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Southbury, Ballantine Park Pool Facility Evaluation Report

Ballantine Park Pool
611 Old Field Road
Southbury, CT 06488

ENGINEER'S REPORT

The Town of Southbury (the Town) is located in western New Haven County, Connecticut. It is a community of roughly 19,904 people (2010 Census), with a square mileage of 40.1. This engineering report provides an evaluation of the Town's bathing facility, swimming pool, and wading pool at Ballantine Park, and provides recommendations for improvements based on Weston & Sampson's site evaluation.

The swimming pool and the wading pool were evaluated based on discussions with the Town, available information provided by the Town, such as record drawings and operation and maintenance (O&M) records, and from a site visit that was conducted on June 13, 2019. During the site visit both the swimming pool and the wading pool were up and running.

To the South of the pool facility, are tennis courts, volleyball courts, baseball/softball fields, and a playground. Patrons to the pool facility can park in the parking lot located directly east of the pool facility building. There is additional overflow parking to the southwest of the facility, however, this lot also serves the athletic fields and courts to the south.

Weston & Sampson was retained to perform professional engineering, compliance evaluations, and planning services in connection with the Town's Pool Facility at Ballantine Park. Our scope of services included the following:

- Review of existing pool plans and systems.
- A code analysis for conformance with Connecticut Public Health Regulations and guidelines Minimum Standards, ANSI, as well as the new Federal Standards for ADA and Virginia Graeme Baker (VGB).
- Evaluation of existing pool facility and filter rooms/buildings.
- Examination of visible existing piping, circulation, chemical treatment and filtration systems.
- Research appropriate repairs and improvements for the pools.
- Preparation of an Engineer's Report that provides recommendations to improve the pools existing conditions and bring the pool into compliance with code.

Code Review

Each pool facility was evaluated based on the below code standards:

- Connecticut Public Health Code 19-13-B33b. Public Pools. (January 2010)
- Connecticut Swimming Pool Design Guide (January 2010)
- American National Standard for Public Swimming Pools (ANSI / NSPI – 2014)
- American National Standard for Aquatic Recreation Facilities (ANSI / IAF – 9 2005)
- International Swimming Pool and Spa Code (ISPC, 2012)
- International Building Code (IBC, 2018)
- International Plumbing Code (IPC, 2018)
- United States Access Board – Accessible Swimming Pools & Spas (ADA Code, June 2014)
- National Electrical Code – Article 680 – 2011 Edition (NEC 680)
- Virginia Graham Baker Pool and Spa Safety Act – January 2012 (VGB code)

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Appendix A – Cost Estimate

1.0 – Background and General Information

The Town of Southbury, CT (the Town) operates and maintains the Ballantine Park Pools (the pool(s)) off of Old Field Road located in central Southbury, see **Figure 1**. The pool is an outdoor seasonal pool that is typically open from mid-June to mid-August.



Figure 1- Ballantine Pool

The Ballantine Pool Facility was established in 1971 and has since not seen any major upgrades. The facility operates a swimming pool and wading (kiddie) pool, for younger patrons. The swimming pool is L shaped and approximately 4,500 square feet, while the wading pool is a square

and approximately 625 square feet. The facility has a building to the east of the pools that houses the Men's and Women's Locker Rooms, miscellaneous storage and an admissions front desk. There is substantial community involvement in the pool's programs, including swimming lessons, free swim, summer camps, and adult swimming.

2.0 – Evaluation of the Ballantine Swimming Pool

2.10 – Description of Existing Pool

2.11 – Swimming Pool

The swimming pool is an outdoor recreational pool, enclosed by a 6-foot high chain link fence. Patrons access the pool through the locker rooms in the bathing facility. Entering the pool area through the locker rooms allows patrons the chance to use the restrooms, change, and/or shower before swimming

The pool is an "L" shaped reinforced concrete pool, with a water surface area of approximately 4,500 square feet, a perimeter length of approximately 333-ft and a volume of approximately 168,075 gallons. It spans approximately 83-ft in length with widths of 53.5-ft and 30-ft, and depths ranging from 3-ft to 10-ft. Based on the current square footage the pool's bather load is 180 bathers.

The pool has three sets of drop in ladders, two in the deep end and one on the northwestern corner of the pool (this ladder was not installed at the time of the visit). Other points of entry in the pool are two sets of stairs located on shallow end of the pool, and two ADA lifts which were not installed at the time of the visit. The entry stairs contain a 2-in contrasting color strip on all the treads of the steps. Some of the strips appear to be painted while others are tile. The pool has a contrasting strip to delineate the 5-ft depth of the pool. When open, the Town installs buoys at this location to define at the pool surface the change in depth.

The pool has six, 7-ft 9-in wide swimming lanes. There are no starting blocks but are signs of previous anchors that were covered up. Lanes are distinguished by a contrasting lane center line that stretches the length of the pool. End wall targets are located on the deep and shallow ends of the pool walls as well. During lap swim hours lane line floats are installed for each lane.

An impervious concrete deck surrounds the pool, extending 9-ft to 24.5-ft from the pool edge. The deck drains away from the pool to local deck drains or to a grass surface which surrounds the pool deck on two sides. The pool has metal depth markers installed in the pool deck and stick-on depth markers on the vertical face of the gutter. All depth markings are starting to fade or wear and are becoming hard to discern. "NO DIVING" is spray painted on the pool deck along the perimeter of the shallow area of the pool, but it's starting to fade.

The Town has two deck installed lifeguard chairs; one at the 5-ft deep area on the west side of the pool and one on the northside of the pool at roughly the 4-ft deep section. There is an additional third portable lifeguard chair which is usually placed on the southside at roughly the midpoint of the lap lanes.

2.12 – Filtration and Recirculation System

The majority of the filtration system is enclosed by a white PVC fence just to the south of the deep end of the swimming pool. To the west of the fence is a small wooden shed that houses the pH system, the portable ADA lifts, and the pool vacuums, as well as provide extra storage for the facility. The pH system currently is not in use due to the chemical controller malfunctioning. The filtration system was installed at the same time as the pool.

Table 1 below includes available information on the existing pool filtration equipment.

Equipment	Manufacturer	Model
Collector Tank	-	-
Centrifugal Pump	Marlow	*Unknown
Pump Motor	Baldor Reliance	JMM3313T
Filter System	Paddock	*Unknown
Chlorine Storage Tanks (volume?)	-	-
Chlorine Feed System	Rola-chem	RC103SC
Muriatic Acid Feed System	Flexflo	A-100N
Chemical Controller	Hayward	HCC2000
Pump Strainer	Mermade	FO Series
Flow Meter	Blue White	F-3060P

Table 1-Swimming Pool Mechanical Equipment

* - Model Number and Manufacturer Tags were Rusted, Not Available, or Painted.

Water from the pool is transported to the collector tank through a perimeter gutter system and one 24-in by 24-in main drain. The main drain was installed in 2009 (certificate of compliance on file?) The gutter system is a Paddock style open gutter system, which is original to the pool.

