Pulaski Indoor Family Center Building Assessment

July 7, 2010

Milwaukee County – Department of Transportation & Public Works

Department of Parks, Recreation and Culture

Pulaski and Noyes Indoor Family Aquatic Center Planning

Architect:

Kahler Slater experience design

Civil & Structural:

GRAEF

HVAC, Plumbing & Electrical:

IBC ENGINEERING SERVICES, INC.

Aquatic Design & Engineering:

WTI WATER TECHNOLOGY INC.

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Milwaukee County – Pulaski Pool Building
July 7, 2010

Milwaukee Project Number: P178-10606 & P178-10607
Milwaukee Project Code: WP178012 & WP179012
Kahler Slater Project Number: 210092.00

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Introduction

The Pulaski Park Pool building is located at 2701 S. 16th Street in Milwaukee, Wisconsin. It is owned by Milwaukee County and operated by the Milwaukee County Parks Department. Drawings were completed in 1976, with construction completed in the late1970's. The building is one story, with a mezzanine surrounding the pool deck on two sides, which contains mechanical spaces and 3 rows of viewing bleachers. It is approximately 24,600 square feet. The pool remains actively in use, and was occupied at the time of the walk-through on Thursday, June 10th, 2010. Weather was mostly sunny, with outdoor temperatures in the 70's. The last measurable rainfall (approx. 1/4") had occurred two days earlier, on Tuesday, June 8th.

The daily use and swimming pool environment has taken its toll on the building but is in fair condition overall for the age of the facility. The attached building assessment is a report of the current conditions of the facility. The report recommends several repairs and upgrades to maintain the building in working order. Several recommendations were not required when the building was built but are recommended to increase the level of life safety & welfare in this building up to current standards. If a significant remodel or addition would be done to this facility majority of the recommendations will need to be completed.

The conclusions in the report are based solely on review of existing drawings provided by the county, on-site visual observations, photo documentation and interviews with operations staff. Unless specifically noted, no mechanical testing of material and/or systems was done, nor was any selective demolition/temporary removal of existing materials done to gain access to otherwise inaccessible spaces/materials for observation.

Many of the recommendations have been give a cost within this report. The costs are estimates on the understanding of observations made. Some assumptions have been made but a final cost may not be known till the full extent of the problems are understood and appropriate solution is executed. The full extent of the problems may not be known till selective demolition is completed. The cost also doesn't include design fees, documentation and other soft cost associated with each recommendation.

Milwaukee County – Pulaski Pool Building

Site Context

The site is located within Pulaski Park at the southeast corner of the intersection fo West Cleveland Avenue and South 16th Street in Milwaukee, WI. The pool building is located on the east side of the Kinnickinnic River.

The existing concrete sidewalks at the building entrances are in relatively good condition. The exception to this is the sidewalk along the east side of the building where settlement has occurred in the first slab adjacent to the building, creating a tripping hazard. If this sidewalk will be used as part of the new site plan it is recommended to replace or mudjack this section.

The site contains many mature trees in the area of the building entrance, north of the parking lot, and south of the building. The trees at the building are recommended to be pruned to improve the visibility of the entry locations. There is one tree north of the parking lot that is dying and should be removed.

Site Utilities

The building and parking lot are served from utility mains located in the adjacent City streets. Electrical, telephone, storm sewer, water main, and sanitary sewer are located on the north side of the building with service from West Cleveland Avenue. Gas service is also located on the north side of the building but originates from South 16th Street.

No current issues have been reported with the water main, storm sewer, or sanitary sewer. Capacities of these utilities to serve the proposed addition will be evaluated during the design process.

Parking

The existing parking lot is located on the north side of the building with a separate entrance and exit drive from and to West Cleveland Avenue. The parking lot pavement is in poor condition and in need of repair or replacement. The pavement has multiple areas of failure with potholes developing around the storm inlets. Additionally there is an area in the loading dock with a circular staining/ cracking pattern that was observed.

The parking lot capacity is currently 24 spaces on site. Overflow parking is available on adjacent City streets.

Drainage

The north portion of the site generally drains to the storm sewer in the parking lot. The east portion of the site

sheet drains to South 16th Street. The south and west portions of the site sheet drain to the adjacent river. This site does not contain any storm water detention.

No existing drainage issues have been identified. Future building existing expansion to the south will need to include provisions for continued drainage to the river. All additions of impervious surfaces will need to include evaluation of the impact on storm water management and the need for storm water controls.

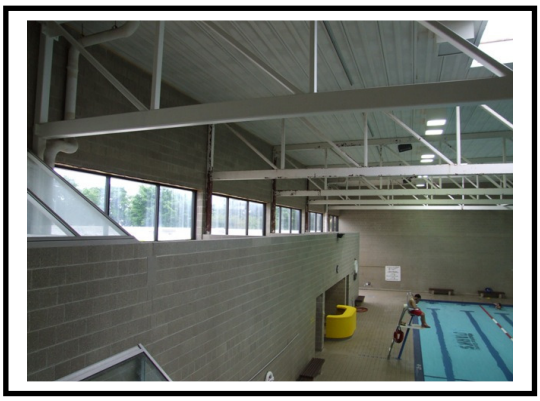
Pulaski & Noyes Indoor Family Aquatic Center Planning
Milwaukee County - Noyes Pool Building
Civil Pricing Estimate

	Description of Repair	Approximate Cost	Priority
	Exterior Work		
	Remove/ replace concrete sidewalk along east face of building	$5,000	Med
	Tree removal/ pruning	$2,000	Med
	Remove/ replace asphalt parking lot pavement	$60,000	Med

2.0 Structural Condition Assessment

The structural system of the core building over the pool consists of custom steel tube trusses spanning 105 feet over the pool and supported on 6 x6 tube columns. The trusses are 19'-4" on center with 4-1/2 inch deep acoustical deck spanning between them. Approximately 20 -30% of the truss have surface corrosion. The exposed portions of the columns have 50-60% surface corrosion and there are small patches of the bottom plate on the acoustical deck that have surface corrosion.

From the visual inspection performed this corrosion does not appear to be severe enough to have caused any significant loss of material of the sections, however a closer inspection of the top surfaces of the trusses and the structural portion of the metal deck should be performed to determine the condition of these surfaces. A program to prepare, prime and paint these members should be implemented within the next two years to halt the corrosion before it impacts the structural capacity of the roof system.



