
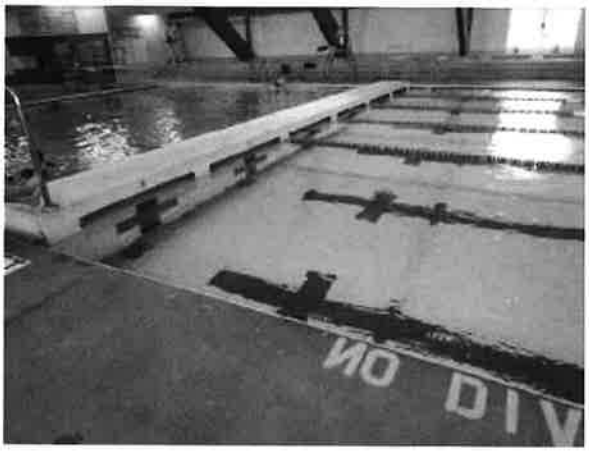


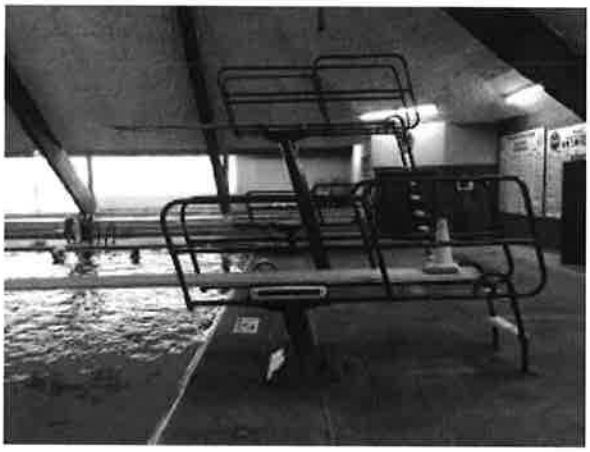

Swimming Pool Assessment

Lions Indoor Pool
509 West Pine St.
Yakima, WA

Counsilman · Hunsaker

AQUATICS FOR LIFE

April 22nd, 2015

Denver • **St. Louis** • Los Angeles
314.894.1245 • www.**chh2o**.com
10733 Sunset Office Drive • Suite 400 • St. Louis, MO 63127

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April 22, 2015

Mr. Ken Wilkinson
Parks & Recreation Manager
2301 Fruitvale Blvd.
Yakima, WA 98902

RE: Lions Indoor Pool
Swimming Pool Assessment

Ken,

The following report was prepared after a site visit on April 22, 2015 to the existing Indoor Aquatic Center at 509 West Pine Street in Yakima, WA. Conditions were evaluated and interviews were conducted with personnel who were familiar with the construction and operation of the facility. Field notes, meeting minutes, and photographs were utilized to prepare assessments, preliminary recommendations, and opinions to complete the scope of services outlined in the agreement between the City of Yakima and Counsilman-Hunsaker.

Goals of the Facility Audit:

- Review the aquatic center for deficiencies with regard to current local health code, federal law, and industry standards.
- Prepare specific commentary on any necessary repairs, replacement or restoration of the swimming pool systems, including identification of issues requiring further intensive evaluation and analysis.
- Prepare a general commentary on support spaces including the equipment areas.
- Recommend priority of renovation or replacement of aquatic center systems, (i.e., immediate, remedial, and/or long range, etc.).
- Provide an Opinion of Probable Construction Cost for any modifications, replacements and/or additions required for the aquatic center.

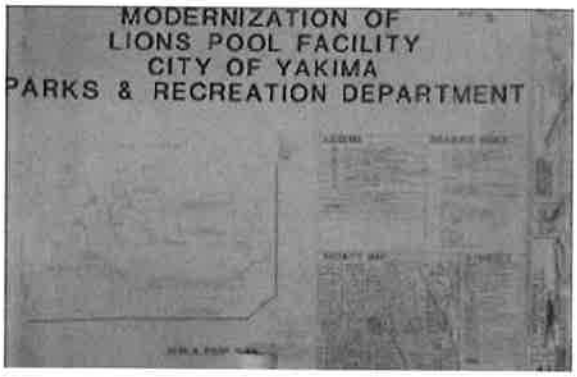
Should you have any questions or need additional information, please do not hesitate to call or email me at (310) 579-6731 or michaelmorehart@chh2o.com.

Respectfully submitted,
COUNSILMAN-HUNSAKER

Michael Morehart
Project Engineer

Executive Summary

Counsilman-Hunsaker completed a site visit on April 22, 2015 to the existing Lions Pool Indoor Aquatic Center in Yakima, WA. This facility consists of an Indoor 6-Lane Stretch Competition Pool that is also utilized for instructional and recreational swimming. In addition to the pool the necessary support spaces such as locker rooms, pool and building mechanical, storage and administrative areas are provided. The facility was originally constructed in 1972 and was an open air structure. Facility Staff reported that the Lions Pool facility was covered during the non-summer swim season with a temporary cover. During the summer months the cover was removed and the pool was exposed to the environment. In 1985 the Lions Pool Facility was renovated and a permanent roof structure was installed. Both the 1972 Construction Documents as well as 1985 Renovation Plans were provided for review.



The purpose of the aquatic facility audit is to identify conditions that are substandard in the pool; identify items not to current industry swimming pool design standards or codes; identify equipment that is not functional or not operating as designed; and to assist in defining a course of action regarding any necessary updates, repairs, or modifications to the pool or pool systems. In addition, an opinion of probable construction cost is provided for recommended repairs and/or updates that would serve to improve the operation of the pool and bring the pools up to current industry swimming pool design standards.

This report with detailed analyses is based on the staff interviews, the visual observations during the site visit, and information provided by staff in the form of both the original 1972 Construction Documents as well as 1985 facility renovation drawings and specifications.

General Pool Information and Summary of Deficiencies

Pool

- Pool Size = 112'-6" x 44'-0" (From 1972 Construction Drawings)
- Surface Area = 4,950 SF (From '72 CDs)
- Perimeter = 313' (From '72 CDs)
- Depth Range = 12'-0" to 3'-0" (From '72 CDs)
- Volume = 214,820 Gallons (28,719 C.F.) (From '72 CDs)
- Turnover Rate (TR) = 6 HRS (Stated by facility staff)
    - 6 hours or less WA State Code Requirement
- Flowrate = 597 GPM (Calculated, based on assumption that TR is exactly 6 HRS)
- Concrete pool shell with rubber paint finish and tile lane lines
- Fully recessed concrete gutter for perimeter overflow system
- CO2 (pH Buffer)
- Calcium Hypochlorite (Sanitizer)
- Diatomaceous Earth filtration system

The following list summarizes modification priorities identified in the report divided into categories of immediate items, short term (0 - 5 Year) items, long term (5 - 10 Year) items, and energy saving (Anytime) items. The list does not identify every priority item noted in the report.

Immediate

1. Replace all exposed mechanical room piping with Sch. 80 PVC — in process some completed
2. Add a contrasting tile band at the 4'-6" depth contour - planned 2019
3. Replace existing main drains sumps and covers with VGB certified system — on order
4. Repaint all depth markers and warning signs. Add additional depth markers and warning signs wherever needed to comply with Washington State Code — in complete
5. Replace all corroding and missing escutcheon plates — Done
6. Permanently anchor the existing pool lift to the deck at the shallow end — repaired
7. Fill in and repair all areas of the pool decks where water is ponding, rebar is showing, or cracks have formed —
8. Replace all missing/broken tiles on pool shell — Done
9. Replace the caulking for the expansion joints between the deck slabs with chlorine resistant caulking similar to Vulkem 116 or 226 — Done
10. Provide flush mounted caps for all utilized deck anchors when they are not in use — Done
11. Provide color coded directional arrows to piping in the mechanical room. Install valve tags on all valves and provide a posted piping and valve schematic in accordance with industry standards - Done
12. Provide new vacuum gauges on the intake suction side of the pumps and pressure gauges on the discharge side — planned when new filter system installed
13. Install a flow meter on the backwash line for backwashing and pool draining procedures - Done
14. Provide a CO2 sensor and alarm for the CO2 room — Done
15. Provide proper HAZMAT signage for the chemical rooms - Done
16. Provide Washington State Code compliant ventilation system for chemical room
17. Repair natatorium dehumidifier — planned replacement - $80 K
18. Replace all starting blocks and starting block deck anchors
19. Remove springboards and install new 1-Meter springboard in prior 3-Meter location — 3 meter removed 1 1 meter removed planned replacement 1 meter Board
20. Install movable entry ramp — not feasible at this time

0 - 5 Years (Short-Term)

1. Provide new recirculation pump
2. Renovate existing d.e. filter pit to accommodate new recirculation pump
3. Provide automatic water level control system, including wet cell and water meter totalizer
4. Replace all valves with Schedule 80 PVC true union style ball valves and butterfly valves. Provide isolation valves for each piece of equipment (e.g. pump, filter system, heater, etc.)
5. Install new Regenerative Media Filtration System
6. Replace pool piping from main drains to surge tank and install modulating float valve in surge tank
7. Provide new bulkhead
8. Provide a safety rail for the steps of the 3-Meter diving board
9. Provide a 6" air gap between each backwash line and the backwash catch basin
10. Install a flow meter on each backwash line for backwashing and pool draining procedures
11. Provide a sealed and ventilated chemical storage rooms for pool sanitizer and pH buffer
12. Provide new chlorine feed system for the pool sanitizer
13. Install new Timing System and Scoreboard
14. Install new Pool plaster finish with ceramic tile trim
15. Provide new natatorium dehumidifier

5 -10 Years (Long-Term)

1. Replace the gutter systems with either new stainless steel gutter systems or new concrete gutter systems
2. Replace all of the gutter underground piping, dropout piping, main drain piping, and pressure return piping going between the pool shell and the pool mechanical room with new Schedule 80 PVC piping
3. Provide new floor inlets with directional eyeball fittings. Provide waterstops for all penetrations through concrete. Properly fill in all old inlet penetrations with concrete.
4. Replace all existing diving stands with new Durafirm stands and new diving boards
5. Replace Pool Boiler

Anytime (Energy Saving)

1. Provide thermal pool covers for when the pool is not in use to reduce pool heating costs
2. Provide stainless steel storage reels for storing the pool covers
3. Provide a VFD for each of the recirculation pump similar to a Pentair Acu-Drive (Danfoss) or H20-Technologies Smart Pump Control System (SPCS)
4. Provide ultraviolet light (UV) disinfection and dechloramination systems for tertiary water treatment to help maintain proper water and air chemistry in the natatorium
5. Provide digital magmeter style flow meters with digital readout for the pool return lines and connect to the VFD and chemical controller to ensure maximum energy efficiency while maintaining the design flow rate

Opinion of Probable Cost (Summary)

- Refer to the complete Opinion of Probable Cost Section on Pg. 57

Immediate

Items Subtotal	$238,150
10% Design Contingency	$23,815
10% Indirect Costs	$23,815
Total (2015 USD)	$285,780

0 – 5 Year Items

Items Subtotal	$747,825
10% Design Contingency	$74,783
10% Indirect Costs	$74,783
Total (2015 USD)	$897,390

5 – 10 Year Items

Items Subtotal	$279,640
10% Design Contingency	$27,964
10% Indirect Costs	$27,964
Total (2015 USD)	$335,568

Anytime Items

Items Subtotal	$67,778
10% Design Contingency	$6,778
10% Indirect Costs	$6,778
Total (2015 USD)	$81,333

Total Pool Replacement Cost

Please refer to the following for the costs associated with constructing one (1) new pool with similar dimensions and features as the current pool at the Lions Pool Natatorium.

New Pool and Pool Systems

• New Six (6) Lane x 25 Meter Stretch Pool:	4,950 SF x $200/SF	= $990,000
• New Concrete Pool Deck w/.drainage:	4,000SF x $15/SF	= $60,000
• New Fiberglass Bulkhead:		= $90,000
• Renovations to pool mechanical and chemical rooms		= $25,000
• New Pool Heating System		= $25,000
• New Natatorium Dehumidification system	14,555SF x $15/SF	= $220,000
Estimated Total Construction Cost		**= $1,410,000**

***Note:** The above numbers are strictly "ball park" numbers and are meant as a starting point for budgetary and planning purposes.

The expected life cycle for a commercial reinforced concrete swimming pool is about fifty (50) years depending on annual maintenance and upkeep. The Lions Pool was built in 1972 and is forty-three (43) years old. Some preventative maintenance has been conducted on the swimming pools throughout its history. For its age the pool is currently functioning fine, but there are many areas for improvement. Our field observations provide evidence that the pool systems are functioning properly, but some aspects, such as the pool recirculation, are barely meeting Washington State Code requirements. Some aspects of the pool do not meet current applicable codes and industry standards.

While the immediate cost for bringing the pool up to current codes and standards is not comparable to the cost of a completely new swimming pool, the age of the facility raises some concern. It may be beneficial from a longevity and value standpoint that a new swimming be considered for Yakima's Lions Natatorium.

I. Pool Items

1.1 Administrative Code

1.2 General Pool Information

1.3 Perimeter Overflow System

1.4 Structure and Finish

1.5 Pool Tunnel

1.6 Main Drains

1.7 Inlets

1.8 Warning Signs and Depth Markings

1.9 Ingress and Egress

1.10 Underwater Lights

A. POOL ITEMS

1.1 Administrative Code

The state administrative swimming pool code referenced as "Washington State Swimming Pool Code" or referenced as "Washington State Code" in the report is as follows.

