

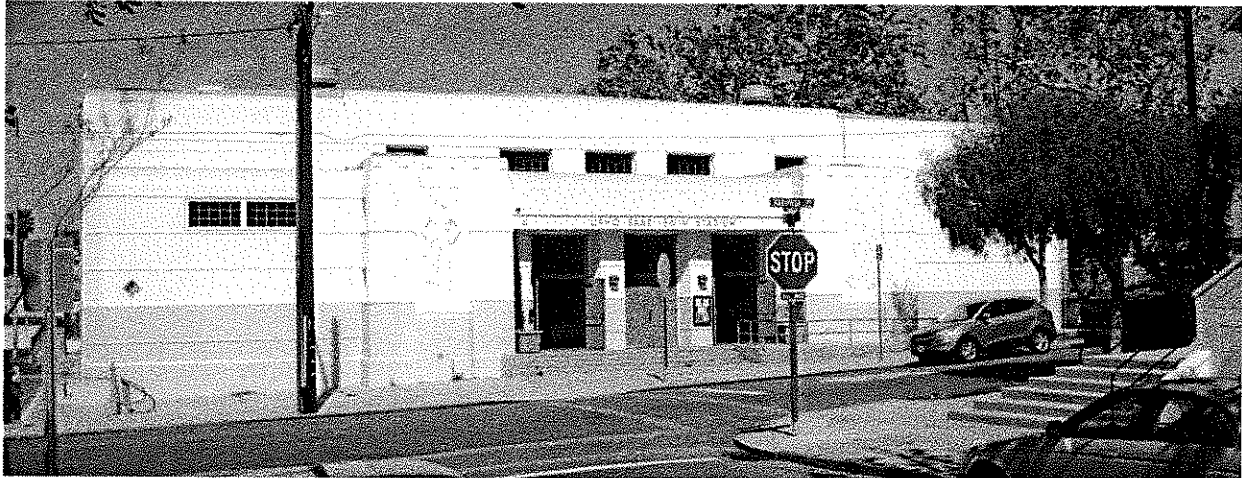


City of El Segundo Uhro Saari Swim Stadium

Mechanical, Renovation, and Financial Analysis

FINAL REPORT and SUMMARY

April 10, 2015



Submitted by the Isaac Sports Group, LLC



Engineering Analysis by Arch Pac Aquatics



OVERVIEW

The Uhro Saari Swim Stadium (or “The Plunge”) has served the aquatic needs of El Segundo residents since its construction in 1938. With the development of the new El Segundo Wiseburn High School Aquatic Center it is time to review and analyze the condition and future of the Swim Stadium. The Isaac Sports Group (ISG) has been retained to conduct this analysis, building on the new programming model for The Plunge when the El Segundo/Wiseburn Aquatic Center is opened. The Design, Programming, and Financial Analysis of the new Aquatic Center that ISG conducted for El Segundo identified several relevant points about The Plunge:

- Overall, the building and pool tank is solid and with key code, mechanical, and amenity upgrades can continue to serve the community for decades to come.
- The Plunge is a very important part of the history of El Segundo and continues to be a symbol of the aquatic history and heritage of the City
- The vast majority of El Segundo residents strongly support the Plunge and its continuing operation
- The Plunge no longer meets the needs of the competitive swimming and water polo in the area
- With the new Aquatic Center at Wiseburn High School, the Plunge can off load much of the competitive aquatic training use and open up significantly more time for a wide variety of aquatic programming for all ages, interests, and abilities of El Segundo residents
 - The Plunge can be a leader in the region in aquatic programming year round, building on being one of the only indoor multi-pool facilities in the area
 - Integrated programming across all the El Segundo pool will allow each pool, especially the Plunge, to provide community programming that is best suited for each pool and its environment
- The new programming model at the Plunge can actually reduce the overall net operating cost of the Plunge by generating additional program and usage revenue

In order to insure that the Uhro Saari Swim Stadium can serve the community for many years to come it is critical to identify current and potential issues with the pool across a wide range of areas, including:

- Pool Mechanical Systems
- Current Code requirements
- Condition of support facilities and potential upgrades to better meet the needs of residents and users
- Impact of systems and features of the Plunge on annual operational costs and long term maintenance
- Design and feature options that can enhance operations and programming

Each of these areas needs to then be analyzed in terms of the following variables:

- Priority and phased timing of work
 - Urgent issues?
 - Future renovations
- Integration with the construction timeline of the new Aquatic Center

- Cost of renovation
- Time line of renovation
- Impact of renovation on programming and use of the Plunge

The goals of this study are to pull all this information together and find the best options and plan for the Plunge that can achieve the following:

- Bring the facility up to current code
- Replace equipment as needed that can significantly reduce annual operating expenses and long term maintenance costs
 - Best Return on Investment and payoff time line
- Identify systems, design features, and amenities that can better support the overall programming model and the aquatic needs of the community, integrated with the new Aquatic Center
- Develop a phased approach integrated with the construction and opening of the new Aquatic Center

The timing of these issues became even more critical as one of the filters at the Plunge has begun to leak and the concern of overall system failure looms.

