network. Two people utilized an ATV to travel throughout the park and evaluate the condition of the sidewalks and pathways. Although the sidewalks and paths have some similar distresses to the roads, they are quite different, so the PCI rating system cannot be used. As such, the condition rating system was evaluated on a scale of 5 to 1. A value of 5 would be concrete/asphalt in perfect condition and a value of 1 would be for concrete/asphalt in the worst possible condition. Table 3-9 provides a general description of each condition class.

Table 3-9
General Description of Sidewalk and Pathway Condition Ranges

Condition	Condition	General Description
5	Very Good	Sound physical condition. Very smooth. Asset likely to perform adequately without major work well into the long-term.
4	Good	Acceptable physical condition. Smooth with few bumps or depressions. Minimal short-term failure risk. Minimal maintenance required.
3	Fair	Deterioration evident. Surface is reasonably comfortable, but more trip hazards, bumps or depressions starting to form. Minor components or isolated sections need replacement. The asset still provides an adequate level of service. Work required, but asset is still serviceable.
2	Poor	Advanced deterioration of the path. Surface is uncomfortable with frequent trip hazards, bumps or depressions. Likely need to replace most of the asset. Substantial maintenance work require in the short-term.
1	Very Poor	Failure imminent or failed. Surface very uncomfortable, with constant trip hazards, bumps and depressions. Immediate need to replace most of the asset. Major work or replacement required.

In addition to the condition rating, the specific number of trip hazards was recorded in each segment. Depending on the extent of the trip hazard, they can be unsafe to the general public. If someone falls and injures themselves because a municipality has not reasonably managed the trip hazard, they can become a liability. Many municipal jurisdictions monitor the number of trip hazards throughout their path network, and develop yearly action plans to eliminate trip hazards. The trip hazards were collected for WCA and included in the database for future use and planning.

Similar to the road network, prior to completing the assessment, the sidewalk and pathway network was divided into manageable segments, which can be seen in the database in Appendix B. The segments were developed based on the surface type (asphalt, concrete, exposed aggregate concrete or paving stone), as well as similar surface characteristics. Each segment was given a unique identifier, so that information for each segment can be maintained in a database. Overall, the pathway network was divided into 286 segments throughout Wascana Centre.

3.2.3 Sidewalk and Pathway Condition Assessment

Each sidewalk and pathway segment in each maintenance area was categorized into the Condition Ranges listed in Table 3-9. The length of each concrete and asphalt path in each PCI range in each of the maintenance areas can be seen in Table 3-10 and Table 3-11, respectively. These results are illustrated in the maps in Appendix C. The detailed distress observations for each sidewalk and pathway segment can be found in the database in Appendix B.

Table 3-10
Length of Concrete Sidewalks and Pathways per Condition Rating per Area

	Length (m)				
Condition	**5**	**4**	**3**	**2**	**1**
Area 1	149	1862	266	0	0
Area 2	145	984	0	0	0
Area 3	1,385	5,086	921	145	0
Area 4	250	1538	135	0	0
Area 5	0	0	0	0	0
Area 6	0	530	0	0	0
Area 7	5794	3623	1,119	214	0
Area 8	375	360	270	0	0
Total	**8098**	**13,983**	**2711**	**359**	**0**
Percent of Total	**32%**	**56%**	**11%**	**1%**	**0%**
Number of Trip Hazards	27	320	88	24	0

In general, the condition of the concrete sidewalks and pathways throughout the park is very good. As seen in Table 3-10, 24.8 km (99%) of the concrete sidewalks and pathways were rated as Condition Rating 3 or better. Based on the existing condition of the concrete sidewalks and pathways, it provides the users a very high level of services. The concrete sidewalks and pathways

in Condition Rating 3, 4 and 5 will not require any major reconstruction in the near term. However, maintenance will be required to reconstruct any isolated sections and reduce trip hazards. There are approximately 435 trip hazards that will require a maintenance strategy. Trip hazards are typically fixed by grinding down the trip, or mud jacking the slab. In severe cases, panels are completely removed and reconstructed.

There is one area of gravel path that is a safety concern by the Trafalgar Overlook entrance. This area has a significant drop from the edge of the path down to the ground below. It is a safety concern that could be addressed with a guard rail like the one installed near the skate park.

There were only 359 m (1%) of the concrete sidewalks and pathways that were rated as poor. They can be found by the Sound Stage in Area 1 and the sidewalk leading up to Washroom #4 in Area 4. These sidewalks and pathways would be more severely distressed (cracks, spalling, etc.). Similar maintenance measures can be applied to the Class 2 sidewalks and pathways, such as grinding trip hazards and replacing severely cracked and spalled sidewalk segments.

Table 3-11
Length of Asphalt Pathways per Condition Rating per Area

	Length (m)				
Class	**5**	**4**	**3**	**2**	**1**
Area 1	920	702	453	267	87
Area 2	0	0	0	0	0
Area 3	265	1135	570	0	0
Area 4	790	150	0	0	480
Area 5	0	0	1050	170	0
Area 6	0	0	440	0	0
Area 7	90	467	1652	155	0
Area 8	38	0	274	0	0
Total	**2103**	**2454**	**4439**	**592**	**567**
Percent of Total	**21%**	**24%**	**44%**	**6%**	**5%**
Number of Trip Hazards	2	1	38	8	10

The asphalt pathways throughout the park are in reasonable condition. As seen in Table 3-11, 9 km (89%) of the asphalt paths are in Condition 3 or better. However, when compared to the concrete sidewalks and pathways, there are only 45% in Condition 4 and 5, relative to 88% in the concrete sidewalks and pathways. As such, the asphalt pathways will require more improvements much sooner than the concrete paths. The asphalt pathways in Condition 4 and 5 are generally in good condition and smooth, and will only require minimal maintenance in the near term. However, it will be important to be proactive and seal cracks to prevent the cracks from expanding and creating local depressions.

A majority of the asphalt pathways in the park are in Condition 3. These pathways are showing more distresses, and the surface is not as smooth as it once was. For example, when roller blading, it would be vibrate due to the aggregate exposure. However, overall the pathways would generally be structurally sound. Similar to the Condition 4 and 5 pathways, it will be important to be proactive and seal cracks and fix areas with concentrated local depressions. Depending on the level of service WCA wants to provide to the public (i.e. smooth when roller blading, or smooth when biking. running), WCA will need to consider how soon they want to start resurfacing these pathways. It would be suggested to look at resurfacing the pathways in Condition 3 that are in the worst shape in high priority areas.

There are approximately 1.2 km (11%) of the pathways that are in poor or very poor condition. Pathways around the Canada Games Complex in Douglas Park, the Wascana Pool and the area in front of the T.C Douglas Building are rough and exhibit a number of distresses throughout. The pathways in very poor condition (Condition 1) will need to be reconstructed due to the significant distresses and structural failures in the pathway. It should be planned to reconstruct the pathways in Condition 2 as well. However, a detailed evaluation can determine if the structure is sound, and the surface may simply need to be replaced.

3.3 POTABLE WATER DISTRIBUTION SYSTEM (DESKTOP REVIEW)

A desktop review of the potable water distribution system within WCA Governed Areas was conducted. WCA record drawings were supplemented with AutoCAD files of underground utilities obtained from the City of Regina, the University of Regina and Innovation Place. As well, WCA personnel were contacted to determine the extent of WCA's ownership and responsibility in managing the underground infrastructure in the park.

According to WCA personnel, each building owner is responsible for the water lines which service their buildings. WCA is responsible for the maintenance and replacement of lines that service WCA facilities as well as potable water irrigation services in areas where lake water is not sourced for irrigation. Irrigation distribution systems were reviewed by others and not included within the scope of this report. All potable water to the park is supplied by the City of Regina through multiple connections to their system.

Out of the total potable water system information that has been obtained, ownership has been identified for 70% of this total. WCA owns and maintains approximately 75% of the potable water system identified. The remaining percentage is either owned and maintained by the City of Regina or is a service connection to a building which would be the building owner's responsibility to maintain.

There is no single source of detailed mapping of the potable water system for Wascana Centre. The review involved combining data from the City of Regina, WCA, University of Regina and Innovation Place.

3.3.1 Area 1

This area contains a number of potable water mains and services. Generally the lines branch off the City of Regina's system from the surrounding streets. They provide potable water and fire protection to the buildings located within this area. WCA is responsible for the maintenance and replacement of lines that service their facilities which include the Area 2 Service Depot, Washroom #3, and the Willow Island Washroom. The City of Regina owns and maintains the lines that service the Wascana Pool. The other building owners in the area would be responsible for the maintenance and replacement of lines that service their buildings.

From the information obtained, ownership has been identified for 49% of this area. Out of the total ownership identified, WCA owns and maintains 43% of the potable water system in this area.

The known water main sizes range from 25 mm diameter to 250 mm diameter with materials of Polyethylene (PE), Asbestos Cement (AC), Polyvinyl Chloride (PVC), Cast Iron (CI) and Steel. The installation dates vary from 1953 to 2003 with the known average being newer than 1974.

3.3.2 Area 2

This area contains potable water lines servicing the buildings within the area. WCA would be responsible for the maintenance and replacement of lines that service Wascana Place and the Wascana Marina Building. The water line servicing the HMCS Queen Building connects to the City system on Broad Street. Maintenance and replacement of this line would be the responsibility of the building owner.

From the information obtained, ownership has been identified for 100% of this area. Out of the total ownership identified, WCA owns and maintains 83% of the potable water system in this area.

The known water main sizes range from 25 mm to 150 mm diameter with materials of PE, Copper (Cu) and AC. The known installation dates vary from 1965 to 1979 with the known average being newer than 1972.

3.3.3 Area 3

Several potable water mains branch from the City of Regina system along Albert Street, 23rd Avenue and Broad Street into the park. This area contains multiple buildings including the Saskatchewan Legislature, Walter Scott Building, Mackenzie Art Gallery, Wascana Rehabilitation Centre, Lloyd Place, and TC Douglas Building. WCA has three maintenance buildings plus two washroom facilities with water service connections to maintain in this area.

From the information obtained, ownership has been identified for 60% of this area. Out of the total ownership identified, WCA owns and maintains 85% of the potable water system in this area.

The water main sizes vary from 100 mm diameter to 300 mm diameter with materials varying from AC, PVC, CI and PE. The installation dates are approximately from 1952 to 2009 based on the information provided by WCA and City of Regina.

The known water main sizes range from 40 mm to 200 mm diameter with materials of PVC, Cu and AC. The known installation dates vary from 1969 to 1985 with the known average being newer than 1987.