Washington Administrative Code
Washington State Legislature
Chapter 246-260 WAC R392-302. Water Recreation Facilities.
As in effect on March 27, 2014

FINA (Fédération Internationale de Natation) Rules and Regulations
Fina Facilities Rules
PART IX: FR 1 - FR 13
2013 - 2017

International Building Code
CHAPTER 4: Special Detailed Requirements Based on Use and Occupancy
SECTION 414: Hazardous Materials
SECTION 415: Groups H-1, H-2, H-3, H-4 AND H-5
SECTION 307: High-Hazard Group H
2012 Edition

NFPA 70
National Electric Code, Article 680
Swimming Pools, Spas, Hot Tubs, Fountains, and Similar Installations
2014 Edition

Virginia Graeme Baker Pool and Spa Safety Act (VGB)
ASME/ANSI A112.19.81
Signed into Law on December 19, 2007
CPSC Staff Interpretation of Section 1404 issued on June 18, 2008

The administrative code requirements must be satisfied if a major modification of the pool is undertaken or if a particular item or piece of equipment is in need of repair. The recommended repairs address all administrative code items identified in this report.

1.2 General Pool Information

Pool

- Pool Size = 112'-6" x 44'-0" (From 1972 Construction Drawings)
- Surface Area = 4,950 SF (From '72 CDs)
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- Depth Range = 12'-0" to 3'-0" (From '72 CDs)
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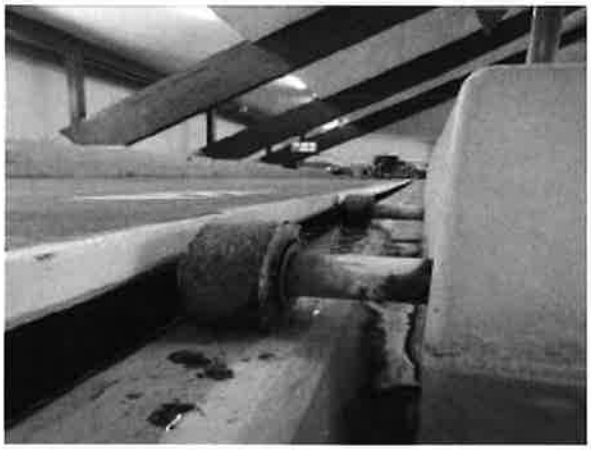
- Concrete pool shell with rubber paint finish and tile lane lines
- Fully recessed concrete gutter for perimeter overflow system
- CO2 (pH Buffer)
- Calcium Hypochlorite (Sanitizer)
- Diatomaceous Earth filtration system

1.3 Perimeter Overflow System

The pool contains a perimeter overflow system that is best described as a fully recessed concrete gutter. The deck level is approximately 4.5" above the pool water surface. The coping at the top of the pool wall was observed to have a radius of 2". The gap between the top of the pool wall coping and the bottom of the deck slab, which allows the free flow of water into the gutter trough, was also observed to be 2" in height. The gutter trough height varies anywhere from 15" to 3'0" with a width of 2'. Due to the varying depth of the gutter and the slope, the water level in the gutter trough was observed to be inconsistent. The gutter is designed to slope towards the surge tank, thus eliminating the need for gutter drop outs.

Due to the slopped trough, the gutter appeared to move water towards the surge tank at an effective rate which prevented standing water. The inside of the trough was observed to be stained and discolored in some areas. It is unknown if the gutter is watertight, but water loss was not an issue mentioned by the facility staff.

The gutter lip, the coping at the top of the pool wall, was observed to be slightly damaged and stained in some areas. An uneven gutter lip could lead to inconsistent overflow in some areas along the perimeter of the gutter. The bulkhead observed at the facility consisted of four wheels which rolled directly on the wall coping. The direct contact of the bulkhead wheels have damaged the wall coping from years of use.


Recommendation

Immediate: Confirm that the front of the gutter lip is level. In the case that the front of the gutter lip is not level, sections of the gutter lip may need to be removed and replaced as necessary.

Thoroughly clean the gutter trough on a regular basis to cut down on staining and corrosion.

Future: Perform a water tightness test on the gutter system to ensure that it is water tight and does not have any leaks.

Replace the gutter system with either a new stainless steel gutter system or a new concrete gutter system that better captures swimmer surge and is more user friendly for egress similar to a deck level gutter or rollout gutter system. The new gutter system should have 100% capacity of the recirculation flow rate. Recommend selecting a gutter system with PVC grating covering the gutter trough opening for safety reasons.

The gutter coping is currently damaged due to the placement of the bulkhead wheels. A new bulkhead shall be installed that is moved by means of a track and wheel system or is inflatable to eliminate any further coping damage. Refer to *Section 2.5* for further information on the existing bulkhead and suggested replacement.

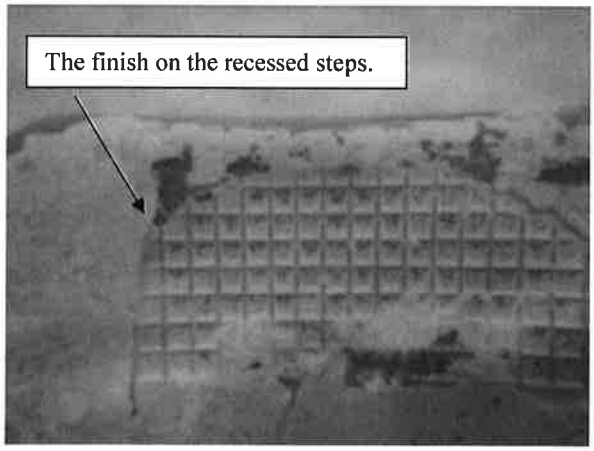
1.4 Structure and Finish

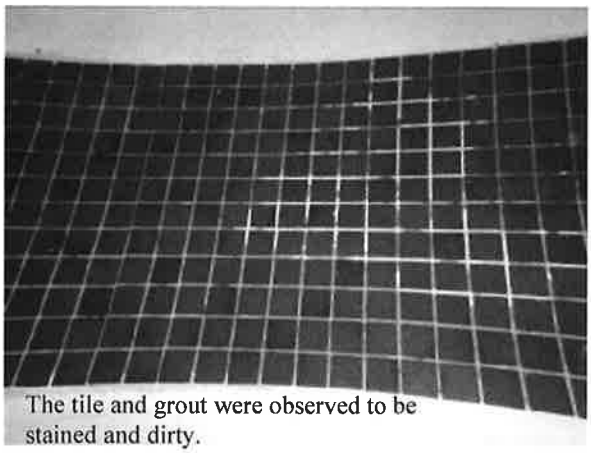
The pool shell, which is the original 1972 construction, consists of reinforced concrete. Relatively little repairs and renovations have been completed since the pool's initial construction. The concrete pool shell appears to be in average to good shape as there were no visible signs of subsidence. The interior finish of the pool is rubber paint with tile lane markers. The paint finish was observed to be stained around the floor inlets. Facility staff noted that in the past the pool had been emptied every three (3) years to reapply the rubber paint finish. Some corrosion and staining was observed on the tile finish. Many sections of the tile grout showed signs of heavy staining. Broken and missing tiles were observed periodically in and around the pool.

The pool's depth varies from 3'0" at the shallow end to 12'0" at the deep end, where the main drains and diving boards are located. The pools overall dimensions, according to the construction documents dated 1972, are 112'-6" x 44'-0". The shallow end of the pool transitions from 3'0" to 4'6" over a span of 75' (25Yds). During the site visit the bulkhead was located at the slope break where the pool slopes from 4'6" to 12'. Due to the location of the bulkhead, a floating safety line could not have been placed at the slope break between the shallow and deep sections of the pool. A designated marking line for the slope transition between the shallow and deep water was not overserved during the site visit. For more information on the warning and depth markers required by Washington State Code, refer to *Section 1.7*.

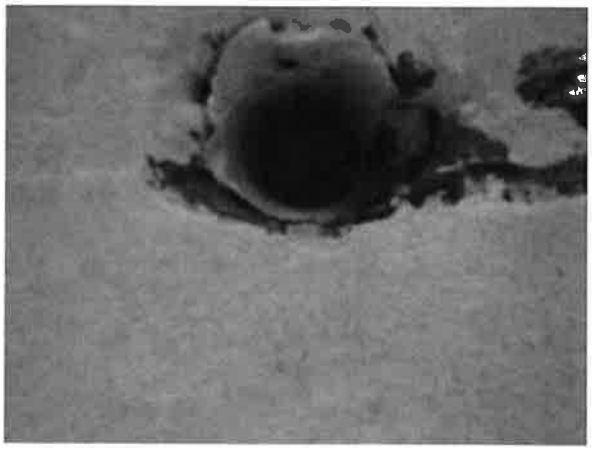
The six (6) racing lane lines and wall targets observed in the pool appeared to be composed of black 1 inch square tiles. The tiles appeared to be in average to good condition.

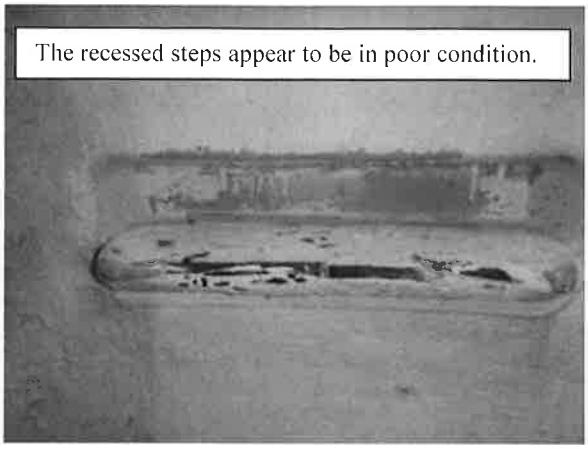
While the shell exhibited visible staining and corrosion, no leaks were observed nor was any water loss mentioned by the facility staff.

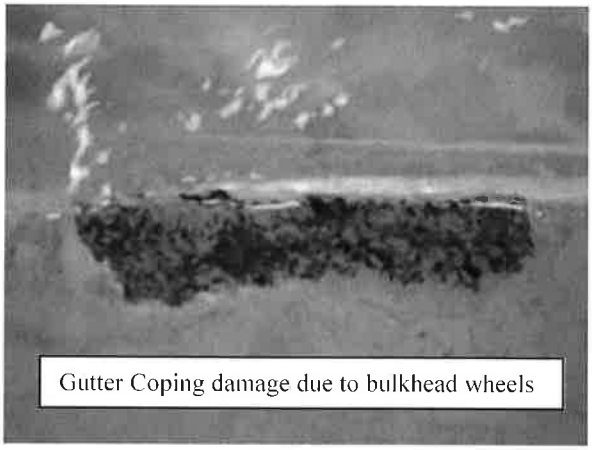


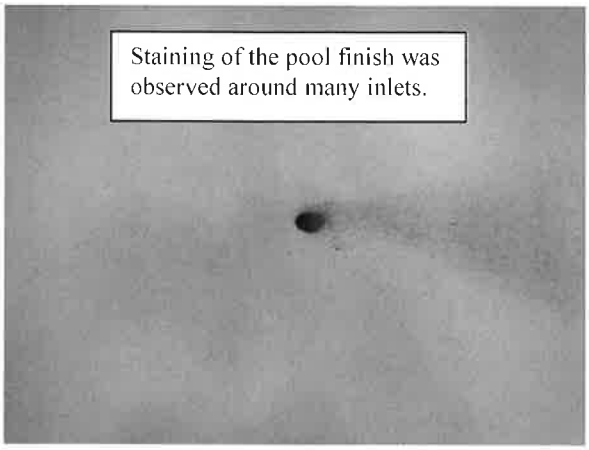


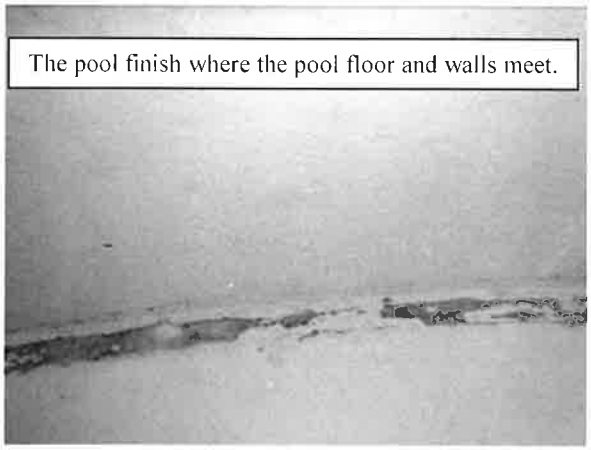
The tile and grout were observed to be stained and dirty.











Recommendation

Immediate: The next time the pool is completely drained, replace any missing or damaged tiles.

If there is no safety marking line for the slope break between the uniform shallow end slope and the deep end of the pool either a permanent painted marking line shall be painted on the shell or a floating safety line shall be provided.

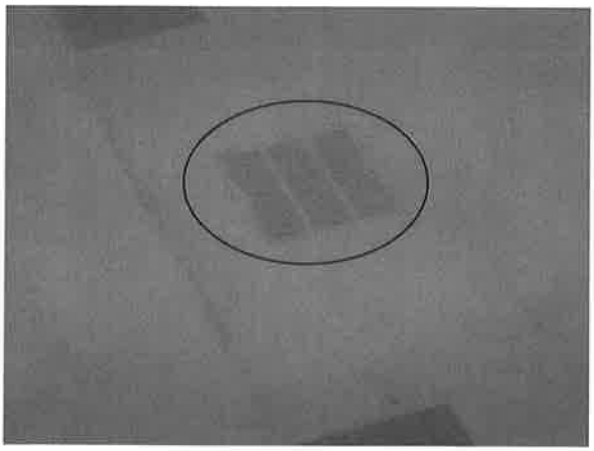
1.5 Main Drains

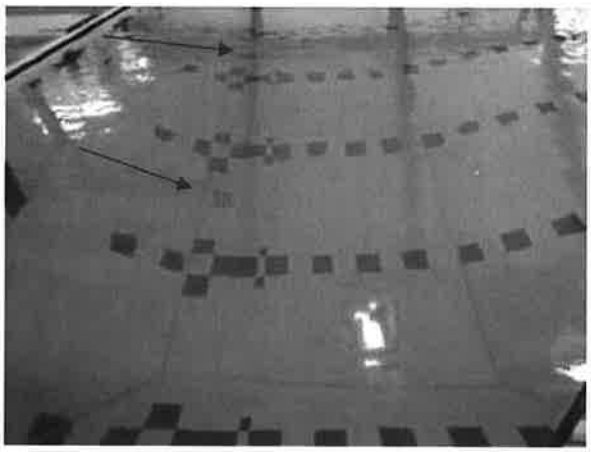
There are two (2) 12" x 12" square main drains located at the deepest part of the pool by the diving boards. The facility staff mentioned that the grates were not compliant by the Virginia Graeme Baker Pool and Spa Safety Act (VGB), ASME/ANSI A112.19.81. All main drains with dimensions 18" x 23" or smaller are classified as "blockable" and must have a VGB stamped and certified "unblockable" grate cover with tamper proof screws.

