

**AQUATIC FACILITY EVALUATION**

**FOR**

**Tony Aguirre Community Center**

**Indoor Swimming Pool**



**December 2010**

**LARKIN AQUATICS**

**(Inspection Date: November 12, 2010)**



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## **Introduction**

For numerous years members of the Tony Aguirre Community Center have enjoyed its indoor swimming pool and facility. Over time, maintenance efforts and repairs have allowed this facility to continue to serve as an amenity. At the time of the site visit it was found that all systems of the facility are in satisfactory condition, and operating correctly. However there a few areas that require attention in order to allow the facility to continue serving the community.

The purpose of this report is to provide the Tony Aguirre Community Center staff with an evaluation outlining the condition of the pool when viewed by today's aquatic facility standards. This evaluation focuses on:

- The condition of the pool basin
- The condition of the perimeter deck
- The recirculation system for the pool (e.g. recirculation pump, filter, gutter system, etc.)
- The chemical system

## **Applicable Codes and Standards**

It is not unusual for an aquatic facility to outlive the standards for which it was designed. The evaluation of this facility is based on comparison to current state, federal and international design standards, guidelines, and building codes. These codes and standards are primarily concerned with safety and health issues. We learn more and more about safety and health as related to the aquatics industry every year. Codes and standards are constantly being updated and modified to accommodate new trends in aquatics. Larkin Aquatics recommends exceeding minimum design standards whenever feasible.

A list of the major codes, regulations and standards follows:

- The Grate Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. (Ten States Standard)
- Virginia Graeme Baker Pool and Safety Act
- National Spa and Pool Institute (NSPI)
- The Americans with Disabilities Act (ADA)
- International Building Code (IBC)
- Uniform Plumbing Code (UPC)
- National Sanitation Foundation (NSF)

## Facility Configuration

The current configuration of Tony Aguirre Community Center pool is “U” shaped. The length of the pool is approximately 82 feet (25 meters). The width of the exercise/racing lanes area is approximately 15 feet. The width of the sloped entry area is approximately 26 feet.

The pool water depth varies from zero inches to approximately 5 feet-6 inches. The deepest end of the pool has two (2) anchoring embedment for racing/starting platforms.

The entire pool is surrounded by a concrete pool deck.

