

**GREENWICH BOARD OF EDUCATION
GREENWICH PUBLIC SCHOOLS
Greenwich, CT**

Board of Education Meeting Agenda Document Cover Sheet

Meeting Date: March 20, 2025

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Agenda Item Title: Amendment to the FY26 Capital Request (GHS Pool Repairs)

Submitted by:

Name: Ben Branyan & Dan Watson

Title: CFAO & Director of School Facilities

Document Purpose/Highlights: (Max 475 Characters)

Please see attached highlights and Final Report.

Recommended Motion (if applicable): (Max 350 Characters)

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Facility Assessment & Recommendations Greenwich High School Pool

This is an update from the oral report provided at the Board Retreat held on February 6, 2025. Quick recap:

- In the Fall of 2024 water appeared to be seeping out of the pool at the Southeast corner. The water was ponding on the new epoxy flooring and was considered a slip hazard as there is no drain in that location. In addition, an athlete cut their hand on a loose tile in the pool.
- GPS Facilities engaged Connecticut Aquatics (CA), the GPS Pool Maintenance Vendor, along with TLBA Architecture. LLC to consult on the issue.
- Investigation revealed that some ceramic tiles on the inside of the pool were loose and falling off at the general vicinity of the cold joint between the pool and the added curb.
- The pool was drained to complete further visual investigation, as well as to make minor repairs.
- During visual review the professionals noted that the 4 drains in the bottom of the pool that were augmented to meet the Virginia Graeme Baker Pool and Spa Safety Act (VGBA) Act may not comply and need immediate attention to continue operating the pool.
 - GPS staff immediately installed an emergency stop button for the pumps. The GPS Athletic Department staff were informed and trained on the operation of the button.
- GPS asked TLBA Architecture to conduct a full review of the natatorium and outline areas of concern. Attached is the final report. Brief Overview:

Main Drain System (VGB Compliance)

- The main drain system is non-compliant with the Virginia Graeme Baker Pool & Spa Safety Act (VGB) and Connecticut Department of Public Health (DPH) regulations.
- Three (3) of the four (4) main drains have little to no water flow, creating a potential suction entrapment risk.
 - The emergency shutoff switch does not eliminate non-compliance and does not guarantee swimmer safety.
- No alternative safety measures can fully mitigate the issue while remaining open.

Diving Clearances

- The pool's diving area is compromised by building and structural elements that violate NCAA (as followed by CIAC) and state building code clearances.
 - The diving board has been secured in an upright position, eliminating this safety issue.

Deck Safety & Accessibility

- The pool deck width is insufficient, failing to meet DPH accessibility and emergency access requirements.
- Spectators currently share deck space with swimmers, violating health code regulations.

Aging Filtration & Mechanical Systems

- The filtration system is near the end of its lifespan and requires full replacement.
- Backwash discharge is improperly routed to a nearby brook instead of the sanitary sewer, violating environmental regulations.
- Electrical panels in the pool equipment room are not rated for corrosive environments, creating a code violation.

Discussion

- GPS presented the report to the State of CT Public Health, Environmental Engineering Program and the Town's Health Department, Building Department, and Risk Manager.
 - The general consensus is the pool was code complaint at the time of permitting. The issues presented are potential liability issues.
- The report highlights several issues with the natatorium. Doing only minor renovations will likely not address all of the issues. An extensive renovation or new building might be necessary to maintain the level of programs that we have today.
- Until the required safety and compliance upgrades are completed, we should consider closing the Greenwich High School pool. This aligns with the Risk Manager's recommendation.
 - Keeping the pool open without resolving these issues creates liability risk, potential endangers users, and violates safety regulations.

ADDITIONAL INFORMATION:

Proposed Timeline (subject to change)

Phase 1: Engineering & Funding (4-8 months)

- Finalize scope and cost estimates for required renovations. Secure funding.

Phase 2: Construction & Renovations (12-24 months)

- Implement drain system, filtration, deck, and electrical upgrades. Conduct regulatory inspections and safety testing before reopening.

Phase 3: Reopening & Long-Term Planning

- Resume operations with a fully compliant and safe facility.
- Establish a preventative maintenance plan to extend the pool lifespan.

Alternative Options Considered

- Temporary safety measures (e.g., increased supervision, emergency shutoff procedures, warning signage) do not remove safety risk to keep the pool open.
- A regulatory variance request is unlikely to be approved for VGB violations, as federal compliance is mandatory.
- Limited-use scenarios (e.g., shallow-end only operations) do not resolve liability risk and still require system-wide upgrades.

Facility Assessment and Recommendations for the Swimming Pool at Greenwich High School Greenwich, CT



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March 3, 2025
TLBA Project # 2025-002

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3. 1997 Department of Health Approval for Renovations

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I. Introduction

Greenwich High School (GHS), located at 10 Hillside Road in Greenwich CT, is home Greenwich Cardinals Swimming, Diving and Water Polo Teams, which train and compete in the swimming pool located within the high school. The swimming pool was initially constructed in 1968 and had a major renovation in 1997. Main Drains covers were replaced in 2008, following the enactment of the Virginia Graeme Baker Pool and Spa Safety Act. No other major upgrades or renovations have been done since, though life-cycle equipment replacement and routine and deferred maintenance has been on-going.

The swimming pool is an 8-lane, 25-yard swimming pool with a single 1-meter diving board. The facility provides aquatic competitive swimming and diving and water polo programs for the high school, as well as other community aquatic programming. The GHS swimming and diving programs have enjoyed great success over the years, boasting multiple FCIAC and State Championships, as well as many personal accomplishments in the pool. The water polo team has been equally successful with multiple New England Championships, Eastern / Mid-Atlantic Titles and FCIAC, CIAC and State Open Championships. Sustainability of the pool is vital to continued success of the program.

At the time the field work was done for this report, the pool was filled with water and as such, precise field measurements were not taken. Dimensions, depths and clearances indicated within this report are based on available documentation, depth markings on the pool deck and physical measurements where possible. It should also be noted that the diving board was hoisted, and as such measurements to the plummet (tip of the diving board) were not able to be made. Noted measurements should be assumed to be approximate, but close to actual measurements.

The pool ranges in depth from 4'-0" to 12'-0". Starting blocks are provided at the deep end for race starts. There is a single 1-Meter diving board, centered on the deep end wall.

Spectator seating occurs in tiered bleachers rising from the pool deck at the west side of the pool. Access to the Locker Rooms, Coaches Office, Storage and the Pool Mechanical Room are directly off the pool deck. Portable bleachers are also deployed at the north end of the pool, on the pool deck.

Pool recirculation, filtration and chemical control systems are located in a Mechanical Room adjacent to the southeast corner of the pool. This room also houses electrical equipment which serves the pool, as well as areas of the school not related to the pool.

Pool decks are ceramic tile bulkhead curbs and resinous epoxy, on concrete slabs-on-grade. A stainless steel gutter was installed in 1997 at an elevation that increased the pool depth by about 12-inches. A bulkhead curb was installed at the pool perimeter to accommodate the elevated gutter, which is fully recessed at the touch walls and semi-recessed at the side walls.

The Natatorium is constructed of a steel girder and beam roof, bearing on concrete columns. Walls are concrete masonry units (CMU), with acoustical CMU at the upper half of the walls.

I. Introduction

Greenwich Public Schools has requested that TLBA provide a preliminary assessment of the natatorium and swimming pool at the High School, inclusive of the pool, pool decks, spectator areas and pool recirculation, filtration and chemical control systems to determine areas of concern with regard to compliance with Building and Fire Codes, Department of Health Regulations, Americans with Disabilities Act (ADA), Virginia Graeme Baker Pool and Spa Safety Act (VGB) and other applicable standards.

The site is complicated by contaminated earth and groundwater, as the school was built on a Brownfield Site. Any renovation plan that requires excavation or dewatering will require input from the Town's environmental consultant to address concerns with the disruption of groundwater and soils.

The goal of this effort is to identify deficiencies related to the following:

- System operation and compliance with applicable Codes, including DPH and VGB.
- Anticipated life cycle of existing or recommended equipment, architectural systems and finishes.
- Filter plant layout, access, and efficiency.
- Review of Natatorium and Filter Room structural systems, and narratives of structural approach for potential additions.
- Review of Pool and Natatorium geometry to verify compliance with standards
- Review of Natatorium and Pool-related Mechanical, Electrical and Plumbing systems.
- Review of Site Development requirements associated with site utilities and additions. Site related issues related to contaminated soils and groundwater will be the responsibility of Greenwich Public Schools.

Based on the results of the analysis, combined with related analysis of other disciplines, this report contains a written Facility Conditions Assessment and Planning Options. A Rough Order of Magnitude Costs is provided for planning purposes.

II. Executive Summary

The Greenwich High School Pool has been a community asset since 1968, when it was constructed as part of the Town's new high school complex. Generally, the overall facility has been cared for and is well maintained. However, swimming pools and natatorium spaces are harsh environments, subject to water, moisture, high humidity, chemical exposure and heavy use. As a result, certain components of the facility are showing its age and it is in need of a significant renovation to ensure its long-term viability. Also of concern are non-compliance issues with regard to VGB and Public Health Code Regulations.

This report identifies a number of issues to be addressed, as well as options for resolution. The degree of urgency varies, but the ones of most concern are as follows:

VGB Compliance: The Virginia Graeme Baker Pool and Spa Safety Act became law in 2008 as a means of reducing the risk of entrapment and entanglement drownings in public swimming pools. It is important legislation and by all metrics a good thing for the pool industry. However, during the roll-out in 2008, upgrades were mandated with little grace period, a patchwork of guidance and a lack of equipment that met the requirements of the law. Greenwich Public Schools proactively sought to comply with the law and shortly after its enactment installed new main drain covers on existing sumps. This was consistent with the practice at the time, and in accordance with guidance provided by the Consumer Product Safety Board. However, the rules regarding main Drains and Suction Outlet Fitting Assemblies (SOFA) and sumps have been clarified and new standards went into effect in 2021. Of note is that under the VGBA, drain covers manufactured on or after November 24, 2020 will be required to comply with the updated standard. Non-compliant installations, whether caused by non-compliant installations or expiring covers, are not grandfathered and must be replaced.

The existing configuration has a pipe stubbing up through the floor, approximately 2" lower than the finish floor of the pool. VGB compliant drain covers are installed, but are on a sump and pipe configuration that is not compliant. As such, modifications are required to the sump in order to make the entire assembly VGB compliant.

At this point, whether the existing Drain was considered compliant at the time of the installation or not is immaterial, as the covers have expired and must be replaced in a manner consistent with the new regulations. Field built sumps are no longer allowed unless the entire assembly is approved by the cover manufacturer. This report provides a recommendation to install fully compliant drains.

II. Executive Summary

Diving Clearances: The State of CT's first formal Building Code was adopted in 1971. Since the building was constructed in 1968, we can assume for purposes of this study that there were no violations at the time of the original installation of the Diving Board. In 1997, as a result of raising the pool water level approximately 12-inches, the requirements of the Codes applicable at the time apply. For the Building Code, that was the 1994 State Building Code, which included BOCA 1990 with CT Supplements. CT Supplement 623.1.1 referred to the Health Department Regulations for "substantial renovations".

The Health Code at the time required an overhead clearance of 15-feet above the board, extending 16-feet ahead of the board and 8-feet behind and to each side, measured from the center of the tip of the board. The 16-foot long diving board, which was installed in the 1997 renovation, had a requirement for overhead clearance to comply with NCAA regulations, by reference in the DPH Regulations. The NCAA Regulations (since March 3, 1991) requires 16'-5" above and ahead of the board and 8'-3" behind and to the sides, again measured from the center of the tip of the board. Refer to Appendix 5 for Diving Well Regulations in effect at the time of the 1997 Renovation.

