RECAPP Facility Evaluation Report

Alberta Health Services-Edmonton

AHE - Building 18 Power Plant

B1022Y

Edmonton

Report run on: March 12, 2014 12:45 PM

Facility Details

Building Name: AHE - Building 18 Power Pla
Address: 17480 Fort Road N. W.
Location: Edmonton

Building Id: B1022Y
Gross Area (sq. m): 1,974.00
Replacement Cost: $0
Construction Year: 0

Evaluation Details

Evaluation Company: Bacz Engineering Ltd.
Evaluation Date: November 7 2013
Evaluator Name: Eric Lumley

Total Maintenance Events Next 5 years: **$24,110,500**
5 year Facility Condition Index (FCI): **0%**

General Summary:

Building #18 was constructed in two sections. The original building was built in 1922 with a major additional area constructed in 1968. The building generates the electrical and heating(steam) needs for the entire complex.

The facility is in need of some elemental replacement and cosmetic upgrades and is generally in marginal condition.

Structural Summary:

The original building was constructed with reinforced concrete foundations and floors, loadbearing masonry walls and pilasters and a steel roof structure. The 1968 addition has a steel frame supporting the roof beams and OWSJ.

Generally the stucture is in acceptable condition.

Envelope Summary:

The building exterior walls are stucco on the existing masonry and facing brick exterior veneer.Other than one area of single ply roofing the roofing is the original built-up tar and gravel roofing.The windows are either steel framed single glazing or aluminum windows. The exterior doors are insulated hollow metal utility doors and metal panel overhead doors. There is little insulation in the building envelope but the building operation generates excess heat so the lack of insulation isn't a factor.

Generally the building envelope is in poor condition.

Interior Summary:

The office areas are painted drywall with t-bar ceilings, the majority of the building is industrial in nature with painted masonry walls and exposed steel roof structure and decking.

Generally the interior is in acceptable condition.

Mechanical Summary:

Three gas fired steam boilers are located in Power Plant Building. Two boilers B1&2 serve 450 psig steam system that provide high pressure steam to 2.5 MW steam turbine and 150 psig steam to heating system serving AHE buildings.
Boiler B3 is a designated heating boiler that provides 150 psig steam to buildings located throughout AHE site.
Boilers B-1&2 are dual fuel type (natural gas and oil), boiler B3 is a natural gas fired boiler. Oils feed lines from two outdoor storage tanks to steam turbine, diesel generator and boilers.
Cooling system consists of cooling tower, water coolers and air cooled chiller complete with chilled water piping distribution and associated pumps.
Three domestic hot water heating systems for the AHE buildings located in Power Plant Building. Each system consists of a storage tank with an internal steam heat exchanger and a domestic hot water circulation pump.
150 psi steam, 8 psi steam, condensate return, chilled water, natural gas, domestic cold water, domestic hot water, domestic hot water recirculation and pneumatics are all provided from the power plant building via service tunnels to the rest of the site.
Black steel natural gas piping distribution from gas house.
Integrated building management system serving boiler controls (B-1&2), boiler B3 is not controlled through BMS.
Fire protection is provided in form of hand held fire extinguishers.

Overall mechanical systems components are in acceptable condition.

Electrical Summary:

The facility was originally built in 1922, and there was a major upgrading 1970. The power plant supplies electrical power for entire site.

The entire site main electrical service fed from a pad mounted transformer. The electrical main distribution system is 25kV-4160V, 5MVA,three phase, four wire. There is only one feed from utility company.

There is a 2.5MW steam power generator as a back-up power for entire facility emergency loads.

Main lighting for the building is T-12 fluorescent fixtures with electromagnetic ballast.

All fire alarm, telephone and data systems meet current facility requirements.

There are limited number of emergency battery pack system for emergency lighting.

The overall rating for the facility shall be "Acceptable"

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* - 1968

Concrete perimeter grade beams on concrete piles.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

A1010 Standard Foundations*- 1922

Cast in place concrete foundation wall and strip footings.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

A1030 Slab on Grade* - 1922

Reinforced concrete slab-on-grade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

A1030 Slab on Grade* - 1968

Reinforced concrete slab on grade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

A2020 Basement Walls (& Crawl Space)* - 1922

Reinforced concrete foundation walls.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

A2020 Basement Walls (& Crawl Space)* - 1968

Reinforced concrete foundation walls.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

B1010.01 Floor Structural Frame (Building Frame)* - 1922

Reinforced concrete structural slab and columns.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B1010.01 Floor Structural Frame (Building Frame)* - 1968