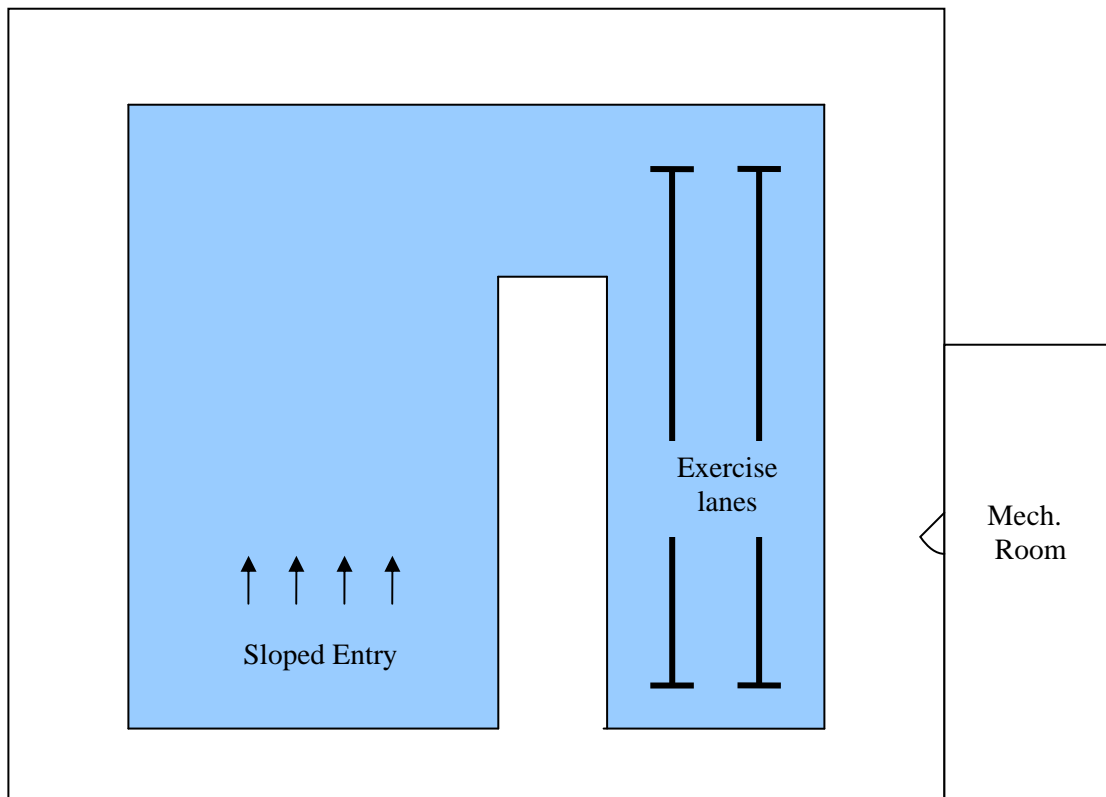


Fig 1. Pool configuration

## Pool Basin

The pool was built as a pneumatically applied concrete basin. A plaster coating was then applied over the concrete. This type of construction is common for indoor swimming pools. When built correctly, these basins are durable and long-lasting.

During the inspection the basin was full of water, and in operation, therefore a thorough evaluation of the basin was infeasible. It is recommended that Larkin Aquatics inspect the basin after the water is drained, and include the findings in an addendum to this report. An investigation of the drained basin would focus on identifying deterioration, potential voids beneath the pool slab, delaminating concrete, or a combination of all these conditions.

While at this time it can not be determined whether or not any portion of the concrete basin needs to be replaced, it is important that the staff monitor the basin. The staff should look for signs of deterioration or displacement of concrete sections, plaster and joint sealant. If the basin does not remain in good condition there is a potential for structural weakening, and/or water loss.

Water loss is unfortunate from an operational cost standpoint. It can also be hazardous because over time excessive water loss can lead to erosion of the sub-grade structure. Such erosion can produce voids beneath the pool structure and be detrimental to the structural integrity of the pool, and potentially the building.

Action:

1. Monitor concrete structure for signs of deterioration
2. Monitor plaster in basin
3. Monitor sealant in the basin joints
4. Monitor sealant in the joint between the basin and the stainless steel gutter

## **Pool Drain System**

The pool was evaluated based on the Virginia Graeme Baker Act. It appeared that the main pool drains have been equipped with certified grating, however because the basin was full of water, Larkin Aquatics could not confirm compliancy of the drain sump. The facility staff should confirm compliancy documentation. If the documentation is unavailable the sump should be evaluated when the pool is drained.

Action:

1. Confirm compliancy of Virginia Graeme Baker Act for drain sump

## Pool Recirculation System

The recirculation system begins with water flowing into the surge tank. The surge tank, located in the mechanical room, collects water from the pool's main drains and the perimeter gutter system. Once in the surge tank the water is drawn from the surge tank by the system's one (1) centrifugal pump. This recirculation pump passes the flow through the sand filter before returning it to the basin through a series of supply inlets in the gutter face.

At the time of the inspection the recirculation pump appeared to be in satisfactory condition. The staff should continue to follow the manufacturer's recommended service plan.

During the inspection of the basin sand (likely filter media) was present in the gutter trough adjacent to the pool office. The amount of sand/media was minimal; however, it requires attention. The presence of sand/media in the trough is an indication that there may be internal damage in the filter. The facility staff should begin planning to repair the internal components of the filter that are allowing the discharge of media.