A lower one story roof is located along the east side of the main pool building. This roof is framed with 24 inch deep steel joists at 4'-0"on center spanning 38 feet east –west with 1-1/2 inch deep metal decking. The original building plans indicate these joists are supported on steel beams and wide flange columns at each end. The majority of this system is not visible due to a plaster ceiling system with the exception of the mechanical room at the south end. This room houses the water filtration and chlorination systems.

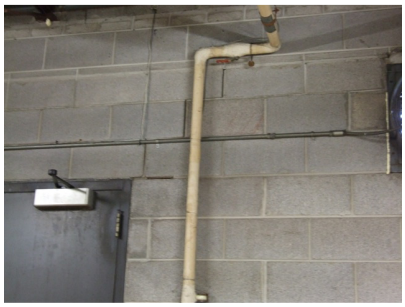
The joists in this area have light surface rust which has not progressed enough to cause any structural concern. However the surface corrosion on the metal deck has progressed to a point that remedial action is warranted. The surface should be sandblasted clean, primed and painted.

Along the north side of the pool building is a two story steel framed wing with a single story bay at the west end. The upper floor is a mechanical room that houses the heating and ventilation equipment. The roof structure over this portion is comprised of 12 inch open web steel joists spanning east-west in direction with a 1-1/2 inch metal deck. This roof framing is supported on 21-inch deep beams supported on wide flange columns. The joists are in good condition and the deck has a light surface rust on the bottom of the ribs. This condition is mainly cosmetic at this time and should be monitored.

The floor construction under the mechanical room is steel joists at 2'-0" on center spanning east west with a 9/16 inch deck and 2-1/2 inch concrete floor slab. The plans indicate the floor is supported on 14 inch deep steel beams and wide flange steel columns. This system was not visible due to the plaster ceilings.

The roof of the single story bay at the west end is framed with 18 inch deep steel joists at 4'-0" on center and 1-1/2 inch metal deck. The system is in good shape with the exception of a 4 foot by 8 foot section in the southwest corner. The deck in this area has corroded completely thru due to roof leaks in this corner. This section of deck should be replaced prior to next winter.

The masonry walls at the west and north sides of the mechanical room appear to have settled creating step cracks in the walls. The 5 inch thick concrete floor slab appears to have settled in the northern half of the storage room. The main electrical feed lines running below the slab have moved along with the slab and have been pulled out of the bottom of the electrical cabinet located midway along the north wall. These settlements may have been caused by poorly compacted soils, poor underlying soils or a loss of soils due to a break in the drainage lines in this area. Monitoring and further investigation is required to determine the cause and the appropriate repairs. If poor soils are found, the slab could be partially removed and underpinning piles could be placed under the foundation wall and new floor slab.



There are two doors to the toilet rooms in the northeast corner of the lobby. Cracks in the masonry walls and floor slab indicate settlement in this area. A review of the original construction drawings indicate a load bearing wall running in the north-south direction was constructed on a footing between the toilet rooms. The east-west wall appears to have been built on top of the floor slab without a footing. Differential settlement between the floor slab and the footing accounts for the cracks in the walls, floor slab and tile floor covering. These cracks should be monitored. If no further movement is detected the cracks in the walls could be tuck pointed and the floor tile replaced. If the cracks continue to move a footing may be required under the east-west walls.

The exterior foundation wall for the brick terrace wall has shifted. This is usually caused by water collecting behind the wall or poor foundation soils. The original building drawings indicate the concrete retaining wall was revised during construction. An un-grouted masonry wall may be collecting water or water may have collected behind the brick facing. Further investigation requiring partial removal of the brick face and a review of the soils will be required to determine the actual cause. Repairs are expected to include removal of the patio slab excavation of the wall and reconstruction of the retaining wall and brick facing.

The masonry walls over the windows on the north and south sides of the observation deck are supported by steel beams. A steel plate fastened to the beam extends to the exterior face of the wall to support the brick façade. The steel plate has corroded causing a buildup of rust which has bent the plate. This condition is known as rust jacking and is usually caused by a lack of or improper flashing behind the brick façade. This condition can also be caused by ineffective weep hole that are provided to allow moisture build up behind the brick to drain. A permanent repair for this condition would be to remove the brick façade, clean prime and coat the plate and install flashing. Similar conditions may exist along the clearstory windows along the east wall of the pool area. These windows were not accessible for inspection.

Similar corrosion of the lintel plates is present at the patio doors along the west side of the pool and the conference room windows along the north wall. Similar conditions may exist along the clearstory windows along the east wall of the pool area. These windows were not accessible for inspection.

A visual survey of this facility was performed by Design Professionals knowledgeable in the systems examined to determine general areas of building soundness. However, because of the physical properties of the many materials and systems commonly used for construction, and the limitations on detecting concealed internal distress, a visual examination may not find all deficient conditions that are not visible from the exterior. No testing, destructive investigations, or design calculations of any system were performed. The cause of any deterioration noted is based on professional judgment using the degree of care and skill ordinarily exercised under similar circumstances in the industry. This report is intended to provide general recommendations for repair and rehabilitation of the systems examined. Repair recommendations provided in this report are conceptual in nature and are not intended for construction.

Milwaukee County – Pulaski Pool Building

Introduction

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Exterior

The exterior of the Pulaski Pool building is in fair overall condition, with numerous spots of mild to moderate – and some severe - deterioration. The building's roof is a built-up roofing system, with prefinished metal copings and counterflashings. The exterior shell of the building is constructed of masonry cavity walls – a modular brick veneer exterior with a structural concrete block back-up on the interior. According to existing drawings, in most locations, the cavity between the brick and block contains a ¾" airspace and 2" rigid insulation. (A few locations do not include insulation.) Existing drawings do not indicate use of any air or vapor retarders, which would not be uncommon practice at the time the building was completed. The main entrances, patio doors and windows are typically anodized aluminum, and the majority of secondary exterior doors are painted hollow metal.

Based on observation, and according to interviews with county staff, the roof at Pulaski is relatively new (early 2000's). The roofing appears to be in good condition at this time. Prefinished metal copings and flashings are also in good condition, and roof drain cover baskets are in place. Some debris could be seen building up in parapet corners, and this should be cleaned periodically to prevent clogging of roof drains.

