RECAPP Facility Evaluation Report

Calgary Health Region

Rockyview General Hospital - Highwood Bldg

B1069A

Calgary

Report run on: April 4, 2012 3:30 PM

Facility Details

Building Name: Rockyview General Hospital
Address: 7007 - 14 Street S. W.
Location: Calgary

Building Id: B1069A
Gross Area (sq. m): 108,753.00
Replacement Cost: $736,575,067
Construction Year: 0

Evaluation Details

Evaluation Company: DC Stewart Architect Limited
Evaluation Date: September 14 2011
Evaluator Name: Don Stewart

Total Maintenance Events Next 5 years: **$10,517,000**
5 year Facility Condition Index (FCI): **1.43%**

General Summary:

The Highwood is the main building at the Rockyview General Hospital site, and was developed in 1986 as a full service hospital to support the Fisher Building which was already on site. The main Highwood Building was originally set upon two full levels (22,172 m2) of underground parking, was four storeys high, and contained 53,094 m2 of space. In 2008, the North Tower was added, rising up to 11 floors and another 7,862 m2 of space, and in 2010, the South Addition of four storeys, contributed another 18,570 m2. At the time of the 2008 renovation, a new Generator Building was developed with 243 m2. In total, this facility has 101,941 m2 of space, provides 12 full operating theatres, and houses 650 patient beds. There is a full complement of diagnostic and treatment facilities, as well as exercise and therapeutic areas, testing laboratory, and emergency centre, kitchen and cafeteria, and all other specific facilities one would expect in a major urban hospital.

Structural Summary:

Foundations for the Highwood Building are concrete spread footings, concrete pads, and grade beams. The structure of the parkade and the lower floors is of reinforced concrete columns and beams with a reinforced concrete slab floor. The upper floors, built at a later date, are of bolted structural steel columns, beams and open web steel joists, supporting a ribbed steel deck and a reinforced concrete topping. The roof is also a bolted structural steel system, with open web steel joists and steel decking above. No major upgrade work, other than the 2008 vertical expansion, has been undertaken with the structure of this building. There is no cracking or settlement evident with the structure, although some work is required to stop the inflow of water into the parkade, and to redevelop the double floor slab in the Interstitial floor space. Deteriorated concrete surfaces in the parkade should also be replaced. Overall, the structure of this building is in acceptable condition.

Envelope Summary:

The exterior cladding for the original building is a combination of modular clay face brick and precast concrete panels. The newer additions are clad in 'alucobond' composite flat aluminum panels, with some brick accents. The flat roof on the original building has been upgraded to an inverted / protected membrane roof, with rock ballast. The newer portions of the roof, and the high roof areas, are provided with a two-ply SBS membrane. Windows, and curtain wall windows, are clear anodized aluminum frames, with fixed sealed double glazing. Main entrance doors are anodized aluminum horizontal sliders with single safety glazing, the emergency entrance doors are a motorized rotating assembly. Utility doors are flush steel in pressed steel frames, painted. The large overhead doors are motorized, and fabricated of insulated prefinished metal panels. Overall, the envelope of this building is in acceptable condition.

Interior Summary:

Interior division in this facility is a combination of gypsum board on metal studs, or concrete block, both of which are painted. The majority of this building has sheet vinyl flooring, with welded seams. There is also a considerable amount of ceramic tile flooring and walls, especially in wet areas, showers, tub rooms, or service rooms. There is some carpet remaining in offices and lounges, but this is also being replaced by sheet vinyl flooring. Ceilings are suspended T-bar with acoustic tiles, plus some gypsum board ceilings and bulkheads. Doors are solid core wood in pressed steel frames, fire doors are flush steel in pressed steel frames, all with a paint finish. There is a considerable amount of plywood millwork throughout, finished with plastic laminate and paint. Wallboard and counters in the Neonatal Intensive Care Unit should be upgraded to address high moisture concerns in the wallboard. The hydraulic passenger elevators into the parkade require upgrading, the two dumbwaiters connecting the Surgical Suite with the Surgical Processing area should be replaced. Overall, the interiors of this hospital are in acceptable condition.

Mechanical Summary:

The original building is heated by 3 steam boilers. All three boilers are high pressure. The boiler controls were replaced in 2008. Steam is used to heat hot water heating and glycol through shell & tube heat exchangers. Domestic hot water is heated in 5 storage tanks with steam immersion coils. The chilled water system was upgraded in 2008, with new centrifugal chillers, rebuilt cooling tower and pumps. Major air handling units have glycol heating coils, chilled water coil, multi-banks of filters, steam humidifiers and VFD drive supply fan. Original VAV boxes have failed,

resulting in building pressurization control issues. Return air fans are separate from the air handling unit. Air handling units AS-2 and AS-3 serve the OR's and require redundancy. The combustion air units serving the steam boilers require replacement. The condensate line upstream of the de-aerator is also corroded. Aging refrigerant compressors for the kitchen coolers utilize obsolete R-12 refrigerant and should be replaced. Perimeter areas of the original building are heated with finned tube radiation. The building has a network of medical gases including oxygen, medical air, vacuum, nitrous oxide and nitrogen, however upgrades are required. Controls for terminal units are still pneumatically controlled, while the centralized cooling plant, heating plant and major air handling units are digitally controlled. Some of the isolation rooms do not have HEPA filtration. The entire hospital has an automatic fire sprinkler system with specialized pre-action sprinkler systems for the OR's. A significant number of original sinks and lavatory faucets are worn out and in need of replacement. Portions of the main DHW line require replacement. The sanitary lines in the parkade are corroded and leaking. The overall mechanical condition of the original building is marginal.

The South Addition was added in 2008. There is another main mechanical room, however steam and chilled water are supplied from the original building. Three hot water boilers heat the addition. Only one floor is occupied, overhead radiant ceiling panels are utilized. The remaining floors are shell spaces, and temporary unit heaters are provided. Air handling units are provided with glycol heating coils, chilled water coil, multi-banks of filters, steam humidifiers and VFD drives. New VAV boxes are prone to problems and require assessment and repair. Domestic hot water is generated by 4 on demand gas fired units. Controls for the addition are digital. The overall condition of the South addition is acceptable.

Electrical Summary:

The Highwood Building was built in 1986. There was an addition completed in 2008, then again in 2010. The main service entering the building is in the form of two separate 13 KV lines that terminate into high voltage switch gear. Each feed is fed from a different ENMAX sub-station. They are then transformed down to 347/600 volts with thee hospital owned transformers. The facility has three large Cummins emergency generators that were installed in 2008, complete with enough capacity to supply full emergency load to the building. The fire alarm is an Edwards EST 3 fully addressable panel, and was installed in 2008. The nurse call system in this facility is a Rauland Responder 4 system, and was installed in 2008. All the critical and essential equipment is protected by two parallel 300 KVA uninterruptible power supplies that were installed in 2008. The majority of the lighting is achieved with the use of T12 fluorescents that were installed in 1986 in the original building, then T8 fixtures in the additions in 2008 and 2010. The facility has an AMEG based security system as well as a CCTV system. The main telephone switch is located in the Fisher Building.

Overall, the electrical systems in the Highwood facility are in acceptable condition.

Rating Guide	
Condition Rating	**Performance**
1 - Critical	Unsafe, high risk of injury or critical system failure.
2 - Poor	Does not meet requirements, has significant deficiencies. May have high operating/maintenance costs.
3 - Marginal	Meets minimum requirements, has significant deficiencies. May have above average operating maintenance costs.
4 - Acceptable	Meets present requirements, minor deficiencies. Average operating/maintenance costs.
5 - Good	Meets all present requirements. No deficiencies.
6 - Excellent	As new/state of the art, meets present and foreseeable requirements.

S1 STRUCTURAL

A1010 Standard Foundations*

Foundations throughout are concrete footings and pads, with reinforced concrete grade beams.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

A1030 Slab on Grade* - Basement Floor

Basement floor is a reinforced concrete slab on grade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

A1030 Slab on Grade* - Parkade

Concrete slab on grade throughout the parkade.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	0	MAR-12

Event: Demolish damaged slabs and replace (9000 sm)

Concern:
Concrete slab on grade throughout the parkade is spalling and shedding aggregate. The driving surface is breaking up.

Recommendation:
Remove upper portion of slab, clean reinforcing steel, and replace slab topping.

Consequences of Deferral:
Further deterioration of floor slabs.

Type	Year	Cost	Priority
Repair	2013	$900,000	Medium

Updated: MAR-12

A2020 Basement Walls (& Crawl Space)*

Basement walls are constructed of reinforced cast in place concrete. Water leaking through walls in parkade.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	100	MAR-12

Event: Conduct a study to identify source of leakage

Concern:
Water leaking through foundation walls in parkade in a number of locations. Worst leakage is in southwest corner. Operator advises that it could be groundwater, or it could be a leaking water line.

Recommendation:
Hire a consultant to conduct a study to identify source of water and a plan for remediation.

Consequences of Deferral:
Further erosion of foundation support and slab base.

Type	Year	Cost	Priority
Study	2013	$20,000	Medium

Updated: MAR-12

Event: Repair water leakage based on Study findings and recommendations (based on 1000 m2)

Concern:
Water leaking through foundation walls in parkade in a number of locations. Worst leakage is in southwest corner. Operator advises that it could be groundwater, or it could be a leaking water line.

Recommendation:
Repair water leakage based on Study findings and recommendations.

Type	Year	Cost	Priority
Repair	2013	$50,000	Medium

Updated: MAR-12

B1010.01 Floor Structural Frame (Building Frame)* - Levels 1 to 2

Structure of Parking levels is a system of reinforced concrete columns and reinforced concrete trusses and beams.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

B1010.01 Floor Structural Frame (Building Frame)* - Levels 3 to 6

The larger floorplates of levels 3 to 6 are supported by a structural system of reinforced concrete columns and beams.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B1010.01 Floor Structural Frame (Building Frame)* - Levels 7 to 11

The structure of the north tower is steel columns supporting bolted steel beams and open web steel joists.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

B1010.02 Structural Interior Walls Supporting Floors (or Roof)*

There are some reinforced concrete shear walls on the basement and main floor levels. Also, some reinforced concrete block masonry walls are in place.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B1010.03 Floor Decks, Slabs, and Toppings* - Level 5

The floor of the interstitial space, above the operating rooms and ancillary spaces, is a double concrete slab, with sound isolation between the two slabs.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	0	MAR-12

Event: Repair slab and isolation space where water has entered (1000 m2)

Concern:

Water is entering the isolation space between the double concrete slabs. The amount is sufficient to fill the space in some areas, especially the south east corner of the interstitial floor.

Recommendation:

Remove affected concrete slabs and determine where the water is entering. Repair and replace the sound isolation and the concrete slab. Note that this will be very difficult to accomplish due to the constant activity in the Operating Rooms below.

Consequences of Deferral:

Danger of water penetrating the sterile rooms below. This could also affect the adjacent UPS battery room.

Type	Year	Cost	Priority
Repair	2013	$100,000	High

Updated: MAR-12

B1010.03 Floor Decks, Slabs, and Toppings* - Levels 1 to 2

The floors above the parkade are cast in place reinforced concrete, cast integrally with the structural frame.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B1010.03 Floor Decks, Slabs, and Toppings* - Levels 3 to 6

Floors are cast in place reinforced concrete slabs.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

B1010.03 Floor Decks, Slabs, and Toppings* - Levels 7 to 11

Upper floors are a ribbed steel deck with a reinforced cast in place concrete slab above.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

B1010.05 Mezzanine Construction*

The mezzanine in the basement mechanical area and the mezzanine in the Level 11 mechanical penthouse are both structural steel, with an open grate structural steel flooring.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B1010.06 Ramps: Exterior*

There are two entrance ramps into the parkade; both are reinforced concrete slab on grade construction.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

B1010.07 Exterior Stairs*

There are cast in place concrete stairs adjacent the main entrance, going down to a sunken terrace off the cafeteria. There is a structural steel stair, with open grate treads, which is provided as an exit from the 2005 office area at the north end of the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

B1010.09 Floor Construction Fireproofing*

Structural steel floor construction at the upper floors has a spray fireproofing applied.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B1010.10 Floor Construction Firestopping*

Where visible, penetrations of fire separations appear to be fire sealed.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B1010.11 Other Floor Construction*

Some floors in service areas are structural steel, with an open grate floor system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

B1020.01 Roof Structural Frame*

The roof structure is a ribbed steel deck, supported by open web steel joists, on bolted steel beams and columns.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B1020.03 Roof Decks, Slabs, and Sheathing*

Roof slabs are reinforced concrete on top of ribbed metal decking.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

B1020.04 Canopies*

The Main Entrance canopy is a bolted steel space frame, with pyramidal plastic skylites above.

