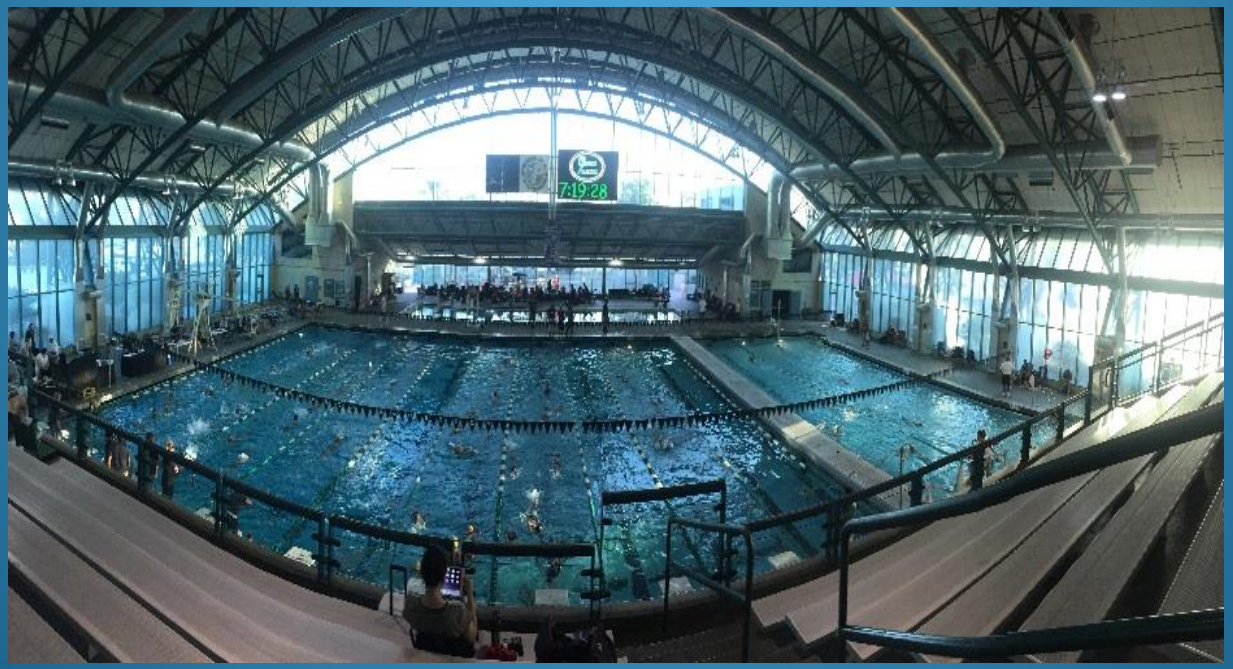
Brenda Villa Aquatic Center Air Quality Evaluation



Air Quality Evaluation

Consisted of:

- Review of drawings and past reports.
- Two-day site visit during the day and during an active swim meet, pool and maintenance staff interviews and existing equipment inspection.
- Record two weeks of air quality conditions.
- Analyze results and provide recommendations to improve:
  - Air quality, mechanical equipment and access, site access for pool equipment, and options for natural ventilation.

The Challenges

- Complicated facility and various competing uses in one facility
- Enclosed facility
- Access limited for new mechanical and pool equipment
- No storage for pool equipment
- Mechanical – aging equipment
- User preferences for ambient air temperature vary

Mechanical Issues

- Both dehumidifiers (DH) are at the end of their 15 year life expectancy. Necessary to remove humidity from enclosed facility. The removed heat from the air is then used to heat the pool water in addition to boilers.
- Exhaust fans no longer operating per design. Operating slowly and then surging or at 80% capacity.
- Outside air dampers for the DH are not automatically controlled so they remain in a closed or nearly closed position.
- The DH bypass dampers are locked in a partially open position and allow unconditioned air to bypass the cooling coils.
- Leaking DH valve.
- Control points need calibration.
- The DH's R-22 refrigerant no longer meets current environmental standards for non-ozone depleting refrigerants. Phasing this out. City needs to use reclaimed gas until DH is replaced. Increasingly expensive.
- Mechanical room – poured in place concrete structure around all equipment including the DH units. They are located on the 2nd floor and access is through a small 3'x3' opening in the ceiling on the ground level.

Mechanical Room Access Issues – encased in concrete

DH Unit – 12'7" L x 7' w x 8' h –
the pool area uses two such units

User Preferences

- Aquatic Center designed for an indoor condition of 82° F with 50-60% relative humidity.
- User preferences have resulted in the pool temperatures ranging from a low 77° F for collegiate meets to a high 89° F for the warm up pool.
- The result from accommodating user preferences is the users are comfortable and the spectators are not.

The Solution–

in phases

Phase 1 Implementation –

Council approved $300,000 as part of FY 2016/17 budget and Capital Improvement Program

Consultant recommendations ($96,500):

- Ventilation fan system repairs and some HVAC modifications for spot cooling spectator area.
- Leaking valve repair on DH unit 1.
- Bypass damper repair on DH.
- Use of existing pool cover.

Staff's added recommendations ($203,500)

- Feasibility assessment of modifying the pool structure to allow natural ventilation ($5,000).
- Re-evaluation of air quality conditions based on new equipment from completed lap pool filtration project ($25,000).
- Model new DH equipment needs based on actual usage not design parameters ($10,000).
- Cost analysis for replacement of HVAC unit 1R for spectator area.
- Draft conceptual plans for expanding the mechanical room on both sides of the building for possible relocation of new DH units to the ground level and to create a pool equipment storage area.

Phase 2 Implementation

- Modify mechanical room if necessary for new equipment and storage needs (estimate to be determined during Phase 1).
- Replace DH units ($3,000,000 - $4,000,000) – this must occur prior to introducing natural ventilation recommended in Phase 3 to prevent aged DH units from being overburdened by attempting to compensate for outside air.
- Replace HVAC unit 1R ($250,000 for Senior Center HVAC unit recently replaced which is similar in size and capacity).
- Phase 2 total costs and recommendations to be presented to Council for approval at a future meeting.

HVAC Unit 1R

Phase 3 Implementation

- Structural modification to accommodate natural ventilation improvements.
- Install two large garage door type openings on each side of the pool area to allow outside air in as needed and for equipment access.
- Replace some glass enclosure panels with manually controlled openings if necessary to further address spectator comfort levels.
- Phase 3 total costs and recommendations to be presented to Council at a future meeting.