Reinforced concrete structural slab supported on concrete basement walls.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

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

Masonry pilasters supporting steel beams.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B1010.03 Floor Decks, Slabs, and Toppings*

Reinforced concrete structural floor slabs.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B1010.05 Mezzanine Construction*

Steel columns and beams with open grate platforms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B1010.07 Exterior Stairs*

Steel framed stairs with open grate treads and pipe rail handrails leading to intermediate and upper roof levels.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B1020.01 Roof Structural Frame*

OWSJ with metal decking on masonry pilasters and steel columns.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

S2 ENVELOPE

B2010.01.06.03 Metal Siding**

Vertical metal siding to attached storage enclosure. Siding appears to have been replaced within the last 10 years.

Rating	Installed	Design Life	Updated
4 - Acceptable	2005	40	MAR-14

Event: Replace metal siding.- (B.O.E. 47 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2045	$1,700	Unassigned

Updated: MAR-14

B2010.01.09 Expansion Control: Ext. Wall*

Brick and stucco finishes have expansion control joints.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

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

Caulking to the perimeter of windows and doors.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	20	MAR-14

Event: Replace caulking.- (B.O.E.108 m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$4,000	Unassigned

Updated: MAR-14

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

Loose fill insulation in concrete block cores. 25mm rigid insulation thermal break over steel beams, columns and girts.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

B2010.05 Parapets* - 1922

Galvanized metal parapet cap flashings.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B2010.05 Parapets* - 1968

Galvanized metal parapet cap flashings.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

B2010.06 Exterior Louvers, Grilles, and Screens*

Horizontal louvres at upper wall level.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

B2020.01.01.01 Steel Windows (Glass & Frame)**

Steel framed single glazed windows adjacent to main overhead door and as transom lights above entrance doors.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	40	MAR-14

Event: Replace steel framed windows.- (B.O.E. 26 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$23,800	Unassigned

Updated: MAR-14

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

Aluminum windows, double glazed, in 1968 section.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	40	MAR-14

Event: Replace aluminum windows.- (B.O.E. 8 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$8,000	Unassigned

Updated: MAR-14

B2030.02 Exterior Utility Doors**

Insulated metal exterior door in steel frames.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	40	MAR-14

Event: Replace exterior utility doors.- (B.O.E. 11 doors.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$10,000	Unassigned

Updated: MAR-14

B2030.03 Large Exterior Special Doors (Overhead)*

Insulated metal panel overhead doors

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

B3010.01 Deck Vapour Retarder and Insulation*

25mm and 50mm rigid insulation on metal roof decking and concrete topping.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

B3010.04.01 Built-up Bituminous Roofing (Asphalt & Gravel)** - 1922

4 ply built up roofing with gravel ballast.

Rating	Installed	Design Life	Updated
2 - Poor	1922	25	MAR-14

Event: Replace Built-up-roofing.- (B.O.E. 272 sq.m.)

Concern:
Built up roofing on the 1922 section has numerous on-going roof leaks.
Recommendation:
Replace built-up roofing.

Type	Year	Cost	Priority
Failure Replacement	2014	$49,500	Medium

Updated: MAR-14

B3010.04.01 Built-up Bituminous Roofing (Asphalt & Gravel)** - 1968

Built-up roofing to 1968 section has exceeded it's design life.

Rating	Installed	Design Life	Updated
2 - Poor	1968	25	MAR-14

Event: Replace built-up roofing. - (B.O.E. 1050 sq.m.)

Concern:
Built-up roofing on 1968 section has numerous on-going roof leaks.

Recommendation:
Replace built-up roofing.

Type	Year	Cost	Priority
Failure Replacement	2014	$191,000	Medium

Updated: MAR-14

B3010.04.05 Membrane Roofing (Single Ply, EPDM, PVC, TPO)** - 1922

Single ply (TPO) roofing.