Both main drain sumps are connected by means of an 8" pipe which is assumed to be cast iron. There is one (1) return line which, according to the provided pool drawings, is not hydraulically centered. The return line runs from one main drain, which is connected to the second main drain, and penetrates directly into the filter pit in the mechanical room. Generally, the main drain line is under suction, however, in this case the water flows via static pressure head to the filter tank. This pipe configuration is not ideal because both drains become useless if the single connecting sump becomes blocked. Even though this situation is unlikely it should be prepared for. According to the provided facility plans the return line from the main drains is opened and closed by way of modulating float valve. The float valve will close the main drain line when the pool water level becomes low and the surge tank level high. As the surge tank fills up it will begin to equalize into the filter tank which subsequently raises the float in the filter tank and closes the main drain line. Based on the assumed flow rate of 597 GPM, the 8" pipe currently has an estimated velocity of 3.83 fps, which is within industry standards.

The assumed max return velocity of the pool piping meets the Washington State Code limit of 6 fps and therefore is code compliant. Typically, the main drain lines flow via suction to the recirculation pump. Based off of site plans provided by the facility staff each main drain is assumed to contain one (1) hydrostatic relief valve.

The federal regulations of VGB were passed by Congress in 2008 and are designed to reduce the potential for suction and hair entrapment in commercial swimming pools at all suction outlets (e.g. main drains, skimmer equalizer lines, etc.). The Consumer Product Safety Commission (CPSC) is tasked with federally enforcing all VGB regulations, but due to the vast number of commercial swimming pools in the United States, enforcement most commonly is the responsibility of the local governing agencies (e.g. public health departments, building departments, etc.).





Recommendation

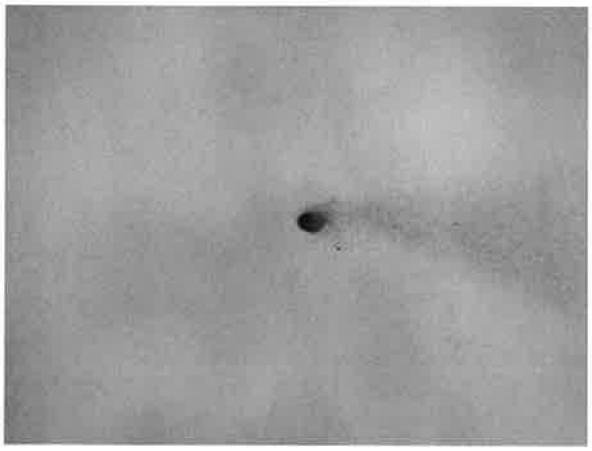
Immediate: Replace both main drains with VGB compliant and stamped grates. When the pool is drained consider replacing the cast iron recirculation piping schedule 80 PVC to prevent any future damage from pipe failure.

A modulating float valve was assumed to be in place due to the pool plans, but wasn't physically observed. If the main drain return does not have a modulating float valve one shall be installed.

Future: When the filter system is replaced, the new system shall allow a direct pipe connection from the main drains to recirculation pump. The modulating float valve shall be located along the suction side of the recirculation pipe on the portion that passes through the surge tank. This setup will allow the main drains to run off of suction rather than static pressure. For more information on filtration system recommendations refer to *Section 3.3*.

1.6 Inlets

The pool is equipped with 68 floor inlets. A single 6" supply line starts in the mechanical room and braches into two (2) 6" supply lines which run directly under lane markers two (2) and five (5). Once the supply lines are routed under the lane markers they each boast 34 small PVC branches that send filtered water to each inlet. The inlets are crisscrossed so that each of the two supply lines has 17 inlets on each side of its lane marker. The branch piping is assumed to be 1". The floor inlets observed at the pool did not have any type of cover.



Recommendation

Immediate: The current inlet configuration meets all State and Local Codes dealing with spacing and depth requirements. Every time the pool is drained, be sure to thoroughly clean each of the floor inlets to combat corrosion and staining.

Future: Provide new floor inlets with directional eyeball fittings. Provide waterstops for all penetrations through concrete. Properly fill in all old inlet penetrations with concrete.

1.7 Warning Signs and Depth Markings

Horizontal and vertical depth markers are located around the pool perimeter in multiple locations. In addition, six (6) "NO DIVING" markers were observed along the sides of the pool from the shallow end up until the bulkhead. Per Industry Standards, "No Diving Signs" and warnings should be provided with all depths of 5'-0" and less. Washington State Pool Code requires a safety line or marking line separating areas where the pool bottom breaks from the uniform shallow end slope to a steeper slope heading towards the deep end of the pool. During the site visit a marking line was not observed on the pool shell at the slope break. Because of the bulkheads position, a floating safety line could be excessive.

According to Washington State Pool Code, WAC 246-260-041 Section 8, Pool depth markings shall be:

(a) Located on the pool vertical wall at or above the water level so as to be easily readable from the water, in numbers at least two inches high. If overflow channels do not allow for placement of vertical wall markings above the water level, they are not required;

(b) Located on the horizontal surface of pool coping or deck of pools within eighteen inches of the water's edge, easily readable while standing on the deck facing the water, in numbers at least four inches high;

(c) Placed at the maximum and minimum water depths and at all points of slope change;

(d) Spaced at increments of water depth of two feet or less;

(e) Spaced along sides of pools at horizontal intervals of twenty-five feet or less;

(f) Arranged uniformly on both sides and ends of pool;

(g) Placed on all major deviations in shape;

(h) Applied in a contrasting color; and

(i) Made of slip-resistant material on decks.

Recommendation

Immediate: To ensure code compliance depth makers shall be installed at increments of 2' of water depth or less. Consecutive depth markers cannot be more than 25' apart. "No Diving Signs" shall be provided where ever the pool depth is five' and shallower. Install a marking line on the bottom of the pool at the 5' water depth or provide a floating safety line.

Ensure all required warning and safety signage, such as HAZMAT signage, is found around the natatorium.

1.8 Ingress and Egress

The pool has recessed steps paired with painted metal grab rails located around the pool perimeter at four (4) locations. The recessed steps were only partially recessed, with around 3" of step extending out from the wall. The steps were observed to be in fair condition and the condition of the grab rails is uncertain due to their paint exterior. The grab rails did not contain escutcheon plates. There is also a movable stainless steel and plastic staircase located in the shallow end. One portable Aqua Creek pool lift was observed at the pool facility.

The pool must have two (2) means of ADA access; one (1) primary and one (1) secondary means of access. The primary access should be an ADA pool lift or ramp entry that is permanently anchored to the pool deck. The secondary means of access must be an additional pool lift, a sloped entry, a transfer system, or a compliant entry stair system. In this situation, the cheapest option would be an ADA approved portable stair system. A portable stair system was observed in the pool, however, it is unknown if it is ADA compliant.

Recommendation

Immediate: Ensure that all new and old grab rail anchors are bonded per NEC 680 and have protective escutcheon plates.

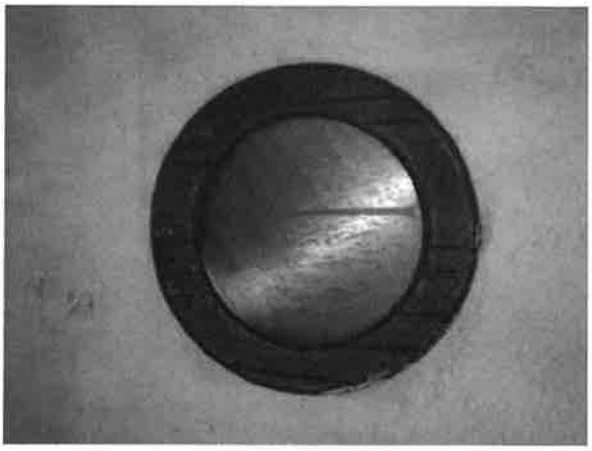
Permanently anchor the existing pool lift to the deck at the shallow end of the pool in order to meet ADA requirements. ADA code states that pool lifts must be anchored to the deck in areas where the pool depth is 48" or less if the pool has areas that shallow. Ensure the pool lift anchors are properly bonded to the pool shell. Per the new ADA guidelines, the pool lift must be installed and ready to use whenever the pool is open and in operation. The pool lift must be readily available for patrons without assistance from the staff.

Replace the existing portable staircase is an entry ramp.

Future: When the bulkhead is replaced ensure the new bulkhead can move along the pool wall without being damaged by the protruding steps. The bulkhead width dimensions can be specialized to prevent contact with the steps, or the steps can be altered so they don't branch off the pool wall as much as they currently do.

1.9 Underwater Lights

The existing underwater lights are located on the side walls of the pool. All lights have been covered with what appeared to be a stainless steel plate and are not used.



Recommendation

Immediate: Confirm the existing overhead lighting in the natatorium allows the bottom of the pool to be seen at all hours of operation. Protective shielding for all lighting fixtures above walking surfaces and any of the pool surface area shall be provided. Washington State Code requires a minimum of 30 foot candles above an indoor pool surface, and 10 foot candles above any pool deck. Industry standard calls for a minimum of 30-100 foot candles above the pool surface depending on the use of the pool. Foot candle requirements increase when competitions inside the natatorium shall be televised.

Future: Remove all existing light fixtures from the pool structure and repair any consequential holes or pool structure damage.

II. Pool Deck Items

2.1 Structure and Finish

2.2 Anchors and Escutcheons

2.3 Diving Boards

2.4 Starting Blocks

2.5 Bulkhead

2.6 Timing Equipment

2.7 Safety Equipment

2.8 Maintenance Equipment

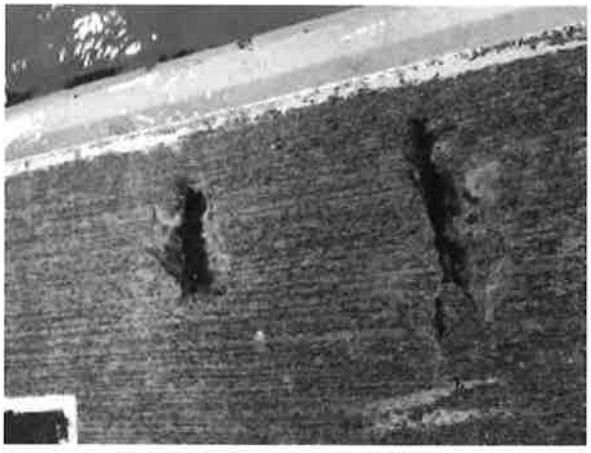
2.9 Deck Equipment

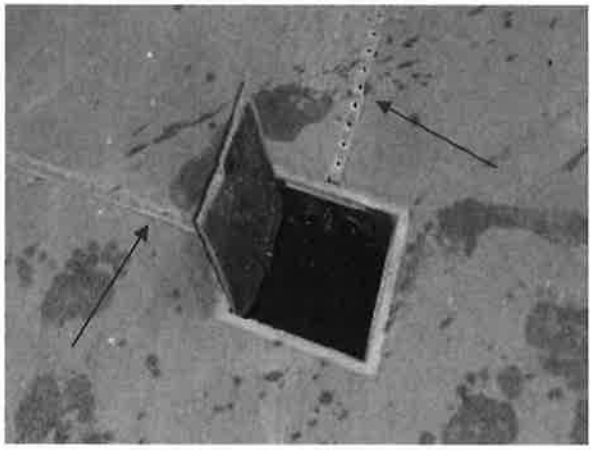
B. DECK ITEMS

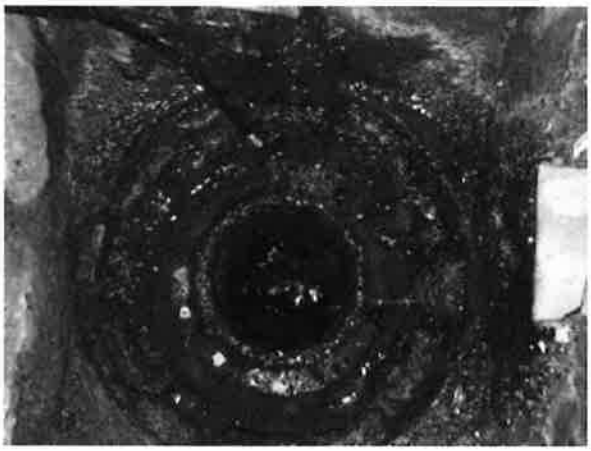
2.1 Structure and Finish

The deck inside the Lions Pool Facility consists of broom finished concrete with painted depth markers and warning signs. The condition of the deck could be described as fair to poor. The concrete was observed to be cracked and stained in numerous places. In multiple locations rebar was visible on the deck's surface and was corroding. From the edge of the pool coping, the perimeter of the deck slopes away from the pool to a narrow slot perimeter drain. The perimeter drain consists of a small trench covered by an even smaller grating with circular holes. The perimeter trench drain empties into four (4) dropouts which were observed to be located at the four (4) corners of the pool. When inspected the dropouts appeared to be full of grit and water. It is possible that the dropouts were partially or fully blocked during the time if inspection.

According to Washington State Code, *"for pools fifteen hundred square feet or larger, walking deck surfaces must be at least six feet wide on fifty percent of the perimeter on indoor pools; and the remaining fifty percent perimeter of the indoor pool must be a minimum of four feet wide"*. Seeing that the Lions Pool deck was greater than 6 feet wide in all areas it exceeds the state code minimum requirements. However, Washington State Code also requires that *"for pools fifteen hundred square feet or more, walking deck surfaces must be at least sixteen square feet per bather"*. To determine if this part of the state code is met, the total surface area of the deck should be calculated. The original construction documents from 1972 list the batherload for the pool to be 400. However using current code requirements, found in WAC 246-260-041 Section 10, the max batherload was calculated to be roughly 186 patrons. Based off a batherload of 186, the total deck area should be at least 2976 square feet.







