

# Noyes 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:



Civil & Structural:



HVAC, Plumbing & Electrical:



Aquatic Design & Engineering:





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**Milwaukee County – Noyes Pool Building  
July 7, 2010**

**Milwaukee Project Number: P178-10606 & P178-10607  
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Kahler Slater Project Number: 210092.00**

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# Milwaukee County – Noyes Pool Building

## Introduction

The Noyes Park Pool Building is located at 8235 W. Good Hope Road in Milwaukee, Wisconsin, and is owned by Milwaukee County and operated by the Milwaukee County Parks Department. Drawings were completed in 1979, with construction completed in the early 1980'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 23,600 square feet. The pool remains actively in use, and was occupied at the time of the walk-through on Wednesday, June 16<sup>th</sup>, 2010. Weather was partly cloudy, with outdoor temperatures in the mid 70's. The last measurable rainfall (approx. ½") had occurred one day earlier, on Tuesday, June 15<sup>th</sup>.

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 – Noyes Pool Building

## Site Context

The site is located at the southwest corner of the intersection of West Good Hope Road and North 76<sup>th</sup> Street in Milwaukee, WI. The pool building is located on the west side of the park to the north of the existing golf driving range.

The existing asphalt sidewalks leading to the building entrances are in fair condition and in need of repair or replacement.

The site contains many mature tree in wooded areas in the area west and south of the building. Of particular note is the large wooded area to the west of the building within the fence. This area serves as a nature education site.

## Site Utilities

The building and parking lot are served from utility mains located in the adjacent City street or surrounding park infrastructure. Electrical, telephone, and storm sewer are located on the northeast side of the building with service from West Good Hope Road. Gas service, water main, and sanitary sewer are located on the southeast side of the building and are served from surrounding park infrastructure.

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 northeast side of the building with a separate entrance and exit drive from and to West Good Hope Road. 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.

The parking lot is a shared use lot with the other park amenities and is not near the building entrance. The entrance circle drive is marked as a fire lane with no parking but was witnessed to have cars parked around the drive. It is recommended to reconfigure the entry circle to provide dedicated parking for the pool at a nearer location.

## Drainage

The north and east portions of the site generally drain to the storm sewer in the parking lot. The west and south





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

	Description of Repair	Approximate Cost	Priority
<b>Exterior Work</b>			
	Remove/ replace asphalt sidewalk and parking lot pavement	\$160,000	Med
	Re-grade southwest grass area for positive drainage	\$5,000	Med

# Milwaukee County – Noyes Pool Building

## 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 10 inch wide flange columns. The trusses are 19'-4" on center with 4-1/2 inch deep acoustical deck spanning between them. Approximately 10 -15% of the truss have surface corrosion. However, the top surfaces of the horizontal members appear to have a higher percentage. The columns appear to be embedded in the masonry and are therefore not visible. 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; 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. At this time this condition may only be cosmetic however a program to prepare, prime and paint these members should be implemented within the next four years to halt the corrosion before it impacts the structural capacity of the roof system.



A lower one story roof is located along the north side of the main pool building. This roof is framed with 24 inch deep steel joists at 5'-0" on center spanning 38 feet in the east-west direction with 1-1/2 inch deep metal decking. The original building plans indicate these joists are supported on steel beams along the south side and bearing on the masonry wall along the north side. The majority of the roof system is not visible due to a plaster ceiling system with the exception of the storage room at the west end. In this area there is a light surface rust on the joists and the metal deck is starting to rust at the bent metal edges. This condition does not require any remedial action at this time but should be monitored.



There is step cracking in the masonry on either side of the overhead door on the west wall of the storage room. It appears the door or jambs have been hit by a vehicle and the masonry repaired in the past. The jambs should be tuck pointed and filled with grout

Along the east side of the pool building is a two story steel framed wing with a single story bay at the south end. The upper floor is the mechanical room that houses the heating and ventilation equipment. The roof structure over this portion is comprised of 14 inch open web steel joists spanning in the north-south direction with 1-1/2 inch metal deck. This roof framing is supported on 12-



## Milwaukee County – Noyes Pool Building

inch deep beams supported on wide flange columns. The joists are beginning to rust and the deck is in good condition. This condition is mainly cosmetic at this time and should be monitored.

A crack in the masonry was found in the north wall of the mechanical room. The crack begins below a joist seat and continues to the northeast corner. The plans indicate a steel column is embedded in the wall and the joists are supported on a steel beam embedded in the wall. The crack is most likely due to thermal expansion of the embedded steel. The crack should be tuck-pointed and the structure studied for thermal movements. A vertical control joint may be warranted at this location.

The plans indicate the floor construction under the mechanical room is 12 inch deep steel joists at 2'-0" on center spanning in the east-west direction 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 south end is framed with 14 inch deep steel joists at 5'-0" on center and 1-1/2 inch metal deck. This area houses the water filtration and chlorination systems. The joists and deck in this area have light surface rust which has not progressed enough to cause any structural concern. This area should be monitored and painted in the future.

Masonry cracks were found at the exterior door from the filtration room and along the north wall of the pump room. These cracks are most likely due to differential footing settlements and should be tuck-pointed.

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 – Noyes Pool Building

## Introduction

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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 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.

