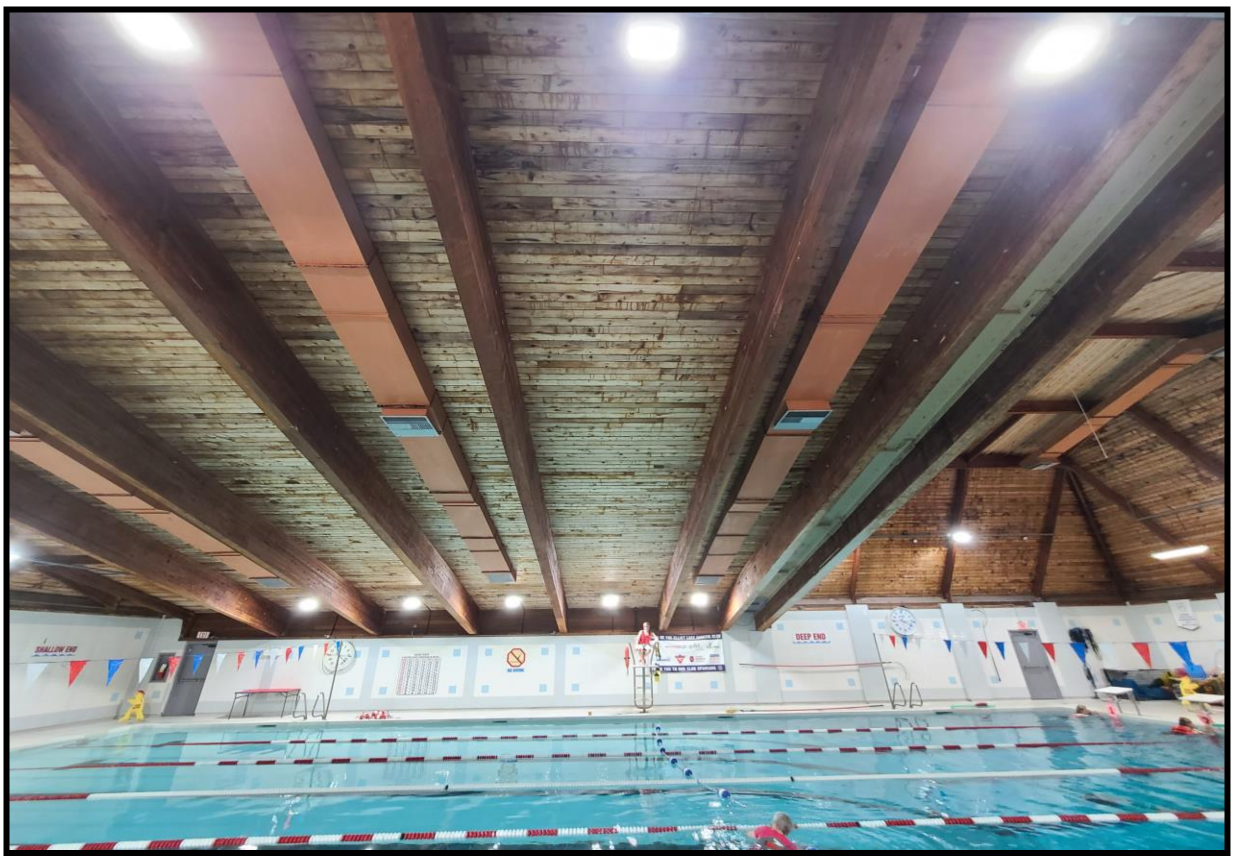
Consulting Engineering
477 Queen Street East, Suite 304
Sault Ste. Marie, ON P6A 1Z5
Tel: (705) 942-3344 Fax: (705) 942-1477
www.meteng.on.ca

MECHANICAL EQUIPMENT ASSESSMENT REPORT

Ruben Yli-Juuti Aquatic Centre

301 MISSISSAUGA AVE., ELLIOT LAKE, ON



Submitted to:	Don Crain
Project No.:	20M74
Report By:	Tim Janzen, P.Eng.
Date:	December 2020
Revision:	0

1.0 GENERAL FACILITY INFORMATION

On Thursday, November 12th, Mr. Tim Janzen visited The Ruben Yli-Juuti Aquatic Centre located at 301 Mississauga Avenue in Elliot Lake, Ontario to review and assess the conditions of the site. The review of the site was conducted with Mr. Don Crain of the town of Elliot Lake. Mr. Crain was very knowledgeable regarding the operation the facility and its equipment, as well as the history of the building.

The enclosed report is based upon review of the site, the information provided by Mr. Crain, and conversations with the present service provider, Brad King of Topline Electric, Plumbing and Heating.

The estimated useful life of a pool is about 40 years. The roughly 45-year-old aquatic facility, built in approximately 1975, has undergone various repairs and replacement mechanical systems to remain operational; however, it is time to look at systematically replacing all major mechanical equipment to ensure the operation of the pool in the future.

In addition to the pool, there is also a fitness facility attached to the building.

The intent of this report is to assess the facility's primary mechanical equipment and to determine the life expectancy and condition of this equipment.