Currently, there is a steel girder approximately 12-feet above and 6'-2" ahead of the board in violation of the requirements, and posing a risk to divers. In addition to the girder, other steel structure, ductwork and piping encroach on this clearance. It also appears the entire roof deck is lower than the 16'-5" high clearance requirement. This report addresses the issue with graphics and photographs, and offers a potential solution for planning purposes, recognizing that further discussion is required to align the project approach with the long-term goals of the School. Options may include eliminating the diving board from the pool, raising the roof structure, which may be impractical, or expanding the footprint of the Natatorium to construct a taller space to accommodate the diving well. Constructing a new facility in another location is also an option, but the scope of this report focuses on the High School Pool options only.

Pool Decks: In the 1997 renovation, in order to achieve greater pool water depth, a bulkhead curb was added to the pool perimeter, and the diving board was mounted on a platform that bisects the deck so it is not continuous around the pool perimeter. This presents issues with access and accessibility that is non-compliant with Health Code Regulations, which requires a minimum 5-foot wide deck around the pool perimeter, including behind the diving board. This requirement is noted in the 1997 DPH approval. As currently configured, deck width is reduced to about 3-feet for a 55-foot long length of deck at the along the east side, and is eliminated behind the diving board. This would prevent a medic from walking along side a gurney in the event of an emergency, inhibits two-way circulation during a meet, where meet officials walk the length of the deck during swim meet or water polo match, and limit maintenance access equipment to a small scissor lift.

In addition to the pool deck width issue, the Health Code prohibits spectators from sharing deck space with swimmers. In the current configuration, spectators enter from the SE and SW corner onto the pool deck to access fixed seating to the west and portable bleachers to the north. At the SW corner of the pool, near the storage room doors, there is a significant low spot that does not drain. Spectators would need to traverse this standing water to get to the seating.

II. Executive Summary

Recirculation, Filtration and Chemical Control Systems: The existing pool mechanical systems are located in a utility space of approximately 430 sf, located off the southeast corner of the Natatorium. In addition to the pool recirculation, filtration and chemical control systems, the Mechanical Room provides space for an electrical main distribution panel and an acid neutralizer from labs outside the area of the pool.

The pool filter system includes two, dual-cell vertical high-rate sand filters, which is different than the 1997 DPH approved bank of (6) smaller filters. The installed filters are showing signs of failure and are need of replacement. It was also noted that the filters backwash to an outlet at a brook on the site, which is not an acceptable approach, as backwash discharge is chlorinated greywater and should be discharged to sanitary sewer. The 1997 DPH approval notes backwash is directed to sanitary sewer, not storm. There is a sanitary sewer ejector system in the filter room that may be usable for backwash, but this needs to be further investigated for capacity, condition and point of discharge.

The electrical equipment located in this room includes a 480v main distribution panel that serves about half the school. Typically, electrical equipment not directly associated with the pool equipment would be located in a separate area, as the pool equipment room is wet and caustic, due to storage and use of chemicals. When unavoidable, the electrical equipment should be NEMA-rated for corrosive, damp environments (NEMA 4X), which this equipment is not. Additionally, there does not appear to be sufficient clearance in front of the electrical equipment, as required by the National Electrical Code.

Break Line: DPH requires a 4-inch wide, contrasting color band at the break point, where the pool transitions into the hopper at the 5-foot depth line. There is no such demarcation in the pool.

Depth Markings: DPH requires depth markings at the vertical face of the pool above the waterline, visible from inside the pool. Depth markings are present on the curb around the deck, but not on the vertical wall above the water, and as such, they are not visible from in the water.

Light Levels: Sanctioning bodies for competitive water sports recommend 100fc of lighting at the surface of the water, without glare. Light levels at the pool were measured at 50—52fc.

Pool Finish: While not observed as part of this report, due to water in the pool, it has been reported that there are tile leaks and seepage and that renovation of pool finishes is required. This can be tile repair and grout, PVC liner or stainless steel retrofit pool. Choosing the best approach will require additional evaluation. Appendix 4 provides options for rehabilitation of the pool shell.

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III.Existing Conditions Analysis

1. Swimming Pool, Finishes and Recirculation, Filtration and Chemical Control Systems

The swimming pool at Greenwich High School is a cast-in-place concrete structure with a ceramic tile finish. The gutter is a stainless steel perimeter gutter, fully recessed at the touch walls and semi-recessed at the side walls. Decks are ceramic tile bulkhead curbs and resinous epoxy on concrete slab-on-grade.

Four pool main drains located at the deep end of the pool are an integral part of the pool's recirculation system. These drains connect to a surge tank located exterior to the building, through a modulating valve, which automatically adjusts the flow to ensure water level in the pool is maintained as swimmers enter and exit the pool.

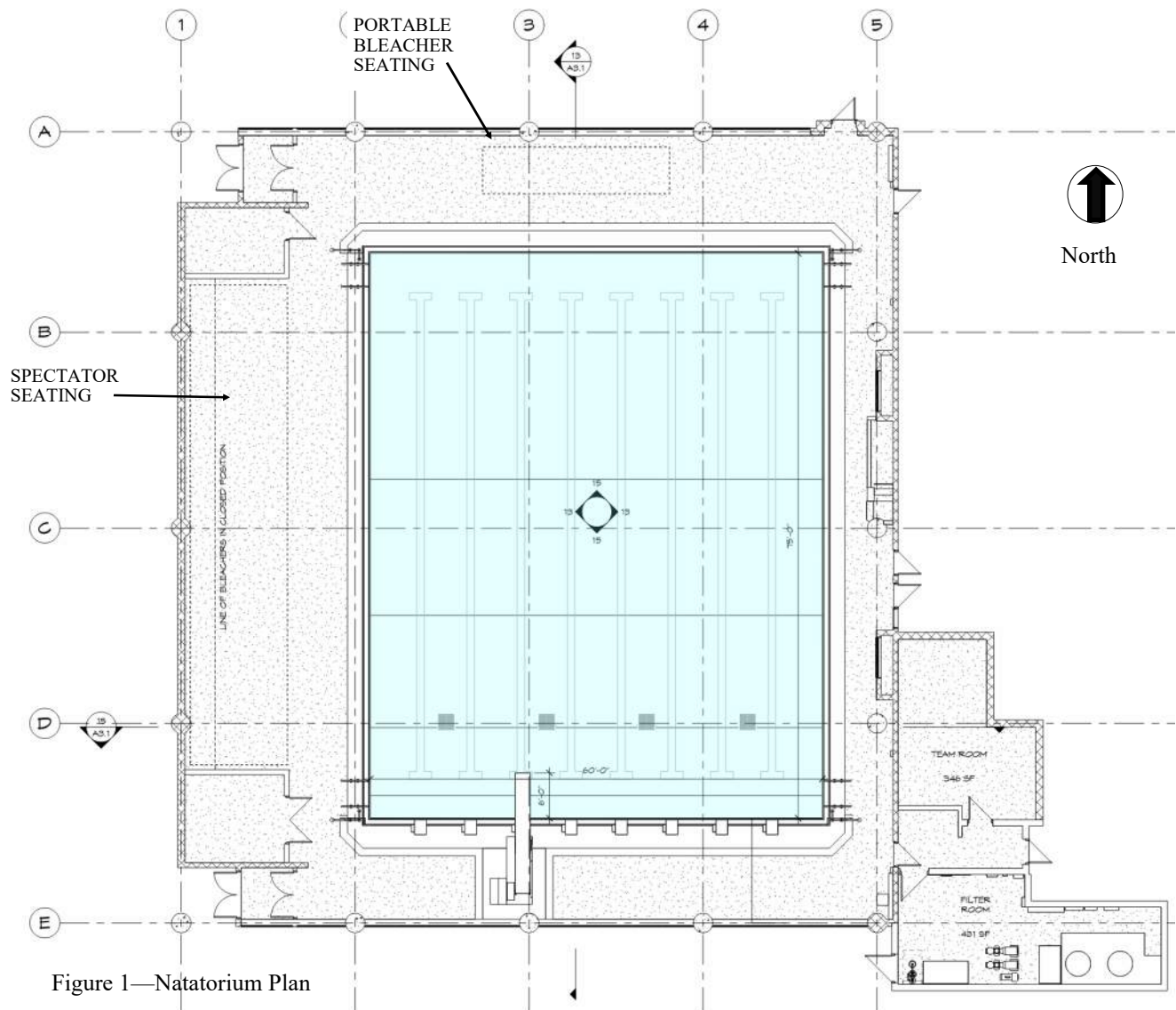
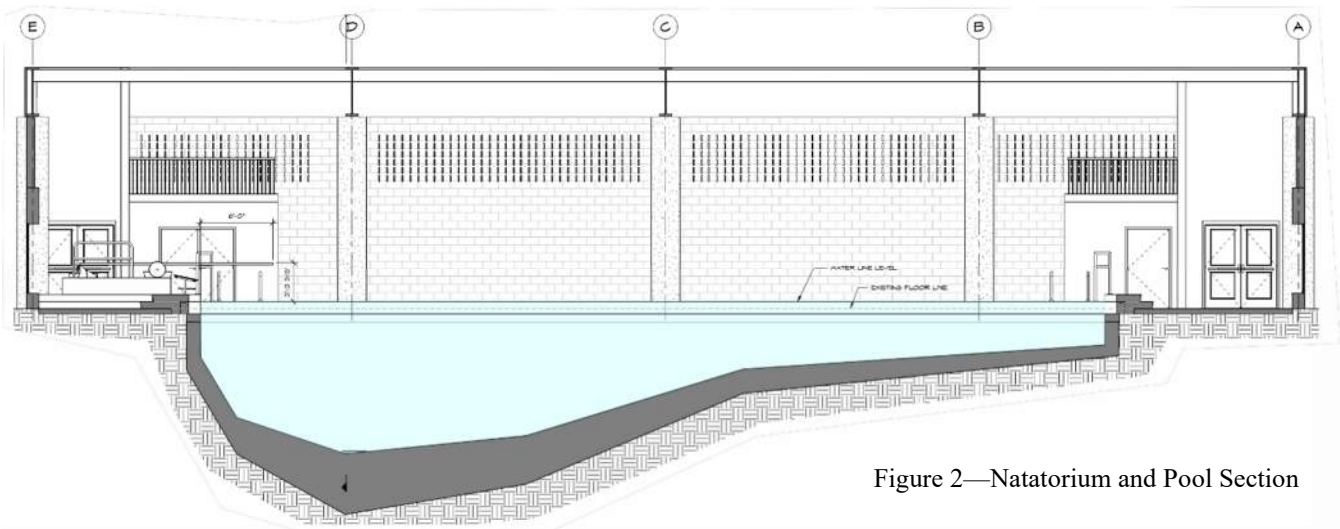


Figure 1—Natatorium Plan

III.Existing Conditions Analysis

1. Swimming Pool, Finishes and Recirculation, Filtration and Chemical Control Systems

The pool is located in a Natatorium constructed with concrete columns supporting a steel roof structure. Walls are concrete masonry, with glazed windows to the north and south. The pool is 4-feet deep at the shallow end, sloping to 6-feet deep over 30-feet. Water depth then transitions to 12'-0" deep at the diving well.



The main pool recirculation pump draws water from the surge tank and directs it to two, dual cell high-rate sand filters, where it is cleaned, then chemically treated, heated and returned to the pool through an integral return line in the stainless steel perimeter gutter.

The pool uses calcium hypochlorite tablets in an erosion feeder as disinfectant and uses Dry Acid in an erosion feeder for pH correction. Pool water chemistry is maintained by an automatic chemical controller, which automatically senses chlorine and pH levels and adjusts chemical introduction into filtered water return piping based on predetermined setpoints. Pool water heat is maintained through a shell and tube heat exchanger, with the source of heat being a building boiler, located outside of the Filter Room.

