Weston&Sampson®
CMR, INC.
CONSTRUCTION / MAINTENANCE / REPAIR

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report

Mill Pond Park Pool Evaluation

Town of Newington
131 Cedar Street
Newington, CT 06111

March 2013

AQUATICS GROUP
a division of Weston&Sampson®

ENGINEERS REPORT

The Town of Newington is located in the Connecticut River valley in Hartford County, Connecticut. It is a community roughly 13.2 square miles in size, with a population of 30,599 based on the 2010 census. The Towns Recreation and Parks Department operates twelve active parks of which two contain swimming pools. Badger Field, Beacon Park, Beechwood Park, Candlewyck Park, Churchill Park, Clem Lemire Recreation Complex, Eagle Lantern Park, Littlebrook Park, Mill Brook Park, Mill Pond Park, Seymour Park, Starr Park. Each park offers many amenities for the community including athletic fields, playgrounds, tennis courts, picnicking, and swimming; this report is limited to the swimming facility at the Mill Pond Park.

Weston & Sampson has been retained to perform professional engineering and planning services in connection with the Mill Pond Park swimming pool and wading pool. Our scope of services includes the following:

- review of existing pool plans and systems
- research appropriate repairs for the main pool and wading pool
- preform code analysis for conformance with the new federal standards for ADA and Virginia Graeme Baker (VGB)
- observe leak testing as needed
- review existing conditions for structural stability
- review building condition
- examine existing piping, circulation, chemical treatment and filtration systems
- Preparation of an Engineers Report that contains pertinent information on pool replacement cost, recommended repairs and cost, and a conclusion and summary of recommendations.

BACKGROUND and PROGRAM

The Mill Pond Park, located on Garfield Street, is the largest town park. Facilities include a baseball field, boundless playground, soccer fields, tennis courts, outdoor pool, basketball court, concession stand, walking nature trail, ice skating, football field, fishing pond for children under 16 years of age, and a waterfall. The swimming pool was constructed in 1959.
There is substantial community involvement in the pool's programs, including seasonal memberships, swimming lessons, summer camps, adult swim, and competitive team usage. In all, the pool enjoys broad appeal across all population groups in the town.

The pool was replumbed in 1999 by Rizzo Pools. The bathhouse building was renovated in 1988. Renovations included: A new public restroom facility for the park, a complete interior wall

reconfiguration, mechanical and electrical upgrades, and replacement of the bathhouse interior finishes. Structural upgrades included a new concrete floor, new doors and windows, and a new roof.

EXISTING CONDITIONS

Figure 1 – Mill Pond Pool

Entrance to the facility is through a fifty five year old concrete masonry bath-house building. The entry bathhouse includes life guard staff offices, first aide room, mechanical room, men's and ladies changing/locker area and restrooms, and storage area.

The entire pool facility is enclosed by 6-foot high galvanized chain link perimeter fence with gates around the perimeter; additionally the wading pool is surrounded by a 4-foot high galvanized chain link fence and self-closing gate to provide separation from the main pool area. Patrons make their way to the pools via 6-foot wide bituminous concrete sidewalk which connect the pools with the bathhouse structure. The walkway leading from the parking lot to the building entrance is relatively flat and is in conformance with ADA requirements. The aerial photograph (Figure 2) to the right gives a general layout of the existing pool facility.

Figure 2 – Overview of Mill Pond Pool facility

The main pool configuration is a "Z" shaped pool. The north side of the "Z", "general swim area" is approximately 40-feet wide by 50-feet long with a 3-foot depth on the north side and sloping to a 4-foot depth where the racing lines begin. The middle section of the pool is the lap pool, which is approximately 50-feet wide by

75-feet long and contains 7 swim lanes. The south end of the pool is considered the deep end and is 12-feet deep. It is approximately 40-feet wide by 50-feet long and contains one diving board. The main pool has 7750 square feet of water surface, 410 linear feet of perimeter, and contains approximately 295,000 gallons. The pool has 21 return inlets and 16 skimmers. The deep end of the pool and lap area is left partially filled with water in the winter to prevent hydraulic lift.

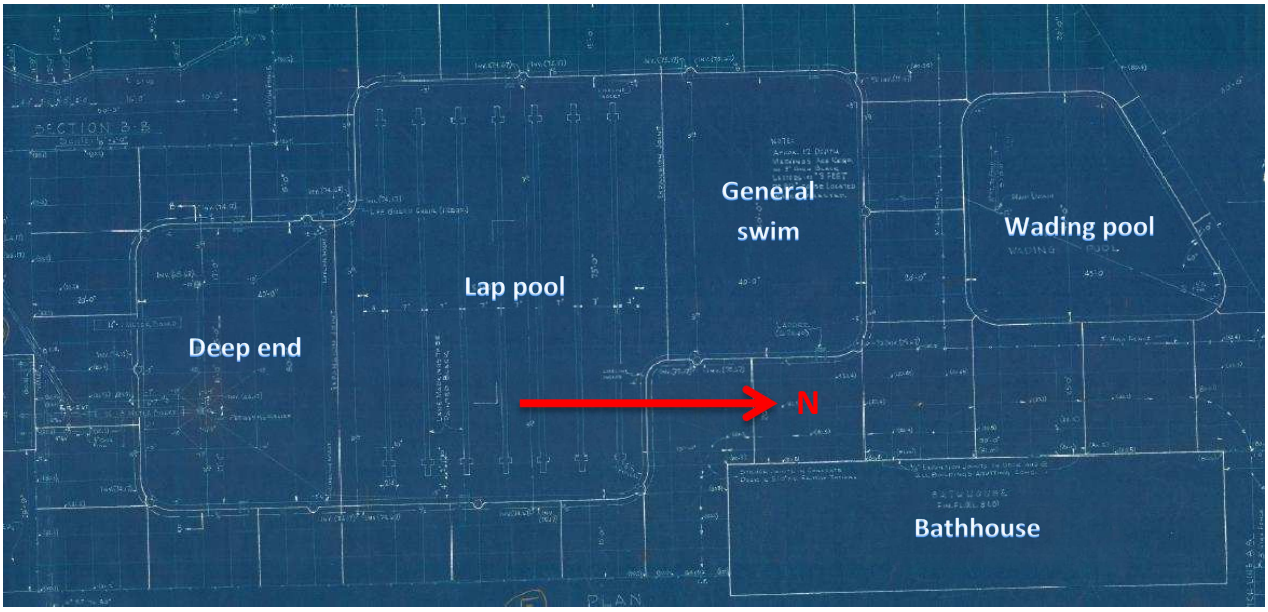


Figure 3 – Plan layout of Mill Pond

The wading pool, located to the north of the main pool, is trapezoidal shaped, and is 40-feet long by 45-feet wide and ranges in depth from 6-inches to 10-inches at the main drains. The pool has 1,450 square feet of water surface and contains approximately 6,500 gallons of water.