## Exterior

The exterior of the Noyes Pool building is in fair to good overall condition, with a few spots of moderate 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, as well as interviews with county staff, it appears that the roof at Noyes is the original roof. This roof has likely exceeded its effective lifespan. Cracks in the roof flashing can be observed in multiple locations around the roof (**Fig. 2**). Large gaps have developed in most of the coping between coping pieces, exposing the galvanized splice plates below (**Fig. 3**). In many instances, the sealants used between coping / flashing have long since dried and cracked (**Fig. 4**). All



Fig. 1



Fig. 2



Fig. 3



Fig. 4

## Milwaukee County – Noyes Pool Building

of these problems are potentially allowing water to penetrate at the top of the wall into the masonry and wall cavity. A few roof drains have missing or dislodged cover baskets (**Fig. 5**), and in 2 instances it can be seen that the roof drain conduits have become clogged, resulting in water ponding on the roof until it can evaporate (or penetrate into the building). One location is the roof drain on the low roof area and centered along the SE elevation wall. The other location is the roof drain above the west exit stair (**Fig. 6**). Water here is particularly deep, with the only apparent relief being the roof edge scuppers on each side of the roof. Per existing drawings, the roof typically has 2" of rigid insulation. The condition of this insulation is unknown, though no "soft" spots were observed or felt. Short of a roof membrane replacement, one way to gain a clearer picture of the insulation condition would be roof core sample tests, which are not included as part of this report.

As the exterior walls are showing signs of deterioration from water infiltration, it is recommended that the roofing be replaced at this time. At a minimum, this work should include new roofing membranes, along with new metal copings and counterflashings. When the old membrane is removed, the condition of the existing insulation can be determined. Decisions about repair or replacement of the insulation can be made at that time. Given rising energy costs, and the fact that more building cooling (summer) or heating (winter) is lost through the roof than through exterior walls, it should be noted that a roof replacement would provide an ideal opportunity to increase the amount of insulation in the roof, as the existing 2" do not meet current general construction standards. In most, if not all, instances, the heights of existing curbs and parapets would allow this increase.

The roof also has 4 barrel shaped skylights. These are aluminum framed with double acrylic glazing. The skylight curbs and metal flashings appear to be in good condition. In all cases the outer acrylic panes are in sound condition, not having developed crazing or large cracks. In many instances, however, the inner panes have warped out of the frames, and at least one cracked inner pane was found (**Figs. 7 & 8**). These have resulted in a build-up of moisture (and dead bugs) between the panes. The metal flashing over the inner curb, other than being covered with dead bugs, appears to be sound. Paint can be seen flaking off of the inner curb structural steel support. Based on what's been observed at the Pulaski Pool location skylights, it is fair to expect that the deterioration of the glazing in these skylights may soon accelerate. Ideally, the glazing in these skylights (or the skylight systems in whole) should



Fig. 5



Fig. 6



Fig. 7



Fig. 8

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be replaced, to prevent the onset of moisture related problems in the surrounding construction.

Most of the exterior brick walls are in good condition, with only some minor efflorescence visible. 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 leached from the masonry and mortar on the surface. In locations where the wall is in good condition, this moisture is most likely due to face absorption from the exterior and interior. While weeps can be seen above most lintels, no weeps or flashing can be seen on the bases of exterior walls and parapets. With few directed exfiltration locations, this moisture migrates back out throughout the face of the wall.

In some locations, however, the moisture problem appears to be more severe, and these tend to mostly be surrounding the pool room. At one location in particular, the west end of the exterior patio wall, water was observed dripping from multiple locations on the wall, suggesting high volumes of water in the wall cavity (**Figs. 9&10**). There could be many reasons for this, and it is likely a combination of all of these reasons. 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. Furthermore, as mentioned above, deterioration of the roofing and roof copings is likely allowing increasing volumes of rainwater and snow melt into the wall. Also, evidence can be seen from the interior that the roof drains are no longer water tight (**Figs. 11, 12 & 51**). Some of the water leaking around roof drains may be traveling along the slope of the roof deck and infiltrating into the wall. In many cases, the moisture in the walls may be contributing to the corrosion of structural lintels below openings in the walls. (More evidence of moisture in the walls can be seen on the walls surrounding the west exit stair. In this case, it is likely due to the volume of water ponding on the roof.)

Numerous brick control joints were utilized in the exterior walls around the building. As a result, very few cracks can be seen in the exterior walls overall due to building expansion/contraction. (The sealant at these joints is long past its effective life, and should be replaced.) None the less, despite the use of control joints, some cracking of the brick can be seen. Much of this might be attributed to the water problems in the wall, as it can usually be observed in the same locations as the other water problems. These cracks are likely due to freeze/thaw cycle of moisture in the wall (**Fig. 13**).

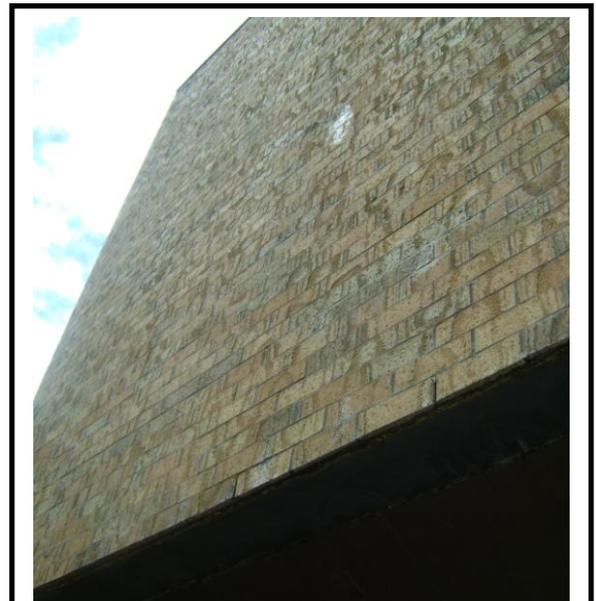


Fig. 9



Fig. 10



Fig. 11



Fig. 12

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In addition to the new roof work already suggested, some steps can 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. (These would be the same as the weeps already in place over opening lintels.) A second option may be to remove whole bricks at regular intervals and replace them with louvered vents to the cavity.