1.1 Property Profile

City & Province:	**Elliot Lake, Ontario**
Location:	**301 Mississauga Avenue**
Lot Size:	**N/A**
Area of Building (Typical):	**N/A**
Number of Stories:	**1**
Number of Tenant Spaces:	**1**
Year Built:	**Estimated 1975**
Building Code:	**OBC**

2.0 Review of Mechanical Systems

2.1 **Exercise Room Rooftop Unit**

In 1998, alterations to the facility included the addition of a front entrance and an exercise room. The added front entrance and exercise room are both serviced by a dedicated Trane Rooftop Unit (RTU) Model YCC030F1M0BE. The RTU provides heating, cooling, and ventilation air to the space. Although the RTU is of adequate design for the space, the unit has surpassed its life expectancy of 15-20 years. Continued use beyond normal life expectancy is possible, but will most likely result in higher costs for repairs on vital components such as heat exchanger and compressors.

Figure 2.1.1: Trane RTU and Fitness Area

The existing Trane RTU is installed onto a 6" tall curb. Typically, for installations of rooftop equipment in Northern Ontario, a taller curb is recommended. Installing equipment on a 18-24" tall curb can mitigate leaks and other issues caused by snow cover.

2.2 **Pool Ventilation and Dehumidification system**

The pool is heated, cooled and dehumidified by an indoor Seresco Air Handler and a Venmar HRV unit. The Seresco unit in Figure 2.2.1 below is an indoor Model NE-232-PH-1A3NT1133N0C4ANO. An additional Venmar HRV unit (shown in Figure 2.2.2) has been installed to introduce fresh air to the pool and also assist in dehumidification.

Fig. 2.2.1: Compressors inside Seresco Unit

Fig. 2.2.2: Venmar HRV

Although it is common practice to install HVAC equipment indoors in dedicated mechanical rooms; it is not recommended with a pool environment in close proximity. The mechanical room in which both the Seresco and Venmar units are installed inside shares common air with the pool. In addition to the extreme humidity levels (relative to outside air) in the pool's atmospheric air, it also contains corrosive particles from the chemicals used to condition the water. This environment severely shortens the usable lifespan the equipment and other various components.

Presently, one of the two compressors in the Seresco unit has failed as a result. Most of the copper piping has corroded and is on the verge of failure beyond repair. Although some of the piping has been coated with an aftermarket paint in effort to extend its life, this may only be a temporarily fix.

Fig. 2.2.3: Example of Corroded piping in Seresco Unit

As seen in Figure 2.2.3 above, the corrosion issue on the Seresco unit is severe and in need of attention. If holes develop in the piping, repair may not be possible without replacing the entire coil and its associated piping.

In addition to the corrosion issue on the piping, both the control and power wiring connections on the unit are corroding, shown below in Figure 2.2.4. The corrosion on the wiring is currently causing issues and will continue to cause problems with reliability in the future.