Fig 2. Filter



Fig 3. Sand/media in gutter trough

See **Observation Notes** for additional equipment information regarding the facility pumps, motors, and filters.

### Action:

1. Service the pump per the manufacturer's recommended schedule
2. Inspect and repair the damaged internal components of the filter.

## Stainless Steel Gutter System

A gutter system surrounds the entire perimeter of the pool. By design, the water breaks over the gutter lip into the gutter trough and is carried to the surge tank by the return piping. This skimming action is intended to remove floating debris and contaminants from the surface of the pool.

In addition to collecting water from the pool, the gutter also supplies filtered and chemically treated water to the basin. The water is supplied through a pressurized chamber that is integrated along the front-face of the system.

The gutter system appears to be operating in satisfactory condition, however, there is an area that requires attention. Near the mechanical room, a seam in the pressure chamber is leaking. The filtered water in the pressure chamber is leaking into the return trough that drains to the surge tank.



Fig 4. Leaking seam

After a closer review, there appears to have been an attempt to seal the leaking seam. The area has excess welding material and marks that do not appear in other areas of the trough, and do not seem to be consistent with the manufacturing welds done in the during production factory. There is a possibility that the attempted repair has compromised the watertight return trough. The repair welding may have penetrated through the bottom of the gutter system. This may be allowing water to leak out the bottom of the pressure chamber and/or out the bottom of the return trough. If this is the case the water would be leaking into the grout bed that is under the gutter system.

Water leaking into the grout bed is a concern. Over time the water could erode the bed. This will adversely effect the structural integrity of the gutter system, and potentially the basin. Also, if there is enough erosion the water could create a path and follow outside of the basin, into the sub-grade materials behind the shell.

The extent of the leaking from the gutter system is unknown, however the leak needs to be repaired in the pressure chamber in the near future. It is recommended that the seam be sealed and return trough patched.

During the inspection, rust was present in the gutter system, specifically in the zero-depth area. It is important to closely monitor these areas. The corrosion can be removed with minimal effort and minimal harm to the structure.



Fig 5. Corrosion in trough

During the initial construction a sealant was placed between the back of the gutter and the concrete deck. This sealant is placed to prevent water on the deck from getting behind the gutter and under deck. At the time of the inspection there were locations where the deck sealant shows signs of deterioration, damage, and even removal. It is important to have these areas repaired. If the conditions remain, water may penetrate the sub-grade materials, over time erosion can occur. Such erosion can create voids under the concrete deck and around the pool shell, reducing the structural integrity of these structures. All the damaged, deteriorating or missing sealant should be removed. The joint should then be properly cleaned and prepared for the application of new sealant.



Fig 6. Gap in sealant

There are a few locations where the depth markers are peeling from the gutter face. They should be repaired, or replaced. The current regulations require that the water depth is clearly marked for patrons inside the water.

Action:

1. Repair leak in gutter pressure chamber – have welding professional inspect previous repair for indication of damage (burn-through)of the gutter
2. Patch return trough
3. Clean corrosion from gutter
4. Repair deteriorating sealant
5. Repair or water depth markers



## Recirculation Rate

Current regulations require the recirculation system for a public pool of this type to filter the equivalent of one entire volume of pool water every 6 hours. This is referred to as the turnover rate. The estimated water volume for the pool is approximately 75,000 gallons. This volume requires a recirculation rate of approximately 200 gallons per minute (GPM) to achieve a 6 hour turnover.

The recirculation pump is the component that is responsible for creating the turnover rate. During the inspection, Larkin observed that the recirculation pump is sized to operate at 402 GPM. This operating condition exceeds the minimum regulations. However, the facility should still verify the pump is operating in this designed range.



Fig 7. Recirculation pump

See **Observation Notes** for additional equipment information regarding the facility pumps, motors, and filters.