The pool volume is 304,500 gallons. The recirculation and filtration system operates at 635 GPM, resulting in an 8-hour turnover rate, which is the maximum allowable by DPH. If flow rate decreases even slightly, the pool will be out of compliance.

Main drain piping to the surge tank is 6" diameter and operates at 7.2 fps, which exceeds the allowable velocity of 6 fps as indicated in the DPH regulations.

Surge tank volume is unknown but should accommodate 1-gallon of operating capacity for every square foot of water surface area, which would be 4500 gallons.

III.Existing Conditions Analysis



Photo 1 (Above): Overall view of pool from shallow-end. Pool edge is built up with a bulkhead curb and steps to form a recessed gutter on the touch walls.

Exposed steel structure is painted and appears to be in good condition, with minimal indications of rust or degradation. Pool lighting and south facing glass results in glare on the surface of the water which is less than optimal for guarding, officiating meets and diving. Light levels are about half of that recommended by sanctioning bodies.

Photo 2 (Right): At the sidewalls, pool gutter transitions to semi-recessed, with a bulkhead curb lower than that at the touch walls.

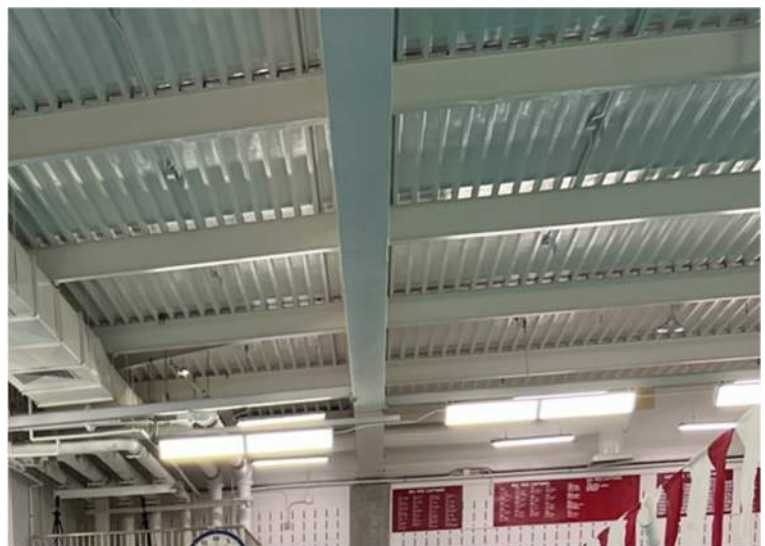
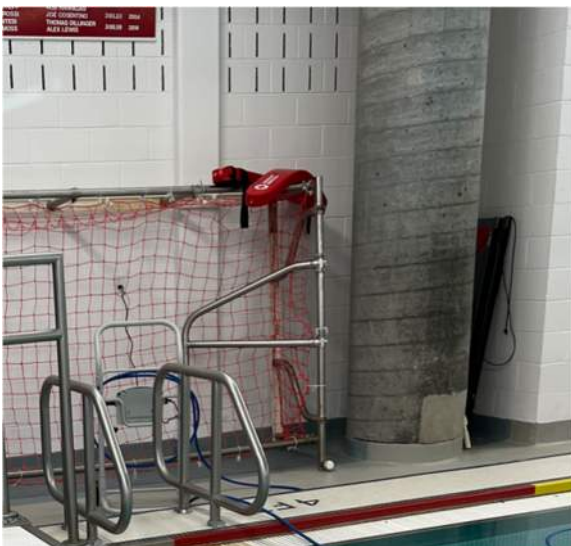


III.Existing Conditions Analysis



Photo 3 (Left): The Natatorium structure is comprised of structural steel girders, spanning 95-feet, supporting steel beams and deck. The girders are supported by round cast-in-place concrete columns. Perimeter walls are concrete masonry units (CMU) with acoustical CMU in the upper half of the wall. All structural systems appear to be in good condition. Refer to Appendix 1 for Structural Engineer's Assessment.

Photo 4 (Below Left): Typical concrete column supporting steel girders.



III.Existing Conditions Analysis

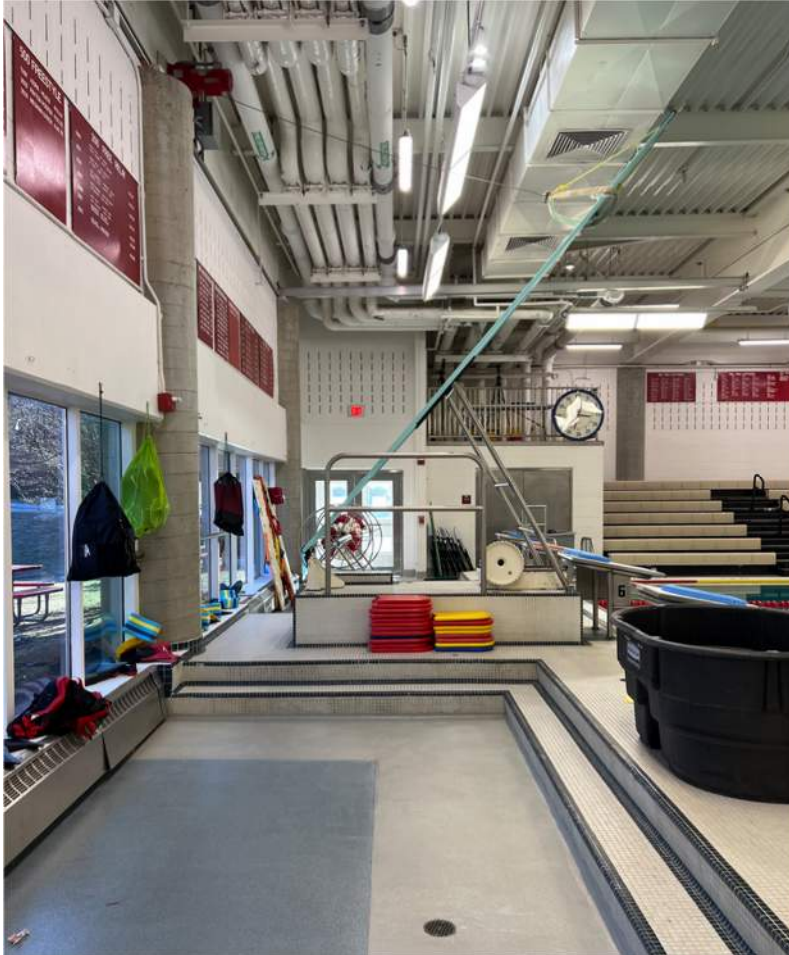


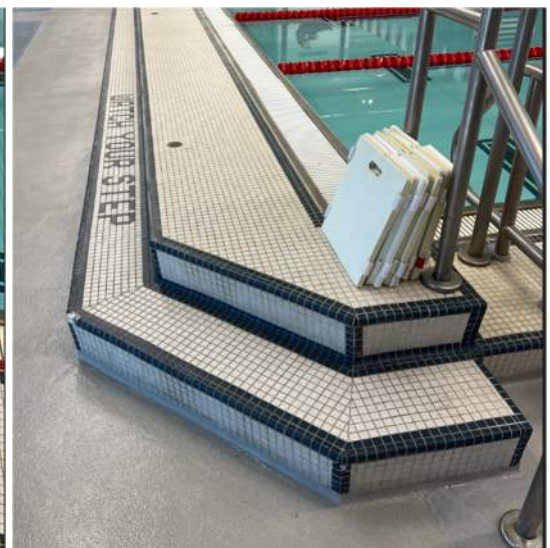
Photo 6 (Left): Pool decks are resinous epoxy with individual floor drains located around the pool perimeter. At the diving board a multi-level, tiered platform is provided to achieve the proper elevation to mount a 1-meter, short-stand diving board. The deep end of the pool also has an extended bulkhead curb to provide mounting space for competitive starting blocks.

Clearance over the diving board is reduced by means of a steel girder, steel beams, sprinkler piping and ductwork (see Figure 3).

Radiator cover should be repaired to eliminate hazard.

Photo 7 (Below Left): The bulkhead curb transitions from fully recessed at touch walls to semi-recessed at side walls.

Photo 8 (Below Right) Steps to raised bulkhead at shallow-end touch wall.



III.Existing Conditions Analysis

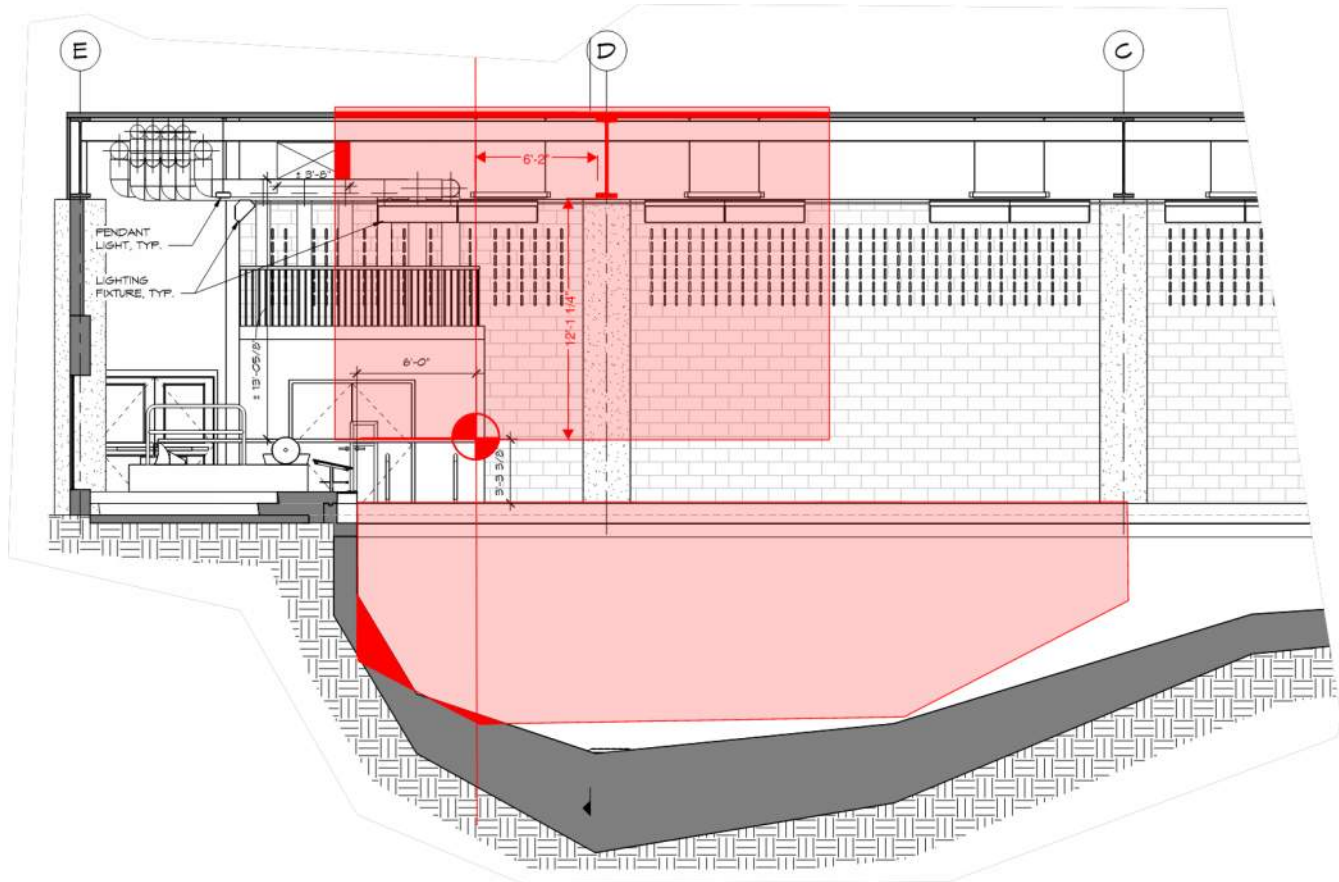


Figure 3: Above is a pool section at the Diving Hopper. Drawing in black indicates existing conditions. Light red indicates the minimum clearance required at the diving board, both overhead and below the water line. The dark red indicates objects that are in conflict with the clearances required.