Recommendation

Immediate: Ensure the deck adequately slopes to drain all water to the trench drains. Repair all areas of the deck that are cracked, especially where there is exposed rebar. Repaint all deck markings with slip resistant paint. Ensure that the deck meets minimum state requirements for square footage.

2.2 Anchors and Escutcheons

Starting block anchors were observed in the pool deck at the deep end of the pool. Several of the anchors were observed to display signs of corrosion and possible electrolysis. Few escutcheons were observed on the equipment around the pool. All deck anchors should be bonded to the pool shell per NEC 680.

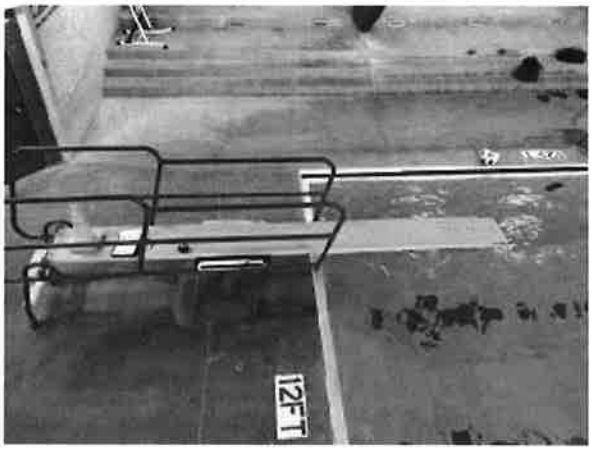
Recommendation

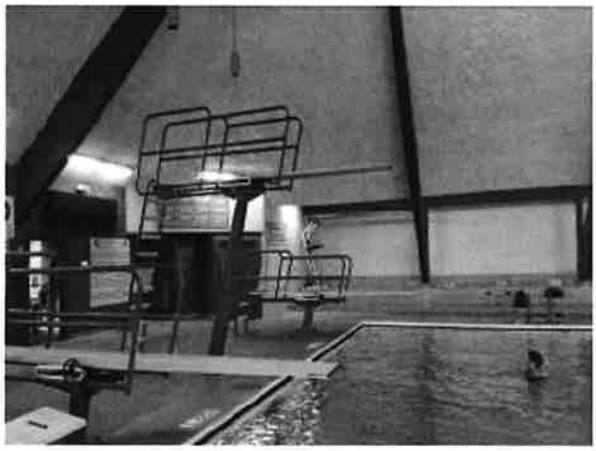
Immediate: Remove and fill in any abandoned and unused deck anchors. Evaluate and confirm that all used deck anchors are properly bonded to the pool shell per NEC 680. Replace corroding escutcheon plates for all grab rail deck anchors and ensure they are properly tightened and secured. Provide flush mounted caps for all utilized deck anchors when they are not in use (e.g. stanchion anchors and starting block anchors when the backstroke flags and starting blocks are removed for recreation).

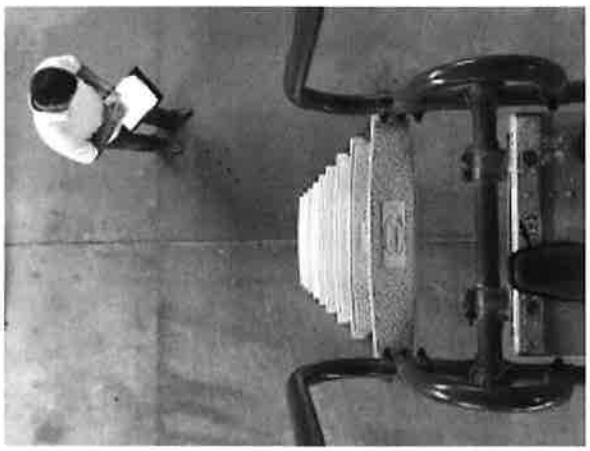
2.3 Diving Boards

There are currently two (2) 1-Meter springboards and one (1) 3-Meter springboard installed for use at the deep end of the swimming pool. Due to their painted exterior it is hard to tell the true condition of the diving stands. The Washington State Code references FINA as the overarching code for facilities with diving platforms or boards greater than ½ Meter. The Lions Pool meets all minimum requirements spelled out by the FINA diving envelope.

All diving board access steps had a slip resistant finish. The 3-Meter diving board was not fully provided with an unobstructed hand rail/safety rail on both sides of the steps.







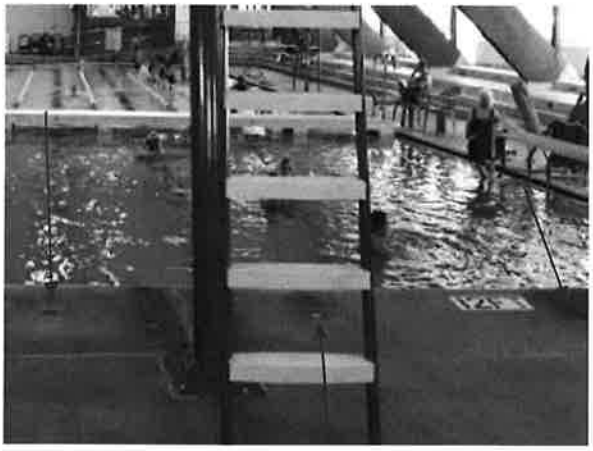
Recommendation

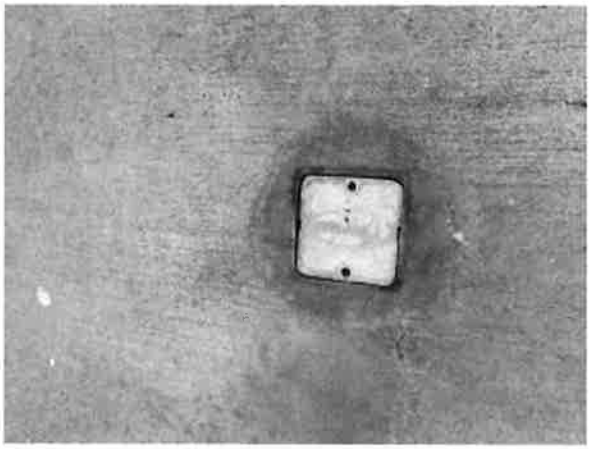
Immediate: Based on the facility's history and risk management concerns, it is recommended that all springboards are removed. Install a new 1-Meter springboard in the prior location of the 3-Meter springboard.

Provide escutcheon plates for diving board ladders and support stands. Ensure all diving board stand anchors are properly bonded and installed per the manufacturer's recommendations. Wipe down the safety railings and diving stands with stainless steel cleaner on a regular basis in order to reduce corrosion.

2.4 Starting Blocks

There are anchor slots for six (6) starting blocks for the six (6) lane, 25 Yard, race course layout. The starting blocks appear to be very old and in fair to poor condition. The height of the starting blocks above the water was not measured during the site visit, however most organizations require a maximum starting block height of 30" above the pool water surface.





Recommendation

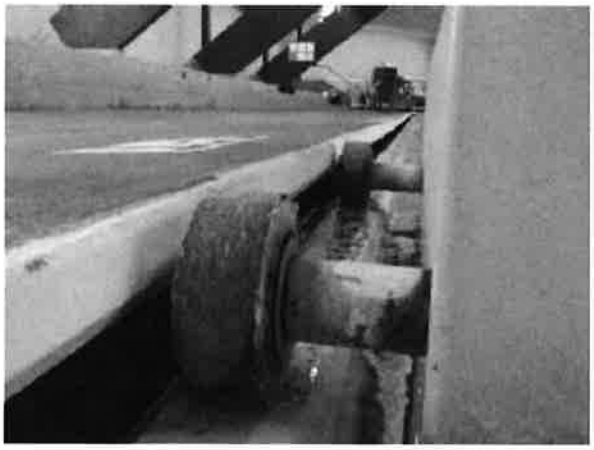
Immediate: Provide new starting blocks that are compliant with the NFSHA.

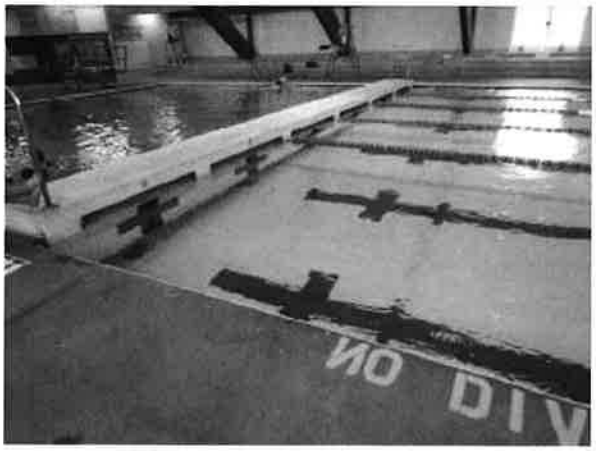
Ensure that all anchors are at the same elevation, completely secure, and properly bonded per NEC 680. Ensure that starting blocks are a maximum of 30" above the water surface when installed.

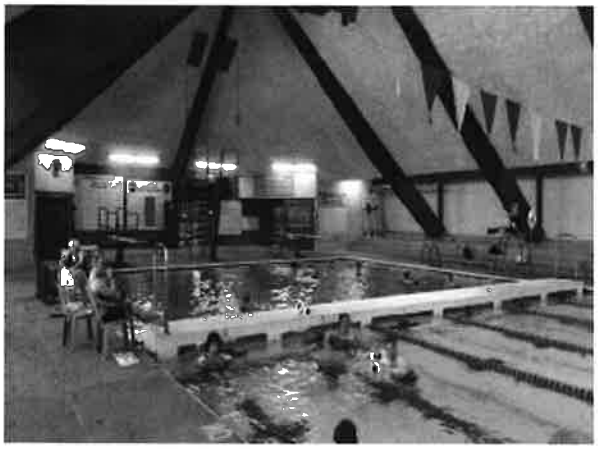
2.5 Bulkhead

The bulkhead at the Lions Pool Facility was observed to be in poor condition. The actual age of the bulkhead was not recorded during the site visit. The bulkhead was observed to be a Stark fiberglass flow through bulkhead. The bulkhead moves manually, so it requires people to push or pull both ends simultaneously. The bulkhead wheels are located directly on the gutter coping and have damaged the gutter finish over the years.

During the time of the site visit the bulkhead was located at the slope break between the shallow and deep ends of the pool. When located at the slope break, the bulkhead creates a 25 yard race course from the bulkhead to the shallow end wall. This course is 4'6" at its deepest point and therefore would not provide adequate depth for starting blocks. According to facility staff, the bulkhead is moved into the shallow end when the pool is to be used for competitive swimming. The only location that starting block anchors were observed was at the deep endwall. The deep end does provide adequate depth for competitive block starts.







Recommendation

Future: Due to the age of the bulkhead, its physical condition, and the gutter coping damage it is causing, a bulkhead replacement shall be considered. If a new bulkhead is purchased as a replacement, it is recommended that an inflatable Stark bulkhead be installed. Inflatable bulkheads are beneficial because they do not require any wheels or tracks for movement. Anchors shall be installed in the pool deck at all locations where the bulkhead will be located for the various course configurations.

2.6 Timing Equipment

A timing system was not observed at the Lions Pool Facility. A single line scoreboard was observed on the natatorium wall. The scoreboard appears to be in good condition, but it was not observed in operation at the time of the site visit. Deck plates for connection of touchpads nor other timing equipment were observed at the facility during the visit.

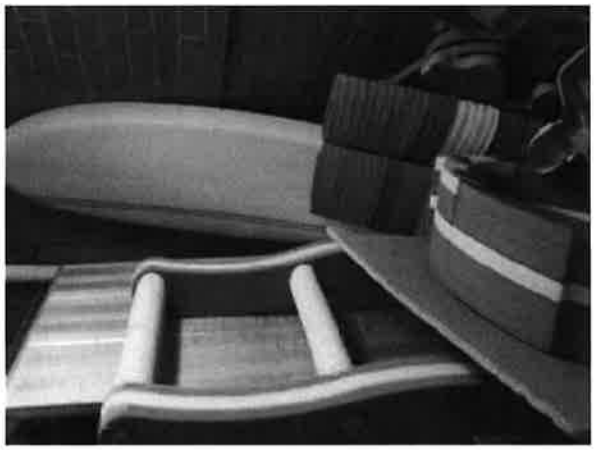
Recommendation

Immediate: Repair the scoreboard on an as needed basis. If touch pads are used, verify that the race course meets the requirements of a 75'-0" course length with touchpads installed on the endwalls.

Future: Due to the amount of swim teams that use the facility, installing a permanent timing system may be a beneficial additional to the facility and its users. The timing shall consist of deck plates, wall plates, touchpads, pace clocks, and any other equipment deemed necessary by facility staff. Colorado Timing Systems or Daktronics are the recommended timing system manufacturers. A new six (6) line scoreboard shall be considered for the facility.

2.7 Safety Equipment

Various pieces of safety equipment can be found throughout the natatorium and its support spaces. A complete inventory was not taken at the time of this site visit.