Per county staff, graffiti is only an infrequent problem at Noyes. The current methods used to remove graffiti from the brick seem relatively successful, but does result in a slight loss of surface/sheen and some discoloration.

With a few exceptions, the aluminum window and entry frame systems appears to be in sound condition. The anodic finish on the window systems has slightly “chalked” over time, but this is only an aesthetic issue. In a few locations, glazing gaskets appear to be coming out – these should be repaired to prevent future problems. At least one instance of frame disrepair was noted – this at the outside of the meeting room window, where a horizontal mullion cap is missing, and the sill cap has become detached (**Fig. 14**). This should be repaired to prevent water infiltration.

Exterior hollow metal doors and frames are not faring well. In many cases the bottoms of doors and frames have severely corroded (**Fig. 15**). 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 the Pulaski location, at least one exterior hollow metal door has been replaced with a fiberglass door/frame. These are indistinguishable in appearance from the hollow metal doors, and staff have been pleased with the performance and weather resistance of these replacement doors.



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The overhead sectional service door appears to be of wood construction. The paint is peeling, and the panels appear to be in the early stages of deterioration (**Fig. 16**). A few fresh coats of paint might buy some more service life.

Some exterior mechanical equipment has become corroded, and in at least one instance, large holes have devolved in an intake duct (**Fig. 17**). These holes are large enough for bugs and birds to pass through.

### Patio Area

The patio area is in relatively good condition. Despite the problems at Pulaski, the garden wall remains in good condition – this is due to the fact that a thru-wall membrane flashing was included below the brick cap (**Fig. 18**). The metal fence is in need of re-finishing. The same can be said of the wood benches on the patio. A few of the planter timbers are dislodged or rotting, and could be replaced. The concrete slabs are generally in good condition, and no severe heaving was seen between slabs.

### Interior

The interior of the Noyes Pool building is in good overall condition for the age of the building. There are numerous spots of mild to moderate deterioration and only a few spots severe deterioration. The majority of the interior of the building was constructed with durable materials; tile flooring, concrete masonry walls and exposed or plaster ceilings. 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.

### Entrance Lobby

The exterior plaster soffits at the entrance vestibules are showing mild signs of moisture damage (**Figs. 19 & 20**), likely the result of exterior wall issues (see previous sections.) The light fixtures are also showing surface corrosion. The radiant heat unit in the entry vestibule is in poor condition – corrosion and mis-aligned panels (**Fig. 21**). Once inside, overall, the lobby is in good condition. There's been little to no moisture damage to the finishes. Some minor corrosion is occurring on the exposed painted steel, such as the stair stringers and handrails, but these can simply be cleaned and repainted. There is a noticeable



Fig. 18



Fig. 19

Fig. 20



Fig. 21



Fig. 22

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bare spot on the wall adjacent to the stair where, presumably, a pay phone has been removed (**Fig. 22**). The wiring is exposed, and at a minimum, a cover plate should be provided.

Though serviceable, the reception desk is showing signs of its age. It is also a large uninviting element. It is the control point that people learn from staff about events and patrons pay for services at this location. The desk is a barrier that limits the interaction of staff and patrons. Due to the outdated design a new layout and style of desk could improve the attractiveness of the lobby space of the facility so patrons feel more welcomed.

The base cabinets in the staff work room behind the reception desk are in fair to poor condition (**Fig. 23**). Doors are missing and the laminate is de-laminating and/or breaking. There is an exposed back box in the wall (clock? wall sconce?) with the left over wiring exposed. This box should be covered with a cover plate. Supply/return grilles are very dirty – as a result, their effectiveness is likely compromised.

### Restrooms off of Lobby

The men's restroom off the lobby is in good condition. (The women's room is assumed to be in similar condition.) The plastic laminate lavatory counter is still sound (**Fig. 24**), and the walls and floor are undamaged, and simply need a cleaning. The glass mirrors have lost a small amount of silvering around the edges, but are otherwise sound (**Fig. 24**). The toilet stalls do not have any significant damage or graffiti, and the door hardware appears to be in working condition.

### Meeting Room

The meeting room is located off the lobby space. It is a medium sized room that can hold 10 people comfortably with chair and tables in it. There is no noticeable damage on the walls or ceiling, other than some left over holes in the wall from some previous piece of equipment. The carpeting, however, is in poor condition, and should be replaced (**Fig. 25**).

### Staff Areas

The staff areas are in mixed condition. The rooms include lifeguard office/viewing, kitchenette, 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



Fig. 23



Fig. 24



Fig. 25



Fig. 26

Fig. 27

## Milwaukee County – Noyes Pool Building

poor condition (**Figs. 26 & 27**). 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.

The cabinetry in the kitchenette is only showing minor signs of wear, and still has service life left. Other than the dated appearance, it only needs to be cleaned.

The block walls and tile floor of the men's staff locker room are in good condition, but should be cleaned. Likewise, the sink and countertop are still in relatively sound condition, but also need a cleaning (**Fig. 31**). The glass mirrors have lost a small amount of silvering around the edges, but are otherwise sound. Overall, the shower stall is in good condition, with the exception of needing a new shower curtain (**Fig. 28**). (The raised curb on the floor is not accessibility compliant.) The plastic laminate toilet stall partition is still in good condition. Water was observed around the toilet, but it is unknown if this is due to leaking or condensation (**Fig. 30**). The bowl appears to be sound, but the toilet could use a new seat. The staff lockers are in very poor condition (**Fig. 29**). The room contains both original fixed lockers, and some portable lockers. Both sets are dented, rusted and covered in graffiti. In some cases, the hardware no longer appears functional. These lockers should be replaced. Furthermore, the portable lockers reduce the exit path out of the locker room to approximately 16" – 18" (**Fig. 32**). Even with these lockers removed, the staff locker room overall would not meet current accessibility standards. The women's staff locker room is presumed to be in similar condition to the men's.