3.3.4 Area 4

This area contains multiple potable water mains that connect to the City of Regina system along Broad Street and 19th Avenue and service the SaskPower Operation Support building, Science Centre & IMAX Theatre. WCA has two washroom facilities and the Goosehill Service Depot to maintain in this area. The City has a 450 mm diameter main that runs under the lake from the proximity of the Science Centre to the proximity of the Conexus Arts Centre.

From the information obtained, ownership has been identified for 78% of this area. Out of the total ownership identified, WCA owns and maintains 38% of the potable water system in this area.

The known water main sizes range from 40 mm to 450 mm diameter with materials of PVC, Cu and AC. The known installation dates vary from 1965 to 1985 with the known average being newer than 1970.

3.3.5 Area 5

This area contains two main potable water mains that are connected to the City of Regina`s system along Broad Street and service the Conexus Arts Centre and multiple fire hydrants in that area for fire protection. WCA has no washroom facilities or service depots that would require maintenance in this area.

From the information obtained, ownership has been identified for 100% of this area. Out of the total ownership identified, WCA owns and maintains 45% of the potable water system in this area.

The known water main sizes range from 150 mm to 450 mm diameter and are AC. All lines with the exception of the City feeder main were installed in 1969.

3.3.6 Area 6

This area contains one main system that is connected to the City of Regina`s system along McDonald Street and Douglas Park Crescent and mainly supplies the Area 4 Service Depot, Overwintering Structure, Maintenance Shop, and Greenhouse Complex. It also supplies the area with multiple fire hydrants for fire protection and two washroom facilities in this area. WCA would be responsible for the maintenance and replacement of the system that services the washroom

facilities, Maintenance Shop, Area 4 Service Depot, Greenhouse Complex and Overwintering Structure in the area.

From the information obtained, ownership has been identified for 98% of this area. Out of the total ownership identified, WCA owns and maintains 100% of the potable water system in this area.

The known water main sizes range from 50 mm to 200 mm diameter with materials of PE and AC. The known installation dates vary from 1959 to 1961.

3.3.7 Area 7

Area 7 is a part of the University of Regina with an intricate network of storm sewer, sanitary sewer and potable water in this area. WCA has one service depot in this area but the University would maintain and replace all the services.

3.3.8 Area 8

Area 8 is a part of the SIAST Campus with a small network of storm sewer, sanitary sewer and potable water in this area. It mainly services the SIAST Campus and the Wascana Campus Parkway Centre. WCA has no buildings in this area. SIAST would maintain or replace any services in this area.

3.4 SANITARY SEWER SYSTEM (DESKTOP REVIEW)

A desktop review of the sanitary sewer system within WCA Governed Areas was conducted. WCA record drawings were supplemented with AutoCAD files of underground utilities obtained from the City of Regina, the University of Regina and Innovation Place. As well, WCA personnel were contacted to determine the extent of WCA's ownership and responsibility in managing the underground infrastructure in the park.

According to WCA personnel, each building owner is responsible for the sanitary sewer lines which service their buildings. WCA is responsible for the maintenance and replacement of lines that service WCA facilities. All sanitary sewage from WCA area flows to the City of Regina system where it goes through their treatment and disposal system.

Out of the total sanitary sewer system information that has been obtained, ownership has been identified for 78% of this total. WCA owns and maintains 54% of the sanitary sewer system identified. The remaining percentage is either owned and maintained by the City of Regina or is a service connection to a building which would be the building owner's responsibility to maintain.

There is no single source of detailed mapping of the sanitary sewer systems for Wascana Centre. The review involved combining the data from the City of Regina, WCA, University of Regina and Innovation Place.

3.4.1 Area 1

This area contains a number of sanitary sewer mains and services. There are three large diameter trunk mains, 675 mm diameter Reinforced Concrete (CONC), 600 mm diameter Vitreous Clay Tile (VCT) and 750 mm diameter CONC, which run through Area 1 and are owned and maintained by the City of Regina. Each building in this area is serviced with sanitary sewer with connections to the City system. WCA's responsibility would be for the maintenance and replacement of the lines that service their facilities which include the washroom facilities near Wascana Pool and on Willow Island in addition to the Area 2 Service Depot.

From the information obtained, ownership has been identified for 84% of this area. Out of the total ownership identified, WCA owns and maintains 8% of the sanitary sewer system in this area.

Excluding the City trunk mains, the sewer main sizes range from 100 mm diameter to 200 mm diameter with materials varying from PVC, VCT and PE. The installation dates vary from 1954 to 2004 based on the information provided by WCA and City of Regina.

3.4.2 Area 2

Area 2 contains sanitary sewer lines servicing the four buildings within this area. WCA would be responsible for the maintenance and replacement of lines that service Wascana Place and the Wascana Marina Building. The sanitary line servicing the HMCS Queen Building connects to the City system on Broad Street. The building owner would be responsible for the maintenance and replacement of this line.

From the information obtained, ownership has been identified for 100% of this area. Out of the total ownership identified, WCA owns and maintains 75% of the sanitary sewer system in this area.

The sizes range from 75 mm diameter to 200 mm diameter with materials of ABS, PVC, VCT and CONC. The installation dates are approximately 1954 to 2008. Information about the installation dates were provided by Wascana Centre Authority and the City of Regina.

3.4.3 Area 3

This area contains several buildings including the Saskatchewan Legislature, Walter Scott Building, Mackenzie Art Gallery, Wascana Rehabilitation Centre, Lloyd Place and TC Douglas Place that connects directly to the City of Regina system. These lines are primarily maintained by the building owners. WCA is responsible for the sanitary sewer service to the two washroom facilities as well as the Area 1 Service Depot and the Central Depot in the area.

From the information obtained, ownership has been identified for 68% of this area. Out of the total ownership identified, WCA owns and maintains 84% of the sanitary sewer system in this area.

The sizes range from 100 mm diameter to 450 mm diameter with materials ranging from PVC, VCT and CI. The installation dates range approximately from 1975 to 1987 based on the information provided by WCA and City of Regina.

3.4.4 Area 4

Area 4 has sanitary sewer lines servicing the SaskPower Operation Support building, Science Centre and IMAX Theatre. The building owner would be responsible for the repair and maintenance for these two buildings. WCA would be responsible for sanitary sewer service to the two washroom facilities and the Goosehill Service Depot.

From the information obtained, ownership has been identified for 75% of this area. Out of the total ownership identified, WCA owns and maintains 83% of the sanitary sewer system in this area.

The sizes range from 75 mm diameter to 200 mm diameter with materials including VCT and PVC. The installation dates range from 1953 to 1966 from the information provided by WCA and City of Regina.

3.4.5 Area 5

Area 5 has one main sanitary sewer line servicing the Conexus Arts Centre. The sewage from the Conexus Arts Centre is pumped from the building to a manhole on Broad Street where it flows by gravity to the City system. The building owner would be responsible for repair and replacement of this line. From the information obtained, ownership has been identified for 100% of this area. Out of the total ownership identified, WCA owns and maintains 33% of the sanitary sewer system in this area. The size of this line is 100 mm diameter with a material of AC. The installation date for this line was in 1969 from the information provided by WCA and City of Regina.

3.4.6 Area 6

Area 6 has one main sanitary sewer line servicing the two washroom facilities for the Canada Games Athletic Complex in this area. From the information obtained, ownership has been identified for 100% of this area. WCA owns and maintains 89% of the sanitary sewer system in this area. The size for this line is 200 mm diameter with the material VCT installed from 1958 to 1961 from the information provided. WCA has the Greenhouse Complex, Maintenance Shop, Area 4 Service Depot and Overwintering Structure which are serviced with three separate septic tanks.

3.4.7 Area 7

Area 7 is a part of the University of Regina with an intricate network of storm sewer, sanitary sewer and potable water in this area. WCA has one service depot in this area but the University would maintain and replace all the services.

3.4.8 Area 8

Area 8 is a part of the SIAST Campus with a small network of storm sewer, sanitary sewer and potable water in this area. It mainly services the SIAST Campus and the Wascana Campus Parkway Centre. WCA has no buildings in this area. SIAST would maintain or replace any services in this area.

3.5 STORM SEWER SYSTEM (DESKTOP REVIEW)

A desktop review of the storm sewer system within WCA Governed Areas was conducted. WCA record drawings were supplemented with AutoCAD files of underground utilities obtained from the City of Regina, the University of Regina and Innovation Place. As well, WCA personnel were contacted to determine the extent of WCA's ownership and responsibility in managing the underground infrastructure in the park.

Out of the total storm sewer system information that has been obtained, ownership has been identified for 58% of this total. WCA owns and maintains 82% of the storm sewer system identified. The remaining percentage is either owned and maintained by the City of Regina or is another building owner's responsibility to maintain.

3.5.1 Area 1

Area 1 contains a number of storm sewers. The City of Regina has one 1950 mm diameter trunk main that runs through the park. The City of Regina would be responsible for repairs to this trunk main. The remaining drainage is handled by two larger systems and several smaller systems within this area that outfall into the Wascana Lake. Wascana Centre Authority would be responsible for the maintenance and replacement of these systems. From the information obtained, ownership has been identified for 72% of this area. Out of the total ownership identified, WCA owns and maintains 28% of the storm sewer system in this area. A number of the buildings within Wascana Centre have storm drainage systems within their sites which connect to the City systems or one of the WCA systems. The sizes range from 200 mm diameter to 600 mm diameter with materials of Corrugated Steel pipe (CSP), CONC, PVC, and VCT. The installation dates also vary from approximately 1950 to as new as 1990 based on the information provided by WCA and City of Regina.

3.5.2 Area 2

This area contains a number of storm sewers which drain Wascana Drive and the parking lots surrounding the four buildings in this area. These systems all discharge directly into Wascana Lake. There are five separate outfalls to Wascana Lake from these WCA systems. The City of Regina has two systems which flow through the area and discharge to Wascana Lake; one near the extension of Regina Ave and one near the Broad Street Bridge. From the information obtained, ownership has been identified for 100% of this area. Out of the total ownership identified, WCA owns and maintains 71% of the storm sewer system in this area. The sizes range from 250 mm

diameter to 375 mm diameter with materials of CONC, VCT and CSP. The installation dates are approximately from 1965 to 1974 based on the information provided by Wascana Centre Authority and the City of Regina.

3.5.3 Area 3

This area contains a large network of storm sewers which drain the parking lots and roads within the area. Some of these systems flow to the City of Regina`s system on Broad street or Albert Street. The inner areas drain into Wascana Lake. There are a number of outfalls to the lake in this area. From the information obtained, ownership has been identified for 40% of this area. Out of the total ownership identified, WCA owns and maintains 92% of the storm sewer system in this area. The sizes range from 150 mm diameter to 1050 mm diameter with materials ranging from CONC, PVC, VCT and CSP. The installation dates range from 1952 to 1990 based on the information provided by WCA and City of Regina.

