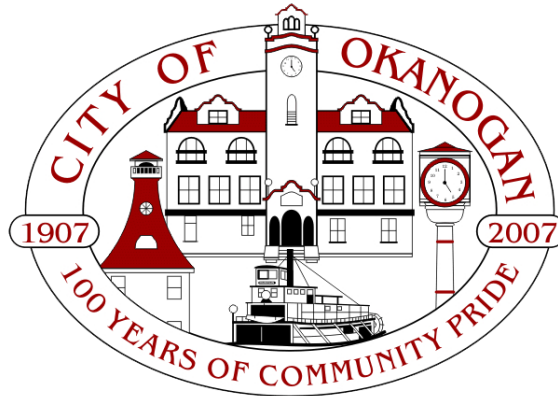


CITY OF OKANOGAN

OKANOGAN COUNTY

WASHINGTON



OKANOGAN POOL FACILITY ASSESSMENT

G&O #21854
FEBRUARY 2024

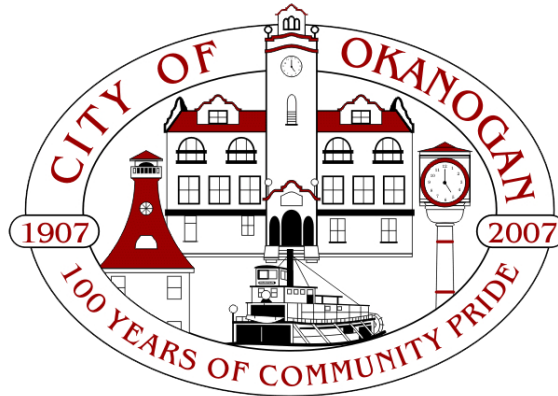


Gray & Osborne, Inc.
CONSULTING ENGINEERS

CITY OF OKANOGAN

OKANOGAN COUNTY

WASHINGTON



OKANOGAN POOL FACILITY ASSESSMENT



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Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE OF CONTENTS

INTRODUCTION	1
METHODOLOGY	1
ARCHITECTURAL ELEMENTS.....	2
Recommendations.....	3
Address Exterior Deterioration	3
Address Interior Architectural Items	4
STRUCTURAL SYSTEMS.....	4
Recommendations.....	5
Structural Improvements – Building.....	6
Structural Improvements – Pool	6
MECHANICAL SYSTEMS	6
Recommendations.....	7
Interior Occupied Spaces	7
Pool Heating Loops.....	7
PLUMBING SYSTEMS	7
Recommendations.....	8
Shower Facilities.....	8
Plumbing Facilities	8
Plumbing Systems.....	8
ELECTRICAL SYSTEMS	9
Recommendations.....	9
Electrical Systems.....	9
Lighting Systems	10
GENERAL SITE ASSESSMENT.....	10
Recommendations.....	10
General Site Improvements.....	11
AQUATIC ELEMENTS.....	11
Observations and Considerations.....	11
Recommendations.....	12
Replace Perimeter Gutters	12
Replace Pool Finish	13
Replace Main Drains.....	14
Replace Floor Returns.....	14
Abandon Underwater Lighting	14
Install New Battery Powered ADA Chairlift	14
Construct “Learn-to-Swim” and ADA Compliant Stair Entry	15
Install Stair Access to 3-Meter Springboard	15
Replace Diving Board Bases	15
Replace Vacuum DE Filtration System with Regenerative Media Filter System	15
Construct Separate Acid Storage Room	16
Relocate Heat Pumps Outside Pool Deck Area	16

Development Options and Cost Opinion	16
RECOMMENDATIONS AND ESTIMATED COSTS.....	17
Repair and Upgrades to Existing Facility	17
New Outdoor Facility	18

LIST OF TABLES

<u>No.</u>	<u>Table</u>	<u>Page</u>
1	Architectural Evaluation	2
2	Structural Evaluation	5
3	Mechanical Evaluation.....	7
4	Plumbing Evaluation.....	8
5	Electrical Evaluation.....	9
6	General Site Assessment.....	10
7	Aquatic Elements Evaluation.....	11
8	Aquatic Elements Improvements and Estimated Costs	17
9	Item List with Costs	18
10	New Outdoor Pool Facility (Existing Site).....	18
11	New Outdoor Pool Facility (New Site).....	19

LIST OF FIGURES

<u>No.</u>	<u>Figure</u>	<u>Follows Page</u>
1	Existing Pool Facility.....	2

APPENDICES

Appendix A – Photographic Support
Appendix B – WTI Evaluation Report

INTRODUCTION

The City of Okanogan (City) contracted with Gray & Osborne, Inc. to conduct a comprehensive condition assessment of the City's outdoor pool facility located in Alma Park at 601 1st Avenue South and shown on Figure 1. The facility is comprised of a CMU block bathhouse containing men's and women's dressing, bath, and shower rooms; mechanical/electrical, control and chlorination rooms. The "L" shaped pool vessel is situated northeast of the bathhouse and consists of six 25-yard lap lanes and a diving well containing two 1-meter springboards and one 3-meter springboard. The pool has an approximate water surface area of 5,950 ft² and approximate water volume of 233,000 gallons. The bathhouse and diving well portion of the pool vessel were constructed in 1973/1974. A free-standing 24' x 30' structural steel pavilion sits immediately southwest of the diving well outside of the fenced pool facility.

The purpose of this report is to provide the City with an overall evaluation of the structural, architectural, mechanical, plumbing, electrical, and aquatic components of the facility and provide recommended repairs, upgrades and estimated improvement costs. In addition, the City has requested cost estimates to demolish the existing facility and build a new outdoor facility at the same location and demolish or abandon the existing facility and build a new outdoor facility at an alternate location.

This condition assessment focused on the following main areas of concern regarding the facility:

- General building condition
- Pool integrity
- Electrical systems condition
- Pool mechanical systems condition
- HVAC condition
- Boiler and heat pump water heating system condition
- Presence of hazardous materials (asbestos, lead), by others

This report identifies observations gathered during a site survey, outlines levels of recommended improvements, provides estimated costs for facility repairs/upgrades, and provides estimated costs for facility demolition, abandonment, and replacement.

METHODOLOGY

The findings of this report rely on the inspection of elements exposed to view and review of construction drawings for the Okanogan Swimming Pool project dated December 12, 1973, prepared by Olson, Richert and Bignold. The facility assessment survey occurred on November 2, 2021, and was performed by Myron Basden, P.E., S.E., Aaron Pease, P.E., and David Ellis, P.E., of Gray & Osborne, Inc., and Ryan Nachreiner of Water Technology, Inc.

The goal of the site survey was to observe and note the condition of all structural, architectural, mechanical, plumbing, electrical, and aquatic components of the facility. The City provided ladders and equipment as required to access the spaces viewed during the site visit.

The sections that follow provide descriptions of the observations and deficiencies that were found during the site survey, along with corresponding recommendations to address the deficiencies. Each structural, architectural, mechanical, plumbing, electrical, and aquatic element deficiency is categorized into one of five categories, as follows:

- Failure
- Poor
- Fair
- Good
- Excellent

ARCHITECTURAL ELEMENTS

G&O observed the conditions of architectural elements at the facility including exterior and interior walls and finishes, doors, windows, furnishings, and roofing. Site photos of the existing facility are provided in the appendix.

Table 1 contains descriptions of the observations from the site visit and a ranking of the noted observations.

TABLE 1

Architectural Evaluation

Observations/Issues	Condition Rank
Building exterior CMU showing signs of weathering and build-up of dirt, mold, lichen, etc.	Fair
Building exterior wood fascia and soffit overhangs showing signs of peeling paint (Plate 1) .	Poor
Front entrance doors and overhead relite have been boarded up with painted plywood (Plate 2) .	Poor
Metal roofing is beginning to show signs of oxidation and weathering. Some portions, such as south-facing ridge caps, have no surface coating remaining (Plate 3) .	Fair
Exterior, laminate window sills and window caulking are weathered and delaminating (Plate 4) .	Poor



CITY OF OKANOGAN
OKANOGAN POOL FACILITY
ASSESSMENT
FIGURE 1
EXISTING POOL FACILITY



TABLE 1 – (continued)**Architectural Evaluation**

Observations/Issues	Condition Rank
Exterior and interior metal doors are beginning to show signs of corrosion. Several doors have had their door frames cut and removed above the floor as a temporary measure to mitigate for corrosion (Plate 5) .	Poor
Concrete floors in the exterior-access restrooms are significantly stained.	Poor
Interior CMU walls and underside of wood roof framing are in good shape and do not show any sign of moisture intrusion or staining (Plate 6)	Good
Interior concrete floors have staining and some cracking	Fair
Women's stall partitions are damaged and beginning to delaminate.	Poor
Men's stall partitions are damaged and beginning to delaminate (Plate 7) .	Poor
Office area counters and cabinets are worn, delaminating, and in poor shape (Plate 8) .	Poor
Office area does not have sufficient space and facilities for staff during peak use summer days.	Poor

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement of architectural items.