### Action:

1. Confirm turnover rate meets 6 hour time period

## Mechanical Room

During the site evaluation it was noticed that corrosion has built on components within the mechanical room. The majority of the corrosion has accumulated on pipe fittings. The corrosion has most likely developed from the combination of poor air circulation and the storage of the pool chemicals within the space. To help prevent further deterioration the chemicals should be stored in another location.

In addition to the concern of the piping and equipment corrosion, the area's electrical panels showed signs of corrosion. Facility staff should monitor the condition so that the situation does not worsen, causing operational malfunctions and compromise the safety of staff.



Fig 8. Mechanical room



Fig 9. Electrical panel

Action:

1. Remove pool chemicals from equipment area
2. Monitor corrosion, replace equipment as needed

### Heater System

At the time of the inspection the heater system was not being called to operate because the water temperature was within the established set points. However, the unit appears to be in good physical condition.

The system appears to be 2-4 years old. The staff should continue operate the heater as is, and follow the manufacturer's guidelines for servicing.

See **Observation Notes** for additional equipment information regarding the sanitation system.

Action:

1. Follow manufacturer's scheduled maintenance plan, or subcontract the services.

### Sanitation System

The sanitation system utilizes a solid-state chlorine system – calcium hypochlorite. This is an approved system by current regulations.

The units appears to be in working order. Staff should continue to monitor the operation of the system and address issues when they arise.

If space is available the facility staff should consider relocating the system outside of the mechanical room. Relocating the system should help reduce the vapors that can cause corrosion on equipment within the room.

Action:

1. Consider relocating the system in a dedicated space of the mechanical room.

### **Pool Deck**

The facility is surrounded entirely by a concrete pool deck. Structurally, the deck is in good condition, although it does display a few cracks in various locations. These cracks should be monitored for propagation. Large cracks in the pool deck can present tripping hazards. If such areas are noticed, repairs should be made as necessary.

There are a few areas where the deck joint sealant has deteriorated. Unsealed joints in the pool deck can increase the likelihood of sub-grade erosion beneath the deck. The deck joint sealant should be maintained and repaired as necessary.

There is a valve located within the deck, adjacent to the mechanical room entrance. The valve has a high-density plastic cover. At the time of the inspection the cover was not secured in place. The staff should secure this valve cover to prevent a tripping hazard, and prevent potential tampering.

There are stainless steel handrails on the deck that run parallel to the sloped entry area. The handrails appear to be in acceptable condition. However, the rail across from the natatorium entrance, and pool office, wobbles under a moderate hand force. The staff should securely fasten the handrail for patron safety.



Fig 10. Valve cover



Fig 11. Loose handrail



Fig 12. Receptacle cover

The perimeter wall of the natatorium has numerous electrical receptacles. A few of the receptacle have loosened or missing cover plates. The staff should repair or replace these covers to prevent potential hazards.

Action:

1. Monitor deck for crack propagation
2. Repair deteriorating sealant
3. Secure the valve cover adjacent to the mechanical room
4. Secure the handrail opposite the natatorium entrance
5. Secure/repair electrical receptacle covers

## Lighting

The Tony Aguirre Community Center pool is currently equipped with an overhead lighting system. However, it has not been determined whether this system provides adequate lighting per current regulations to allow use of the facility after dark. It is recommended that a photometric study be done to determine if the lighting system provides illumination enough to safely operate the facility.

Action:

1. If it is determined that current lighting system does not provide adequate illumination the lighting system should be updated to provide proper illumination

## ADA Accessibility

The ADA standards require a public facility provide two means of accessible entry into the swimming pool. The primary can either be a mechanical lift or ramp. The secondary means of entry can be either a pool staircase or a transfer wall.

The facility will need to address their compliancy with the ADA standards. The facility will need both primary and secondary forms of entry. The sloped entry at the facility does not classify as an approved ramp. No mechanical lift was observed. Also, no secondary form of entry was observed.