The Red Target indicates the “Plumet” which is the center of the tip of the diving board. This is the point where all clearances are measured from.

Overhead: There are major obstructions within the required overhead clearance, including a steel girder, about 4-feet lower and 10-feet closer than allowed. Also encroaching into the clearance is the roof beam and deck structure, sprinkler piping and ductwork. All of these elements are reachable from the diving board, as evidenced by a water bottle placed on the flange, and names written on the beam, which would require a diver to actually hang from the beam to write the name. It should also be noted that when the board needs to be replaced, no manufacturer will sell a board to a facility with a non-compliant diving area.

Pool Depth: It seems the added pool depth may have been related more to increased depth for water polo than for diving, as the depth (based on available documentation, not field verified) is several inches deeper than required at the Plumet, but is still non-compliant behind the board.

III.Existing Conditions Analysis



Photo 9: The steel girder, beams, ductwork and sprinkler piping are all within the required overhead clearance for diving, as shown in Figure 3.

Circled in the photo is a water bottle placed on the flange of the girder by a diver. Also visible in the photo are names that were written on the beam (obscured so as to not identify students). This could only have been accomplished by hanging from the beam long enough to write the name.

III.Existing Conditions Analysis



Photo 10: There are four main drains at the deep end of the pool. Each drain has a 10" diameter sump, approximately 7" deep, with a 6" pipe stubbed up to the bottom of the sump. The original sump is adjacent to the change in floor plane. As such, the frame and covers installed in 2008 were leveled on grout in order to properly secure them.

Modifications to the sumps, frames, grates and hardware will be required in order to fully comply with current VGB requirements.

However, even if the drains are reconfigured, the buried 6-inch diameter pipe is too small to comply with the DPH velocity requirements. It is also likely that the pipe configuration doesn't comply with requirements for safe drain operation.

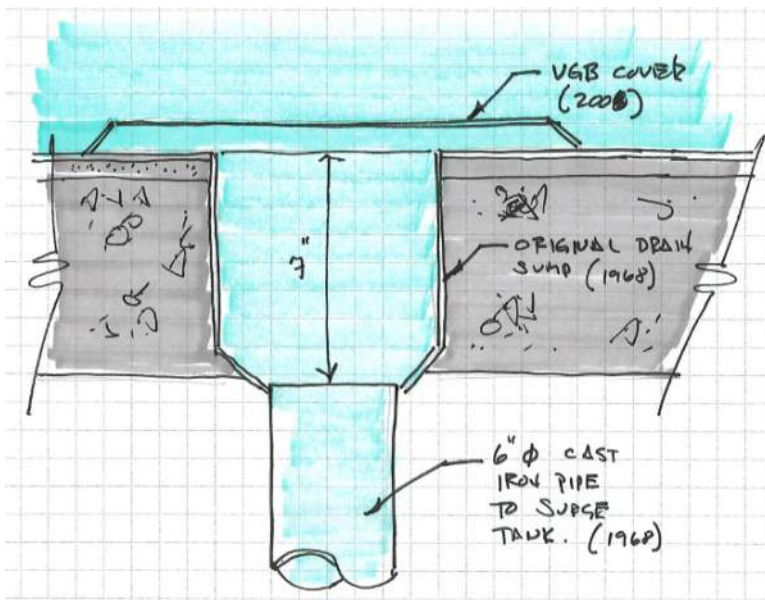


Figure 4: Existing Main Drain configuration, with 10" diameter, 7" deep sump and 6" diameter pipe to surge tank. There are four of these drains, piped in a series, as was typical at the time (1968).

Recent inspection of the main drain piping by the school's pool maintenance contractor indicates that there is significant tuberculation in the piping and only the drain furthest east is operable, and there is no flow through the other three.

III.Existing Conditions Analysis



Photo 11: To mitigate risk resulting from the main drain configuration, Greenwich Public Schools installed an emergency shut-off switch to shut down the pumps in the case of an emergency, releasing suction at the drains. Our understanding is that the shut-off plunger is staffed by a trained individual at all times when the pool is occupied.



Photo 12: The scorer's platform was constructed as part of the 1997 renovation, on the east side of the pool. It is not handicapped accessible and contributes to the narrow deck along that side of the pool. (See Photo 13)

III.Existing Conditions Analysis

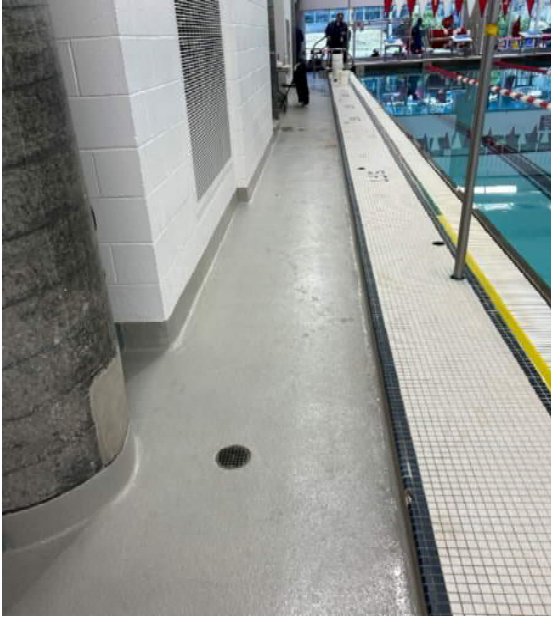
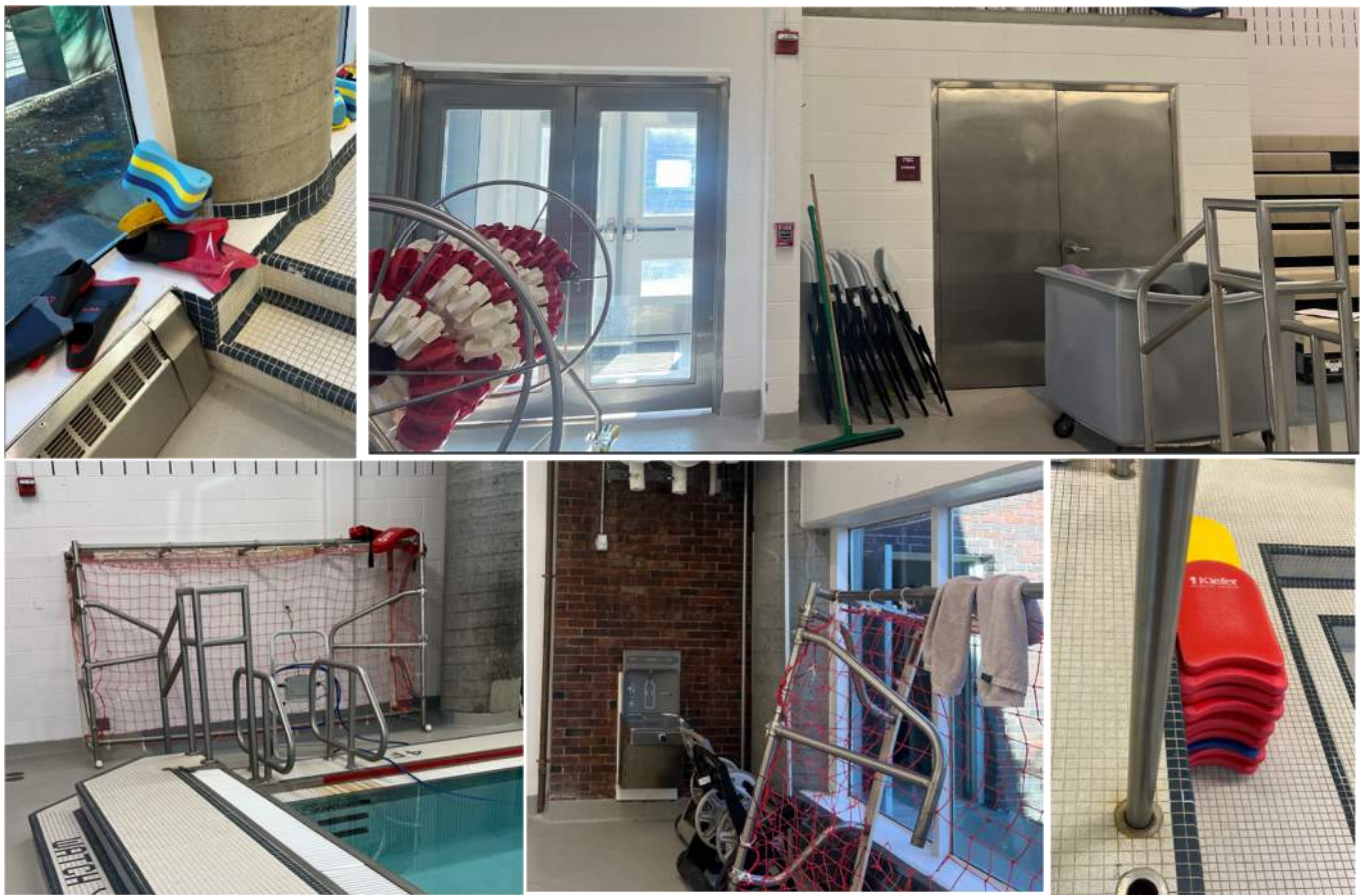


Photo 13: The pool deck at the east side is reduced to about 3-feet wide, well shy of the 5-feet required by the DPH regulations.

Photos 14 - 19: Pool decks are used for storage of pool equipment, further reducing deck clearance and maneuverability. Options for storage of equipment off of the deck should be explored. In addition to concerns over space restrictions, storage of wet equipment on window sills, bleachers, etc. will eventually cause damage those assemblies.



III.Existing Conditions Analysis

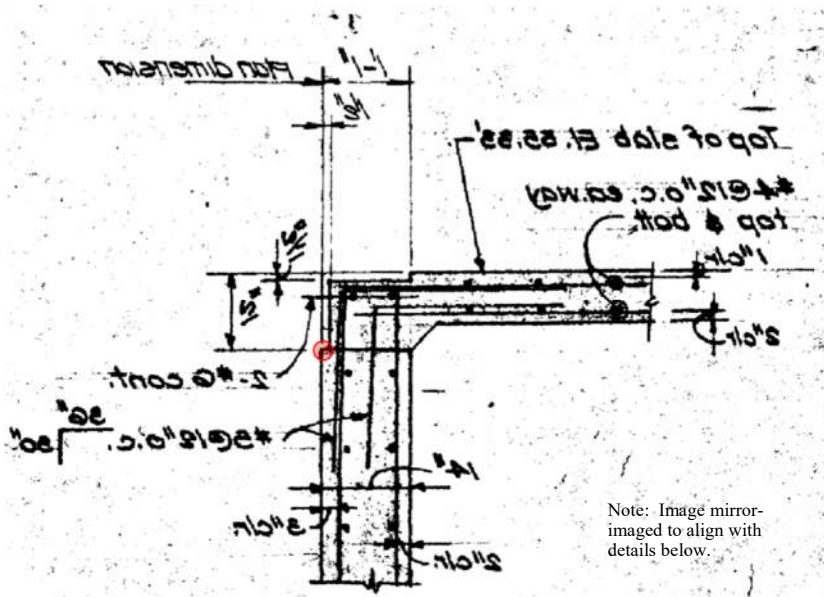


Figure 5: The original construction documents (1968) show the concrete configuration to accommodate a tile gutter or skimmer system. The gutter was removed in the 1997 renovation and the overbuild was constructed on top of the pool wall. (On the details, the red dot is a common reference point.)