### Custodial Closet

Though cluttered, the custodial closet appeared to be in relatively good condition, other than some minor corrosion on some of the shelving.

### Outside Toilet Rooms

This building includes toilet room accessible only from the outside. These rooms were inaccessible at the time of the walk through. However, per county staff, these rooms were never completed as part of the original project, and have only been roughed-in for the fixtures shown on the original plans. Presumably, these rooms are used for storage.

### Locker Rooms

The men's locker room is in overall fair condition. Both locker rooms are accessible from the lobby and the pool. . The layout of the locker room is a large open space with few areas for privacy. The tile floors and walls are in sound



Fig. 28

Fig. 29



Fig. 30

Fig. 31

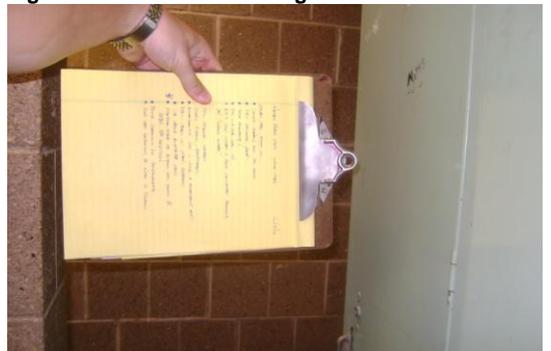


Fig. 32



Fig. 33



Fig. 34

## Milwaukee County – Noyes Pool Building

condition, but need to be cleaned. Some spots of water damage can be seen on the plaster ceilings, and should be repaired (**Fig. 33**). The hollow metal door frames are severely corroded at the base, and the painted wood doors are showing signs of damage at the bottoms from prolonged exposure to the moist environment. The plastic laminate lavatory counter is in very poor condition, and one sink is missing (**Figs. 35 & 36**). This should be replaced with a solid surface countertop, preferably with integrated sink bowls. The glass mirrors have lost a small amount of silvering around the edges, but are otherwise sound. The reception counter just inside the locker entry is also delaminating, and is completely unused. If this was removed, perhaps some other program function could use that floor space. The lockers appear to be the original prefinished metal lockers (**Fig. 34**). The floors of many of the lockers appear to be rusty, some lockers are dented, and a few pieces are missing (**Fig. 37**). Likewise, the floor bases of the fixed benches are quite corroded (**Fig. 38**). Overall, however, 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.

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

### Pool Room and Balcony

The tile deck of the pool room is in good condition, with only a few spots needing re-grouting (**Fig. 39**). The walls are exposed, burnished concrete block, and these are also in mostly good condition. Throughout the space, stainless steel outlet and cover plates are severely corroded, and light fixtures are also showing signs of corrosion (**Fig. 40**). The same can be said for the exposed steel lintels – these are all showing signs of corrosion (**Fig. 41**). Some of this can be attributed to the wall moisture problems discussed previously, and the rest can be attributed to the high humidity environment. The paint on the steel trusses is flaking and peeling, and the steel pipe handrails at the balcony are showing corrosion as well (**Fig. 42**). Numerous spots of corrosion can be seen on the roof/ceiling deck as well – some of this is due to roof issues, and some to the humid environment (**Figs. 43, 44, 45 & 51**). In all cases, all exposed metal in the pool room should be cleaned,



Fig. 35



Fig. 36



Fig. 37

Fig. 38



Fig. 39

Fig. 40



Fig. 41

Fig. 42



Fig. 43

## Milwaukee County – Noyes Pool Building

corrosion removed, and re-finished. A regular re-finishing schedule should be maintained to slow future deterioration.

Doors and frames in an around the pool room are in fair to poor condition. The finishes on wood doors are peeling, and the wood is becoming damaged. Hollow metal frames are corroding, and much of the door hardware is corroding as well (**Figs. 46, 47 & 48**).

As mentioned previously in this report, one particularly bad spot of water problems in the wall can be seen in the west end of the balcony, due to high humidity as well as roofing and roof drain problems. Signs of rust staining on the wall might possibly be due to corrosion of the horizontal wall reinforcing in the wall, or deposits from corroding steel above the ceiling (**Fig. 12**).

At the east side of the pool there is a “foot check” station, presumably used previously for towel distribution, etc. This looks to be little used now, other than as a means of hiding trash bags, or temporary storage of pool accessories. The counter is painted plywood, with a plastic laminate countertop, all of which is set on a raised tiled curb. It is in deteriorating condition – laminations of plywood are splitting, and in some cases have broken away (**Fig. 52**). Other than aesthetics, it may be of no consequence to do nothing, but other options might be to repair/replace it, or completely remove it.

Though compliant at the time of construction, the guard railings on the stairs and balcony do not meet current code. The railings need to be 42” high off the ground and limit a 4” sphere from penetrating opening between the openings in the railing. Any new work done to the building will likely require that these be made code compliant. Additional, steel members will need to be added or replaced to update the guard railings on all stairs and the balcony.



Fig. 44



Fig. 45

Fig. 46



Fig. 47

Fig. 48



Fig. 49

Fig. 50



Fig. 51

Fig. 52

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### West Exit Stair

There is a lot of water on the floor of the stairwell (**Fig. 49**). This could be from the pool, but it is more likely the result of the ponding water on the roof due to the clogged roof drain. Corrosion of the stair stringers and handrails is a bit worse in this space than in other similar spaces, and these should be cleaned and re-painted to slow further corrosion (**Fig. 50**). The tile wall base has delaminated from the block wall, presumably do to the potential water problems in the walls.