The roof also has 4 barrel shaped skylights. These are aluminum framed with double acrylic glazing. The skylight

curbs appear to be in good condition as a result of the new roof work. But, the metal cap flashings, on the other hand, are in a corrosive state of disrepair. This is likely due to the fact that the skylights themselves are in poor condition. In almost all cases the outer acrylic panes have crazed (tiny cracks over the whole pane) and in many cases have developed large cracks. As a result, the skylights are no longer water tight. Significant built-up moisture can be seen between the panes. It was not raining at the time, but it is presumed that these skylights also leak during rain. This moisture has led to significant corrosion of the metal cap flashing over the inner curb. This is also likely contributing to the peeling paint and corrosion on the interior structural steel support. It is fair to expect that the deterioration of these skylights will only accelerate. Ideally, the skylight system as a whole should be replaced, which will also provide the opportunity to replace the curb cap flashing. At the very least, the glazing in these skylights should be replaced, to slow additional moisture related problems in the surrounding construction.

The exterior brick walls are in fair condition. Significant efflorescence is visible in numerous locations around the building. This is caused by moisture in the cavity migrating back through the masonry and mortar. As the moisture evaporates on the surface, it deposits minerals leeched from the masonry and mortar on the surface. In locations where the wall is in relatively good condition, this moisture is most likely due to face absorption from the exterior and interior. Cotton wick weeps can be seen above most lintels, but these have long been ineffective, as over time the minerals deposited from weeping moisture have hardened them and made them mostly impervious. Furthermore, no weeps or flashing can be seen on the bases of exterior walls and parapets. With few directed exfiltration locations, moisture migrates back out throughout the face of the wall, leaving the efflorescence on the surface. This is particularly acute at the bases of walls and parapets, where mortar joints have been spalling out. As the moisture builds up and goes through freeze/thaw cycles, it is pushing the mortar out of its bed. Where it has not spalled yet, the mortar joints can be seen to have significant mineral deposits on the face where, again pointing to significant moisture build-up in the wall cavity. A more severe wall problem is the condition of the steel lintels over wall openings. In almost all cases, severe corrosion of the bottom plates of these lintels can be observed. The build-up of moisture in the wall is likely a significant contributor to this problem.

Replacement of the roof has likely curbed one of the significant contributors to wall moisture. But, in addition to infiltration of weather related water, another contributor to moisture in the wall cavity is likely the humid air in the pool room. As mentioned in an above paragraph, existing drawings do not indicate any sort of air or vapor retarder in

the wall cavity. Thus, as moisture laden air migrates from the interior pool room through the wall to the exterior, the moisture is being deposited within the wall.

Steps should be taken to further mitigate water problems in the wall. Clear sealers can be applied to the interior face of the wall to decrease interior to exterior vapor migration. To assist moisture exfiltration from inside the wall cavity, weeps could still be introduced at the base and tops of the walls by removing the mortar at head joints between bricks at regular intervals, and leaving these head joints open. A second option may be to remove whole bricks at regular intervals and replace them with louvered vents to the cavity. Once this is done, spalled mortar joints should be repaired using tuck pointing, and sealants at all brick control joints should be removed and replaced.

The sloped plaster soffits above the patio doors have significant sections of moisture related deterioration, and should be replaced/repaired to maintain the integrity of the building envelope.

Per county staff, graffiti is a frequent problem at the Pulaski pool. Over time, the methods used to remove graffiti have resulted in moderate pitting of the brick surfaces and significant discoloration. Unfortunately, when the surface becomes pitted, the bricks become even more absorptive than they were originally. County staff said that an aerosol sensor was recently installed in an attempt to curb graffiti, but it is unknown if this has been effective. Anti-graffiti coatings for brick are available. These will render the bricks much less absorptive/permeable. Given the moisture problems behind the wall, unless weeps are introduced as described above, it would be difficult to recommend these coatings, as they may otherwise exacerbate the moisture problems in the wall.

The aluminum window and entry frame systems appears to be in relatively sound condition. The anodized finish on the window systems has slightly “chalked” over time, but this is only an aesthetic issue. Glazing gaskets, where they’ve popped out, should be repaired to prevent future problems. In a few instances, it appears that acrylic panes have been installed on the exterior to cover sections of window. It is unknown why this has been done, but it is possible that this is meant to be a vandalism deterrent. County staff said that the sliding patio doors have been troublesome, but their condition and operability appeared to be sound during this walk-through.

Exterior hollow metal doors and frames are not faring well. In most, if not all, cases the bottoms of doors and frames have severely corroded. Various repairs have been attempted over time with little long term success. This corrosion likely affects door operation, as well as envelope

integrity with regards to heating/cooling. In the long run, this could lead to compromised building security as well. At least one exterior hollow metal door has been replaced with a fiberglass door/frame. This is indistinguishable in appearance from the hollow metal doors, and staff has been pleased with the performance and weather resistance of these replacement doors.

The overhead sectional service door appears to be of wood construction. The paint is peeling/faded away, and the bottom panel, in particular, is moderately to severely deteriorated. Temporary repairs can possibly be made, but for the long term, this door should be replaced.

The garden walls which surround the patio and wading pool areas are in particularly poor condition. According to the original drawings, these were constructed with a metal coping over the brick cap. This metal cap flashing is no longer present, and has likely been gone for a long time. Thus, these walls are absorbing a great deal of water through the brick cap. In the cold months, the freeze/thaw cycle of this water is putting enormous strain on the masonry and joints. As a result, these walls are experiencing significant cracking, spalling and efflorescence. (Additionally, they appear to be frequent targets of vandalism.) In order to maintain these walls long term, cracks should be repaired, missing/spalled bricks should be replaced, and new metal copings should be added at the top to prevent water infiltration at the top from rain and snowmelt. These garden walls are constructed of solid brick 3 wythes wide, and photos seem to indicate that the brick cores were grouted solid, leaving no true air cavities in the wall. Because of this, efforts to create weeps at the top and base of the wall would be mostly, if not completely, ineffective. Metal fences need repainting.

Interior

The interior of the Pulaski Pool building is in fair overall condition for the age of the building. There are a few spots of severe deterioration. The interior of the building was constructed with durable materials; tile flooring, concrete masonry walls and exposed or plaster ceilings for the most part. Generally, the finish color schemes and overall aesthetics of the interiors are outdated. It should be noted that all spaces need to be cleaned, particularly tile floors/walls, countertops, and many of the high out of reach spaces surrounding the pool room. Numerous supply and return grilles could be seen clogged with dust and debris, which is not only affecting the air quality, but is also putting strain on the HVAC equipment. The ceilings and painted surfaces are where most of the damage has occurred.