Rating	Installed	Design Life	Updated
4 - Acceptable	2006	25	MAR-14

Event: Replace single ply roofing.- (B.O.E. 209 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2031	$42,650	Unassigned

Updated: MAR-14

S3 INTERIOR

C1010.01 Interior Fixed Partitions*

Drywall on steel studs.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C1010.04 Interior Balustrades and Screens, Interior Railings*

Steel pipe guard rails where needed.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C1010.05 Interior Windows*

Pressed metal interior glazing to control room and office.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

C1020.01 Interior Swinging Doors (& Hardware)*

Painted metal doors and solid core wood doors in pressed steel frames.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C1030.01 Visual Display Boards**

Whiteboards and tackboards to control room and office.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	20	MAR-14

Event: Replace visual display boards. B.O.E. 3 units

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$2,000	Unassigned

Updated: MAR-14

C1030.12 Storage Shelving*

Metal and wooden storage shelving throughout the "shop" areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C1030.14 Toilet, Bath, and Laundry Accessories*

Washroom is equiped with mirror, toilet roll holder, waste bin, soap dispenser.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C2010 Stair Construction*

Steel stringers and treads.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

C2020.08 Stair Railings and Balustrades*

Pipe rail handrails and guardrails.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

C3010.11 Interior Wall Painting*

Painted finish to all interiors.

Rating	Installed	Design Life	Updated
3 - Marginal	1922	0	MAR-14

Event: Repaint all interior surfaces.- (B.O.E. 4780 sq.m.)

Concern:
All interior surfaces are in need of repainting. Walls are damaged and paint is in poor condition.

Recommendation:
Repaint all interior surfaces.

Type	Year	Cost	Priority
Repair	2014	$140,000	Low

Updated: MAR-14

C3020.07 Resilient Flooring**

VCT flooring in offices and washrooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	20	MAR-14

Event: Replace VCT flooring.- (B.O.E. 86 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$4,400	Unassigned

Updated: MAR-14

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

T-bar ceiling in control roof and office.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	25	MAR-14

Event: Replace T-bar ceiling.- (B.O.E. 63 sq.m.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$2,950	Unassigned

Updated: MAR-14

C3030.07 Interior Ceiling Painting*

Painted drywall ceilings in washrooms.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

S4 MECHANICAL

D2010.04 Sinks**

Stainless steel sink, counter mounted complete with faucet.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	30	MAR-14

Event: Replace 1 Sink.

Type	Year	Cost	Priority
Lifecycle Replacement	2019	$1,500	Unassigned

Updated: MAR-14

D2010.08 Drinking Fountains/Coolers**

Wall mounted, stainless steel, refrigerated drinking fountain.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	35	MAR-14

Event: Replace 1 Drinking Fountain.

Type	Year	Cost	Priority
Lifecycle Replacement	2024	$2,000	Unassigned

Updated: MAR-14

D2010.09 Other Plumbing Fixtures*

Emergency eyewash stations located in some areas of the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	0	MAR-14

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

Floor mounted, vitreous china water closet.
Enameled steel lavatories.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	35	MAR-14

Event: Replace 2 Washroom Fixtures.

Type	Year	Cost	Priority
Lifecycle Replacement	2024	$3,000	Unassigned

Updated: MAR-14

D2020.01.01 Pipes and Tubes: Domestic Water*

PVC, steel and copper domestic piping distribution.
150mm diameter domestic hot water feed into service tunnel to the rest of the site.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D2020.01.02 Valves: Domestic Water**

Domestic water circulation and distribution valves are provided throughout. Generally ball valves or gate valves.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	40	MAR-14

Event: Replace 60 Domestic Water Valves.

Type	Year	Cost	Priority
Lifecycle Replacement	2029	$135,000	Unassigned

Updated: MAR-14

D2020.01.03 Piping Specialties (Backflow Preventers)**

Backflow preventors and double check valves are provided on the boiler feed water, chilled water, domestic cold water supply from the city and from the tower and soft water system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	20	MAR-14

Event: Replace 14 BFP.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$118,000	Unassigned

Updated: MAR-14

D2020.02.02 Plumbing Pumps: Domestic Water**

In-line pump serving 25mm diameter domestic hot water recirculation system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	20	MAR-14

Event: Replace 1 Pump.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$6,000	Unassigned

Updated: MAR-14

D2020.02.04 Domestic Water Conditioning Equipment**

Zeolite water softners complete with circulation pumps, brine tank, meas. Tank, filter, 75mm soft water piping distribution, flow transmitters and accessories.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	20	MAR-14

Event: Replace 4 Water Softners and Accessories.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$165,000	Unassigned

Updated: MAR-14

D2020.02.06 Domestic Water Heaters**

Three domestic hot water heating systems for the AHE buildings located in Power Plant Building. Each system consists of a storage tank with an internal steam heat exchanger and a domestic hot water circulation pump.
Domestic water heaters are complete with level control and alarm. 150mm main domestic hot water service from the heaters.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	20	MAR-14

Event: Replace 3 Domestic Water Heaters.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$245,000	Unassigned