The Emergency Entrance canopy is a welded steel structure, with flat safety glazing above.

The Entrance from the Helipad is also a welded steel structure, with flat safety glazing above.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B1020.06 Roof Construction Fireproofing*

Structural steel roof construction has a spray fireproofing applied.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

S2 ENVELOPE

B2010.01.01 Precast Concrete: Exterior Wall Skin*

The original building, up to the 6th floor, has precast concrete accent panels. At the sixth floor, the entire elevation is precast concrete.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	75	MAR-12

B2010.01.02.01 Brick Masonry: Ext. Wall Skin*

The majority of the building exterior is modular clay brick masonry. Minimal efflorescence, no step cracking noted.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	75	MAR-12

B2010.01.06.02 Composite Panels*

The north tower, above the 6th floor, is clad in composite aluminum (Alucobond) panels. The south addition is clad in the same material.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

B2010.01.06.03 Metal Siding**

Prefinished metal siding is installed at the north end office block, at the mechanical penthouses, and at some upper walls of the south addition.

Rating	Installed	Design Life	Updated
4 - Acceptable	2005	40	MAR-12

Event: Replace 2300 sm metal siding

Type	Year	Cost	Priority
Lifecycle Replacement	2045	$670,000	Unassigned

Updated: MAR-12

B2010.01.09 Expansion Control: Ext. Wall*

Brick masonry walls are provided with expansion / control joints at appropriate locations.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	75	MAR-12

B2010.01.11 Joint Sealers (caulking): Ext. Wall**

Caulking is provided around windows, door frames, at dissimilar materials, and in control joints.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	20	MAR-12

Event: Replace 3500 lm exterior caulking

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$105,000	Unassigned

Updated: MAR-12

B2010.02.03 Masonry Units: Ext. Wall Const.*

Some exterior brick masonry cavity walls are provided with concrete block backup.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B2010.02.04 Load-Bearing-Metal Studs: Ext. Wall*

Exterior brick masonry cavity walls are supported on metal studs and exterior sheathing.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B2010.03 Exterior Wall Vapour Retarders, Air Barriers, and Insulation*

We are advised that the original building has a poly vapour barrier only, while the north tower and south addition have both an air barrier and a vapour barrier.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

B2010.05 Parapets*

Parapets are constructed as per the wall below; and the inner face is sealed with material similar to the roof membrane.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B2010.06 Exterior Louvers, Grilles, and Screens*

Exterior grilles are fabricated from anodized aluminum frames and blades.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B2010.09 Exterior Soffits*

Soffitts at the main floor are constructed of metal studs, exterior sheathing, and acrylic stucco. Where a soffit is adjacent a composite aluminum wall panel, the soffit is of the same material.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

B2020.01.01.02 Aluminum Windows (Glass & Frame)** - 1986

Clear anodized aluminum frames with sealed double glazing - Original Building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace 390 aluminum framed windows

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$817,000	Unassigned

Updated: MAR-12

B2020.01.01.02 Aluminum Windows (Glass & Frame)** - 2008

Clear anodized aluminum frames with sealed double glazing - North Tower.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace 480 aluminum framed windows

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$1,005,000	Unassigned

Updated: MAR-12

B2020.01.01.02 Aluminum Windows (Glass & Frame)** - 2010

Clear anodized aluminum frames with sealed double glazing - South Addition.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	40	MAR-12

Event: Replace 90 aluminum framed windows

Type	Year	Cost	Priority
Lifecycle Replacement	2050	$188,000	Unassigned

Updated: MAR-12

B2020.03 Glazed Curtain Wall**

A large portion of the west wall of the South Addition, is a glazed curtain wall - clear anodized aluminum frames with sealed double glazing, glass clad infill panels.

Rating	Installed	Design Life	Updated
4 - Acceptable	2009	40	MAR-12

Event: Replace aluminum framed curtain wall (1100 sm)

Type	Year	Cost	Priority
Lifecycle Replacement	2049	$1,200,000	Unassigned

Updated: MAR-12

B2030.01.01 Aluminum-Framed Storefronts: Doors** - 1986

Original Building: Clear anodized aluminum frames with single safety glazing. Doors into connecting corridors are mostly held open with magnetic locks.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace 14 aluminum framed doors

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$46,000	Unassigned

Updated: MAR-12

B2030.01.01 Aluminum-Framed Storefronts: Doors** - 2010

South Addition: Clear anodized aluminum frames with single safety glazing. Doors into connecting corridors are mostly held open with magnetic locks.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	30	MAR-12

Event: Replace 18 aluminum framed doors

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$58,000	Unassigned

Updated: MAR-12

B2030.01.06 Automatic Entrance Doors**

Aluminum framed doors with single safety glazing. Main entrance and one connecting link are horizontally sliding; emergency entrance is a rotating door assembly.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 3 sets of automatic entrance doors

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$50,000	Unassigned

Updated: MAR-12

B2030.02 Exterior Utility Doors** - 1986

Original Building: Flush steel doors in pressed steel frames, painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace 10 exterior steel doors

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$8,000	Unassigned

Updated: MAR-12

B2030.02 Exterior Utility Doors** - 2008

Noth Tower: Flush steel doors in pressed steel frames, painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace 4 exterior steel doors

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$4,000	Unassigned

Updated: MAR-12

B2030.02 Exterior Utility Doors** - 2010

South Addition: Flush steel doors in pressed steel frames, painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	40	MAR-12

Event: Replace 12 exterior steel doors

Type	Year	Cost	Priority
Lifecycle Replacement	2050	$10,000	Unassigned

Updated: MAR-12

B2030.03 Large Exterior Special Doors (Overhead)*

Exterior overhead doors, insulated steel panels, vertical steel track, motor operated. Quick acting vertical lift doors at the new emergency entrance. Standard operating hardware at original emergency entrance, and at loading dock area.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

B3010.04.04 Modified Bituminous Membrane Roofing (SBS)**

The south addition and all high roof areas are covered with an SBS membrane roof. A large roof terrace at the south addition is covered with precast concrete pavers.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	25	MAR-12

Event: Replace 950 sm SBS roof membrane

Type	Year	Cost	Priority
Lifecycle Replacement	2035	$160,000	Unassigned

Updated: MAR-12

B3010.04.08 Membrane Roofing (Inverted/Protected)**

The original building was re-roofed with an inverted / protected membrane roofing system. Ballast is provided with rock, and in some locations by precast concrete pavers.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	30	MAR-12

Event: Replace 1250 sm inverted membrane roofing

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$235,000	Unassigned

Updated: MAR-12

B3010.07 Sheet Metal Roofing**

A small area of sloped, standing seam, prefinished steel roofing is provided at the Chapel.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace 50 sm prefinished steel roofing

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$12,000	Unassigned

Updated: MAR-12

S3 INTERIOR

C1010.01 Interior Fixed Partitions*

Interior partitions are gypsum board on metal studs. Some interior walls are concrete block, especially in service areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

C1010.03 Interior Operable Folding Panel Partitions**

Folding panel partitions, suspended overhead track. Provided in the original EMT area on main floor.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 100 sm folding panel partitions

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$110,000	Unassigned

Updated: MAR-12

C1010.05 Interior Windows*

Interior windows are pressed steel frames with single glazing. Some windows are provided with wired glass.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	80	MAR-12

C1010.07 Interior Partition Firestopping*

Where visible, penetrations of fire separations appear to be fire sealed.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	50	MAR-12

C1020.01 Interior Swinging Doors (& Hardware)*

Interior doors are a combination of solid core wood or flush steel, in pressed steel frames. Some wood doors have a natural finish in a painted frame.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

C1020.03 Interior Fire Doors*

Interior fire doors are flush steel in pressed steel frames. Some fire doors have wired glazing.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	50	MAR-12

C1020.04 Interior Sliding and Folding Doors*

There are numerous horizontal sliding aluminum framed doors, with single safety glazing; located into intensive care rooms, ward separations, and sterile areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

C1030.01 Visual Display Boards**

Whiteboards are provided in some offices, sterile corridors, nurse stations, and meeting rooms. Tackboards are provided in nurse stations, some office areas and lounges.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace 100 display boards

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$65,000	Unassigned

Updated: MAR-12

C1030.02 Fabricated Compartments (Toilets/Showers)**

Prefinished steel panels and doors, floor mounted, overhead braced. Installed during 2008 renovation.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 65 prefinished steel toilet compartments

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$75,000	Unassigned

Updated: MAR-12

C1030.05 Wall and Corner Guards*

High traffic areas in corridors and suites, provided with extruded plastic corner guards. There are also some stainless steel guards.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	15	MAR-12

C1030.06 Handrails*

Corridors and public areas in patient wings are provided with either wood handrails, or extruded plastic handrails.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

C1030.08 Interior Identifying Devices*

There is a considerable amount of signage in the hospital, on individual doors, at entrance into suites, and wings, and into specialized areas. Most signage is an engraved lamacoid type, although there are some specialty signage installations, most notably to identify a patron or a memorial.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

C1030.10 Lockers**

There are both full height and half height lockers, prefinished steel construction. Installed during 2008 renovation.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 750 prefinished steel lockers

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$355,000	Unassigned

Updated: MAR-12

C1030.12 Storage Shelving*

There is a variety of wood or steel shelving systems provided, paint finish.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

C1030.14 Toilet, Bath, and Laundry Accessories*

Standard institutional quality bath fixtures, stainless steel finish.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

C2010 Stair Construction*

Stairs in the basement of the main building, and in the parkade, are cast in place, reinforced concrete construction. Stairs in the upper floor stair towers are welded steel construction, with concrete filled steel pan treads. Stairs in service areas, and in the interstitial floor, are welded steel with open grille steel treads. The stair located in the central core is cast in place concrete construction, with concrete shear walls.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	100	MAR-12

C2020.01 Tile Stair Finishes*

The six main perimeter stairs are finished in non-slip ceramic tile treads and landings. At some point in time, a number of the stairs were upgraded with embossed rubber flooring tile to the treads and landings.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	60	MAR-12

C2020.05 Resilient Stair Finishes**

Approximately half of the six perimeter stairs are finished in radial rubber flooring to the treads and landings.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace rubber treads and landings on 25 flights of stairs

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$15,000	Unassigned

Updated: MAR-12

C2020.08 Stair Railings and Balustrades*

Stair railings are welded steel pipe, with welded steel pickets, paint finish.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

C2030 Interior Ramps*

Reinforced concrete vehicle ramps connect the two levels of parkade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

C3010.02 Wall Paneling**

In most high traffic areas and corridors, the walls are protected by installation of reinforced plastic panels, up to a height of 1.2 metres. Installed during 2008 renovation.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 1500 sm of plastic wall paneling

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$130,000	Unassigned

Updated: MAR-12

C3010.04 Gypsum Board Wall Finishes (Unpainted)*

Metal framed interior partitions are sheathed in gypsum wallboard. Gypsum wall board to some intensive care areas is standard board and not waterproof.

Rating	Installed	Design Life	Updated
2 - Poor	1986	60	MAR-12

Event: Upgrade wallboard and counters in Neonatal Intensive Care Unit

Concern:

Inspections by Infection Prevention and Control discovered moisture levels up to 30% in gypsum wallboard behind several countertops. The close proximity of clean and soiled areas associated with counters is of concern to Infection Prevention and Control.

Recommendation:

Upgrade Neonatal Intensive Care Unit to Infection Prevention and Control standards for sinks and countertops to ICU's. Replace gypsum wall board showing high moisture levels with mould resistant board. Modify millwork to separate clean areas from soiled. Upgrade 12 sinks and lavatories to integral stainless steel; or integral acrylic (corona) countertops including integral backsplash.

Consequences of Deferral:

Danger of spread of infection.