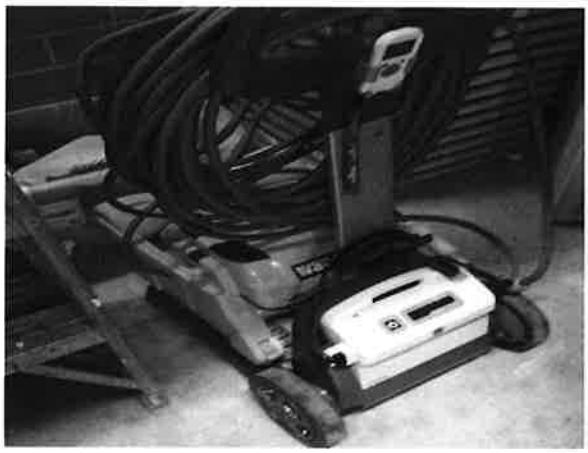
Recommendation

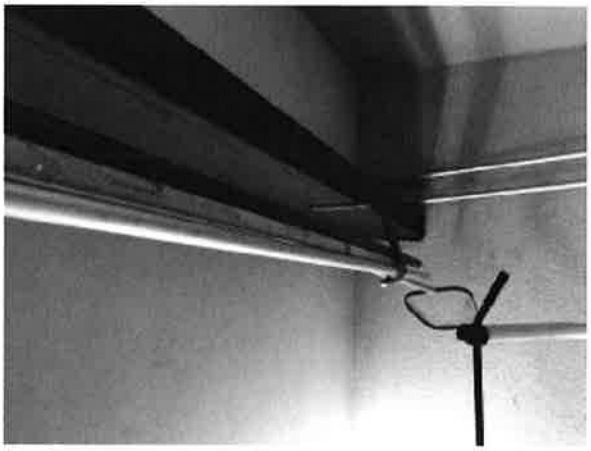
Immediate: The aquatic safety protocol or risk management was not discussed at the time of the site visit. It would be advisable to take inventory of the present equipment to ensure compliance with all local and state codes. The following safety equipment items should be found throughout the natatorium and its support spaces.

- U.S. Coast Guard approved life rings with throw ropes 1-1/2 times the width of pool (at each guard stand)
- Shepherds hook minimum 12 ft. in length
- Safety ropes complete with anchors at proper locations (transition depth points)
- First aid kit as per health department regulations
- Eye wash station at or near chemical treatment systems (wall hung package unit)
- Fire extinguisher as per local code
- Deck located emergency shut off switch for the pool recirculation pump

2.8 Maintenance Equipment

The facility currently utilizes a Palintest Pool Test 9 for manual water testing protocol. Pool cleaning is provided by two (2) different types of portable vacuums. A Manual Max-Sweep and a Robotic Dolphin Wave-E 100 were observed in the storage closet nearest the diving boards. The working condition of the vacuums was not confirmed at the time of the site visit.





Recommendation

Immediate: The Pooltest 9 by Palintest adequately meets the water testing needs of the Lions Pool facility. When using the test kit ensure to adhere to the test parameters provided in the Washington State Code.

Confirm emergency action plan is in place and rules signage is approved. Also, confirm administrative code required forms, record keeping, and operating protocols and procedures are provided.

2.9 Deck Equipment

Various pieces of deck equipment can be found throughout the natatorium and its support spaces. A complete inventory was not taken at the time of this site visit. Kick boards, fins, life jackets, aqua belts, weights, and other flotation devices were observed to be stored on the pool deck and in the storage closet behind the diving boards.

Recommendation

Immediate: It appears that almost all of the pool deck equipment is stored on the pool deck. Although deck clearance does not appear to be an issue, it would be advisable to store deck equipment in a nearby storage room or support space.

III. Pool Mechanical Items

3.1 Piping

3.2 Pumps

3.3 Natatorium Dehumidifier and Pool Heating System

3.4 Filtration System

3.5 Surge Tank

3.6 Valves

3.7 Chemical Treatment System

3.8 Pool Water Level Control

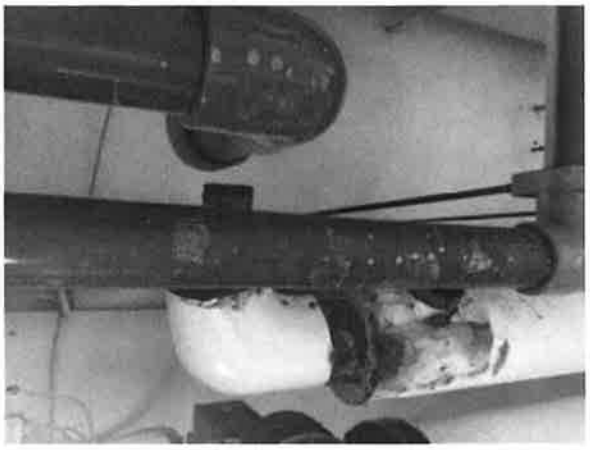
C. Pool Mechanical Items

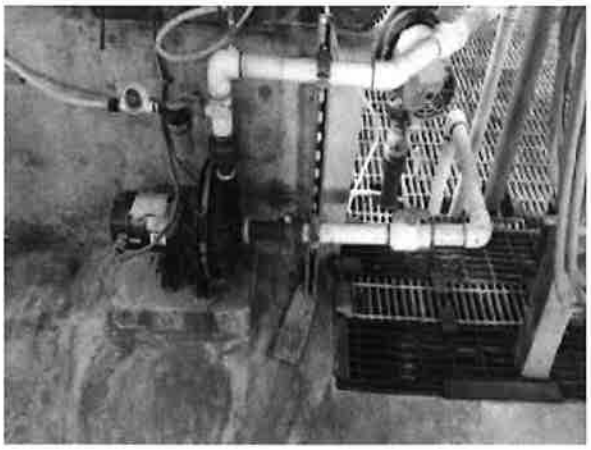
3.1 Piping

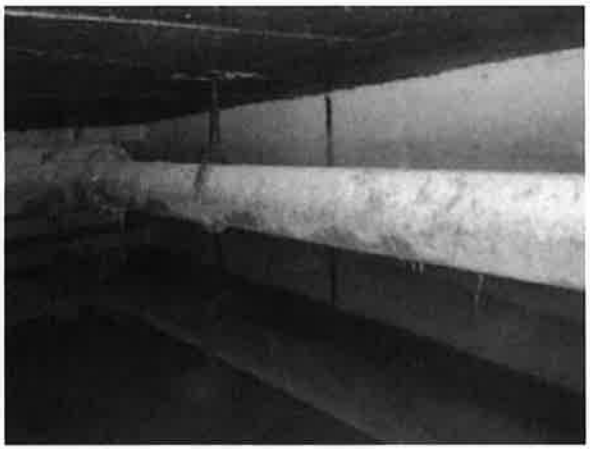
The visible recirculation piping for the pool in the pool mechanical room is cast iron. The chemical feed loop piping that intersects the main recirculation loop and the fresh water fill line are 40 PVC. The piping appears to be in fair to poor condition. Some sections of the main cast iron recirculation pipe were stated to be in near failing condition by facility staff. However, visual observation could not be done due to the pipe locations. The return line from the main drains is shown as an 8" line on the '72 construction drawings. This section of pipe runs underneath the pool, comes up through the surge tank floor, and then penetrates the filter tank wall. Water flows from the main drains into the filter tank when the modulating float valve is actuated. The provided pool drawings indicated the presence of a modulating float valve, but the existence of the valve could not be confirmed from the site inspection.

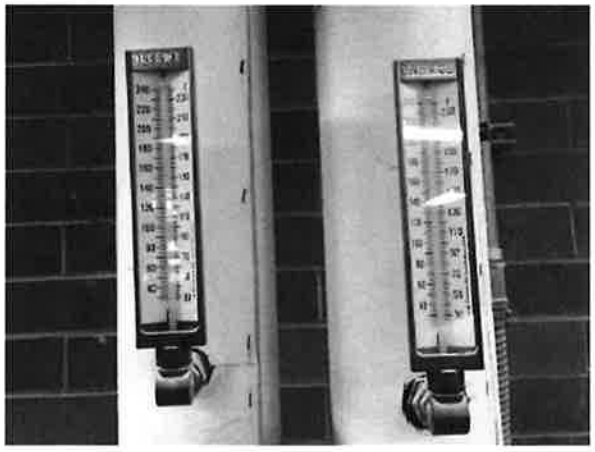
Very little, if any, color coding or labeling was observed on the mechanical room piping. It is industry standard to provide plumbing identification through either color coding or labels. The majority of the valves in the mechanical room have labels identifying their purpose, however there is no posted piping and valve schematic.

The pool has an 8" cast iron pipe that routes water from the two (2) main drains back to the filter via static pressure head. An 8" cast iron equalizer line also routes water from the surge tank to the filter tank. It is industry standard to size gravity piping to flow at 3 fps. Due to the unique design of the pool's perimeter overflow system, there was no gravity piping to take into consideration, rather the perimeter gutter trench flowed via gravity, albeit in a pressurized condition. Washington State Code requires a 1% slope minimum for all gravity piping. In the case that a 1% slope is not provided for gravity piping, a design solution, prepared with a detailed explanation may be sufficient. The Washington State Code requires suction piping to not exceed 6 fps. The max water velocity in the main drain suction lines would be around 4 fps, assuming a flow rate of 597 GPM. The discharge piping, from the effluent end of the pool recirculation pump back to the pool, is 6" PVC, and believed to be Schedule 40 PVC. Again assuming a flow rate of 597 GPM, the discharge velocity is approximately 6.62 fps. Washington State Pool Code does not provide any guidelines on maximum or minimum discharge velocity, as long as the flow rate meets the minimum State required turnover rate. Because the discharge piping velocity falls below the typical industry maximum velocity, it can be assumed that the piping is adequately sized for the current flowrate.










REHEAT COIL RETURN

Recommendation

Immediate: A majority of the mechanical room piping is in need of replacement. Industry standard for all exposed pool piping outside of the pool shell is Schedule 80 PVC. All exposed mechanical room piping including, including the recirculation loop, shall be replaced with Schedule 80 PVC.

When new piping is installed, any potential future flow rates shall be considered as the basis for pipe sizing. According to facility staff the current recirculation system is sized to meet the minimum turnover required by the State. The future system should be designed to provide a faster turnover, in the range of 4 to 5 HRS. Measures should be taken to ensure that pressure piping does not exceed a velocity of 10 fps, all gravity piping does not exceed 3 fps, and all suction piping does not exceed a velocity of 6 fps in accordance with industry standards and applicable codes.

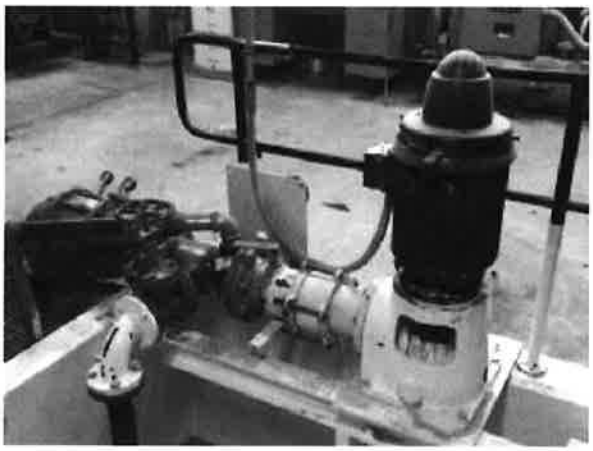
Color coded directional arrows for the piping in the mechanical room should be considered but is not necessary for compliance with Washington State Code. Additionally, valve tags/labels should be located on any unidentified valves and a posted piping and valve schematic in accordance with industry standards shall be provided.

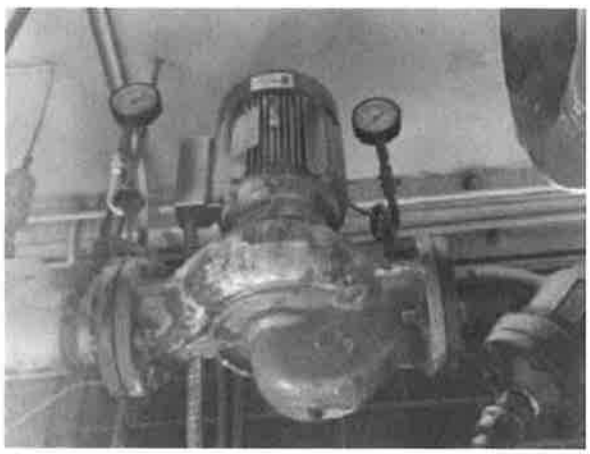
3.2 Pumps

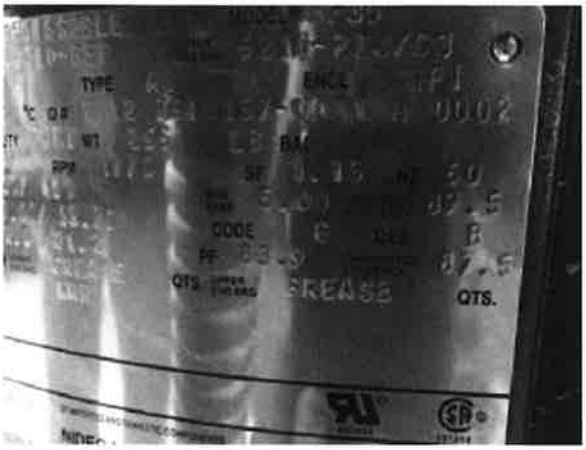
The pool has one recirculation pump, which was recorded as one (1) US Motors pump, model number BF30. The pump was observed to be a 15 HP, 3 phase, 60 Hz, 1770 RPM, vertically mounted recirculation pump. Facility staff noted that the pump motor was last replaced in 2013. Even though the pump was replaced recently, facility staff expressed dissatisfaction with its performance. According to facility staff the pump barely provides enough flow to meet the minimum State required turnover of 6 HRS. During the site visit no flow meters were observed. The pump strainer was in the form of a square stainless steel screen. A pressure gauge, reading 8 psi, was recorded along with a vacuum gauge reading of 5 Hg (-12.4 psi). As per industry standard, vacuum and pressure gauges are required on the suction and pressure sides of pool pumps. The pump is mounted on brackets that span over the filter tank. The motor did not appear to be bonded and the knife disconnect was not labeled.