Address Exterior Deterioration

Many architectural components of the exterior are in need of maintenance or replacement to extend the service life of the building. The recommended improvements include:

- Pressure wash exterior CMU faces to a clean and sound surface and reseal surfaces with clear siloxane type sealer or similar.
- Remove loose paint and miscellaneous impurities from exterior wood fascia and recoat.
- Replace interior and exterior metal doors. Many of the existing doors are corroding. It appears the front entrance doors and relite have been boarded up to protect against vandalism. In this case it is recommended that doors without windows and relite be installed in place of the existing doors.
- Replace metal roofing. While the existing metal roofing may have some service life remaining, it is attached with exposed fasteners which may have limited service life before they are no longer watertight. The new

metal roof should be standing seam with concealed fasteners to maximize the service life of the roofing.

- Replace windows, window sills and caulking around the windows. Because the existing deteriorating laminate sills are under the window, the window needs to be removed to replace the sills. New windows are recommended to be fiberglass or vinyl. The new sill should be masonry to maximize its durability and service life.

Address Interior Architectural Items

- Prepare and coat interior concrete floors to address staining and address cracks in the floor. The coating may be a heavy duty clear or colored floor coating system. The cracks shall be routed out and filled with repair grout.
- Replace all partition walls in the restrooms to address existing walls which are delaminating.
- Replace all office counters and cabinets to address existing deterioration.
- Modify interior layout to improve staff working areas to accommodate peak use on summer days. The modifications would need to be defined through a detailed architectural study, but may include reorganization of storage space to maximize usable floor area or revision of interior partition wall locations and layout.

STRUCTURAL SYSTEMS

G&O observed the conditions of structural systems at the facility including concrete surfaces, walls and roof structure.

Table 2 contains descriptions of the observations from the site visit and a ranking of the noted observations.

TABLE 2
Structural Evaluation

Observations/Issues	Condition Rank
Building	
Some concrete sidewalk slabs around the building have experienced settlement, creating cracks and ledges in the walking surface of up to 1” in height.	Fair
The settlement of the sidewalk is particularly noticeable at the southeast corner of the building, where sidewalk that originally was flush with the building floor at the doorway has settled more than 2”. We understand there is piping between the building and pool under this sidewalk and there is concern that a leak in the pipe may have caused some soil voids under this area (Plate 9) .	Poor
The roof framing is conventional 2x wood construction and is in good condition at interior spaces. The framing is exposed at exterior soffits and is weathered but still in good condition. The roof is sloped and is covered with metal roof panel with exposed fasteners.	Good
The structural walls of the building are masonry block construction and are in good condition.	Good
The foundation of the building was not directly observed during the site visit, but the absence of significant cracking in the masonry walls of the building indicates the foundation is stable.	Good
A room at the southeast portion of the building contains a concrete tank below grade. The top of the tank is covered with grating panels. Many of these grating panels and their ledger supports are significantly corroded and should be replaced (Plate 10) .	Failure
Pool	
Some concrete sidewalk slabs around the pool have cracked and/or settled.	Fair
A large crack in the slab was found adjacent to the mounting plate for one of the diving boards (Plate 11) .	Poor
Some joints between concrete slab panels on the floor of the pool have failing sealant and some deterioration of concrete near the joint.	Failure
Away from joints, concrete walls and slab panels do not have cracking and appear to retain their structural integrity.	Fair
The reinforced concrete for the gutter that surrounds the pool has cracking and exposed rebar with corrosion. The remaining service life of the gutter is limited and it should be replaced.	Failure

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement of structural items.

Structural Improvements – Building

In general cracking and settlement in the concrete sidewalks around the building shall be addressed with grinding and grouting to make surfaces smooth, or by replacing the affected sidewalk panels. At the southeast corner of the building where settlement of the sidewalk is most extreme, it may be prudent to remove all sidewalk panels and excavate to exposed below grade piping to verify if there is piping leakage that is creating voids under the sidewalk.

Existing metal grating and ledger supports over the concrete tank within the southeast portion of the building are corroded and shall be removed and replaced with new galvanized grating and ledgers.

Structural Improvements – Pool

Cracking and settlement in the concrete sidewalks around the pool shall be addressed with grinding and grouting to make surfaces smooth, or by replacing the affected sidewalk panels.

Failed joints in the concrete floor of the pool do not require structural repair because a liner system is recommended to make the existing pool watertight – see the Aquatic Elements section of this report for further description.

The existing concrete gutters of the pool shall be replaced per the Aquatic Elements sections of this report.

MECHANICAL SYSTEMS

G&O observed the conditions of mechanical (HVAC) systems at the facility including heating and ventilation systems (no air conditioning systems are present).

Table 3 contains descriptions of the observations from the site visit and a ranking of the noted systems observations.

TABLE 3**Mechanical Evaluation**

Observations/Issues	Condition Rank
The occupied portion of the building does not include any mechanical systems; ventilation is only by natural air movement. Pool staff indicate the interior spaces become very warm during summer months.	Fair
High ceiling ventilation louvers in both the Men's and Women's locker rooms are impacted with dirt and debris.	Poor
The exterior pool heating heat pumps are in an undesirable layout taking up deck space; exterior PVC pipe and conduits will prematurely reach the end of their useful life due to UV exposure (Plate 12) .	Fair

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement and modernization of the facility, and to help ensure suitable ongoing, long-term use.

Interior Occupied Spaces

Existing louver intakes should be thoroughly cleaned and repairs made to worn or torn screens. Equipping the space with mechanical ventilation would help minimize the build-up of internal heat during summer months, particularly if ventilation systems were programmed with a Night Purge to ventilate during the cooler hours of the night. In this manner the building may stay somewhat cooler longer during the following day.

Pool Heating Loops

The City could consider a larger project to relocate the pool heating heat pumps off of the pool deck. This would include allocating additional site space for these units, likely requiring relocation of the nearby picnic gazebo and significant plumbing and electrical modifications to reroute these utilities. Restoration would include new sidewalk slabs in the affected areas as well as new security fencing around the relocated heat pumps.

PLUMBING SYSTEMS

G&O observed the conditions of plumbing systems at the facility including fixtures and piping that was visible.

Table 4 contains descriptions of the observations from the site visit and a ranking of the noted systems observations.

TABLE 4
Plumbing Evaluation

Observations/Issues	Condition Rank
Women's column showers are corroded and close to becoming unserviceable.	Poor
Men's waterclosets and flush valves are showing signs of corrosion and pulling away from walls.	Poor
Plumbing in Men's wall chase is not properly anchored to walls allowing some exposed plumbing to be loose (Plate 13) .	Poor
Men's column showers are corroded and close to becoming unserviceable (Plate 14) .	Poor
Fixtures in both exterior-access restrooms are permanently stained/soiled and beginning to show signs of corrosion.	Poor
Overhead insulated and exposed piping in locker rooms is stained/soiled.	Fair
Much of the interior plumbing is galvanized iron pipe and is likely near the end of its useful life due to interior corrosion and calcification	Poor
Roof thru-flashing at roof vents in bad shape	Poor

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement and modernization of the facility, and to minimize future failures and disruptions to service.

Shower Facilities

It is recommended the City plan for replacement of the column showers in both the Women's and Men's shower rooms.

Plumbing Facilities

The City may consider full replacement of the plumbing fixtures in both the Women's and Men's rooms (lavatories, waterclosets, urinals). While this is potentially an aesthetic upgrade, as these fixtures currently work, if the City pursues a larger facility rehabilitation effort, this is an item that would be recommended to be included within that larger project. If the City does not pursue this, fixtures that are loose or coming off walls should be repaired as soon as possible to prevent further damage.