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$125,000	High

Updated: MAR-12

C3010.06 Tile Wall Finishes** - 1986

Original Building: Ceramic wall tile has been installed in public washrooms, sterile rooms, therapy rooms, kitchen, food storage, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace 500 sm ceramic wall tile

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$120,000	Unassigned

Updated: MAR-12

C3010.06 Tile Wall Finishes** - 2008

North Tower: Ceramic wall tile has been installed in public washrooms, sterile rooms, therapy rooms, kitchen, food storage, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace 4300 sm ceramic wall tile

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$1,032,000	Unassigned

Updated: MAR-12

C3010.06 Tile Wall Finishes** - 2010

South Addition: Ceramic wall tile has been installed in public washrooms, sterile rooms, therapy rooms, kitchen, food storage, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	40	MAR-12

Event: Replace 200 sm ceramic wall tile

Type	Year	Cost	Priority
Lifecycle Replacement	2050	$48,000	Unassigned

Updated: MAR-12

C3010.11 Interior Wall Painting*

Gypsum board walls and concrete block walls are painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	10	MAR-12

C3020.01.02 Painted Concrete Floor Finishes*

Some concrete floors in service areas, especially in the basement, are painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	10	MAR-12

C3020.02 Tile Floor Finishes** - 1986 Ceramic

Original Building: Ceramic floor tile has been installed in public washrooms, sterile rooms, therapy rooms, tub rooms, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

Event: Replace 250 sm ceramic floor tile

Type	Year	Cost	Priority
Lifecycle Replacement	2036	$40,000	Unassigned

Updated: MAR-12

C3020.02 Tile Floor Finishes** - 2008 Ceramic

North Tower: Ceramic floor tile has been installed in public washrooms, sterile rooms, therapy rooms, tub rooms, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	50	MAR-12

Event: Replace 1700 sm ceramic floor tile

Type	Year	Cost	Priority
Lifecycle Replacement	2058	$272,000	Unassigned

Updated: MAR-12

C3020.02 Tile Floor Finishes** - 2010 Ceramic

South Addition: Ceramic floor tile has been installed in public washrooms, sterile rooms, therapy rooms, tub rooms, and other wet areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	50	MAR-12

Event: Replace 50 sm ceramic floor tile

Type	Year	Cost	Priority
Lifecycle Replacement	2060	$8,000	Unassigned

Updated: MAR-12

C3020.02 Tile Floor Finishes** - Food Service Quarry Tile

Quarry tile flooring has been installed in the kitchen, food preparation and food storage areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

Event: Replace 2500 sm quarry tile flooring

Type	Year	Cost	Priority
Lifecycle Replacement	2036	$630,000	Unassigned

Updated: MAR-12

C3020.07 Resilient Flooring** - 1986

Original Building: Flooring throughout is sheet vinyl, with welded seams.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	20	MAR-12

Event: Replace 11,000 sm vinyl flooring

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$880,000	Unassigned

Updated: MAR-12

C3020.07 Resilient Flooring** - 2008

North Tower: Flooring throughout is sheet vinyl, with welded seams.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace 38,000 sm vinyl flooring

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$3,040,000	Unassigned

Updated: MAR-12

C3020.07 Resilient Flooring** - 2010

South Addition: Flooring throughout is sheet vinyl, with welded seams.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	20	MAR-12

Event: Replace 6,000 sm vinyl flooring

Type	Year	Cost	Priority
Lifecycle Replacement	2030	$480,000	Unassigned

Updated: MAR-12

C3020.08 Carpet Flooring**

All carpeted areas are being upgraded to sheet vinyl flooring.

Rating	Installed	Design Life	Updated
2 - Poor	1986	15	MAR-12

Event: Replace existing carpet with sheet vinyl flooring

Concern:
Carpet is original carpet installed in 1984 - 86. Permanently Soiled/stained. Infection Prevention and Control issue. Cannot be cleaned. To replace existing worn carpet with new resilient flooring. Project ongoing. Phase 3 and Phase 4 remaining.

Recommendation:
Replace existing worn carpet with new resilient flooring. Project ongoing. Phase 3 and Phase 4 remaining.

Type	Year	Cost	Priority
Failure Replacement	2013	$300,000	Medium

Updated: MAR-12

C3030.06 Acoustic Ceiling Treatment (Susp. T-Bar)** - 1986

Original Building: The majority of ceilings in this building are suspended t-bar with acoustic tiles.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

Event: Replace 12,000 sm acoustic tile ceilings

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$480,000	Unassigned

Updated: MAR-12

C3030.06 Acoustic Ceiling Treatment (Susp. T-Bar)** - 2008

North Tower: The majority of ceilings in this building are suspended t-bar with acoustic tiles.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

Event: Replace 40,000 sm acoustic tile ceilings

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$1,600,000	Unassigned

Updated: MAR-12

C3030.06 Acoustic Ceiling Treatment (Susp. T-Bar)** - 2010

South Addition: The majority of ceilings in this building are suspended t-bar with acoustic tiles.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	25	MAR-12

Event: Replace 8,000 sm acoustic tile ceilings

Type	Year	Cost	Priority
Lifecycle Replacement	2035	$320,000	Unassigned

Updated: MAR-12

C3030.07 Interior Ceiling Painting*

Gypsum board ceilings and bulkheads are painted.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

C3030.09 Other Ceiling Finishes*

Some elevator lobby ceilings are linear metal systems. (This component and event are from the previous report - added by others).

Rating	Installed	Design Life	Updated
3 - Marginal	1986	50	MAR-12

Event: Replace all metal linear ceilings

Concern:
Original ceiling from 1985 construction
Recommendation:
Replace all aluminum ceilings and associated lighting

Type	Year	Cost	Priority
Failure Replacement	2013	$400,000	Low

Updated: MAR-12

D1010.01.01 Electric Traction Passenger Elevators**

There are a total of 11 Electric Traction Passenger Elevators in the Highwood Building:
Main Building - 4 public elevators, 8 stops, 1361 kg capacity.
Main Building - 4 service elevators, 8 stops, 2949 kg capacity.
South Addition - 2 public elevators, 4 stops, 1815 kg capacity.
South Addition - 1 service elevator, 3 stops, 1815 kg capacity.
Main building elevators are original, but upgraded and extended in 2008, South Addition elevators were installed in 2010.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 11 electric traction elevators

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$1,750,000	Unassigned

Updated: MAR-12

D1010.01.02 Hydraulic Passenger Elevators** - Parkade

There are a total of 2 Hydraulic Passenger Elevators from the main Highwood Building to the parkade levels:
Main Building - 2 public elevators, 4 stops, 1134 kg capacity.
Main building elevators are original.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	30	MAR-12

Event: Replace 2 parkade elevators

Concern:
Oil is leaking from hydraulic pistons, which could cause complete failure.
Recommendation:
Upgrade elevator hydraulic and safety systems. Refurbish elevator cabs.

Type	Year	Cost	Priority
Failure Replacement	2013	$300,000	Medium

Updated: MAR-12

D1010.01.02 Hydraulic Passenger Elevators** - Service Elevators

There are a total of 2 Hydraulic Passenger Elevators in the Highwood Building:
Main Building - 1 service elevator, 3 stops, 1815 kg capacity, serving ICU/CCU.
Main Building - 1 service elevator, 2 stops, 1815 kg capacity, serving operating theatres.
Main building elevators are original, but upgraded in 2008.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 2 hydraulic elevators

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$150,000	Unassigned

Updated: MAR-12

D1090 Other Conveying Systems* - Dumbwaiters

Two drum operated dumbwaiters are installed, connecting the Surgical Processing area with the Surgical Suite. These lifts are critical, as they deliver sterilized materials to the operating rooms, and return soiled or dirty materials to the basement processing area.

Rating	Installed	Design Life	Updated
2 - Poor	1986	0	MAR-12

Event: Replace 2 dumbwaiters

Concern:
These two dumbwaiters are original building equipment, and are in poor operating condition. They are not reliable and suffer breakdowns and inefficient service.
Recommendation:
Replace both dumbwaiters with two new units.
Consequences of Deferral:
Disruption to Operating Room schedules, potential for contamination.

Type	Year	Cost	Priority
Failure Replacement	2012	$110,000	High

Updated: MAR-12

D1090 Other Conveying Systems* - Televeyer

The South Addition of the Highwood Building is provided with a "televeyer" pneumatic materials movement system, which eventually may inter-connect the entire building.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	0	MAR-12

S4 MECHANICAL

D2010.04 Sinks** - 1986

Level '3'
SS sink - 60 Units
Pot sink - 6 Units
Janitorial sink - 10 Units
Scrub sink - 1 Unit
Bed pan washer - 1 Unit

Level '4'
SS sink - 45 Units
Janitorial sink - 8 Units
Scrub sink - 15 Units
Bed pan washer - 4 Units

Level '5'
Janitorial sink - 1 Unit

Level '6'
SS sink - 92 Units
Janitorial sink - 5 Units
Scrub sink - 1 Unit
Bed pan washer - 5 Units

Level '7'
SS sink - 106 Units
Janitorial sink - 4 Units
Bed pan washer - 2 Units

Level '8'
SS sink - 53 Units
Janitorial sink - 2 Units
Bed pan washer - 1 Unit

Rating	Installed	Design Life	Updated
3 - Marginal	1986	30	MAR-12

Event: Replace 310 Sinks

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$465,000	Unassigned

Updated: MAR-12

Event: Replace Sinks - 112 Units

Concern:
12 Scrub sinks in OR leak water between the panels, foot pedals fail frequently.
Approximately 100 stainless steel sinks are worn and faucets corroded.

Recommendation:
Replace scrub sinks with new.
Replace stainless sinks with new.

Type	Year	Cost	Priority
Failure Replacement	2013	$200,000	Medium

Updated: MAR-12

D2010.04 Sinks** - 2008

Level '4'
SS sink - 44 Units
Janitorial sink - 3 Units
Scrub sink - 1 Unit
Bed pan washer - 2 Units

Level '8'
SS sink - 44 Units
Janitorial sink - 2 Units
Bed pan washer - 5 Units

Level '9'
SS sink - 44 Units
Janitorial sink - 2 Units
Bed pan washer - 5 Units

Level '10'
SS sink - 2 Units
Janitorial sink - 2 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Sinks - 156 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$235,000	Unassigned

Updated: MAR-12

D2010.05 Showers** - 2008

Roll in BF Showers - 52

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Showers - 52 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$182,000	Unassigned

Updated: MAR-12

D2010.05 Showers** -1986

Showers - 155 Units
Roll in BF shower - 2 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Showers - 157 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$550,000	Unassigned

Updated: MAR-12

D2010.06 Bathtubs** - 1986

Bathtubs - 2 Units
Therapeutic tub - 6 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Bathtubs - 2 Units; Replace Therapeutic Tubs - 6 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$50,000	Unassigned

Updated: MAR-12

D2010.06 Bathtubs** - 2008

Therapeutic tub - 4 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Therapeutic Tubs - 4 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$40,000	Unassigned

Updated: MAR-12

D2010.08 Drinking Fountains/Coolers** - 1986

Stainless steel refrigerated drinking fountains - 18 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	35	MAR-12

Event: Replace Drinking Fountains/Coolers - 18 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2021	$55,000	Unassigned

Updated: MAR-12

D2010.08 Drinking Fountains/Coolers** - 2008

Stainless steel refrigerated drinking fountains - 9 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Event: Replace Drinking Fountains - 9 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$28,000	Unassigned

Updated: MAR-12

D2010.09 Other Plumbing Fixtures* - 1986

Emergency shower & eyewash - 4 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

D2010.09 Other Plumbing Fixtures* - 2008

Emergency shower & eyewash - 4 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

D2010.10 Washroom Fixtures (WC, Lav, Urnl)** - 1986

Level '3'
Wall mount lav - 26 Units
Drop in lav - 12 Units
Wall hung WC - 43 Units
Urinal - 5 Units

Level '4'
Wall mount lav - 45 Units
Drop in lav - 17 Units
Wall hung WC - 44 Units
Swing out WC - 17 Units
Urinal - 4 Units

Level '5'
Wall mount lav - 1 Unit
Wall hung WC - 1 Unit

Level '6'
Wall mount lav - 8 Units
Drop in lav - 61 Units
Wall hung WC - 70 Units
Bidets - 38 Units (not used)

Level '7'
Wall mount lav - 9 Units
Drop in lav - 82 Units
Wall hung WC - 96 Units

Level '8'
Wall mount lav - 5 Units
Drop in lav - 40 Units
Wall hung WC - 46 Units

Rating	Installed	Design Life	Updated
3 - Marginal	1986	35	MAR-12

Event: Repair Faucets on Lavs - 75 Units

Concern:
Approximately 75 lav faucets require repair/replacement due to corrosion and wear.
Recommendation:
Repair/replace faucets on 75 lavs.