Updated: MAR-14

D2020.03 Water Supply Insulation: Domestic*

Water piping insulated throughout.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D2030.01 Waste and Vent Piping*

Cast iron and copper.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D2030.02.04 Floor Drains*

Cast iron floor drains located throughout Power Plant.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D2030.03 Waste Piping Equipment*

Drain sumps at lower level of Power Plant.
Trenches serving boiler feed lines.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

D2040.01 Rain Water Drainage Piping Systems*

Cast iron rain water piping from roof drains to underslab storm main.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

D2040.02.04 Roof Drains*

Roof drains with strainers connect to internal rain water leaders.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D2090.01 Compressed Air Systems (Non Controls)**

Gardner Denver rotary screw air compressor provides instrument air for the Power Plant building and to designated location on site.

Rating	Installed	Design Life	Updated
4 - Acceptable	1999	30	MAR-14

Event: Replace 1 Compressor and Accessories.

Type	Year	Cost	Priority
Lifecycle Replacement	2029	$75,000	Unassigned

Updated: MAR-14

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

Oil supply system is provided for the following equipment:
- emergency generator
- boilers B-1 &2
- steam turbine

System consists of two outdoor oil storage tanks, fuel oil piping (supply and return), circulation pumps, oil tanks with level gauges, oil cooler, filters and pressure switches.
Indoor day tank is provided for back-up generator.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	0	MAR-14

D3010.02 Gas Supply Systems*

Elevated pressure black steel natural gas supply lines from gas house to boilers B-1,2&3.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D3020.01.01 Heating Boilers & Accessories: Steam**

There are 3 steam boilers located in Power Plant.
B-1: Babcock & Wilcox, 50,000 Ibs/hr (installed in 1968).
B-2: Volcano, 50,000 Ibs/hr (installed in 1977).
B-3: Babcock & Wilcox, 30,000 Ibs/hr (installed in 1962).
Boilers B-1&2 provide high pressure (450 psi) superheated steam system serving turbine as well as back-up heat for high pressure (150 psi) steam heating system.
Boiler B-3 provides 150 psi steam to building heating systems throughout the hospital.
Boilers B-1&2 are dual fuel boilers with primary natural gas fee section and secondary oil heating sections.
Boilers B-1&2 are equipped with economizers, sample cooler and continuous blowdown connections. Three blowdown tanks located in lower level boiler room.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	35	MAR-14

Event: Replace 3 Boilers and Accessories

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$9,500,000	Unassigned

Updated: MAR-14

D3020.01.02 Feedwater Equipment*

Condensate return lines from buildings located throughout the site to condensate receiver.
System consists of the following componenets:
- condneser
- condensate surge tank
- three condensate transfer pumps serving condensate tank
- two circulation pumps serving outdoor copndensate tank
- two desuperheater pumps
- two deaerators completed with steam pressure equilizing lines, level controls, pressure indicators and chemical feed. Deaerators were replaced in 1993.
- four boiler feedwater pumps serving 150mm diameter 600 psig service to boilers B-1&2 and 100mm diameter 200 psig service to B-3.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

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

Combustion air is provided by boiler feed fans.
Individual boiler vents extend up through the roof.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	35	MAR-14

Event: Replace 3 Boiler Vents.- (BOE: 75m length.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$120,000	Unassigned

Updated: MAR-14

D3020.01.04 Water Treatment: Steam Boilers*

Three chemical feed tanks complete with circulation pumps serving boilers and turbine.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D3030.03 Reciprocating Water Chillers**

Air finn cooler located on the ground outside the Power Plant complete with 100mm diameter chilled water piping distribution to oil cooler serving steam turbine.

Rating	Installed	Design Life	Updated
4 - Acceptable	1978	25	MAR-14

Event: Replace 1 Chiller.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$675,000	Unassigned

Updated: MAR-14

D3030.05 Cooling Towers**

Baltimore Aircoil Company model Vtl-066jcx cooling tower complete with centrifugal fans.

Rating	Installed	Design Life	Updated
4 - Acceptable	2005	25	MAR-14

Event: Replace 1 Cooling Tower.

Type	Year	Cost	Priority
Lifecycle Replacement	2030	$450,000	Unassigned

Updated: MAR-14

D3030.06.02 Refrigerant Condensing Units**

Ruud model UAKA-060CAZ condensing unit complete with refrigerant piping to fan coil serving Control Room and adjacent areas. R-134a refrigerant.

Rating	Installed	Design Life	Updated
4 - Acceptable	2003	25	MAR-14

Event: Replace 1 Condenser.