### Mechanical Rooms and Garage

The interior walls and doors of the mechanical rooms are in overall sound condition (**Figs. 51 & 52**). In some locations, the roof deck is showing mild to moderate corrosion and some roof joists also have a mild patina of rust (**Fig. 54**). These instances should be cleaned and repainted in order to retard the advancement of corrosion. (Additionally, some corrosion can be observed on some panels and piping, but the condition of mechanical and electrical equipment will be addressed elsewhere in this report.) In one instance, there is a large hole in an insulated louver cover – presumably from a removed piece of equipment. In addition to be a very large thermal gap in the building envelope, the screen on the outside louver is of a large gauge. It will prevent the passage of birds, but not insects, leaving the mechanical room vulnerable to an insect infestation (**Fig 53**).

Generally, the mechanical rooms are all very limited for space and have little to no additional room for any future equipment. If any of the existing pieces of large equipment were to fail, replacement may be a challenge due to the standard size doors.



Description of Repair	Approximate Cost	Necessity
<b>Exterior Work</b>		
Add weeps top & bottom of exterior walls @32" o.c.	\$50,000 - \$75,000	High
Re-seal brick control joints	\$700 - \$1,000	High
Clear coat sealant at inside of pool room walls	\$11,000 - \$14,000	Med
Anti-graffiti coating on ext. brick	\$17,000 - \$20,000	Low
New built-up roofing system (including insulation, copings, flashings, trim, etc.)	\$250,000 - \$300,000	High
Remove/replace hollow metal doors/frames/hardware	\$11,000 - \$13,000	High
Miscellaneous repairs to exterior windows	\$4,000 (allowance)	Med
Replace skylight glazing (1" dual glazed acrylic)	\$15,000 - \$20,000	High
Sand/Repaint exterior sectional overhead door	\$100 - \$150	High
Repair exterior plaster soffits	\$16,000 - \$23,000	Med
Sand/Repaint patio fence	\$800 - \$1,000	Low
Repair masonry around garage door	\$6,000 - \$8,000	Med
<b>Interior Work</b>		
<b>Entry/Reception</b>		
Replace Reception Desk	\$10,000- \$20,000	Low
Replace work counter in work room	\$2,000 - \$3,000	Low
<b>Meeting Room</b>		
New Carpet @ meeting room	\$1,100 - \$1,700	Low
<b>Staff Areas</b>		
Replace work desk	\$4,000 - \$6,000	Low
Repair/repaint wall to pool room		
Replace staff lockers (double tier)	\$2,200 - \$2,400	High
<b>Public Locker Rooms (Men's and Women's)</b>		
Repair Plaster Ceilings	\$20,000 - \$30,000	Med
Remodel private showers for ADA	\$8,000- \$12,000	High
New countertops at lavatories	\$5,000- \$7,000	High
New ADA Toilet Stall	\$20,000- \$40,000	High
Remove or replace locker reception counters	\$2,000 - \$8,000	Low
Replace metal public lockers (type varies)	\$33,000 - \$39,000	Low
Replace locker room benches	\$3,000 - \$4,000	Low
Miscellaneous Repairs	\$10,000- \$20,000	Med
<b>Pool Room area</b>		
Repair and Repaint in pool area- Structure, HVAC, Lintels & etc.	\$50,000- \$100,000	High
Replace interior doors/frames/hardware surrounding pool	\$12,000- \$20,000	Med
Make Guard Railing ADA and Repaint	\$40,000- \$50,000	High
Remove or replace "foot check" counter		Low
<b>HVAC Mechanical Room</b>		
Tuckpointing masonry wall	\$1,000 - \$2,000	Med
<b>Pool Filtration Mechanical Room</b>		
Tuckpointing masonry wall	\$1,000 - \$2,000	Med
<b>Miscellaneous</b>		
Sand/Repaint all exposed metal not already included in pool room work (handrails/lintels/etc.)	\$5,000 - \$10,000 (allowance)	High
Repaint structure/roof deck at mech. rooms 101, 141, 142	\$5,000 - \$7,000	Med
Make balcony guardrail ADA compliant	\$40,000 - \$50,000	High

## Milwaukee County – Noyes Pool Building

### PLUMBING and HVAC

- Mechanical, electrical and plumbing systems were installed in 1981, 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.

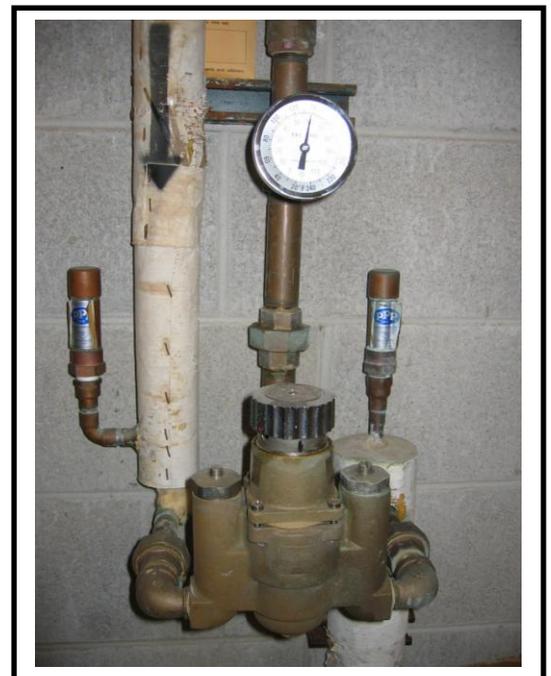
### PLUMBING

The plumbing system consists of a steam heat exchanger in the original storage tank (approx. 600 gal capacity). The control valve appears to have been replaced. The hot water recirculation pump was also replaced. The mixing valve is not maintaining the set temperture all the time. Either rebuilding the existing valve or a replacement should correct this issue. Regular maintenance should provide many more years of service. A few years ago a project was started and not completed. As it stands, there appears to be a cross connection issue that stems from this project. Tempered water and cold water are mixing. This cross connection should be investigated soon and corrected.