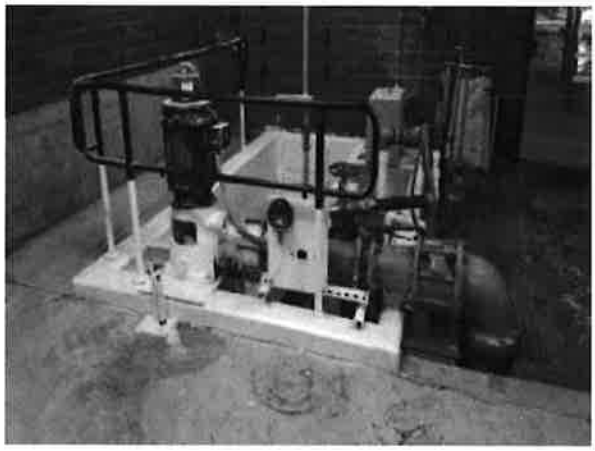
A booster pump was observed in the mechanical room by the chemical loop. According to facility staff the booster pump was installed to help circulate water through the chemical feed loop. The flow that the recirculation pump provides does not create enough pressure to simultaneously circulate the secondary chemical loop. It is unknown if the booster pump was needed before the recirculation pump was replaced in 2013. The booster pump was observed to be an Emerson ¾ HP, 1 phase, 60 Hz, 3450 RPM, horizontally mounted pump. At the time of the site visit no flowmeters or gauges were observed on the suction or pressure sides of the pump. As per industry standard, vacuum and pressure gauges are required on the suction and pressure sides of all pumps. The pump appeared to be attached to a housekeeping pad. The motor did not appear to be bonded but a labeled knife disconnect switch was observed.

Three (3) additional booster pumps were observed in the mechanical room but were not in operation. One (1) of the three (3) booster pumps was located in the old heat exchanger loop but served no purpose due to the heat exchanger being inoperable.









Recommendation

Immediate: Replace the recirculation pump with a pump that can adequately surpass the state required turnover as well as power the chemical feed loop. To meet a 4 HR turnover the new recirculation pump will need to provide a flowrate of 895 GPM. Provide vacuum gauges on the intake suction side of all pumps and pressure gauges on the discharge side. Provide labels for the knife disconnects and ensure they are working properly. Ensure all pumps are properly bonded as per NEC 680.

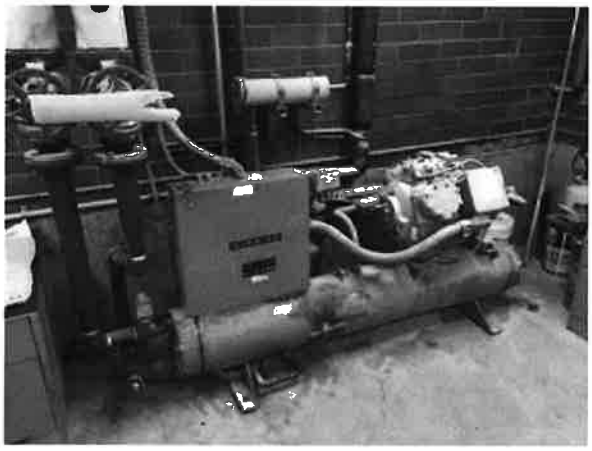
Future: Provide a VFD for the recirculation pump. This addition will cut down on energy costs drastically. The VFD should be a product manufactured for the commercial aquatics industry similar to a Pentair Acu-Drive (Danfoss) or H20-Technologies Smart Pump Control System (SPCS). Provide digital magmeter style flow meters with digital readout for the pool return lines and connect to the VFD and chemical controller to ensure maximum energy efficiency while maintaining the design flow rate. The flow meter should be capable of sending a 4/20 mA signal to the VFD and chemical controller. The flow meter should be located where there are at least 10 x pipe diameters of straight pipe before and after the sensor after the filter system on the discharge side of the pump.

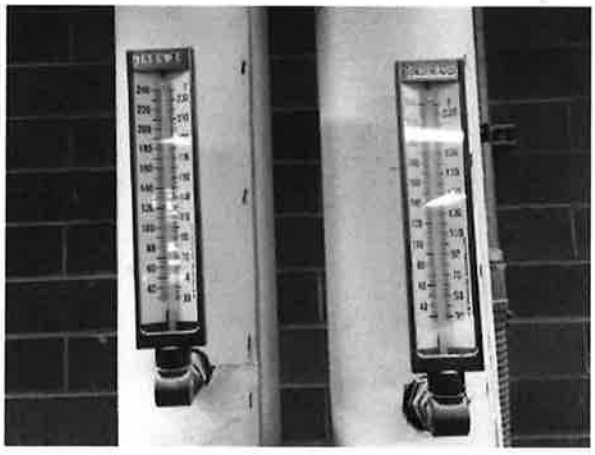
3.3 Natatorium Dehumidifier and Heating System

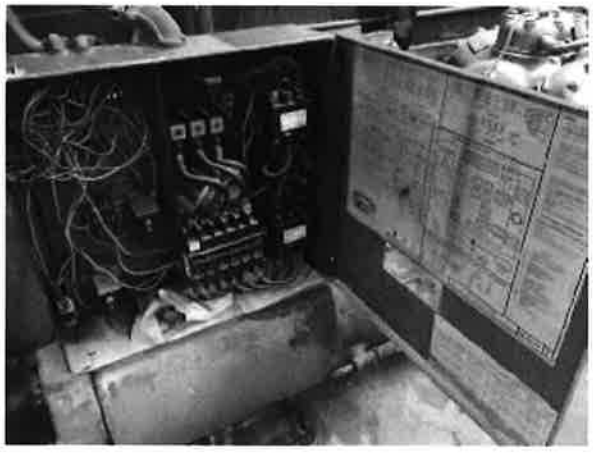
The natatorium dehumidifier observed at the Lions Pool Facility was not in use during the site visit. According to the facility staff, the water supplied to the dehumidifier for cooling purposes was too hot and therefore could not sufficiently cool the dehumidifier down.

The air and water temperatures inside the natatorium were recorded to only be a few degrees apart and the chemical controller displayed the water to be 87°F. Industry standard is to maintain air temperature approximately 2 degrees above water temperature (although not usually above 86°F), maximizing human comfort and minimizing evaporation. Evaporation of the water surface is affected by water temperature, air temperature, air velocity and relative humidity.

The current pool heating system was recorded to be functioning effectively and therefore no additional immediate action is required. Due to the age of the pool boiler, a replacement should be concerned in 5-10 years.







Recommendation

Immediate: Repair existing dehumidification system.

Future: Replace the natatorium's dehumidification system, HVAC unit, and pool boiler.

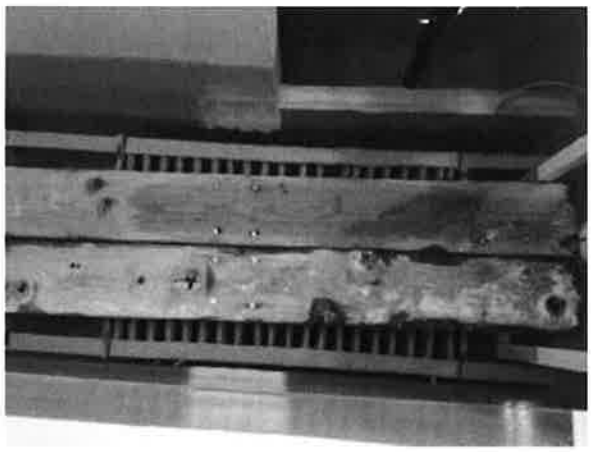
3.4 Filtration System

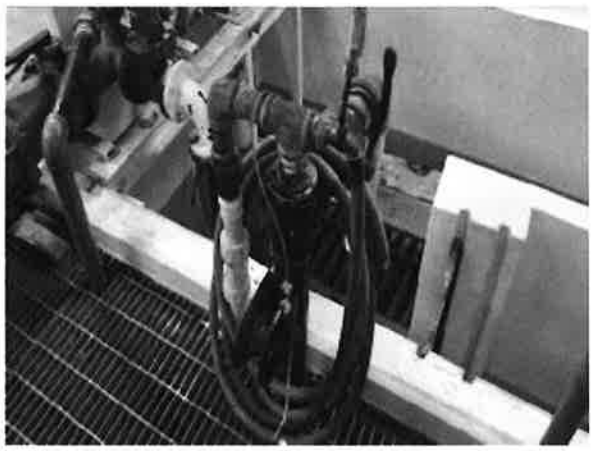
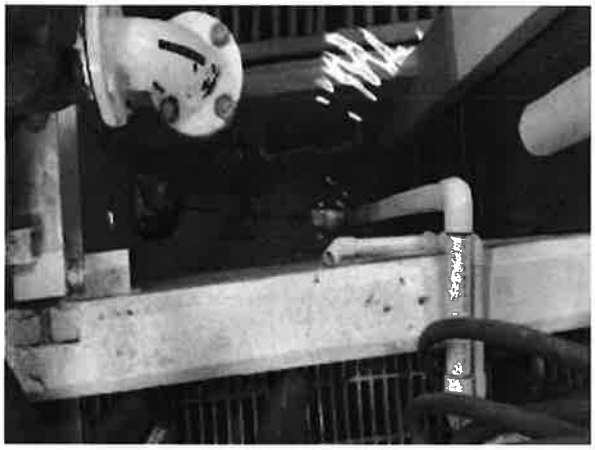
Currently, the pool utilizes a vacuum diatomaceous earth filtration system. The system is composed of a filter tank which houses twenty (20) 32" square diatomaceous earth cartridges. The cartridges provide 142 SF of filter area. At the current assumed flow rate of 597 GPM, the approximate filtration rate is 4.20 GPM/SF of Filter Area. This is significantly higher than the usual standard of 1.5 GPM/SF. Higher filtration rates typically result in more backwashing, as well as deterioration of overall filtration performance. Typically Facility staff noted that the cartridges are generally bumped every two (2) weeks and the filter media is replaced every 2½ months.

The backwash discharge from the open top filter tank is by gravity and the filter elements are cleaned by water jet sprays and/or by manual labor. As a result, only a little more than the volume of the filter tank including the spent D.E. needs to be discharged via the sanitary sewer system.

The Lions Pool does not have a backwash catch basin resulting in a direct conveyance of filter backwash water to the pool sanitary sewer. Many jurisdictional authorities require a reclamation tank between the D.E. filter tank and the backwash outfall so that the spent D.E. is captured and not discharged into the sanitary sewer. The captured D.E. is then hauled to an approved dump site.

The filter tank itself is open to atmosphere which is convenient for maintenance and monitoring. Two (2) wooden planks were observed to serve as a walking bridge over the filter tank. The floating planks were dangerous due to the fact that they began to sink when stepped on.




Recommendation

Immediate: Confirm that diatomaceous earth can continually be drained directly to sewer during backwash cycles.

Future: The perimeter of the filter tank shall be provided with better barriers to prevent patrons or facility staff from falling into the pit. The wooden planks inside the filter tank shall be supported in a way that they do not sink when stepped on.

During the site visit the water clarity was observed to be good. While the observed water quality was good, a new filtration system is still recommended to be installed. Regenerative media filters that are under pressure in lieu of a vaccum are becoming more common than vacuum diatomaceous earth filters because they can be more environmentally friendly and are often considered less labor intensive. The common media used in regenerative media filters is known as Perlite. One benefit of Perlite being environmentally friendly is that it can be routed directly to sewer after backwashing. If a closed filter system is installed, it is recommended to install an automatic air relief valve to

each filter. The automatic relief valves should be hard plumbed to the nearest floor drain to limit excess water from pooling on the mechanical room floor. All filter tanks should be securely anchored to a housekeeping pad and pool mechanical room floor to limit vibrations.

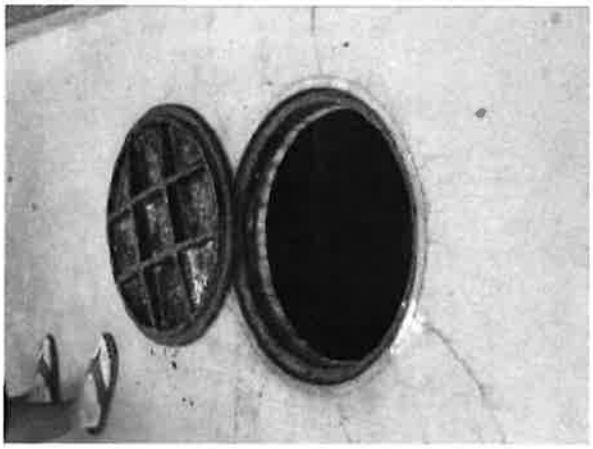
Install a flow meter on each backwash line for backwashing and pool draining procedures. Each backwash line must have a 6" air gap prior to discharging into the backwash catch basin. Ensure the inside surfaces of the backwash catch basin are properly waterproofed. Confirm the sewer capacity with the city. If the sewer capacity cannot handle the current backwash flowrate, it would be necessary to enlarge the current backwash catch basin as coordinated with the city to meet the backwash flow rates.