Entrance Lobby

The entrance lobby is in great shape except for the ceiling. The plaster ceiling has signs of extensive water damage from either leaky walls or the roof above. It appears that some of the leaks are still occurring. Finding the leaks and repairing the ceiling is a necessity to providing a welcoming and warmer entry.

The reception desk in the lobby is a large uninviting element. It is the control point that people learn from staff about events and where patrons pay for services. The desk is a barrier that limits the interaction of staff and patrons. A visual observation occurred while conditioning the walk through; a patron proceeded into the locker room without paying. Since the entrance to get out from behind the desk is on the other side of the desk, the staff member jumped over the desk to stop the patron. A new design and layout of desk could improve the activeness of the lobby space so the facility could feel more welcomed.

Restrooms off of Lobby

The men's restrooms off the lobby were in good shape but out dated. (The women's room is assumed to be in similar condition.) There was evidence of graffiti on the minor that was attempted to be repaired, but still evident. Also, glass mirrors have lost a small amount of silvering around the edges. The toilet stalls do not have any significant damage or graffiti, and the door hardware appears to be in working condition. The exhaust grill was fully clogged due to dust and debris over it. We recommend the grill be cleaned to improve air quality and improve performance of the HVAC system.

Meeting Room

The meeting room is located off the lobby space. It is a large room that can hold 10-15 people comfortably with chair and tables in it. The bones of the room are in fairly good condition. The plaster ceiling that appears to have one spot of recent and continuous water damage. The interior room finishes within this room are in need of repair; including a new carpet, repair blinds or just remove them, clean and paint HVAC grills, repair damaged lights futures, and paint interior borrowed lite frames and plaster ceiling.

Staff Areas

The staff areas are a little dated but in relatively decent shape. The rooms include a several offices, lifeguard office/viewing, locker room/storage, and toilet/shower rooms. The lifeguard office viewing room adjacent to pool deck has a built in desk that is integrated with the view window. Construction is a combination of plastic laminate and painted plywood. Though serviceable, it is in moderately poor condition. The laminate is chipping and de-laminating, and the paint is flaking. The plywood below is also beginning to show signs of water damage. Sanding and repainting the plywood can probably buy some additional time.

Within the locker room/storage room there is some minor water damage in the ceiling, which looks to be from many years prior. The sliding door to the locker room is falling from the ceiling and needs to be repaired or replaced with a swinging door and frame.

The block walls and tile floor of the men's staff locker room are in good condition, but should be cleaned. The glass mirrors have lost a small amount of silvering around the edges, but are otherwise sound. The only damage that has occurred within these rooms over time is the plastic laminate on the countertops have delaminate.

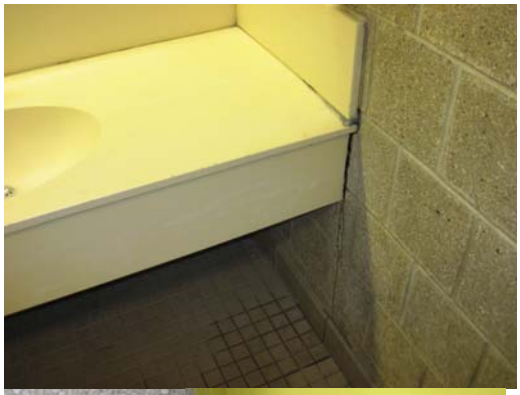
Locker Rooms

The locker rooms are adjacent to the lobby with both the women's and men's having direct access to the pool. The men's locker room is in moderate condition but dated. The layout of the locker room is a large open space with a few areas for privacy. The lockers are made of stainless steel, which are in pretty good shape with only one locker door missing out of the group. The solid surface countertops and sinks are in fair condition. The countertop is sagging/not level and is causing water to damage the joint at side splash and wall.

Overall, the lockers and benches appear to still be in serviceable condition. The private shower stalls are not ADA compliant due to the tall curb, but otherwise appear sound. The group shower room is in good condition, and is sized adequately to accommodate ADA requirements. The existing shower pedestals are also in good condition, but the controls do not meet ADA requirements. The plastic laminate toilet room stalls are still in serviceable condition, and relatively clean. The last stall, however, does not meet ADA size requirements.

Other minor updates and repairs could be done within the men's locker room. Several light fixtures are rusting due to the high exposure to moisture in the air. One can light fixture is missing. One HVAC grill is not fully connected to the plaster ceiling above. Another HVAC grill needs cleaning.

As the pool was open and active, conditions in the women's locker room were not observed. However, these are assumed to be similar to the conditions found in the men's locker room.



Pool Room and Balcony

The pool is an eight lane lap pool with three diving boards. The tile deck of the pool room is in good condition, with only a few spots needing re-grouting. The walls are exposed, burnished concrete block, and these are also in mostly good condition. The depth of the pool has a slope depth from 3'-0" in the shallow end to 12'-0" in the deep end. The preferred temperatures that staff would like to maintain the system at are between 72^{o} - 74^{o} for the air and 83^{o} for the water.

The pool deck and pool shell are in relatively good shape. The high moisture content in the air has done damage to all exposed metal elements. The exposed metal items include light fixtures, light switch covers outlet covers, kick plates and etc. Most of these elements are in bad enough shape that they are beyond repair and should be replaced.

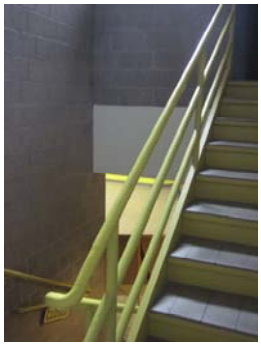
Most of the metal objects including; trusses, beams, decking, HVAC ducts, roof conductors, lintels, metal door frames and guard railings, appear to have original paint from the 1970's. The paint has/is cracking and pealing from all above. In many locations where the paint has peeled off rusting has occurred. The rusting appears to have only cause minor damage and if repaired soon and repainted it will limit the extent of the problem.