WCA staff advised that two Provincial Government buildings had been discharging runoff through outfalls at the South Shore Overlook causing ice to buildup in the pipes during winter. The issue may have been resolved recently and will be monitored in Winter 2013.

3.5.4 Area 4

Area 4 contains three larger networks plus three small networks of storm sewers which discharge directly from the parking lots and roads into the Wascana Lake. The City of Regina have a number of storm sewers that range from 1800 mm diameter concrete to 600 mm diameter concrete that drain through and discharge directly into the Wascana Lake. The City of Regina would maintain and replace these mains. From the information obtained, ownership has been identified for 90% of this area. Out of the total ownership identified, WCA owns and maintains 82% of the storm sewer system in this area. WCA storm sewer system pipe sizes range from 750 mm diameter to 200 mm diameter with materials of VCT, CONC and PVC. The installation dates vary from 1957 to 1980 based on the information provided by Wascana Centre Authority and the City of Regina.

3.5.5 Area 5

Area 5 contains four main drainage systems which discharge directly from the parking lots into Wascana Lake. Portions of the storm sewer systems are being upgraded in 2012 in conjunction with parking lot reconstruction around the Conexus Arts Centre. PVC was used as a material with the size being unknown. From the information obtained, ownership has been identified for 98% of this area. Out of the total ownership identified, WCA owns and maintains 96% of the storm sewer system in this area. The rest of the storm system that drains the remaining parking lots has materials of VCT and CONC. The installation date for the remaining system is approximately 1969 from the information provided by WCA and City of Regina.

3.5.6 Area 6

Area 6 has two main storm systems. One drains directly into the City of Regina`s network along Douglas Park Crescent. The second system drains directly to Wascana Lake. This system drains everything from the ball diamond and athletic track in this area. From the information obtained, ownership has been identified for 65% of this area. Out of the total ownership identified, WCA owns and maintains 100% of the storm sewer system in this area. The materials used in this area are primarily CONC and VCT. The dates of installation range from 1958 to 1984 with the sizes ranging from 200 mm diameter to 600 mm diameter based on the information provided by WCA and City of Regina.

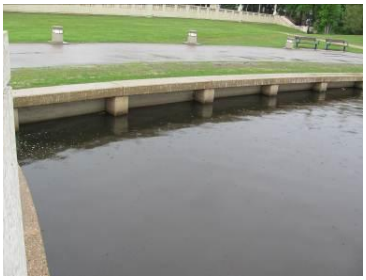
3.5.7 Area 7

Area 7 is a part of the University of Regina with an intricate network of storm sewer, sanitary sewer and potable water in this area. WCA has one service depot in this area but the University would maintain and replace all the services.

3.5.8 Area 8

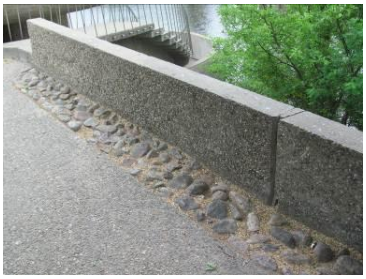
Area 8 is a part of the SIAST Campus with a small network of storm sewer, sanitary sewer and potable water in this area. It mainly services the SIAST Campus and the Wascana Campus Parkway Centre. WCA has no buildings in this area. SIAST would maintain or replace any services in this area.

3.6 RETAINING WALLS AND SHORELINE PROTECTION



3.6.1 North Shore Retaining Wall (Area 1)

The north shore retaining wall was constructed in 2004 and is constructed of concrete panel sections and concrete wall sections on piles with an exposed aggregate finish. In general, the wall is in good condition and at the northeast a void is to be filled behind the wall.



3.6.2 East Shore Retaining Wall by Willow Island (Area 2)

The retaining walls along the shore adjacent to the Willow Island Overlook were constructed in 1964 and are cast in place concrete on piles with an exposed aggregate finish. In general, the walls are in good condition, however vertical cracks along control joints have developed and the cracks require sealant to prevent water migrating into the concrete.

3.6.3 Pine Island Main Shoreline (Area 3)

Pine Island was constructed in 2004. The shoreline is protected by a series of gabion baskets and they are in fair condition. At the southwest corner, gabions have shifted and deformed. Gabion baskets are damaged and missing rocks along the west side. The terraced upper viewing area is constructed of cast-in-place concrete retaining walls and is in good condition.

The former bridge abutment where the new waterfall structure is supported is in fair condition and exhibits some cracking, localized damaged areas, staining and moss growth. A large vertical crack (5-10mm) at the corner between west wingwall and backwall of abutment was observed however the concrete is still sound around the crack. A large vertical crack was observed at west side of backwall (20-30 mm) and there is staining and weak concrete. On the east side of the backwall, a concrete core (300 mm deep X 100 mm diameter was observed as well as an intermediate crack (4mm) with weakened concrete around damaged area. A large vertical crack (15-20 mm) was also measured. Along the top of the backwall, the concrete is damaged and a crack (2 mm) is located where the wingwall meets the backwall on the east side. The aged concrete requires repair.

3.6.4 Marina Retaining Walls (Area 2)

The retaining walls surrounding the marina were constructed in 1974 and consist of cast in place concrete on piles with an exposed aggregate finish. In general, the walls are in good condition.

3.6.5 Trafalgar Pedestrian Bridge Shoreline (Area 2)

The shoreline around the Trafalgar pedestrian bridge was constructed in 2002. The shoreline is protected by a series of gabion baskets and they are in good condition. Some baskets are missing rocks along the west. One basket under the west abutment of pedestrian bridge is missing significant rocks and should be replaced or refilled.

3.7 PEDESTRIAN BRIDGES

There are four pedestrian bridges in Wascana Centre and each was constructed within the last ten years. The bridges were visually inspected by a structural engineer in accordance with Alberta Infrastructure and Transportation principles. No previous inspection reports were identified. Typically, municipal pedestrian bridges are recommended to undergo a visual inspection every three to five years and a maintenance inspection annually. With proper maintenance and regular inspections, the remaining life of each of the bridges is in excess of 50 years.

3.7.1 Broad Street Pedestrian Bridge (Area 2)

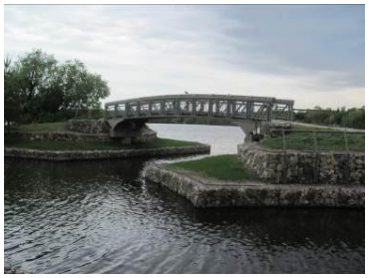
The bridge was constructed in 2010 and is a three span steel girder main span bridge with cast in place deck jump spans and concrete deck. The bridge is in very good condition.

3.7.2 Albert Street Pedestrian Bridge (Area 1)

The bridge was constructed in 2004 and is a four span cast-in-place deck slab bridge. In general the bridge is in good condition.

3.7.3 Pine Island Pedestrian Bridge (Area 3)

The bridge was constructed in 2004 and is a single span steel through truss bridge with wood decking and is in good condition. Some settlement has occurred along the west sides of both approach pathways and additional granular fill is required. Timber decking at the south abutment is to be repaired, guardrail bolting at one location on the east needs tightening, and guardrail spacer blocking on the west requires replacement. Portions of the grouted rip rap at the headslopes of both abutments are missing and require replacement.



3.7.4 Trafalgar Pedestrian Bridge (Area 2)

The bridge was constructed in 2002 and is a single span steel through truss bridge with wood decking and is in good condition. The guardrail fastening on the southeast should be repaired. It was observed that the steel bearing plates were installed with a slight overhang at both abutments on the north edges; one overhangs by 8 mm and the other by 20 mm. No action is recommended at this time, but should be monitored in future inspections.

3.8 IRRIGATION PUMP HOUSES

3.8.1 Willow Island Pump House (Area 1)

Built in 1965, the pump house is integrated with the Willow Island Overlook structure.

Envelope

The structure is cast in place concrete construction. In fair condition, the concrete slab is scaled and worn and should be patched.

Interior
There are no interior partition walls; the finish inside the pump house is exposed concrete. The interior steel stairs are in fair condition; however, the intermediate landing is loose and requires re-fastening.

Conveying System
A lifting hook is cast in the ceiling in order to hoist pumps from the pumpwell below.

Mechanical
Two vertical turbine pumps are original to the facility and are in fair condition. In 2012, one of the pumps was re-built and the shaft seal lubrication was changed to water from an oil drip. The pumps are currently mounted with steel angles but the mounting on Pump 1 is loose. The pumps require installation on pump bases as recommended by the pump manufacturer; vibration will shorten the pump's service life. Gate valves and check valves are also original and are in fair condition. The 600 mm diameter slide gate valve and the screens were submerged and not accessible for review.

The remainder of the associated piping, valves and instrumentation were replaced in 1994 and are in good condition. There are ports on the discharge piping that appear to be for instrumentation that has been removed. The ports should be removed and plugs installed in the openings.

Electrical
The main distribution panel, power distribution panels, and 25 kVA transformer appear to be in good condition however auto controls for pumps are not functional. Pumps are started and stopped manually.

3.8.2 Legislative Pump House (Area 3)

Constructed in 1958, the pump house contains both irrigation pumping and cooling pumps for the Legislature powerhouse. Several modifications to the pump house have been made since 1958 including addition of the electrical superstructure in the 1970's and grating platforms at the water level and docks in 2001. The Legislative overlook structure is at a separate location and its assessment is summarized in another section.

Envelope
The lowest level of the facility is a cast in place concrete pump house. The upper level is a double wythe brick wall construction with brick exterior. The roof is cast in place concrete with an exposed sloped metal cladding roof.

Interior
The interior consists of painted concrete inside the pump house and exposed brick and concrete in the powerhouse. There are signs of staining, spalling and deterioration on the ceiling of the powerhouse. Localized rusting is observed on the ceiling of the pump house, particularly around embedded steel components.

Conveying System
A monorail complete with a ½ ton capacity hoist is mounted above the pumpwell.

Mechanical
The 600 gpm irrigation pump was installed in 1972 and is in good condition. There are two additional pumps in the station that are used for the Legislature powerhouse cooling; a vertical turbine pump and a horizontal split case centrifugal pump. These two pumps are operated by the Legislature staff. The horizontal split case pump is no longer in service and should be removed along with associated piping, check valve and isolation valve.

Valves should be replaced with manual isolation valves and one new hydraulically actuated pressure relief valve installed on the irrigation pump.

Screens were submerged and not accessible for review.