WATER LOSS

The pool staff reports that Mill Pond Pool is not losing significant water. The total water usage is averaging only $85/month. This is based on water bills showing approximately 425 gallons used per day, of which most is probably bathroom and shower usage and evaporation. The pool staff reports that if the pool is drained, water enters the pool through cracks in the pool walls and floor. The only reasonable explanation that the pool does not loose water is because the water table is so high and there is equal water pressure on both sides of the cracks. Mill Pond is directly adjacent to the pool. (See Figure 2)

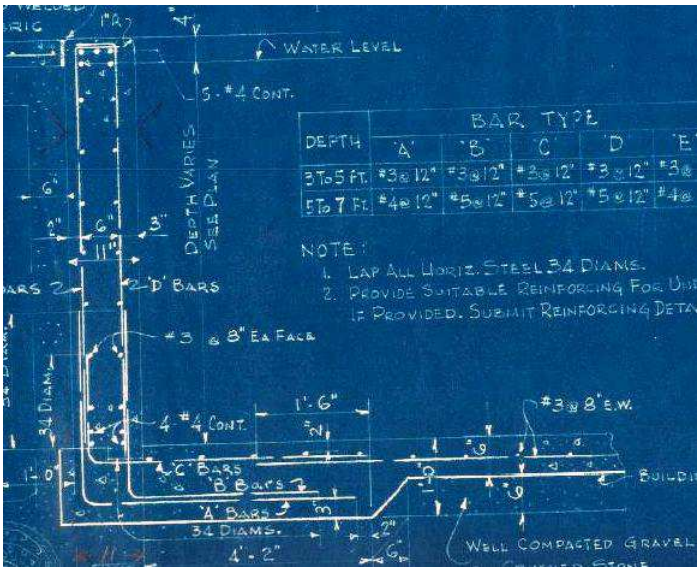


Figure 4 – Pool wall detail

POOL SHELL

The main pool consists of a "Z" shaped structure of approximately 130 feet long by 75 feet wide, and varies in depth from 3-feet to 12-feet. The original pool construction is reinforced concrete, the pool floor is poured in panels with a thickened footing around the entire perimeter. The walls were constructed on top of the floor footing and are approximately 11-inches thick. Construction plans from 1958 (Figure 4) show rebar, and expansion joints filled with joint sealant. Also called out are keyway joints with 9-inch pvc waterstop. The plans also show a French perimeter drainage system at the base of the pool floor.

Mill Pond is located very close to the pool and water comes through cracks in the wall when the pool is drained. The static water pressure relief valve in the deep end has been cemented over. The static valve should be working correctly to allow water to enter the pool if the ground water table rises. The concrete pool floor is lightly reinforced and not designed to handle upward pressures due high ground water. The pool floors and walls have numerous cracks, and have been patched in various locations. (Figure 5) The expansion joints in the pool appear to be properly caulked.


Figure 5 – Expansion joint, cracks, and patches

A core sample of the concrete floor was taken in the shallow end of the pool (Appendix B). Compressive strength was found to be 6,850psi, which is good and means the pool shell is structurally sound. The soil beneath the floor appeared to be mostly clayish gravel. Clayish material is unsuitable for a structural base because it can result in movement that along with the static pressure will cause structural cracks.

Figure 6 – Peeling paint and PVC joint separation

The curvature of the floor and walls in the deep end of the pool do not meet the requirements for a 1-meter diving board.

The pool operator plans to repaint the pool this year and stated that the concrete under the paint in some areas seems to be powdery and flakes off down to the aggregate. The paint is flaking and delaminating in many areas. The coping strip at the top of the pool walls is coming out in places and may be a source of water loss. (Figure 6)

POOL DECK

The deck shows signs of settling and cracking in some areas that creates potential tripping hazard and can be uncomfortable and possibly cause an injury to bare feet. (Figure 8) Areas of the deck are discolored and some areas have been repaired. Overall the deck is not it too bad of shape for its age. Most of the caulking in the expansion joints on the decks is old brittle and cracked allowing for water to get beneath the deck and increase settling of the deck and the possibility of frost heaves. (Figure 7) Some of the expansion joints in the middle of the deck and the expansion joints between the deck and bathhouse are not sealed.

The lack of a gutter or drain in the low spot between the bathhouse building and the pool has caused concrete deck separation. All water in this area is

Figure 7 – Failed expansion joint caulking

Figure 8 – Frost heave or settling concrete deck

draining through cracks and is saturating the soil under the deck. Water saturated soil can also put pressure on pool and foundation walls. The perimeter of the deck closest to the pool is newer than the rest of the deck. This portion of the deck was removed in 1999 when the piping was replaced. Rust is showing through the concrete deck in some areas. The welded wire mesh may have been installed too close to the surface.

POOL AREA & DECK EQUIPMENT

The depth markers on the pool walls and deck are hand painted or stickers. Most are faded or missing. (Figure 9) Some of the depth markers are incorrect. The depth must be measured from the floor of the pool to the water level. Depth markers must be provided on the pool rim at points of minimum and maximum depths, at all points where the pool floor changes slope, and at appropriate points in between. Depth markers at these points must be visible from within the pool and while standing on the pool deck. Letters and numbers must be at least 4-inches tall.

Figure 9 – Peeling depth markers

Ladders should not be no more than 75 ft apart when measured along linear feet of wall. The ladders in the deep end are over this far apart from one another.

