Fidalgo Pool and Fitness Center
Facility Audit
Anacortes, WA

Counsilman · Hunsaker
AQUATICS FOR LIFE

In Association With

ARC Architects

DRAFT 2.17.17

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FIDALGO POOL AND FITNESS CENTER

INTRODUCTION

Counsilman-Hunsaker, in association with ARC Architects, was authorized by the Fidalgo Pool and Fitness Center to provide a swimming pool audit in January 2017 on the Fidalgo Pool. The indoor pool was constructed in the 1975 and is a "T-Shaped" 6-lane, 25-yard by 6-lane, 25 meter competition pool.

Counsilman-Hunsaker was commissioned for this audit to assist in identifying items that are substandard or not operating as designed, as well as to offer insight to help the owner consider various options for the future of the pool. Providing a safe and sanitary environment for the users of the pools is the highest priority for Counsilman-Hunsaker and the Fidalgo Pool and Fitness Center.

A site visit to the aquatic facilities was performed by George Deines from Counsilman-Hunsaker on January 23, 2017. The purpose of the site visit was to evaluate the existing indoor pool including the pool and mechanical system.

The Fidalgo Pool is in declining physical condition, and the mechanical system is in need of a complete renovation. Counsilman-Hunsaker will typically assign a life-span of 40-50 years to an indoor aquatic center. At 42 years, Fidalgo Pool and Fitness Center in the middle of this timespan. There are several areas where the pool does not meet the current State of Washington Code.

- The depth markings around the perimeter of the pool are incorrect, when compared to the actual depth of the pool.

- The current perimeter overflow system cannot handle 100% of the pool's flow rate as required by code.

- The pool does not have "No Diving" markings around the perimeter of the shallow end.

- The pool floor drops immediately from a depth of 4 feet to a depth of 12 feet. The administrative code as well as the industry standard requires a maximum slope of 1:3 from shallow water to deep water.

- The pool surface has significant staining in both the shallow and deep ends and surface etching has started to occur.

- ADA requires two means of access for pools with a perimeter larger than 300 lineal feet. A primary means of access is a pool lift and a secondary means would include a stair entry with the appropriate hand rail spacing. Currently the pool has only one means of access.

- There is insufficient storage space for deck equipment.

- Spectators are unable to see the first two lanes from the spectator seating area on the second level.

- The current mechanical system is functioning; however, within the next 5-7 years this equipment will begin to reach the end of its useful lifespan. If plans call for extending the life of Fidalgo Pool for more than 5-7 years, a complete mechanical room renovation should be considered.

- Counsilman-Hunsaker typically assigns a 40 to 50 year lifespan to indoor aquatic facilities. The Fidalgo Pool and Fitness Center is within the recommended age for a substantial renovation or new construction.

The findings of the facility audit indicate that the pools have a multitude of deficiencies that require major repairs. It is the Consultant's opinion that the pools are nearing the end of their useful life expectancy, and that the cost effectiveness of undertaking major repairs or renovations to facilities of this age and condition should be carefully evaluated as viable long term solution. It is recommended that the option to replace the facility with a newly constructed aquatic center designed to meet the evolving needs of the Anacortes community and provide compliance with all applicable codes and standards should be given consideration for the purposes of comparison.

FIDALGO POOL AND FITNESS CENTER SWIMMING POOL INFORMATION

- Facility Opening 1975
- Lap Pool Surface Area: 5,040 sq/ft
- Lap Pool Total Volume: 280,000 gallons
- Flow Rate: 803 GPM
- Turnover: 5.8 Hours

ADMINISTRATIVE CODE

The state administrative swimming pool code referenced as “Washington State Code” in the report is as follows.

Washington Administrative Code
Chapter 246-260 WAC
Water Recreation Facilities

Applicable Federal Code Section:

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

Americans with Disabilities Act (ADA)
U.S.C. 12101 et seq.
Signed into Law on July 26, 1990

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.