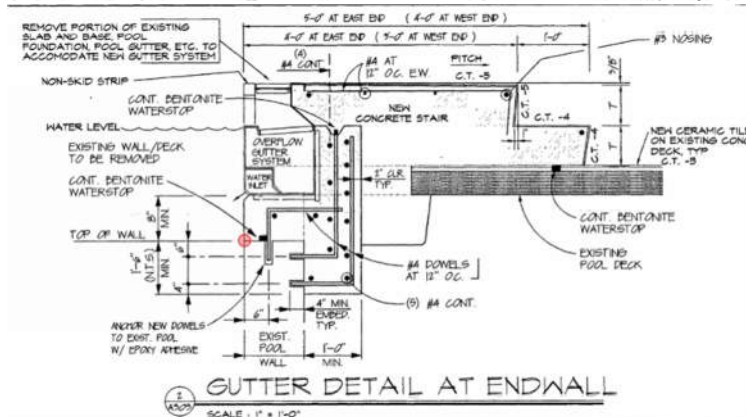


Figure 6: The 1997 construction drawings indicate a fully recessed stainless steel gutter at the touch walls, built on top of the existing pool wall and extending a total of 5-feet from the face of pool wall, onto the deck.

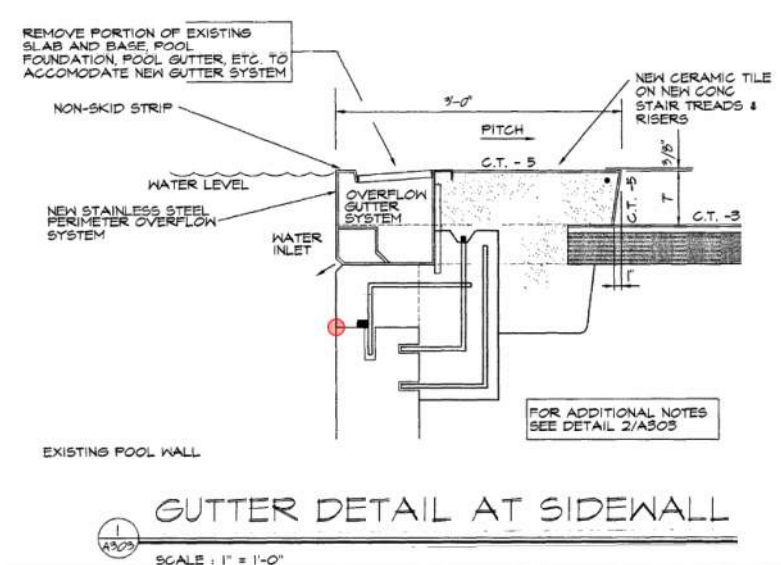


Figure 7: The 1997 construction drawings indicate a semi-recessed stainless steel gutter, built on top of the existing pool wall and extending a total of 3-feet from the face of pool wall, onto the deck.

III.Existing Conditions Analysis

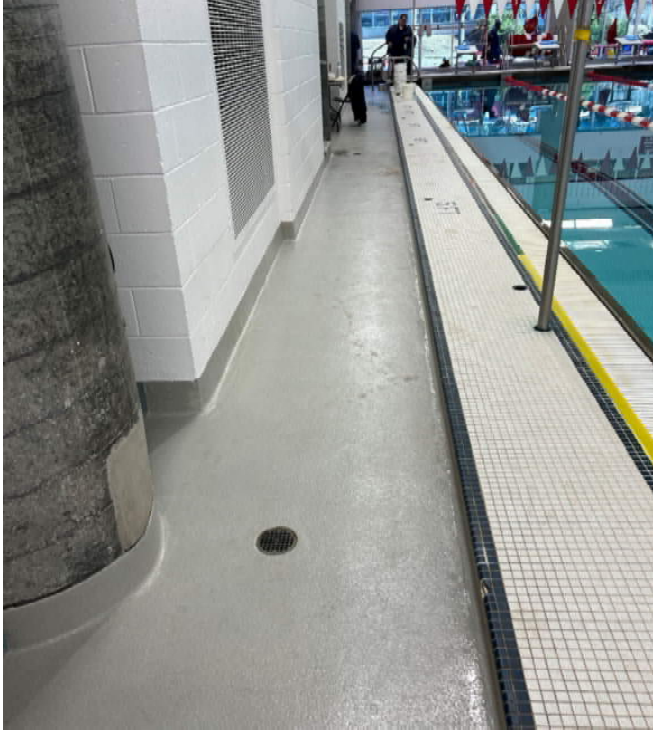


Photo 20, Left: The result of the overbuild as shown in Figure 7 is a reduced pool deck at both sides of the pool. At the east side, the deck reduction is most impactful, as it reduces the deck clearance significantly.

Photo 21, below: At the west side, there is more space, but the bulkhead curb reduces the available deck between the pool and the bleachers. DPH regulations prohibit deck being shared by spectators and swimmers. There is an attempt to distinguish these areas by use of color on the deck, but the Regulations require an “absolute separation”.



III.Existing Conditions Analysis



Photo 22, Above: Three sections of portable bleachers have been placed on the pool deck at the shallow end of the pool. When deployed, these virtually eliminate deck space along that end the pool. If used by spectators, the deck is shared by swimmers and spectators, which is prohibited by DPH.

Photo 23, Right: Entrance doors for spectators enter directly onto the pool deck at the north and south end of the west side of the pool. This leads to dirty decks, contamination of pool water, potential slip and falls and interference with meets.



III.Existing Conditions Analysis



Photo 24: (Left) Pipe pit provides an area way for piping into and out of surge tank, which is located below grade south of the Filter Room Wall.



Photo 25: The surge tank is comprised of two, pre-cast concrete tanks with manhole access at grade. The two tanks communicate by means of connection pipes that allow water to equalize in the tanks. Water gravity flows from the gutter drains into the tank. Main drain flow enters the tank through a modulating valve.

The main recirculation pump draws water from the tank to send it to the filters.

III.Existing Conditions Analysis



Photo 26: Dual recirculation pumps draw water from the surge tanks and send it to the filters. Pumps run in tandem to deliver 635 GPM through the system.

The small pump to the left is the booster pump for the chemical delivery system.



Photo 27: Pool water is filtered through two, dual-cell, high rate sand filters. Each cell has 12.57 sf of sand bed for a total of 50.28 sf. At a flow rate of 635 GPM, the filter operates at 12.63 GMP/sf, which is an acceptable filtration rate.

These filters were installed as part of the 1997 renovation. They are at the end of their useful life and need to be replaced.

Each cell is backwashed individually at a flow rate of 189 GPM. A typical 5 minute cycle will discharge 945 gallons per cell. When all four cells are cleaned, this is 3,780 gallons of chlorinated greywater to the brook at each complete backwash cycle. When filters are replaced, backwash water should be directed to sanitary sewer.

III.Existing Conditions Analysis



Photo 28: The proximity of the filters to the electrical panels is problematic, as is the storage of chemicals in close proximity to the electrical equipment.

A dedicated area for chemical storage should be provided, and nothing should be stored in the clear floor space in front of the panels.

Currently, there is only about 30-inches from the filter housekeeping pad to the face of the electrical equipment. This is less than required by the National Electric Code. Relocation of filters or reduction of the pad size is required. Alternatively, consideration can be given to relocation of electrical equipment.

Refer to CES report in Appendix for additional information on age and condition of the electrical systems.



Photo 29: Significant rust at the filter manways, indicates leaks and likely weakening of the pressure vessel's steel shell. It has been reported that filter media is discharged to the pool during backwash, indicating failed laterals within the filters.

III.Existing Conditions Analysis



Photo 30: Chemical control systems include a calcium hypochlorite erosion feeder for disinfectant and a dry acid erosion feeder for pH control. Chemicals are delivered in dry briquette form in 5-gallon buckets. A dedicated storage areas should be planned for chemical stock.

This system is appropriate for the pool and can continue use in a planned renovation.



Photo 31: Chemicals are automatically monitored and fed through a chemical controller. The Prominent Unit installed at the pool is relatively new and is appropriate for continued use.

III.Existing Conditions Analysis



Photo 32: An sewage ejector pit is located in the Filter Room. When renovations are planned, the capacity and location of discharge of this system should be confirmed to determine if it can be used for filter back-wash water, in addition to other sanitary waste it serves.



Photo 33: There is an acid neutralization system located behind the filters, that serves laboratories in another area of the building. Its condition and function was not reviewed as part of this report, but in a planned renovation it needs to be accounted for in the space planning.

IV. Planning Options

The varied issues related to Code Compliance, VGB Compliance, Life Cycle equipment replacement and deferred maintenance present the Greenwich Public Schools with decisions to be made regarding the long-term use of the facility and capital costs necessary to implement improvements. If issues are addressed individually, it will be difficult to bring the facility into full compliance. A thorough design phase will be required in order to optimize cost and outcomes. This section of the report provides scenarios and options for consideration, but should not be considered recommendations without further due diligence.

VGB Compliance: VGB compliance requires that the drain sumps and covers be replaced with an assembly certified by the drain cover manufacturer. However, it is important to note that a drain upgrade that brings the pool into compliance with VGB, without a piping replacement, does not address Health Department violations related to the piping size and configuration. There is also information from the pool maintenance company that the piping is heavily tuberculated and three of the four drains have no flow. Below are some scenarios for consideration:

Option 1: Replace main drain sumps and covers. VGB compliance will be met but DPH requirements will not be met. There is also a risk lack of flow or pipe failure if pipes cannot be properly cleared and lined. There is some “surplus” pool depth that would allow sumps and drain covers to be installed with little to no demolition of concrete. Utilizing a system such as Aquastar VGBA 1824-18f would provide a retrofit solution if properly installed.



VGBA-2017 PRODUCT SPECIFICATIONS
Suction Outlet Fitting Assembly (SOFA)
VGBA-2017 Flow Ratings, Sump Dimensions,
and Sump Flow Path Zone



Certified to
NSF/ANSI/CAN 50
ANSI/APSP/ICC 16 - 2017

DIRECTIONS: Read and follow the instructions provided with the product. Never exceed a SOFA Model flow rating when the pool is in use. SOFA Covers shall only be installed over sumps that meet or exceed the minimum flow path zone defined by: minimum pipe size and sump exit orientation, and the minimum pipe depth. Please see page 2 of 2 for help determining the proper flow rating for any pipe size changes within 16 inches of the pool interior finish. AquaStar SOFA covers are authorized for use over any compatible manufactured or field-built sump (§ 3.5.1). Scan the QR code or visit: www.aquastarpoolproducts.com/flowcode for the most current version of these specifications, instructions, and product information.