The fence around the pool is galvanized, but is starting to show signs of rust. The fence is bent in some areas and has large gaps. The gaps between vertical members and between the ground and the bottom of the fence cannot be greater than 2-inches. (Figure 10)

Figure 10 – Fence gate

The diving board support is outdated with concrete counterweights. The diving board is 14' long. The lifeguard chairs are in good condition and appear to made of PVC composite material. The anti-slip strips on some of the lifeguard chairs are worn off and could result in a slip hazard for a lifeguard. Some of the concrete anchors holding down the lifeguard chairs are corroded and should be

Figure 11 – Copper pipe for handicap lift

replaced with stainless steel anchors. The temporary stairs do not meet ADA code requirements.

Pool staff reports new handicap lifts will be ordered for the upcoming season. The lifts will be hydraulic portable units, which need to be permanently anchored to meet ADA requirements (even though they are portable). This pool used to be equipped with a permanently mounted hydraulic (water powered) lift. The same connection can be used. The copper pipe connecting the lift was installed in an expansion joint in the concrete. The copper pipe is above the caulking and sticking out of the ground in areas. (Figure 11)

POOL PIPING

The pool piping in the filter room and under the concrete deck was completely replaced in 1999 by Rizzo Pools.

Pool staff reports the Virginia Graeme Baker (VGB) main drain covers are 24”x24” with 6” direct suction. The covers and pipe were under water during the inspection and this information is consistent with what is shown on the 1958 plans. Water is returned to the pool through a 6-inch pipe branching out to1.5-inch return inlets. The pool has 21 return inlets and 16 skimmers.

Figure 12 – Repaired skimmer

Many of the skimmers have stress cracks on the inside but have been repaired with fiberglass resin. (Figure 12) There are no skimmers along the deep end wall closest to

Figure 13 – Cracked joint between concrete and skimmer

the diving board. Skimmers are recommended in the deep end. The skimmers do not have equalization ports which are recommended by CT pool design guidelines. The skimmers appear to be cast in concrete with no caulking around the mouth of the skimmers. (Figure 13) The shrinkage between the skimmers and the concrete should be caulked to prevent water loss.

The return piping fittings are relatively new 1.5-inch PVC fittings with PVC covers. They have stainless steel hardware and appear to be in good condition. The return fittings are not original and most likely were replaced during the last major renovation.

The main drain piping is undersized and do not meet CT pool design guidelines. The flow rate must not exceed 4-feet per second at 100% design flow rate. The design flow rate for a 6 hour turnover is 819 gpm (gallons per minute). This equates to over 9-feet per second. The flow rate must be reduced to meet federal Virginia Graeme Baker (VGB) law. Surge tanks (balance tanks) should be considered to eliminate direct suction from the main drains.

This pool does not have an auto makeup or automatic water level controller. Automatic water makeup systems are recommended at public pools in Connecticut.

WADING POOL

The wading pool contains approximately 6,500 gallons. Water in the wading pool is circulated with a 1.5hp pump and filtered with a duel filter arrangement. The majority of the concrete shell appears to be in good shape with minimal cracks. As with the main pool, the caulking joints in the deck and coping around the wading pool are cracked.

The concrete coping is cracked in areas and has heaved around one of the skimmers. (Figure 14) The

Figure 14 – Wading pool cracked coping above skimmer

Figure 15 – Cracked skimmer and coping concrete

Figure 16 – Wading pool

skimmers appear to be cast in concrete with no caulking around the mouth of the skimmers. The shrinkage between the skimmers and the concrete should be caulked. Some skimmers have cracked and have been repaired with fiberglass. (Figure 15)

The electrical panels in the wading pool equipment room show signs of corrosion. The equipment room is ventilated with two small louvers located near the ceiling (approximately 1 square feet each). Mechanical ventilation by the use of a fan and louver at a lower level will reduce corrosion. The wading pool equipment room is part of the bathhouse and contains the filter, pump, chlorine, and acid chemical tanks.

MAIN POOL EQUIPMENT ROOM

The main pool filter system consists of five (5) sand filters which were installed in 1993. The sand has not been replaced since then. Water chemistry is controlled automatically through the use of liquid chlorine and liquid acid. Stenner chemical feed pumps transport the chemicals to injection points. The pool pump is 15hp and has a 6-inch suction and a 4-inch discharge. Two (2) filters are backwashed at a time through a 2" pipe to the backwash pit. The backwash pit is connected to city sewer.

Figure 17 – Main pool filters, chemical storage, and stairs

An emergency eyewash station was present. Acid is used to lower pH. Carbon Dioxide (CO_2) is much more commonly used than acid because it is less hazardous and is commonly available. Chemical tanks should have secondary containment in case of a leak. (Figure 17)

The existence of an electrical bonding grid around the pool is unknown, and probably non-existent. If major repairs are made metal deck equipment in the pool area and concrete reinforcement will need to be connected to a bonding grid. The bonding grid must connect to the pool pump. The pump is not bonded, and no bonding is shown on the plans. A wire just outside of the equipment room has been cut after it exits the building and before it enters the ground. (Figure 18) This wire may be either a ground wire or bonding wire.

Figure 18 – Cut bonding or grounding wire

Figure 19 – Main pool pump

General corrosion inside the equipment room is apparent. Electrical panels, the pump, pipe flanges, and flange hardware are corroded. The paint on the cement block walls is delaminating (either from cement deterioration, moisture, or chemical exposure). Improved ventilation will reduce corrosion. A copper water pipe is not securely attached to the wall and is free to vibrate.

BUILDINGS – Interior/Exterior

Two separate building were inspected as part of this evaluation. The bathhouse located to the East of the pool and the main pool filter building located to the South of the pool. The bathhouse was completely renovated in 1988, at which time according to the drawings, a new system of wood trusses were installed above the flat steel bar joints to give the building a gable roof design.

Figure 20 – Rear of bathhouse

Figure 21 – Main pool filter building

The roofing shingles appear to be original to that renovation, which would make them 25 years old. The shingles do not show signs of leaking but are nearing the end of their service life and should be replaced. The roof on the filter building was converted from a flat metal roof to a wood framed pitched roof in recent years, giving the roof a similar appearance as the main bathhouse. The roof appears to be in good condition.