The lintels on the clearstory on the East wall have significant water damage. The damage is been caused

by moisture within the pool air condensing on the cold lintels in the winter and/or water penetrating from the exterior wall. From our visual review and comments for the maintenance staff we believe that the exterior wall is the main culprit and will need to be repaired prior to the lintels being repaired and repainted. Most likely this wall is also causing the damage/leaks in the ceiling in the lobby.

The locker room doors to the pools are made of wood. Over time the door has rotted from the bottom up. It appears that maintenance staff has cut the bottom 4" off the bottom of the door to reduce further damage. Also, the plastic laminate counter/casework in the pool area has delaminated.

The guard railings on the stairs and balcony do not meet current codes. The railings need to be 42" high off the ground and limit a 4" sphere from penetrating openings in the railing. Additional, steel members will need to be added or replaced to the guard railings on all stairs and the balcony to meet current codes. Also, during the inspections there were pieces of wood on one of the landings within an exit stair, blocking the exit path. Also, within the same stair, there were wood storm doors being stored at the bottom of the stair. Codes limit the use of an exit stair for storage and the doors should be removed.



Outside Toilet Rooms

This building includes toilet room accessible only from the outside on the patio for the wading pool. These rooms were inaccessible at the time of the walk through.

Mechanical Rooms and Garage

The bones of the rooms; walls, doors, floors and ceilings appear to be in good condition for the age of the building. The equipment is dated with some pieces rusting, special the electrical boxes in the pool equipment room. The rooms are all very limited for space and have no additional room for any future equipment. If any of the existing pieces of large equipment were to fail, their removal and replace would be a challenge due to the standard size doors (special the boiler room).

Pulaski & Noyes Indoor Family Aquatic Center Planning Milwaukee County - Pulaski Pool Building Architectural Pricing Estimate

	Description of Repair	Quantity	Approximate Unit Cost	Approximate Cost	Necessity
	Exterior Work				
	Add weeps top & bottom of exterior walls @32" o.c.	Approx 650	$20	$12,000 - $14,000	High
	Re-seal brick control joints	500 lf	$1.50	$700 - $1,000	High
	Clear coat sealant at inside of pool room walls	8,000 SF	$1.50	$11,000 - $14,000	Med
	Anti-grafitti coating on ext. brick	17,500 SF	$1.00	$17,000 - $20,000	Low
	Remove/replace hollow metal doors/frames/hardware	8 doors	$1,200	$9,000 - $11,000	High
	Miscellaneous repairs to exterior windows			$4,000 (allowance)	Med
	Replace skylight	4 @ 8'x12'		$40,000 - $50,000	High
	Sand/Repaint exterior sectional overhead door	64 SF	$1.50	$100 - $150	High
	Repair exterior plaster soffits	1,250 SF	$13-18 per SF	$16,000 - $23,000	Med
	Sand/Repaint patio fence	150 LF	$7 LF	$1,000 - $1,500	Low
	Interior Work				
	Entry/Reception				
	Replace Plaster Ceilings in Lobby, Parts of meeting Room & other locations	1500 SF	$13-18 per SF	$20,000 - $30,000	High
	Replace Reception Desk	16 lf	$350 lf	$5,000- $10,000	Low
	Replace mirror in Men's Rest Room			$100 - $400	Low
	Meeting Room				
	Remodel Meeting Room- Ceiling part of #1	350 SF			
	New Carpet		4.50 sf	$1,400 - $2,000	Low
	Repaint		1.50 sf	$300 - $500	Low
	Miscellaneous Repairs			$2,000- $3,000	Low
	Staff Areas				
	Replace Countertop in Mens and Women's Toilet Room	2 @ 4'	$250 lf	$2,000- $4,000	
	Replace door to staff locker room	1	$1,000 per	$1,000- $2,000	Low
	Public Locker Rooms (Men's and Women's)				
	Locker Rooms Both Men's and Women's				
	Add ADA Shower	4 fixtures	$1,000 per	$4,000- $8,000	High
	New countertops	12 lf x 1 per locker room	$200 lf	$5,000- $7,000	Med
	New ADA Toilet Stall	1 per locker room		$10,000- $20,000	High
	Miscellaneous Repairs	1 Per locker room		$10,000- $20,000	Med
	Pool Room area				
	Repair Rusted Metals - Light Fixtures, outlet covers & Kick Plates			$20,000- $60,000	Med
	Repair and Repaint in pool area- Structure, HVAC, Lintels & etc.	12,000 SF	$4.50 sf	$50,000- $200,000	High
	Replace interior Doors	10 doors	$1,000 per	$10,000- $20,000	med
	Miscellaneous				
	Make Guard Railing ADA and Repaint	Approx. 260 lf	$150-200 per lf	$40,000- $50,000	High

PLUMBING and HVAC

- Mechanical, electrical and plumbing systems were installed in 1976, and in general is remains as is with several modifications listed below.
- Building is not sprinkled.
- During last couple years building undergoing through energy conservation performance contracting process specifically:
- Lighting retrofit.
- Building Automation System (BAS) that includes boilers and pumps start/stop control, water temperature monitoring and control, air handlers start/stop and discharge air temperature control.
- Modified control of flat plate heat exchangers at the air handlers and adding frost control.
- Overall systems are functional, yet require continuously increased maintenance and it is not energy efficient. Some of the components already reaching state of disrepair and should be replaced.

PLUMBING

The plumbing system consists of a hot water heater that was installed in 1992 and the original storage tank (approx. 1,000 gal capacity). The steam heat exchanger was removed and the inlet and outlet pipes were capped when heater was installed. The hot water recirculation pump was also replaced when the domestic hot water system was taken of the steam system. The mixing valve is fuctioning fine. A regular maintenance schedule should provide many more years of service. The existing water service has a pressure reducing station. There were no comments regarding water pressure.

Throughout the building, the isolation/shut-off valves are failing. All of these valves should be replaced.

The existing counter tops in the toilet/ locker rooms were of particle board construction with plastic laminate surfaces. The particle board had severely swelled and was failing. Therefore, the lavs have been replaced with wall hung style fixtures.