Electrical
The main transformer appears to have been replaced recently and the main panel appears to have been upgraded recently. Both are in good condition. There is debris on electrical components on the pump house level.

3.8.3 Douglas Park Pump House (Area 6)

Built in 1968, the pump house is integrated with the Douglas Park Overlook structure.

Envelope
The structure is cast in place concrete construction. In fair condition, the concrete slab is scaled and worn and should be patched.

Interior
There are no interior partition walls; the finish inside the pump house is exposed concrete. The interior steel stairs are in fair condition however the intermediate landing is loose and requires re-fastening.

Conveying System
Lifting loops are cast in the ceiling in order to hoist pumps from the pumpwell below.

Mechanical
Two vertical turbine pumps are circa 1968 and are in fair condition. In 2012, one of the pumps was re-built and the shaft seal was changed to water lubrication from an oil drip. Gate valves, check valves and screens are original and are in fair condition. The 600 mm diameter slide gate valve and the screens were submerged and not accessible for review.

The remainder of the associated piping, valves and instrumentation were replaced in 1994 and are in good condition.

Rainbird self-backwashing water filters were installed in 2010. The drain from filters goes directly to the floor. It is recommended that piping to drain the water back to the lake be installed.

Electrical
The main distribution panel, power distribution panels, and 25 kVA transformer appear to be in good condition; however, auto controls for pumps are not functional. Pumps are started and stopped manually.

3.8.4 Nursery Pump House (Area 3)

The nursery pump house is located on the south shore of the lake west of Broad Street. The original year of construction is 1962.

Envelope
The pump house structure consists of a cast in place concrete slab with cast in place walls and precast concrete roof structure. Three louvres are located on the exterior walls; two on the south are in good condition but the north louvre is damaged.

Interior
The facility has exposed concrete finish inside. There are some gaps in the precast roof planks that require sealant. The roof flashing was repaired approximately five years ago according to WCA staff. The single steel entrance door is slightly rusted along the frame.

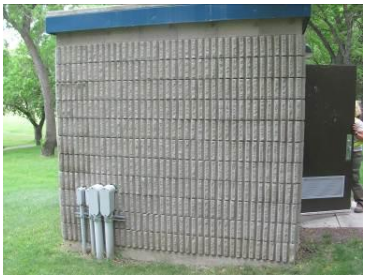
Conveying System
A steel hoist beam is in fair condition and requires replacement in the next five years.

Mechanical
The single vertical turbine pump and the sliding gate valve that isolates the wet well from the lake are in fair condition. The remaining piping, valves and pressure indicator are in good condition. The screen was not accessible to review.

Electrical
The main distribution panel and power distribution panel appear to be in good condition.

3.9 AERATION SYSTEMS AND FOUNTAINS

3.9.1 North Aeration System and North Lake Fountain (Area 1)



The lake's north aeration system compressor and controls are housed north of the lake. The aerators and submersible fountain pump are installed at the bottom of the lake. The aeration system and fountain were installed in 2004.

Envelope and Interior
The aeration equipment is supported on a slab on grade complete with architectural concrete block walls and a flat concrete roof. The concrete slab is unpainted and the interior has painted plywood on the walls and ceiling. The building is in good condition.

Mechanical
The reciprocating air compressor is in good condition. However a blower may be a better solution than a reciprocating compressor to supply air for the aerators. The compressor has a low efficiency and most of the energy is spent in wasted heat, which increases the temperature in the building and reduces the life of the compressor and other components. An exhaust fan should be considered to assist in removing waste heat generated by the equipment from the building.

Rotameters which measure the air flow in the aerators have become filled with debris from the compressor and are no longer functional. The pressure gauge has also been damaged by high temperatures and debris from the compressor and requires replacement. According to WCA operations staff, the aerators and instrumentation were installed in 2004.

The aerators and the fountain submersible pump are installed at the bottom of the lake and were not accessible for review. However, WCA operations staff reported that on if the submersible fountain pumps had failed due to the pump type and installation, and one of the aerators is blocked. The submersible pump selection should be reviewed to ensure it is the proper type of pump for the intended purpose.

Electrical
The main distribution panel, power distribution panels, and transformer appear to be in good condition.

3.9.2 South Aeration System and Trafalgar Fountain (Area 2)

The lake's south aeration system compressor and controls are housed in a building under the Trafalgar Overlook. The aerators and submersible fountain pump are installed at the bottom of the lake. The aeration system and fountain were installed in 2002.

Envelope and Interior

The aeration equipment is supported on a slab on grade complete with architectural concrete block walls and a flat concrete roof. The concrete slab is unpainted and the interior has painted plywood on the walls and ceiling. The building is in good condition.

Mechanical

The reciprocating air compressor is in good condition. However a blower may be a better solution than a reciprocating compressor to supply air for the aerators. The compressor has a low efficiency and most of the energy is spent in wasted heat, which increases the temperature in the building and reduces the life of the compressor and other components. Rotameters which measure the air flow in the aerators have become filled with debris from the compressor and are no longer functional. The pressure gauge has also been damaged by high temperatures and debris from the compressor and requires replacement. According to WCA operations staff, the aerators and instrumentation were installed in 2004. An exhaust fan should be considered to assist in removing waste heat generated by the equipment from the building.

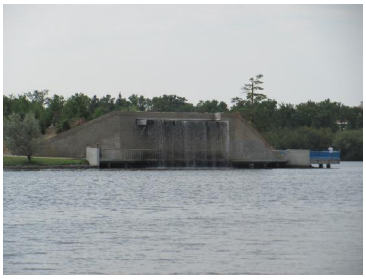
The aerators and the fountain submersible pump are installed at the bottom of the lake and were not accessible for review. However, WCA operations staff reported that one of the submersible fountain pumps had failed due to the pump type and installation. The submersible pump selection should be reviewed to ensure it is the proper type of pump for the intended purpose.

Electrical

The main distribution panel, power distribution panels, and transformer appear to be in good condition.

3.10 WATERFALLS

3.10.1 Pine Island Waterfall System (Area 3)



The waterfall system at Pine Island is housed in a building adjacent to the waterfall. Waterfall works were installed in 2004.

Waterfall Structure

The waterfall trough is fastened to an existing cast in place concrete bridge abutment and a walkway passes underneath the waterfall. It consists of galvanized steel HSS 102X102 at 1350 on centre, wide flange beams,

steel plate/deck, aluminum railing and FRP grating.

Envelope and Interior
The aeration equipment is supported on a slab on grade complete with architectural concrete block walls and a flat concrete roof. The concrete slab is unpainted and the interior has painted plywood on the walls and ceiling. The building is in good condition.

Mechanical
The reciprocating air compressor is in good condition. However a blower may be a better solution than a reciprocating compressor to supply air for the aerators. The compressor has a low efficiency and most of the energy is spent in wasted heat, which increases the temperature in the building and reduces the life of the compressor and other components.

The self-priming waterfall pump had failed shortly before the site assessment – the pump was new and being run for the first time.

An out of service compressor should be removed from the facility.
The aerators are installed at the bottom of the lake and were not accessible for review. However, WCA operations staff reported that one of the aerators is blocked.

Electrical
The main distribution panel, power distribution panels, and transformer appear to be in good condition.

3.11 DOCK SYSTEMS

3.11.1 Wascana Marina Dock System (Area 2)

The Wascana Marina docks are constructed of 2x6 pressure treated plywood decking with 2'x6' cross members at 2' on centre. There are 24 docks. Year of construction is unknown. Some light damage is visible. Metal connections are in good shape, some localized rust. Dock #14 South (not labelled) has a chipped and damaged connection to Dock #14 West Dock that should be repaired.

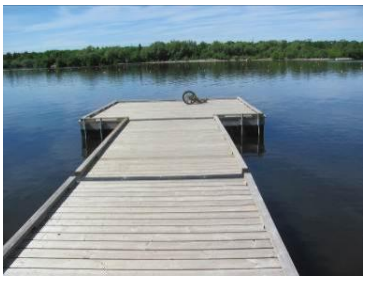
3.11.2 Willow Island Dock System (Area 1)

At the Willow Island overlook on the mainland and at Willow Island, the dock systems each consist of cast in place concrete slabs and steel mooring posts anchored to the slabs. The mainland structure was installed in 1964. The slab at Willow Island was recently reconstructed and WCA staff advise that the wooden access ramp will be replaced soon. Both docks are in

good condition. The slab on the mainland is cracked and the concrete bench on the slab is also cracked. The railing down to the dock is damaged and requires repair. Mooring posts on the mainland slab are loose and require tightening.

The ferry dock system is south of the Willow Island overlook and accessible through a gate. Public is not allowed access. It consists of four floating wood framed sections and a ramp framed in wood with expanded metal mesh for slip resistance. The ramp is designed to be movable in order to avoid ice damage. Two sections of dock against the shore are in poor condition and could be replaced with a permanent structure fixed to the shore. The year of construction is not known.

3.11.3 Wascana Canoe Club Dock System (Area 2)



There are seven floating docks at the Wascana Canoe Club. Year(s) of construction are unknown. Four docks are constructed of 2'x6' decking supported on 2'x8' cross members at 2' on centre atop plastic flotation bins. Two docks are constructed of plywood on two layers of 2'x6' framing, and one dock is constructed with plywood on 2'x6' framing with 2'x4' side rails. There is also a small length of gabion retaining wall system along the north area. Four of the docks are in fair to poor condition due to deteriorated timbers and connections either missing or damaged.

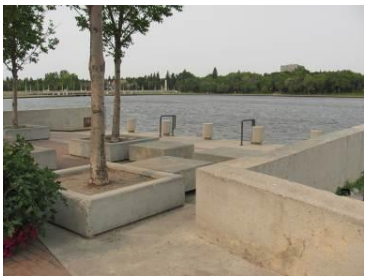
3.12 LAKE OVERLOOKS

3.12.1 Douglas Park Overlook (Area 6)

The overlook was constructed in 1968 and is integrated with the Douglas Park Pump House structure. The overlook portion of the facility consists of a cast in place concrete deck in a circular shape with a monolithic concrete perimeter wall atop the pump house. The overlook is in fair condition but requires attention in several locations. The gravel should be re-graded and vegetation be removed at the entrance to minimize the step up to the overlook deck slab. The membrane protecting the concrete deck has worn and requires replacement. The concrete deck slab and perimeter wall is pocked and cracked. One of the stairs down to the lower concrete deck is severely damaged and requires replacement. The retaining walls adjacent to the structure exhibit vertical cracks at control joints and require sealant to prevent water migration.