The exterior CMU block walls on both buildings are painted. The masonry joints needs to be caulked or repointed in numerous areas. There are a handful of holes in the CMU block on the outside of the building that should be filled with mortar or caulking. The holes may be from old piping or conduit. Some of the joints on the filter building show traveling cracks. (Figure 22)

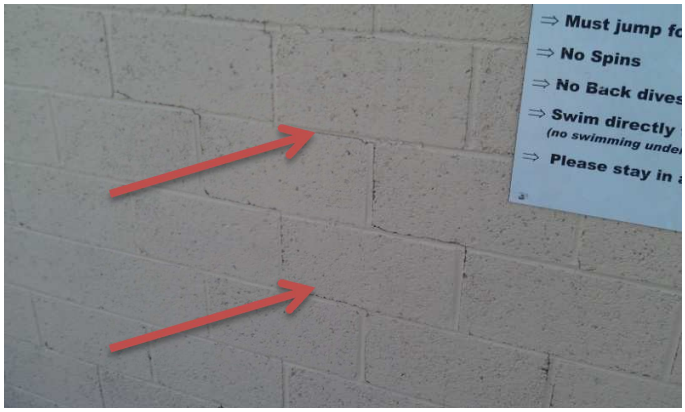


Figure 22 – Traveling cracks on filter building

The bathrooms are not ADA accessible and will need to be made compliant if any major renovations are made. A handicap shower is available (Figure 23), but does not have a private enclosure for a wheelchair bound person. In multiple locations, such as the main entrance, there is greater than a ¼-inch bump in floor elevation. Floor transitions between rooms must be smooth. The four other showers share two floor drains. Each shower floor must be pitched so that water does not pass from one bather to another. It appears the original floor was not pitched correctly in the vicinity of the showers and drainage slits were cut into the floor to reduce puddling. (Figure 24) A clear 5' of width is required at all turning points for wheelchairs. (Figure 25)

Figure 23 – Existing handicap shower

Figure 24 – Floor drains

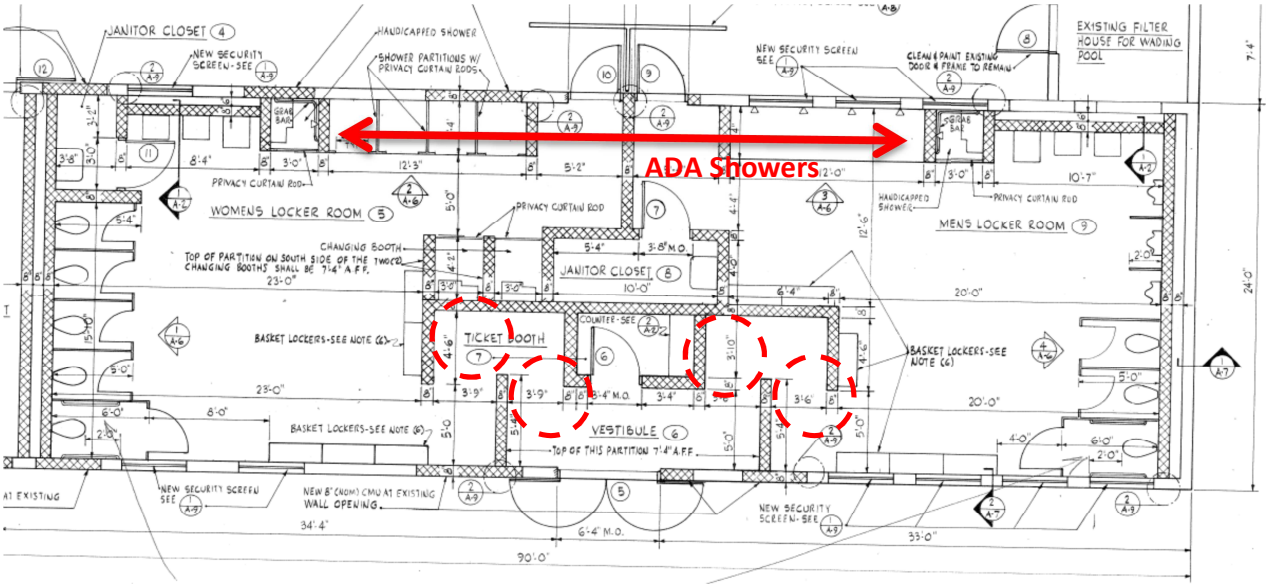


Figure 25 – ADA issue areas (showers and insufficient turning radiuses)

Health and safety signage is posted, but does not meet current standards. New signs should be mounted that are current with ADA and Health Department requirements. The bathhouse does not have a handicap mirror. The mechanical and plumbing fixtures (hot water heater, toilets, sinks, etc.) all appear to be original to 1988. There are no exit signs posted at the egress doors and no emergency lighting. The building contains no smoke detectors or fire alarms.

Figure 26 – Conduit at rear of filter building

The rear of the filter building has a snapped conduit with exposed wires (Figure 26). Conduit failure is common along foundation walls where conduit expansion joints are not installed, and the foundation has settled or heaved. The window glazing is cracked and in serious need of repair (Figure 27). The metal fascia and soffit on the bathhouse is falling out and missing in areas (Figure 28).

Figure 27 – Window glazing failure

Figure 28 – Soffit and fascia damage

BUILDING - STRUCTURE

The original building was constructed in 1958 and renovated in 1988 at which time the roof was converted into a gable roof. The building is 90 feet long by 24 feet wide, one-story masonry bearing wall structure and does not have a basement. The original roof framing consisted of 12" deep steel bar joints spaced at 30" on center clear span across the width of the building. (Figure 29)

Figure 29 – Original steel roof structure of filter building

A separate, similarly constructed building houses the pool equipment that is situated outside the immediate pool deck area adjacent to the double gate at the south end of the facility near the parking area.

The bathhouse is at the pool deck level and includes the patron's entrance, separate men's and women's lockers, showers and changing rooms. Interior partition walls are constructed of masonry block walls. Exterior walls are constructed of 8-inch masonry units.

The foundation is constructed of reinforced concrete wall with a continuous concrete strip footing set below the frost line (-3'-6"). The floor is a 6-inch concrete slab on grade reinforced with welded wire fabric.

Figure 30 – Side of bathhouse

The 1988 renovation drawings call-off the design loads which are consistent with the snow loads currently required by the Connecticut State Building Code, therefore the framing should be adequate for the anticipated snow loads.