Cover Model Number:
1824xxx



FIGURE 1:
SOFA Model Number Key

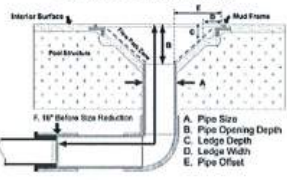
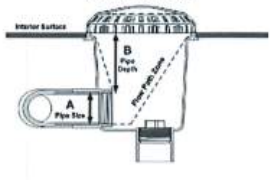


FIGURE 2:
Flow Path Zone

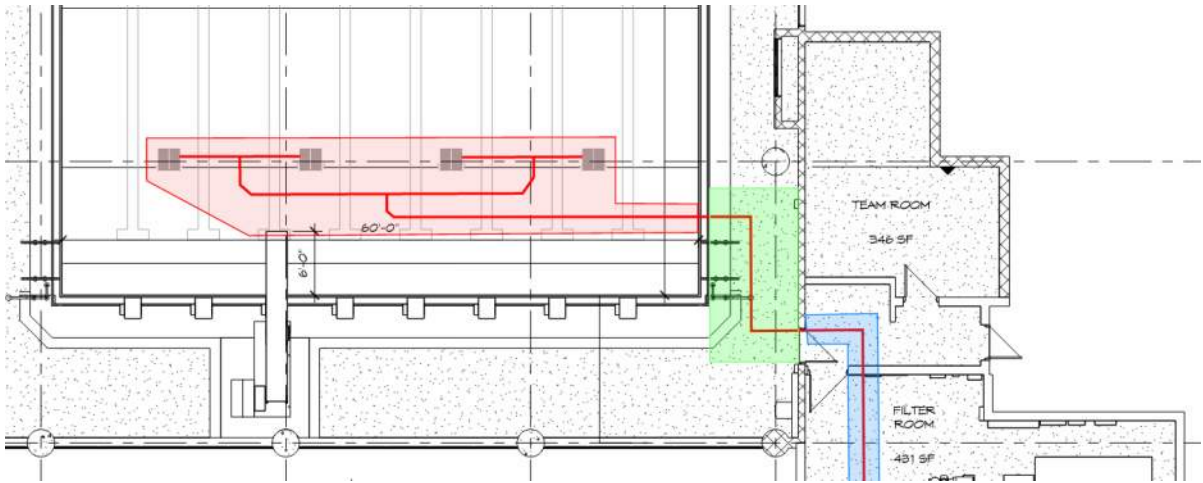




SOFA Model No.	(A) Pipe Size (Nominal)	(B) Pipe Depth (Minimum)	Orientation (Wall / Floor)	Flow Rating (GPM)	Head Loss Curve
1824-18f_A-1.5b_B3_C1.4_D1.4_E2.9_F16	1.5" (b)	3"	Floor (f)	126	A
1824-18f_A-2b_B3_C1.4_D1.4_E3.1_F16	2" (b)	3"	Floor (f)	168	B
1824-18f_A-2.5b_B3_C1.4_D1.4_E3_F16	2.5" (b)	3"	Floor (f)	250	C
1824-18f_A-3b_B3_C1.4_D1.4_E3.2_F16	3" (b)	3"	Floor (f)	288	D
1824-18f_A-4b_B3_C1.4_D1.4_E3.1_F16	4" (b)	3"	Floor (f)	398	E
1824-18f_A-6b_B3_C1.4_D1.4_E3.1_F16	6" (b)	3"	Floor (f)	590	F
1824-18f_A-8b_B3_C1.4_D1.4_E3.2_F16	8" (b)	3"	Floor (f)	590	G

IV. Planning Options

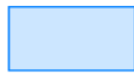
Option 2: For a fully compliant system, remove a portion of concrete pool floor to install new fully compliant sumps and drains, and properly configured piping. The pool floor is approximately 5-feet thick in the area of the drains. The approach would require removal of approximately 30" of concrete over an area of approximately 10-feet x 45-feet. It would also require remove of a portion of deck slab and excavation along the pool wall to the depth of the drain pipe.



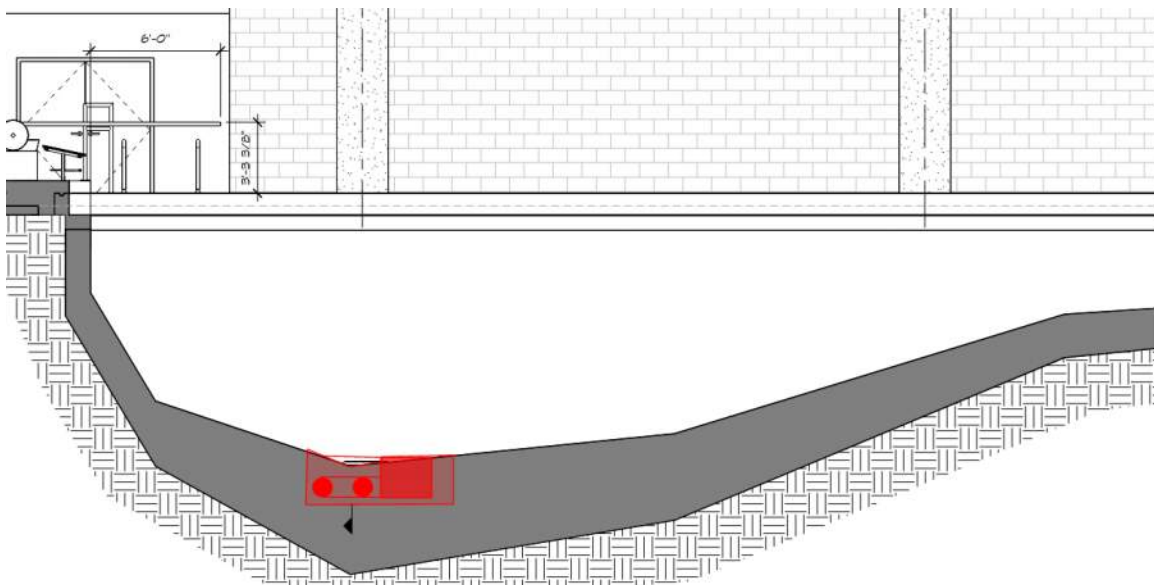
Sawcut and remove approximately 30" deep concrete for new drains and piping.



Remove pool deck and excavate to pool floor level for piping. Pipe to rise to about 4-feet deep



Trench floor and excavate for new piping to surge tank, approximately 4-feet deep.

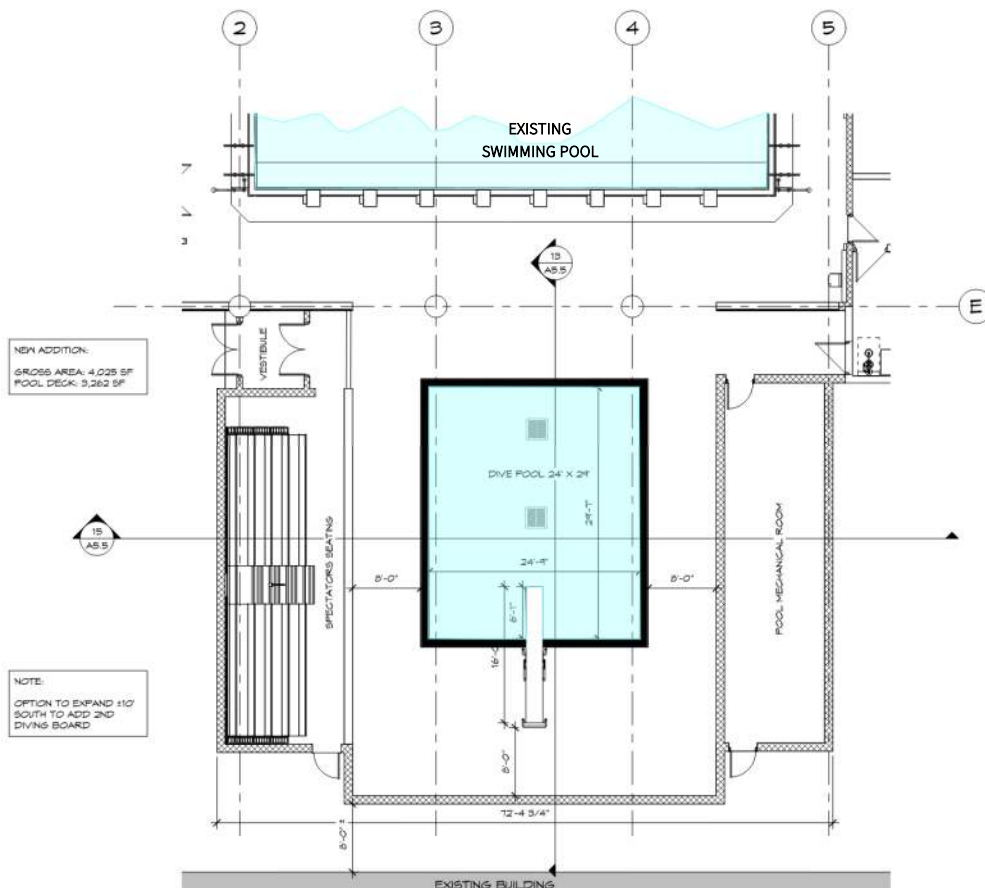


Pool Section (Not to Scale)

IV. Planning Options

Diving Clearances: Resolving the overhead clearance issue at the Diving Board will require a significant investment, or a significant change to the diving program. Short of building a new facility, there are three viable options to consider, as follows:

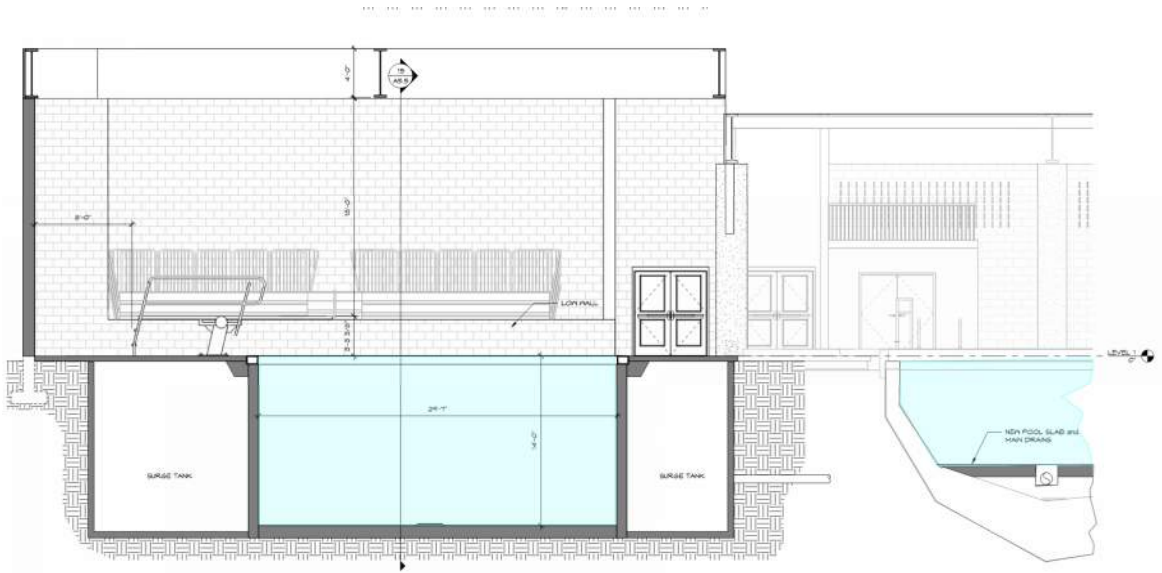
- Option 1: Eliminate diving program from the High School Pool. If the program is to continue, it would need to be done at another facility. If this option is pursued, drain and piping replacement gets significantly simpler, as piping can occur on top of the pool floor and the depth reduced to 9-feet or less. Decks and water level can then be returned to their original level, addressing deck clearance issues as well.
- Option 2: Raise the roof. This has not been explored for feasibility but in theory may be an option. However, if this option is pursued, it does not solve any of the other issues identified. It would be a costly endeavor and solve only one issue.
- Option 3: Eliminate the diving well as noted in Option 1 and add a diving facility outside the footprint of the existing building, where sufficient height and depth is achievable. Below is a concept for locating the addition on the south side, in the courtyard area. This approach can provide a solution to all issues identified in this report.