Type	Year	Cost	Priority
Repair	2013	$30,000	Low

Updated: MAR-12

Event: Replace Washroom Fixtures - 670 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2021	$1,100,000	Unassigned

Updated: MAR-12

D2010.10 Washroom Fixtures (WC, Lav, Urnl)** - 2008

Level '4'
Wall mount lav - 35 Units
Corian under mount - 10 Units
Wall hung WC - 30 Units
Urinal - 3 Units

Level '8'
Wall mount lav - 33 Units
Drop in lav - 26 Units
Wall hung WC - 43 Units

Level '9'
Wall mount lav - 33 Units
Drop in lav - 26 Units
Wall hung WC - 43 Units

Level '10'
Wall mount lav - 10 Units
Wall hung WC - 12 Units
Urinal - 3 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Event: Replace Washroom Fixtures - 307 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$460,000	Unassigned

Updated: MAR-12

D2020.01.01 Pipes and Tubes: Domestic Water* - 1986

Domestic water lines are constructed of copper, galvanized steel, and stainless steel.

Rating	Installed	Design Life	Updated
2 - Poor	1986	40	MAR-12

Event: Replace Portion of DHW and Recirc Lines (200m with SS pipe in a confined space)

Concern:
Main domestic hot water line is constructed of galvanized pipe and is leaking. Pipe requires replacement from the power house up to Level 5. Recirc line is worn out and pin holes are developing.

Recommendation:
Replace portion of DHW pipe with stainless steel. Replace recirc line.

Type	Year	Cost	Priority
Failure Replacement	2013	$300,000	High

Updated: MAR-12

D2020.01.01 Pipes and Tubes: Domestic Water* - 2008

Domestic water piping is constructed of copper.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

D2020.01.02 Valves: Domestic Water** - 1986

Domestic water valves are located throughout to isolate washrooms and patient care rooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Domestic Water Valves - 1500 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$1,125,000	Unassigned

Updated: MAR-12

D2020.01.02 Valves: Domestic Water** - 2008

Domestic water valves are located throughout to isolate washrooms and patient care rooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace Domestic Water Valves - 600 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$450,000	Unassigned

Updated: MAR-12

D2020.01.03 Piping Specialties (Backflow Preventers)** - 1996

Backflow preventers provided for:
Domestic water
R.O Boiler feed water
Fire Protection
Glycol make-up connection
Condenser water make-up

Rating	Installed	Design Life	Updated
4 - Acceptable	1996	20	MAR-12

Event: Replace Backflow Preventers - 8 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$60,000	Unassigned

Updated: MAR-12

D2020.01.03 Piping Specialties (Backflow Preventers)** - 2008

Backflow preventers provided for South Addition:
Domestic water
Boiler feed water
Fire Protection
Glycol make-up connection

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace Backflow Preventers - 6 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$50,000	Unassigned

Updated: MAR-12

D2020.02.02 Plumbing Pumps: Domestic Water**

Domestic water recirculation pump is provided for the Main Building and South Addition.

Domestic cold water has two booster pumps; 25 HP each.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace Recirc and Booster Pumps - 4 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$25,000	Unassigned

Updated: MAR-12

D2020.02.04 Domestic Water Conditioning Equipment**

Domestic water in the Main Building and South Addition are processed through a reverse osmosis machine and U.V. unit for specialty areas, including labs. 82 deg. C hot water is sent through a water softener system.

Rating	Installed	Design Life	Updated
4 - Acceptable	2007	20	MAR-12

Event: Replace Domestic Water Conditioning Equipment (R.O. Unit & Water Softener System)

Type	Year	Cost	Priority
Lifecycle Replacement	2027	$150,000	Unassigned

Updated: MAR-12

D2020.02.06 Domestic Water Heaters** - 1986

Domestic hot water is generated in the main building in five tanks with steam immersion coils. Three tanks are for the 60 deg C system and two tanks for the 82 deg C system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	20	MAR-12

Event: Replace Domestic Water Heating Equipment (5 H.W. tanks c/w heating coils)

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$150,000	Unassigned

Updated: MAR-12

D2020.02.06 Domestic Water Heaters** - 2008

South addition hot water heaters:
Aerco KC; 293 kw on demand heaters; 4 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Capacity Size	Capacity Unit
293x4	kW

Event: Replace Domestic Water Heaters - 4 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$100,000	Unassigned

Updated: MAR-12

D2020.03 Water Supply Insulation: Domestic*

Domestic water lines are insulated with fiberglass.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

D2030.01 Waste and Vent Piping* - 1986

Waste and vent piping is constructed of cast iron and copper.

Rating	Installed	Design Life	Updated
2 - Poor	1986	50	MAR-12

Event: Replace Drain Lines in Parkade (20,000 m2 of parkade)

Concern:

Existing pipes failing and corroding. Drainage has frequent leaks in parkade area.

Recommendation:

Cut, saw and remove existing cast iron lines. Replace with PVC pipe.

Type	Year	Cost	Priority
Failure Replacement	2013	$300,000	Medium

Updated: MAR-12

D2030.01 Waste and Vent Piping* - 2008

South addition piping is constructed of System 15 pipe.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

D2030.02.04 Floor Drains*

Floor drains are located in all mechanical rooms, large washrooms and service areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

D2030.03 Waste Piping Equipment* - 1986

Sumps are provided in the P1 parkade - 7 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

D2030.03 Waste Piping Equipment* - 2008

Waste water from the lower basement of the South addition is drained back to the P1 parkade. 6,000 litre storage tank and two grinder pumps are provided.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

D2040.01 Rain Water Drainage Piping Systems*

Rain water is collected internally and connected to a below grade collection system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

D2040.02.04 Roof Drains*

Roof drains are provided on all flat roof areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

D2090.10 Nitrous Oxide Gas Systems**

Bottles are piped together in a manifold system consisting of 11 pressure bottles. Additional storage tank is located outside. Medical gases are piped to all areas of the hospital, alarm panels are provided at nurse stations

Rating	Installed	Design Life	Updated
2 - Poor	1986	30	MAR-12

Event: Install Auto Change-Over For Nitrous Oxide Gas System

Concern:
Nitrous oxide system is the only medical gas system that requires manual change-over from outside storage to back-up bottles.

Recommendation:
Provide automated change over.

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$15,000	High

Updated: MAR-12

Event: Replace Nirous Oxide Gas System (area served = 24,259 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$500,000	Unassigned

Updated: MAR-12

D2090.11 Oxygen Gas Systems**

Oxygen supply is outside, the back-up supply is located in a power house storage room. The room has gas detection. Medical gases are piped to all areas of the hospital, alarm panels are provided at nurse stations.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Oxygen Gas System (area served = 24,259 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$500,000	Unassigned

Updated: MAR-12

D2090.13 Vacuum Systems (Medical and Lab)**

Medical vacuum units are located in the Level 5 mechanical room. Four 25 HP units are provided with a receiver tank. Medical gases are piped to all areas of the hospital, alarm panels are provided at nurse stations. Another set of vacuum pumps are provided in the power house.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Vacuum Systems - Medical and Lab (area served = 24,259 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$500,000	Unassigned

Updated: MAR-12

D2090.14 Acid Waste Systems**

Lab has glass piping drainage.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Glass Piping (area served = 918 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$50,000	Unassigned

Updated: MAR-12

D2090.15 Pool & Fountain Equipment**

Rehabilatation area has a pool. The pool equipment consists of a heat exchanger, circulation pumps, chemical treatment and sand filter. The pool is no longer used, as a result, no lifecycle replacement of these items is needed.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	20	MAR-12

D2090.16 Medical Air System* - Medical Gas Outlets

Current medical gas outlets are Medstar.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	0	MAR-12

Event: Medical Gas Conversion from Medstar to Diameter Index System Standards (area served = 24,259 m2)

Concern:

Current medical gas outlets are Medstar, technology is dated to 1985. New construction will have Diameter Index System Standards outlets causing a problem with the rest of the facility with regards to supplying equipment from central distribution.

Recommendation:

Replace Medstar gas outlets with Diameter Index System Standards medical gas outlets

Type	Year	Cost	Priority
Operating Efficiency Upgrade	2013	$475,000	Medium

Updated: MAR-12

D2090.16 Medical Air System* - Supply and Distribution

Quincy model QRDT-30 medical air compressor is provided with a receiver tank. Medical gases are piped to all areas of the hospital, alarm panels are provided at nurse stations

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

D3010.01 Oil Supply Systems (Fuel, Diesel)*

Emergency generators have (2) 14,800 litre diesel tanks.
Steam boilers have (2) 25,000 litre oil tanks as a back-up fuel supply.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	60	MAR-12

Event: Sump Pump Installation for Flammable Storage

Concern:

No sump pump for spill containment. This violates building code and risks explosion. (This event included from the previous report - added by others)

Recommendation:

Install sump pump for spill containment

Type	Year	Cost	Priority
Code Upgrade	2013	$140,000	Low

Updated: MAR-12

D3010.02 Gas Supply Systems*

Natural gas is piped to the powerhouse. The gas meter room is located indoors. The room is vented. Gas is also piped to the Level 6 mechanical room in the South addition.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	60	MAR-12

D3020.01.01 Heating Boilers & Accessories: Steam**

Three steam heating boilers;
(2) Babcock & Wilcox Canada, 2,971 sq ft heating surface; 12,450 KW
(1) H.G. Vidal, model HCV-E600VH-H2G, 600 HP; 6,065 KW

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	35	MAR-12

Event: Replace Steam Heating Boilers & Accessories - 3 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2021	$4,000,000	Unassigned

Updated: MAR-12

D3020.01.02 Feedwater Equipment*

Five boiler feed water pumps are provided. A de-aerator is provided, condensate receiver tank, and (2) 5 HP condensate feed pumps.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

D3020.01.03 Chimneys (& Comb. Air): Steam Boilers**

Each steam boiler is vented individually into a common stack. Three gas fired MUA's are provided for combustion air.
ICG Model BMA-2002 DA 5,660 l/s - 2 Units
Engineered Air Model HE-70; 2,600 l/s - 1 Unit

Rating	Installed	Design Life	Updated
2 - Poor	1986	35	MAR-12

Event: Replace MUA Combustion Air Units (3 units)

Concern:
MUA units frequently shut down, units do not provide reliable service.
Recommendation:
Replace MUA's with new.

Type	Year	Cost	Priority
Failure Replacement	2013	$75,000	High

Updated: MAR-12

Event: Replace Steam Boiler Chimney

Type	Year	Cost	Priority
Lifecycle Replacement	2021	$25,000	Unassigned

Updated: MAR-12

D3020.01.04 Water Treatment: Steam Boilers*

Boiler feed water is sent through a Siemens reverse osmosis skid package and duplex softening system. Two R.O. booster pumps are provided.

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	35	MAR-12

D3020.02.01 Heating Boilers and Accessories: H.W.**

Boiler Smith model CF3L-250-G-90 - 3 Units
Each boiler has a Armstrong circulation pump, 8x8x10 7.5HP
Building heating pumps - Armstrong 10x10x13, 100HP
Two expansion tanks are provided for the hot water heating.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Capacity Size	Capacity Unit
2,930	kW

Event: Replace Heating Boilers and Accessories - 3 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$2,000,000	Unassigned

Updated: MAR-12

D3020.02.02 Chimneys (& Comb. Air): H.W. Boiler**

Each boiler is vented individually. Three direct fire MUA's (Engineered Air are provided for combustion air.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 3 Chimneys & 3 MUA Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$150,000	Unassigned

Updated: MAR-12

D3020.02.03 Water Treatment: H. W. Boiler*

Water treatment program is in place.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

D3020.03.01 Furnaces**

Chapel is served with two gas fired furnaces.
Lennox model G20RQ4-5E-125-5
Lennox model G20RQ4-4E-100-8

Rating	Installed	Design Life	Updated
4 - Acceptable	1994	25	MAR-12

Event: Replace Furnaces - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2019	$5,000	Unassigned

Updated: MAR-12

D3020.04.03 Fuel-Fired Unit Heaters**

Two gas fired unit heaters are provided in the emergency generator building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Unit Heaters - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$10,000	Unassigned

Updated: MAR-12

D3020.04.04 Chimney (& Comb. Air): Fuel-Fired Heater*

Unit heaters are vented to the exterior, combustion air is provided.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D3030.01 Absorption Water Chillers**

Absorption Chiller - York ST-C3-58-S, 450 ton capacity.