The foundation is experiencing some cracking and spalling of concrete at the northeast corner of the building. (Figure 31) The threshold at the patron's entrance at the rear double door does not

meet ADA due to the finish grade of the bituminous walkway. There is a loose 2x plank used to mitigate the change in elevation, which poses a tripping hazard. (Figure 32)

Overall, the building does not appear to be experiencing any major structural problems.

Figure 31 – Foundation spalling

Figure 32 – Bathhouse entrance trip hazard

SUMMARY AND RECOMMENDATIONS:

In summary, the deficiencies identified at the pool facility fall into three categories – immediate safety issues, recommended code upgrades, and structural/mechanical issues. For each of these categories, we recommend that the following improvements be undertaken by the Town:

Immediate Safety Issues:

- Repair gaps in fence, and secure loose fence areas.
- Review the inventory of lifesaving equipment and replace or supplement as necessary.
- Modify the main drain piping to keep water velocity flow rates under the rating on the Virginia Graeme Baker covers. This may conflict with CT pool guidelines, but is the only short-term solution.
- Remove the existing diving boards, and install smaller up to date boards that are compliant with the deep end dimensions.
- Replace depth markings.

Recommended Code Upgrades:

- Reconfigure the bathhouse to meet current ADA standards.
- Install mechanical ventilation in the chemical storage area.
- Install larger main drain sumps and larger main drain piping.
- Eliminate direct suction from the main drains by incorporating a 4,000 gallon surge tank.
- Install double walled chemical tanks or a secondary containment basin.
- Install automatic water level controller.
- Install new skimmers and an equalization port for each skimmer.
- Install new ADA compliant stairs, handicap lifts, and correct number of ladders.

Structural/Mechanical Issues:

- Option 1: Repair cracks in the pool walls with hydrophobic polyurethane grout crack injection. Replace all caulking and backer rod in expansion joints.
- Option 2: Install a new gunite pool inside the shell of the existing pool.
- Option 3: Remove the existing pool shell and install a completely new pool.
- Replace corroded valves, fittings, main pool pump, and corroded hardware.
- Replace the acid injection system with a CO_2 system.
- Install new chemical control equipment.
- Epoxy paint entire pool
- Replace depth markings.
- Replace concrete pool deck and sub base. Incorporate deck drains where needed.
- Replace diving board & stand.

Recommendations:

We recommend option 2 as the best approach to renovate the pool. The pool has many deficiencies and any renovation will require all code compliant items to be addressed. A complete demolition and replacement of the pool shell may involve expensive PCB remediation. Ground water management will be a major expense. By shooting a new gunite pool inside of the existing shell, ground water will be easier to manage. Excavation for new main drain piping will be the most challenging task regarding ground water. The community will get a pool only slightly smaller than the existing pool and minimal excavation/demolition will be required. It is common practice when doing this kind of renovation to install a zero entry ramp in the shallow end and reduce the depth of

the deep end to approximately 6-feet. The new pool would incorporate a stainless steel gutter system, eliminating all skimmers and incorporating return piping into the gutter. This greatly reduces the chances of broken piping.

Option 1: The following table presents a tabulation of estimated project costs. Costs assume prevailing wage rates.

Item	Unit	Quantity	Unit Cost	Total
Code Issues				
Structural and bathhouse update	EA	1	$331,500.00	$331,500.00
Fence repair	EA	1	$6,000.00	$6,000.00
Fence replacement	LF	580	$60.00	$34,800.00
New Lifesaving Equipment - Allowance	EA	1	$500.00	$500.00
Chemical Storage Room Ventilation	LS	2	$4,000.00	$8,000.00
Surge tank	LS	1	$35,000.00	$35,000.00
Main drain piping & autofill	LS	1	$30,000.00	$30,000.00
Chemical containment	EA	4	$1,200.00	$4,800.00
New skimmers and equalization ports	EA	16	$3,000.00	$48,000.00
ADA stairs, handicap lift, and ladders	LS	1	$12,000.00	$12,000.00
			Subtotal	$510,600.00
Structural Issues (Option 1)				
Crack injection and caulking	LF	1,000	$40.00	$40,000.00
Expansion joint caulking	LF	1,000	$20.00	$20,000.00
Epoxy paint	LS	1	$25,000.00	$25,000.00
Tile depth markers and no diving tiles	EA	40	$200.00	$8,000.00
Remove & Replace Pool Deck & Subbase	SF	9,825	$12.00	$117,900.00
			Subtotal	$210,900.00
Mechanical Issues				
Replace pump, and corroded equipment	LS	1	$13,000.00	$13,000.00
Replace Acid System with CO_2	LS	2	$1,700.00	$3,400.00
Chemical control equipment	LS	2	$4,000.00	$8,000.00
			Subtotal	$24,400.00
			Contingency 15%	$111,885.00
			Soft Costs 20%	$149,180.00
			Grand Total	**$1,006,965.00**

Structural & Bathhouse Costs:

1. Apply block filler on the exterior masonry walls and repaint. (10 years) ($15,000)
2. Replace the asphalt shingles (5 years) (2,800 SF Roof Area, $41,000)
3. Repair foundation (5 years) ($1,000)
4. Adjust threshold at double door entrance (Immediate) ($3,000)
5. Emergency Lighting & Smoke Alarm (Immediate) ($5,000)
6. Paint Exposed Metal Deck and Bar Joist in Filter Building (5 years) ($2,500)
7. General Renovation / Updates (5 years) Cost per square foot ($60/SF, 2,200 SF, $132,000)

Option 2: The following table presents a tabulation of estimated project costs. Costs assume prevailing wage rates.