### Action:

1. Make modifications to comply with ADA entry standards

## Summary of Actions

While all the systems are functioning, there are areas that require attention. Below is a summary of the action items detailed within the report. Each item within the report was evaluated based on the following order of priority:

1. Safety implications
2. Current operating status
3. Importance of the component with respect to the entire facility
4. Life expectancy.

	<b>Item</b>	<b>Concern</b>	<b>Resolution</b>
1	ADA access	Current configuration does not meet standards	Provide an approved system
2	Main drain	Virginia Graeme Baker Act Compliance	Confirm with documentation
3	Leak in gutter seam	Water loss and erosion of grout bed	Repair seam and patch gutter trough
4	Handrail	Loose/wobble under hand force – patron safety	Secure
5	Electrical receptacles	Staff and patron safety	Secure
6	Valve cover	Trip hazard, tampering	Secure cover
7	Sand/media in gutters	Damaged internal components of filter	Repair

8	Deck joint sealant	Water loss and erosion of structures	Routinely clean and replace
9	Corrosion of gutter	Loss of structural integrity	Clean corrosion routinely
10	Chemical storage in mechanical room	Fumes contributing to equipment corrosion	Store in separate location

## Programming Opportunities

Operating a swimming pool is costly. To offset these expenses communities need to identify all the potential areas of revenue. The majority of time a facility's strategy will be to create revenue through the sale of seasonal passes, daily passes, swim lesson programs and facility rentals. These are common methods that have proven to be reliable sources of income.

The main source of income for most facilities is the sale of admissions; either daily admission passes, seasonal passes, "Value Packs" or some combination. While this is potentially a profitable method there are more opportunities. Many facilities increase revenue by selling participation in various aquatics programs. Below is a list of programs that other communities offer that maybe possible at the Tony Aguirre Community Center. Accompanying each program is a brief description of the program and some potential requirements that may be compulsory for their successful operation.

<b>Program</b>	<b>Description</b>	<b>Requirements/Needs</b>
Shallow water aqua-aerobics	An exercise program designed to utilize the benefits of the low impact properties of water in a depth which participants can stand	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Various water depths</li> <li>- Training equipment</li> <li>- Appropriate water temp</li> <li>- Equipment storage</li> </ul>
Aquatic therapy	Therapy sessions developed and conducted for various patient rehabilitation needs. The sessions are typically one-on-one. Certification is available through organizations like Aquatic Therapy & Rehab Institute	<ul style="list-style-type: none"> <li>- Qualified therapist</li> <li>- Various water depths</li> <li>- Appropriate water temp</li> <li>- Equipment storage</li> </ul>
Water walking	An exercise program that takes advantage of the buoyancy nature of water to reduce impact to joints in the body. The water is typically chest-deep	<ul style="list-style-type: none"> <li>- Certified lifeguard(s)</li> <li>- Current channel or "lazy river" is desired for added resistance</li> <li>- Chest-deep water</li> </ul>