POOL ITEMS

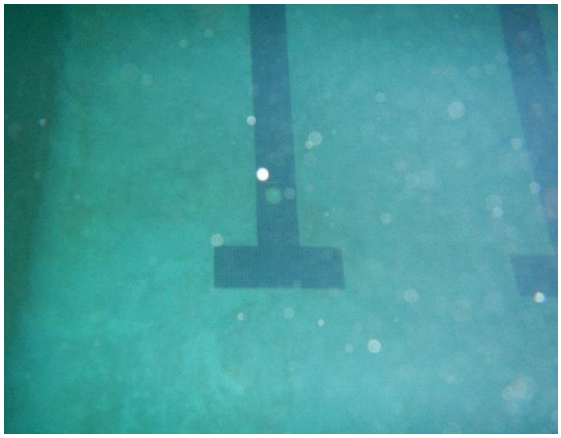
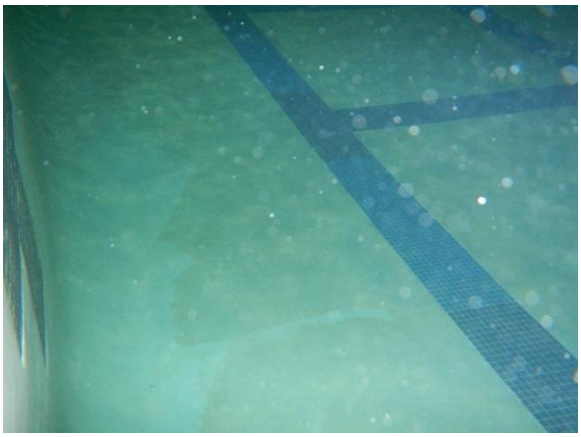
CH Observations, Comments and Recommendations:

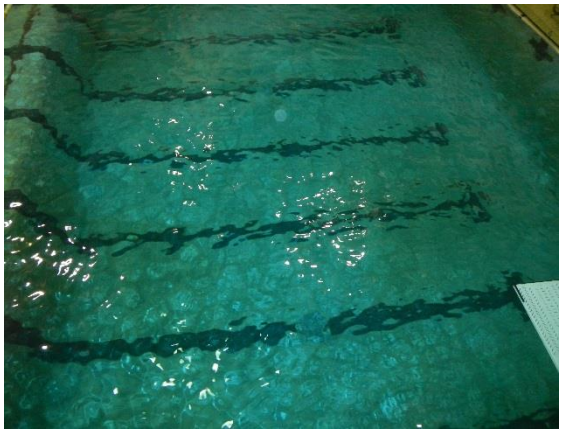
A. Structure and Finish

Constructed in 1975, the concrete pool shell is now 42 years old. The plaster pool finish features tile trim, including tile lane markings and wall targets. The gutter is tiled with 1” x 1” tiles, in between the tile pool deck and the plaster pool finish. The existing tile and plaster pool finish shows significant signs of staining, both on the pool floor and on the pool walls. There are also signs of etching of the pool surface.

Staining of the pool surface can be attributed to poor water balance or metals found in the pool water. Fill water which is high in copper or iron must be removed or severe staining can result. Staff should ensure the pool water balance is adequate to prevent scaling and corrosion. Rust colored stains can be a clear indication that the pH of the pool water is out of balance. The low pH levels are typically caused by overfeeding muriatic acid. Corroding of cast iron piping remaining in the system is another potential source for this staining. This is a common issues in indoor pools. The surface can be cleaned when the pool is drained for routine maintenance, but with the extent of the staining a new application of plaster or quartz aggregate surface such as Diamond Brite is recommended.

The pool floor drops immediately from a depth of 4 feet to a depth of 12 feet. The Washington administrative code as well as the industry standard requires a maximum slope of 1:3 from shallow water to deep water. Assuming a future slope modification occurred at the current 4 foot depth, the slope and depth of the diving well would no longer be in compliance.


B. Perimeter Overflow System

A fully-recessed gutter with an all-tile finish is provided for surface skimming around the pool perimeter. The gutter system is in fair condition and has noticeable staining of the tile, but very few tiles were observed to have delaminated. The pool gutters drain by gravity to the surge pit through a 10” pipe that can handle up to 672 GPM at 3 ½ ft/sec. This pipe can handle 83% of the overall flow for the pool.