3.12.2 South Shore Overlook (Area 3)

The overlook is built of steel support beams, wood framing, and composite decking supported on concrete foundations. Year of construction is not known. It is in fair condition due to the condition of the concrete piles – three out of four concrete piles are cracked at the top and require repair.



3.12.3 Legislative Overlook (Area 3)

The overlook was constructed in 1980 and is constructed out of cast in place concrete walls, benches and planters. The slab consists of sections of cast in place concrete and red brick. There are several locations where the brick is damaged and needs to be replaced.

3.12.4 Albert Street Pedestrian Bridge Overlook (Areas 1 & 3)

The overlooks are the approaches to the pedestrian bridge. Built in 2004, they are constructed of cast in place concrete slabs and precast concrete wall panels with an asphalt surfacing. In general the overlooks are in good condition. One image fastened to a decorative panel at the south is loose.

3.12.5 Willow Island Overlook (Area 1)

The overlook was constructed in 1964 and is integrated with the Willow Island Pump House structure. The overlook portion of the facility consists of a cast in place concrete deck in a circular shape with a monolithic concrete perimeter wall atop the pump house. Considered in fair condition, the approach slab has settled and cracked in several locations and should be mud-jacked. The membrane protecting the concrete deck has worn and requires repair or replacement.

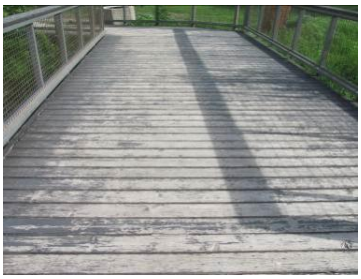
3.12.6 Trafalgar Overlook (Area 2)

The overlook was built in 1987 and is constructed of timber framing and decking supported by a cast in place concrete abutment and nine cast in place concrete piers. The structure is in good condition however broken planks at the south end of the overlook require replacement.

3.12.7 Broad Street Pedestrian Bridge Overlook (Areas 2 & 3)

The overlooks are the approaches to the pedestrian bridge and the Broad Street Underpass. Built in 2004, they are constructed of cast in place concrete slabs and retaining walls. In general the overlooks are in good condition.

3.12.8 Candy Cane Park Overlook (Area 4)



The overlook was constructed in 1968 and consists of steel framing, timber decking and concrete pile supports. In fair condition overall, there are indications that the abutment foundation wall may have moved and requires stabilization.

A steel bearing plate at the abutment has crushed the grout underneath; therefore the grout requires replacement and the anchor bolts should be repaired. The timber decking also requires repainting and localized repairs.

3.13 NATURAL GAS DISTRIBUTION SYSTEM (DESKTOP REVIEW)

SaskEnergy has a small network of natural gas lines that run throughout the Wascana Park. These lines service a number of different buildings and pump houses throughout this area. SaskEnergy is responsible to maintain and replace all lines in this area.

3.14 POWER DISTRIBUTION SYSTEM (DESKTOP REVIEW)

SaskPower has a number of underground and above grade power lines running through Wascana Centre. These lines service numerous buildings, as well as lights and electrified parking stalls. According to WCA personnel, SaskPower would maintain and replace lines entering the park and servicing facilities in this area, and WCA is responsible for the power feeds to the street lights.

3.15 COMMUNICATIONS DISTRIBUTION SYSTEM (DESKTOP REVIEW)

SaskTel has a small network of phone and fibre optic lines that run throughout the eight areas in Wascana Park. These lines provide the buildings within this area with phone, internet and cable. SaskTel is responsible to maintain and replace all lines in this area.

3.16 STREET LIGHTING (DESKTOP REVIEW)

There are at minimum 1570 lighting fixtures installed along the roads, pathways and parking lots throughout Wascana Centre. The majority of fixtures (63.6% calculated in a 1985 report) are Single Globe Units. This style of fixture has been modified over the years in order to minimize damage due to vandalism and is the preferred light style in Wascana Centre. At least 16 other types of lights have been installed in Areas 1

through 8.
WCA is responsible for the replacement of lamps and globes in Areas 1 through 6. Approximately 5% of globes per year are replaced. A higher percentage of lamps are replaced as needed. Other electrical concerns are addressed by electricians or electrical engineers as required.

3.17 TRAFFIC SIGNS (DESKTOP REVIEW)

All traffic signs require authorization by Wascana Centre Authority Board in accordance with the Wascana Centre Bylaw #18 for Traffic Signs. Therefore WCA is required to maintain detailed plans of all regulatory and information signs throughout the park. At present there are at least 925 traffic signs in the park.

According to WCA personnel, WCA fabricates and installs all replacement signs for all areas with the exception of the University of Regina and Innovation Place (Area 7). Replacement of damaged or missing signs is one of several tasks that maintenance personnel are responsible for and thus timing of the sign installation is based on availability. The University of Regina and Innovation Place hires WCA to fabricate signs on a cost recovery basis. The University and Innovation Place personnel install signs within their areas.

In general, the signs are in fair condition. A number of signs intersecting with Broad Street, Albert Street and College Avenue have recently been upgraded to be compliant with Transportation Association of Canada (TAC) standards. The majority of signs within the park are aesthetically consistent; however the regulatory signs are not TAC compliant in terms of size, visibility and reflectivity.

4 Assessment Methodology

The assessment of the buildings and infrastructure was performed in a manner consistent with asset management techniques outlined in the National Guide to Sustainable Municipal Infrastructure (InfraGuide).

The reviews were conducted in order to determine the visual condition of the buildings and infrastructure at an asset component level. As noted in the previous section, engineers and technical staff in the disciplines of mechanical, electrical, structural, and civil evaluated the buildings and infrastructure.

The engineers and technical staff reviewed the age, current condition, operating status, and individual criticality of components, and gathered further information in relation to potential remedial measures required for each asset. Through the assessments, a list of items have been identified that need to be addressed, in the short term, medium term and long term, to maintain the current level-of-service provided by WCA and to avoid reactive capital maintenance practices.

For the benefits of the assessments to be fully realized, this document and its findings should be integrated into a formalized asset management plan for WCA staff to reference. This will ensure that future decisions are made on the best available and most current information.

4.1 BUILDING AND SURFACE INFRASTRUCTURE ASSESSMENT TERMINOLOGY

This report is dependent on the asset inventory and condition assessment that was provided by the project team technical experts using objective data that accurately represents the existing assets at the time of inspection. The supplied asset inventory contains the following asset specific information. Careful regard was paid to the inclusion of information that was considered valuable from a functional end use perspective: Refer to Appendix B for the asset inventory databases.

Component Description – individual asset description (137 individual assets in the LLPS, see database)
Install Date – the approximate installation or in-service date of an asset
Asset Valuation – modern equivalent asset replacement cost including supply and install; today's dollars
Assessment Date – date the asset was inspected
Inspected By – name of inspector
Overall Condition – numeric value ranking the general condition of the asset (see below):

1 = Good – no work required; no dollar amount; perform normal maintenance
2 = Minor Defect – repair or maintenance required; dollar amount
3 = Replacement – replacement required; full asset replacement cost

Frequency of Failure – numeric value ranking the reliability of an asset (see below):

1 = Rare – asset may fail in exceptional circumstances but has not occurred in the past
2 = Unlikely – asset could fail at some time and has occurred less than once every five to ten years; asset has been refurbished or rebuilt
3 = Possible – asset has failed and may fail once every year; asset is beginning to approach the end of its service life

4 = Likely – asset has failed and may fail every quarter; asset is near the end of its service life
5 = Imminent – asset has failed and continues to fail on a monthly or frequent basis; asset has exceeded its service life

Consequence of Failure – numeric value ranking the ramification of an asset failing:

1 = Insignificant – no injuries or illness; no environmental impact; population is unaffected; minor investment required (current O & M budget)
2 = Minor – potential injuries or illness; minor environmental impact; low or no impact to population; unplanned investment would be required to repair/replace but could be covered by current budget
3 = Significant – minor injuries or illness; easily reversible environmental impact; small population affected for short period of time; unplanned investment would be required to repair/replace ($25,000 - $100,000); non-compliance
4 = Major – severe injury or health hazards; significant and/or not easily reversible environmental impact; small population affected for extended period of time or large population affected for a minimal amount of time; unplanned investment would be required to repair/replace ($100,000 - $250,000); basement flooding
5 = Catastrophic – death or serious injury; severe and irreversible contamination; large population affected for extended period of time; significant unplanned investment would be required to repair/replace (greater than $250,000)

Comments – general notes about the asset and recommendations where applicable
Asset Repair Cost – estimated cost to repair a damaged asset; today's dollars

Data for each asset was collected on standardized inspection sheets. The information from the inspection sheets was input into a database for further analysis and result development.

4.2 PAVEMENT ASSESSMENT TERMINOLOGY

During the condition assessment, each road segment was driven a minimum of two times near the posted speed limits to allow the capture of distress and condition data. Refer to databases in Appendix B. A description of each ASTM condition distress indicator collected, and its causal effect are as follows:

Alligator Cracking – a series of interconnecting cracks caused by fatigue of the asphalt concrete (AC) under repeated traffic loading.
Bleeding – a film of bituminous material on the pavement surface that creates a shiny, glasslike, reflecting surface that can be sticky and is caused by excessive amounts of asphaltic cement, tar, or sealant in the AC mix or low air void content.
Depression – localized pavement surface areas with elevations slightly lower than those of the surrounding pavement caused by the settlement of the foundation soil or a result of improper construction.
Shoulder Drop-Off - the difference in elevation between the pavement edge and the shoulder caused by erosion, shoulder settlement or building up the road without adjusting the shoulder level.
Longitudinal and Transverse Cracking – cracks that are parallel to the pavement's centreline (longitudinal) or extend across the pavement at right angles (transverse) caused by poorly constructed paving lane joints, shrinkage of AC, or reflective cracks caused by cracking beneath the surface course.

Patches – an area of pavement that has been replaced with new material to repair the existing pavement and subsequently will not perform as well as the original pavement section.
Potholes – bowl shaped depressions in the pavement surface that generally have sharp edges and vertical sides near the top of the hole caused by severe alligator cracking and the freeze-thaw effect of water within the road structure.
Rutting – surface depression in a wheel path caused by the permanent deformation in a pavement layer or subgrade usually resulting from consolidated or lateral movement of materials due to traffic loading.
Shoving – permanent longitudinal displacement of a localized area of the pavement surface caused by traffic pushing against the pavement resulting in short, abrupt waves in the pavement surface.
Raveling – the wearing away of the pavement surface due to a loss of asphalt or tar binder and dislodged aggregate particles caused by hardened asphalt binder or a poor quality mixture.