Plumbing Systems

Exposed piping throughout the interior of the facility could be cleaned and/or repainted to upgrade appearance. The City should plan for replacement of all galvanized plumbing systems to minimize failures and help avoid significant disruptions to service. In

conjunction with piping upgrades, or sooner if upgrades are not pursued, the flashing at roof vents should be inspected and/or replaced by a qualified roofing contractor.

ELECTRICAL SYSTEMS

G&O observed the conditions of electrical systems at the facility. An electrician was not available at the time of the site visit therefore these observations are based on the vintage of the equipment and physical appearance.

Table 5 contains descriptions of the observations from the site visit and a ranking of the noted systems observations.

TABLE 5
Electrical Evaluation

Observations/Issues	Condition Rank
Electrical gear appears to be original to the building and is nearing the end of its useful service life.	Fair
All electrical gear should be assessed and the Code-required clearances in front of each item should be maintained (Plate 15).	Fair
Light fixtures in mechanical room are lacking diffusers/lens and are showing signs of corrosion	Poor
Light fixtures are generally fluorescent based fixtures; upgrades to modern LED fixtures would improve lighting and efficiency	Fair

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement and modernization of the facility, and to minimize future failures and disruptions to service.

Electrical Systems

Replace the existing electrical gear with new and provide a new grounding system consisting of a grounding rod and associated grounding electrode conductors.

The main electrical gear is required by the National Electrical Code (NEC) to have free and unobstructed dedicated space in front and above the equipment. NEC requires 48-inches or more space be maintained clear in front of the gear. Clutter in front of the electrical equipment can create a fire or possible life safety hazard for electrical work or maintenance

The electrical gear is also required to have Arc-Flash hazard warning markings to inform qualified persons of potential electric shock hazards. Electrical equipment likely to

require examination, adjustment, servicing or maintenance while energized require Arc-Flash Hazard warning markings by the NEC. Further investigation and a study are required to properly calculate the available fault current from the upstream electrical distribution system. The available fault current value is used to determine the severity of potential exposure, specific Arc-Flash labeling requirements per NFPA 70E (Standard for Electrical Safety in the Workplace) and selecting personal protective equipment.

Outdated panelboard directories should be replaced with accurately traced circuit designations and typed directories reinserted in their respective panel holders.

Lighting Systems

The City should consider replacing facility lighting with new LED light fixtures and integral occupancy sensors to meet current Washington energy codes and reduce the facility's consumption of power while increasing the level and quality of light within.

GENERAL SITE ASSESSMENT

G&O observed the conditions of the site elements at the facility. General site elements include facility entrance, parking lot, interior access roads, area fencing, and general landscaping.

Table 6 contains descriptions of the observations from the site visit and a ranking of the condition of site components is indicated.

TABLE 6

General Site Assessment

Observations/Issues	Condition Rank
Asphalt paved areas (facility entrance, parking, and interior access roads) all exhibit severe alligator cracking (Plate 16).	Poor
Wheelstops, barrier curbs, curb ramp, striping, and planter strip in poor condition.	Poor
Exterior chain link fence posts, fabric, and 3-strand barbed wire exhibits minor signs of corrosion.	Fair

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement of the exterior site facilities.

General Site Improvements

Replace all deteriorated asphalt pavement, wheelstops, barrier curbs, curb ramp, and planter strip within the facility. Alligator cracking indicates failure of the pavement section and cracks allow water infiltration into the underlying materials, posing continued threat to deterioration of the asphalt pavement section, especially during freeze/thaw cycles.

AQUATIC ELEMENTS

The information provided in this section is taken from the *Aquatic Evaluation Report* (March 14, 2022) prepared by WTI. The full report is provided in the appendix.

OBSERVATIONS AND CONSIDERATIONS

WTI observed the condition of the aquatic elements at the facility. Aquatic elements include pool vessels, water features, pool filtration systems, pool circulation pumps, piping, valves and controls, and water treatment systems. Observations were conducted in a non-destructive manner and did not involve the removal of any structures or disassembly of any equipment.

Major components of the aquatic system and structures are further categorized in the report and scored based on their observed condition. The condition scores are weighted and aggregated to produce an overall evaluation score.

Table 7 contains descriptions of the observations from the site visit for major components of the aquatic amenities. A ranking of the condition of each component is indicated.

TABLE 7

Aquatic Elements Evaluation

Observations/Issues	Condition Rank
Pool Vessel – concrete w/numerous joints; cracking and shifting/movement.	Fair
Pool Finish – painted w/significant wear and deterioration; spalling, delamination (Plate 17).	Poor
Pool Gutter – concrete w/significant cracking and spalling; insufficient rim flow, cracking and spalling (Plate 18).	Failing
Pool Accessibility – water powered chairlift requires hose laid across deck; pool perimeter size requires second means of access; hardware corrosion.	Failing
Pool Handrails – stainless steel; scale.	Good
Underwater Lighting – wet niche style; non-operating w/frame corrosion.	Fair

TABLE 7 – (continued)**Aquatic Elements Evaluation**

Observations/Issues	Condition Rank
Main Drains – dual w/retrofit covers; location and quantity acceptable; recommend facility check for records of drain sump VGBA compliance (Plate 19) .	Fair
Return Inlets – stubbed floor inlets; small diameter stubbed pipes prone to failure and clogging.	Poor
Piping – PVC.	Fair
Filtration – vacuum DE; partially disassembled, emptied and no grids present (Plate 20) .	Good
Circulation Pump – vertical turbine not operating at time of observation.	Good
Circulation Valves – butterfly.	Good
Chemical Control – BECSys3.	Good
Chemical Storage and Safety – chlorine in small room off pool deck; acid-carboys in general mechanical area; insufficient spill protection; missing/inoperable eyewash station.	Poor
Primary Disinfection – calcium hypochlorite.	Good
Supplemental Disinfection – none.	Failing
Chemical Balance – hydrochloric acid; lack of spill containment; located over surge tank.	Poor
Pool Water Heating – heat pumps.	Good

RECOMMENDATIONS

The following repairs or replacements are encouraged for improvement and modernization of the aquatic facility. These recommendations are needed to allow the facility to operate more efficiently and effectively, renew the lifespan of the pool, and provide a safe, healthy, and beneficial experience by facility users.

Replace Perimeter Gutters

The function of pool perimeter gutters is one of the most important aspects of pool design. Gutters are intended to skim only the very top of the pool water from the rest of the pool. The majority of contamination and unwanted material in a pool, such as body oils, greases and bacteria, reside at the surface of the water. Continuously removing this part of the water and sending it to the filtration and water treatment systems is crucial to maintaining a clean and healthy pool.

The current pool perimeter gutters are badly deteriorating. There are numerous cracks in the walls of the gutter and several areas of spalling concrete, some with exposed and corroded steel reinforcement. When the concrete reinforcement is corroding, the strength

of the concrete structure is weakening and will continue to break apart and, at some point, fail completely if not properly repaired. Cracking in the gutter as well as joints in the gutter are suspected of being the source of leaking pool water.

Furthermore, the gutter edge, or rim, is not level around the entire pool. This prevents the water from evenly skimming over the front gutter edge and achieving the rim-flow needed for the gutter to function properly.

The existing gutter should be replaced with a new deck level perimeter gutter with PVC gutter grating. The existing gutter should be demolished, and a new gutter installed utilizing the Myrtha RenovAction system. Myrtha Pools is a manufacturer of PVC laminated stainless steel pool vessel systems and custom fabricates replacement gutters for existing pools. This system has the benefits of fast construction and installation timelines, the precision of factory fabricated stainless steel, and durability and resistance of the hot calendared PVC finish.

The existing perimeter gutter is a parapet design with several disadvantages: (1) the parapet and narrow opening to the gutter makes accessing the gutter for maintenance difficult; (2) the parapet creates a freeboard in the pool, or a vertical distance between the surface of the pool deck and the surface of the pool water. The existing freeboard is approximately 4 inches; and (3) the parapet design results in a front gutter wall located below the parapet and acting as a narrow step and a potentially easy tripping or slipping hazard.

Deck level gutters are the superior form of pool surface water removal. A modern deck level gutter provides a flush transition from the pool deck to the pool water, crossing over PVC grating covering the gutter trough. Eliminating the freeboard and bringing the surface of the water to the same level as the deck, deck level gutters provide easy access into and out of the pool. Accessing the gutter trough for maintenance or cleaning is as easy as removing the PVC grating.