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.

There are 2 roof drains that were clogged during our site visit. These drains should be snaked out.



## Milwaukee County – Noyes Pool Building

System or component description	Problems and modification descriptions	Age	Remaining life expectancy	Projected construction cost	Priority
Mixing valve	Does not provide set temperature	29	20	Rebuild = \$1,500 - \$2,000 Replace = \$4,500 - \$5,350	Medium
Plumbing isolation/shut-off valves	Valves are old and leaking. – field verify quantities of each size	29	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
Pool heater	Existing heat exchanger is old, use of boilers for domestic hot water is inefficient.	29	5	Provide dedicated water heater – \$15,000 - \$20,000	Medium

## Milwaukee County – Noyes Pool Building

### HVAC

The basic system consists of four Aerco 1,000 MBH each gas fired condensing boilers with circulation pumps. There are also two air handlers and a small RTU servicing the offices. HV-1 is servicing the pool and HV-2 is servicing the rest of the facility. Neither of the units has air conditioning.

The boilers are approximately 15 years old. One boiler is not operational (control panel has been removed), boilers 2 & 3 need the control panels replaced (units are not modulating, and cycle on manual set of firing range – boiler 2 set at 66.6%, boiler 3 is set at 33%). All four boilers need an inspection and repairs or replacement of the heat exchangers. The boilers have the venting system extended through the side wall and the existing boiler vent is disabled.

The boiler room has a deficient combustion make up air system consisting of combustion louvers, non functional OA dampers, and a hole in the plenum (not in compliance with codes). The system needs to be re-engineered and replaced.

The boilers operate year round at a variable discharge water temperature (140 to 180 deg. F). The boilers provide hot water to the air handling units, de-frost coils, domestic water storage tank with heat exchanger, pool hot water heat exchanger, and terminal units (booster coils, baseboard radiators, cabinet and unit heaters). The hot water distribution system consists of two pumps installed in parallel and alternate manually on a monthly basis. One of the pumps was replaced, the other pump is original. Pumps are close coupled and suction base mounted. They are 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 result the result is an inability for ongoing maintenance. It requires all hot water maintenance to be done during summer shut-down cycle.



## Milwaukee County – Noyes Pool Building

The pool heat exchanger was re-built 10 year ago.  
Unit was sized at 180 deg F but operates at 140 deg. F.



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

Exhaust duct servicing REF -1 inside of the mechanical room was replaced with stainless steel duct.



The outside air intake hood is fully corroded and needs to be replaced.

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



## Milwaukee County – Noyes Pool Building

The heat exchangers were not operational until last year when de-frost coils were installed. The 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 exchanger filters have been removed. As a result, they require excessive maintenance (pressure washing at least twice a year).

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.



## Milwaukee County – Noyes Pool Building

Table 1

System or component description	Problems and modification descriptions	Age	Remaining life expectancy	Projected construction cost	Priority
Boilers	Defective components. Recommend to repair or replace boilers.	15	5	Repair = \$15,000 - \$20,000 Replace = \$80,000 - \$90,000	High
Pool water heater	Inefficient operation, excessive wear. Recommend to install separate pool heater.	15	15	\$50,000 - \$60,000	Medium
Boiler room	Ventilation and combustion air. - Recommend to install forced combustion system.	15	0	\$10,000 - \$12,000	High
Boiler pumps	Inefficient operation. Recommend to replace second pump and install VFD drives.	29	5	\$15,000 - \$18,000	Low
Hydronic isolation valves	Valves are old and leaking.	29	0	\$15,000 - \$18,000	Medium
Hydronic control valves and space sensors	Valves are old and failing, control tubing is leaking and require extensive troubleshooting and repairs,	29	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	29	5	\$150,000 - \$165,000	Medium.
Control dampers at air handlers	Dampers are not functional and could cause freeze-ups of the units.	29	0	\$5,000 - \$6,000	High

## Milwaukee County – Noyes Pool Building

### 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 600A. The lights were updated with new ballasts and lamps within the last 2 years due to an energy audit.

The main service equipment appears to be in good shape. There is some surface rust on the equipment housing but the equipment itself appears to be in working order.

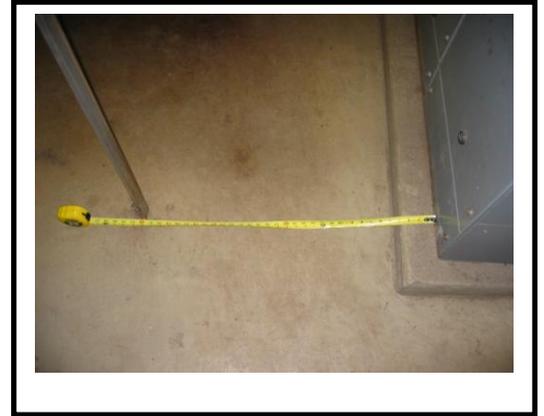


The majority of the electrical equipment located in the pool equipment room has some surface rust from the moisture and chemicals in the room. The equipment appears to be functioning properly but should be replaced and moved to a location without the pool equipment.



## Milwaukee County – Noyes Pool Building

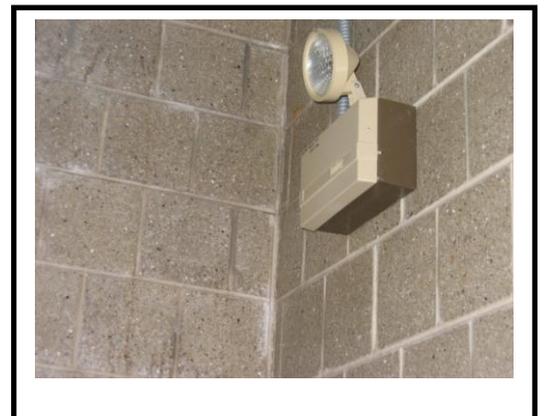
The electrical equipment in the HVAC equipment room appears to be in good condition. It was noticed that the Motor Control Center does not have the required 3ft working clearance in front of the equipment to meet code.