To provide the full analysis of the Plunge, this final report contains two main documents:

- The Pool Technical Study
 - Engineering and code analysis by Ken Moeller of Arch Pac Aquatics
 - Design and amenity upgrades relevant to new programming at the Plunge once the Aquatic Center opens by ISG
 - Recommendations and detail of all that needs to be done at the Plunge by Arch Pac and ISG
- Final Report and Summary
 - Compiled by ISG based on the technical report and building on pool and program research developed for the Aquatic Center Program, Design, and Financial Analysis by ISG
 - Cost estimates of all recommendations developed jointly by ISG and Arch Pac
 - Financial impact analysis on programming and operating expenses
 - Phasing and project grouping of recommendations

METHODOLOGY

ISG used a wide variety of resources and methods to conduct the analysis and determine recommendations for the Uhro Saari Swim Stadium. The Project Team includes the following:

Stu Isaac	ISG-Project Leader
Duane Proell	ISG-Operations, Management, and Programming Input
Ken Moeller	Arch Pac Aquatics-Technical and engineering analysis of pool

Information and analysis of the Plunge involved the following:

- Draw on previous ISG research on the current and potential future programming and use of the Plunge

- Previous site visits and meetings with El Segundo staff, including Public Works and Recreation and Park department leadership.
- March 14th site visit by Ken Moeller to the Plunge to conduct engineering and code inspection
- Pricing developed based on comparable recent California pool projects

The findings of the report are broken down into three main categories:

- Mechanical and Water Handling Systems Priority #1
- Locker Room and user amenities Priority #2
- Pool features, equipment, and miscellaneous Priority #3

Each project area is broken down by specific element and costing. This breakdown will also include calculations on impact on annual operating costs, return on investment, and pay-off time period.

CODE ISSUES and CHALLENGES

The difficulty in developing logical priorities and phasing of the recommended renovations to the pool is the chance that one change triggers the demand to address all code issues. Will replacing the filters systems, which is number one priority, trigger the need to re-do emergency lighting, pool depth markings, hose bib changes, and all the other current code violations, be they big or small. Technically this is usually the case but the historic heritage of the Swim Stadium and the nature of some of the code issues may give the City a little leeway in phasing the work.

Code issues were found in the following areas and are detailed in the attached report with the appropriate code language:

- Mechanical Systems
 - Filter capacity and turnover/flow rate
 - Independent filtration and water handling systems required on separate pools
 - Independent surge tanks for each pool with increased capacity
 - Separate chemical storage areas with ventilation, dual containment vessels, and seismic restraints
 - Reduced Pressure Backflow Prevention device needs to be installed
 - Increase size and capacity needed in main floor drains in both pools when filter flow rate is brought up to code
 - Inlets need to be repositioned and increased as flow rate is brought up to code
 - Update in electrical system, including grounding, GFIs, bonding, and other new electrical safety measures
- Access and Safety
 - Accessible exit locations
 - Required markings on exit locations
 - Raised curb around each pool prevents suitable ADA access
 - Water Depth Markers on vertical walls (currently just on flat deck curb)
 - Inadequate number of toilets, showers, sinks, and drinking fountains for capacity based on square footage of pool surface area
 - ADA accessible bathroom fixtures

- ADA accessible hardware and panic bars on exit doors
- Additional safety signage needed
- Chemical warning/hazardous materials signage

MECHANICAL SYSTEMS

The most immediate and significant issue with The Plunge is the pool filter and water handling systems. The details of code requirements and current system issues are found in the attached Pool Technical Report. The recommendations are summarized in Attachment #1 showing every recommendation with each broken down by code requirements, project area, and benefits.

IMMEDIATE FILTER VALVE ISSUE

Currently one filter tank is leaking and the drain valve is stuck in the open position. The City needs to determine if this can be fixed temporarily prior to a major renovation. The fear is that any temporary fix will put additional strain on other piping and components resulting in a total failure of the system. At this point, there is no guarantee that an overall system failure could be prevented. Any attempt to fix the bottom drain valve on the one filter should involve someone going into the filter tank and inspecting the tank and tank bottom to properly fix the valve and filter. The entire process of fixing this valve may cost as much as \$30,000 to \$40,000 to insure a proper fix, even if the fix is just intended to be a short term valve replacement until major renovations and replacement can be replaced. The recommendation from Arch Pac is to continue operating on the three filters if the filters are able to maintain water clarity and meet the water quality testing criteria.