Replace Pool Finish

The interior pool surface is currently painted. A painted pool requires frequently reapplying paint, often annually. The paint fades, chips, and is worn away. The paint on the bottom of the pool is significantly worn and deteriorated, with many chips, cracks, and delaminating areas. The painted finish will continue to be a significant maintenance burden.

Furthermore, the pool is constructed with numerous joints, which require caulking and sealing. While some joints in a concrete pool are necessary, the amount in this pool is excessive in comparison to modern pool design. Staff reports the pool vessel joints have been the source of leaks in the past. An advantage of the Myrtha system is the continuation of the PVC membrane finish on the floor and all interior surfaces of the pool vessel. This PVC membrane is a durable and chemically resistant material to provide the

waterproofing of the pool, leaving the existing concrete vessel needing to only provide the structural support. This renders any failing joints or cracks inconsequential toward the pool's ability to hold water. The PVC finish of the Myrtha system requires significantly less maintenance than paint and comes with a 10-year warranty.

Replace Main Drains

The existing main drain covers and sumps appear, although unconfirmed, to be compliant with VGBA requirements. However, record drawings indicate piping to the second main drain passes through the sump of the first main drain, and visual examination appears to conform this arrangement. To be fully compliant with VGBA regulations suction piping from the main drains must branch off equally and independently to each main drain sump. Correction of the piping arrangement will require replacement of the main drains. All existing piping to the main drains able to be reused should be confirmed to be PVC and pressure tested.

Replace Floor Returns

The pool water is returned to the pool after filtration and treatment through many small return pipes in the pool floor. These small pipes are stubbed flush with the floor and at an angle. This style of return has been prone to clogging and requires monitoring and cleaning. There is also no ability to adjust the flow to evenly balance the water return. The floor returns should be replaced with flush floor inlet fittings with adjustable diverter plates. All existing piping to the return fittings able to be reused should be confirmed to be PVC and pressure tested.

Abandon Underwater Lighting

The existing wet niche lighting fixtures have reached the end of their useful lifespan. Staff is frequently repairing these lights, the fixtures and housings are corroded, and several lenses hold mineral buildup. Underwater lighting is not required for daytime swimming. Unless there is a desire for nighttime swimming (after dusk or before dawn), the underwater lighting can be abandoned.

Install New Battery Powered ADA Chairlift

The existing ADA chairlift is water-powered and requires a water supply hose to lay across the deck when installed. This creates a potential tripping hazard for guests. A new battery powered chairlift should be installed to eliminate this hazard, as well as provide guests with more user-friendly operating controls.

Construct “Learn-to-Swim” and ADA Compliant Stair Entry

The pool perimeter is over 300 linear feet and requires a second means of ADA compliant access. A secondary means of access is allowed to be a stair entry if constructed with proper dimensions. The existing stair entry should be replaced with and ADA compliant stair entry. This new stair entry may also be constructed with extra width, which is especially useful for learn-to-swim classes and serves as a place for children to have a more accommodating entrance to the water.

Install Stair Access to 3-Meter Springboard

The existing 3-meter diving board is accessed with a traditional ladder behind the board. With a height of 3 meters, this ladder has been found to be a leading source of severe injuries at public pools. Converting this ladder access to stair access significantly increases the safety of a 3-meter diving board. The ladder should be replaced with a stair access. This can be done in conjunction with replacement of the diving stand base as discussed below.

Replace Diving Board Bases

All three of the steel bases of the diving boards are severely corroded and should be replaced with new stands. One of the concrete foundations has a large crack throughout the base and is also required to be replaced. The 3-meter base should be replaced with an integrated stair access as mentioned above.

Replace Vacuum DE Filtration System with Regenerative Media Filter System

The pool is currently filtered using a Vacuum DE Filtration system. This style of filtration is effective at trapping small particles for removal from the water. However, it is inefficient in the use of water a media compared to more modern techniques and is also a significant maintenance burden involving frequent flushing and cleaning of the filter grids.

A Regenerative Media Filter (RM) is a pressure filter utilizing perlite media; commonly used in the beverage industry and a safer alternative to diatomaceous earth. With a RM filter, pool water passes through hanging tubes coated with perlite to remove particles and contaminants. This design allows for a very compact footprint, saving space in the mechanical room. The RM filter utilizes a regenerative “bump” cycle to mechanically separate media that successfully trapped dirt or debris from cleaner media with remaining filtration capacity. This process drastically prolongs the life of filtration ability of the media cycle and greatly reduces the water of water. The regenerative cycle is fully automated to optimize the filtration performance and initiated by the operator’s command. The regenerative cycle is responsible for significantly reducing water usage, which thereby reduces heating energy usage and chemical demand. While an RM filter

has a higher capital cost than other comparable pressure systems, the lower operational costs result in a typical payback period of just a few years.

Construct Separate Acid Storage Room

The pH of the pool is balanced through the injection of hydrochloric acid into the pool via a peristaltic pump monitored by an automatic chemical controller. The acid containers are stored on structural grating over the sump to sanitary and immediately adjacent to the structural grating over the DE filter tank. Ideally, this acid is stored in a separate room with spill containment and independent ventilation. The fumes of hydrochloric acid are extremely corrosive, and, while the containers are sealed, any potential leaks will cause corrosion on metal surfaces in the mechanical room in addition to being unhealthy for staff. At a minimum, the acid containers should be stored above a spill containment pallet capable of collecting potential spills.

Relocate Heat Pumps outside Pool Deck Area

The eight heat pumps providing heating to the pool are interconnected with piping and located on the pool deck between the diving area and bathhouse. This deck area is highly valuable space and is likely congested on busy summer days. The heat pumps should be relocated to an area outside of the pool deck and with restricted access to any non-staff visitor.

DEVELOPMENT OPTIONS AND COST OPINION

The previously discussed recommendations are intended to renew the lifespan of the pool and maintain the aquatic components of the facility in proper working order. These Base Recommendations are necessary, at a minimum, to continue operating the pool efficiently long-term. When a significant capital investment is considered for components of an asset, the cost to replace the complete asset is often a valuable comparative consideration. Therefore, the probable construction costs for both Base and New development options are provided below in Table 8 for consideration.

The costs associated with the provided recommendations are the opinion of WTI based on a professional understanding of market conditions. Cost amounts have not been trade- or contractor-verified, and are intended only to provide guidance for a preliminary aquatic budget. Cost amounts involve the construction of the pool vessel, pool piping and pool filtration and treatment systems, and exclude general site work, excavation, site drainage, utility connections, decks and walks, deck drainage, turf and landscaping, irrigation, security, area lighting, fences and barriers, signage, natatorium/buildings, concessions/kitchen, change rooms, support and storage spaces, and mechanical rooms.

Development of a new pool involves the replacement of the existing pool and associated pool systems with a newly constructed pool vessel, pool piping and pool mechanical systems. The newly constructed pool vessel would be designed and engineered to

modern standards of quality and compliance and be supported by today's advanced mechanical, filtration, and water treatment systems.

TABLE 8

Aquatic Elements Improvements and Estimated Costs

Recommend Improvement	Estimated Cost (2024)
Base Recommendation – Renovating Existing Pool (Replace pool vessel finish, perimeter gutters, pool piping, main drains, floor returns, diving board bases, pool pump and vacuum DE filtration w/regenerative media filter system; install new battery powered ADA chairlift, ADA compliant stair entry, and stair access to 3-meter springboard; and relocate heat pumps outside pool deck area)	\$1,308,700
New Outdoor Pool (approximately 5,950 ft²) (Includes six 25-yard lap lanes, two 1-meter springboards, one 3-meter springboard, shallow water area, stair entry, deck level perimeter gutter)	\$2,258,025

RECOMMENDATIONS AND ESTIMATED COSTS

REPAIR AND UPGRADES TO EXISTING FACILITY

The above sections represent the observations and recommendations resulting from the site survey. The tables within this section illustrate the criticality categories that each recommendation has been classified as, and include typical planning level construction costs. These costs are based on typical values and square foot cost from estimating guides, such as RSMeans, and from Gray & Osborne project experience on similar types of projects. General assumptions have been made to generate these costs. Prior to undertaking construction of specific items, costs should be verified during the planning and design phases of those items.

Please note that these costs are based on the current level of usage of the facility and the building elements needed to address the functional deficits noted in this report. They do not include the significant upgrades that would be necessary to change the overall building appearance or use, or cost associated with hazardous materials removal and disposal.