With a flow rate of roughly 650 gallons per minute (gpm) the pool has a turnover rate of approximately 4.30 hours (hrs). The filter is backwashed when the flow meter reading drops below 500 gpm, producing a turnover of 5.6 hours, and there is a filter pressure differential of 15 psi. Backwash from the filter is conveyed to the backwash tank found in the enclosure. As the backwash tank is filled the valve to release water is opened and water then freely drains down the grass hill to the south. The Town noted that the sand volleyball court gets flooded but drains quickly and does not cause any problems. Makeup water for the pool comes from the hose bibb on the outside of the bathing facility building.

Power for the pump is supplied through an underground conduit that runs from the bathing facility to the mechanical area. The pump breaker can be found next to the pump in the pit. No ventilation for the pump, filter and chlorine system is needed as they are not enclosed.

Currently the pool receives deliveries of chemicals once per week. Due to the pH feeder not currently being used the pool operators have to hand measure and calculate chemical usage to adjust the pH levels.

2.13 – Pool Patron Usage and Programming

The Ballantine pool offers a variety of programs providing for its diverse patrons. Currently the pool offers swimming lessons, free swim, summer camps, and adult swimming. On a nice summer day the pool sees upwards of 350 to 400 patrons over the course of the day. Most regular/daily patrons buy a season pass at the beginning of the summer, however the pool does offer daily passes for purchase.

(Information on yearly revenue and yearly operation costs)

2.14 – Pool Existing Challenges

The Ballantine Park Pool Facility has outlived its current facility. With the facility in constant operation for swim team practices, swimming lessons, free swim, summer camps, and adult swimming, filtration system is barely keeping up.

In the mechanical area one of the largest challenges that the pool operators face is balancing the pool. With no working chemical controller and no autofill, staff have to constantly sample the water and manually adjust the chlorine and pH levels. The pool loses roughly XXX gallons per day, costing the Town \$XXX per summer. With no autofill the staff is forced to have manually fill the pool using the hose connections on the deck. This loss and addition of water causes the pool to become chemically unbalanced, requiring additional chemicals to be added to maintain proper residuals. Not only does this add more maintenance items for the staff to stay in control of, the added water makes the pool colder and uncomfortable to the patrons swimming.

The second most time-consuming task is backwashing the system. Due to the age of the valves and equipment, opening and closing valves and shutting down and starting up the pump can be a huge time commitment. It has become such an overburdening task to get the system up and running that backwashing has been minimized, resulting in increased turnovers.

Within the pool are additional challenges that the operators and maintenance team have to deal with every season. At the time of the visit multiple leaks within the gutter were pointed out by staff. Most of these leaks were in areas that previously had a leak and were welded but over time the welds broke down and are now re-leaking. The leaks cause the water to occasionally drop below the gutter if not addressed right away, causing ineffective skimming. This could be corrected if there was an autofill installed. Currently the operator has to pay close attention to the pools water level and manually add supplemental water as needed using the deck hose. The addition of supplemental water also effects the chlorine and pH concentrations, causing more chemical usage.

A hammer test was not performed, however, with the gutters leaking it can be assumed that there are voids around the perimeter of the deck. When looking at the pool floor it was apparent that there was settling in certain areas, refer to **Figure 2**. This could either be due to the leaking gutter or could be a sign of additional leaks possibly through cracks in the pool shell.

While there were no immediate signs of structural deterioration, there were significant amounts of spalling and cracking paint seen throughout the pool. These areas were not able to be inspected at the time of visit due to the pool being full.

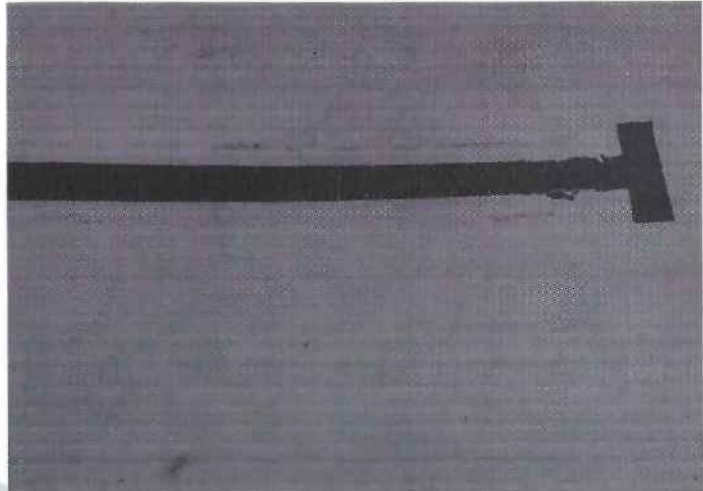


Figure 2 - Settling pool floor and spalling paint at lane line

Additional challenges include the current ADA lifts. The town had the ADA lift anchors installed prior to receiving the board of health's approval, therefore the facility is not allowed to use the lifts. To gain approval they would need to remove the current anchors, submit for approval and then only once approved reinstall the deck anchors. Another challenge is providing enough deck space for patrons. Currently there is some deck space but it can become rather crowded forcing patrons to sit up in the grassy areas.

2.20 – Existing Swimming Pool Conditions

2.21 – Pool Structural

As previously mentioned, the existing swimming pool is a reinforced concrete pool. The swimming pool shows no immediate signs of structural deterioration. However, in March and April of 2019 3 to 4-inches of the wall below the gutter was replaced in an attempt to add a vinyl liner to the pool. In addition, there were a couple small areas that had settlement, spalling paint, or possible cracking but these were not able to be confirmed with the pool full. During the field visit it was determined that the gutter does have multiple leaks.

2.22 – Pool Finishes

The pool has a reinforced concrete finish with 1-in by 1-in ceramic tile for the contrasting edges, lane line markers, targets, and 5-ft depth marker.

The tiled contrasting edges, lanes, end targets and 5-ft depth markers are black in color and still

in good condition with minor repairs needed. In places where repairs were done or tiles have fallen off the Town painted contrasting strips. The town indicated that they paint the pool shell every 5-6 years.

At both entry stairwells the center railing escutcheon plates are not able to be properly installed due to railing location. Refer to **Figure 3**.

Currently the pool has three sets of ladders, one set in each corner of the deep end of the pool and one in the northwestern corner of the pool.

Some of these ladders are experiencing rust and wear which could be due to use over the pools lifetime. The rusting ladders and rails could also be experiencing rust due to an issue with the equipotential bond, bonding was not tested. In addition to the rusting, the ladder in the northwestern corner of the pool obtrudes into the northern most lap lane. This creates a potential hazard to patrons swimming laps in that lane. The facility does not install this ladder for that reason.