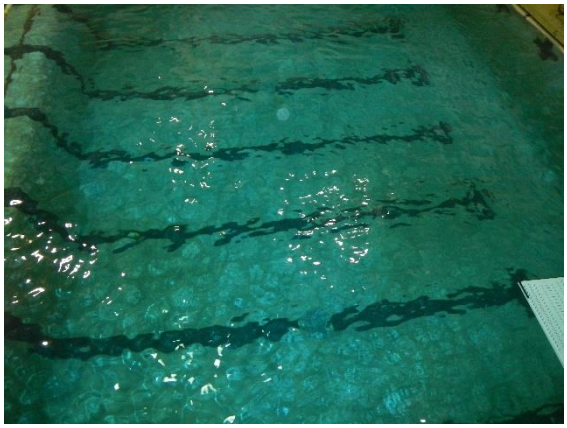
The current Washington Administrative Code requires overflow gutters shall be capable of continuously removing no less than 100% of the recirculated water, which is not met with the current flow rate and gutter capacity. The ability for the gutters to be able to handle 100% of the pool’s flow is generally recommended and an industry design standard.

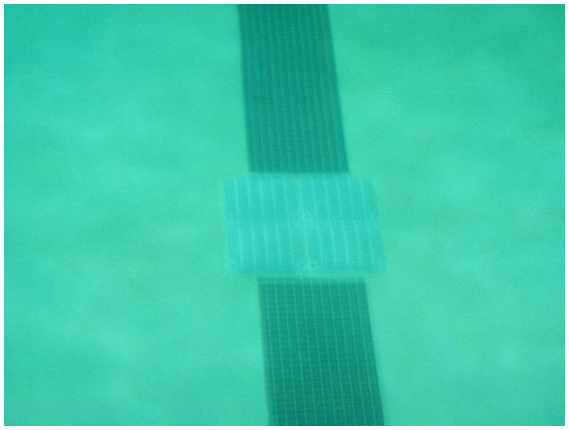
C. Main Drains

There are two (2) 24” x 24” square, fiberglass main drain covers located in the deep part of the competition pool. The main drains appear to have secured grate covers that are suction and hair entrapment certified as required 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. 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.).

Staff report that the main drain is gravity-fed. It is routed to a single 10in pipes that is rated 672 GPM at 3 ½ feet per second. The CH standard is for the main drain to be able to handle 100% of the circulation, which is not met by the single 10” pipe at the observed flow rate of 803 GPM. The pool drawings indicate the main drains are under suction and the Washington State Code allows for a flow of 6 feet per second. The 10” pipe could handle up to 1,343 GPM. Staff should confirm if the main drain has a direct or indirect piping connection between the main drain and the pump.



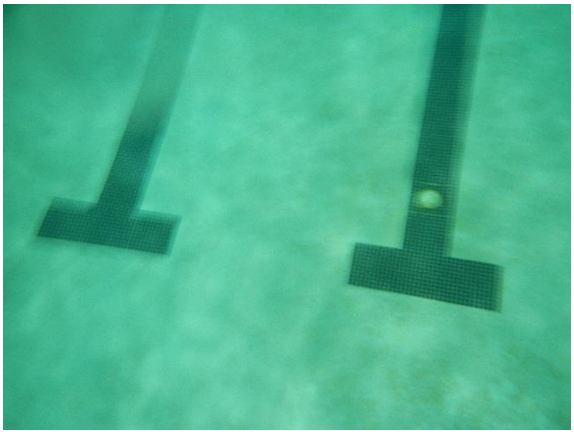


D. Inlets

The pool is equipped with 12 floor inlets in the shallow end and 6 floor inlets in the deep end. The inlets are fed with a 6” supply line that is rated for up to 812 GPM at 8 feet per second and 975 GPM at 10 feet per second. The flow rate of 803 GPM falls within the rating for the current piping.

Of the two inlet systems (floor and wall), the floor inlets are usually recommended over wall inlet systems for larger pools. The reason is that a relatively equidistant location of the floor inlets provides a more uniform distribution of filtered water over the floor. This situation affects, in a positive way, the subsurface turbulence created by the swimmers overhead. The floor system also provides a “sweep and clean” movement of the water across the pool floor, picking up small dirt and debris.

The Washington Administrative Code requires inlets to be located on the bottom of swimming and wading pools over twenty-five hundred square feet and spa pools greater than ten thousand gallons. The current inlets meet this requirement.



E. Ingress and Egress

The pool has deck-anchored stainless steel grab rails with embedded steps located around the pool perimeter in the wall. A compliant Americans with Disabilities Act accessible means of entry is provided for the pool. The ADA Act requires that a swimming pool with a perimeter that is more than 300' have at least two accessible means of entry and requires accessible lifts to be capable of unassisted operation from both the deck and water levels. Controls and operating mechanisms shall be unobstructed when the lift is in use.