Type	Year	Cost	Priority
Lifecycle Replacement	2028	$10,000	Unassigned

Updated: MAR-14

D3040.01.04 Ducts: Air Distribution*

Low pressure galvanized steel ductwork distribution serving Control Room and adjacent areas.

Rating	Installed	Design Life	Updated
4 - Acceptable	2003	0	MAR-14

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

High pressure steam distribution to turbine and buildings heating systems.
There are two 150mm diameter high pressure steam piping distribution systems from Boiler B-1 and B-1 to 450 psig header and one 150mm diameter from B-3 to 150 psi header.
200mm diameter high pressure steam from 450 psig header to steam turbine complete steam strainer.
150mm diameter steam line from 150 psig header to service tunnel.
400mm diameter low pressure steam from steam turbine to variety of buildings on site through service tunnels.
100mm diameter low pressure steam feed to domestic water heaters, unit heaters serving Power Plant and heat exchanger serving water softening system.
Piping is steel schedule 40 and steel schedule 80.
This section is to be read in conjunction with section D3020.01.02.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	40	MAR-14

Event: Replace 13 Pumps Serving Steam Distribution System, Piping and Associated System Components.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$7,500,000	Unassigned

Updated: MAR-14

D3040.03.02 Chilled Water Distribution Systems**

PVC and steel 100mm diameter chilled water piping distribution system complete with two circulation pumps provide distribution from chiller and cooling tower.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	40	MAR-14

Event: Replace 2 Chilled Water Pumps and Associated Piping Distribution.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$750,000	Unassigned

Updated: MAR-14

D3040.04.01 Fans: Exhaust**

Variety of exhaust fans provided throughout the Power Plant. Exhaust fans are the following types: wall mounted, roof mounted centrifugal up-blast, indoor centrifugal, gland steam exhaust serving turbine, ceiling mounted cabinet type.

Rating	Installed	Design Life	Updated
4 - Acceptable	1968	30	MAR-14

Event: Replace 9 Exhaust Fans.

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$105,000	Unassigned

Updated: MAR-14

D3040.04.03 Ducts: Exhaust*

Galvanizes steel and black steel exhaust air ductwork.
Schedule 30 and schedule 40 steel ductwork serving steam relief vents and oil tank vents.

Rating	Installed	Design Life	Updated
4 - Acceptable	1962	0	MAR-14

D3040.05 Heat Exchangers**

Plate heat exchanger serving domestic soft water system.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	30	MAR-14

Event: Replace 1 Heat Exchanger.

Type	Year	Cost	Priority
Lifecycle Replacement	2019	$20,000	Unassigned

Updated: MAR-14

D3050.05.02 Fan Coil Units**

Blower coil complete with DX system is providing ventilation air, AC and heating to Control Room and adjacent areas. ~1706 kW cooling capacity.

Rating	Installed	Design Life	Updated
4 - Acceptable	2003	30	MAR-14

Event: Replace 1 Fan Coil.

Type	Year	Cost	Priority
Lifecycle Replacement	2033	$5,000	Unassigned

Updated: MAR-14

D3060.02.02 Pneumatic Controls**

Two air compressors (comp Air) serving pneumatic piping distribution throughout the AHE site. System consists of two air compressors, air receivers, air filters, after cooler, air dryers (Pall), purge valves and controllers. 75mm diameter compressed air supply into tunnel and pneumatic actuators / dampers in Power Plant.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	40	MAR-14

Event: Replace 2 Air Compressors, Piping and Accessories.

Type	Year	Cost	Priority
Lifecycle Replacement	2029	$275,000	Unassigned

Updated: MAR-14

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

Integrated building management system serving boiler controls (B-1&2), including: burners, feed water lines, letdown stations, desuperheater station valves and other system components. Remote operation station located in Control Room. System front end was upgraded in 2003 and 2008 respectively.

Rating	Installed	Design Life	Updated
4 - Acceptable	1998	20	MAR-14

Event: Add BMS to control boiler B3 operation.- (1)

Concern:
Boiler B3 is not controlled through BMS.
Recommendation:
Expand existing BMS to include control points to boiler B3.

Type	Year	Cost	Priority
Operating Efficiency Upgrade	2015	$40,000	Low

Updated: MAR-14

Event: Replace BMS.- (BOE: 1974 sq.m. GFA.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$145,000	Unassigned

Updated: MAR-14

D4030.01 Fire Extinguisher, Cabinets and Accessories*

Fire extinguishers provided throughout:- carbon dioxide, multi-purpose dry chemical. All units complete with up-to-date certification tags.