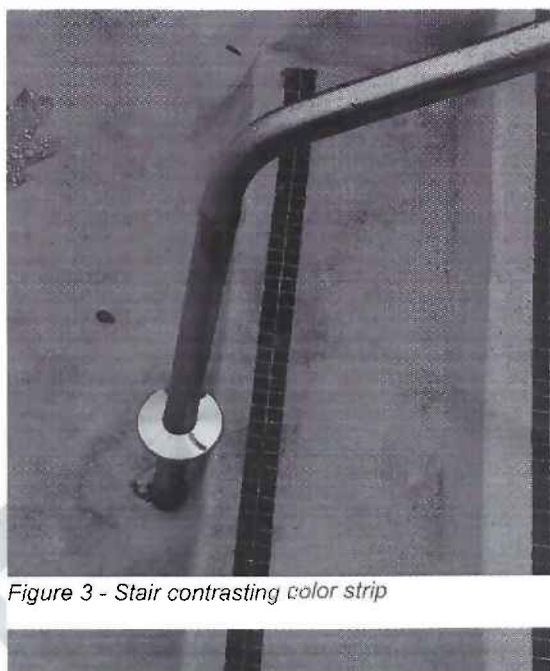


Figure 3 - Stair contrasting color strip

2.23 – Pool Deck

The pool deck is a series of cast in place concrete slabs. The deck is original to the pool and is in poor condition. Throughout the deck are large cracks due to the lack of saw cuts and expansion joints. There are some areas where the caulking over the expansion joint has decayed and the different sections of concrete have separated causing a hazard to patrons. It also appears that a lifeguard chair was removed and the deck anchors. The holes will need to be grouted or tiled over and the portion of the post removed, as they present a tripping and abrasive hazard to patrons.

A portion of the deck currently drains away from the pool to area drains found between the pool and the bathing facility. The area drains appear to be original to the pool deck. The remainder of the deck drains away from the pool to the surrounding grassy areas. There was noticeable ponding around the pool deck indicating signs of settling.

The depth markers and "NO DIVING" symbols located within the pool deck along the perimeter of the pool are in bad condition, and are hard to read.

2.24 – Pool Filtration System

Most of the mechanical equipment for the pool is original to the pool. Since its installment the equipment has surpassed its lifetime and/or is being over worked causing further wear on the equipment. The equipment is not enclosed and therefore it has seen the effects of UV degradation and the harsh New England elements, refer to

Figure 4.

Below is an assessment on the current filtration equipment.

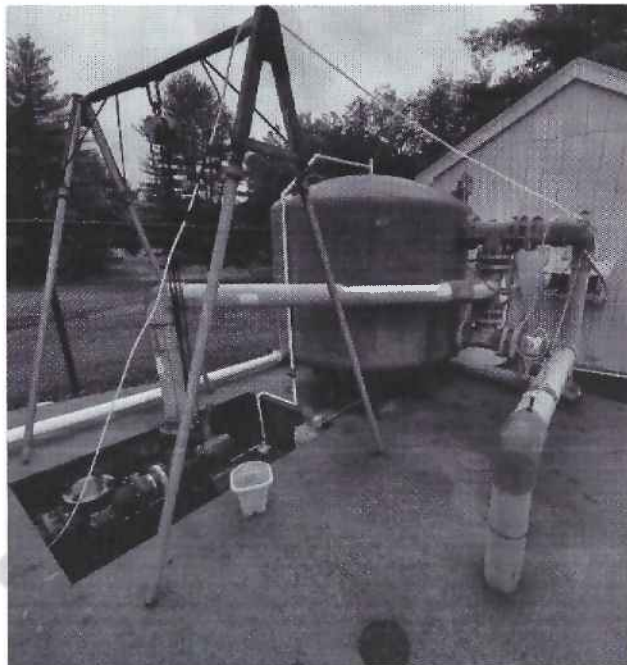


Figure 4 - Pool Filtration system

Flow Meter

There is only one flow meter found on the swimming pool system. The flow meter is a pitot flow meter found on the return line that feeds the pool inlets. The flow meter is not properly positioned and will need to be adjusted to properly display the correct flows.

High Rate Sand Filter

The current filter is original to the pool and still in workable condition. The pool staff has provided the proper care and maintenance to prolong the filters lifespan and keep it running. However, it has surpassed its lifetime, and there are noticeable rust spots and environmental wear on the steel structure.

(when was the sand last changed?)

Filter Pump and motor

The pump is original to the pool but is very rusted and in need of replacement. The pumps motor was recently refurbished this year. The Town indicated that it would not start up, most likely due to being left uncovered for its lifetime. The refurbished motor was installed at the time of the visit and seemed to be in good condition and running properly.

Chemical Controller

The Hayward chemical controller was more recently purchased to streamline the chemical

measuring and dosages' for the pool. The Town noted that they had numerous issues with the system before it stopped working. The Town has since switched back to hand calculating and measuring the chemicals. Manually maintaining the pools water chemistry is a time intensive process and can lead to inconsistencies in water chemistry.

Piping

As a result from the piping being exposed to UV light without any protection, the piping has faded and is brittle. The piping is currently not labeled, the flow is not defined, and the piping is unrestrained. The risk is the brittle, unrestrained piping could fail if water hammer was placed on the piping.

2.30 – Swimming Pool Compliance Issues

2.31 – Pool Code Requirements

The Ballantine Main swimming pool is considered a "Class B" pool in accordance with American National Standard for Public Swimming Pools (ANSI/APSP/ICC – 2014). A "Class B" pool is any pool, not otherwise classified, intended for public recreational use. The following is a review of current requirements as they pertain to this pool.

Connecticut Public Health Code 19-13-B33b, Public Pools, applies to this section.

No Diving Symbols

Code Requirements

In accordance with *ISPSC 409.3 - No Diving Symbol*, "Where the pool depth is 5-feet or less, the "No Diving" symbol shall be displayed. The symbol shall be placed on the deck at intervals of not more than 25 feet."

Compliance Assessment

Currently the pool does not meet this code requirement. There are no "NO DIVING" symbols on the deck where the pool depth is 5-ft or less. The words "NO DIVING" were painted on the deck but were faded and hard to read.

Marking of Depth

Code Requirements

In accordance with *Connecticut Public Health Code 19-13-B33b, Public Pools, Depth and Depth Markings - 5.3*, "Depth markers shall be in numerals of four inches minimum height and a color

contrasting with the background. Where depth markers cannot be placed on the vertical walls above the water level, other means shall be used; said markings to be plainly visible to persons in and out of the swimming pool. Depth of water shall be plainly marked near the water surface on the vertical wall and on the edge of the deck next to the pool. Depth markers shall be placed at the following locations:

- a. At the points of maximum and minimum depths.
- b. At any change of pool floor slope, including the point of change of slope between the deep and shallow portions of the pool, that is the breakpoint;
- c. At intermediate one-foot increments of water depth in the shallow end; and,
- d. If the pool is designed for diving, at appropriate points to denote the water depths in the diving area.
- e. If the pool is of constant depth, at appropriate points that will satisfactorily denote the water depth."

In accordance with *ISPSC 409.2.1 Depth Markers*, "Depth markers shall be spaced at intervals not to exceed 25 feet (7620 mm)."

Compliance Assessment

Currently there are sticker depth markers along the gutter curbing. Over the years these stickers have ripped and have begun to fall off. There are currently deck depth markers located on the pool deck, however some of the depth markers exceed the 25-ft intervals required by code. Additionally, the depth markers are not spaced at one-foot depth intervals in the shallow portion of the pool. Depth markers will need to be added to meet these code requirements.