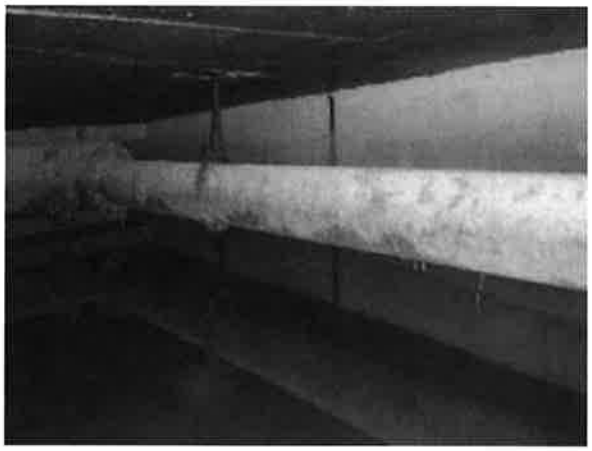
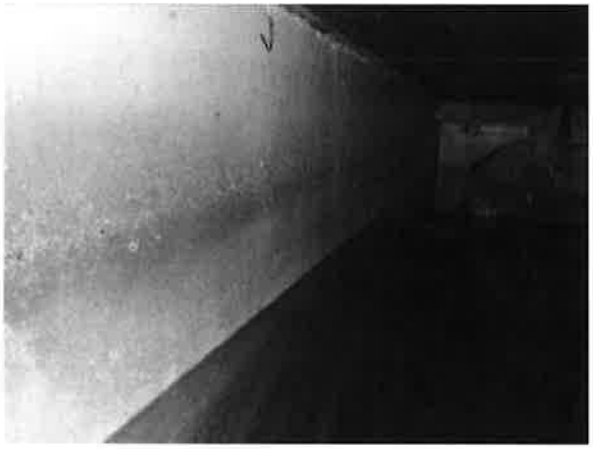
3.5 Surge Tank

Currently, there is one (1) surge tank at the facility. A circular manhole located in the deck serves as the main access point into the surge tank. The surge tank is located directly under the deck behind the diving boards. Water is conveyed to the surge tank via the pool's perimeter gutter and main drains. The perimeter trench drain appears to drop at a constant slope on all sides of the pool until it empties into the surge tank. At the floor of the surge tank there is a drain which sends the perimeter overflow water directly into the filter tank. The surge tank drain is noted to have some form of screen covering the opening. The '72 construction drawings indicate that the surge tank is 22'-5" x 7'-4" x 7'-5", which provides a surge capacity over 9000 gallons. It is common practice in the aquatics industry to size surge tanks for one (1) gallon of surge capacity for every square foot of pool surface area. (Note: this is in addition to the normal operating level of the water in the surge tank which is typically 36" above finish floor.) Currently, the perimeter overflow trench flows via gravity to the surge tank and the main drain lines flow via static pressure head to the filter tank.

At the time of the site visit, the operating water level in the surge tank could not be confirmed in relation to the operating water level in the pool. However, based upon visual observation the operating level appeared to be at an expected level with several feet of surge capacity.

It was not clear if there was waterproofing provided on the interior surfaces of the surge tank. Due to the configuration of the surge tank it seems that the only way for air to evacuate the inside of the surge tank is back out through the perimeter overflow gutter. If this isn't providing adequate ventilation, the chloramine concentration within the surge tank is most likely high. Because chloramines can attack metals contributing to corrosion, the cast iron piping located in the surge tank appeared to be in poor condition.



Recommendation

Immediate: Replace all piping within the surge tank with Sch. 80 PVC. All piping supports found within the surge tank shall be stainless steel.

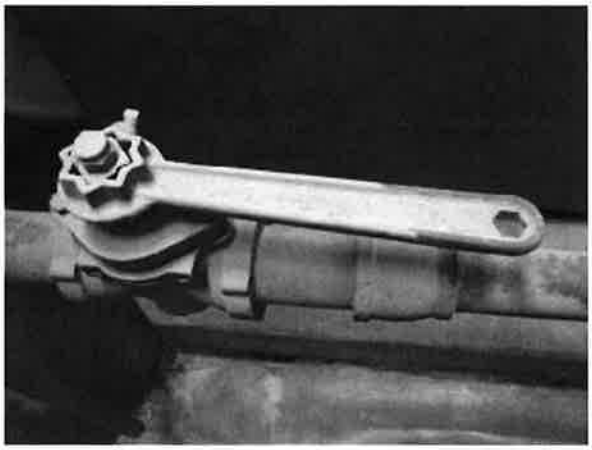
If any valves are to exist within the surge tank, they must have extensions and be accessible through access ports in the surge tank lids

Future: Provide new access hatch for the surge tank.

No ventilation system was observed for the surge tank during the site visit. Install a ventilation system for the surge tank and vent all air to the exterior of the building. Completely waterproof the interior surfaces of the surge tank and conduct a water tightness test.

3.6 Valves

The valves in the mechanical room are a mix of cast iron gate and ball valves, PVC ball valves, and butterfly valves. The industry standard is to use true union ball valves to allow the valve to be accessed without having to cut the connecting PVC piping for valves smaller than 3". All valves greater than 3" shall be butterfly valves. Some of the valves in the mechanical room have identification tags, but there is no posted piping and valve schematic.



Recommendation

Immediate: Provide valve tags for each valve and post a piping and valve chart system schematic in the pool mechanical room.

Future: Replace all valves with Schedule 80 PVC true union style ball valves and butterfly valves. This upgrade would make the most sense to complete when the pool mechanical room piping is upgraded to Schedule 80 PVC. Ensure each piece of mechanical room pool equipment (e.g. pumps, filter systems, heater, etc.) has isolation valves to assist with maintenance and cleaning.

3.7 Chemical Treatment System

The Lions Pool facility contains a chemical room located inside of the mechanical room. The chemical room contains all chemical treatment operating equipment for all the pool chemicals. The chemical room also serves as storage for all chemicals. Minimal signage was observed and the room was lacking a proper ventilation system. One large portion of the chemical room wall was cut out allowing the air to equalize with the air within the mechanical room.

Currently, the pool is utilizing CO_2 as the pH buffer. There is a bulk tank stored in a small chemical room near the backdoor of the mechanical room. The bulk tank has a filling point located inside a lockbox on the outside wall of the natatorium building. There are also 3 additional smaller cylinders that are located in the small chemical room. The extra cylinders appeared to be connected and ready to use in the circumstance that the bulk cylinder tank runs out of CO_2. One (1) Strantrol CO_2 feed system was observed in the mechanical room. Pressure gauges were observed on all cylinders in the chemical room. Gauge readings varied during the time of inspection from "order gas" seen on the small tank gauge to "120 psi" seen on the bulk tank. The only chemical signage observed indicating the presence of carbon dioxide gas was on the outside of the chemical room door. From inspection it appeared that chemicals are injected after the heating loop.

Currently, the facility uses calcium hypochlorite as a sanitizer. Calcium hypochlorite is the solid form of chlorine which comes in varying sizes from small puck shaped pellets to briquettes. The calcium hypochlorite pellets and the chlorination system are stored in the same chemical room that houses the CO_2. Minimal HAZMAT signage was observed in or around the chemical room. The outside of the chemical room door had a "Danger Chlorine" sign posted. Inside the chemical room a poster was observed that described how to properly handle and store the calcium hypochlorite. The facility uses one (1) Pulsar 3 Chlorination System and small oval calcium hypochlorite pellets about the size of a quarter. The injection line which supplies the Pulsar 3 system with water is located directly after the booster pump and has a small red paddle wheel flow sensor. An additional line was observed right after the Pulsar 3 injection line. The second line is shown going from the chemical loop up to the chemical controller. Because this line is on the pressure side of the pump we can tell that water is flowing from the chemical loop to the chemical controller where the water quality is read, allowing the chemical controller to make needed adjustments. A third line was observed running from the chemical controller to a location under the deck grating. It is assumed that this line is then injected into the main recirculation line or the main chemical loop right before it ties into the recirculation line. Both the CO_2 and chlorine lines leave the chemical room together and fall below the deck grating at the same location.

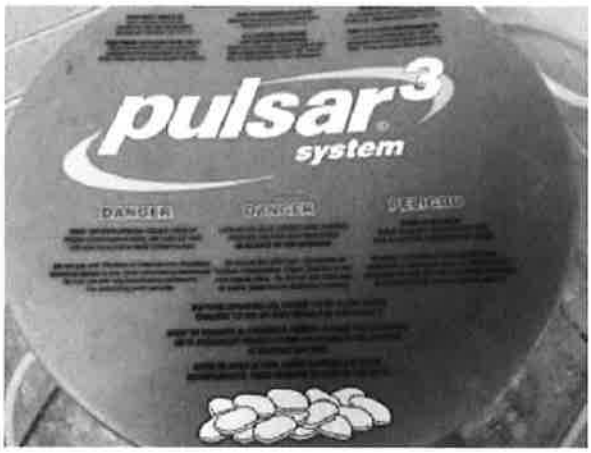
Calcium Hypochlorite (tablet chlorine) is classified as a corrosive - class 3 oxidizer. It is flammable and high in hazard. Some codes limit storage from 2 to 200 lbs. in a single location. If this maximum quantity is exceeded, this space will need to be classified as a high-hazard group H occupancy. High Hazard group occupancy ratings require sprinkler systems, non-combustible floors, storage containment requirements and fire ratings. These requirements can be found in the IBC and IFC. These areas should also be vented by the

requirements set forth in the International Mechanical Code (IMC). During the site visit very small quantities of calcium hypochlorite were observed, and facility staff noted that excess chemicals were stored at another facility.

In regards to ventilation, Washington State Code (WAC 246-260-031 Section 17.e) states, "*Owners shall provide adequate ventilation (in conformance with ASHRAE standards for pools and decks) to maintain air quality and to prevent moisture buildup in indoor areas. Design considerations must include maintaining negative pressure in the pool and deck area; providing adequate total airflow for acceptable air distribution; and preventing short-circuiting of fresh air return to exhaust. Chlorine rooms must have mechanical exhausting ventilation that includes:*"

- *Air inlets located as far as possible from fan intakes to promote good air circulation patterns;*
- *A minimum of one air change per minute in the chlorine room when fan is operating;*
- *A remote switch outside the room or a door-activated switch to turn on fan before entering;*
- *Suction for fan near the floor*
- *Exhaust vents located to prevent chlorine contaminated air from being drawn into supply air*
- *Screened chlorinator vents.*

There is one (1) chemical controller secured to the wall directly outside the chemical room opening. The chemical controller is a Becsys 5 which was installed in 2013. At the time of the site visit, the pool had a pH reading of 7.48, an ORP of 819 mV, and a temperature of 87 °F.

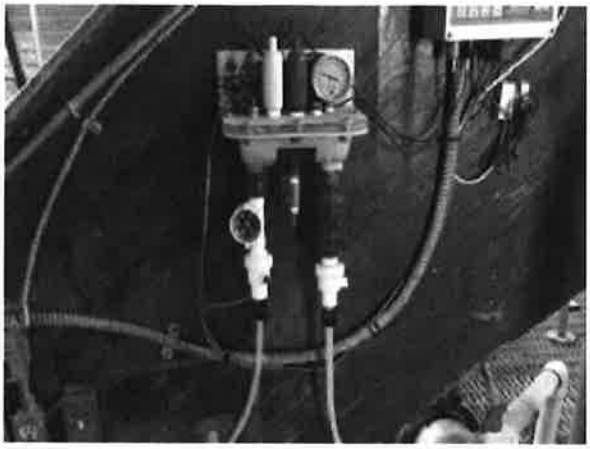


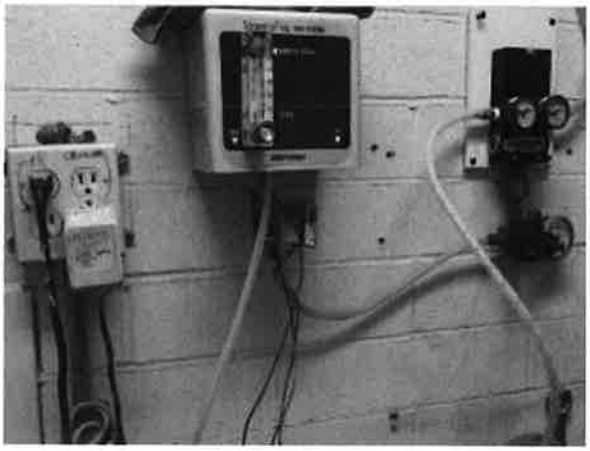

PH
CHLORINE
CHLORINE


CYLINDER IN USE
INDICATORS


easy
CARB


easy
CARB





Recommendation

Immediate: Washington State Pool code has no specific requirements for calcium hypochlorite and CO_2 being stored separately. However the International Building Code does pose restrictions on the varying amounts of chemicals that are allowed to be stored in a space based on the room's hazard rating. If less than 200lbs of Calcium Hypochlorite is to be stored at the Lion's Pool Facility the room will not need to be classified as a high hazard space and will therefore incur less restrictions. However Washington State Pool code still requires certain measures be taken for any room that will house chlorine. According to Washington State Code (WAC 246-260-031 Section 17.e), "*Chlorine rooms must have mechanical exhausting ventilation that includes: Air inlets located as far as possible from fan intakes to promote good air circulation patterns; A minimum of one air change per minute in the chlorine room when fan is operating; A remote switch outside the room or a door-activated switch to turn on fan before entering; Suction for fan near the floor; Exhaust vents located to prevent chlorine contaminated air from being drawn into supply air; Screened chlorinator vents.* Because the chemical room is open to the mechanical room they may both require exhausting ventilation.

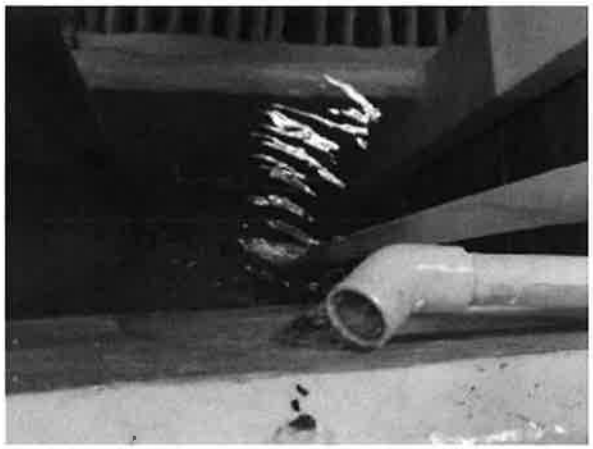
Provide adequate HAZMAT signage for the chemical room.

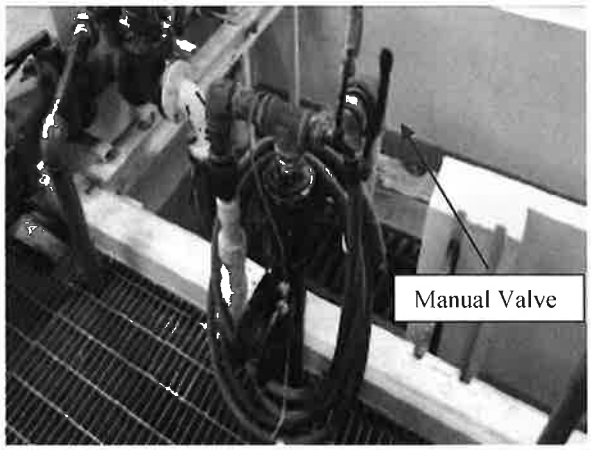
Future: Provide an additional chemical room that is outfitted with the proper signage and ventilation.