Rating	Installed	Design Life	Updated
4 - Acceptable	1990	25	MAR-12

Capacity Size	Capacity Unit
1582	kW

Event: Replace Absorption Chiller - 1 Unit

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$500,000	Unassigned

Updated: MAR-12

D3030.02 Centrifugal Water Chillers**

Centrifugal Chiller - McQuay model C4212DLYY2-B - 2 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

Capacity Size	Capacity Unit
3500x2	kW

Event: Replace Centrifugal Water Chillers - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$2,300,000	Unassigned

Updated: MAR-12

D3030.05 Cooling Towers**

Two cooling towers are provided.
Baltimore Air Coil rebuilt in 2008.
Evapco Cooling tower induced draft; 4-500 Ton cells.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

Event: Install new cooling tower access platform

Concern:
Lack of a safe means of access to lower east section of cooling tower CT3.3. Requires access for annual cleaning. Platform would increase worker safety and the ability to clean thoroughly and therefore more closely achieving cooling tower's design efficiency

Recommendation:
Install new access platform

Type	Year	Cost	Priority
Code Upgrade	2013	$25,000	High

Updated: MAR-12

Event: Replace Cooling Towers - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$2,500,000	Unassigned

Updated: MAR-12

D3030.05.04 Liquid Coolers and Evaporative Condensers

Fluid cooler for MRI cooling equipment - Ref Plus CLR 040-8

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

Event: Replace 1 Fluid Cooler

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$35,000	Unassigned

Updated: MAR-12

D3030.06.01 Refrigeration Compressors**

Kitchen coolers are original and operate with R12 refrigerant - 10 Units

Rating	Installed	Design Life	Updated
2 - Poor	1986	25	MAR-12

Event: Replace Cooler and Freezer Compressors - 10 Units

Concern:
Compressors are at their life expectancy, freezer has no redundancy, R12 refrigerant is not replaceable.

Recommendation:
Replace compressors with new.

Type	Year	Cost	Priority
Failure Replacement	2013	$50,000	Medium

Updated: MAR-12

D3030.06.02 Refrigerant Condensing Units**

Split condensing units provided for Chapel furnaces.
Lennox Model HS23-5N-1P - 2 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1994	25	MAR-12

Event: Replace Condensing Units - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2019	$5,000	Unassigned

Updated: MAR-12

D3040.01.01 Air Handling Units: Air Distribution** - 1986

The following units serve a dual duct system in the main building. These unit are located in the Level 5 mechanical room.

AS-1 - Hot Deck, Cold Deck - serves levels 6, 7 & 8.
AS-2 - Hot Deck, Cold Deck - serves levels 4.
AS-3 - Hot Deck, Cold Deck - serves levels 3, 4 & 6.
AS-4 - Hot Deck, Cold Deck - serves levels 3, 4, 6, 7, 8.
AS-5 - Hot Deck, Cold Deck - serves levels 6 & 7.

Rating	Installed	Design Life	Updated
2 - Poor	1986	30	MAR-12

Event: Provide redundancy for AS-2 & AS-3.

Concern:
AS-2 and AS-3 requires redundancy. These unit serve critical portions of the hospital and equipment failure is not an option. These unit serve processing, CT, Diagnostic Imaging, Or's, ICU, etc.

Recommendation:
Provide additional AHU to serve as back-up in case of failure to AS-2 or AS-3.

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$1,000,000	High

Updated: MAR-12

Event: Replace Air Handling Units - 5 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$2,500,000	Unassigned

Updated: MAR-12

D3040.01.01 Air Handling Units: Air Distribution** - 1997

Fitness AHU; AS-6 Engineered Air LM-13-C; glycol htg coil; chilled water clg coil.
Construction Offices; AS-7 Engineered Air LM-13-C; glycol htg coil; chilled water clg coil.

Rating	Installed	Design Life	Updated
4 - Acceptable	1997	30	MAR-12

Capacity Size	Capacity Unit
5,662	L/s

Event: Replace Air Handling Unit - 2 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2027	$100,000	Unassigned

Updated: MAR-12

D3040.01.01 Air Handling Units: Air Distribution** - 2008

Scott Springfield Manufacturing c/w chilled water cooling, glycol heating coils, heat recovery wheel
AS-8; 15,200 l/s
AS-9; 10,450 l/s

Haakon; units serve isolation rooms, c/w HEPA filtration.
AS-10; 2,900 l/s
AS-11; 2,900 l/s
AS-16; 2,850 l/s
AS-17; 2,850 l/s
AS-18; 2,850 l/s
AS-19; 2,850 l/s

Haakon; Serve c/w chilled water cooling, glycol heating coils, heat recovery wheel
AS-12; 15,000 l/s; South addition emergency
AS-13; 15,000 l/s; South addition Level 3
AS-14; 15,000 l/s; South addition Level 5
AS-15; 15,600 l/s; South addition P2
AS-20; 11,000 l/s; Main OR's 1-8, 15 & 16
AS-21; 11,000 l/s; Main OR's 9-12
AS-22; Return Air; Main OR's 1-8, 15 & 16
AS-23; Return Air; Main OR's 9-12
AS-24; 12,000 l/s; Urology Clinic
AS-25; 12,000 l/s; Urology Clinic

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Air Handling Units - 18 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$4,500,000	Unassigned

Updated: MAR-12

D3040.01.03 Air Cleaning Devices: Air Distribution*

All air handling equipment is equipped with disposable filter media.

Rating	Installed	Design Life	Updated
2 - Poor	1986	30	MAR-12

Event: Provide HEPA filtering on Isolation Room Exhaust - 5 Units

Concern:
Contaminated air is released out of the hospital.
Recommendation:
Provide HEPA filtering for Isolation rooms.

Type	Year	Cost	Priority
Hazardous Materials Abatement	2013	$100,000	High

Updated: MAR-12

D3040.01.04 Ducts: Air Distribution*

Ductwork is constructed of galvanized sheet metal. Ductwork is externally insulated.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

D3040.01.06 Air Terminal Units: Air Distribution (VAV/CV Box)** - 1986

Main building utilizes a dual duct VAV system.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	30	MAR-12

Event: Replace 1800 VAV boxes with digital control

Concern:

Pneumatic box failures. Deferred maintenance from 1986. Seals are leaking. Excessive energy consumption. Building pressurization - control issues. Building envelope failures. Building zone pressure relationship between adjacent areas.

Recommendation:

Replace 1800 volume boxes complete with digital control. Expand front end (Building Management System) monitoring to accommodate new boxes.

Type	Year	Cost	Priority
Failure Replacement	2013	$1,000,000	Medium

Updated: MAR-12

D3040.01.06 Air Terminal Units: Air Distribution (VAV/CV Box)** - 2008

South Addition Level 4 - 200 Units

Rating	Installed	Design Life	Updated
3 - Marginal	2008	30	MAR-12

Event: Replace VAV Units - 200 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$250,000	Unassigned

Updated: MAR-12

Event: Troubleshoot and repair Siemens VAV boxes (200 units)

Concern:
New Siemens VAV boxes are prone to problems.
Recommendation:
Trouble shooting required, likely parts replacement necessary.

Type	Year	Cost	Priority
Repair	2013	$50,000	Medium

Updated: MAR-12

D3040.01.07 Air Outlets & Inlets: Air Distribution*

Air outlets consist of linear slot diffusers, perforated diffusers and double deflection grilles

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D3040.02 Steam Distribution Systems: Piping/Pumps**

Steam is produced in the Main Building powerhouse. Steam is distributed to the Level 5 mechanical room and Level 6 mechanical room in the South Addition. Additionally, steam is piped to the Fisher and Ambulatory Care Buildings. Condensate piping is pumped and graded back to the powerhouse.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	40	MAR-12

Event: Replace Condensate Line - 20m section

Concern:
Condensate line upstream of de-aerator is corroded.
Recommendation:
Replace 20m section of condensate line.

Type	Year	Cost	Priority
Repair	2013	$20,000	High

Updated: MAR-12

Event: Replace Steam Distribution Systems: Piping/Pumps

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$2,000,000	Unassigned

Updated: MAR-12

D3040.03.01 Hot Water Distribution Systems** - 1986

Hot water is distributed throughout building to perimeter radiation, unit heaters and reheat coils.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Hot Water Distribution System (67,700 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$7,500,000	Unassigned

Updated: MAR-12

D3040.03.01 Hot Water Distribution Systems** - 2008

Hot water is distributed through out Levels 8, 9, 10 and South addition to perimeter radiation, unit heaters and reheat coils. New piping is constructed of black steel piping with Victaulic fittings.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

Event: Replace Hot Water Distribution System (26,300 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$2,500,000	Unassigned

Updated: MAR-12

D3040.03.02 Chilled Water Distribution Systems**

Chilled water is piped to small specialized cooling units and major air handling units through the entire facility. Chilled water is also piped to the Fisher and ambulatory building.
Chilled water pumps (level '5') - Pacific Pumping 7.5 HP - 6 Units
Chilled water pumps - Aurora 150 HP replaced in 2008 - 2 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Chilled Water Distribution Systems (94,000 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$5,000,000	Unassigned

Updated: MAR-12

D3040.03.03 Condenser Water Distribution Systems Pumps*

Condenser water pumps,
Armstrong model 10x10x13 - 2 Units
Taco model 6BDC30-9.1 -2 Units

Condenser water sumps provided.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

D3040.04.01 Fans: Exhaust**

Generator Rm Ventilation Fan - Northern Blower Axial - 1 Unit
Powerhouse Ventilation Exhaust fans - Trane model T21LPHGTH - 2 Units
Parkade - Engineered Air model LM-19; 9,900 l/s - 8 Units
Parkade - Northern Blower Axial Transfer - 2 Units
Level 5 Mech Rm - Chicago Blower Utility fans - 4 Units
Level 5 North Fan Rm - Northern Blower Utility Fans - 12 Units
Level 5 West Fan Rm - Northern Blower Utility Fans - 15 Units
Additional smaller units through out building - 30 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Exhaust Fans - 74 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$1,500,000	Unassigned

Updated: MAR-12

D3040.04.03 Ducts: Exhaust*

Exhaust ducts are constructed of galvanized sheet metal.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

D3040.04.05 Air Outlets and Inlets: Exhaust*

Exhaust grilles are provided in service rooms, washrooms, OR's and isolation rooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D3040.05 Heat Exchangers** - 1986

Parkade Ramp - Plate & Frame; HW to Glycol c/w Bell & Gosset circulation pump - 3 Units
AHU Htg Coils - Shell & Tube; Steam to Glycol c/w Aurora 5 HP pump - 11 Units
Heating - Shell & Tube; Steam to HW c/w circulation pumps - 2 Units
Volatile Storage - Shell & Tube; Steam to Glycol c/w Bell & Gosset 5 HP pumps - 1 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Heat Exchangers - 17 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$500,000	Unassigned

Updated: MAR-12

D3040.05 Heat Exchangers** - 2008

Condenser free cooling - Plate & Frame; Armstrong 450 ton - 1 Unit
Walkway entrance slab heating - Brazed plate; HW to Glycol; c/w circulating pump - 1 Unit
Heli-pad slab heating - Plate & Frame, HW to Glycol; c/w circulating pump - 1 Unit
MRI cooling - Plate & Frame, Chilled Water to Glycol; c/w circulating pump - 1 Unit
Vertical Expansion Heating; Shell & Tube; Steam to HW; c/w circulating pump Armstrong 30HP - 2 Units
Vertical Expansion AHU Coils; Shell & Tube; Steam to Glycol; c/w circulating pump Armstrong 15HP - 2 Units
South Addition AHU Coils; Shell & Tube; HW to Glycol; c/w circulating pump Armstrong - 2 Units
Back-up Heating; Shell & Tube, Steam to HW; c/w circulating pump Armstrong - 1 Unit

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Heat Exchangers - 11 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$300,000	Unassigned

Updated: MAR-12

D3050.01.04 Unit Air Conditioners**

Level 10 Elevator machine room cooling; Magic Aire model 240-HBA W-4
Level 5 UPS room cooling; Magic Aire model BMB60-4D
Level 5 UPS back-up cooling; Carrier model 40RM-016 with split condenser model 38ARD016.
MRI magnet cooling; HEC cabinet with chilled water to helium
Level 3 Switch gear cooling; Trane model LPCAD12G4; chilled water coil.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Specialized Cooling Units - 5 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$200,000	Unassigned

Updated: MAR-12

D3050.05.02 Fan Coil Units**

Chilled water fan coils are utilized at point of use areas for cooling - 6 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Fan Coil Units - 6 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$50,000	Unassigned

Updated: MAR-12

D3050.05.03 Finned Tube Radiation**

Finned tube radiation is used in the main building with exception of the cafeteria, Levels 8, 9, 10 and the South Addition. Radiation is located in stainless cabinets and furred into perimeter walls with linear bar grill outlets.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Finned Tube Radiation (27,745 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$1,300,000	Unassigned

Updated: MAR-12

D3050.05.06 Unit Heaters** - 1986

Shipping and receiving - 5 Units
Parkade - Mark Hot model H-16 - 50 Units
Power house - 6 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Unit Heaters - 61 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$250,000	Unassigned

Updated: MAR-12

D3050.05.06 Unit Heaters** - 2008

South addition level '3' shell space - 12 Units
South addition level '5' shell space - 12 Units
Ambulance bay - 6 Units
Level '10' Mech Rm - 6 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace Unit Heaters - 36 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$150,000	Unassigned

Updated: MAR-12

D3050.05.08 Radiant Heating (Ceiling & Floor)** - Ceiling Radiant Panels

Linear radiant ceiling panels are located in the cafeteria, levels 8, 9, 10 and South addition (level 4).