Pool Steps

Code Requirements

In accordance with *Connecticut Public Health Code 19-13-B33b, Public Pools, Ladders, Recessed Treads and Stairs - 16.2*, "Steps leading into the swimming pool shall be of non-slip design, have a minimum tread of 12 inches and a maximum rise or height of ten inches. The top step shall be at least 4 feet wide. There shall be no abrupt drop off or submerged projections into the pool, unless guarded by handrails."

In accordance with *Connecticut Public Health Code 19-13-B33b, Public Pools Ladders, Recessed Treads and Stairs - 16.5*, "The edge of all steps at the riser/tread junction shall be delineated with bands or lines of a dark contrasting color so as to be easily visible from above and below water level."

Compliance Assessment

Currently the pool step risers are not uniform and have heights that vary from 10-in to 16-in in height. This causes a potential tripping or falling hazard within the pool.

Additionally, the pools steps only have a 2-in contrasting strip on the tread and are lacking the contrasting strip on the vertical faces. The contrasting color tile or paint will need to be added to meet code compliance.

Main Drains

Code Requirements

In accordance with *Code 6.1 – The Association of Pool & Spa Professionals*, "Periodic evaluation, testing, and maintenance. Covers/grates and suction entrapment avoidance systems and related components shall be evaluated, maintained, and replaced by a person licensed or qualified in accordance with applicable manufacturer's instructions and local law".

Compliance Assessment

Currently the main drain grate has not been inspected since they were installed in 2009, after the mandatory VGB compliance enforcement. The main drain grate needs to be inspected and replaced accordingly. The certificate of compliance letter from the manufacturer will have the date the grate was installed and the date it will need to be replaced. The main drain needs to be inspected and possibly replaced.

Main drain pipe size?

Ladders and Entry Points

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b – 16.1*: "Steps or ladders shall be provided at the shallow end of the swimming pool if the vertical distance from the bottom of the pool to the deck or walk is over two feet. Recessed steps or ladders shall be provided at the deep portion of the swimming pool. If the pool is over 30 feet wide, such steps or ladders shall be installed in each side of the deep portion".

Compliance Assessment

The ladder at the northwest corner of the pool needs to be installed at all times. Without this ladder there is a span of pool width greater than 30-ft without ladders on each side. Additionally, without

the northwest corner ladder there is approximately 130 linear feet of pool perimeter between entry points. Standard practice in pool design is to have an access point every 75-ft. Minimal access points creates a hazard for bathers by not providing proper exit from the pool facility.

Openings in Deck

Code Requirements

In accordance with *ADA Code 302.3 Openings*, "Openings in floor or ground surfaces shall not allow passage of a sphere more than 1/2 inch (13 mm) diameter except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel".



Figure 5 - Deteriorated Expansion Joint

Compliance Assessment

The pool deck has separated creating large openings greater than 1/2-in. Refer to, **Figure 5**.

Changes in Level

Code Requirements

In accordance with *ADA Code 303.2 Vertical Changes in Level*, "Changes in level of 1/4-in high maximum shall be the permitted to be vertical.

Compliance Assessment

The pool deck has heaved creating changes in vertical greater than 1/4-in.

Eyewash Station

Code Requirements

In accordance with *29 CFR 1910.151*, from the Occupational Safety and Health Administration (OSHA), "Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use."

Compliance Assessment

Chlorine and muriatic acid are both corrosive materials that are used to disinfect the pool water.

Currently there is no eyewash station provided within the mechanical enclosure/building.

ADA Compliance

Code Requirements

In accordance with *ADA Standards for Accessible Design 242.2*, large pools must have a minimum of two accessible means of entry. A large pool is defined as any pool with over 300 linear feet of pool wall. Pool walls at diving areas and in areas where swimmers cannot enter because of landscaping or adjacent structures are still counted as part of the pool's total linear feet. Primary means of entry must be by sloped entry or lift, secondary means can be any of the following permitted types."

Permitted Means of Pool Access					
Pool Type	Sloped Entry	Lift	Transfer Walls	Transfer Systems	Stairs
Swimming (less than 300 linear feet of pool wall)	X	X			
Swimming (300 or more linear feet of pool wall)	X	X	X	X	X

Table 2 - Permitted Means of Pool Access

Compliance Assessment

The current swimming pool perimeter exceeds 300 linear feet. This requires two forms of ADA access. The Town currently has two lifts but did not receive approval from the health department prior to installation of the anchors and therefore are legally not allowed to install the lifts.

2.32 – Mechanical Code Requirements

Operating Instructions

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b – 15.4, Equipment Room – Lifesaving Equipment*, "Operating instructions and a schematic drawing for all pool equipment are to be provided in the pool equipment enclosure or room."

Compliance Assessment

Currently there are no operating instructions found on site.

Pressure Gauges

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b –11.7*, “All pumps shall have a vacuum and effluent pressure gauges.”

Compliance Assessment

Currently there are no effluent pressure gauges found after the filter pump.

Flow Measurement

Code Requirements

In accordance with *ISPSC 311.7 Flow Measurement*, “Public swimming pools and wading pools shall be equipped with a flow-measuring device that indicates the rate of flow through the filter system. The flow rate measuring device shall indicate gallons per minute and shall be selected and installed to be accurate within plus or minus 10% of actual flow.”

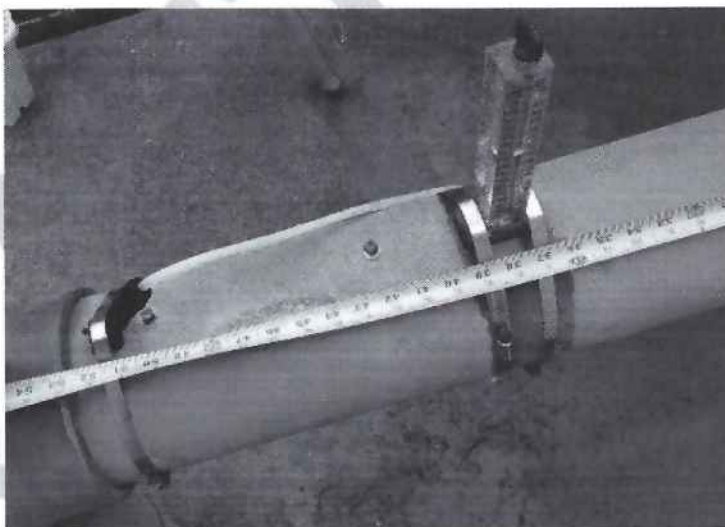


Figure 6 - Incorrect flow meter installation

Compliance Assessment

Currently there is a flow meter on the filtration system, however, it is not installed per the manufacturer's recommendations. An incorrectly installed flow meter will result in inaccurate readings see **Figure 6**.

3.0 – Evaluation of the Ballantine Wading Pool

3.10 – Description of Existing Wading Pool

3.11 – Wading Pool

The wading pool is located to the south of the swimming pool, within the same 6-ft tall perimeter fence as the swimming pool. To access the wading pool patrons must first enter onto the swimming pool deck via the locker rooms. Once on the swimming pool deck they have to open a secondary 4-ft tall fence, using a self-closing, self-latching gate to access the wading pool.