The pool also has two fiberglass stairs with stainless steel grab rails as an alternative means of entry and exit for the pool. The handrails on the stairs are 27" apart and do not comply with the ADA standard 1009.6.2 Handrails, which stipulates handrails must be within 20" and 24".

"1009.6.2 Handrails. The width between handrails shall be 20" (510 mm) minimum and 24" (610 mm) maximum. Handrail extensions required by 505.10.3 shall not be required on pool stairs."

F. Depth Markings and Warning Signage

Tile horizontal depth markings are located on the tile deck around the perimeter of the pool, and inside the gutters below the deck. The deck tile markings are 7 inches tall while the gutter tile markings are 5 inches tall. This meets the Washington State Code requirement that depth markings should be “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.”

The measurements of the pool depth markings are off by roughly 2 inches. Staff reports the gutter lip was raised by two inches several years ago, but the depth markings were never adjusted to reflect the new depth.

DECK ITEMS

CH Observations, Comments and Recommendations:

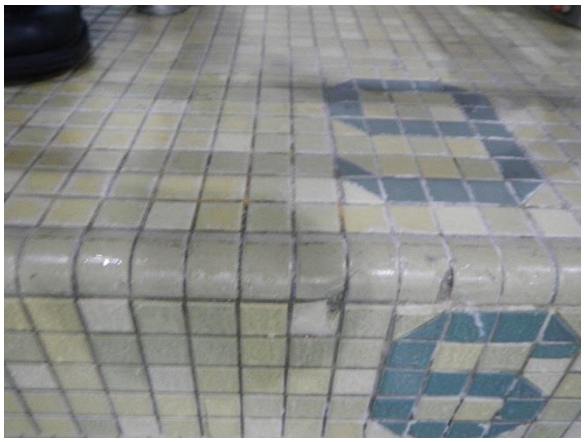
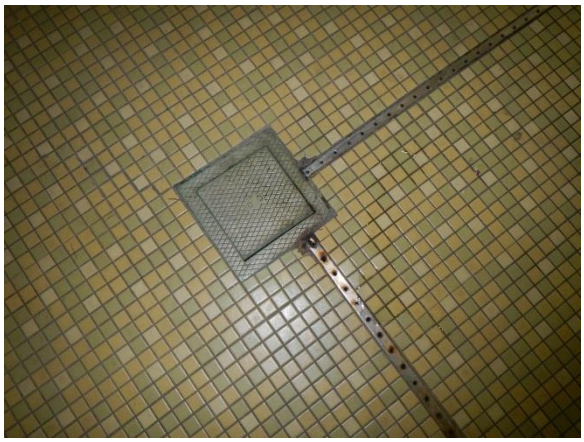
A. Deck

The pool deck is in fair condition with minimal observable cracks. The perimeter trench drain appears to be working effectively as standing water was not observed at the time of the site visit. There were areas of the deck/tile gutter connection that had sharp edges that could cause injury to pool guests, as well as a few areas were the tile had been chipped or in some instances popped off.

This facility meets the Washington State Code requirement for pool decks below.

"For pools fifteen hundred square feet or larger, walking deck surfaces must be at least six feet wide:
(i) Around the entire perimeter of outdoor pools;
(ii) On fifty percent of the perimeter of indoor pools; and
(iii) The remaining fifty percent perimeter of the indoor pool must be a minimum of four feet wide."



B. Starting Blocks

The pool has nine (9) starting blocks that are interchangeable and moved in between the shallow end and deep end of the pool, depending on the course length used by the competitive swim teams. This depth requirement meets the National Federation of High School Swimming (NFHS) requirement of a 4 foot minimum depth of water and that the blocks are a maximum of 30 inches above the surface of the water.

The starting blocks are an older model that does not meet the current expectations for competitive swimming. Today's industry standard for starting blocks includes dimensions of 24" x 32" for the platform. The current blocks are 22 x 22 which is close to the minimum standard for starting blocks.

These blocks meet the Washington State Code that requires protective equipment when not in use. "If water depth is less than nine feet, starting blocks must be removed or covered with protective equipment unless used by competitive swimmers trained in proper use of starting blocks."