CURRENT POOL SYSTEMS:

Following are the key mechanical and water handling issues:

- The current system, even at full operating capacity does not meet current Code requirements for water circulation and turnover
 - The pool was built in 1938 when Code required an 8 hour turnover rate for the filter system
 - With old partially clogged and corroded piping, the actual current turnover rate is estimated at approximately 10 hours
 - The current code requires a 6 hour turnover rate
 - Because of the high percentage of young children and the warmer and shallower water ISG recommends a turnover rate of 3 hours or even less for the small teaching pool
- Running on just three filters (taking the fourth leaking filter out of the system) may not be adequate to keep the pool clean during heavy use and would increase the likelihood of an overall system failure
- Code requires that each pool be on a separate filtration/water handling system
- Circulation pumps need to be placed below water level to facilitate priming and efficient operation
- The current pool piping is old and often clogged in the portions with original iron piping.
- Any replacement of the filter systems would require inspection of all the under-deck and below-pool piping. It is expected that the existing pipes would not support the flow rates needed to achieve the 6 hour turnover rate required.

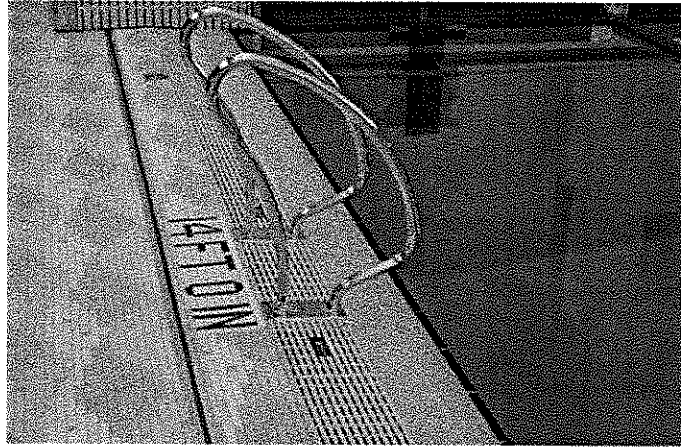
- Current gutter drainage system has limited capacity and does not adequately draw surface water into the filter system resulting in inefficient water filtration and circulation
- Water inlets are not placed correctly to maximize circulation of the filtered water throughout the entire pool, further decreasing filtering effectiveness
- Current pool does not have adequate backflow protection.
- Surge tanks for both pools are needed, both to bring up to code and provide more effective circulation during peak use
- Currently the chemicals are stored in the main filter room.
 - Code requires a separate ventilated and secure area for each of the chemicals
 - Storage tanks also need to be seismically restrained
 - Storage must be ventilated
 - Proper eyewash system needs to be in place in chemical storage
 - Proper signage and posting of chemical and hazardous materials storage
- Storing the chemicals in the main filter room creates a very corrosive atmosphere which negatively affects the operation of the pool mechanical systems and shortens the life of all systems and equipment
- Automated chemical systems are old and nearing the end of their useful life
- Wiring and electrical panels are outdated and should be replaced for code and safety reasons

RECOMMENDATIONS

Based on these issues, the following are recommendations and benefits for the Filter and Water Handling System (detail in Technical Pool Analysis Report). These recommendations not only address the issue but provide solutions and technology that reduce costs and better support the quality of water and pool use.

- Demolish existing pool systems in mechanical room
- Install new regenerative media filters (such as Neptune Benson Defenders)
 - Benefits:
 - Reduces need to backwash and reduces labor needed to operate and maintain
 - Filters down to 1 micron in particle size, significantly better than filter ability of traditional high rate sand filters which can only filter down to 15-30 microns
 - Reduce current backwash water consumption by 75-85%, saving as much as 250,000 gallons of water each year
 - Saves water and sewer costs
 - Good for environment
 - Reduces chlorine and pool chemical use by approximately 20% per year
 - Save approximately 10% year on electric costs based on decreased pump capacity needed for these filters
 - Filters require much less space in filter room, freeing up space to be converted to family and handicap changing rooms and additional pool storage
 - Energy, water, and chemical savings pay off the premium paid for regenerative media filters in less than 1 ½ years
- Replace pumps and strainers for each pool