The wading pool is a square shaped Gunit pool, with a water surface area of 625 square feet, a perimeter length of 100-ft and a volume of approximately 5,700 gallons. Based on the current square footage the wading pool has a bather load of 62 bathers. The pool has one step within the pool at the shallower 1-ft deep end, it then gradually slopes to the opposing side where it is approximately 1-ft 6-in in depth. The entry stair has a 2-in contrasting color strip on the tread of the step.

When looking at the pool floor there were significant amounts of spalling and cracking paint seen throughout the pool. These areas were not able to be inspected at the time of visit, due to the pool being full.

An impervious concrete deck surrounds the pool, extending 10-ft on all sides from the pool edge. The deck primarily drains away from the pool to a pervious grass surface. The pool has depth markers and "NO DIVING" painted on the perimeter of the pool deck and tile depth markers on the vertical face of the pool wall. All depth markings and "NO DIVING" markings have started to fade or wear and are becoming hard to discern.

3.12 – Wading Pool Filtration and Recirculation System

The wading pool filtration system is located within the same white PVC fence as the swimming pool.

Table 3 below includes available information on the existing pool filtration equipment.

Equipment	Manufacturer	Model
Centrifugal Pump	Pentair	WF-6
Filter System	Pentair	TR-60
Chlorine Feed System	Hayward	CL220
Flow Meter	Blue White	F-300

Table 3- Wading Pool Mechanical Equipment

Water from the wading pool is suctioned through the two skimmers and two 8-in round main drains. The main drains were installed with the wading pool in 1971.

With an estimated flow rate of roughly 50 gpm the pool has a turnover rate of approximately 1.9 hrs. The filter is backwashed once per week. Backwash from the filter is conveyed to the shared backwash tank found in the mechanical enclosure. Makeup water for the pool is manually added by the operator through a hose bibb.

Power for the pump is supplied through an underground conduit that runs from the bathing

facility. The pump breaker can be found next to the pump. No ventilation for the pump filter and chlorine are needed as they are not enclosed. There is no pH feeder, currently the operator manually adjusts the pH levels as needed.

3.13 – Patron Usage

With the wading pool sharing the same facility as the swimming pool, patron usage fluctuates based on the patrons' age and intended use of the facility. The Town does not actively keep records of the number of patrons using the wading pool.

3.14 – Wading Pool Existing Challenges

In the mechanical area most of the challenges are similar to the swimming pool. Currently the largest challenge for the wading pool is that the operator has to manually balance the water. There is no chemical controller, so staff have to constantly sample the water and adjust the chlorine and pH levels. To supplement the small chlorinator on the system the Town adds a floating chlorinator to the pool after hours and then removes it upon opening the facility to the public.

The next most time consuming task is backwashing the system. Due to the age of the valves and equipment opening and closing valves and shutting down and starting up the pump can be a huge time commitment.

3.20 –Existing Wading Pool Conditions

3.21 – Wading Pool Structure

As previously mentioned, the existing wading pool is a reinforced concrete pool with a perimeter coping stone edge. Some of the coping stones around the edge of the pool appear to have been replaced since the original installation. The pool however, shows no immediate signs of structural deterioration.

3.22 – Wading Pool Finishes

The wading has a painted finish with 1-in by 1-in ceramic tile for the contrasting edge of the stair, waterline tiles, and skimmer mouths. The town paints the pool every 5-6 years.

3.23 – Wading Pool Deck

The wading pool deck is cast in place concrete slabs, connecting to the swimming pool. The deck is original to the wading pool and is in poor condition. Like the swimming pool the wading pool deck has large cracks due to the lack of saw cuts and expansion joints. There are some areas where the caulking over the expansion joint has decayed and the different sections of

concrete have separated causing a hazard to patrons.

Surrounding three of the four sides of the deck are grassy areas that the deck drains to. The sides shared with the pool drain to common deck drains. There was noticeable ponding in areas that connected to the swimming pool deck, indicating signs of settlement.

The depth markers located within the pool deck along the perimeter of the pool are in bad condition, and are hard to read. There is also a discrepancy between the depth markers on the deck and the depth markers in the pool. The deck depth markers in the deep end indicate 18-inches (1-ft 6-in), while the depth markers on the inside pool wall indicate 1-ft. The pool does in fact slope from 1-ft to 1-ft 6-in.

3.24 – Wading Pool Filtration System

The wading pool filtration equipment is original to the pool. Being over 40 years old and constantly exposed to the New England weather and sun, the equipment has surpassed its lifetime. Along with the swimming pool equipment it is recommended that the equipment be housed in a permanent enclosure, extending its lifetime.

Below is an assessment on the current filtration equipment.

Flow Meter

There is only one flow meter found on the system, which is on the return line back to the wading pool. The flow meter is not properly positioned and will need to be adjusted to properly display the correct flows.

High Rate Sand Filter

The current filter is original to the pool and still in workable condition. The pool staff provide the proper care and maintenance to prolong the filters lifespan and keep it running. However, the filter is very faded from UV degradation and has surpassed its lifetime.

Filter Pump and motor

The pump is original to the pool but is very faded and the motor has begun to rust. The Town has not yet experienced any major issues with the pump. However, being exposed to the natural elements over the years has taken a toll on the pump and it may not last much longer.

Chlorine Feeder

The current chlorine feeder is original to the wading pool and still in workable condition. The pool staff provide the proper care and maintenance to prolong the lifespan and keep it running. However, due to the style of feeder the chlorination can become out of balance as the bather load, temperature and sunlight change throughout the day. This style of feeder has an adjustable nob that regulates how much chlorine is delivered to the system. Therefore, if bather loads become high the chlorine levels may drop, creating improper disinfection.

3.30 – Wading Pool Compliance Issues

3.31 – Wading Pool Code Requirements

The Ballantine wading pool is considered a "Class F" pool in accordance with American National Standard for Public Swimming Pools (ANSI/APSP/ICC – 2014). "Class F" pools are wading pools. The following is a review of current requirements as they pertain to this pool.

Connecticut Public Health Code 19-13-B33b, Public Pools, applies to this section.

No Diving Symbols

Code Requirements

In accordance with *ISPSC 409.3 - No Diving Symbol*, "Where the pool depth is 5-feet or less, the "No Diving" symbol shall be displayed. The symbol shall be placed on the deck at intervals of not more than 25 feet."

Compliance Assessment

Currently the pool does not meet this code requirement. There are no "NO DIVING" symbols on the deck where the pool depth is 5-ft or less.

Marking of Depth

Code Requirements

In accordance with *ISPSC 409.2.3 Depth Accuracy*, "Depth markers shall indicate the actual pool depth within + 3 inches (76 mm), at normal operating water level when measured 3 feet (91 cm) from the pool wall or at the tangent point where the cove radius meets the floor, whichever is deeper."