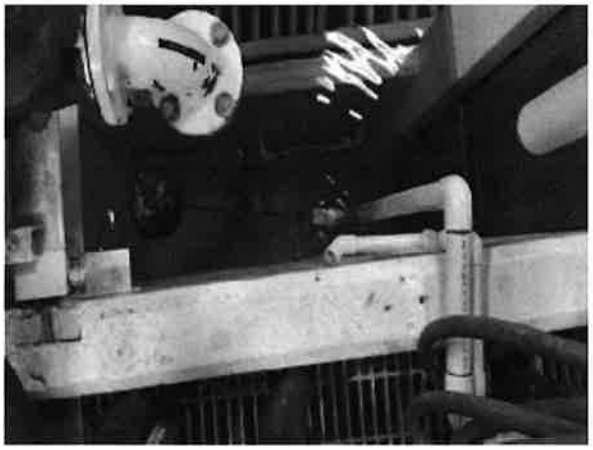
Provide one (1) ultraviolet (UV) light disinfection and dechloramination system for tertiary water treatment to help maintain proper water chemistry and air quality in the natatorium. Ensure an Ethernet connection is provided for remote access.

3.8 Pool Water Level Control

The water level control system for the pool uses a modulating float valve located within the d.e. filter tank. When the water drops to a certain height in the filter tank, the float triggers the valve to open which adds water to the filter tank. The valve will begin to close as the float rises to the desired height from the added fill water. There is also a manual fill valve located by the auto fill line. This valve can be actuated by a facility operator at any time.







Recommendation

Future: Because there appears to be no high level water sensor, it is recommended to provide an automatic water level control system complete with a monitor located in the pool mechanical room, one (1) surge tank mounted wet cell with normal and high level sensor probes, and an automatic solenoid valve on the fill line. System to be similar to an ELC-810 by AquiControl Technology. Provide a water totalizer meter for the domestic fill water for the pool system with a digital readout similar to those manufactured by Sensus. It would make the most sense to complete these upgrades when the surge tanks is repaired, replaced, or even cleaned.

IV. Conclusion

D. CONCLUSION

The items/issues addressed in this report reflect only the observable conditions during the site visit. It is therefore suggested that the report be amended and/or expanded as necessary by individuals that have been involved with the day-to-day operation of the facility. Their experience and knowledge of the pool's history is vital in preparing a comprehensive appraisal of the facilities shortcomings and specific defects.

Immediate

1. Replace all exposed mechanical room piping with Sch. 80 PVC
2. Add a contrasting tile band at the 4'-6" depth contour
3. Replace existing main drains sumps and covers with VGB certified system
4. Repaint all depth markers and warning signs. Add additional depth markers and warning signs wherever needed to comply with Washington State Code
5. Replace all corroding and missing escutcheon plates
6. Permanently anchor the existing pool lift to the deck at the shallow end
7. Fill in and repair all areas of the pool decks where water is ponding, rebar is showing, or cracks have formed
8. Replace all missing/broken tiles on pool shell
9. Replace the caulking for the expansion joints between the deck slabs with chlorine resistant caulking similar to Vulkem 116 or 226
10. Provide flush mounted caps for all utilized deck anchors when they are not in use
11. Provide color coded directional arrows to piping in the mechanical room. Install valve tags on all valves and provide a posted piping and valve schematic in accordance with industry standards
12. Provide new vacuum gauges on the intake suction side of the pumps and pressure gauges on the discharge side
13. Install a flow meter on the backwash line for backwashing and pool draining procedures
14. Provide a CO2 sensor and alarm for the CO2 room
15. Provide proper HAZMAT signage for the chemical rooms
16. Provide Washington State Code compliant ventilation system for chemical room
17. Repair natatorium dehumidifier
18. Replace all starting blocks and starting block deck anchors
19. Remove springboards and install new 1-Meter springboard in prior 3-Meter location
20. Install movable entry ramp

0 - 5 Years (Short-Term)

1. Provide new recirculation pump
2. Renovate existing d.e. filter pit to accommodate new recirculation pump
3. Provide automatic water level control system, including wet cell and water meter totalizer
4. Replace all valves with Schedule 80 PVC true union style ball valves and butterfly valves. Provide isolation valves for each piece of equipment (e.g. pump, filter system, heater, etc.)
5. Install new Regenerative Media Filtration System
6. Replace pool piping from main drains to surge tank and install modulating float valve in surge tank
7. Provide new bulkhead
8. Provide a safety rail for the steps of the 3-Meter diving board
9. Provide a 6" air gap between each backwash line and the backwash catch basin
10. Install a flow meter on each backwash line for backwashing and pool draining procedures
11. Provide a sealed and ventilated chemical storage rooms for pool sanitizer and pH buffer
12. Provide new chlorine feed system for the pool sanitizer
13. Install new Timing System and Scoreboard
14. Install new Pool plaster finish with ceramic tile trim
15. Provide new natatorium dehumidifier

5 -10 Years (Long-Term)

1. Replace the gutter systems with either new stainless steel gutter systems or new concrete gutter systems
2. Replace all of the gutter underground piping, dropout piping, main drain piping, and pressure return piping going between the pool shell and the pool mechanical room with new Schedule 80 PVC piping
3. Provide new floor inlets with directional eyeball fittings. Provide waterstops for all penetrations through concrete. Properly fill in all old inlet penetrations with concrete.
4. Replace all existing diving stands with new Durafirm stands and new diving boards
5. Replace Pool Boiler

Anytime (Energy Saving)

1. Provide thermal pool covers for when the pool is not in use to reduce pool heating costs
2. Provide stainless steel storage reels for storing the pool covers
3. Provide a VFD for each of the recirculation pump similar to a Pentair Acu-Drive (Danfoss) or H20-Technologies Smart Pump Control System (SPCS)
4. Provide ultraviolet light (UV) disinfection and dechloramination systems for tertiary water treatment to help maintain proper water and air chemistry in the natatorium
5. Provide digital magmeter style flow meters with digital readout for the pool return lines and connect to the VFD and chemical controller to ensure maximum energy efficiency while maintaining the design flow rate

V. Opinion of Probable Cost

OPINION OF PROBABLE CONSTRUCTION COST

Preparing a budget to restore the pools and putting the pools back into a "new" operating condition must take into account possible "surprises" that may surface during the process. Accordingly, the recommendations for remedial work and/or equipment described in this report must be assumed to be the minimum required based on visual assessments and from commentary by staff.

The following opinion of probable cost addresses the items identified in this report needing repair, replacement, or renovation. The opinion of probable cost addresses the deficiencies of the aquatic center and swimming pool, safety related items for the facility, and code related items that are required by local governing agencies.

Each opinion of probable cost item has a priority ranking, "Immediate" and "Short-Term" (0 - 5 Years). These items are the highest priority items that need immediate attention, are safety issues, code and regulation issues, or tasks done in conjunction with another "Immediate or Short-Term" item and should be completed within five (5) years. Priority "Long-term" (5 - 10 Years) items are items that are functioning presently but may need to be addressed in the near future or should be considered to be included with the renovation work at this time. Priority "Anytime" items are items that present energy saving opportunities that do not have to be added due to any code requirements.

The opinion of probable costs provided for all of the options listed are strictly "ball park" numbers and are meant as a starting point for budgetary and planning purposes to schedule repairs in the future. Counsilman Hunsaker and the Design Team highly recommends soliciting multiple bid quotes for each item prior to contracting any work to ensure the most competitive and up to date bid numbers.

Immediate						
	Item Description	Quantity	Unit Type	Unit Cost	Total	Notes
1	Replace all exposed mechanical room piping with Sch. 80 PVC	1	LS	$50,000	$50,000	
2	Add a contrasting tile band at the 4'-6" depth contour	1	LS	$2,500	$2,500	Washington State Code Requirement
3	Replace existing main drains sumps and covers with VGB certified system	2	EA	$12,500	$25,000	Federal Law Requirement
4	Repaint all depth markers and warning signs. Add additional depth markers and warning signs wherever needed to comply with Washington State Code.	1	LS	$1,500	$1,500	Washington State Code Requirement.
5	Replace all corroding and missing escutcheon plates	8	EA	$100	$800	
6	Permanently anchor the existing pool lift to the deck at the shallow end	1	LS	$500	$500	Federal ADA Law Requirement.
7	Fill in and repair all areas of the pool decks where water is ponding, rebar is showing, or cracks have formed	1	LS	$10,000	$10,000	
8	Replace all missing/broken tiles on pool shell	1	LS	$5,000	$5,000	
9	Replace the caulking for the expansion joints between the deck slabs with chlorine resistant caulking similar to Vulkem 116 or 226	1	LS	$1,000	$1,000	
10	Provide flush mounted caps for all utilized deck anchors when they are not in use	6	EA	$50	$300	
11	Provide color coded directional arrows to piping in the mechanical room. Install valve tags on all valves and provide a posted piping and valve schematic in accordance with industry standards	1	LS	$2,500	$2,500	
12	Provide new vacuum gauges on the intake suction side of the pumps and pressure gauges on the discharge side	4	$/Unit	$100	$400	
13	Install a flow meter on the backwash line for backwashing and pool draining procedures	1	$/Unit	$1,200	$1,200	
14	Provide a CO2 sensor and alarm for the CO2 room	1	$/Unit	$500	$500	
15	Provide proper HAZMAT signage for the chemical rooms	1	LS	$200	$200	
16	Provide Washington State Code compliant ventilation system for chemical room	1	LS	$5,000	$5,000	
17	Repair Natatorium dehumidifier	1	LS	$100,000	$100,000	
18	Replace all starting blocks	7	EA	$2,750	$19,750	
19	Replace all starting block anchors	6	EA	$500	$3,500	
20	Remove the 3-Meter springboard	1	LS	$1,500	$1,500	
21	Install movable entry ramp	1	EA	$7,000	$7,000	

Items Subtotal	**$238,150**
10% Design Contingency	**$23,815**
10% Indirect Costs	**$23,815**
Total (2015 USD)	**$285,780**

0 - 5 Year						
	Item Description	Quantity	Unit Type	Unit Cost	Total	Notes
1	Provide new recirculation pump	1	EA	$10,000	$10,000	
2	Renovate existing d.e. filter pit to accommodate new recirculation pump	1	LS	$20,000	$20,000	
3	Provide automatic water level control system, including wet cell and water meter totalizer	1	LS	$12,000	$12,000	
4	Replace all valves with Schedule 80 PVC true union style ball valves and butterfly valves. Provide isolation valves for each piece of equipment (e.g. pump, filter system, heater, etc.)	1	LS	$30,000	$30,000	
5	Install new Regenerative Media Filtration System	1	LS	$125,000	$125,000	
6	Replace pool piping from main drains to surge tank and install modulating float valve in surge tank	1	LS	$25,000	$25,000	
7	Provide new bulkhead	1	LS	$90,000	$90,000	
8	Provide a safety rail for the steps of the 3-Meter diving board	1	LS	$2,500	$2,500	
9	Provide a 6" air gap between each backwash line and the backwash catch basin	1	LS	$1,500	$1,500	
10	Install a flow meter on each backwash line for backwashing and pool draining procedures	1	EA	$1,000	$1,000	
11	Provide a sealed and ventilated chemical storage rooms for pool sanitizer and pH buffer	100	$/SF	$150	$15,000	Confirm requirements with local building department and fire
12	Provide new chlorine feed system for the pool sanitizer	1	EA	$7,500	$7,500	
13	Install new Timing System and Scoreboard	1	LS	$50,000	$50,000	
14	Install new Pool plaster finish with ceramic tile trim	7000	SF	$20	$140,000	
15	Replace natatorium dehumidifier	14555	SF	$15	$218,325	

Items Subtotal	**$747,825**
10% Design Contingency	**$74,783**
10% Indirect Costs	**$74,783**
Total (2015 USD)	**$897,390**

5 - 10 Year						
	Item Description	Quantity	Unit Type	Unit Cost	Total	Notes
1	Replace the gutter systems with either new stainless steel gutter systems or new concrete gutter systems	314	LF	$260	$81,640	Includes demolition and removal of existing gutter system.
2	Replace all of the gutter underground piping, dropout piping, main drain piping, and pressure return piping going between the pool shell and the pool mechanical room with new Schedule 80 PVC piping	1	LS	$100,000	$100,000	
3	Provide new floor inlets with directional eyeball fittings. Provide waterstops for all penetrations through concrete. Properly fill in all old inlet penetrations with concrete.	56	$/Location	$500	$28,000	
4	Replace all existing diving stands with new Durafirm stands and new diving boards	3	$/Unit	$15,000	$45,000	
5	New Pool Boiler	1	$/Unit	$25,000	$25,000	

Items Subtotal	**$279,640**
10% Design Contingency	**$27,964**
10% Indirect Costs	**$27,964**
Total (2015 USD)	**$335,568**

Anytime						
	Item Description	Quantity	Unit Type	Unit Cost	Total	Notes
1	Provide thermal pool covers for when the pool is not in use to reduce pool heating costs	7911	SF	$2.50	$19,778	
2	Provide stainless steel storage reels for storing the pool covers	2	EA	$10,000	$20,000	
3	Provide a VFD for each of the recirculation pump similar to a Pentair Acu-Drive (Danfoss) or H20-Technologies Smart Pump Control System (SPCS)	1	EA	$1,000	$1,000	
4	Provide ultraviolet light (UV) disinfection and dechloramination systems for tertiary water treatment to help maintain proper water and air chemistry in the natatorium	1	EA	$25,000	$25,000	
5	Provide digital magmeter style flow meters with digital readout for the pool return lines and connect to the VFD and chemical controller to ensure maximum energy efficiency while maintaining the design flow rate	2	EA	$1,000	$2,000	

Items Subtotal	**$67,778**
10% Design Contingency	**$6,778**
10% Indirect Costs	**$6,778**
Total (2015 USD)	**$81,333**