The ASTM condition distress indicators were used to analyze the pavement condition of the road network throughout Wascana Centre. The average severity of each distress indicator was assigned to each road segment based on a rating scale of high (H), medium (M), and low (L). In addition to the severity of each distress indicator, the extent of each indicator was quantified based on the percentage of segment surface area that was covered by the distress indicator. The percentage of distress indicators were visual estimates and were not manually measured. Percentages were rounded to the nearest whole number, so if the occurrence of a distress indicator was observed and only represented 0.25% of the road segment surface area, it would be recorded as 1%.

The identification of the severity and extent distress indicators enabled the assignment of a Pavement Condition Index (PCI). To determine the PCI for each road segment, the ASTM standards were modified by relying on the road assessor's comparative judgment to assign a PCI value. This modification significantly expedited the assessment process and is considered accurate to within +/- 2 PCI percentage points of the calculated PCI value.

Additional information that was collected by the road assessors was the ride comfort indicator which was based on a rating system of 1 to 5 as well as quantity and condition information related to curbs and gutters. The remaining information presented in the database was either pre-existing to the road assessment, noted as a comment by the road assessors or provided by WCA after the road assessment was complete. These supplementary indicators were important in forming the complete roadway asset inventory which included the following:

AEID - (Area # –Type # Segment #) - unique identification code assigned to each pipe segment
- Area # – defines a specific area within Wascana Centre Authority from 1 to 8
- Type # – Defines what a specific type of segment
  - 01 – roads & parking lots
  - 02 – paths
  - 03 – sanitary storm
  - 04 – storm sewer
  - 05 – potable water main
- Segment # – defines a specific segment within the Wascana Center Authority

Pavement Status – description of road surface (paved or un-paved)
Road Width (m) – width of road segment; metres
Length (l) – length of road segment; metres
Recapped – number of occurrences when road segment has been recapped
Yr_Pave – year in which the paved road segment was originally constructed
Yr_Recap – year in which the paved road segment was last recapped
Yr_Gravelled – year in which the gravel road segment was originally constructed
Name – official name of street which the road, curb and gutter segments are apart
From – official name of street intersection where the road, curb and gutter segments begin
To – official name of street intersection where the road, curb and gutter segments end
Alligator_% - the percentage of the road segment with alligator cracking
Alligator_Sev – the average severity of the road segment with alligator cracking (high, medium, low)
Bleeding_% – the percentage of the road segment with bleeding
Bleeding_Sev – the average severity of the road segment with bleeding (high, medium, low)
Depression_% – the percentage of the road segment with depressions
Depression_Sev – the average severity of the road segment with depressions (high, medium, low)
Shoulder_% – the percentage of the road segment with shoulder drop off
Shoulder_Sev – the average severity of the road segment with shoulder drop off (high, medium, low)
Longtranscracking_% – the percentage of the road segment with longitudinal and/or transverse cracking
Longtranscracking_Sev – the average severity of the road segment with longitudinal and/or transverse cracking (high, medium, low)
Patch_% - the percentage of the road segment with patch work
Patch_Sev – the average severity of the road segment with patch work (high, medium, low)
Potholes_% – the percentage of the road segment with potholes
Potholes_Sev – the average severity of the road segment with potholes (high, medium, low)
Railroad_% – the percentage of the road segment with railway crossings
Railroad_Sev – the average severity of the road segment with railway crossings (high, medium, low)
Rutting_% – the percentage of the road segment with wheel rutting
Rutting_Sev – the average severity of the road segment with wheel rutting (high, medium, low)
Shoving_% – the percentage of the road segment with shoving
Shoving_Sev – the average severity of the road segment with shoving (high, medium, low)
Raveling_% – the percentage of the road segment with raveling
Raveling_Sev – the average severity of the road segment with raveling (high, medium, low)
Comments – general notes about the road segment and recommendations where applicable
Ride_5 – numeric value ranking the 'smoothness' of the ride driven at the designated speed limit (see below):

0 = ride not determined due to road segment under construction;
1 = Very Poor – uncomfortable with constant bumps or depressions;
2 = Poor – uncomfortable with frequent bumps or depressions;
3 = Fair – comfortable with intermittent bumps or depressions;
4 = Good – smooth with few bumps or depressions;
5 = Excellent – very smooth.

PCI_100 – numeric value ranking the condition of the surface of a road segment based on the severity and extent of distresses over a scale of 1 to 100; 1 represents the lowest possible condition rating while 100 represents the highest possible condition rating; refer to Appendix A for a sample of PCI values associated with pictures from Wascana Centre to illustrate the relationship; PCI values are categorized for all road segments as follows:

0 = NA - PCI = 1; condition not determined due to road segment under construction;
1 = Very Poor – 55 >=PCI;
2 = Poor– 70 > PCI >= 55;
3 = Fair – 80 > PCI >= 70;
4 = Good – 90 > PCI >= 80;
5 = Excellent – PCI >= 90.

No_of_curbs – numeric value identifying number of curbs including median curbs (0, 1, 2, 3, 4)
Curb_rating_5 – numeric value ranking the general condition of the curb and gutter (see below); refer to Appendix D for a sample of ranking values associated with pictures from Wascana Centre to illustrate the relationship:

0 = no curb and/or gutter exist;
1 = Very Poor – replacement required; full replacement cost
2 = Poor – repair or maintenance required;
3 = Fair – some minor maintenance may be required;
4 = Good – no work required; perform normal maintenance;
5 = Excellent – no work required; curb and gutter are new or appear new and well maintained

Curb_comments – general notes about the curb segment and recommendations where applicable
Inspection_Date – date the road, curb and gutter segments were inspected

The above indicators for each road, curb and gutter segment was compiled into a database. This information was then analyzed relative to existing WCA rehabilitation and reconstruction practices.

4.3 POTABLE WATER, SANITARY SEWER AND STORM SEWER ASSESSMENT TERMINOLOGY

During our desktop review, each pipe was divided into segments in AutoCAD and listed in a database. Various categories of information were tabulated as follows:

AEID (Area # -Type # Segment #) - unique identification code assigned to each pipe segment

Area # - defines a specific area within Wascana Centre Authority from 1 to 8
Type # - Defines what a specific type of segment

01 – roads & parking lots
02 – paths
03 – sanitary storm
04 – storm sewer
05 – potable water main

Segment # - defines a specific segment within the Wascana Center Authority

Material – material type of asset
Diameter – Diameter of pipe segment

Installation – year asset was installed
Approximate yrs remaining – the approximate life remaining for a pipe segment. The life expectancies for various pipe materials are assumed as follows:

Asbestos Cement (AC) – 50 years
Copper (Cu) – 50 years
Polyvinyl Chloride (PVC) - 60 Years
Polyethylene (PE) - 60 Years
Cast Iron (CI) - 50 Years
Reinforced Concrete (CONC) - 35 Years
Vitreous Clay Tile (VCT) - 50 Years
Corrugated Steel Pipe (CSP) - 40 Years
Valves - 40 Years
Hydrants - 50 Years
Catch Basins - 40 Years

Status – Active, Not in use, Abandoned
Sub Type – Type of asset (Trunk, Main, Distribution, Hydrant Lead)
Length – Length of pipe segment

5 Recommendations and Cost Estimates

Based on the assessments of WCA's buildings and infrastructure detailed in Sections 2 and 3, recommendations for repair prioritization and maintenance and operational considerations follow. Repair cost estimates have also been categorized according to short term (1-2 years), medium term (3- 5 years) and long term (6-10 years) timeframes included at the end of this Section.

5.1 BUILDINGS

Twenty two WCA owned buildings and miscellaneous structures were assessed. Four facilities are considered to be in good condition (an FCI less than 5%), four in adequate condition (an FCI less than 10%), and 14 are in poor condition (an FCI less than 60%).

Repairs or replacement are required for approximately 25% of the building components that were reviewed. Replacements would include such tasks as re- roofing, replacing or repainting interiors, and replacing of plumbing fixtures and exhaust fans. Approximately 35% of the building assets have exceeded their theoretical lifespans and WCA should budget for their eventual replacement. Additional funds should also be reserved for replacement of a portion of buildings over the next 20 years.

Further investigation is required at eight facilities as detailed in Section 2. Note that the recommendation to retain a consultant may significantly alter both the estimated deficiency costs and the forecasted life cycle. A summary of issues requiring professional investigations is as follows:

2900 Wascana Drive – Wascana Place (Area 2)
Circuit panels in the facility are at approximately 74% capacity. Circuit panels in the facility have exceeded their forecasted life cycle but are still in serviceable condition. Retain an electrical consultant to analyze and ensure equipment is in operating condition.

Motor control center installed on the Main Floor Janitor/Electrical Room. 208V, 600A, 3 phase, 4 wire. The unit has exceeded its forecasted life cycle but is still operating as required. Retain electrical personnel to analyze and ensure equipment is operating as intended.

3201 Broad Street – Central Depot (Area 3)
An extreme amount of water was noted in the basement of the facility. Also noted was corrosion on structural teleposts. Retain a foundation consultant to analyze and make recommendations for remediation.

12"x12" vinyl asbestos tile (VAT) flooring installed in various areas in the facility is worn and damaged. Tile is being ground down to a dust with makes it extremely hazardous to building occupants, as the tile dust can easily become airborne. This situation must be corrected immediately. Retain a hazardous materials consultant to analyze and make recommendations for remediation. Replace VAT flooring with sheet vinyl products.

Circuit panels in the facility are at approximately 77%. Circuit panels in the Mechanical Room appear to have exceeded their forecasted life cycle. An electrical consultant should be retained to analyze and make recommendations for remediation.

1955 College Ave – Area 2 Service Depot (Area 1)
Mechanical Mezzanine joists appear to be over spanned and may require additional support. Retain a structural engineer to analyze and make recommendations for remediation. This issue should be repaired as soon as possible.

Area 1 Service Depot (no Civic Address, by Legislature) (Area 3)
Concrete floor is severely cracked and heaving was noted. Concrete floor in some cases has dropped 4"-6". Retain a structural engineer to evaluate and make recommendations for remediation.

Exterior walls clad with clay brick veneer wall skin with a natural finish. Extreme cracking was noted on the West side of the building. Retain a structural engineer to analyze and make recommendations for remediation. This issue should be repaired as soon as possible.

Significant cracking and separation was evident in concrete masonry unit walls in the Shop Area. Retain a structural consultant to analyze and make recommendations for remediation.

Campus Service Depot A (Area 7)
Cracking noted in the Locker Room concrete masonry unit partition walls. Repair cracking in Locker Room and monitor. If conditions worsen retain structural consultant.