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.

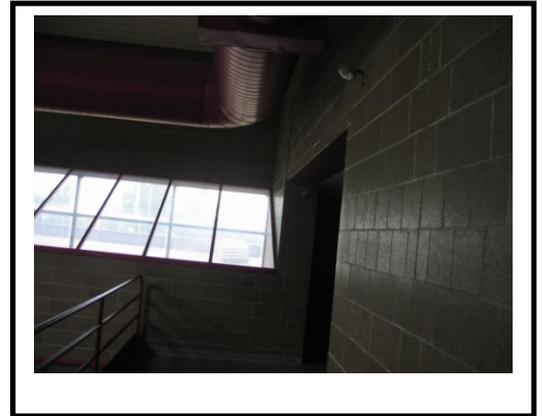


The quantity and location of emergency lights in the building appears to be inadequate in most areas to provide the code required means of egress lighting levels. Some emergency battery units located were tested and did not function.

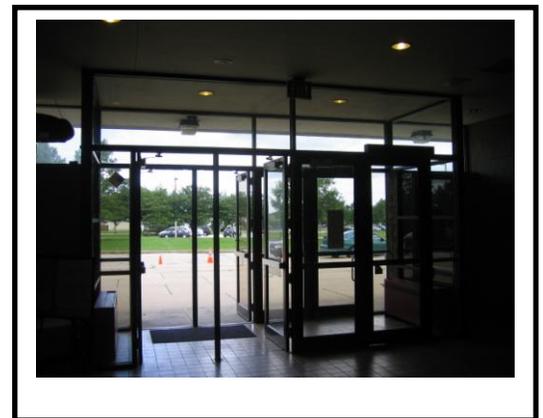


## Milwaukee County – Noyes Pool Building

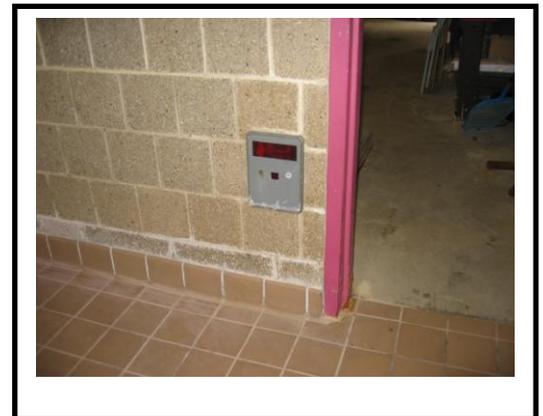
The exit signs appeared to be in good condition, but several of the signs were positioned incorrectly. They were mounted back to the wall instead of the side, so that the sign is visible to people walking toward the exit.



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 appears to be the original system. I was told it is not used, but not directed if that was because it was broke or too old. It is recommended to replace the system if a functioning system is needed.



## Milwaukee County – Noyes Pool Building

The electrical devices in the pool and pool equipment 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.



**Table 1**

<b>System or component description</b>	<b>Problems and modification descriptions</b>	<b>Projected construction cost</b>	<b>Priority</b>
Main Service Entrance	Some rust on the equipment. Recommend to replace main service panel	\$8,000 - \$15,000	Low
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
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
Fire Alarm System	There is no fire alarm system. Recommend to add fire alarm system	\$125,000 - \$175,000	Low
Security System	System is not in use. Recommend looking at updating system.	\$50,000 - \$100,000	Low
Electrical Devices in pool area	Electrical devices in pool and pool equipment area are rusted and corroding. Recommend replacing devices with weatherproof devices	\$5,000 – \$10,000	Medium

# Milwaukee County – Noyes Pool Building

## POOL EXECUTIVE SUMMARY

This study was conducted to determine the current condition of the swimming pools at the Noyes 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. 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 **Noyes Outdoor 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)

# Milwaukee County – Noyes Pool Building

## 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 16, 2010.

The following record drawings were reviewed as part of the analysis:

Forty (41) Drawing sheets dated February 15 1976 - Prepared by Brust-Zimmerman, Inc.

## FACTS

The Noyes Pool has been a fixture in this community since 1980. The 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 4,607 square feet and contains approximately 213,500 gallons of water.

## GENERAL OBSERVATIONS

The overall maintenance of the pool appears to be very good. The 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.



## Milwaukee County – Noyes Pool Building

- 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 one (1) one meter and one (1) three meter diving boards.

### Swimming Pool:

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

- Course Layout = 25 meter (82'-1-3/4") x 8-lane (56'-1") 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" x 1" 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 593 G.P.M. x 125% = 741 G.P.M.

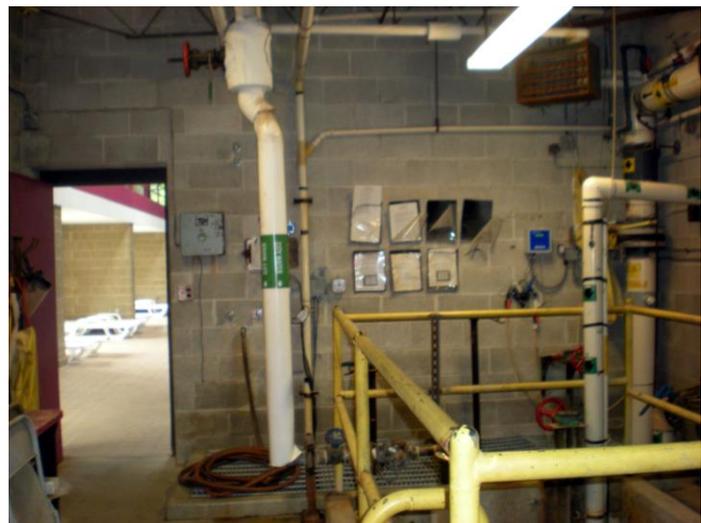
### Inlet Return System:

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:

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 593 G.P.M. (based on the filtration pump rating). The operating filtration is 1.4 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.