- Benefits
 - Increased energy efficiency
 - More effective strainers and increased ease of access to clean
- Install Variable Frequency Drives (VFDS) on all pumps to save energy and provide variable speeds to maximize pump and filter efficiency
 - Benefits
 - Reduce electrical use by 10-15%
 - Increase life expectancy of pumps
- Install new chemical controller
 - Benefits:
 - More efficient use of chemicals, resulting in lower chemical bills
 - More consistent water quality
 - Can be monitored off site by CPO through the internet
- Add UV (Ultraviolet) water purification to both pools
 - Benefits
 - Highly recommended in new Model Aquatic Health Code and likely to become mandatory
 - Kills and eliminates types of bacteria that chlorine does not kill, specifically *Cryptosporidium*, which is the leading cause of pool related illnesses
 - Reduced consumption of chlorine
 - Limits amount of chlorine broken down into chloramines, which are a primary cause of “bad air” in indoor pools
- Replace all pool piping
 - Benefits
 - Increase circulation capacity to meet code requirements
 - Prevent any future failure of old piping
- Replace main drains and water inlets
 - Benefits
 - Meet VGB main drain code requirements
 - Updated strategically placed water inlets to meet code and increase circulation efficiency through proper inlet and flow balancing
- Replace current scum gutters with rim flow gutter system with hand holds
 - Benefits
 - Greatly improve surface water circulation
 - Create much easier access to pool, compared to current raised gutter and deck curb on existing pool
 - Especially helpful for the increased swim lesson, aquatic fitness, senior, and special needs programs to be offered at The Plunge



Example of flush deck Rim-Flow gutter

- Replace current heater with new high efficiency heaters, one for each pool
 - Include external head exchangers\
 - Benefits
 - Reduce utility costs
 - Separate pool systems
 - May be able to utilize the current heater for a few more years to heat the main pool
- Create separate storage areas for pool chemicals as indicated above (detail in Technical Pool Study)
 - Benefits
 - Safer environment
 - Protects all the pool mechanical and electrical equipment from the corrosive atmosphere created by chemical storage
- Remove and replace existing electrical service entrance and sub-panels
 - Include new bonding grid to meet code
 - Benefits
 - Eliminate old wiring and electric control and safety systems
 - Bring up to code concerning wiring around pools and water