Rating	Installed	Design Life	Updated
4 - Acceptable	1989	0	MAR-14

S5 ELECTRICAL

D5010.01.02 Main Electrical Transformers (Utility Owned)*

A pad mounted 25kV-4160V, 5000kVA transformer were installed for the facility. The transformer fed from utility over head power lines. It is serviced by a utility company.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5010.02 Secondary Electrical Transformers (Interior)**

There are two house transformers as listed:

T1 4160-277/480V, 750kVA, 3-Phase, 4 wire
T2 4160-120/208V, 300kVA, 3-Phase, 4 wire

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	40	MAR-14

Event: Replace 2 Secondary Electrical Transformers (Interior)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$105,000	Unassigned

Updated: MAR-14

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

Power plant Medium Voltage Distribution Center for the site is located in this building. There are two 4160V, 1200A, 3 Phase, 4 Wire rated distribution panel, completed with SCADA system. These two panels are connected together with tie breaker.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	40	MAR-14

Event: Replace 2 Main Electrical Switchboards (Main Distribution)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$500,000	Unassigned

Updated: MAR-14

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

Power plant Medium Voltage Distribution Center for the site is located in this building. There are two 277/480V, 1600A, 3 Phase, 4 Wire rated distribution panel. One 600-120/208V, 800A, 3 Phase, 4 Wire rated distribution panel.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	40	MAR-14

Event: Replace 2 Main Electrical Switchboards (Main Distribution)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$135,000	Unassigned

Updated: MAR-14

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

12 panels are provided throughout the facility for power services to all loads.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	30	MAR-14

Event: Replace 12 Electrical Branch Circuit Panelboards (Secondary Distribution)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$144,000	Unassigned

Updated: MAR-14

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

Two 120/208, 3 Phase, 4 Wire MCC's were installed in the facility for the major mechanical loads. All together there are 12 sections.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	30	MAR-14

Event: Replace 12 section Switchboards, Panelboards, and (Motor) Control Centers]**

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$180,000	Unassigned

Updated: MAR-14

D5010.07.02 Motor Starters and Accessories**

Individual motor starters and load switches are used major mechanical ventilation units and some small water pumps. Starters are complete pilot lights and hand-off-auto selector switches.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	30	MAR-14

Event: Replace 105 Motor Starters and Accessories

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$157,500	Unassigned

Updated: MAR-14

D5010.07.03 Variable Frequency Drives**

There are 2 Hitachi VFD for major mechanical loads.

Rating	Installed	Design Life	Updated
4 - Acceptable	1993	30	MAR-14

Event: Replace 2 Variable Frequency Drives

Type	Year	Cost	Priority
Lifecycle Replacement	2023	$30,000	Unassigned

Updated: MAR-14

D5020.01 Electrical Branch Wiring*

Most of wiring are installed inside conduit with original building construction. BX is used from junction boxes to light fixtures.Cable trays are used for major cable routes.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

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

Lighting has been controlled by line voltage switch.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5020.02.02.01 Interior Incandescent Fixtures*

There are few fixture in the main distribution room.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

D5020.02.02.02 Interior Fluorescent Fixtures**

The light fixtures were originally T-12 completed with magnetic ballast.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	30	MAR-14

Event: Replace 790 Interior Fluorescent Fixtures

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$256,750	Unassigned

Updated: MAR-14

D5020.02.02.03 Interior Metal Halide Fixtures*

There are High bay lights in the plant area.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5020.02.03.01 Emergency Lighting Built-in*

The Hospital has a power generator for house load. The building is fed from this power generator for emergency power needs and lighting system. Some of the florescent lights are assigned as emergency lights with good coverage.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5020.02.03.02 Emergency Lighting Battery Packs**

There are 10 battery pack are provided for the critical areas. Batteries are tested regularly, if required replaced.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	20	MAR-14

Event: Replace 8 Emergency Lighting Battery Packs

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$9,600	Unassigned

Updated: MAR-14

D5020.02.03.03 Exit Signs*

Exit signs are located at required locations and exits. Exist signs are incandescent type.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5020.03.01.01 Exterior Incandescent Fixtures*

There are some fixture on the wall.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

D5020.03.01.04 Exterior H.P. Sodium Fixtures*

There are some fixture on the wall.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

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

Light fixtures are completed with photo cell individually.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5030.01 Detection and Fire Alarm**

An Edward ESTcontrol panel is used for the facility fire alarm system and located at the main entrance, and completed with manual pull stations, detectors, throughout the building. One of command center is in the building for entire site monitoring.