System or component description	Problems and modification descriptions	Age	Remaining life expectancy	Projected construction cost	Priority
Water Heater	Water heater is functioning fine, but ventilation and combustion air in boiler room - Recommend installing forced combustion system.	18	15	Related to boiler room ventilation – see below	High

Plumbing isolation/shut-off valves	Valves are old and leaking. – field verify quantities of each size	35	0	4" = $1,500 ea 3" = $1,000 ea 2" = $250 ea 1½" = $200 ea 1¼" = $175 ea 1" = $150 ea ¾" = $125 ea ½" = $100 ea Total estimated $10,000 - $15,000	High

HVAC

The basic system consists of a hot water boiler with circulation pumps, two air handlers and small RTU servicing office. HV-1 is servicing pool and HV-2 servicing rest of the facility. Neither of the units has air conditioning.

The boiler is approximately 10 years old and in good condition. The boiler is a Weil McLain sectional cast iron with natural gas combustion, power burner and the original venting system. The boiler room has a deficient combustion make up air system consisting of combustion louvers and a wall exhaust fan. The system needs to be re-engineered and replaced with a forced make-up air system. The boiler operates year round at a fixed discharge water temperature (set at 180 deg. F). During the summer months the boiler is greatly oversized and experiences excessive cycling that causes poor energy performance and increased wear on the boiler.

The hot water system consists of two pumps installed in parallel and alternate manually on monthly basis. One of the pumps was replaced, the other pump is original. Pumps are close coupled and suction base mounted and reaching the end of their life expectancy.
Most of the piping is black iron steel with the original isolation valves. Some of the isolation valves are not functional and resulting inability of ongoing maintenance (requires all hot water maintenance to be done during summer shut-down cycle). The hot water is distributed to the two air-handling units, de-frost control coils at the outside air heat exchangers, pool heater heat exchanger, cabinet heaters, unit heaters and baseboard radiators.

HV-1 is 80% OA system consisting of Trane modular air handler (Climate Changer M25) with dual centrifugal fan assembly, heating coil with three way control valve, 30% eff. 2" thick filter section, return fan with return and relief dampers, outside air intake with flat plate heat exchanger and associate face-bypass dampers.

HV-2 is 100% OA system consisting of Trane modular air handler with dual centrifugal fan assembly, heating coil with three way control valve, 30% eff. 2" thick filter section, return fan with relief damper, outside air intake with flat plate heat exchanger and associate face-bypass dampers.

Heat exchangers were not operational until last year when de-frost coils had been installed. Heat exchanger's face-bypass dampers were replaced two years ago. Primary OA, return, and relief dampers are original and need to be replaced. Return fans are original with original motors. When the heat exchangers were upgraded, new sheaves for the fans and motors were installed. The system has new valve and damper actuators.

HV-1 and HV-2 units are at the end of the life expectancy and will require to be replaced or rebuilt within next 10 years. Heat exchangers do not have access for removal nor have filters. As result, they require excessive maintenance (pressure washing at least twice a year).
The pool heat exchanger is a tube and shell original unit with new control valve. The unit is corroded from the outside and is missing insulation.

Office RTU is 4 ton gas fired DX cooling and approximately 4 years old.

Baseboard radiators and cabinet heaters are original to the building. Several are corroded and covered in rust. They have two way control valves with old pneumatic control valves and the original isolation valves. As an ongoing maintenance item, the cabinets and fin tubes could be replaced. Control valves need to be replaced.

Ductwork distribution, especially outside air ductwork, and some of the exhaust air ductwork are corroded with moisture damaged insulation.

Diffusers, grilles, and registers throughout the building are covered in dust. These grilles and diffusers should be cleaned as an ongoing maintenance task.

Table 1

System or component description	Problems and modification descriptions	Age	Remaining life expectancy	Projected construction cost	Priority
Boiler	Inefficient operation, excessive wear. Recommend to install separate pool heater.	10	15	$50,000 - $60,000	Medium
Boiler room	Ventilation and combustion air. - Recommend to install forced combustion system.	35	0	$15,000 - $18,000	High
Boiler pumps	Inefficient operation. Recommend to replace second pump and install VFD drives.	35	10	$15,000 - $18,000	Low
Hydronic isolation valves	Valves are old and leaking.	35	0	$20,000 - $24,000	Medium
Hydronic control valves and space sensors	Valves are old and failing, control tubing is leaking and require extensive troubleshooting and repairs,	35	0	$15,000 - $18,000	High
Air handlers and heat recovery	Old inefficient units, heat exchangers are not user friendly, system require extensive maintenance. – Recommend to replace air handlers with new	35	5	$150,000 - $165,000	Medium
Control dampers at air handlers	Dampers are not functional and could cause freeze-ups of the units.	35	0	$5,000 - $6,000	High
Pool heat exchanger	Unit is corroded and missing insulation. Clean unit, apply insulation on unit and hot water piping.	35	10	$5,000 - $6,000	Low
Ductwork insulation	Damaged insulation promotes corrosion of the ductwork and if not corrected, it will require ductwork replacement. - Remove damaged insulation, install new inside of mechanical room.	35	0	$15,000 - $20,000	Low

ELECTRICAL

The electrical equipment is mainly located in 3 rooms; the receiving/electrical room, the pool equipment room and the HVAC equipment room. The main service enters in the receiving/electrical room. It is a 208V, 3ph service at 800A. The lights were updated with new ballasts and lamps within the last 2 years due to an energy audit.

The floor underneath the electrical service entrance panel has settled causing the conduits to become separated from the bottom of the distribution panel. This has also caused the distribution panel itself to move. The electrical equipment in the back receiving/electrical room is in good shape.

The majority of the electrical equipment located in the pool equipment room is rusted and corroding. There were some conduits, junction boxes and relays in the room that were not rusted or corroding, but they appeared as if they were installed within the last 5 years. Everything that was installed before that is rusted from exposure to the moisture and chemicals in the room.

The electrical equipment in the HVAC equipment room appears to be in good condition. It was noticed that the Motor Control Center does not have the required 3ft working clearance in front of the equipment to meet code.

The lighting underwent energy audit upgrades in the last 2 years. All of the fixtures received new ballasts and upgrades to T8 fluorescent lamps or compact fluorescent bulbs. So the internal parts of the fixtures are in good condition. Most of the fixture housings are in good shape with some visible rust on the trim. A couple of fixtures were missing door frames and lenses.

The quantity and location of emergency lights in the building appears to be inadequate in most areas to provide the code required means of egress lighting levels. The emergency battery units located in the pool equipment room and the HVAC equipment rooms were tested and did not function. Some of the existing emergency lights were aimed incorrectly.