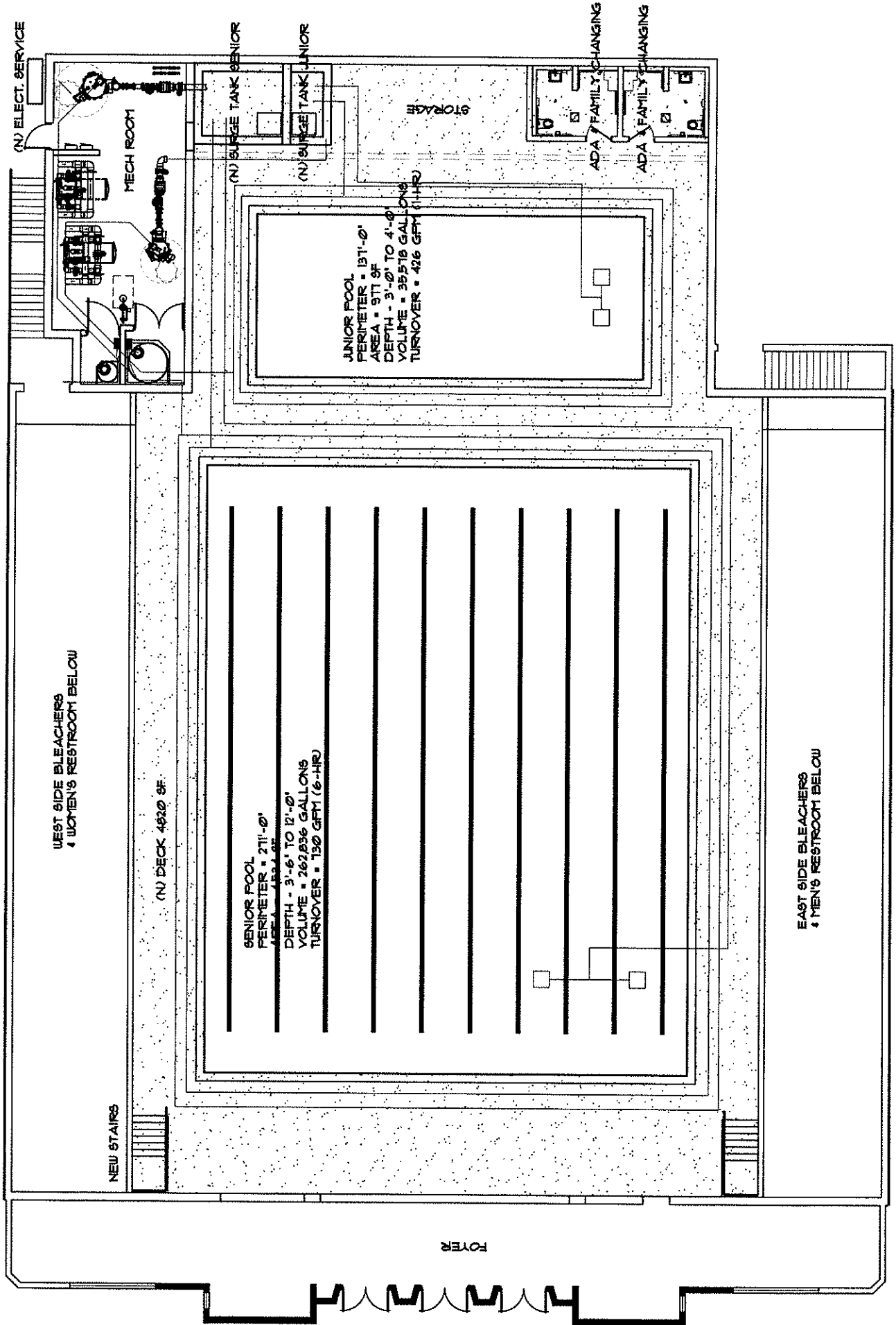
LOCKER ROOMS and USER AMENITIES

The review of the facility indicated several code updates needed in the locker rooms and user amenities as well as improvements that can enhance the programs and user experience at the Plunge.

Issues:

- Number of toilets, sinks, and water fountains do not meet current code based on user bather capacity as calculated by square footage of pool surface area (see Technical Pool report for details)
 - Updated numbers needed: See page 14 of the Technical Pool Study
 - Benefits: Improve user amenities
- Add family and handicap accessible changing rooms in area opened up in renovated pool mechanical room
 - Benefits
 - Create much more family friendly environment
 - Increased use of pool and program participation by families, young children, and those with special needs
 - Increase child safety around the pool
 - May be able to reduce amount of work needed to bring current locker rooms into total ADA compliance

Potential design sketch of pool layout with family changing rooms:



WEST SIDE BLEACHERS
4 WOMEN'S RESTROOM BELOW

(N) DECK 4820 SF

NEW STAIRS

FOYER

SENIOR POOL
PERIMETER = 211'-0"
AREA = 1837 SF
DEPTH = 3'-6" TO 12'-0"
VOLUME = 262,836 GALLONS
TURNOVER = 130 GPM (6-HR)

JUNIOR POOL
PERIMETER = 131'-0"
AREA = 911 SF
DEPTH = 3'-0" TO 4'-0"
VOLUME = 35,578 GALLONS
TURNOVER = 426 GPM (1-HR)

STORAGE

ADA FAMILY CHANGING

ADA FAMILY CHANGING

(N) ELECT. SERVICE

MECH ROOM

(N) SURGE TANK SENIOR

(N) SURGE TANK JUNIOR

EAST SIDE BLEACHERS
4 MEN'S RESTROOM BELOW

- Improve ADA access in locker rooms
- Replace current hot water heating system for locker rooms with on-demand hot water system
 - Benefits
 - Lower energy costs
 - Better delivery of hot water on demand, especially to the men's locker rooms and showers that are currently a long way from hot water source
 - Eliminate current hot water storage tank

POOL and NATATORIUM UPDATES

The study of the pools and natatorium building also found additional current code issues and some other user related features that need to be updated. These are the following:

- Pool markings and Signage
 - Need depth markings and warnings on both deck and vertical pool walls
 - Provide pool safety signage
 - New illuminated exit signs for pool exits
- Update hardware on pool exit doors as needed
- Replace current natatorium lighting with new LED lights
 - Benefits
 - Decrease energy costs
 - Lights over pool deck, not over the water, to make changing of bulbs much easier and safer
- Pool equipment
 - If deck and gutter system is redone the following components will need to be replaced
 - Starting blocks if you determine that these are needed once the aquatic center is open
 - New lane line and backstroke flag anchors
 - Evaluate existing equipment and determine any new needs
 - Lifeguard stand
 - ADA lift
 - Fire extinguishers
 - Pool Safety equipment
 - Evaluate emergency equipment
 - Evaluate existing pool cleaning and maintenance equipment and determine any needs for new equipment
 - Automated pool vacuum
 - Deck cleaner
- Miscellaneous operational equipment and features
 - New hose bibs to meet current code on location and type
 - Indoor pool covers—can reduce energy and water consumption even in indoor pools
 - NOTE: Specific lightweight covers are now made specifically for indoor pools
 - Add inside stairs to west side bleachers