Water jogging	Using an underwater treadmill for exercise while taking advantage of the low-impact benefits of water	<ul style="list-style-type: none"> <li>- Underwater treadmill</li> <li>- Chest-deep water</li> </ul>
Arthritis exercises	“Gentle activities in warm water with guidance from a trained instructor, will help build strength and flexibility. Participants enjoy decreased pain and stiffness.” – Arthritis Foundation	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Various water depths</li> <li>- Appropriate water temp</li> </ul>
Swim team	An organization emphasizing competitive swimming on regional, national or international levels	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Certified pool length</li> <li>- Appropriate course markings</li> <li>- Training equipment</li> <li>- Appropriate water temp</li> <li>- Equipment storage</li> </ul>
Masters swimming	A national organization that provides organized workouts, competitions, clinics and workshops for adults aged 18 and over. Programs are open to all adult swimmers who are dedicated to improving their fitness through swimming	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Certified pool length</li> <li>- Appropriate course markings</li> <li>- Training equipment</li> <li>- Equipment storage</li> </ul>
Triathlon training	Swimming is one of the three components that make up triathlon competitions.	<ul style="list-style-type: none"> <li>- Certified pool length</li> <li>- Appropriate pool markings/spacing</li> <li>- Training equipment</li> <li>- Equipment storage</li> </ul>
Special Olympics	A volunteer program focused on introducing athletics to persons with intellectual disabilities	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Certified pool length</li> <li>- Appropriate course markings</li> <li>- Training equipment</li> <li>- Equipment storage</li> </ul>
Kayak and canoe training	Instruction of skills necessary for recreation and competition	<ul style="list-style-type: none"> <li>- Qualified instructor(s)</li> <li>- Medium depth water</li> <li>- Training equipment</li> <li>- Equipment storage</li> </ul>
Facility rentals	Rents the facility, or a portion of the facility, to user groups. For example, birthday parties, family reunions, Boys and Girls Scouts, rescue service training	<ul style="list-style-type: none"> <li>- Certified lifeguards</li> </ul>
Inner-tube water polo	An intramural activity uses inner-tubes or kayaks	<ul style="list-style-type: none"> <li>- Inner-tubes</li> <li>- Equipment storage</li> </ul>

Underwater hockey	It is played on the bottom of a swimming pool by two teams of six. Players wear fins, mask, snorkel, a protective glove and headgear. The stick is short, approximately 1 foot long, the puck is heavy, around 3 lb., and the goal is 3 meters (9') long. ( <a href="http://underwater-society.org/">http://underwater-society.org/</a> )	<ul style="list-style-type: none"> <li>- Certified pool dimensions</li> <li>- Appropriate pool markings/spacing</li> <li>- Training equipment</li> <li>- Equipment storage</li> </ul>
Special promotional events	Facility often times rental their pools for special events. Some examples are "Floating Movie Night"	<ul style="list-style-type: none"> <li>- Staff members</li> <li>- Appropriate equipment</li> </ul>

Before implementing a new or additional program the facility's management staff must first understand the specific program. Each program will have particular needs and requirements that are necessary for the overall success of the program. The next step is to evaluate the facility's ability to facilitate the program because there are a number of aquatic programs that have specific requirements for the pool configuration. If certain requirements are not met it will be difficult, if not impossible, to manage some programs. The third step in the evaluation is the examination of the staff's capabilities and expertise of conducting the program. It is important for the safety of the participants that the necessary training has occurred before a program begins. If proper training is neglected there is a possibility of harmful results. The final step of the evaluation is to identify any additional equipment or teaching aids necessary for the program.

Once a program has been reviewed and is deemed appropriate for the facility, the management staff should compare the potential revenue versus the cost of implementation – the equipment requirements, training equipment and aids, staff training and certification, etc. This comparison should be taken one step further. The staff should evaluate the effect of the addition of a new program with regard to existing programs. Can the new program promote and foster other programs? Can a program satisfy a community need that is not being served, and be profitable? Would it restrict other programs? Would it inhibit pool space, or scheduling requirements, necessary for other programs?

Below are the Top 5 programs Larkin would recommend the staff consider putting into service at the facility. These programs seem appropriate after considering the pool's current configuration, the popularity of programs at other facilities and the ease of implementation.



1. Facility Rentals – The scale and extent of the rental agreement can range. Some facilities offer a basic rental rate that requires renters to pay the additional costs of the lifeguard wages and supplies. Other facilities include the lifeguard wages, food and drink in their fees.

The Tony Aguirre facility would need to determine the appropriate time to offer rentals without limiting the facilities other programs.

2. Shallow Water Aqua-Aerobics – These classes are very popular with adults and seniors. The Tony Aguirre Community Center pool would be a suitable configuration for this type of aerobics because of the amount of water that is 3-feet to 4-feet deep. Also, the sloped entry would make it inviting for patrons with restricted mobility.

The Tony Aguirre facility would need to provide an instructor and the appropriate equipment.