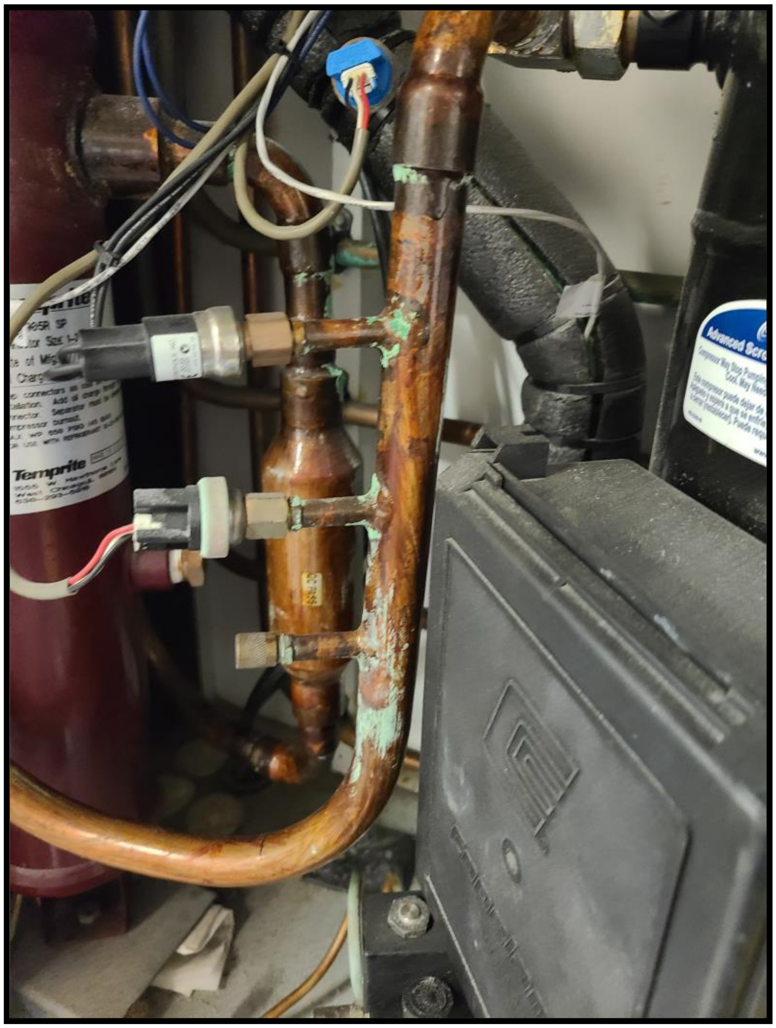


Fig. 2.2.4: More corroded piping inside unit

The Venmar unit is very simple in comparison to the Seresco unit, however, it as well has significantly deteriorated over time and will be difficult to maintain or repair moving forward. Although the fan in the unit was replaced recently, the bearings and control board are still in need of replacement. The ductwork and drains from the unit have also rusted out and failed, temporary setups are currently in place due to this. In an effort to provide dilution to reduce humidity and corrosion, staff have made a 'makeshift' hole in the ductwork (Figure 2.2.5) to provide some fresh outside air into the mechanical room.

Fig. 2.2.5: Temporary opening in ductwork

While most of the corrosion issues exist indoors, the exterior refrigerant piping and condenser are also deteriorating. The exterior refrigerant piping is not properly protected and has consequently deteriorated to the point where it needs to be replaced and properly insulated.

Fig. 2.2.6: Seresco Cooling Units and Piping

The condenser unit contains multiple leaks that require repairs, although, repair may not be possible. The coils on the condenser may need to be replaced to keep the units running.

2.3 **Heating Plant and Domestic Hot Water**

The main heating plant for the facility is a RBI 33DB2100NASS 2,100 MBH boiler. This boiler provides heat to the entire building, as well as for the domestic hot water throughout. This past summer, the unit had failed and it had taken most of the summer to get the necessary parts for repair. A temporary heating plant was installed to provide domestic water through the summer. The parts have recently arrived to repair the boiler.

Fig. 2.3.1: RBI Hot Water Boiler

The boiler is now 20 years old and has reached its life expectancy. A heating plant of this size should be comprised of multiple boilers so that there is redundancy; if one unit fails, there is another unit that can provide heat until the inoperable boiler can be repaired.

Even though pumps are not as critical since parts are more readily accessible, they should still be reviewed regularly and maintained. Spare parts should be stocked to provide the ability to repair a system quickly in the event of a failure.

As is the case with the air handling equipment in the mechanical room, the heating plant's associated piping is also in very poor condition and is severely rusted in most areas. While some, of this is only surface, but a lot of the valves and joints are corroding and will be prone to leaks.

2.4 **Change Rooms and Spectator Areas**

The change rooms, and spectator areas are serviced separately from the air handling units in the mechanical room. These units servicing these areas are now 45 years old with a life expectancy of about 25 years. Parts have been replaced to keep them operational, but none of the controls on the unit function and most of the dampers and valves are operated manually.

Figure 2.4.1 Redundant Air Handler

3.0 Recommendations and Conclusions

A review of the pool equipment and air handling units shows that they have all surpassed their reasonable life expectancy. The building's mechanical systems are outdated and highly inefficient; the costs associated with maintaining these systems are increasing exponentially as well. There is very little redundancy throughout any of the systems, and if failure were to occur in any individual piece of equipment, the pool would likely need to be closed long term.

There is potential that upgrades could be done, but this will be very expensive and all capital work needs to be looked at with the future use and cost to operate, as well as the cost of downtime and the required maintenance to keep things operational for the remaining life of the building.

If you are going to keep the building, a largescale plan needs to be put in place to upgrade each area and systematically replace all major components of the building and mechanical systems.

If there are no immediate plans to replace the pool, a new ventilation system needs to be considered for all parts of the building. Typically, this system should be installed outside of the building on a concrete pad and ducted into the building. A system of this design will allow you easier access to service the unit, and also provide more longevity because it will be removed from the corrosive air.

If you were to consider a new building, it is a long-term process and short-term plans will need to be put in place to ensure the viability of the pool until it is replaced and taken out of service permanently.

4.0 Budgets

MET ENERGY SYSTEMS
Consulting Engineering
477 Queen Street East, Suite 204
Sault Ste. Marie, ON P6A 1Z5
Tel (705)942-3344
Fax. (705)942-1477

MET Project No. 20M74

ELLIOT LAKE BUILDING ASSESSMENT

RUBEN YLI-JUUTI AQUATIC CENTRE POOL

Budget Pricing

1	New Pool Dehumidifier Installed outside	$350,000.00
2	Exercise Room and Front Lobby HVAC upgrades	$45,000.00
3	Replacement of Boiler for heat and Domestic Hot Water	$200,000.00
4	General Exhaust and Change Room HVAC	$100,000.00
5	Pool Mechanical Room Ventilation	$15,000.00

Sub-Total	$710,000.00
20% Contingency:	$142,000.00

Total Budget Price: (HST Extra)	**$852,000.00**

These numbers are only high end budgets. Pricing will depend on design and market conditions at the time of construction.