Floor Plan at Addition (Not to Scale)

IV. Planning Options

Option 3 (continued): Site utilities within the courtyard include electrical, storm piping and gas piping. All are original to the building and would require replacement in the proposed option. They could be re-routed further north and tie into the existing utilities where they enter the building.



Pool Section at Addition (Not to Scale)



Site Location Plan (Not to Scale)

V. APPENDICES

APPENDIX 01: E2—Structural Engineering Field Report



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January 28, 2025

Mr. Michael P. Fortuna, AIA
Principal
TLB Architecture, LLC
92 West Main Street
Chester, Connecticut

Re: Review of Observed Existing Conditions
Greenwich High School Natatorium
10 Hillside Road
Greenwich, Connecticut

Dear Mike,

Per your request, e2 engineers (Engineer) has performed a site visit to the existing natatorium at Greenwich High School. The date of the Engineer's visit was Tuesday, January 14, 2025. The purpose of the Engineer's site visit was to observe existing conditions to compile a cursory structural condition assessment of the facility. The Engineer's scope was limited to the confines of the natatorium and mechanical room servicing the natatorium.

The existing natatorium measures roughly 95' x 105' and has a pool with eight swim lanes. The structure is comprised of structural steel girders spanning the 95' dimensions supporting steel roof beams and metal roof deck. The steel girders are supported by round cast-in-place concrete columns. The exterior walls are concrete block masonry walls.

The pool and pool deck are covered with ceramic tile. Per conversations at the site, the pool deck is constructed with cast-in-place concrete slab-on-grade all around. There is no crawl space tunnels around the pool structure. At the pool coping, the entrance to the pool has been elevated to achieve greater depth.

The pool will be undergoing renovations and one of the major components of the said renovation is the introduction of more pool drains along the deep end. Once concern in regards to this is the presence of a high water table. It is likely that dewatering wells will have to be constructed in order to cut the thickened mat slab at the deep end location. This dewatering will allow for the installation of new drainage systems.

There is a possible addition planned for the pool machine room due east of the natatorium that will most likely be a small structure with slab-on-grade construction.

Overall, the structure was observed to be in very good condition and the Engineer sees no major issues with the natatorium superstructure.

If you have any questions or concerns, please contact the Engineer.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'R. Scott Erricson', written over the printed name.

R. Scott Erricson, PE
Principal
e2 engineers

V. APPENDICES

APPENDIX 02: CES—MEP Report



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Memorandum

Memorandum Date: 1/30/2025

Written To: Mike Fortuna, AIA

Project Name: Greenwich HS Natatorium Study

CES Project Number: 2025012.00

Regarding: Greenwich High School Natatorium Existing Conditions

Written By: Cody Pereira, Matt Olszewski

Dear Mike,

Pursuant to your request CES conducted a site investigation survey on Wednesday, January 15, 2025, of the existing Greenwich High School Natatorium located at 10 Hillside Rd, Greenwich, CT 06830. Our survey was focused on the existing electrical/pool equipment room located adjacent to the natatorium space as well as observations related to the natatorium space. The intent of this survey was to identify deficiencies of the equipment and spaces being served.

Mechanical:

The pool equipment space is currently served by means of mechanical ventilation and exhaust, exact airflow values were not able to be confirmed during our visit, however the space seemed adequately ventilated. The supply air duct routes over the top of the main electrical panels, within the 6ft clearance restriction. There were no current means of heating serving the space; the room gained heat from a partially insulated steam heat exchanger and sections of uninsulated steam piping located in the equipment room. Maintaining these systems in place, or modifying these systems to serve an alternate equipment/electrical location is feasible.

The natatorium is served by a single poolroom air handler located within a rooftop penthouse space. Precise date of manufacture of this unit is unknown, however is assumed to be original to the building. The ductwork distribution is comprised of two (2) metal supply air ducts located at the ends of the pool, and small branches to serve the spectator viewing area. The ductwork is painted, and did not show any signs of premature failure/deterioration from the pool deck viewing level. The supply grilles appeared in good condition and spaced well for distributed airflow. Return air is achieved by two (2) low wall return grilles of approximately 63"x52" size along the locker room side of the natatorium. The space appeared to be well ventilated and comfortable from a temperature control perspective. Large 4" diameter chilled water, and hydronic heating piping is routed overhead through the natatorium space along the diving board end of the pool. These pipes were noted to have adequate insulation and PVC protective shields both in good condition. Perimeter fin tube radiators are located at the ends of the pool to provide additional heating along the exterior windows. These radiators appeared to be in good condition.

Electrical:

The existing pool equipment room is also used as a building electrical closet, serving about 50% of the school. It is believed that the main distribution panel located in this room is served from the main electrical room located on the opposite side of the building which then goes on to serve larger pumps and HVAC loads as well as feeders to branch circuit panels throughout this portion of the building. A majority of the existing electrical equipment is past its intended lifespan and sourcing replacement parts will become more difficult as the likelihood of maintenance increases. Additionally, it should be noted that, although not observed to be a significant issue, electrical equipment installed in pool equipment rooms should be rated for installation in corrosive and damp environments (NEMA 4X), which is not the case. Lastly, in several instances, the electrical equipment installed appears to be shy of the National Electrical Code clearance requirements in front of the electrical gear.

For any major renovative work, it is highly recommended to isolate all the electrical equipment in this room to its own dedicated space. To minimize the extent of downstream electrical distribution rework, several NEMA 4X splice/ pull boxes can be installed (in the pool room) and the replacement electrical gear can be installed in a new dedicated room with the existing feeders and circuits extended from the current pool equipment space.

In regard to the natatorium space, the existing electrical systems appear to be in generally fair shape. The existing fire alarm devices appear to have been installed in the past decade without any noticeable concerns. Some miscellaneous electrical items include a water fountain, timing board, winch lift and an emergency power off button for the pool pumps. In all cases, the equipment appears to be in fair condition (equipment was not tested at the time of the visit). General pathway lighting was observed and turned on during the visit. Some areas, specifically in the corners of the space appeared to be a bit dim and additional general purpose lighting is recommended. Specialty light fixtures are installed and angled at the pool for additional lighting while activities in the pool are being conducted. Separate independently controlled, linear pendant hung, LED gasketed fixtures are installed above the stands which appear to be in good shape however, neither the stand lighting nor pool lighting could be turned on and tested at the time of the visit. Additional investigation will be required to confirm all fixtures work as intended. Exit lights are fully operational and in good condition. Emergency lighting could not be tested as classes were in session. Electrical devices (receptacles) are scarce in the space however, if there is no desire from the end user to have additional power throughout the space, the existing device layout can be considered sufficient.

Plumbing:

There are several floor drains of various sizes located within the pool equipment room. The presence of trap primers serving these floor drains were not able to be confirmed during our visit. Large sections of cold water, hot water, and steam piping were observed to be uninsulated throughout the equipment room. A 12" diameter cast iron pipe stub up serves as a drainage termination for the backwash tanks. It is the team's understanding that this pipe terminates to local stream. There is a large vault with cover grate that serves as the below grade entry point for the pool water supply and return. Through this same pit, there are three (3) 4" steel pipes that are capped off and abandoned; previous use unknown. There is considerable plumbing/pool related infrastructure located within this space routed overhead, and within the concrete floor slab. Relocation of such plumbing infrastructure is feasible, however invasive to the existing floor slab and alternate location due to excavation and connection points.

Plumbing services on the pool deck level are limited. A recently added wall hung electric water cooler with bottle filling station is located at the diving board end of the pool.

Fire Protection:

The natatorium is served by a fully sprinklered system that appears adequately spaced for coverage. The sprinkler heads are horizontal, exposed side wall type, positioned along the structural beams spanning the natatorium. The sprinkler piping, and heads appeared to be in good condition despite natatorium corrosive conditions.

P:_Proj-25\2025012.00 - Greenwich HS Natatorium Study\Narratives\Existing Conditions Memorandum – R1.docx

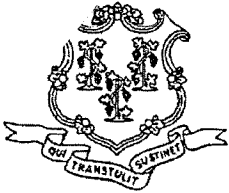
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V. APPENDICES

APPENDIX 03: Department of Public Health—1997 Approval for Renovation



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STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL HEALTH SECTION

EHS Circular Letter # 2008-91

DATE: December 1, 2008

TO: Directors of Health/ Districts
Chief Sanitarians
Building Officials
Pool Contractors

FROM: Pamela E. Scully, Sanitary Engineer 3
Recreation Program, Environmental Health Section

RE: Guidance on the Virginia Graeme Baker Pool & Spa Safety Act for All Public Pools

The Virginia Graeme Baker Pool and Spa Safety Act (Act) was signed into federal law in December 2007. The Act is being administered by the U.S. Consumer Product Safety Commission (CPSC) and goes into effect December 19, 2008. The Act imposes mandatory requirements for suction entrapment avoidance, to promote the safety of pools, spas and hot tubs. The Act requires:

- **Safety Drain Covers.** Each swimming pool or spa drain cover manufactured, distributed, or entered into commerce in the United States shall conform to the American National Standard ASME A112.19.8 - 2007 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs published by the American Society of Mechanical Engineers (ASME). Compliance with this Standard will be enforced by the CPSC as a consumer product safety rule.
- **Public Pool Drain Covers.** Every public pool and spa, both new and existing, must change out the existing main drain covers and install main drain covers that conform to the ASME/ANSI A112.19.8 - 2007 Standard. ("Main Drain" as defined in the Act is "a submersible suction outlet typically located at the bottom of a pool or spa to conduct water to a circulating pump")
- **Public Pool Drain Systems.** Every public pool and spa, both new and existing, with a single main drain, other than an unblockable drain, or with multiple main drains that are less than three (3) feet apart, shall be equipped with one or more additional devices or systems designed to prevent suction entrapment that meet the requirements of any applicable ASME/ANSI Standard. Such additional devices or systems include a safety vacuum release system (SVRS), or suction limiting vent system, or gravity drainage system, or automatic pump shutoff system.

SUMMARY TABLE:

TYPE OF POOL	Change Drain Covers	Install Auxiliary Drain System
One (1) Main Drain	Yes	Yes - if blockable No- if unblockable (larger than 18"x23")
Two (2) or More Drains -drains more than 3 feet apart	Yes	No
Two (2) or More Drains – drains less than 3 feet apart	Yes	Yes – if blockable No- if unblockable (larger than 18"x23")

EXISTING PUBLIC POOLS:

Public Health Code (PHC) Section 19-13-B33b(g) states that the Director of Health, if there exists a condition that constitutes a "safety hazard", "may order such public pool closed until the correction is made". The Act is a federal law, which the State of Connecticut has not adopted it into regulation, however **it is the expectation of the DPH that the Directors of Health, under the authority of PHC Section 19-13-B33b(g), will take action to ensure that the public pools are safe with regards to the entrapment issues addressed in the Act.** Therefore the DPH - Recreation Program recommends and will support local health directors on the following course of action pertaining to recognizing the issues that arise from the Act:

1. All public pools, as defined in PHC Section 19-13-B33b, with the exception of gravity drain pools, that have not complied with the requirements of the Act by December 19, 2008 for pools that are open, or by the date they re-open for seasonal pools, where products for compliance are commercially currently available or not, should be ordered closed until such time as they are in compliance. These pools present a safety hazard since they are not in compliance with the Act. Pools used by children pose the greatest risk. Therefore the local health directors should exercise their own judgment and enforce the PHC by closing the pool under PHC Section 19-13-B33b(g).
2. Gravity drain public pools, as defined in PHC Section 19-13-B33b, that have not complied with the requirements of the Act by December 19, 2008 for pools that are open, or by the date they re-open for seasonal pools, where products for compliance are **NOT** commercially available, may file a letter with the local health officials and the DPH Recreation Program that documents their efforts to comply with the Act and stating their intent to fully comply once the products needed for compliance are commercially available to them. These pools should be allowed to remain open for use up to three months after products are commercially available. Gravity drains, due to their design, pose a much lower risk for entrapment. (Gravity drain pools are pools with a gutter system, having a surge tank or balancing tank. For these types of pools the main drains are not directly connected to a circulating pump.) DPH will offer training; including recognition of gravity drain pools, in the first quarter of 2009.
3. All public pools, as defined in PHC Section 19-13-B33b, that have complied with the requirements of the Act may send a written statement to the local health officials stating that they are or will be in compliance either by December 19, 2008 or the date in which they re-open for use. Please note that this letter is not a legal requirement, but a suggested method to help track compliance.
4. Splash pads/Spray parks, with no standing water, by definition are exempted from the Act. They do not need to make any changes to their main drains and can remain open and continue to operate as usual.
5. A licensed professional (Consumer Protection License SP-1 for contractors and SP-2 for journeymen/workers) should do all the work necessary for compliance to ensure that correct flows are maintained across the drain and that the correct connection of the main drain cover to the sump is achieved.
6. As in the past, any public pool that is missing a main drain cover or has a broken main drain cover should be ordered closed until a repair is made. These pools present a high safety hazard and should be closed immediately under PHC Section 19-13-B33b(g).