C. Diving Boards

A single 1-meter diving board is provided. The board is mounted on a concrete pedestal and is in good condition. When comparing the existing diving well dimensions to the dimensional requirements of NFHS, FINA and the NCAA, the following items were observed: (diagrams illustrating these items are found below)

The pool meets the current 1-meter depth/slope requirement for NCAA, FINA and High School.

POOL MECHANICAL ITEMS

CH Observations, Comments and Recommendations:

A. Piping

The visible, above ground recirculation piping for the pool in the pool mechanical room is Schedule 80 PVC piping, which is in good condition. According to staff, the original underground cast iron piping still exists and has never been replaced. Corrosion is noticeable at some of the pipe connections both the bolts and the valves, but overall the majority of piping and connections are in good condition. There is visible corrosion on several of the pipe supports throughout the mechanical room, and the pipe from the pool heater has significant corrosion. Directional arrows are provided on the exposed piping as per industry standards. The valves in the mechanical room have been replaced as necessary. Several of the overhead pipe supports show significant signs of corrosion.

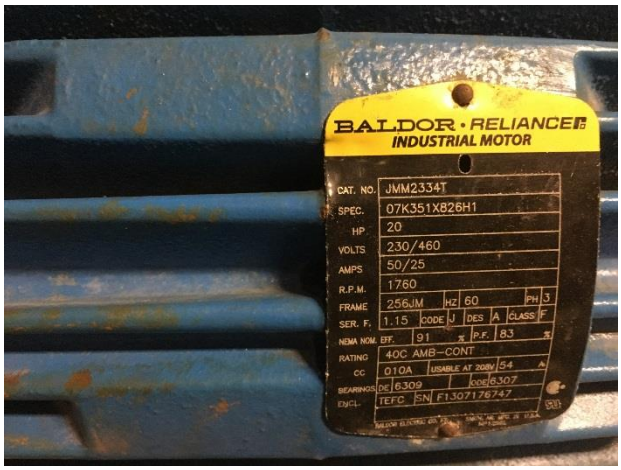
With a pool of this age it is not uncommon that some of the underground piping has corroded to the point of failure. The corrosion build up on the interior of the pipes also impact pipe velocities and could be contributing to the pool surface staining. A camera test could be done to determine the integrity of the piping.

B. Pump

Both pumps and motors have been recently replaced and are alternately used on a monthly basis. They do have visible signs of corrosion, but appear to be in good condition. The recirculation pump is fed by a 20 horsepower motor. A strainer is provided for the pump as required by the administrative code. The GPM rating for the pump was not verified by nameplate during the site visit.

The pump impeller should be statically and dynamically balanced and trimmed for the specified design condition. A coating system to protect the pump cast iron from corrosion is an industry standard on all non-bronze pumps. Staff should confirm the impellers are coated to ensure their expected lifespan.

A variable frequency drive is installed on the circulation system, model Eco-Flow-C. A variable-frequency drive (VFD) is a system for controlling the rotational speed of an alternating current (AC) electric motor by controlling the frequency of the electrical power supplied to the motor. Staff report the VFD was installed in 2014 and it is operating correctly at this time.



C. Flow Meter

There are two flow meters installed on the pool, one is an acrylic flow meter and is installed on the pressure piping back to the pool, downstream from the filter, which is the preferred place for mounting. The other is tied directly into the BecSys chemical controller. Flow sensors should be installed with at least ten pipe diameters downstream and five pipe diameters upstream on a straight run of piping.

The flow meter was giving a reading of 803 GPM which places the turnover at 5.8 hours. According to the Washington State Code, "Owners of swimming pools shall design and maintain water treatment recirculation rates to completely turn over the entire pool water volume of pool in six hours or less." The Fidalgo Pool meets this requirement.

D. Filtration System / Surge Tank

The pool uses open-air vacuum Diatomaceous earth (DE) filters for its filtration. This system was installed during the initial construction. While these filters have served the facility well and provided ample water quality over the years, it is an antiquated system and should be replaced during a facility renovation with either high-rate sand filtration or regenerative media filtration.

The size and capacity of these filters could not be verified by nameplate on site during the audit, but staff notes have estimated each disc at 26 inches of diameter, equaling 121 SF of total surface area. The standard flow rate for this type of filtration system is to stay within 1 to 3 GPM/SF of surface area. With a flow rate of 803 GPM, the filtration rate is calculated at 6.6 GPM/SF which exceeds the industry standard for this type of filter by more than double.