3. Water Walking/Jogging – Walking against the resistance of water has become a popular activity at many facilities. Some facilities offer this as a group/class activity, while others simply offer designated times for “water walkers.” Also, many facilities promote the activity as an extension of existing programs, especially programs geared to the senior population.

The Tony Aguirre facility would need to provide lifeguard(s) during the designated times. Some equipment may be requested by participants.

4. Masters Swimming – This program is geared towards adults that swim laps but wish to have instruction on stroke technique and training practices. Facilities that offer this type of program typically designate pool time, and offer a knowledgeable instructor.

Because of the existing lap lanes the Tony Aguirre facility could implement this program with designated pool time, and the proper instructor.

5. Inner-tube Water Polo – This program is typically geared towards youth and young adults. Some facilities offer the program as an intramural activity, or league. It is also offered in conjunction with facility rentals.

The Tony Aguirre facility would need to provide the appropriate equipment.

## **Conclusion**

The Tony Aguirre Community Center swimming pool is in working order. The staff has worked hard to maintain the facility through repairs and scheduled maintenance. These preventative maintenance practices will prolong the facility's operating life, and help minimize the magnitude of future issues by identifying them before they progress.

There are a few issues that need to be addressed to ensure the health and safety of pool patrons. This report will serve as a guideline for options of repair, renovation, and replacement of the existing pool.

## Observation Notes

Tony Aguirre Community Center Swimming Pool

Date Inspected: November 12, 2010

Inspected By: Kyle A. McCawley

### Pool Notes

- VGB Grating
- Starting platforms are in 5'-0" deep water
  - o 2 sets of anchors in the deck
- All zero-depth entry sprays freely flowing
- Sand/filter media present in gutter trough, near natatorium entrance
- Corrosion on gutter trough
- Handrail by locker room entrance is loose
  - o Remaining handrail appeared to be secure under a moderate hand force
- Minimal deck crack present in the peninsula
- 3 locations of rust staining present on deck. Source was unidentifiable
- Grating of gutter return converter box was secure under a moderate hand force
- Pressure side of gutter trough exhibited a leak
  - o Location: 5'-0" deep section, adjacent mechanical room
  - o Seam of pressure column appeared to be have deteriorated
  - o Seam appeared to have be repaired previously
- Depth markers on vertical portion of the gutter face are peeling
- Gap in deck sealant between deck slab and gutter
  - o Location: across from mechanical room door
- Valve cover not fastened to deck
  - o Location: corner of deck near 5'-0" deep water
- No outlet cover on electrical receptacle
  - o Location: wall near 5'-0" deep water

## Mechanical Room

- Corrosion present on the electrical panels
- Corrosion on recirculation valves and valve handles
- Chemical stored were being stored in the equipment space – 2 buckets
- Safety shower appeared in good condition
  - o Functionality was not checked
- Gas heater appeared to be 3-5 years old; appeared to be in satisfactory condition
  - o Heater space is naturally ventilated – 24” x 24” louver to outside
- Pump
  - o Nameplate Conditions: 402 gpm @ 65’
  - o Aurora 3x4x9B, Type: 341BE
  - o Motor: 10 HP, 230/460, 3Ø, 1740 RPM, TEFC
- Filter – Neptune Benson
  - o 6’-0” Diameter
  - o Operating Influent: 17 psi, Operating Effluent: 13 psi (At the time of inspection)
- Chemical pump
  - o Operating conditions not legible
  - o Motor: 1.0 HP, 3450 RPM
- Heater – Lochinvar
  - o 399,999 Btu/hr
  - o Max water pressure: 125 psi
- Heater pump
  - o Operating conditions: 100 gpm, TDH not legible
  - o Motor: 1.0 HP, 60 Hz, 1730 rpm
- Space ventilation – forced air
  - o Could not see AHU info to verify operating conditions

## Electrical Room

- Space is for building systems, not natatorium