## Milwaukee County – Noyes Pool Building

- The circulation pump is a Marlow Model 6E6AEL 6" 15 HP; 1150 R.P.M. 600 G.P.M. @ 55 ft. Head.
- A 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.

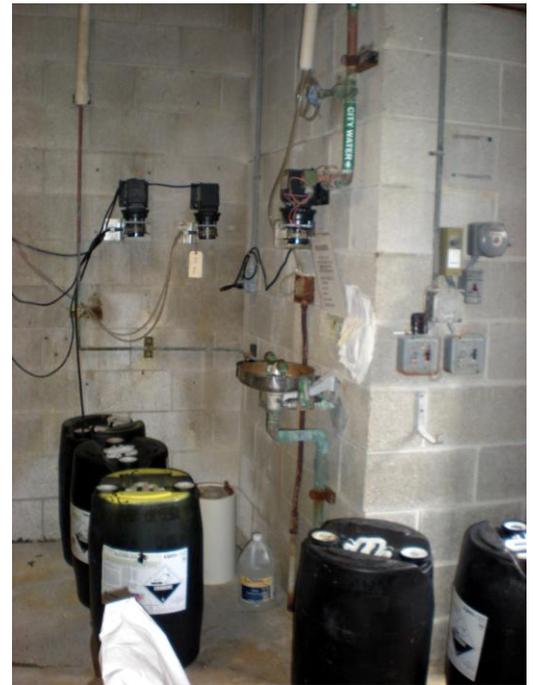
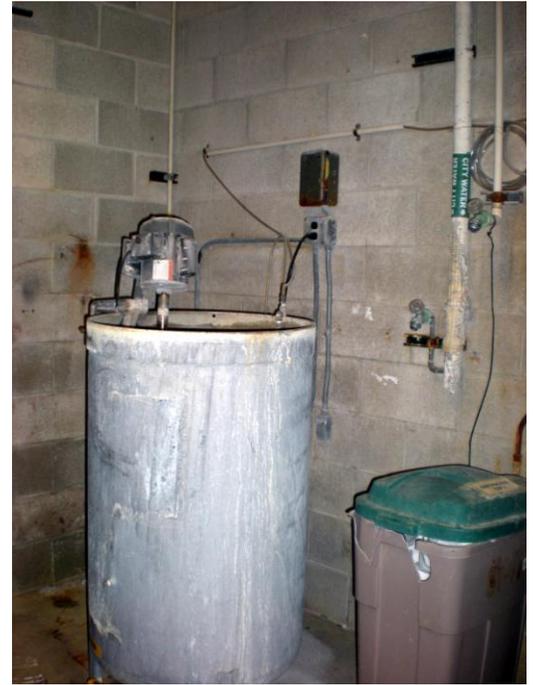
### Filters:

Filtration, as mentioned previously, is a vacuum DE filtration system.

- The 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 pool's chemical balance is monitored and controlled by an automatic chemical 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.



# Milwaukee County – Noyes Pool Building

## Pool Heat:

The 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.



## Milwaukee County – Noyes Pool Building

### **Americans with Disabilities Act (ADA) Requirements:**

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

As indicated previously in this report, there are some items with the 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.

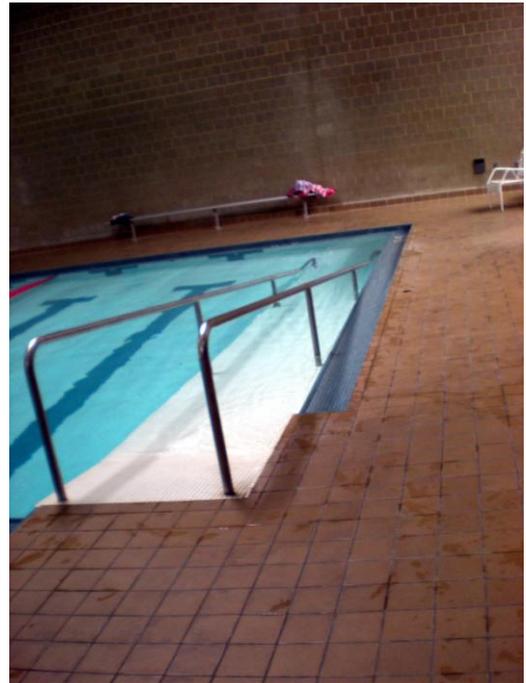
The pool vessel and associated mechanical systems will continue to require maintenance and repairs. The physical condition of the pool structure does not suggest that a total replacement would be necessary at this time unless competitive diving, upgraded competitive swimming or other programs are desired.

### **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.



## Milwaukee County – Noyes Pool Building

<b>Item</b>	<b>Recommendations</b>	<b>Probable Cost Range</b>
Item A	Repair Pool Tile Grout	\$7,500 - \$10,000
Item B	Provide ADA Approved Lift	\$4,000 - \$5,000
Item C	Replace Pool Heat Exchanger with Stand alone Pool Heater	\$27,500 - \$35,000
Item D	Replace Pool Filtration with Sand Filter System	\$65,000 - \$85,000

**END OF REPORT**