The exit signs appeared to be in good condition, but several of the signs were positioned incorrectly. They were mounted back to the wall instead of the side, so that the sign is visible to people walking toward the exit.

The parking lot lighting appears to be inadequate. There are only 2 light fixtures to cover the whole parking lot. The fixtures and the poles appear to be in good condition and would just require additional lights to what is currently present.

There is no fire alarm system installed in the building. It is not required to have a fire alarm system in the building because it is under 300 occupants, but it is recommended to install a fire alarm system due to the public nature of the building. If the building is expanded to 300 or more occupants a fire alarm system will have to be installed.

The security system is in need of some minor repair, such as covers. Some individual components appear to be not functioning or in need of replacement.

The electrical devices in the pool area are in need of repair. The cover plates are rusted and corroding. The electrical devices in the non-pool area appeared to be in good condition.

There are a couple of areas where too much equipment was plugged into one outlet. The equipment should be moved to lower the possibility of overloading the circuit or additional circuits and receptacles provided.

Table 1

System or component description	Problems and modification descriptions	Projected construction cost	Priority
Main Service Entrance	Floor shifted, moving panels and pulling conduit from panel. Recommend to replace distribution panel	$20,000 - $30,000	Medium
Pool Room Equipment	Electrical equipment is rusted and corroded. Recommend to replace all equipment in new location separated from the pool equipment.	$125,000 - $175,000	High
Fix Broken Light Fixtures	Some light fixtures are missing the complete door frame and lenses. Recommend to replace door frames and lenses.	$5,000	Low
Emergency Lights	Inefficient operation. Recommend to replace battery units and install additional emergency lights where needed.	$12,000 - $20,000	High
Exit Signs	Exit signs not located properly. Recommend to replace exit signs with new signs.	$ 7,500 - $15,000	Medium
Parking lot lights	Parking lot light is insufficient. Recommend adding additional parking lot lights.	$12,000 - $20,000	High
Fire Alarm System	There is no fire alarm system. Recommend to add fire alarm system	$125,000 - $175,000	Low
Security System	Parts of security system need repair. Recommend fixing broken security system components and looking at updating systems.	$1000 - $10,000	Low
Electrical Devices in pool area	Electrical devices in pool area are rusted and corroding. Recommend replacing devices with weatherproof devices	$5,000 – $10,000	Medium
Overloaded Outlet	Too much equipment plugged into outlet. Recommend moving equipment to new location or adding outlet.	$0 - $500	High

POOL EXECUTIVE SUMMARY

This study was conducted to determine the current condition of the swimming pools at the Pulaski Pool facility. A representative from Water Technology Inc. (hereinafter WTI) conducted an on-site visit of the facility, interviewed staff and reviewed record documents of the facility.

The record documents provided to WTI indicated the facility was constructed in 1978. The pools consists of an indoor 8 Lane X 25-Meter (60'0" X 82'2") competition/instruction pool and an outdoor wading pool. The wading pool has not been operated for the past two years. Minor repairs and modifications to the pools have taken place over the years. There was no information provided to WTI that indicated any major changes to the pool facility. The concrete pool tanks appear in reasonable operating and structural condition.

INTRODUCTION

Water Technology, Inc. prepared the following report for the **Pulaski Indoor Swimming Pool Facility**.

The report discusses the following:

OBSERVATIONS OF THE EXISTING FACILITY CONDITIONS

- Pool Evaluation
- Pool Equipment Evaluation

SUGGESTIONS FOR UPGRADING THE EXISTING POOL FACILITY

- Code
- ADA
- Wisconsin Department of Commerce (WDC) – Comm. 90 Swimming Pool Code
- National Federation of State High School Associations (NFHS)

FACILITY EVALUATION METHODOLOGY

The facility evaluation consisted of an on-site visual inspection of the pool and mechanical room, gutter system, exposed piping, filter, chemical control and feed systems, deck and deck equipment. In addition, Milwaukee County Parks staff provided information regarding systems' performance and specific areas of concern.

Dean Mueller of WTI conducted the site review on June 10, 2010.

The following record drawings were reviewed as part of the analysis:
Forty (40) Drawing sheets dated March 10 1976 - Prepared by Brust-Zimmerman, Inc.

FACTS

The Pulaski Pool has been a fixture in this community since 1978. The indoor pool consists of a large, single body of water – rectangular shaped with competitive swimming starting blocks and diving boards at one end. The pool includes anchors for dividing the pool into eight (8), 25-meter lap lanes. Water depths range from 3'-0" to 12'0". The surface area of the pool is approximately 4,620 square feet and contains approximately 203,262 gallons of water. The outdoor wading pool is a 52 foot diameter circle. The water depths vary from 0" to 2'6".

GENERAL OBSERVATIONS

The overall maintenance of the pools appear to be very good. The wading pool has not been used for two years. The indoor pool is certainly upgradeable for extended life for recreational use. However, there are other considerations such as reviewing the projected community uses for swimming competitions and community needs for the next 30 years. Given the age and condition of the below grade pool piping, is this pool a good candidate for the future programmatic uses qualifying it to be renovated?

Deck and Deck Equipment:
The pool deck and misc. deck equipment are in good condition. The pool deck consists of tiled concrete around the pool perimeter. Drainage of the main deck areas is achieved by sloping the deck to drain to the pool gutters. Standing water on the deck was not noted and indicates that the system is working adequately. Some corrosion is evident on the stainless steel ladders and other associated deck equipment.

- There are three fixed guard chairs.
- Eight (8) starting platform anchors are installed at the deep end of the pool.
- Anchors are installed for the competitive swimming false start and turn stanchion posts.
- There are three (3) one meter diving boards.

Indoor Swimming Pool:
The swimming pool is constructed entirely of concrete and finished with 1" x 1" tile.

- Course Layout = 25 meter (82'-6") x 8-lane (56'-0") configuration. The lanes are marked on the floor and walls of the pool and lane lines are provided between each lane. No buffer lane is provided at each side of the pool. Water depths range from 3'-0" at the shallow end to 12'-0"" at the diving/starting block end.
- Repairs were made to the pool shell and tile. The main drains have not been replaced with VGBA (Virginia Graeme Backer Act) compliant grates.
- Pool surface finish is 1" x1" tile. The lap lane markings are also tile. The pool tile is in good condition. The tile grout requires attention.