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Event: Replace Ceiling Radiant Heating Panels (26,300 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$1,200,000	Unassigned

Updated: MAR-12

D3050.05.08 Radiant Heating (Ceiling & Floor)** - Heli Pad and Entrance

Helicopter pad and concrete outside of South addition entrance is heated with an in-slab glycol heating system.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Event: Replace In-Slab Heating System (400 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$150,000	Unassigned

Updated: MAR-12

D3050.05.08 Radiant Heating (Ceiling & Floor)** - Parkade Ramp

Parkade ramp entrances are heated with an in-slab glycol heating system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	35	MAR-12

Event: Replace Ramp Heating (350 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2021	$100,000	Unassigned

Updated: MAR-12

D3060.02.02 Pneumatic Controls**

Radiation, terminal heating and zone box controls within the original building up to Level 8 are pnuematic. The exception is the OR's, which have digital control. Compressors consist of (2) Atlas Copco units (1998) c/w an air dryer and large receiver tank.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Pneumatic Controls (67,700 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$500,000	Unassigned

Updated: MAR-12

D3060.02.05 Building Systems Controls (BMCS, EMCS)**

Major equipment in the original portions of building has been converted to digital control including the heating plant, cooling plant, OR's and major air handling units. The vertical expansion of the original building and entire South addition are digitally controlled.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

Event: Building Management Control System - Add Monitored Medication Fridges

Concern:
Medications not being kept at correct temperatures
Recommendation:
Add all medication fridges to Building Management System monitoring system

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$100,000	Medium

Updated: MAR-12

Event: Replace Digital Building Systems Controls (100,000 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$1,000,000	Unassigned

Updated: MAR-12

D4010 Sprinklers: Fire Protection*

Fire protection sprinklers are located in all areas of the building, with some areas having specialized systems. Sprinklers adjacent to parkade ramps have glycol loops, sprinklers in the OR's have a pre-action system.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	60	MAR-12

Event: Replace Sprinkler Heads on Level 6 (1,176 m2)

Concern:
Escutcheon plates fall off, heads no longer detect heat properly and their certification rating is effected.

Recommendation:
Sprinkler heads and escutcheon plates require replacement.

Type	Year	Cost	Priority
Repair	2013	$50,000	Low

Updated: MAR-12

D4020 Standpipes*

Fire protection standpipes are located throughout the original building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	60	MAR-12

D4030.01 Fire Extinguisher, Cabinets and Accessories*

Portable fire extinguishers are provided in all areas of the hospital.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D4090.04 Dry Chemical Fire Extinguishing Systems (Kitchen Hood)**

Kitchen hoods are provided with a water mist extinguishing system.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	40	MAR-12

Event: Replace Water Mist Extinguishing System with Dry Chemical (2 systems)

Concern:
Water mist extinguishing system are no longer used. Not as effective as dry chemical.

Recommendation:
Replace with dry chemical type.

Type	Year	Cost	Priority
Failure Replacement	2013	$60,000	Medium

Updated: MAR-12

D4090.06 Smoke Protection & Exhaust Fans**

Stair pressurization unit located in parkade - Engineered Air Model HE-27; 1,040 l/s - 6 Units
Link pressurization fan - Northern Blower; - 1 Unit
Smoke exhaust fans - Northern Blower; - 6 Units

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace Smoke Protection Units - 13 Units

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$75,000	Unassigned

Updated: MAR-12

D4090.07 Fire Pumps & Water Storage Tanks*

Two fire pumps are provided in the power house. Aurora model 4-483-11C, 60HP

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

S5 ELECTRICAL

D5010.01.01 Main Electrical Transformers (Facility Owned)**

The facility has three 13200/7680:347/600 volt step down transformers. Each transformer is a Federal Pioneer transformer that has a secondary output rating of 4,330 amps per transformer. The transformers are located in the main electrical room.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Capacity Size	Capacity Unit
4330	amps

Event: Replace three 13200:347/600V (secondary amperage 4330A) step-down transfromers

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$3,500,000	Unassigned

Updated: MAR-12

D5010.02 Secondary Electrical Transformers (Interior)** - 1986

The facility has several transformers installed in the electrical rooms. These transformers were installed in 1986 and installed on floors P1 and P2 as well as levels 3, 4, 5, 6, 7 and half of level 8. All the transformers appear to be either Bemag or FPE.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	40	MAR-12

Event: Replace approx. 50 transformers

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$800,000	Unassigned

Updated: MAR-12

D5010.02 Secondary Electrical Transformers (Interior)** - 2008

The facility has several transformers that were added during the expansion of levels 8, 9 and 10. These transformers are of varying sizes and were installed in 2008. All appear to be Rex Power Magnetic transformers.

Rating	Installed	Design Life	Updated
5 - Good	2008	40	MAR-12

Event: Replace approx. 15 transformers

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$250,000	Unassigned

Updated: MAR-12

D5010.02 Secondary Electrical Transformers (Interior)** - 2010

The facility has transformers installed in all the new electrical rooms. They were installed in 2010 during the expansion of the South Wing. The transformers are of varying sizes. All appear to be Rex Power Magnetics transformers.

Rating	Installed	Design Life	Updated
5 - Good	2010	40	MAR-12

Event: Replace approx. 15 transformers

Type	Year	Cost	Priority
Lifecycle Replacement	2050	$250,000	Unassigned

Updated: MAR-12

D5010.03 Main Electrical Switchboards (Main Distribution)** - 1986

The facility has two incoming high voltage distribution panels fed from two separate Enmax feeds. Both boards are fed from different Enmax sub stations. The main high voltage panels are Brown Bevier equipment.

There is also three 5000A Federal Pioneer 600A 347/600 volt main distribution panels. The breakers in the main 600V distribution panel are all ACB (Air Circuit Breakers).

There is a main emergency power distribution panel installed in the old generator room. This equipment is Federal Pioneer and contains 17 ACBs split between 6 different 1600 amp cells.

There is an additional set of main distribution panels installed in the Level 5 mechanical room. All the main distribution panels on level 5 appear to be Federal Pioneer. They are of varying sizes and capacities, all complete with Air Circuit Breakers.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	40	MAR-12

Event: Replace 42 Air Circuit Breakers

Concern:
It was noted that the relay trip coils in the air circuit breakers were causing some maintenance issues due to some nuisance tripping. As the relays are no longer manufactured, the equipment is having to be repaired on site.
Recommendation:
Replace all air circuit breakers with modern breakers.
Consequences of Deferral:
Increased maintenance cost as the relays are having to maintained and often repaired by the maintenance staff.

Type	Year	Cost	Priority
Repair	2015	$420,000	Low

Updated: MAR-12

Event: Replace Main Distribution Panels (approx. 15)

Type	Year	Cost	Priority
Lifecycle Replacement	2026	$9,500,000	Unassigned

Updated: MAR-12

D5010.03 Main Electrical Switchboards (Main Distribution)** - 2008

There is a Square D main distribution panel installed in the Level 5 mechanical room. This panel is fed from Level 5 Essential Power Distribution. This equipment was installed in 2008, with new draw out type breakers. The panel is made up of three six cell sections, each cell rated at 1600A at 600V.

Rating	Installed	Design Life	Updated
5 - Good	2008	40	MAR-12

Event: Replace 1 Square D Main Distribution Panel

Type	Year	Cost	Priority
Lifecycle Replacement	2048	$275,000	Unassigned

Updated: MAR-12

D5010.05 Electrical Branch Circuit Panelboards (Secondary Distribution)** - 1986

All the 1986 panels installed in this facility are Federal Pioneer. They were installed as part of the original construction and are of varying sizes. Approximately 80% of the breaker spaces have been allocated.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace Branch Circuit Panels from 1986 (Approx. 400 panels)

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$2,000,000	Unassigned

Updated: MAR-12

D5010.05 Electrical Branch Circuit Panelboards (Secondary Distribution)** - 2008

Additional Square D branch panels were added during the 2008 expansion. All panels installed in the electrical rooms are surface mounted and all panels in the the patient area are flush mounted.

Rating	Installed	Design Life	Updated
5 - Good	2008	30	MAR-12

Event: Replace Branch Panels on Levels 8, 9 and 10 (Approx. 25 panels)

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$125,000	Unassigned

Updated: MAR-12

D5010.05 Electrical Branch Circuit Panelboards (Secondary Distribution)** - 2010

There are several Square D panels installed in the south expansion, which also includes the shelled spaces that have not yet been renovated to meet end user needs.

Rating	Installed	Design Life	Updated
5 - Good	2010	30	MAR-12

Event: Replace branch panels in South Wing Expansion (Approx. 50 panels)

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$250,000	Unassigned

Updated: MAR-12

D5010.07.01 Switchboards, Panelboards, and (Motor) Control Centers** - 1986

The facility has several Motor Control Centers (MCCs) installed in all the mechanical rooms. All the MCCs of this vintage are Siemens or Klockner Moeller.

Main Mechanical Room:
1 - Normal power 1000 amp 600 volt MCC complete with 37 starters.
1 - Normal Power 1000 amp 600 volt MCC complete with 20 starters.

1 - 12 starter Klockner Moeller MCC in electrical room beside Chiller room.

1- Siemens Motor Control Center in Parkade Level P1 complete with 8 starters.

1 - Siemens Motor Control Center in Parkade Level P2 complete with 5 starters.

1 - Siemens Motor Control Center in the Parkade Level P2 complete with 10 starters.

1 - Normal power Motor Control Center on Level 5, complete with 35 starters (Siemens).

1 - Emergency power MCC on Level 5, complete with 39 starters (Siemens)

1 - Klockner Moeller MCC on Level 5, complete with 5 starters.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace 9 Motor Control Centers

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$1,500,000	Unassigned

Updated: MAR-12

D5010.07.01 Switchboards, Panelboards, and (Motor) Control Centers** - 2008

The facility has several Motor Control Centers installed in all the mechanical rooms. All the MCCs of this Vintage are Square D.

1 - Square D Motor Control Center Installed level 5 complete with 9 starters.
1 - Square D MCC installed on Level 5 complete with 15 starters.
1 - Square D MCC fed from emergency power in the elevator machine room lobby, complete with 4 starters.
1 - Square D MCC fed from emergency power in the Level 6 mechanical room, complete with 29 starters.
1 - Square D MCC fed from normal power in the Level 6 mechanical room, complete with 19 starters.

Rating	Installed	Design Life	Updated
5 - Good	2008	30	MAR-12

Event: Replace 5 Motor Control Centers

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$400,000	Unassigned

Updated: MAR-12

D5010.07.01 Switchboards, Panelboards, and (Motor) Control Centers** - 2010

The facility has several Motor Control Centers installed in all the mechanical rooms. All the Motor Control Centers of this Vintage are Square D.