Rating	Installed	Design Life	Updated
5 - Good	2013	25	MAR-14

Event: Replace Detection and Fire Alarm. - (B.O.E. 1974 sq. m. GFA.)

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

Updated: MAR-14

D5030.02.04 Video Surveillance**

There is a 1 camera, and wired to building 3 security center.

Rating	Installed	Design Life	Updated
5 - Good	2013	25	MAR-14

Event: Replace Video Surveillance - (B.O.E. 1974 sq. m. GFA.)

Type	Year	Cost	Priority
Lifecycle Replacement	2038	$5,000	Unassigned

Updated: MAR-14

D5030.04.01 Telephone Systems*

Meridian telephone backboard and termination blocks are located in the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

D5030.04.04 Data Systems*

Data outlets are installed through offices; and Copper wiring is typically CAT 5E balanced twisted pair with FT4 rated insulation. Bell supernet has been brought into the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	2006	0	MAR-14

D5030.04.05 Local Area Network Systems*

Switching equipment is installed in racks and cabinets and communications wiring including copper and optical fibre runs in conduit systems and cable tray systems.

Rating	Installed	Design Life	Updated
4 - Acceptable	2006	0	MAR-14

D5030.06 Television Systems*

There is a TV outlet in the building.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

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

A 480V, 3-Phase, 4 Wire, 675 kVA Standford diesel generator in the building for emergency mechanical loads.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	35	MAR-14

Event: Replace Packaged Engine Generator Systems (Emergency Power System) - (B.O.E. 1974 sq. m. GFA.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$350,000	Unassigned

Updated: MAR-14

D5090.08 Power Generation Systems (Co-generation)*

A Brown Boveri steam cogeneration system is provided for the entire back-up power system. It is rated 2.5MVA, 4160V, 433A, 3 Phase, 4 Wire.

Rating	Installed	Design Life	Updated
4 - Acceptable	1970	0	MAR-14

Event: Replace Power Generation Systems (Co-generation) - (B.O.E. 1974 sq. m. GFA.)

Type	Year	Cost	Priority
Lifecycle Replacement	2017	$2,500,000	Unassigned

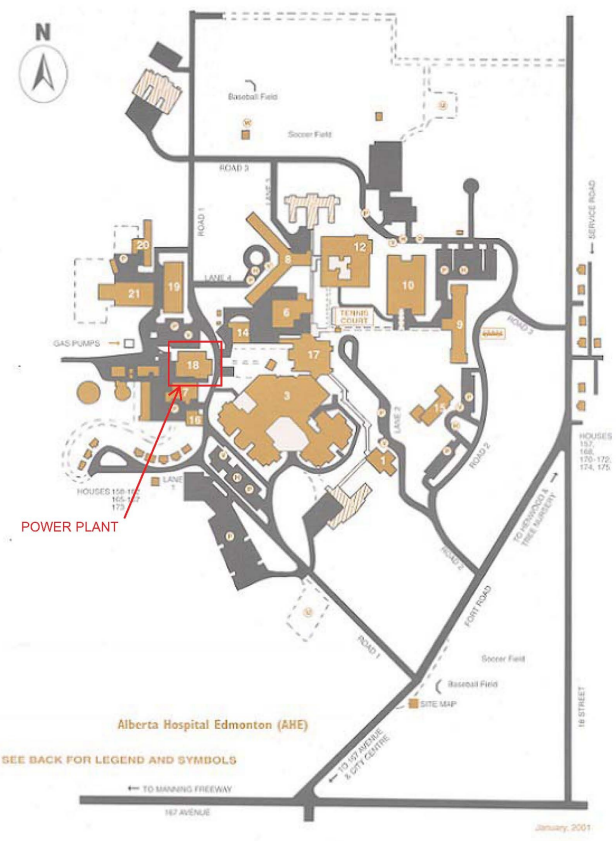
Updated: MAR-14

S6 EQUIPMENT, FURNISHINGS AND SPECIAL CONSTRUCTION

E2010.02 Fixed Casework**

Millwork vanities in washrooms, workbenches in "shop" areas and kitchen cabinets in staff kitchen.

Rating	Installed	Design Life	Updated
3 - Marginal	1968	35	MAR-14



Site Plan

Event: **Replace millwork.- (B.O.E. 7m)**

Concern:
Laminate countertops are damaged.
Recommendation:
Replace kitchen and washroom cabinets.