In accordance with *Connecticut Public Health Code 19-13-B33b, Public Pools, Depth and Depth Markings - 5.3*, "Depth markers shall be in numerals of four inches minimum height and a color

contrasting with the background. Where depth markers cannot be placed on the vertical walls above the water level, other means shall be used; said markings to be plainly visible to persons in and out of the swimming pool. Depth of water shall be plainly marked near the water surface on the vertical wall and on the edge of the deck next to the pool. Depth markers shall be placed at the following locations:

- a. At the points of maximum and minimum depths.
- b. At any change of pool floor slope, including the point of change of slope between the deep and shallow portions of the pool, that is the breakpoint;
- c. At intermediate one-foot increments of water depth in the shallow end; and,
- d. If the pool is designed for diving, at appropriate points to denote the water depths in the diving area.
- e. If the pool is of constant depth, at appropriate points that will satisfactorily denote the water depth."

Compliance Assessment

Currently there are tile depth markers on each of the faces of the pool walls that read 1-ft. The pool slopes from 1-ft to 1-ft 6-in, these depth markers will need to be replaced with more accurate depth markers. Refer to **Figure 7 and 8**.



Figure 8 - Painted depth marker on deck



Figure 7 - Tile depth marker on pool wall

There are faded depths that were painted on the deck that read "DEPTH 18(1-ft 6-in), these are hard to read, don't include units such as "FT" or "IN", and do not align with the marking inside the

pool. Improper markings will need to be removed and updated so that all depth markers on the face of the wall align with the deck depth markings.

Pool Steps

Code Requirements

In accordance with *ISPSC 610.5.3, Pool Steps*, "The leading edge of all steps shall be distinguished by a color contrasting with the color of the steps and the pool floor."

Compliance Assessment

The pools step only has a 2-in contrasting strip on the tread and is missing the contrasting strip on the vertical face. A contrasting color tile or paint will need to be added to meet code compliance.

Main Drains

Code Requirements

In accordance with *Code 6.1 – The Association of Pool & Spa Professionals*, "Periodic evaluation, testing, and maintenance. Covers/grates and suction entrapment avoidance systems and related components shall be evaluated, maintained, and replaced by a person licensed or qualified in accordance with applicable manufacturer's instructions and local law".

Compliance Assessment

Currently the main drain grates are original to the wading pool. The drains were not inspected or replaced during the 2009 mandatory VGB compliance enforcement. The main drain grates need to be inspected and replaced accordingly. The certificate of compliance letter from the manufacturer will have the date the grates were installed and the date they will need to be replaced. The main drains need to be inspected and possibly replaced.

It is our recommendation the pool to be closed until the system has been evaluated, or engineered.

Openings in Deck

Code Requirements

In accordance with *ADA Code 302.3 Openings*, "Openings in floor or ground surfaces shall not allow passage of a sphere more than 1/2 inch (13 mm) diameter except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long

dimension is perpendicular to the dominant direction of travel".

Compliance Assessment

The pool deck has separated creating large openings greater than ½-in, refer to **Figure 9**.



Figure 9 - Wading pool expansion joints

Changes in Level

Code Requirements

In accordance with *ADA Code 303.2 Vertical*

Changes in Level, "Changes in level of ¼-in high maximum shall be the permitted to be vertical.

Compliance Assessment

The pool deck has heaved creating changes in vertical greater than ¼-in.

ADA Compliance

Code Requirements

In accordance with *ADA Standards for Accessible Design 242.3*, "At least one accessible means of entry shall be provided for wading pools. Accessible means of entry shall comply with sloped entries complying with 1009.3."

Compliance Assessment

The current wading pool perimeter is less than 300 linear feet. With the depth of the wading pool a handicap lift would not grant access, and therefore would need a sloped entry to meet code requirements.

Skimmers

Code Requirements

In accordance with *Connecticut Public Health Code 19-13-B33b, Public Pools, Skimmers - 10.3*, "Where skimmers are used, they shall be applied to public swimming pools on the basis of 500 square feet of water surface area per unit or fraction thereof. The required skimmers shall be distributed to insure effective skimming of the entire surface. Their location shall also take into consideration the pool shape, prevailing winds and the circulation patterns within the pool.

Rectangular pools which are twenty (20) feet or less in width and fifty (50) feet, or less, in length, shall be provided with at least two skimmers. Each skimmer is to be located not greater than ten (10) feet from the end wall.

The two skimmers may be located on one side of the pool when the prevailing wind is considered a factor. Otherwise the two skimmers should be located diagonally, one at each side of the pool. The inlets should be placed so as to increase the water circulation toward the skimmers for effective skimming, and in order to eliminate dead spots.”

Compliance Assessment

The current wading pool skimmers are both found on the western side of the pool. The inlets are along the step into the pool on the northern side of the pool. With the current skimmer and inlet configuration proper water circulation does not occur. Skimmers will need to be rearranged to allow for effective skimming.

3.32 – Wading Pool Mechanical Code Requirements

Operating Instructions

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b – 15.4*, Equipment Room – Lifesaving Equipment, “Operating instructions and a schematic drawing for all pool equipment are to be provided in the pool equipment enclosure or room.

Compliance Assessment

Currently there are no operating instructions found on site.

Pressure Gauges

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b – 11.7*, “All pumps shall have a vacuum and effluent pressure gauges.”

Compliance Assessment

Currently there are no pressure gauges found after the filter pump.

Flow Measurement

Code Requirements

In accordance with *ISPSC 311.7 Flow Measurement*, “Public swimming pools and wading pools

shall be equipped with a flow-measuring device that indicates the rate of flow through the filter system. The flow rate measuring device shall indicate gallons per minute and shall be selected and installed to be accurate within plus or minus 10% of actual flow.”

Compliance Assessment

Currently there is a flow meter on the filtration system, however, it is not installed per the manufacturer's recommendations. An incorrectly installed flow meter will result in inaccurate readings. Most

Manufacturers recommend a straight pipe distance of 10 times the pipe diameter before the flow meter and straight pipe 5 times the pipe diameter after. These distances allow for a more accurate reading, see **Figure 10 and 11.**

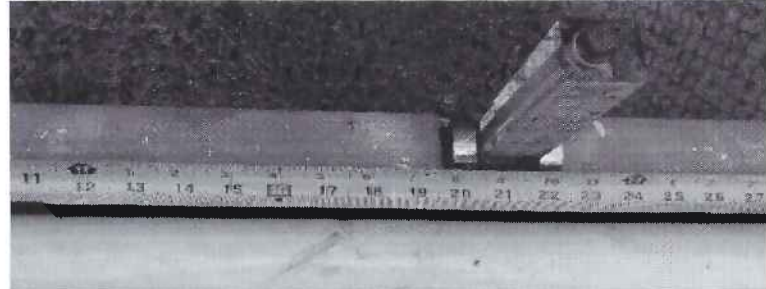


Figure 11 - Wading pool distance prior to flow meter

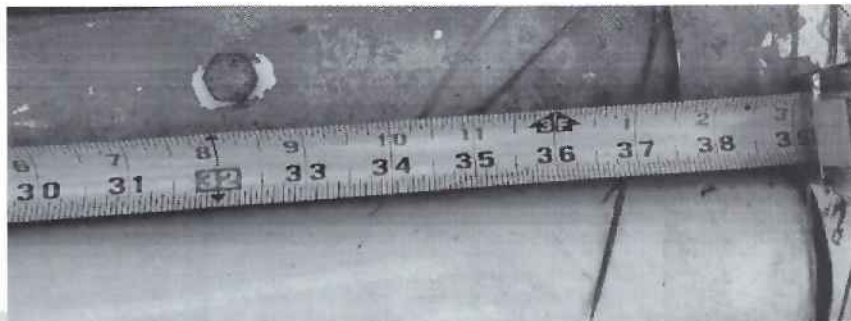


Figure 10 - Wading pool distance post flow meter

The current wading pool flow meter is not able to read flow.