One Square D Motor Control Center Installed in the P1 parkade electrical room complete with 6 starters.
One Square D MCC installed in the Level 10 Electrical Room, complete with 10 starters. Fed from Emergency Power.
One Square D MCC installed in the Level 10 electrical room, complete with 7 starters. Fed from normal power.
One Square D MCC fed from emergency power in the Level 6 mechanical room, complete with 29 starters.
One Square D MCC fed from normal power in the Level 6 mechanical room, complete with 19 starters.

Rating	Installed	Design Life	Updated
5 - Good	2010	30	MAR-12

Event: Replace Motor Control centers(Five Motor Control Centers)

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$400,000	Unassigned

Updated: MAR-12

D5010.07.03 Variable Frequency Drives** - 2001

The facility has several VFD's that were installed in 2001. These units are typically Danfuss VFDs, and are installed on all major pumps and fans.

Rating	Installed	Design Life	Updated
4 - Acceptable	2001	30	MAR-12

Event: Replace VFDs (approx. 30)

Type	Year	Cost	Priority
Lifecycle Replacement	2031	$700,000	Unassigned

Updated: MAR-12

D5010.07.03 Variable Frequency Drives** - 2008

The variable frequency drives installed in 2008 are all MGI Technologies.

Rating	Installed	Design Life	Updated
5 - Good	2008	30	MAR-12

Event: Replace VFDs (approx. 15)

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$350,000	Unassigned

Updated: MAR-12

D5010.07.03 Variable Frequency Drives** - 2010

The variable frequency drives installed in 2010 are all MGI Technologies.

Rating	Installed	Design Life	Updated
5 - Good	2010	30	MAR-12

Event: Replace VFDs (approx. 40)

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$900,000	Unassigned

Updated: MAR-12

D5020.01 Electrical Branch Wiring*

The majority of the wiring consists of single conductor cable installed in conduit. The facility also uses teck cable for large panel feeders, as well as AC90 cable for fixtures drops and connections to mechanical equipment. The distribution risers are in the form of Buss Ducts.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	50	MAR-12

D5020.02.01 Lighting Accessories: Interior (Lighting Controls)*

The interior lighting is controlled with low voltage switches and associated relays. The low voltage relays appear to be Douglas relays throughout. There is some line voltage switching in some miscellaneous offices, storage rooms and service rooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D5020.02.02.01 Interior Incandescent Fixtures*

There are several styles of incandescent fixtures installed, including:
- decorative pendant mounted fixtures
- decorative wall mounted fixtures
- track lighting with MR16 style lamps
- recessed pot lights in corridors and drywall ceilings.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D5020.02.02.02 Interior Fluorescent Fixtures** - 1986

The majority of the fluorescent fixtures installed in 1986 are T12 with magnetic ballasts. They include recessed fixtures (both 2x4 and 1x4), wall mounted cube fixtures, chain suspended industrial fixtures in service rooms, and several strip fixtures for cove lighting. Parkade Levels P1 and P2 utilize chain suspended 8 foot fixtures throughout. There are several suspended indirect fixtures installed in nurses' stations throughout.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

Event: Replace T12 fluorescent fixtures (based on 85,000 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2016	$3,200,000	Unassigned

Updated: MAR-12

D5020.02.02.02 Interior Fluorescent Fixtures** - 2008

T8 fluorescent fixtures complete with electronic ballasts were added as part of the addition in 2008.

Rating	Installed	Design Life	Updated
5 - Good	2008	30	MAR-12

Event: Replace T8 fixtures installed in 2008 (based on 6,300 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$237,500	Unassigned

Updated: MAR-12

D5020.02.02.02 Interior Fluorescent Fixtures** - 2010

T8 fluorescent fixtures complete with electronic ballasts were added as part of the addition in 2010.

Rating	Installed	Design Life	Updated
5 - Good	2010	30	MAR-12

Event: Replace T8 fixtures installed in 2010 (Based on 17,500 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2040	$659,000	Unassigned

Updated: MAR-12

D5020.02.02.04 Interior H.P. Sodium Fixtures*

High pressure sodium fixtures are installed in the main mechanical rooms. This lighting is slowly being replaced with fluorescent fixtures. The lighting that does remain appears to be operational and appears to provide adequate lighting for current needs.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D5020.02.03.01 Emergency Lighting Built-in*

Emergency lighting in the Highwood Building utilizes the general lighting. All lighting is connected to emergency power through the emergency power distribution system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	35	MAR-12

D5020.02.03.02 Emergency Lighting Battery Packs**

A number of battery packs are installed at specific locations throughout the facility. They include the generator building to provide emergency lighting in the unlikely event that the generators do not start during loss of power. There is also a battery pack installed in the Chapel. The stairwells also have battery packs at each mid-level to ensure there is no loss of lighting during the transfer to emergency power after a power outage occurs.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

Event: Replace Battery Packs (approx. 20)

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$15,000	Unassigned

Updated: MAR-12

D5020.02.03.03 Exit Signs* - 1986

The existing exit lights installed in 1986 consist of incandescent style fixtures. These exit lights are connected to the emergency power distribution system so back up DC power from battery packs is not needed.

Rating	Installed	Design Life	Updated
3 - Marginal	1986	30	MAR-12

Event: Install additional exit lights in parkade on levels P1 and P2 (approx. 20)

Concern:

The parkade exit lights on P1 and P2 levels are provided directly above each stairwell door only. There are no additional exit lights located away from the door to provide exiting paths to those doors.

Recommendation:

Install additional exit lighting to provide better exiting path indication (approximately ten lights per level for a total of twenty).

Consequences of Deferral:

In the even of power failure or emergency, the exiting paths will not be clearly indicated.

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$15,000	Medium

Updated: MAR-12

Event: Replace burnt out exit sign lamps (approx. 50 fixtures)

Concern:

Several exit lights appear to have burnt out lamps.

Recommendation:

Replace lamps in approximately 50 fixtures.

Consequences of Deferral:

Exit lights are not illuminated and in the event there is a loss of power, the exiting paths will not be clearly indicated.

Type	Year	Cost	Priority
Repair	2013	$5,000	Medium

Updated: MAR-12

D5020.02.03.03 Exit Signs* - 2008

The facility has LED style exit lights connected to the emergency power distribution system (not to the battery packs). These lights were installed in 2008 in Units 83 and 84 on Level 8 and on Levels 9 and 10.

Rating	Installed	Design Life	Updated
5 - Good	2008	0	MAR-12

D5020.02.03.03 Exit Signs* - 2010

The facility has LED style exit lights connected to the emergency power distribution system (not to the battery packs). These fixtures were installed in 2010 when the South wing was expanded. They are installed in the shelled space on Level P2, in the south wing expansion on Level 3, the new Emergency Room on the main floor, in the shelled space on Level 5, and also in the new Engineering and Operations area located on Level 6.

Rating	Installed	Design Life	Updated
5 - Good	2010	0	MAR-12

D5020.02.11 Operating Room Lighting* - 1986

General lighting in the older operating rooms include several 2x4 T12 fluorescent fixtures with magnetic ballasts, controlled with line voltage switches. There are also square, recessed incandescent fixtures controlled with dimmers. Surgical lighting is provided by two double head, ceiling mounted operating lights.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

D5020.02.11 Operating Room Lighting* - 2007

General lighting in the operating rooms that were added in 2007 include recessed 2x4 T8 fluorescent fixtures, controlled with low voltage switches. There are also square, recessed compact fluorescent fixtures controlled with dimmers. Surgical lighting is provided by three ceiling mounted operating lights, independently controlled with three switches.

Rating	Installed	Design Life	Updated
5 - Good	2007	0	MAR-12

D5020.03.01.03 Exterior Metal Halide Fixtures*

Recently installed high pressure sodium fixtures are installed along the walkways, sidewalks and roadways around the Highwood Building.

Rating	Installed	Design Life	Updated
5 - Good	2009	0	MAR-12

D5020.03.01.04 Exterior H.P. Sodium Fixtures*

There are several high pressure sodium wall mounted fixtures, installed in 1986.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D5020.03.02 Lighting Accessories: Exterior (Lighting Controls)*

Exterior lighting on the Highwood facility is controlled with a time clock and photocell. All switching is controlled through the low voltage relay system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	30	MAR-12

D5030.01 Detection and Fire Alarm**

The fire alarm system has been upgraded to an Edwards EST 3 system. This upgrade took place in 2008 and included all building sections associated with the Highwood. The fire alarm consists of Network panels installed throughout the building, smoke detectors in each patient room and electrical/data room, manual pull stations at each exit, and speaker/strobes throughout. The system also includes remote annunciators at each nurses' station as well as in each elevator lobby. The main fire alarm control room houses the main fire alarm panel, the Active graphic and one of the Fire Works program computers.

The fire alarm paging system also doubles as the general paging system throughout the facility.

Rating	Installed	Design Life	Updated
5 - Good	2008	25	MAR-12

Event: Replace Fire Alarm System (based on 101,941 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$2,500,000	Unassigned

Updated: MAR-12

D5030.02.01 Door Answering*

The Highwood Building includes an intercom system installed at specific doors around the facility. This intercom is connected to the Main Security desk, and allows security to open locked doors for after hours entry, if required. The doors are locked at a specific time (main entry doors only, Emergency Room doors are open 24/7).

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

D5030.02.02 Intrusion Detection**

The intrusion detection system was recently upgraded to a AMEG based system installed by Siemens. This system covers all secure doors for door status. Several of the units also have duress buttons at the nurses' stations to signal security in the event of an issue. This system also covers the Fisher Building and ACC Building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

Event: Replace Intrustion Detection System (based on 101,941 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$600,000	Unassigned

Updated: MAR-12

D5030.02.03 Security Access**

Access control forms part of the AMEC security system. All doors requiring access control are secured with either door mags or electric strikes. Access control is achieved through card access or a combination keypad/card access. This enables restricted entry into specific areas of the building. All the doors are controlled with Altronic components installed and connected to the Siemens security cabinets.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

Event: Replace security access control system (based on 101,941 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$2,400,000	Unassigned

Updated: MAR-12

D5030.02.04 Video Surveillance** - 1986

The original CCTV system consists of fixed cameras installed at various locations in the facility. Several of the fixed cameras have been replaced with new equipment, however, a few of the original cameras still remain in operation. The cameras are a hard-wired Legacy camera and are connected to monitors in the main security room.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

Event: Replace hard wired cameras with IP based cameras (based on 30% GFA or 30,000 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2015	$581,000	Unassigned

Updated: MAR-12

D5030.02.04 Video Surveillance** - 1997

There is a stand alone CCTV system installed on the sixth floor in Unit 61. This camera is connected to monitors at the nurses' station for entry in the Labour and Delivery Unit. There is no DVR as it is strictly for monitoring of the door for access into the unit.

Rating	Installed	Design Life	Updated
4 - Acceptable	1997	25	MAR-12

Event: Replace Camera and Monitor at Unit 61 Main Entrance Door

Type	Year	Cost	Priority
Lifecycle Replacement	2022	$5,000	Unassigned

Updated: MAR-12

D5030.02.04 Video Surveillance** - 2008

The facility has recently added several IP based security cameras throughout the facility. These cameras operate on two different software systems. They include a Verent system, which is slowing being replaced with Omni software. All the cameras are connected to monitors in the main security room, and all DVR recording is accomplished from an offsite security office in Edmonton.

Rating	Installed	Design Life	Updated
5 - Good	2008	25	MAR-12

Event: Replace IP-based Video Surveillance System (based on 70% GFA or 71,000 m2)

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$1,162,000	Unassigned

Updated: MAR-12

D5030.03 Clock and Program Systems* - 1986

The facility has an Edwards 2470 clock system which consists of 120 volt clocks throughout with Edwards control cabinets installed in miscellaneous electrical rooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

D5030.03 Clock and Program Systems* - 2008

As the original Edwards 2470 clocks are no longer available, the recently added clocks are digital 120 volt Primex wireless clocks, connected to the Primex clock controller in the Level 11 elevator machine room lobby.

Rating	Installed	Design Life	Updated
5 - Good	2008	0	MAR-12

D5030.04.01 Telephone Systems*

The main telephone switch for the Highwood Building is located in the Fisher Building. It was recently upgraded to a Nortel Networks Meridian switch. Each handset is connected to the closest data closet with a CAT5 cable. The switch was installed in 2010,

Rating	Installed	Design Life	Updated
4 - Acceptable	2010	25	MAR-12

D5030.04.03 Call Systems**

The entire nurse call system in the Highwood Building was upgraded in 2008 to a Rauland Responder 4 system. The system includes call stations by each patient bed, indicator lights outside of each patient room and pull cords in each washroom.