Item	Unit	Quantity	Unit Cost	Total
Code Issues				
Structural and bathhouse update	EA	1	$331,500.00	$331,500.00
Fence repair	EA	1	$6,000.00	$6,000.00
Fence replacement	LF	580	$60.00	$34,800.00
New Lifesaving Equipment - Allowance	EA	1	$500.00	$500.00
Chemical Storage Room Ventilation	LS	2	$4,000.00	$8,000.00
Surge tank	LS	1	$35,000.00	$35,000.00
Main drain piping & autofill	LS	1	$30,000.00	$30,000.00
Chemical containment	EA	4	$1,200.00	$4,800.00
ADA stairs, handicap lift, and ladders	LS	1	$12,000.00	$12,000.00
			Subtotal	$450,600.00
Structural Issues (Option 2)				
Install gunite pool inside existing pool shell	LS	1	$350,000.00	$350,000.00
Epoxy paint	LS	1	$25,000.00	$25,000.00
Tile depth markers and no diving tiles	EA	40	$200.00	$8,000.00
Remove & Replace Pool Deck & Subbase	SF	9,825	$12.00	$117,900.00
			Subtotal	$500,900.00
Mechanical Issues				
Replace pump, and corroded equipment	LS	1	$13,000.00	$13,000.00
Replace Acid System with CO_2	LS	2	$1,700.00	$3,400.00
Chemical control equipment	LS	2	$4,000.00	$8,000.00
			Subtotal	$24,400.00
			Contingency 15%	$146,385.00
			Soft Costs 20%	$195,180.00
			Grand Total	**$1,317,465.00**

Option 3: The following table presents a tabulation of estimated project costs. Costs assume prevailing wage rates.

Item	Unit	Quantity	Unit Cost	Total
Code Issues				
Structural and bathhouse update	EA	1	$331,500.00	$331,500.00
Fence repair	EA	1	$6,000.00	$6,000.00
Fence replacement	LF	580	$60.00	$34,800.00
New Lifesaving Equipment - Allowance	EA	1	$500.00	$500.00
Chemical Storage Room Ventilation	LS	2	$4,000.00	$8,000.00
Surge tank	LS	1	$35,000.00	$35,000.00
Main drain piping & autofill	LS	1	$30,000.00	$30,000.00
Chemical containment	EA	4	$1,200.00	$4,800.00
ADA stairs, handicap lift, and ladders	LS	1	$12,000.00	$12,000.00
			Subtotal	$450,600.00
Structural Issues (Option 3)				
Demo existing pool - posible PCB's	LS	1	$150,000.00	$150,000.00
Install new pool & dewatering	LS	1	$450,000.00	$450,000.00
Epoxy paint	LS	1	$25,000.00	$25,000.00
Tile depth markers and no diving tiles	EA	40	$200.00	$8,000.00
Remove & Replace Pool Deck & Subbase	SF	9,825	$12.00	$117,900.00
			Subtotal	$750,900.00
Mechanical Issues				
Replace pump, and corroded equipment	LS	1	$13,000.00	$13,000.00
Replace Acid System with CO_2	LS	2	$1,700.00	$3,400.00
Chemical control equipment	LS	2	$4,000.00	$8,000.00
			Subtotal	$24,400.00
			Contingency 15%	$183,885.00
			Soft Costs 20%	$245,180.00
			Grand Total	**$1,654,965.00**

APPENDICES

A. Concrete test results
B. Crack injection data sheets
C. Photographs

APPENDIX A. CONCRETE TEST RESULTS

Of Massachusetts
"The Construction Testing People"

5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Compressive Strength Report - Concrete Cores

Distribution Copy

Report Date 03-25-2013
Report No. 1
Job Number 16019
Project Newington,CT-Mill Pond & Church Hill Rd

Contractor Weston & Sampson

The following are results of compressive strength tests performed on concrete cores obtained at the above site. Testing in accordance with ASTM C-42.

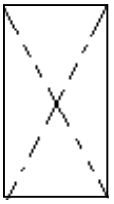
Core Mark No.	Lengt After Cap (in.)	Height (in.)	Diameter (Inches)	Height to Diameter Ratio	Area (Sq. in.)	Date Cast	Date Tested	Age Days	Required PSI	Total Load (lbs.)	Unit Load (PSI)	Corrected Unit Load (PSI)	Fracture Type
1	4.8	4.6	2.7	17.0	5.7		03/25/2013			40,000	7,020	6,850	2
2	5.6	5.4	2.7	2.0	5.7		03/25/2013		Unknown	34,000	5,960	5,960	2

GENERAL REMARKS: Core #1, Mill Pond and Core #2, Church Hill pool. Both cores were bagged and tagged for client and cores saved at the UTS lab. Corrected Unit Load - Strength correction factor applied, ratio of length of core to diameter of core, Length/Diameter as per ASTM C-42-77, if applicable.

Inspector Name	Premium Time	Hours	Travel Time
R. Granada	No		

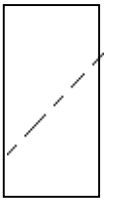
REVIEWED BY: Robert S. Granada

FRACTURE TYPES


(1) Cone


(2) Cone and Split


(3) Cone and Shear


(4) Shear


(5) Columnar

Our reports are available in PDF form via email. Please email us at reports@utsofmass.com for more information.

cc: Weston & Sampson Paul Jensen

APPENDIX B. CRACK INJECTION DATA SHEETS

de neef®
CONSTRUCTION CHEMICALS, INC.

TECHNICAL INFORMATION
URETHANES

PRODUCT NAME
HYDRO ACTIVE® Flex SLV
Hydrophobic Polyurethane Grout

MANUFACTURER
De Neef Construction Chemicals, Inc.
5610 Brystone Drive
Houston, TX 77041
1(800) 732-0166

PRODUCT DESCRIPTION
HYDRO ACTIVE® Flex SLV is a very low viscosity hydrophobic polyurethane that, when used with **HYDRO ACTIVE® Flex Cat**, is designed to form a flexible gasket or plug in very tight joints and hairline cracks. In its uncured form, **HYDRO ACTIVE® Flex SLV** is a pale yellow, nonflammable liquid. When in contact with water the grout expands and depending on temperature and the amount of accelerator (**HYDRO ACTIVE® Flex Cat**) used quickly cures to a tough, flexible, closed cell polyurethane foam that is essentially unaffected by corrosive environments.

APPROPRIATE APPLICATIONS
- Sealing leaks thru very tight joints and hairline cracks in concrete and masonry.