4.0 – Evaluation of the Ballantine Bathing Facility

4.10 – Description of Existing Bathing Facility

4.11 – Bathing Facility

The bathing facility is a wooden structure sitting on a slab on grade foundation. The building was renovated 9 years ago with updates to appliances, wall finishes, the front desk area, locker room fixtures, and adding ventilation fans. The layout of the facility did not change during the renovation. During the renovations exhaust fans were added to each locker room to create a forced draft, allowing the locker rooms to draw in fresh air from the doorways.

The Bathing facility includes both a Women's and Men's locker room, storage for miscellaneous equipment and an admissions/first aid area. At the entrance to the facility patrons are greeted by staff at the admissions desk, where they can pay to use the facility, show them their season

pass or ask any questions that they might have. From there patrons enter into the locker rooms, where they can either head straight for the pool deck or use the facilities, such as the restrooms or shower, prior to entering onto the pool deck. Each locker room has bathrooms, sinks, showers and changing stalls (Refer to **Table 4** for quantities of each).

Fixture	Women's Locker Room	Men's Locker Room
Water Closets	3	2
Urinals	N/A	2
Lavatories	2	2
Showers	3	3
Changing Stalls	2	1

Table 4 - Men's and Women's Fixture Quantities

Both locker rooms have one ADA accessible water lavatory and water closet, but do not have a fully ADA accessible shower.

4.12 – Existing Challenges

Due to the layout and configuration of the locker rooms, patrons are not lead past the showers prior to entering onto the deck and can skip showering. When patrons skip the showers, oils and dirt are then brought into the pool. This results in the filtration system working harder to clean the pool, putting extra loads on the system.

Another challenge is that with the current configuration a handicap person in a wheel chair cannot easily make their way through the maze of the locker room. Many of the pathways are too narrow for a wheelchair to fit through or turn in. To avoid any complications the Town allows ADA access onto the pool deck through the staff/first aid entryway. The patron can then enter the locker room from the pool deck entrance. **Refer to Figure 12.**

The facility is also challenged with having to open after sunrise and close at sunset. There are outdoor lights at the facility but they no longer work. With no working outdoor lights the facility can only operate when the sun light allows, restricting the overall use and programs that could be offered.

4.20 – Bathing Facility Existing Conditions

4.21 – Bathing Facility Structure

At the time of the inspection the facility appeared to be in good shape. There were no structural deficiencies that stood out. It appeared as though they resurfaced the slab on grade during the renovations, which still appeared to be in good condition.

4.22 – Bathing Facility Finishes

During the renovations the entire bathing facility received new wall finishes. The outside of the building received a vinyl siding and new shingles, while the inside received a vinyl type of finish to protect against mold and water damage.

Each locker room has floor drains to capture water as well as each shower has a designated drain.

The facility is equipped with enough lights to provide adequate lighting to the locker rooms and entryway, in addition, the facility has sky lights in each locker room. The sky lights provide supplemental light to each locker room.

4.30 – Bathing Facility Compliance Issues

4.31 – Bathing Facility Code Requirements

Showers

Code Requirements

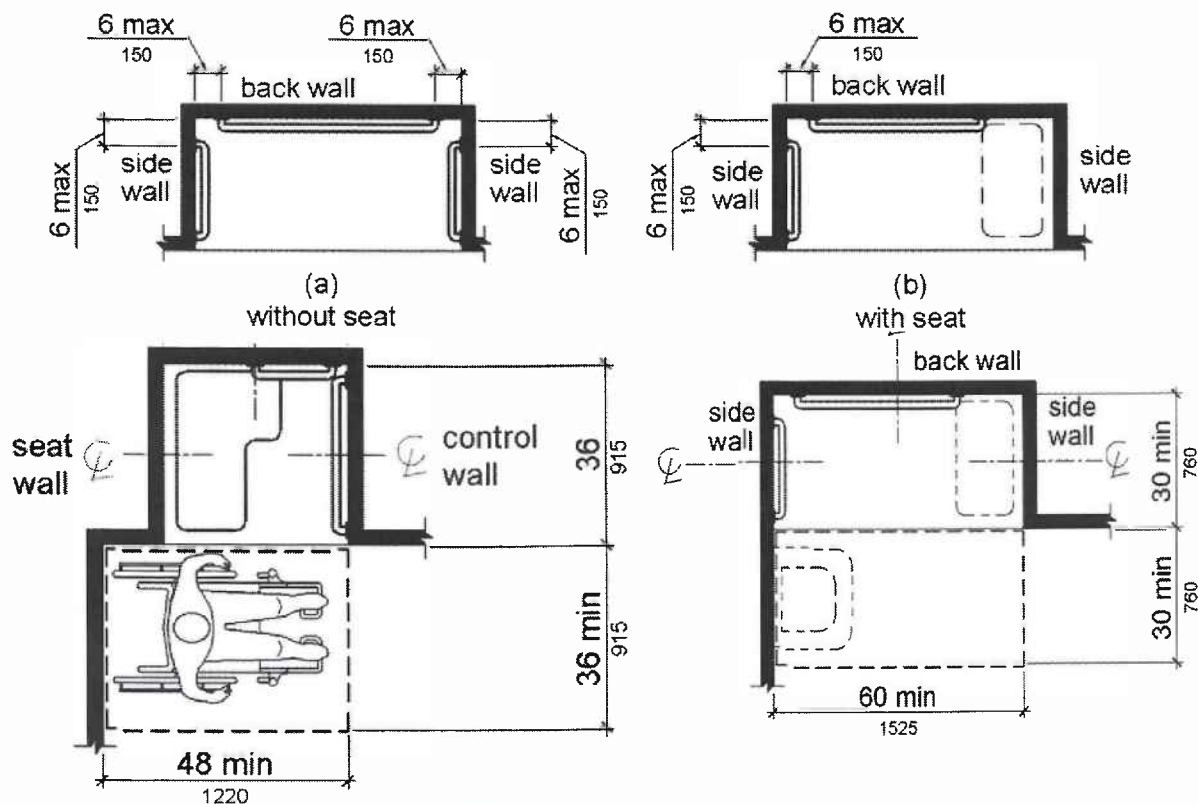
In accordance with *2010 ADA Standard for Accessible Design: Chapter 6: Plumbing Elements and Facilities, 607.6 Shower Spray Unit and Water*, "A shower spray unit with a minimum hose length of 59 inches (1500 mm) long can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Bathtub shower spray units shall deliver water that is 120°F (49°C) maximum."