Douglas Park Washroom (Area 6)
4 ply 2x12 Built-up wood beam supported by steel teleposts. One of the telepost has been altered and a study is required to determine if the building structure has been compromised. The concrete masonry unit walls exhibit several stress cracks and require further investigation. Have an assessment completed by a structural engineer to determine the safety of the structure.

217E Assiniboine Ave Greenhouse Complex including the Header House (Area 6)
Water infiltration was noted in the Basement Storage Room and concrete bunker. Retain a consultant to investigate and make recommendations for remediation.

Branch circuit panels installed in various areas throughout the facility are at approximately 80% capacity. Many circuit panels in the facility are dated. Circuit panels installed in the greenhouse corridor are extremely weathered and worn. Retain an electrical consultant to analyze the electrical system and make recommendations for remediation.

300E Assiniboine Ave Overwintering Structure (Area 6)
Branch circuit panels are at approximately 63% capacity. Circuit panels have exceeded their forecasted life cycle and breaker operation may be compromised. Retain electrical consultant to perform a functional analysis to ensure circuit panels are in proper working order.

Prioritizing building asset repairs and replacements is dependent on WCA's acceptable level of risk, required level-of-service demand and available funding. A suggested prioritizing strategy is as follows:

1. Define asset needs and prioritize maintenance and renewal dependent on acceptable level of risk, required level-of-service and available funding.
   - Code and regulatory compliance issues
   - Assets, or groups of assets, which have the highest risk based on the Consequence of Failure and Frequency of Failure.

2. Explore Strategic Opportunities with regard to capital creation and leveraging strategies.
   - Energy savings through demand reduction or generation
   - Operations and maintenance savings through lifecycle extension
   - Utilization savings through right-sizing and / or consolidation of property
   - Real estate leveraging (property disposition / acquisition)
   - Community Partnership – shared asset models.

3. Manage Implementation Strategies.
   - Measurable results that tie back to master plan
   - Effective monitoring of implementation and outcome results
   - Continuous update of capital plan
   - Communication strategies to community stakeholders

5.2 ROADWAYS AND PARKING LOTS

The results of visual distress surveys indicate that approximately 55% of WCA's road network is in good condition or higher (PCI >80), 26% is in fair condition (PCI 70-80), and 20% is in poor condition or lower (PCI <70). For the parking lots, approximately 68% are in good condition or higher, 11% are fair, and 20% are in poor condition or lower.

Although, 55% of the road network and 68% of the parking lots are in good condition, it will be important to continue preventative maintenance on these roads. It is well known that the performance of a pavement structure is affected by the type, time of application, and quality of maintenance it receives. Timely preventative maintenance slows the rate of pavement deterioration due to traffic and environmental effects. Delays in maintenance increase the quantity and severity of the distress, and when corrected, the cost of the repair is greater. For example, the pavement may have to be completely reconstructed, as opposed to overlaid.

As WCA further advances its pavement management program, it should consider developing a maintenance policy to provide guidelines for specific improvements for various road classifications. For example, the PCI could be used to help identify thresholds for preventive and corrective maintenance measures for given pavement condition states based on specific distresses (i.e. alligator cracking would trigger a structural overlay or reconstruction, or ravelling would trigger a chip seal or thin lift overlay). Thresholds would be determined based on level of service expectations from it users, along with specific budgets. In the end, it would help define maintenance strategies for the maintenance crews, as well as help categorize maintenance and rehabilitation requirements during the budgeting and planning process. This would be one of the steps in advancing an overall asset management system for Wascana.

The priority of the projects will have to be balanced over the next several years. It should be noted that the PCI rating is one tool to provide a broad overall measure of the state of the road network. The PCI will provide WCA guideline for prioritizing projects. However, the prioritization of capital projects requires the consideration of several factors:

- Integration of the roadwork with replacement and upgrading of underground utilities (sanitary sewers, storm sewers and water mains)
- Condition of the road
- Volume of traffic on the road
- Road classification
- Stakeholder concerns
- Public safety (i.e. any unsafe pavement conditions)
- Yearly budgets
- Federal and Provincial grants
- Private cost sharing

5.3 SIDEWALKS AND PATHWAYS

Concrete and asphalt surface sidewalks and pathways throughout the Wascana Governed Area were assessed. The results of the assessment revealed that 88% of the concrete sidewalks were observed to be in good condition or higher (Condition >4), 11% were in fair condition (Condition 3), and only 1% was observed to be in poor condition or lower (Condition <2). The asphalt pathways were in slightly worse shape. In total 44% of the asphalt paths were in good condition or higher, 44% were in fair condition, and 12% were in poor condition or lower.

Asphalt and concrete sidewalks are maintained slightly differently. For concrete pathways, maintenance measures typically consist of eliminating local trip hazards and replacing failed sections of sidewalk. Asphalt sidewalks require more annual preventative maintenance, similar to roads. Active preventative maintenance includes filling cracks and potholes, and sand sealing segments of the paths. Once the asphalt surface is very rough or structurally unsound, the path must be completely reconstructed, or new asphalt be overlaid.

For concrete pathways, no major repairs have been recommended for sideways with a condition rating of 5, 4 and 3 (very good to fair). However, maintenance will be required to reconstruct any isolated sections and reduce trip hazards. When a concrete path reaches a condition rating of 2 or 1 (poor or very poor) it would trigger the complete reconstruction of the sidewalk.

For the asphalt pathways, no major repairs have been recommended for paths with a condition rating of 5 and 4 (very good and good). Pathways that have a condition rating of 3 (fair) triggered an overlay. These paths are showing more distresses, and the surface is not as smooth as original. However, they are structurally sound. Depending on WCA's desired level of service to provide to the public (i.e. smooth when roller blading, or smooth when biking or running), WCA will need to consider how soon to begin resurfacing these paths. It is suggested that paths with a condition rating of 3 that are in the worst shape in high priority areas be repaved first.

Asphalt pathways with a condition rating of 2 or 1 (poor or very poor) would trigger the complete reconstruction of the sidewalk. The paths in very poor condition (Condition 1) will need to be reconstructed due to the significant distresses and structural failures in the path. WCA should plan to reconstruct the paths with a condition rating of 2 as well. However, a detailed evaluation can determine if the structure is sound, and the surface may simply need to be replaced.

Similar to the roads, the priority of the asphalt and concrete rehabilitation will have to be balanced over the next several years. The prioritization of capital projects requires the consideration of several factors:

- Condition of the path
- Number of trip hazards
- Number of pedestrians
- Stakeholder concerns
- Public safety (i.e. any unsafe pavement conditions)
- Yearly budgets
- Federal and Provincial grants
- Private cost sharing

In addition to evaluating the condition rating of each of the asphalt and concrete pathways, the specific number of trip hazards were recorded in each segment during the visual review. As previously noted in other sections, depending on the extent of the trip hazard, they can be unsafe to the general public. If someone falls and injures themselves because a municipality has not reasonably managed the trip hazard, the hazards can become a liability, such as the gravel path by the Trafalgar Overlook entrance which has a significant drop from the edge of the path to the ground below. This area could be addressed with a guard rail like the one installed near the skate park. Many municipal jurisdictions monitor the number of trip hazards throughout their path network, and develop yearly action plans to eliminate trip hazards. The trip hazards were tabulated for WCA and included in the database for future use and planning. If WCA has not already done so, it is recommended a plan be developed to eliminate trip hazards throughout the park.

5.4 POTABLE WATER, SANITARY SEWER AND STORM SEWER SYSTEMS

WCA's network of water, sanitary and storm underground infrastructure varies in age and material. The AutoCAD files supplied by the City of Regina, in addition to WCA's plans, the University of Regina and Innovation Place were reviewed. The City of Regina has comprehensive digital mapping of the area which is tagged with information on each pipe segment they have mapped. However we found during our review that the City mapping did not include all of the existing piping. The data included most of the infrastructure the City was responsible for plus a good portion of other infrastructure, but there is a significant amount of utilities that is not included in the digital mapping. This additional data had to be gleamed from paper plans. We recommend that WCA undertake a program to produce digital maps of all water, sanitary and storm infrastructure in the park. This mapping would be invaluable in areas such as maintenance, budgeting and planning.

Where there is any significant surface work planned, it is suggested that a full review of the undergrounds in the area be undertaken. Any required maintenance or replacement can be done at a cost saving if surface repairs are already budgeted for.

WCA is responsible primarily for the water and sanitary connections that service their facilities and the City and building owners within the park are responsible for a portion of the total inventory. In general terms we have assumed that potable water, sanitary sewer and storm sewers within the park are the responsibility of WCA, except for the final service connection to the building or where the pipe has been clearly identified as being the responsibility of others. Nonetheless, a Maintenance Log would be beneficial for WCA to keep. A Maintenance Log is a binder of notes for repairs for each year, by type. Information on the problem, method of repair, date received and date completed would also be recorded. Then based on this historical data, WCA staff could prepare statistics and graphs of the number of repairs, unit costs, crews and so forth. This information could be used to develop annual maintenance budgets and to anticipate where and when breaks are likely to occur.

There are also several 'InfraGuide' Best Practices publications distributed by the Federation of Canadian Municipalities related to maintenance of underground infrastructure.

The majority of the potable water, sanitary sewer and storm sewer infrastructure was installed in the 1960s and 1970s with pipe materials having a forecasted service life of 50 to 60 years. It can be concluded that over the next 20 years, the underground infrastructure will require an increased number of repairs and/or replacement. It is recommended that budget be allocated for the anticipated maintenance and replacement.

Theoretically, if 5% of the underground system was replaced per year, the entire system would be replaced in 20 years. However practically speaking, pipe failures would happen with increasing frequency as the 20 year horizon becomes closer. Therefore it is recommended the potable water, sanitary sewer and storm sewer network repair and replacement budget be 1-2% of the network value per year in the first few years and increase to 8-10% of the network value per year as the system ages.

The costs provided in the estimates are for replacement of the sewer and water infrastructure with new mains of the same size. There are alternatives to full replacement which may be better, depending on the specifics of each site. Alternatives may include:

- Slip lining of sewers where the existing pipe has a liner placed in it.
- Replacement of lines with no dig technologies.

Use of these methods would have to be assessed on a case by case basis to determine if they are a cost effective alternative to replacement.

5.5 RETAINING WALLS AND SHORELINE PROTECTION

The retaining walls and shoreline protection systems are in fair condition. Preventative maintenance items for the concrete retaining walls include the use of silane sealer to extend the life of the concrete and the sealing of any cracks with sealant to prevent water ingress and further damage. Shoreline protection systems include the network of gabion baskets used to prevent shore erosion. These baskets need to be inspected and rocks added if necessary every couple of years to ensure their continued performance. In the medium term, soft spots in composite decking along the Pine Island shoreline should be repaired, and weak sections and cracks in the old bridge abutment should be repaired.