The costs outlined below are also not intended to represent complete, individual project costs. For some of the work, it will be prudent to proceed with multiple items that are either within proximity to each other or where some items will inherently affect other items of work.

TABLE 9**Item List with Costs**

No.	Item Description	Estimated Cost
1	Mobilization and Demobilization	\$290,000
2	Architectural Improvements	\$336,640
3	Structural Improvements	\$40,000
4	Mechanical Improvements	\$86,500
5	Plumbing Improvements	\$89,000
6	Electrical Improvements	\$125,000
7	General Site Improvements	\$400,000
8	Aquatic Improvements	\$1,308,700

Subtotal.....	\$668,960.00
Contingency (25%).....	\$284,308.00
Washington State Sales Tax (8.5%)	\$836,200.00
Architectural and Engineering (25%).....	\$2,675,840.00
TOTAL ESTIMATED COST	\$4,465,308.00

NEW OUTDOOR FACILITY

Table 10 outlines the costs to demolish the existing facility and construct a new outdoor pool facility substantially similar in design to the existing pool facility in the same location.

TABLE 10**New Outdoor Pool Facility (Existing Site)**

No.	Item Description	Estimated Cost
1	Mobilization and Demobilization	\$630,000
2	Demolition (Existing Bathhouse, Pool Vessel, Deck, HMA)	\$120,000
3	Site Excavation Work	\$150,000
4	Bathhouse	\$1,550,000
5	Electrical and Controls	\$108,500
6	HVAC	\$77,500
7	Plumbing	\$124,000
8	Chlorination	\$200,000
9	Pool Vessel	\$2,258,025
10	Decks and Walks	\$130,000
11	Finish Site Work	\$500,000

Subtotal.....	\$1,462,006.25
Contingency (25%).....	\$621,352.66
Washington State Sales Tax (8.5%)	\$1,827,507.81
Architectural and Engineering (25%).....	\$5,848,025.00
TOTAL ESTIMATED COST	\$9,758,891.72

Table 11 outlines the costs to abandon the existing bathhouse and demolish the existing pool vessel, deck, and appurtenant features and construct a new outdoor pool facility substantially similar in design to the existing pool facility at an alternate location. Costs do not include land acquisition.

TABLE 11**New Outdoor Pool Facility (New Site)**

No.	Item Description	Estimated Cost
1	Mobilization and Demobilization	\$530,000
2	Demolition (Existing Pool Vessel, Deck)	\$60,000
3	Site Excavation Work	\$120,000
4	Site Fill (Pool Vessel, Deck)	\$170,000
5	Bathhouse	\$1,550,000
6	Electrical and Controls	\$108,500
7	HVAC	\$155,000
8	Plumbing	\$31,000
9	Chlorination	\$200,000
10	Outdoor Pool	\$2,258,025
11	Decks and Walks	\$130,000
12	Finish Site Work	\$500,000

Subtotal\$1,453,131.25
 Contingency (25%)\$617,580.78
 Washington State Sales Tax (8.5%).....\$1,816,414.06
 Architectural and Engineering (25%)\$5,812,525.00
TOTAL ESTIMATED COST.....\$9,699,651.09

APPENDIX A

PHOTOGRAPHIC SUPPORT



Plate 1 – Exterior Wood Fascia and Soffit Peeling Paint



Plate 2 – Metal Roofing Oxidation



Plate 3 – Front Entrance Boarded Doors and Relite



Plate 4 – Exterior Window Sill Delamination



Plate 5 – Door Corrosion



Plate 6 – Interior CMU Walls & Wood Framing



Plate 7 – Stall Door Delamination



Plate 8 – Office Counters and Cabinets



Plate 9 – Sidewalk Settlement



Plate 10 – Corroded Grating Panels



Plate 11 – Concrete Crack at Diving Board Mounting Plate



Plate 12 – Pool Heat Pumps



Plate 13 – Men's Restroom Wall Chase



Plate 14 – Men's Shower

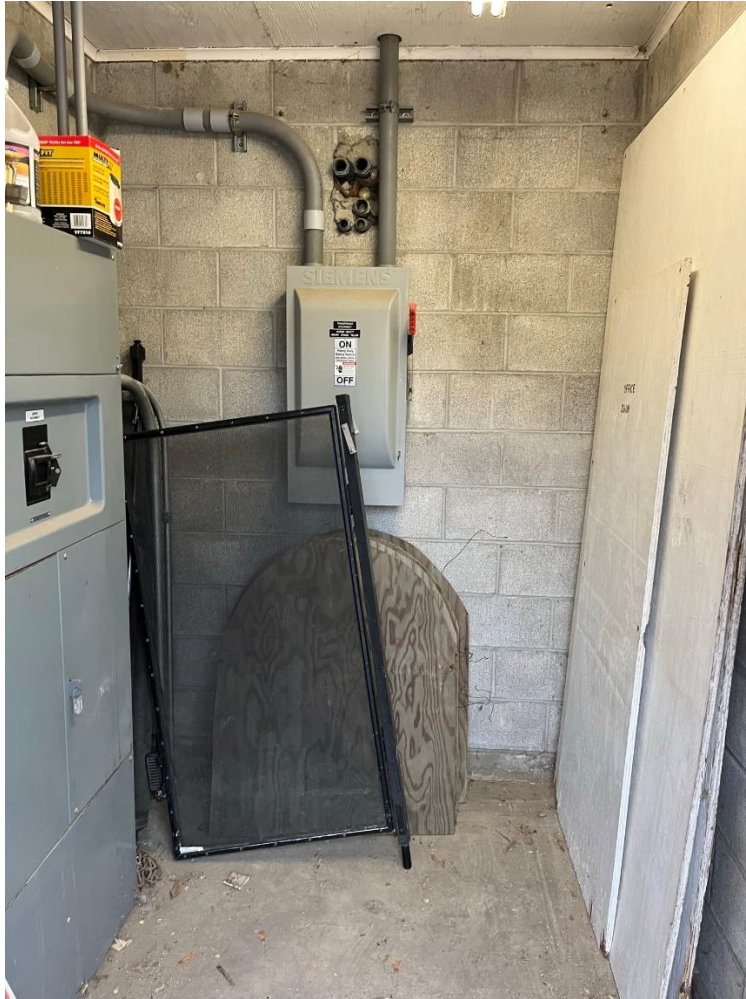


Plate 15 – Electrical Gear Clearances



Plate 16 – Asphalt Cracking



Plate 17 – Pool Finish



Plate 18 – Pool Gutter Rim



Plate 19 – Main Drain with Retrofit Cover

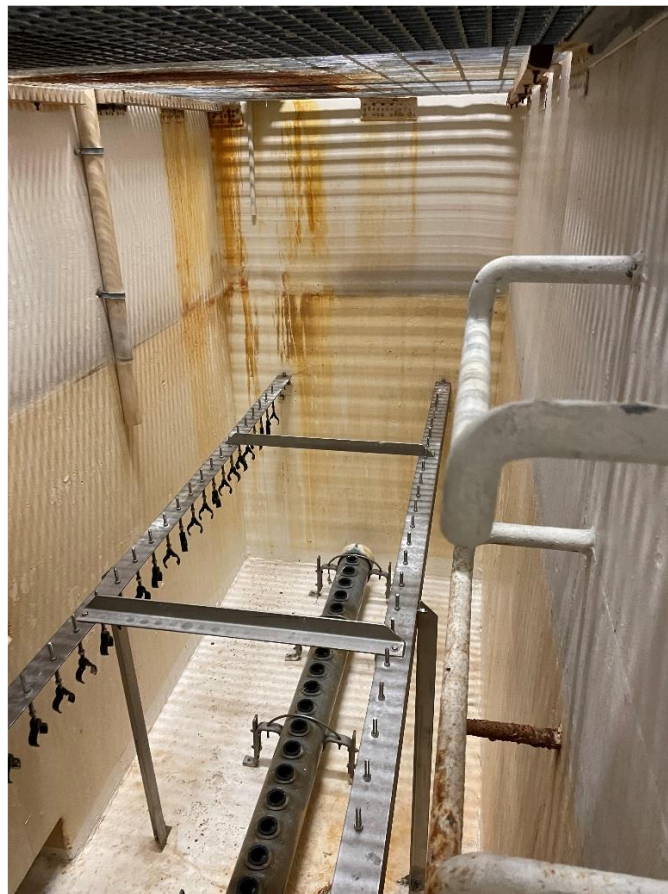


Plate 20 – Vacuum DE Filter Tank

APPENDIX B

WTI EVALUATION REPORT



Aquatic Evaluation Report

Okanogan, Washington

March 14, 2022

Prepared For:

City of Okanogan
120 3rd Avenue North
Okanogan, WA 98840

Prepared By:

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Executive Summary

WTI has been commissioned by the City of Okanogan to report on the current condition of the existing outdoor pool located in Alma Park at 601 1st Ave S, Okanogan, WA. WTI visited the facility on November 2, 2021, toured the pool and related amenities, and met with staff to discuss operations. The enclosed report documents the observations from the site visit and outlines recommended capital and operational changes. Major components of the aquatic amenities have been given a score based on their observed condition, and these scores are weighted and aggregated to provide a total score. Below is a summary outline of the condition scores and recommendations.