In accordance with *2010 ADA Standard for Accessible Design: Chapter 6: Plumbing Elements*



Figure 12 - Entry way to pool deck bypassing the showers

and Facilities, 608.2.1, Transfer Type Shower Compartments, "Transfer type shower compartments shall be 36 inches (915 mm) by 36 inches (915 mm) clear inside dimensions measured at the center points of opposing sides and shall have a 36 inch (915 mm) wide minimum entry on the face of the shower compartment. Clearance of 36 inches (915 mm) wide minimum by 48 inches (1220 mm) long minimum measured from the control wall shall be provided."



Compliance Assessment

The current ADA showers do not have a spray unit with a 59 inch long hose. Refer to **Figure 13**.

The ADA showers have a lip at the break between the shower basin and bathroom floor, making them transfer showers. In accordance with ADA code, the units shall have a 36 inch by 48 inch clearance for the user to transfer into the shower. While the facility meets the 36 inch minimum width requirement it does not meet the 48 inch width requirement, as there is another shower that this dimension would overlap with.

Signage

Code Requirements

In accordance with *Connecticut Public Health Code 19 – 13 – B33b – (17)*, "Signs. Signs shall be conspicuously posted at the pool and in public dressing rooms stating the following:

- (A) All persons shall bathe with warm water and soap before entering the pool.
- (B) Any persons known or suspected of having a communicable disease shall not use the pool.
- (C) Spitting or blowing the nose in the pool is prohibited.
- (D) Running, boisterous or rough play (except supervised water sports) is prohibited".

Compliance Assessment

The required signage was not posted entering or exiting the restroom facilities.

Flow of Traffic

Code Requirement

In accordance with *Connecticut Public Health Code 19 – 13 – B33b, (21.2)* "Dressing Rooms, Toilets, and Showers – Bathhouses to be used simultaneously by both sexes shall be divided into two parts separated by a tight partition, each designated for men or women. The entrances and exits shall be screened to break line of sight. The layout of the bathhouse should be such that the bathers on leaving the dressing room pass the toilets and showers en-route to the swimming pool."

Compliance Assessment

Currently patrons do not pass the toilets and showers en-route to the swimming pool.



Figure 13 - ADA shower

Equipment Protection

Code Requirement

In accordance with *Connecticut Public Health Code 19 – 13 – B33b, (15.1 – 15.3)*, “Equipment Room – 15.1: All filters, pumps, chemical feeding apparatus and other mechanical equipment shall be secured and protected by an appropriate enclosure or room, separate and apart from the swimming pool.”

“15.2: The equipment enclosure or room shall be designed so that the pool equipment can be easily and safely maintained and repaired. “

“15.3: Sufficient area, reasonably separate from the recirculation equipment, shall be provided for the satisfactory storage of pool water chemicals and supplementary pool equipment.”

Compliance Assessment

Currently the filter equipment for both bodies of water is housed outside the facility. There is not canopy or enclosure to protect the equipment from the natural elements making it hard for staff to properly and safely maintain.

5.0 – Recommendations

The following is recommended to bring the existing Ballantine Park Facility into compliance with code requirements, help improve the existing conditions and address existing challenges.

Code Required Improvements

- Adding signs identifying the filter room and storage rooms.
- “No Diving” symbols should be installed along the perimeter of the pool decks where the depth is 5-feet or less. The symbols shall be placed no more than 25-ft apart.
- Accurate depth markers need to be installed where the depth and distance exceeds code and markings need to be installed no more than 25-ft apart on the deck and vertical face of the pool wall.
- Pool entry stairs need to be uniform in height and have a maximum height of 10-in.
- Contrasting strips need to be on the vertical faces of all stairs
- All main drain grates need to be inspected and new grates installed if applicable.

- There shall be an entry/exit point at a minimum of 75-ft of pool perimeter.
- Pool deck joints needs to be re-caulked and/or replaced to cover up any large openings.
- Portions of the deck need to be releveled to keep the changes in vertical height less than ¼-in.
- An eye wash station needs to be added near the chemical equipment.
- The pool lifts need to be reinstalled with the health departments approval, so that they may be legally used.
- ADA access needs to be created for the Wading pool.
- Realign interior walls to grant proper ADA access to the bathrooms.
- Operating instructions need to be kept near the filtration equipment.
- All pumps need to have a vacuum and pressure gage installed.
- Flow meter needs to be reinstalled to manufacturers recommended dimensions.
- A spray hose needs to be in each ADA shower.
- ADA showers need to have proper entry clearances.

Existing Conditions Upgrades

- At a minimum the filter sand should be changed.
- Flow meters shall be replaced and relocated to allow for proper calibration and flow measurements.
- Due to UV deterioration, the piping should be replaced.
- It is highly recommended that a chemical controller be installed on both systems, to operate the chlorination and pH metering pumps.
- An auto fill line should be installed in the collector tank for the swimming pool and in the skimmer for the wading pool.
- The gutter and main drains should be replaced in the attempt to stop leaking.

- Pool walls need to be structurally assessed to assess for structural integrity.
- To improve the efficiency of the filter pumps it is recommended that Variable Frequency Drives (VFD) are installed.
- Replace rusted and corroded railings and ensure they are properly bonded. This will keep users safe while rails are in use.
- Promote patrons to bathe prior to entering the pool by restricting access only through the locker rooms. This will help reduce the amount of oils in the pool, in turn reducing the amount of filter media changes required.
- Add an additional backwash tank to handle full backwash flow.
- Enclose or cover all mechanical equipment to prolong its lifetime.

6.0 – Cost Estimate

The above-mentioned recommendations are estimated to cost \$2,155,242. This cost includes both improvements required by code and recommended to improve the existing condition of the facility. A breakdown of the cost estimate is included in **Appendix A**.

7.0 – Conclusions

In the above report are the findings from Weston & Sampson's evaluation of the existing Ballantine Park Pool Facility.

We would like to note that the pool facility staff have done an excellent job maintaining this facility throughout its life of operation.

The evaluation did not test for any contaminations such as lead, polychlorinated biphenyls (PCB's), asbestos, and other contaminants at the existing pool location. The facility was constructed during a time where these contaminants could have been used in the construction industry and therefore it can only be assumed that the facility may contain these contaminants. Additionally, our structural evaluation was limited to a visual inspection of the pool and facilities, and a review of the record drawings. Concrete testing was not performed for this evaluation.

Weston and Sampson finds that with the above mentioned facility upgrades the pool would have approximately another 5 years of operable life. Operating this pool much beyond 5 years could create unnecessary costs associated with operating an inefficient system. Currently much of the

facility is in need of code compliant upgrades, along with recommended upgrades to improve its overall efficiency. We will continue to work with the Town to understand the most appropriate and viable option to meet the needs of the Town and its patrons.

This concludes our analysis of the Ballantine Park Pool Facility.

DRAFT

Appendix A