5.6 PEDESTRIAN BRIDGES

The pedestrian bridges are in very good condition since they have all been constructed in the last ten years. It is recommended that visual inspections are conducted every five years. Preventative maintenance items include the use of silane sealer to be placed on concrete elements every five years, and the repainting of steel members to extend their life. In the medium term, the approach path to the Pine Island Pedestrian Bridge should be regarded, and riprap be regrouted. In the long term, bearings should be monitored at the Trafalgar Pedestrian Bridge.

5.7 IRRIGATION PUMP HOUSES

The irrigation pump houses are in fair condition. Even though many of the components have met or exceeded their expected service life, it is reasonable to expect the pump houses to remain functional with regular maintenance. WCA should continue with their program of improving components as required to improve the operability of the pump houses, such as removing the oil drip lubrication from the pumps and installing the water filters. As the equipment ages, the likelihood of failure will increase but as detailed in the database in Appendix B, the consequence of failure for the irrigation pumping equipment is insignificant. The database in Appendix B also lists the items that require immediate repair.

WCA should implement a formal documented maintenance schedule and training program for the operation of the irrigation equipment. A documented maintenance schedule would provide a record of the “corporate knowledge” to be used for staff changes. The information would aid in identifying possible failures and provide information on the equipment to perform repairs if a failure occurs. A formal training program would

provide another method for the operators to ensure the equipment continues to function.

Structurally, the exterior concrete stair at the Douglas Park Pump House should be re-poured in the short term. In the medium term, the Willow Island Pump House floor slab should be patched and repaired. Long term considerations include patching the Legislative Pump House roof slab, replacing the Douglas Park Pump House door, and replacing the hoist beam in the Nursery Pump House.

5.8 AERATION SYSTEMS, FOUNTAINS AND WATERFALLS

The aeration systems, fountains and waterfall have been constructed within the past ten years. The components are in good condition but failures of some of the components have been reported. The equipment failures are not documented, which creates difficulties in finding the cause and preventing similar early failures.

The consequence of failure of the aeration equipment is minor, as noted in the database in Appendix B. The aeration systems help maintain oxygen levels in the water in Wascana Lake.

The operator of the aeration systems reported frequent failures of the aeration compressors. The compressors generate a significant amount of heat that caused damage to the rotameters and pressure gauges in the aeration buildings. There is no provision in the buildings that house the aeration equipment to remove the waste heat from the compressors. The issues could be improved by evaluating the air supply equipment used for the aeration systems. A blower could supply air more efficiently than the reciprocating compressors currently in use. This would reduce the amount of heat generated in the buildings. A comparison between the existing reciprocating compressors and a blower should be performed to evaluate the suitability for the application. An exhaust fan and intake louver could be installed in each building to remove the waste heat from the equipment. The buildings do have louvers for exhaust, but there is no intake louver to allow for air movement and no means for forced air movement.

Each aeration system has only one compressor. A second compressor could be installed to provide easy means to provide continued air supply. Another option is to maintain a common backup for the equipment that can be readily installed in the event of a failure. Backup equipment may not be required since the probability of failure should be low and the consequence of failure is minor, but the equipment is inexpensive and the capital investment would be low.

The fountains function mainly for aesthetic purposes and provide only a minimal amount of oxygen transfer to the lake waters. The capital investment in these items is low. The equipment can be run to failure and replaced as required. The frequency of failures should be monitored and the type of equipment re-evaluated if the frequency is unacceptably high. One operator reported that one of the fountain pumps had failed due to the type of installation. If these failures continue, the equipment should be evaluated for its suitability with the application.

WCA should implement a formal documented maintenance schedule and training program for the operation of the aeration systems, fountains and waterfall equipment. A documented maintenance schedule would

provide a record of the “corporate knowledge” to be used for staff changes. The information would aid in identifying possible failures and provide information on the equipment to perform repairs if a failure occurs. A formal training program would provide another method for the operators to ensure the equipment continues to function. One operator reported that only minimal “on the job” training was provided.

In the short term, WCA should install exhaust fans and intake louvres, replace the air supply equipment pending an evaluation, and supply a common backup.

5.9 DOCK SYSTEMS

The docks are in fair condition and have a minor contribution to the aesthetics in the park. The mainland Willow Island dock has some cracks in the concrete but the island dock has recently been replaced. The Marina and Canoe club dock systems are wood modular systems and it would be easy to replace dock units as they become unusable.

5.10 LAKE OVERLOOKS

The lake overlooks are in fair condition and have a major contribution to the aesthetics in the park. Preventative maintenance items for the concrete portion of the overlooks include the use of silane sealer to extend the life of the concrete and the replacement of the waterproof membrane on the top surface of the Willow Island and Douglas Park overlooks. Wood members including handrails and planks need to be reviewed every couple of years and replaced when required. The wood walking surfaces should be painted and/or stained when required.

In the short term, repairs are required at each structure:

- Candy Cane Overlook – Stabilize foundation wall and repair anchor bolts
- Trafalgar Overlook – Repair broken planks on overlook
- Willow Island Overlook – Mudjack approach slab to remove tripping hazard
- South South Overlook – Repair cracks in top of piles at anchor bolts
- Legislative Overlook – Repair or replace broken bricks

In the medium term, further repairs and replacement are required:

- Candy Cane Overlook – Repaint walking surface
- Willow Island Overlook – Replace membrane
- Douglas Park Overlook – Replace membrane

5.11 NATURAL GAS, POWER AND COMMUNICATIONS

Based on results of the desktop review, there are no recommendations at this time. As described in Section 5.4, it is beneficial to keep current the AutoCAD plans of underground infrastructure within Wascana Park. Ultimately ‘Sask 1st Call’ maintains a database of underground facility information within Saskatchewan. They must be contacted prior to the start of any excavation work.

5.12 STREET LIGHTING

WCA is responsible for the maintenance of their lighting fixtures. Bulbs and globes are replaced as required. There are merits to retaining the single globe units throughout Wascana Centre because of their durability and aesthetic appeal. Other styles of light fixtures have been installed as part of various development projects funded by different stakeholders. They are also functional and their long term durability is anticipated to be comparable to the single globe units.

5.13 TRAFFIC SIGNS

WCA is responsible for the maintenance of their sign inventory. As signs are damaged or vandalized, new signs are fabricated and installed by WCA. It would be beneficial to replace regulatory signs within Wascana Centre to be compliant with TAC standards; however, the priority of this activity should be gauged in comparison in other to funding requirements.

5.14 COST ESTIMATES

Cost estimates for anticipated repairs in the short term (1-2 years), medium term (3-5 years) and long term (6-10 years) timeframes are included in Table 5-1. Detailed summaries of the cost estimates are tabulated in Appendix A and are included in the databases in Appendix B.

All cost estimates in this report are considered to be level 5 order of magnitude (-30% to +50%). Costs were derived using recent local project construction cost data as well as RS Means with location based cost factors for Regina from Quarter 2 of 2012.

Additional markups of 15% for design, 20% for design contingency and 5% for construction contingency were included in the cost estimates for the asset valuation of asset components.

It is important to apply an appropriate escalation factor to any cost estimates when budgeting beyond 2012. For example, construction costs in Saskatchewan have increased by 4% from January to June of 2012. The recent escalation of costs is due to the combination of a strong economy, material costs and labour shortage. It is anticipated that this trend will continue past 2012.

Where further investigation is recommended, the costs associated with retaining a consultant reflect the cost of an additional investigation/study for a particular asset component. The results from these investigations may significantly alter the estimated costs and life cycle data for these particular asset components.

Additional funds should be reserved for replacement of a portion of buildings over the next 20 years. Building replacement costs have been calculated to be in the order of $27 Million and are tabulated in Appendix A.

Table 5-1
Summary of Repair Cost Estimates

ITEM	COMPONENT	CONST. ESTIMATE ($)	DESIGN & CONTINGENCIES ($)	TOTAL ESTIMATE ($)
1	**SHORT TERM REPAIRS (1 to 2 years)**			
	Buildings	1,490,000	590,000	2,080,000
	Wascana Place HVAC Replacement	940,000	370,000	1,310,000
	Roads (including Areas 7 and 8)	200,000	80,000	280,000
	Potable Water, Sanitary Sewer and Storm Sewer Underground Infrastructure (excluding Areas 7 and 8)	360,000	150,000	510,000
	Surface Infrastructure	40,000	10,000	50,000
	Street Lighting (including Areas 7 and 8)	560,000	225,000	785,000
	Traffic Signage (including Areas 7 and 8)	50,000	24,000	74,000
	SUBTOTAL	**3,640,000**	**1,449,000**	**5,089,000**
2	**MEDIUM TERM REPAIRS (3 to 5 years)**			
	Buildings	410,000	160,000	570,000
	Roads (including Areas 7 and 8)	500,000	200,000	700,000
	Parking Lots (including Areas 7 and 8)	700,000	280,000	980,000
	Concrete Pathways (including Areas 7 and 8)	10,000	10,000	20,000
	Asphalt Pathways (including Areas 7 and 8)	90,000	40,000	130,000
	Potable Water, Sanitary Sewer and Storm Sewer Underground Infrastructure (excluding Areas 7 and 8)	560,000	230,000	790,000
	Surface Infrastructure	20,000	10,000	30,000
	Street Lighting (including Areas 7 and 8)	1,120,000	450,000	1,570,000
	Traffic Signage (including Areas 7 and 8)	110,000	38,000	148,000
	SUBTOTAL	**3,520,000**	**1,418,000**	**4,938,000**
3	**LONG TERM REPAIRS (6 to 10 years)**			
	Buildings	490,000	190,000	680,000
	Roads (including Areas 7 and 8)	1,300,000	520,000	1,820,000
	Parking Lots (including Areas 7 and 8)	2,110,000	840,000	2,950,000
	Concrete Pathways (including Areas 7 and 8)	40,000	10,000	50,000
	Asphalt Pathways (including Areas 7 and 8)	270,000	110,000	380,000
	Potable Water, Sanitary Sewer and Storm Sewer Underground Infrastructure (excluding Areas 7 and 8)	1,460,000	580,000	2,040,000
	Surface Infrastructure	10,000	4,000	14,000
	Street Lighting (including Areas 7 and 8)	2,240,000	900,000	3,140,000
	Traffic Signage (including Areas 7 and 8)	210,000	86,000	296,000
	SUBTOTAL	**8,130,000**	**3,240,000**	**11,370,000**
	TOTAL	**15,290,000**	**6,107,000**	**21,397,000**