The Total Aggregated Evaluation Score is shown below, and out of a possible high score of 100, is an indication of the condition of the aquatic amenities.

Total Aggregated Evaluation Score: **43.75**

The condition of a facility is a major determination of the effort and cost of maintaining the utility and value of the amenities. A deteriorated facility will demand higher annual operating expenses over time as parts break, systems fail, finishes deteriorate, and structures weaken. There are also efficiencies lost when operating aging systems or equipment which are unable to take advantage of current methods and financially sustainable practices. The recommended repairs, replacements and renovations detailed in this report seek to modernize aquatic components and renew the efficient lifespan of the facility.

Below are the recommended repairs or replacements based on the observed condition of the aquatic components. A detailed description for each repair or replacement is included further in the report.

Recommendations

- Replace Perimeter Gutters
- Replace Pool Finish
- Replace Main Drains
- Replace Floor Returns
- Abandon Underwater Lighting
- Install New Battery Powered ADA Chairlift
- Construct "Learn-to-Swim" and ADA Compliant Stair Entry
- Install Stair Access to 3-meter Springboard
- Replace Diving Board Bases
- Replace Vacuum DE Filtration with Regenerative Media Filter System
- Construct Separate Acid Storage Room
- Relocate Heat Pumps Outside Pool Deck Area

Introduction

The purpose of this evaluation is to review the present condition of the aquatic amenities and aquatic mechanical systems at the existing Okanogan City Pool. The evaluation consists of visual examination of the pool and associated mechanical equipment. The report outlines the present condition of the systems, equipment, and components and provides recommendations for repairs or replacements. Each recommendation is given an estimated range for the probable cost to construct, install, or perform the renovation or repair.

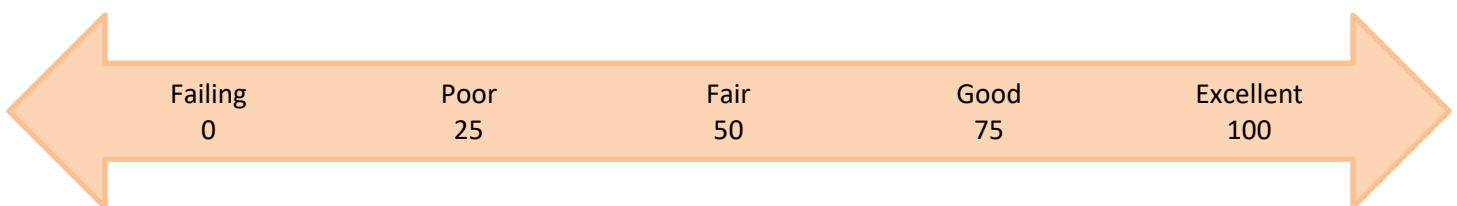
The aquatic center is a stand-alone aquatic facility serving the city and community of Okanogan. The facility holds a single body of water shaped as an "L" with lap lanes and diving boards. The six lap lanes are approximately 75 yards in length and diving well contains three springboards: two 1-meter boards and one 3-meter board. The pool has an approximate water surface area of 5,950 ft² and a water volume of 233,000 gallons.

The pool vessel and gutters are constructed with concrete and the interior finish is painted. The pool is filtered using a vacuum DE filter. The pool is disinfected with a calcium hypochlorite, and pH is balanced using hydrochloric acid. Pool water heat is provided by eight heat pumps.

Methodology

WTI observed the condition of the aquatic elements at the facility. Aquatic elements include pool vessels, water features, pool filtration systems, pool circulation pumps, piping, valves and controls, and water treatment systems. Observations were conducted in a non-destructive manner and did not involve the removal of any structures or disassembly of any equipment.

Major components of the aquatic systems and structures are categorized in the report and scored based on their observed condition. The condition scores are weighted and aggregated to produce an overall evaluation score. Potential scores range from zero to one hundred, representing the condition descriptions below:



Total evaluation scores for the pool and aquatic amenities are compiled and weighted to create a total aggregated evaluation score. The total aggregated evaluation score provides an indication of the overall condition of the aquatic amenities of the facility.

Included in the report are observations and indications of the condition of the accessible means of pool entry and exit. WTI has endeavored to identify problems with the means of access and potential non-compliance with the Americans with Disabilities Act (ADA). Observations and evaluations included in this report do not constitute certification or verification of compliance with ADA requirements. ADA compliance is a legal opinion, and WTI is not able to anticipate or guarantee judicial interpretation with respect to a facility's legal compliance. WTI recommendations are based on a current understanding of the technical requirements of ADA regulations on aquatic amenities.

Compliance with Virginia Graeme Baker Pool and Spa Safety Act (VGBA) regulations has not been verified or investigated as a part of this evaluation and report. Any statements regarding drains, suction fittings, or any other component pertaining to VGBA are preliminary observations only, and further inspection to substantiate compliance is necessary.

Any cost amounts associated with the provided recommendations are the opinion of WTI based on a professional understanding of market conditions. Cost amounts have not been trade or contractor verified, and are intended only to provide guidance for a preliminary aquatic budget.

Observations

Below are descriptions of the observations from the site visit for major components of the aquatic amenities. A ranking of the condition of each component is indicated with an associated score.

	Condition Rank	Condition Score	Weight Value	Total Score
Pool Vessel	Fair	50	0.100	5.00
Type/Style: Concrete				
Comments: Structural integrity not verified. Numerous construction joints.				
Issues/Problems:				
☒ Cracking		☐ Groundwater Infiltration		
☐ Spalling		☐ Exposed Reinforcement		
☒ Shifting/Movement		☐ Leaking/Water Loss		
Pool Finish	Poor	25	0.050	1.25
Type/Style: Paint				
Comments: Significant wear and deterioration				
Issues/Problems:				
☐ Cracking		☐ Coarse/Rough Surface		
☒ Spalling		☐ Softening/Dissolving		
☒ Delamination		☐ Staining		
Pool Gutter	Failing	0	0.100	0.00
Type/Style: Concrete				
Comments: Significant cracking and spalling				
Issues/Problems:				
☐ Broken Grating		☒ Cracking		
☐ Insufficient Channeling/Flow		☒ Spalling		
☒ Insufficient Rimflow		☐ Staining		
☐ Flooding/Insufficient Capacity		☐ Excessive Noise		
☐ Ineffective Dropouts/Removal				
Pool Accessibility	Failing	0	0.050	0.00
Type/Style: Water Powered Chairlift (1)				
Comments: Existing lift requires hose laid across deck. Pool perimeter size requires second means of access				
Issues/Problems:				
☐ Not Operable Without Assistance		☐ Not Present at Time of Observation		
☐ Insufficient Capacity/Lifting Power		☒ Hardware Corrosion		
Pool Handrails	Good	75	0.025	1.88
Type/Style: Stainless Steel				
Issues/Problems:				
☐ Staining		☒ Scale Formation		
☐ Corrosion		☐ Loose/Insecure		
Underwater Lighting	Fair	50	0.025	1.25

Type/Style: Wet Niche

Issues/Problems:

- | | |
|---|---|
| ☒ Not Operating | ☐ Not Removable |
| ☐ Broken Frame or Lense | ☒ Frame Corrosion |

Main Drains	Fair	50	0.075	3.75
--------------------	------	----	-------	------

Type/Style: Dual with retrofit covers

Comments: Compliance with VGBA not verified. Location and quantity acceptable. Recommended facility check for records of drain sump VGBA compliance