- NOTE: Need to evaluate the use of the seating areas and options for these spaces at least on one side of pool
 - Consider addition of underwater lights in main pool, easily installed when deck is torn up for piping installation
 - NOTE: This may be an aesthetic issue, not as much of a functional issue. Little impact on programming or pool use if the overhead lighting is improved
- Consider future installation of new HVAC system to improve air quality in natatorium (not included in current project priority and pricing)
- Operational Issues
 - Update emergency procedures manual
 - Create better daily log system for pool data, including temp, chemical readings, and other key pool data and procedures
 - Any additional staff training needed (have not reviewed with Rec and Parks)

SUMMARY OF PROJECT RECOMMENDATIONS

The detailed elements of the recommendations are broken out in the following grid. Each element of the different phases of renovation is identified and is identified by key features or need, including:

- Priority
- Code required?
- Program and Best Practice Benefit
- Cost savings benefit
- Mechanical system
- Locker rooms
- Pool and Deck

This breakdown follows:

**UHRO SAARI SWIM STADIUM
PROJECT RECOMMENDATIONS and ANALYSIS**

April 6, 2015

NOTE: Each element number corresponds to the numbered item in the costing projection worksheet.

#	Project elements	Priority	Code Req?	Program Best Practice	Cost Saving	Mechanical	Locker Rooms	Pool & Deck	Comments
1	Demolish existing pool filters, recirculation systems and pool piping	A				X			
2	Demolish existing concrete curb and scum gutters around pool perimeter.	B	X	X		X		X	
3	Provide new rim-flow style gutter with safety hand hold.	B	X	X		X		X	
4	Build chemical storage areas for the acid and chlorine which contain each of the seismically restrained dual containment tanks, where the off-gassing cannot have a deleterious effect on the remainder of the equipment in the pool mechanical room. Locate away from pool heaters and electrical cabinets. Mechanically exhaust each containment area.	A	X	X		X			
5	Remove existing electrical service entrance and sub-panels, replace with new.	A	X			X			
6	Replace pool recirculation system piping – separate each by pool and construct surge tank for each pool at proper and required turnover rate.	A	X	X	X	X			
7	Provide new pump and strainer for each pool with new filters. Pump to be flooded suction vertical style with VFD for energy efficiency locate in lower portion of pool mechanical room.	A	X	X	X	X			Consider creating pump pit
8	Remove existing wall inlets and replace with new – adjust and balance as required.	B	X					X	
9	Remove existing main drain sumps and replace with VGB compliant sumps of proper size and depth.	A	X					X	
10	Provide tile depth markers and warning markers.		X	X				X	
11	Patch Tile.							X	
12	Provide pool safety signage.		X					X	
13	Provide chemical safety signage, equipment and data sheets.	A	X	X		X		X	
14	Provide Emergency Eye Wash and chemical safety equipment in chemical storage rooms.	A	X	X		X			
15	Make-up water RPBFP for pool water makeup – automate same.	A		X		X			
16	New pool heaters with external heat exchangers.	A		X	X	X			
17	Provide electrical bonding grid, grounding, gasketed electrical service panels and non-metallic conduits and GFCI breakers. Include pump shut-off and VFD	A	X			X			
18	Move chemical metering pumps to containment areas – dual contain feed lines and metering pumps.	A	X	X	X	X			
19A	Provide underwater LED lights	Option						X	
19B	Provide LED Deck/ Building lighting	B			X			X	
20	Make bathrooms accessible with correct fixture count.		X				X		
21	Provide ADA access, possible family changing area in lieu of complete restroom remodel.		X				X	X	
22	Provide ADA lift for access to pools.		X					X	Explore Ramp if re-do decks-Check on current lift
23	Provide separate reduced pressure backflow prevention device for each pool and domestic water-surge tanks	A	X	X		X			

Attachment #1

#	Project elements	Priority	Code Req?	Program Best Practice	Cost Saving	Mechanical	Locker Rooms	Pool & Deck	Comments
24	Provide new automated controller to minimize need for maintenance and operation.	A		X	X	X			
25	Ensure backwash reception system (sanitary sewer) is of adequate size – based on filter selection.	A	X	X		X			
26	Domestic hot water system – dedicated to each side, men's & women's. Delete storage tank.			X	X		X		
27	New pool deck equipment, backstroke poles, flags, starting blocks, stanchions, ladders, rope anchors, lane lines with tenstomers, safety hooks and life buoys, and life guard stands, etc.							X	Not sure what would be needed if deck and gutters are redone
28	New emergency equipment, haz-mat station, spine board, etc.	A	X	X		X		X	
29	New chemical handling and safety equipment, including test kit and logs	A	X	X		X			
30	New maintenance equipment, vacuum, brushes, etc.								
31A	Add UV system to both pools	A	X*	X	X	X		X	Check what is already there *Recommended in new Model Aquatic Health Code
31B	Add dehumidification or exhaust system to natatorium			X		X		X	
32	Fire extinguisher		X			X		X	
33	Stair to bleacher on west side similar to stair on east side.		X					X	
34	Pool Covers			X	X			X	
35	Train Maintenance and Operations Staff, provide manual of emergency procedures.			X					
36	New exits with illuminated EXIT signs that are accessible. Separate from front entry – with proper hardware.		X					X	
37	Place hose bibbs in proper locations as required by code.		X					X	