Washington State Code requires the capacity in gallons of the surge tank to equal the square footage of the pool. This would require the surge tank to hold 5,040 gallons.

E. UV System

The pool mechanical system contains a Hanovia Ultraviolet Light Water Treatment System (UV). UV becomes beneficial in water treatment applications due to its ability to eliminate combined chlorine (also known as “chloramines”) and kill chlorine resistant pathogens. While UV does break down free chlorine, the good form of chlorine used for pool disinfection, it is still highly recommended due to its ability to eliminate chloramines. Lower levels of chloramines lessens the corrosive off-gassing which attributes to the corrosion of deck equipment, HVAC, and internal structures of some facilities. Additionally, chloramines are typically responsible for the odor and irritation experienced by athletes, coaches and staff.

Eliminating chloramines creates a healthier and more enjoyable environment for facility users and staff. A UV system should be included in any future mechanical system renovations, or the construction of a new aquatic facility. Not only will UV systems kill pathogens and chloramines, but they will also eventually provide cost savings. It is common for a UV units to help lengthen and enhance the life expectancy of building materials, dehumidification units, etc. due to the elimination of combined chlorine before it is released into the air and causes corrosion of these materials.

F. Chemical Treatment System

Currently the pool chemicals are located in the same area as the pool mechanical room. The pool is sanitized with Calcium hypochlorite (tablet chlorine) through a Pulsar 3 system and both CO2 and muriatic acid are used as the pH buffer. The 50 lb. buckets of calcium hypochlorite are stored inside the pool mechanical room on a platform above the surge tank. The muriatic acid and CO2 are stored in the same area, next to the chemical controller.

According to the Washington State Code, "Owners shall provide a separate chemical storage area or room that conforms to manufacturer's requirements for each chemical used in the pool area." A separate dedicated and ventilated chemical storage room for both the sanitizer and pH buffer is recommended and is the current industry standard. The existing chemical storage area does not meet the current requirement or standard. Dedicated chemical storage spaces should be included in any future plans, whether for a renovation or a new facility.

The pool is controlled by a BecSys 5 chemical controller. The chemical controller automatically adds chlorine and the pH buffer, maintaining the proper chemical balance throughout each day. The controller is in good working condition and is appropriate for this type of usage.

G. General Observations

- There is not enough storage space at the Fidalgo Pool and Fitness Center. Currently the pool deck is used for storage for items such as the Daktronics timing equipment, lane ropes for the 25 meter course length, and swim lesson equipment (such as kickboards, floats and underwater benches).

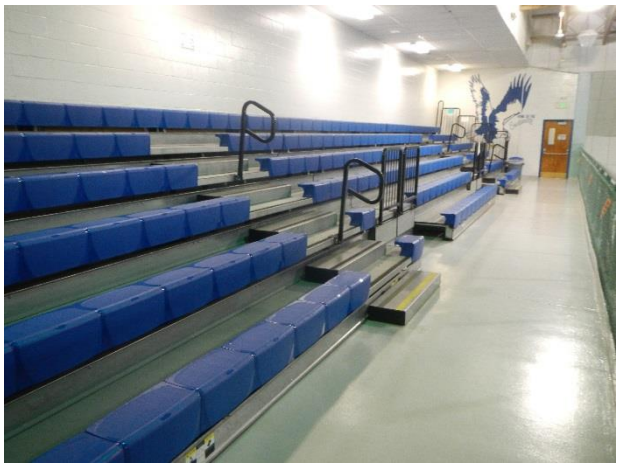
- The deck space behind the starting blocks on the 25 meter course length is insufficient. Swim team staff report that during swim meets, there is not adequate room for timers, swimmers and coaches in this area, specifically during relay swims.