Rating	Installed	Design Life	Updated
5 - Good	2008	25	MAR-12

Event: Replace Rauland Responder 4 Nurse Call System (based on 60,000 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$968,500	Unassigned

Updated: MAR-12

D5030.04.04 Data Systems*

The data system is managed by a sub-contracted IT group and consists of a vertical cabling backbone of both copper and fiber cable. From each of the data racks, horizontal CAT5 cables are extended to each outlet. The main server room is located in the Fisher Building which also feeds the ACC Building. The facility has Alberta Supernet as well as an Enmax Envision fiber optic cable entering the building for building data.

Rating	Installed	Design Life	Updated
4 - Acceptable	1996	25	MAR-12

D5030.04.05 Local Area Network Systems*

A wireless network system is installed throughout the facility. Each wireless access point is connected to the closest data rack with a CAT5 cable and appears to provide adequate coverage.

Rating	Installed	Design Life	Updated
4 - Acceptable	1996	15	MAR-12

D5030.05 Public Address and Music Systems**

The Highwood Building has a stand alone paging system installed in the Emergency Room. The system is split out into two separate zones: one for the ER and a second for the Triage area. This paging system is not connected to the main building paging so as to provide localized paging only. This Bogen paging system is connected through the telephone system and was installed in 2010.

The balance of the building paging system is achieved through the fire alarm speakers installed throughout the building. It utilizes a minor tie connection between the fire alarm system and the telephone system and all amplifiers are incorporated into the fire alarm equipment.

Rating	Installed	Design Life	Updated
5 - Good	2010	25	MAR-12

Event: Replace Bogen Paging System in ER (based on 4500 SQM)

Type	Year	Cost	Priority
Lifecycle Replacement	2035	$48,500	Unassigned

Updated: MAR-12

D5030.07 Other Communications and Security Systems*

The facility has a newly added antenna system installed. This system utilizes the existing ductwork as an antenna to provide better coverage throughout the facility. The antenna system is connected to the Ambulatory Care Center and Fisher Building with a multi-strand fiber cable. The system had not been fully commissioned at the time of our site visit, but is scheduled to be completed this year.

Rating	Installed	Design Life	Updated
5 - Good	2011	0	MAR-12

D5090.01 Uninterruptible Power Supply Systems**

The UPS was recently upgraded to two Mitsubishi 9800A units. Each 300 kVA UPS is operated through a paralleling switch. The system switches from normal to UPS power through an ASCO 7000 transfer switch. These UPS units were installed in 2008.

Rating	Installed	Design Life	Updated
5 - Good	2008	30	MAR-12

Event: Replace two 300 KVA Mitsubishi UPS units.

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$1,500,000	Unassigned

Updated: MAR-12

D5090.02 Packaged Engine Generator Systems (Emergency Power System)**

The facility has three 347/600 volt 1500 KW Cummins diesel generators controlled by a Master Command center installed in the main generator building. The generators have enough capacity to supply the full load of the entire building. Each generator is tested weekly to ensure they start. The day tank is emptied weekly and the main fuel storage tanks are emptied every 43 weeks to ensure the fuel is used on a yearly basis.

Rating	Installed	Design Life	Updated
5 - Good	2008	35	MAR-12

Capacity Size	Capacity Unit
1500	kW

Event: Install a Cummins Generator Master Command Center For Redundancy

Concern:

It was noted during the review that if the Main Master Command Center fails, the generators will have to be manually started.

Recommendation:

Install an additional Cummins Master Command Center to operate in parallel to the current master command center.

Consequences of Deferral:

Possibility of delayed starting of the emergency emergency generators if the controller does fail.

Type	Year	Cost	Priority
Program Functional Upgrade	2013	$50,000	Low

Updated: MAR-12

Event: Replace three 1500 KW 347/600 volt Cummins Generators

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$2,400,000	Unassigned

Updated: MAR-12

D5090.06 Lightning Protection Systems*

There is a lighting protection ground grid installed on the roof of the building. All exposed metal objects appear to be connected to this grid, all air craft marker lights are connected to this grid, and all the required lightening protection probes appear to be installed.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

S6 EQUIPMENT, FURNISHINGS AND SPECIAL CONSTRUCTION

E1020.07 Laboratory Equipment*

There is a complete diagnostic and testing laboratory in the building, complete with all the necessary equipment, and it is set up and managed by an independent contractor.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

E1020.08 Medical Equipment*

Various medical equipment and devices are provided, suitable for a full service hospital. Specialized counters, trays, beds, sinks, etc, provided in stainless steel fabrication.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	25	MAR-12

E1030.02 Parking Control Equipment*

The two levels of underground parkade are for the use of hospital staff only, and is controlled by a card reader system, connected to gates and door openers.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	20	MAR-12

E1030.03 Loading Dock Equipment*

The four enclosed truck docks are provided with dock bumpers and dock leveling devices. The one exterior truck dock is provided with dock bumpers only.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

E1090.02.02 Waste Compactors and Destructors*

An enclosed waste container is provided, complete with a compaction system. The container is removed off site by an independent contractor.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

E1090.03 Food Service Equipment*

A full commercial kitchen of 1100 square metres is provided, complete with on-site refrigerated storage. Equipment is of a large scale and everything is finished in stainless steel. Hospital management is in the process of installing a new dish washing machine, to replace the existing equipment.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	25	MAR-12

E1090.07 Athletic, Recreational, and Therapeutic Equipment*

There is an exercise room in the basement, and various pieces of exercise and therapeutic equipment is provided throughout the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	15	MAR-12

E2010.02 Fixed Casework**

Fixed casework provided in patient rooms, kitchens, serveries, washrooms, nurse stations, workrooms, offices, lounges -- plywood construction, plastic laminate counters.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	35	MAR-12

Event: Replace 7500 lm fixed casework

Type	Year	Cost	Priority
Lifecycle Replacement	2043	$5,700,000	Unassigned

Updated: MAR-12

E2010.03.01 Blinds**

Exterior windows and some interior windows are covered with vertical blinds. Some west-facing windows are provided with rolling solar blinds.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	30	MAR-12

Event: Replace 950 window blinds

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$210,000	Unassigned

Updated: MAR-12

F1030.05 Other Special Construction Systems*

The entire fifth floor of this building was designed as an interstitial space, to provide direct and accessible mechanical and electrical services to the operating theatres and other specialized areas of the floor below.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

F1040.01 Aquatic Facilities*

A cast in place reinforced concrete swimming pool is provided, complete with ceramic tile finish. This facility is currently not in use.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	40	MAR-12

F1040.06 Other Special Facilities*

There is a small building located directly north of the hospital, for the storage of flammables and volatiles. It is constructed as explosion proof, with large roof mounted explosion relief hatches.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	50	MAR-12

F1040.06 Other Special Facilities*

A separate generator building was developed on site, to provide electrical service to the hospital in the event of an emergency. See the electrical portion of this report for details.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

S8 SPECIAL ASSESSMENT

K4010.01 Barrier Free Route: Parking to Entrance*

A number of parking structures are connected to the main floor by elevator. Also, the internal roadway arrives at the same level as the Main Entrance.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

K4010.02 Barrier Free Entrances*

The main entrance, as well as other entrances to the building, are equipped with automatic door operators.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

K4010.03 Barrier Free Interior Circulation*

Corridors are wide and unobstructed. Elevators are provided to all levels of the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1986	0	MAR-12

K4010.04 Barrier Free Washrooms*

Barrier free washrooms are provided throughout the public areas, as well as in all patient areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

K4020.01 Safety Code (Fall Prevention)*

Tie-back safety anchors are not provided to all roof areas.

Rating	Installed	Design Life	Updated
2 - Poor	2008	0	MAR-12

Event: Install rooftop tie-back anchors

Concern:

Safety for new code requirements, Occupational Health and Safety standards. Rooftop safety and tie back anchors required.

Recommendation:

Install rooftop safety and tie back anchors to all areas of the roof.

Type	Year	Cost	Priority
Code Upgrade	2013	$300,000	High

Updated: MAR-12

K4020.03 Other Codes*

Numerous fire doors are propped open, presumably by cleaning staff.

Rating	Installed	Design Life	Updated
2 - Poor	0	0	MAR-12

Event: Instruct staff regarding fire doors

Concern:
Numerous fire doors propped open. Some doors have had the closers detached.
Recommendation:
Staff to be instructed to not block open fire doors in any circumstances.
Consequences of Deferral:
Danger of spread of fire.

Type	Year	Cost	Priority
Code Repair	2012	$1,000	Medium

Updated: MAR-12

K4030.01 Asbestos*

No asbestos was noted or reported.

Rating	Installed	Design Life	Updated
4 - Acceptable	0	0	MAR-12

K4030.02 PCBs*

No PCB's were noted or reported.

Rating	Installed	Design Life	Updated
4 - Acceptable	0	0	MAR-12

K4030.04 Mould*

No conditions supporting mould growth were noted or reported.

Rating	Installed	Design Life	Updated
4 - Acceptable	0	0	MAR-12

K4030.08 Biohazardous Materials*

A collection system is in place for biohazard materials, including an independent contractor to remove these materials from site.

Rating	Installed	Design Life	Updated
4 - Acceptable	2008	0	MAR-12

K4030.09 Other Hazardous Materials*

No other hazardous materials were noted or reported.

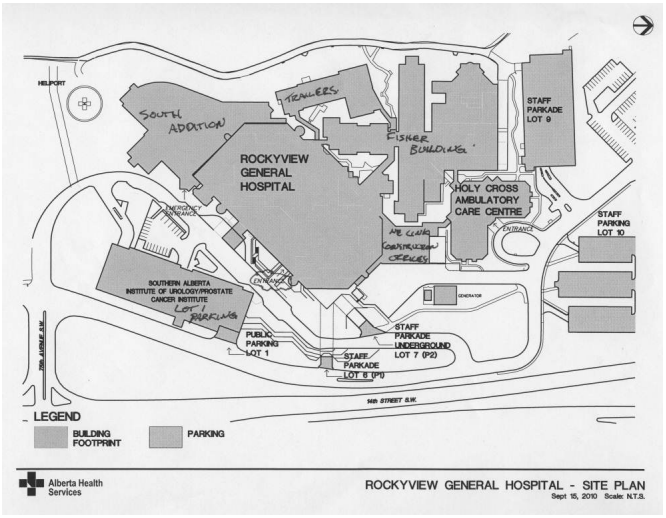
Rating	Installed	Design Life	Updated
4 - Acceptable	0	0	MAR-12

K5010.01 Site Documentation*

Site plan provided by Alberta Health Services, Facility Management Group.

Prime Consultant: Don Stewart - DC Stewart Architect Limited.
Evaluation Date: Sept. 14, 2011.

Rating	Installed	Design Life	Updated
4 - Acceptable	2011	0	MAR-12



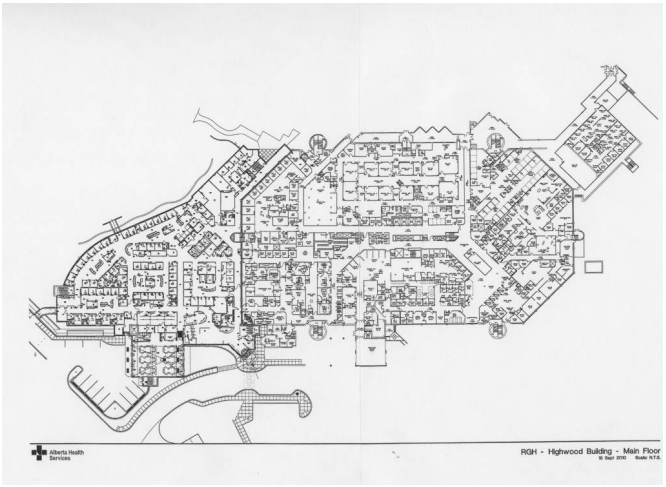
Rockyview General Hospital - Site Plan

K5010.02 Building Documentation*

Building plans provided by Alberta Health Services, Facility Management Group.

Prime Consultant: Don Stewart - DC Stewart Architect Limited.
Evaluation Date: Sept. 14, 2011.

Rating	Installed	Design Life	Updated
4 - Acceptable	2011	0	MAR-12



Highwood Building - Main Floor