PROJECT COSTS

These estimated project costs were developed by ISG and Ken Moeller of Arch Pac Aquatics. The costs are based on current pricing in the California market with input from manufacturers and pool builders factored in. All of the recommendations are factored into the pricing in one of the three main project categories. These categories and costs are the following (rounded to nearest \$1,000):

• Mechanical and Water Handling Systems	Priority #1	\$1,643,000
• Locker Room and user amenities	Priority #2	\$ 423,000
• <u>Pool features, equipment, and miscellaneous</u>	Priority #3	\$ 330,000
TOTAL		\$2,396,000

If all code related updates are required to be addressed during the first phase, the costing spreadsheet would need to be updated. The actual excel spreadsheet is included with this report to assist the City in moving project elements around as necessary within the costing structure.

Several assumptions and the overall approach to the pricing need to be mentioned.

- The pricing is on the high range in each project reflecting the unknowns that often come up in renovating old buildings
- Contingencies
 - A higher than normal contingency of 12% is used in the Mechanical and Water Handling project since there is still so much unknown about the piping under the deck and additional problems that may surface when work is started
 - A 10% contingency is used in the other two project areas
- Soft Costs
 - Contractor overhead and profit are both calculated at 10% of hard costs. This can be reduced if any work is done at the same time as the Aquatic Center or the same GC and pool contractor are used creating lower “package deal” pricing.
 - A & E fee is 8%
 - Overall soft costs are at the high end of most similar projects to be on the safe side
- Where there are questions of current equipment might be reused we have assumed that none of the existing equipment to be reused. Again, this pricing errs on the side of the higher cost projection.
- The specific equipment identified and priced are the most energy efficient and state of the art technology that provide the lowest annual operating costs, lowest long term maintenance costs, and the best return on investment.
- We have highlighted in green line items that we need to review with the City Public Works Department and the Recreation and Parks Department to assess the current equipment or determine specific needs.
- Explanations are included in the comment column as appropriate

The Costing Detail follows:

FINANCIAL OPERATING COSTS and IMPACT

The recommended mechanical renovations and replacement all include new technology which will reduce annual operating costs in the following areas:

- Electricity use
- Natural Gas used for water heating
- Natural Gas used for shower and facility hot water
- Pool chemical usage
- Water and sewer usage

The annual operational savings for key elements are as follows:

Regenerative Media Filters with VFD (Variable Frequency Drives) and UV Purification System	
Water/Sewer savings of 75% per year =	\$5,250
Electricity savings of 25% per year	
Chemical savings of approximately 20% per year	\$2,600
Natural Gas (pool water heating) 15%/year	

New high efficiency pool heaters

Natural Gas savings of 15%

NOTE: Offset by 5% for warmer small pool

Currently utilities are lumped together in the budget, so the above savings would generate an overall annual savings of approximately 25% in current utility costs, equaling \$17,500.

Total annual savings in operating costs per year (1st year) add up as follows:

Water/Sewer	\$ 5,250
Utilities (gas, electric)	\$17,500
<u>Pool Chemical</u>	<u>\$ 2,600</u>
TOTAL ANNUAL OPERATIONAL SAVINGS	\$25,350

The use of indoor pool blanket covers could further reduce these savings by approximately \$3,500 to \$5,000/year.

These annual savings do not take into account the reduced or virtually eliminated routine maintenance on the current aging systems. Current Plunge operational actuals were used in these estimates. The savings will likely be greater in several years based on rising cost of water and utilities.

CONCLUSIONS

The Uhro Saari Swim Stadium will continue to be a very valuable resource for the residents of El Segundo. With the opening of the new El Segundo/Wiseburn High School Aquatic Center and the restructuring of the programming at the Swim Stadium this pool will actually provide aquatic programs and access to a wider range and number of El Segundo residents.