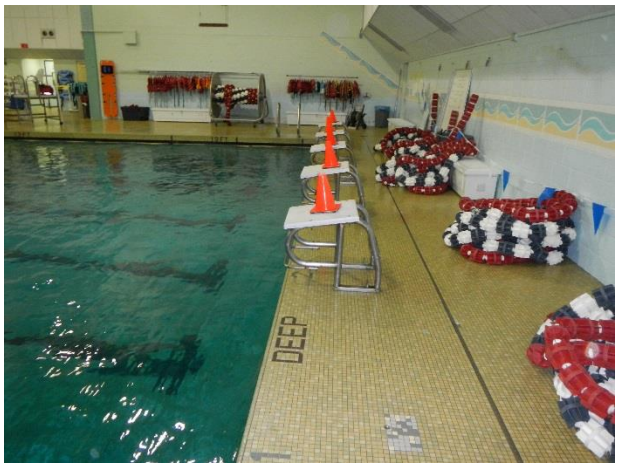
- The first two rows in the upstairs spectator seating for the swimming pool are not able to see the first two lanes during swim meets.

- The ceiling material in the Fidalgo Pool area is not what is typically specified for indoor natatorium environments. The ceiling panels in a natatorium are usually made of galvanized steel with a coating of high-build epoxy coating. Other materials can be precast concrete, wood or aluminum. As with other materials in a natatorium, acoustical wall and ceiling must be corrosion resistant and interface with a vapor barrier, if necessary.

- User groups reported the air quality in the second-level spectator seating area is poor. Spectator areas should have higher air velocities of cool air (40 ft/min to 50 ft/min). Ceiling fans have also been used to improve spectator comfort. High velocity warm air in the face of spectators can be uncomfortable; therefore, cool air should be introduced over any raised spectator gallery for a major venue facility.

- Significant corrosion exists around the door frame on the east wall of the natatorium.

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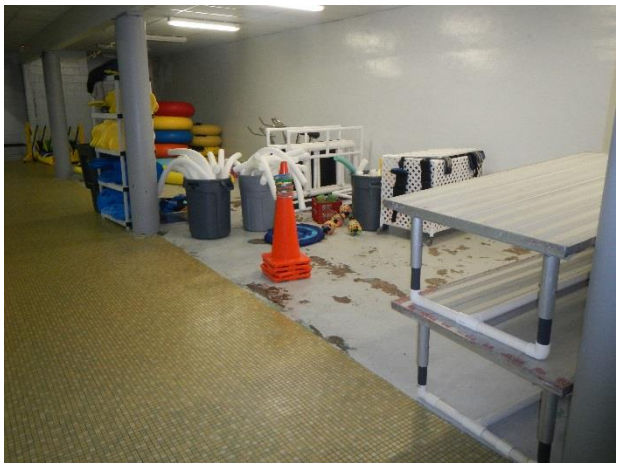

OPINION OF PROBABLE COST

The following spreadsheet provides the Opinion of Probable Construction Cost to repair Fidalgo Pool for the recommendations detailed in the report.

Fidalgo Pool Renovation	Unit	Cost / Unit	Cost	Opinion of Cost	Opinion of Cost
ALL POOLS -- REPAIR				$747,400	$747,400
Plaster pools and tile lane lines (short and long course)	SF	5,040	35	$176,400	
Underground Piping Replacement	Allowance	1	75,000	$75,000	
Deck Replacement	SF	4,000	50	$200,000	
ADA Lift / Stairs	Allowance	1	10,000	$10,000	
Mechanical Room Equipment / Renovation	Allowance	1	200,000	$200,000	
Surge Tank	Allowance	1	35,000	$35,000	
Chemical Storage Rooms	SF	100	300	$30,000	
Starting Blocks	Quantity	6	3,500	$21,000	
Repair Construction Costs				**747,400**	**747,400**
Site Construction Costs				$25,000	$25,000
Subtotal				$772,400	$772,400
Inflation (1 year)	5%			$38,620	$38,620
Contingency	20%			$154,480	$154,480
Indirect Costs	10%			$77,240	$77,240
Opinion of Project Costs				**$1,042,740**	**$1,042,740**

*This cost estimate does not include any modifications that might be required to address the pool slope.

The opinion of probable construction costs is based on current 2017 prices. This report is based on information that was current as of February 2017.

The preceding opinion of probable costs estimates are based upon a protocol in which a general contractor or swimming pool contractor executes all of the tasks with its own labor and that of qualified subcontractors.

It is recognized that the Consultant or Owner have no control over the cost of labor, materials or equipment, over the Contractor's methods of determining bid prices, or over competitive bidding, market or negotiating conditions. Accordingly, the Consultant cannot, and does not, warrant or represent that bids or negotiated prices will not vary from the Owner's project budget