Issues/Problems:

- | | |
|---|---|
| ☐ Missing/Broken Cover | ☐ Unsafe Fitting Condition |
|---|---|

Return Inlets	Poor	25	0.050	1.25
----------------------	------	----	-------	------

Type/Style: Stubbed Floor Inlets

Comments: Small diameter stubbed pipes prone to failure and clogging

Issues/Problems:

- | | |
|--|---|
| ☐ Broken Fixture | ☐ Missing Cover/Face |
| ☐ Blocked/Non-Functioning | |

Piping	Fair	50	0.050	2.50
---------------	------	----	-------	------

Type/Style: PVC

Issues/Problems:

- | | |
|---|--|
| ☐ Leaking | ☐ Unnecessary Connections |
| ☐ Corrosion | ☐ Inefficient Routing |
| ☐ Metal Components | ☐ Blockages/Plugged |

Filtration	Good	75	0.100	7.50
-------------------	------	----	-------	------

Type/Style: Vacuum DE

Comments: Partially disassembled, emptied and no grids present

Issues/Problems:

- | | |
|--|--|
| ☐ High Operating Pressure | ☐ Insufficient Capacity |
| ☐ Low Operating Pressure | ☐ Insufficient Flow |
| ☐ Clogs/Debris | ☐ Inoperable Valves |
| ☐ Biological Growth | ☐ Leaking Tank |

Circulation Pump	Good	75	0.050	3.75
-------------------------	------	----	-------	------

Type/Style: Vertical Turbine

Comments: Not operating at time of observation

Issues/Problems:

- | | |
|--|--|
| ☐ Excessive Motor Heat | ☐ Corrosion |
| ☐ Excessive Motor Noise | ☐ Insufficient Flow |
| ☐ Leaking | |

Circulation Valves	Good	75	0.050	3.75
---------------------------	------	----	-------	------

Type/Style: Butterfly

Issues/Problems:

- | | |
|---|-------------------------------------|
| ☐ Inoperable - Closed | ☐ Broken Handle |
| ☐ Inoperable - Open | ☐ Corrosion |
| ☐ Limited Flow Adjustment | ☐ Leaking |

Chemical Control	Good	75	0.050	3.75
-------------------------	------	----	-------	------

Type/Style: BECSys3

Issues/Problems:

- | | |
|--|--|
| ☐ Inaccurate Disinfectant Readings | ☐ Inaccurate pH Readings |
| ☐ Control Flowswitch | ☐ Alerts |

Chemical Storage and Safety	Poor	25	0.050	1.25
------------------------------------	------	----	-------	------

Type/Style: Chlorine - small room off pool deck; Acid - carboys in general mechanical area

Issues/Problems:

- | | |
|---|---|
| ☐ Insufficient Fire Protection | ☒ Insufficient Spill Protection |
| ☐ Lack of Chemical Separation | ☐ Inoperable Air Evacuation |
| ☐ MSDS Not Present | ☒ Missing/Inoperable Eyewash Station |
| ☐ Leaking Containers (Liquids) | ☐ Missing Personal Protective Equipment |
| ☐ Spilled Containers (Powders/Solids) | ☐ Open Containers / Exposure to Fumes |

Primary Disinfection	Good	75	0.050	3.75
-----------------------------	------	----	-------	------

Type/Style: Calcium Hypochlorite

Issues/Problems:

- | | |
|--|--|
| ☐ Hazardous Injection Location | ☐ Leaking |
| ☐ Hazardous Conveyance Methods | ☐ Lack of Automation |

Supplemental Disinfection	Failing	0	0.050	0.00
----------------------------------	---------	---	-------	------

Type/Style: None

Issues/Problems:

- | | |
|--|---|
| ☐ Broken Bulb | ☐ Broken Wiping Mechanism |
| ☐ Insufficient Voltage | ☐ Lack of Downstream Strainer |

Chemical Balance	Poor	25	0.050	1.25
-------------------------	------	----	-------	------

Type/Style: Hydrochloric Acid

Comments: Lack of spill containment, located over surge tank

Issues/Problems:

- | | |
|--|--|
| ☐ Hazardous Injection Location | ☐ Leaking |
| ☐ Hazardous Conveyance Methods | ☐ Lack of Automation |

Pool Water Heating	Good	75	0.025	1.88
---------------------------	------	----	-------	------

Type/Style: Heat Pumps

Issues/Problems:

- | | |
|---------------------------------|---|
| ☐ Corrosion | ☐ Insufficient Heat |
| ☐ Leaking | |

Total Pool Score	Weight	Score
Observations	1.00	43.75

Recommendations

The following repairs or replacements are encouraged for improvement and modernization of the aquatic center. These recommendations are needed to allow the facility to operate more efficiently and effectively, renew the lifespan of the pool, and provide a safe, healthy, and beneficial experience to facility users.

Aquatic amenities and components have been observed and considered for recommendations for improvement. Elements of the facility beyond the aquatic components, such as site, building, and building mechanical components, are excluded from the analysis of this report.

Replace Perimeter Gutters

The function of pool perimeter gutters is one of the most important aspects of pool design. Gutters are intended to skim only the very top of the pool water from the rest of the pool. The majority of the contamination and unwanted material in a pool, such as body oils, greases and bacteria, reside at the surface of the water. Continuously removing this part of the water and sending it to the filtration and water treatment systems is crucial to maintaining a clean and healthy pool.

The current pool perimeter gutters are badly deteriorating. There are numerous cracks in the walls of the gutter and several areas of spalling concrete, some with exposed and corroded steel reinforcement. When the concrete reinforcement is corroding, the strength of the concrete structure is weakening and will continue to break apart and, at some point, fail completely if not properly repaired. Cracking in the gutter as well as joints in the gutter are suspected of being the source of leaking pool water.

Furthermore, the gutter edge, or rim, is not level around the entire pool. This prevents the water from evenly skimming over the front gutter edge and achieving the rim-flow needed for the gutter to function properly.

The existing gutter should be replaced with a new deck-level perimeter gutter with PVC gutter grating. The existing gutter should be demolished, and a new gutter installed utilizing the Myrtha RenovAction system. Myrtha Pools is a manufacturer of PVC laminated stainless steel pool vessel systems and custom fabricates replacement gutters for existing pools. This system has the benefits of fast construction and installation timelines, the precision of factory fabricated stainless steel, and durability and resistance of the hot calendared PVC finish.

The existing perimeter gutter is a parapet design with several disadvantages: 1) The parapet and narrow opening to the gutter makes accessing the gutter for maintenance difficult. 2) The parapet creates a freeboard in the pool, or a vertical distance between the surface of the pool deck and the surface of the pool water. The existing freeboard is approximately four inches. 3) The parapet design results in a front gutter wall located below the parapet and acting as a narrow step and a potentially easy tripping or slipping hazard.

Deck Level Gutters are the superior form of pool surface water removal. A modern deck level gutter provides a flush transition from the pool deck to the pool water, crossing over PVC grating covering the gutter trough. Eliminating the freeboard and bringing the surface of the water to the same level as the deck, Deck Level Gutters provide easy access into and out of the pool. Accessing the gutter trough for maintenance or cleaning is as easy as removing the PVC grating.

Replace Pool Finish

The interior pool surface is currently painted. A painted pool requires frequently reapplying paint, often annually. The paint fades, chips, and is worn away. The paint on the bottom of the pool is significantly worn and deteriorated, with many chips, cracks, and delaminating areas. The painted finish will continue to be a significant maintenance burden.

Furthermore, the pool is constructed with numerous joints, which require caulking and sealing. While some joints in a concrete pool are necessary, the amount in this pool is excessive in comparison to modern pool design. Staff reports the

pool vessel joints have been the source of leaks in the past. An advantage of the Myrtha system is the continuation of the PVC membrane finish on the floor and all interior surfaces of the pool vessel. This PVC membrane is a durable and chemically resistant material to provide the waterproofing of the pool, leaving the existing concrete vessel needing to only provide the structural support. This renders any failing joints or cracks inconsequential toward the pool's ability to hold water. The PVC finish of the Myrtha system requires significantly less maintenance than paint and comes with a 10-year warranty.