The Plunge has a sound pool tank and building structure that can last for many more years. The mechanical systems are badly out of date and do not meet current codes and require replacement in the very near future. It is hoped that this replacement can be executed after the Aquatic Center is opened and not required due to an overall system failure prior to the opening of the new pool. The mechanical systems updates will also generate approximately \$25,000 or more in operational savings each year.

Once the mechanical systems are updated, space will be created in the current mechanical rooms to provide the much needed family and handicap accessible changing areas.

Additional code required updates are needed in many areas, including access, safety, signage, etc. The additional renovation recommendations are based on improving the experience for users, making the pool more user friendly for the full range of resident needs, and providing design support to meet the changing programming to be conducted at The Plunge.

**UHRO SAARI SWIM STADIUM
PROJECT RECOMMENDATIONS and ANALYSIS**

April 6, 2015

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2	Demolish existing concrete curb and scum gutters around pool perimeter.	B	X	X		X		X	
3	Provide new rim-flow style gutter with safety hand hold.	B	X	X		X		X	
4	Build chemical storage areas for the acid and chlorine which contain each of the seismically restrained dual containment tanks, where the off-gassing cannot have a deleterious effect on the remainder of the equipment in the pool mechanical room. Locate away from pool heaters and electrical cabinets. Mechanically exhaust each containment area.	A	X	X		X			
5	Remove existing electrical service entrance and sub-panels, replace with new.	A	X			X			
6	Replace pool recirculation system piping – separate each by pool and construct surge tank for each pool at proper and required turnover rate.	A	X	X	X	X			
7	Provide new pump and strainer for each pool with new filters. Pump to be flooded suction vertical style with VFD for energy efficiency locate in lower portion of pool mechanical room.	A	X	X	X	X			Consider creating pump pit
8	Remove existing wall inlets and replace with new – adjust and balance as required.	B	X					X	
9	Remove existing main drain sumps and replace with VGB compliant sumps of proper size and depth.	A	X					X	
10	Provide tile depth markers and warning markers.		X	X				X	
11	Patch Tile.							X	
12	Provide pool safety signage.		X					X	
13	Provide chemical safety signage, equipment and data sheets.	A	X	X		X		X	
14	Provide Emergency Eye Wash and chemical safety equipment in chemical storage rooms.	A	X	X		X			
15	Make-up water RPBFP for pool water makeup – automate same.	A		X		X			
16	New pool heaters with external heat exchangers.	A		X	X	X			
17	Provide electrical bonding grid, grounding, gasketed electrical service panels and non-metallic conduits and GFCI breakers. Include pump shut-off and VFD	A	X			X			
18	Move chemical metering pumps to containment areas – dual contain feed lines and metering pumps.	A	X	X	X	X			
19A	Provide underwater LED lights	Option						X	
19B	Provide LED Deck/ Building lighting	B			X			X	
20	Make bathrooms accessible with correct fixture count.		X				X		
21	Provide ADA access, possible family changing area in lieu of complete restroom remodel.		X				X		
22	Provide ADA lift for access to pools.		X					X	Explore Ramp if re-do decks-Check on current lift
23	Provide separate reduced pressure backflow prevention device for each pool and domestic water-surge tanks	A	X	X		X			

#	Project elements	Priority	Code Req?	Program Best Practice	Cost Saving	Mechanical	Locker Rooms	Pool & Deck	Comments
24	Provide new automated controller to minimize need for maintenance and operation.	A		X	X	X			
25	Ensure backwash reception system (sanitary sewer) is of adequate size – based on filter selection.	A	X	X		X			
26	Domestic hot water system – dedicated to each side, men's & women's. Delete storage tank.			X	X		X		
27	New pool deck equipment, backstroke poles, flags, starting blocks, stanchions, ladders, rope anchors, lane lines with tensioners, safety hooks and life buoys, and life guard stands, etc.							X	Not sure what would be needed if deck and gutters are redone
28	New emergency equipment, haz-mat station, spine board, etc.	A	X	X		X		X	
29	New chemical handling and safety equipment, including test kit and logs	A	X	X		X			
30	New maintenance equipment, vacuum, brushes, etc.								
31A	Add UV system to both pools	A	X*	X	X	X		X	Check what is already there *Recommended in new Model Aquatic Health Code
31B	Add dehumidification or exhaust system to natatorium			X		X		X	
32	Fire extinguisher		X			X		X	
33	Stair to bleacher on west side similar to stair on east side.		X					X	
34	Pool Covers			X	X			X	
35	Train Maintenance and Operations Staff, provide manual of emergency procedures.			X					
36	New exits with illuminated EXIT signs that are accessible. Separate from front entry – with proper hardware.		X					X	
37	Place hose bibbs in proper locations as required by code.		X					X	