ADVANTAGES
- NSF 61 Potable water approved
- Contains no volatile solvents
- Single component
- High elongation creates tight seal in moving cracks
- Controllable cure time
- Free foam expansion up to 15 times its liquid volume
- Very low viscosity permits injection into hairline cracks
- Resistant to most corrosive environments

TYPICAL PROPERTIES

Uncured

Solids	100%	ASTM D 2369 B
Viscosity at 77°F	150-250 cps	ASTM D 2196 A
Color	Pale yellow	
Density	9.0 – 9.15 lbs/gal	ASTM D 3574
Flashpoint	>130°C	ASTM D 92
Corrosiveness	Non-corrosive	
Influence of pH	No influence between 2-11	

Flex Cat

Appearance	Transparent Liquid	
Viscosity	5-16 cps at 77°F	ASTM D 2196
Density	8.50 – 8.60 lbs/gal	ASTM D 3574
Flashpoint	> 200° F	ASTM D 92
Influence of pH	No influence when pH < 7	

Cured

Density	8.76 – 9.20 lbs/gal	ASTM D 3574
Tensile Strength	174 psi	ASTM D 3574
Elongation	250%	ASTM D 3574
Shrinkage	Less than 4%	ASTM D 1042
Influence of pH	No influence between 2-11	
Toxicity	Non-toxic	

The data shown above reflects typical results based on laboratory testing under controlled conditions. Reasonable variations from the data shown above may result.

Reactivity

	%HYDRO ACTIVE® Flex Cat	Geltime in min-sec
*** at 50°F**	1%	7' 50"
	3%	3' 50"
*** at 68°F**	1%	6' 00"
	3%	3' 00"
*** at 86°F**	1%	5' 50"
	3%	2' 30"

Example - 1% Flex Cat =1.3 oz. per gallon of Grout
Note: Flex Cat must be agitated by shaking the can prior to adding to resin.

PACKAGING

HYDRO ACTIVE® Flex SLV:

- 55 gallon metal drum sealed under dry nitrogen.
- 5 gal metal pail sealed under dry nitrogen.

HYDRO ACTIVE® Flex Cat Accelerator:

- 25 oz. cans.

LIMITATIONS

Low temperatures will significantly affect viscosity. If site temperatures are extremely low, heat bands or heated water baths may be used on the pails before and during installation to maintain the product's temperature. Avoid splashing water into open containers, as the material is water activated. Avoid exceeding 90ºF when warming.

CAUTION: pH NOTICE. Water used to activate HYDRO ACTIVE® Grouts must be in a range of pH 3-10 for optimum foam quality.

SURFACE PREPARATION

Refer to De Neef Surface Preparation Guidelines for more details.

INSTALLATION PROCEDURES

Prior to installation, both the grout and accelerator must be agitated separately before combining by vigorously shaking the containers or by mixing with a jiffy mixer. The grout should never be used with more **HYDRO ACTIVE® Flex Cat** than the amount recommended on this data sheet. Excess acceleration will cause a vigorous expansion that is prone to shrinkage. Pour the desired amount of **HYDRO ACTIVE® Flex SLV** into a clean pail. Measure the appropriate amount of **HYDRO ACTIVE® Flex Cat** and pour it into the **HYDRO ACTIVE® Flex SLV** and stir until adequately mixed. During injection the grout will follow the path of least resistance. When the material has stopped penetrating it will continue to expand against the confines of the crack/joint and compress within itself, forming a very dense, closed cell material stopping the leak.

For application procedures in extreme temperatures and specific environments or equipment recommendations call the DeNeef Technical Service Department.

STORAGE & HANDLING

Store in dry area in original resealable containers.

Warning! If **HYDRO ACTIVE® Flex Cat** is allowed to freeze, it will lower performance.

PRECAUTIONS

Always use protective clothing, gloves and goggles consistent with OSHA regulations during use. Avoid eye and skin contact. Do not ingest. Ventilation is recommended. Refer to Material Safety Data Sheet for detailed safety precautions.

SAFETY INFORMATION

In the event of an EMERGENCY call:
CHEM-TREC 800-424-9300.

WARRANTY INFORMATION

De Neef Construction Chemicals, Inc. products are warranted under the policy set forth under the WARRANTY section of the De Neef Construction Chemicals Inc., product catalog. Warranty information can also be obtained via the De Neef Construction Chemicals Inc. website at www.deneef.com, by calling 713-896-0123 or toll free at 1-800-732-0166.

Rev. 08/2009

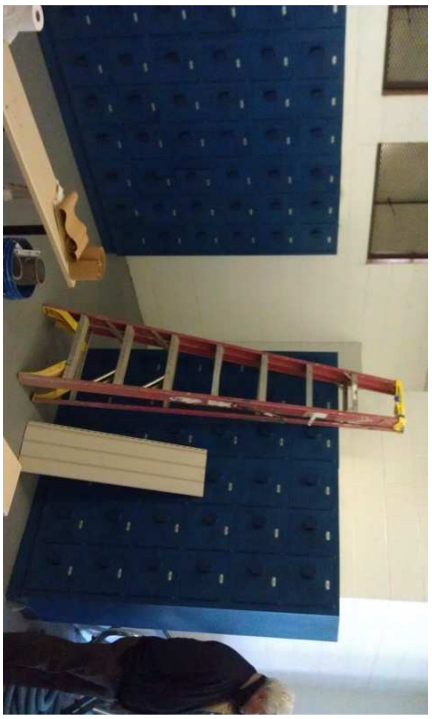
DRINKING WATER SYSTEM COMPONENTS
ANSI/NSF 61
3N76

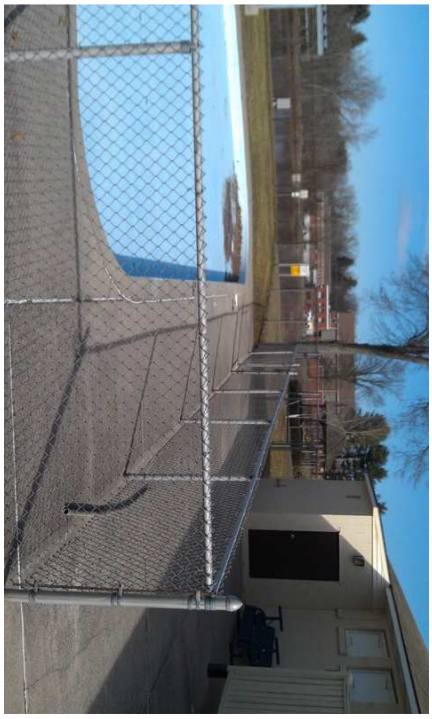
"HYDRO ACTIVE® FLEX SLV GROUT"
MAXIMUM SURFACE AREA TO VOLUME RATIO
0.25 CM²/L AT 23ºC
ONLY WHEN MIXED WITH
"HYDRO ACTIVE® FLEX CAT" ACTIVATOR (1-3%)