Replace Main Drains

The existing main drain covers and sumps appear, although unconfirmed, to be compliant with VGBA requirements. However, record drawings indicate piping to the second main drain passes through the sump of the first main drain, and visual examination appears to confirm this arrangement. To be fully compliant with VGBA regulations suction piping from the main drains must branch off equally and independently to each main drain sump. Correction of the piping arrangement will require replacement of the main drains. All existing piping to the main drains able to be reused should be confirmed to be PVC and pressure tested.

Replace Floor Returns

The pool water is returned to the pool after filtration and treatment through many small return pipes in the pool floor. These small pipes are stubbed flush with the floor and at an angle. This style of return has been prone to clogging and requires monitoring and cleaning. There is also no ability to adjust the flow to evenly balance the water return. The floor returns should be replaced with flush floor inlet fittings with adjustable diverter plates. All existing piping to the return fittings able to be reused should be confirmed to be PVC and pressure tested.

Abandon Underwater Lighting

The existing wet niche lighting fixtures have reached the end of their useful lifespan. Staff is frequently repairing these lights, the fixtures and housings are corroded, and several lenses hold mineral buildup. Underwater lighting is not required for daytime swimming. Unless there is a desire for nighttime swimming (after dusk or before dawn), the underwater lighting can be abandoned.

Install New Battery Powered ADA Chairlift

The existing ADA chairlift is water-powered and requires a water supply hose to lay across the deck when installed. This creates a potential tripping hazard for guests. A new battery powered chairlift should be installed to eliminate this hazard, as well as provide guests with more user-friendly operating controls.

Construct "Learn-to-Swim" and ADA Compliant Stair Entry

The pool perimeter is over 300 linear feet and requires a second means of ADA compliant access. A secondary means of access is allowed to be a stair entry if constructed with proper dimensions. The existing stair entry should be replaced with an ADA compliant stair entry. This new stair entry may also be constructed with extra width, which is especially useful for learn-to-swim classes and serves as a place for children to have a more accommodating entrance to the water.

Install Stair Access to 3-meter Springboard

The existing 3-meter diving board is accessed with a traditional ladder behind the board. With a height of 3 meters, this ladder has been found to be a leading source of severe injuries at public pools. Converting this ladder access to stair access significantly increases the safety of a 3-meter diving board. The ladder should be replaced with a stair access. This can be done in conjunction with replacement of the diving stand base as discussed below.

Replace Diving Board Bases

All three of the steel bases of the diving boards are severely corroded and should be replaced with new stands. One of the concrete foundations has a large crack throughout the base and is also required to be replaced. The 3-meter base should be replaced with an integrated stair access as mentioned above.

Replace Vacuum DE Filtration System with Regenerative Media Filter System

The pool is currently filtered using a Vacuum DE Filtration system. This style of filtration is effective at trapping small particles for removal from the water. However, it is inefficient in the use of water and media compared to more modern techniques and is also a significant maintenance burden involving frequent flushing and cleaning of the filter grids.

A Regenerative Media Filter (RM) is a pressure filter utilizing perlite media; commonly used in the beverage industry and a safer alternative to diatomaceous earth. With a RM filter, pool water passes through hanging tubes coated with perlite to remove particles and contaminants. This design allows for a very compact footprint, saving space in the mechanical room. The RM filter utilizes a regenerative “bump” cycle to mechanically separate media that successfully trapped dirt or debris from cleaner media with remaining filtration capacity. This process drastically prolongs the life and filtration ability of the media cycle and greatly reduces the waste of water. The regenerative cycle is fully automated to optimize the filtration performance and initiated by the operator’s command. The regenerative cycle is responsible for significantly reducing water usage, which thereby reduces heating energy usage and chemical demand. While an RM filter has a higher capital cost than other comparable pressure systems, the lower operational costs result in a typical payback period of just a few years.

Construct Separate Acid Storage Room

The pH of the pool is balance through the injection of hydrochloric acid into the pool via a peristaltic pump monitored by an automatic chemical controller. The acid containers are stored on structural grating over the sump to sanitary and immediately adjacent to the structural grating over the DE filter tank. Ideally, this acid is stored in a separate room with spill containment and independent ventilation. The fumes of hydrochloric acid are extremely corrosive, and, while the containers are sealed, any potential leaks will cause corrosion on metal surfaces in the mechanical room in addition to being unhealthy for staff. At a minimum, the acid containers should be stored above a spill containment pallet capable of collecting potential spills.

Relocate Heat Pumps Outside Pool Deck Area

The eight heat pumps providing heating to the pool are interconnected with piping and located on the pool deck between the diving area and bathhouse. This deck area is highly valuable space and is likely congested on busy summer days. The heat pumps should be relocated to an area outside of the pool deck and with restricted access to any non-staff visitor.

Development Options & Cost Opinion

The previously discussed recommendations are intended to renew the lifespan of the pool and maintain the aquatic components of the facility in proper working order. These Base Recommendations are necessary, at a minimum, to continue operating the pool efficiently long-terms. When a significant capital investment is considered for components of an asset, the cost to replace the complete asset is often a valuable comparative consideration. Therefore, the probable construction costs for both Base and New development options are provided below for consideration.

The cost amounts associated with the provided recommendations are the opinion of WTI based on a professional understanding of market conditions. Cost amounts have not been trade or contractor verified, and are intended only to provide guidance for a preliminary aquatic budget. Cost amounts involve the construction of the pool vessel, pool piping and pool filtration and treatment systems, and exclude general site work, excavation, site drainage, utility connections, decks and walks, deck drainage, turf and landscaping, irrigation, security, area lighting, fences and barriers, signage, natatorium/buildings, concessions/kitchen, change rooms, support and storage spaces, and mechanical rooms.

Development of a new pool involves the replacement of the existing pool and associated pool systems with a newly constructed pool vessel, pool piping and pool mechanical systems. The newly constructed pool vessel would be designed and engineered to modern standards of quality and compliance and be supported by today's advanced mechanical, filtration, and water treatment systems.

Base Recommendations - Renovating Existing Pool

\$1,138,000.00

- Replace Pool Vessel Finish
- Replace Perimeter Gutters
- Replace Pool Piping
- Replace Main Drains
- Replace Floor Returns
- Install New Battery Powered ADA Chairlift
- Construct "Learn-to-Swim" and ADA Compliant Stair Entry
- Install Stair Access to 3-meter Springboard
- Replace Diving Board Bases
- Replace Pool Pump
- Replace Vacuum DE Filtration with Regenerative Media Filter System
- Relocate Heat Pumps Outside Pool Deck Area

*- Probable cost amount does not include the cost of constructing a separate acid storage room.

New Outdoor Pool (approximately 5,950 ft²)

\$1,963,500.00

The new outdoor pool is assumed to involve a substantially similar design program as the existing pool and involves:

- 6 lap lanes, 25-yard length
- Two 1-meter springboard diving boards
- One 3-meter springboard diving board
- Shallow water area
- Stair entry
- Deck level perimeter gutter

Appendix:

Site Observation Images

collected on 11/2/2021



Floor of pool in shallow area, deteriorating paint finish



Underwater light with corrosion and mineral buildup



Main drains in diving well



Gutter edge with spalling concrete



Gutter parapet with chipping and cracking



Cracking in the back of gutter



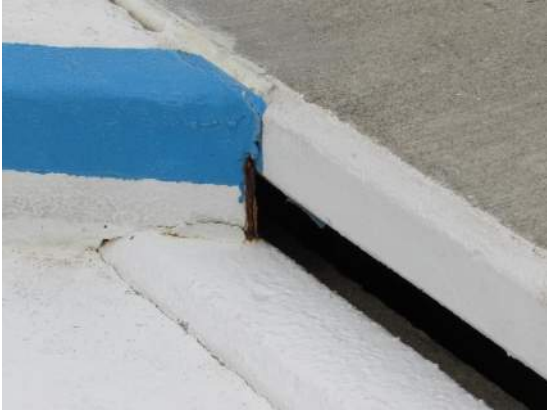
Spalling in gutter with exposed and corroded reinforcement



Vertical cracking along gutter and pool wall



Entry steps with handrail, not ADA compliant



Cracking at joints of stairs with exposed and corroded reinforcement



1-meter diving board with severely corroded stand base



Calcium hypochlorite erosion feeder



3-meter diving board stand base, severely corroded and cracking



Stubbed floor return in pool floor



ADA chairlift stored in bathhouse



Heat pumps on pool deck



Hydrochloric acid stored in mechanical room



Vacuum DE filter tank with DE grids removed