Type	Year	Cost	Priority
Failure Replacement	2014	$8,000	Low

Updated: MAR-14

S8 SPECIAL ASSESSMENT

K4010.01 Barrier Free Route: Parking to Entrance*

Main level of building is at grade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K4010.02 Barrier Free Entrances*

Main entrances are at grade.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K4010.03 Barrier Free Interior Circulation*

Numerous changes in floor level with steel stairs providing access.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K4010.04 Barrier Free Washrooms*

Washrooms are not barrier free.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K4030.01 Asbestos*

Loose fill wall insulation may contain asbestos.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K4030.04 Mould*

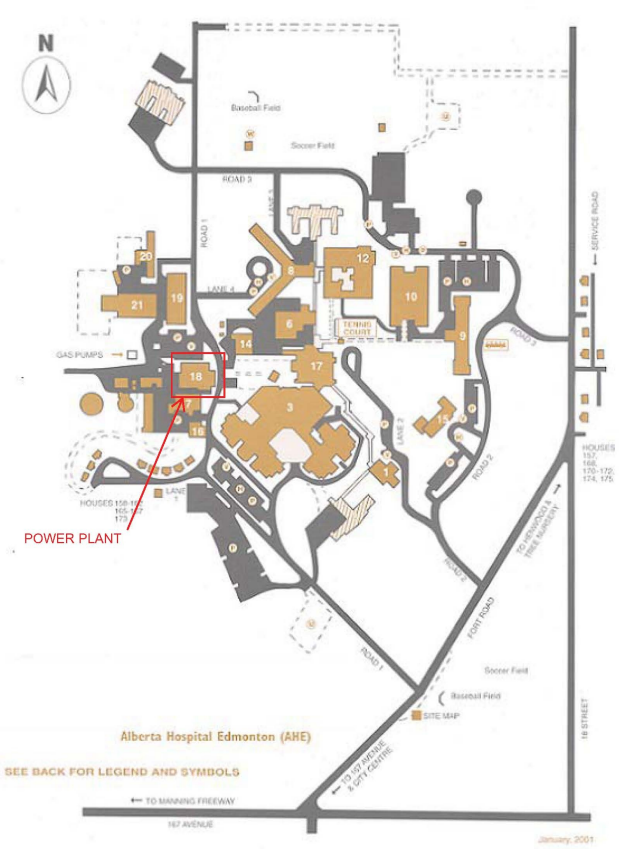
No mould noted or reported.

Rating	Installed	Design Life	Updated
4 - Acceptable	1922	0	MAR-14

K5010.01 Site Documentation*

Prime Consultant: Bacz Engineering Ltd.
Year of Evaluation: 2013
Building Area Evaluated: 1974 m2

Rating	Installed	Design Life	Updated
4 - Acceptable	2013	0	MAR-14

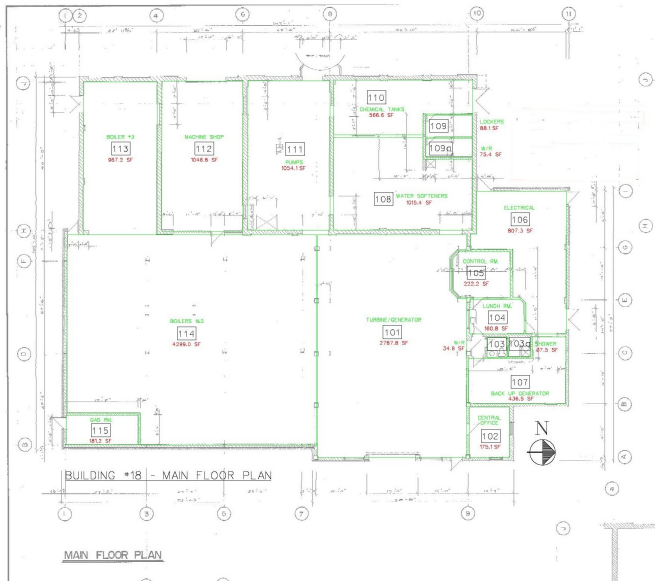


SITE PLAN.jpg

K5010.02 Building Documentation*

Power Plant was constructed in two sections. The original building was built in 1922 with a major additional area constructed in 1968.
The building generates the electrical and heating(steam) needs for the entire complex.

Rating	Installed	Design Life	Updated
4 - Acceptable	2013	0	MAR-14



Main Floor.