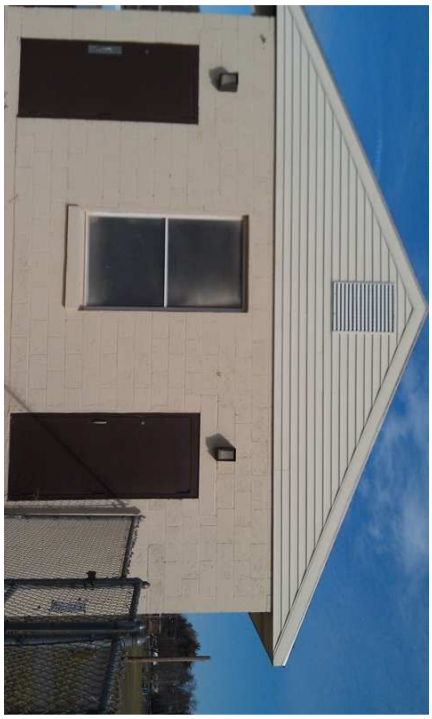
CLASSIFIED UL WATER QUALITY

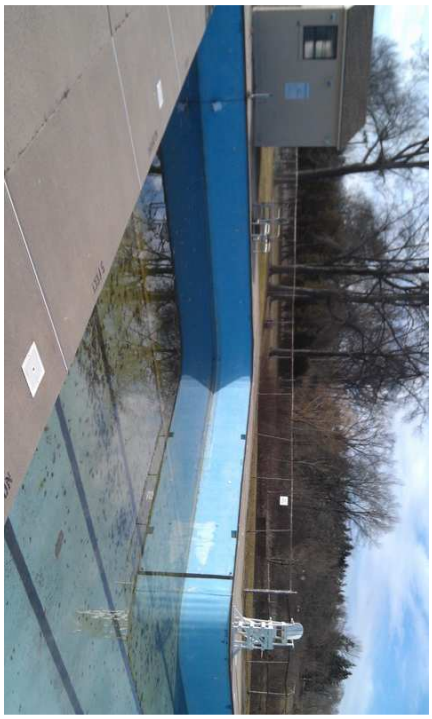
APPENDIX C. PHOTOGRAPHS


GENERAL ELECTRIC
ON
OFF







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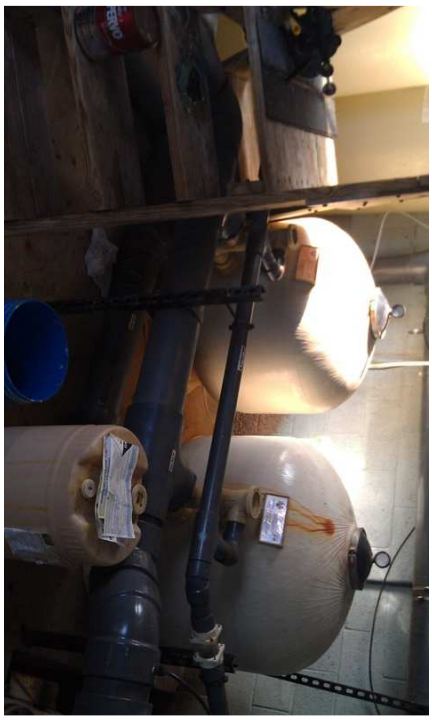

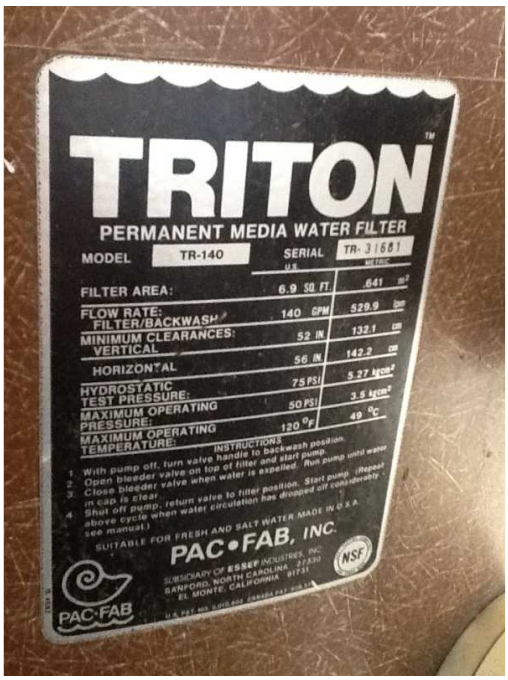
TRITON
PERMANENT MEDIA WATER FILTER
MODEL TR-140
SERIAL TR-31681
FILTER AREA: 6.9 SQ FT .641
FLOW RATE: FILTER/BACKWASH 140 GPM 529.9
MINIMUM CLEARANCES: VERTICAL 52 IN 132.1
HORIZONTAL 56 IN 142.2
HYDROSTATIC TEST PRESSURE: 75 PSI 5.27
MAXIMUM OPERATING PRESSURE: 50 PSI 3.5
MAXIMUM OPERATING TEMPERATURE: 120 °F 49 °C
INSTRUCTIONS
1. With pump off, turn valve handle to backwash position.
2. Open bleeder valve on top of filter and start pump.
3. Close bleeder valve when water is expelled. Run pump until water in cap is clear.
4. Shut off pump, return valve to filter position. Start pump. (Repeat above cycle when water circulation has dropped off considerably - see manual.)
SUITABLE FOR FRESH AND SALT WATER MADE IN U.S.A.
PAC•FAB, INC.
SUBSIDIARY OF ESSEF INDUSTRIES, INC.
SANFORD, NORTH CAROLINA 27330
EL MONTE, CALIFORNIA 91731
PAC-FAB
NSF