Gutter System:
The gutter consists of concrete and tile perimeter gutter system. The gutter system is integral with the pool wall. The water level at the gutter lip is five (5") below the deck level. A slot drain is located in the base of the perimeter gutter that allows water to flow back to the surge tank by gravity. The design flow is 565 G.P.M. x 125% = 706 G.P.M.

Inlet Return System:
The filtered water inlet return system consists of sixteen (24) 2" floor inlets. The system is integral with the pool floor.

Exposed Piping and Mechanical Equipment:
Indoor pool filtration is provided by a Separmatic vacuum DE filter open tank system. There are sixteen filter leaves located in one tank. The combined filter leaves provide a total of 425 sq ft of filtering surface area. The operating flow rate is 565 G.P.M. (based on the filtration pump rating). The operating filtration is 1.33 GPM/SQFT of filter area.

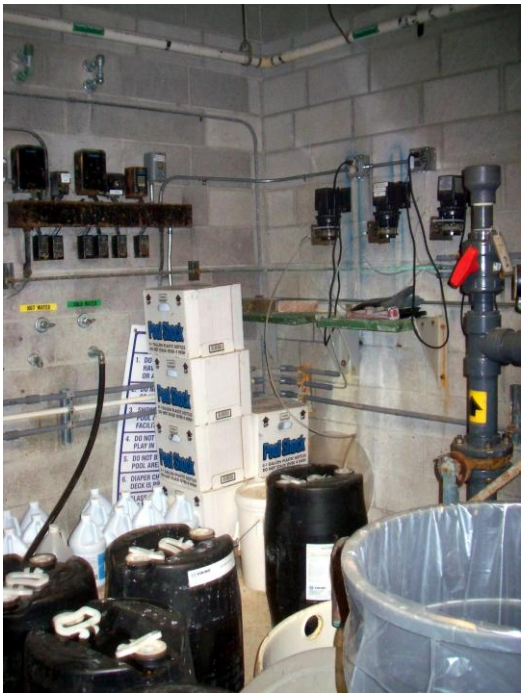
- Exposed piping in the mechanical room is a combination of Schedule 40 and Schedule 80 PVC with connections to cast iron steel piping from the below grade piping. Some of the steel piping and supports are severely corroded. Some updates have been made to some of the pool piping.

- The circulation pump is a Marlow Model 6E6AEL 6" 15 HP; 1150 R.P.M. 565 G.P.M. @ 53 ft. Head.
- No flow meter is present.
- There are pressure gauges or vacuum gauges located on the circulation pump.
- Valves are tagged, and pipes are marked with flow direction arrows.

Outdoor Wading Pool filtration is provided by a separate vacuum DE filter open tank system. This system has not been operated for two years.

Indoor/Outdoor Pool Filters:
Filtration, as mentioned previously, is a vacuum DE filtration system.

- The indoor pool filter appears to be in good working condition. This filtration system is very labor intensive when compared to new filtration systems.
- This open tank has vented humid chlorinated vapors in the mechanical room and caused severe corrosion to all of the pool equipment, associated piping and building systems.



Chemical Feed and Control Systems:
The indoor pool's chemical balance is monitored and controlled by an automatic chemical controller. Current code requires the use of an automatic controller. Disinfection is accomplished with sodium hypochlorite, which is fed by a Stenner metering pump. Ph reduction is accomplished by the addition of acid which is fed by a single Stenner metering pump. These pumps have been replaced in recent years and appear to be in good condition. There were no reports from the staff of difficulty with this equipment. However, all chemical tanks are open and located in the basement pool mechanical room. They are required to be manually filled and sometimes mixed. This causes corrosion and potential hazards. They also create the potential that this space will be defined as a confined space.

Pool Heat:
The indoor pool is heated through the use of a single wall water to water heat exchanger. Current code requires the use of a dual wall heat exchanger or non-toxic fluids in the boiler. This system uses the building boilers to provide heat. It is recommended that this system be replaced with an independent pool heater. Pool blankets are budgeted to be installed.

Americans with Disabilities Act (ADA) Requirements:
The perimeter of this indoor swimming pool is 277 feet. Per the current design requirements of the ADA, this pool requires one (1) means of access. The requirements state this means of access needs to be either an ADA approved pool lift or a 1:12 sloped entry. The current ramp does not meet these requirements.

CONCLUSION

The Pulaski pool facility is in its thirty-second year of operation in 2010. There has been ongoing maintenance of the main body of the indoor pool.

As indicated previously in this report, there are some items with the indoor pool structure that need to be addressed at this time: Clean corroded deck equipment; replace misc. pool equipment, relocate chemical systems, replace mechanical room steel hangers, and replace pool filtration and heating system.

The indoor pool vessel and associated mechanical systems will continue to require maintenance and repairs. The physical condition of the indoor pool structure does not suggest that a total replacement would be necessary at this time unless competitive diving, upgraded competitive swimming or other programs are desired.

DESIGN AND INDUSTRY STANDARDS
The design and configuration of competition and recreational swimming pools has changed dramatically over the years. Today's community aquatic facilities usually incorporate a shallow water area for smaller children to enjoy. A competition pool would still be a component of the design; however, swim teams prefer water depths of at least 3'6" at the shallow end. Good air quality and acoustically controlled environments within natatoriums have become increasingly popular in the municipal and commercial facilities.

HVAC Design:
When a new pool HVAC system is designed, a few basic concepts are held to keep the pool area in good shape. The first concept is maintaining 6 air changes (AC) per hour in the pool area with a continuous supply of 30% outside air in the room at all times. The second is to provide 100% outside air when shocking the pool. The third concept is supply and return air to the pool both high and low. The air supplied and returned low provides some "sweeping" of the pool surface; thereby eliminating the chloramines build-up over the pool and deck surfaces. The fourth is to maintain 82° to 85° F (2° above water temperature) and 50% relative humidity.

Item	Recommendations	Probable Cost Range
Item A	Repair Pool Tile Grout	$7,500 - $10,000
Item B	Install Flow meter on Pool Circulation.	$1,500 - $2,000
Item C	Provide ADA Approved Lift	$4,000 - $5,000
Item D	Replace Pool Heat Exchanger with Stand alone Pool Heater	$27,500 - $35,000
Item E	Replace Pool Filtration with Sand Filter System	$65,000 - $85,000

END OF REPORT