NEW PUBLIC POOLS:

PHC Section 19-13-B33b(1) requires that new pools be built in compliance with the Connecticut Public Swimming Pool Design Guide as it is amended from time to time. The Design Guide was amended to require drain covers as set forth in the Act. Therefore no plans will be approved after December 19, 2008 without the necessary covers.

Public Pools that have already received approval from the DPH on their plans and specifications and are presently under construction will be treated as "existing" public pools for compliance with the Act at the time when they seek approval to open for use.

Background/Issues With Regards This Act:

The Act was passed prior to the availability of products, specifically main drain covers, necessary for existing pools to become in compliance with the requirements of the Act. Since passage, some main drain covers have become available allowing some pool owners to come into compliance with the Act. Note that the Act requires that all main drain covers be certified by specific agencies such as the NSF. We are advised the certification process, and then the manufacturing, distribution and installation process takes time, more time than the Act allotted for. The majority of pools, like hotel and condominium pools should be able to comply with the Act since this type of main drain is very common and products exist for these type pools. Seasonal pools have until when they re-open next season to comply. The CPSC is supposedly maintaining a web site with a list of cover manufacturers at www.cpsc.gov/whatsnew.html#pool

The larger indoor pools (municipal pools, school pools, YMCAs, etc.) are at risk for being out of compliance come December 19, 2008. Drains for these type pools can be of a unique design or so large that products have not been designed, manufactured or certified as being in compliance with the requirements of the Act. Fortunately most of these pools are gutter pools with gravity drains that are, due to their design, an extremely low risk for entrapment. Any of these larger pools with drains other than gravity drains, would a safety hazard and should be closed until they are in compliance with the Act.

Many of the additional devices or systems (i.e. SVRS, automatic pump shut of systems) necessary for compliance with the Act, for the pools with single main drains, other than an unblockable drain, or with multiple main drains less than three (3) feet apart, are available on the market.

Resources:

CPSC has indicated that they will be maintaining a list of approved products. This list and other information distributed by CPSC on this Act can be found at: www.cpsc.gov/whatsnew.html#pool

To check out what these covers look like just visit any of the manufacture's websites and search for main drain covers. They all proudly display their covers and the ASME/ANSI certification they have received.

cc: Suzanne Blancaflor, M.S., Chief, Environmental Health Section
Ellen Blaschinski, R.S., M.B.A., Chief, Regulatory Services Branch

(12/2/2008)



#98-12
12/15/97

December 10, 1997

William Sawicki, Supervising Environmental Sanitarian
Recreational Health and Safety Program
State of Connecticut Department of Health Services
450 Capitol Avenue, MS#51 REC
P.O. Box 340308
Hartford, Connecticut 06134-0308

RE: Greenwich High School
Greenwich, Connecticut

Dear Mr. Sawicki:

We respectfully submit the application for approval on the renovation of the Greenwich High School swimming pool, along with the form covering discharge of public swimming pool water drainage, data sheet, two sets of prints, and a check in the amount of \$600.00.

The existing pool will be partially demolished to accept a Paddock stainless steel gutter system with automatic water level control and a 4,500 gallon surge tank. The addition of the new gutter will increase the pool water depth approximately 12" and will have a parapet around the pool perimeter. In addition to the above, we will be adding one (1) sand filter to the existing filter battery, a new pump and motor, flowmeter, and accessory items. The chemical treatment will be bromine, CO2 with ozone assist, and a chemical controller.

We respectfully request your review and subsequent approval. It is important that we receive an early review since construction will begin in March of 1998.

If you have any questions or need any additional information, please feel free to contact me at any time.

Sincerely,

SCOTT SWIMMING POOLS, INC.


Don Vanden Bosch
Commercial Division

DVB/cwb
Encl.: As listed above

Scott Swimming Pools, Inc.
Distinguished Swimming Environments Since 1937®
75 Washington Road, Woodbury, Connecticut 06798
(203) 263-2108 Fax: (203) 266-0822
Westport 227-7559

APPLICATION FOR APPROVAL OF PLANS FOR SWIMMING POOLS

✓ 22 SEPTEMBER 19 97

To the Commissioner of Health:

✓ The GREENWICH PUBLIC SCHOOL SYSTEM
(Insert title of organization or names of persons making application)

in the City or Town of GREENWICH

here makes application to the Commissioner of Health for the approval of

✓ plans prepared by ANTINOZZI ASSOCIATES for a swimming pool to
(Name of engineer or architect)

✓ be located at GREENWICH HIGH SCHOOL

10 HILLSIDE ROAD • GREENWICH, CT

This application is made under and in full accordance with Regulation
19-13-B33 of the Connecticut Public Health Code.

Remarks: _____

Please print or type name and mailing
address of applicant:

✓ GREENWICH PUBLIC SCHOOLS

HAVEMEYER BUILDING

290 GREENWICH AVENUE

GREENWICH • CT 06830

*Signatures and official titles

Fredrick P. Baker
Director of Operations
Greenwich Public
Schools

*Applications must be signed by responsible officials of organization or
municipality or municipal subdivision or by owner or lessee of swimming
pool.

Note: Applicants should secure from the state department of health the
pamphlet entitled "Swimming Pools and Bathing Places". On page 13 of this
pamphlet is listed information on "Preparation and Submission of Plans for
Artificial Swimming Pools".

SEP-30-97 07:14 FROM: SEUL POOLS ID: 2032850822
 ENVIRONMENTAL HEALTH SERVICES DIVISION

PAGE 4

CONNECTICUT STATE DEPARTMENT OF HEALTH

79 Elm Street

Hartford, Connecticut 06115

APPLICATION FOR PERMIT FOR THE DISCHARGE OF PUBLIC SWIMMING POOL WATER DRAINAGE

1. Name of applicant: GREENWICH PUBLIC SCHOOLS

Address: 290 GREENWICH AVENUE, GREENWICH, CONNECTICUT 06830

Telephone Number: Home: Office: 203-625-7435

2. Location of swimming pool:

Premises: 10 HILLSIDE ROAD, GREENWICH, CONNECTICUT 06830

Nearest main roads:

(Other recognizable landmarks)

3. In area in public water supply watershed: NO

4. Capacity of swimming pool: 286,790 gallons.

5. Method and exact location of pool water discharge: EXISTING VIA PORTA-PUMP TO STORM DRAIN

6. Discharge of swimming pool water to:

Ground (See below)

Storm drain ☒ Approved by Public Works Dept. John FrongiaPublic sewer ☐ Approved by Sewer AuthorityStream or pond ☐

If to ground, distance from point of discharge to:

	FEET	SLOPE OF GROUND
Stream		
Catch basin		
Property line		
Owners of downhill property		

7. Pond or Lake: Name Tributary to

8. Species of fish present:

9. Persons or places that may be affected by the discharge:

✓ Fredrick P. Baker
 (Signature of Applicant)

10/8/97
 Date

CT: EXAMINATION OF PLANS AND SPECIFICATIONS FOR
SUBJECT: A PROPOSED PUBLIC SWIMMING POOL TO BE LOCATED AT

To: Connecticut Dept. of Health Services
 Environmental Health Services Section

From: GREENWICH PUBLIC SCHOOLS - MR. FREDERICK BAKER

(Important Note: The make and model numbers of equipment must be specified)

LOCATION (STREET & TOWN): 10 HILLSIDE ROAD, GREENWICH, CONNECTICUT

ENGINEER OR ARCHITECT: MR. ROBERT KEATING

POOL CONSTRUCTION FIRM: SCOTT SWIMMING POOLS, INC., WOODBURY, CONNECTICUT

APPLICANT (PER APPLICATION FORM): GREENWICH PUBLIC SCHOOLS

PROPOSED CONSTRUCTION: EXISTING - POURED IN PLACE CONCRETE

WATER SUPPLY: DOMESTIC - MUNICIPAL

RECOMMENDED MAXIMUM BATHING LOAD: $\frac{4,500 \text{ Ft}^2}{25 \text{ Ft}^2} = 180 \text{ Bathers}$

PLAN DIMENSIONS & CAPACITY: 60' X 75'; 4,500 Ft²; 304,555 Gallons

SLOPE OF BOTTOM IN SHALLOW AREA: 4'-0" Feet to 6'-0" Feet Water Depth in 30 Feet
 Linear = 1:15

SLOPE OF BOTTOM 5 FEET TO MAXIMUM DEPTH: 6'-0" TO 11'-6", IN 18 LIN.FT. 1:3.27

VERTICAL WALLS (Deep End): 4'-6" BELOW WATER LINE, 3' FROM WALL, 9½' DEEP

DIVING BOARD: (1) 1-METER DURAFIRM #70-231-524 WITH 16' BOARD

EFFECTIVE DEPTH AT DIVING AREA: 10'-6" BELOW BOARD, 12'-6" AT MAIN DRAIN

MINIMUM HEIGHT OF CEILING ABOVE DIVING BOARD: 16'

RECIRCULATING INLETS: INTEGRAL WITH PERIMETER OVERFLOW GUTTER, INLETS 36" ON CENTER

OUTLETS/MAIN DRAINS: (4) EXISTING 15" DIA.

OVERFLOWS/SURFACE SKIMMERS: PADDOCK #9210 ASC-W PERIMETER OVERFLOW WITH FLUSH END WALLS

SUCTION CLEANER: PADDOCK #3180 PORTABLE 1/2 HP

MARLOW CIRCULATING PUMP: 4SP10EC; 10 H.P.; Rated at 635 G.P.M. at 55 Feet T.D.H.

TIME FOR POOL TURNOVER: $\frac{304,555 \text{ Gallons}}{635 \text{ G.P.M.} \times 60 \text{ Min./Hr.}} = 7.99 \text{ Hours}$

FLOW GAUGE: (1) SIGNET 6" 0-1000 GPM

HAIR CATCHER: INTEGRAL WITH PUMP - 6" SUCTION

FILTER: ADD (1) PACFAB TR140 TO (5) EXISTING TR140 - 36" DIA.

FILTER AREA: 42.36 Ft²

FILTRATION RATE: 635 G.P.M./Ft² of Filter Area When Operating at 14.99 G.P.M.

BALANCE/SURGE TANK: CONCRETE 10'W X 14'L X 8' DEEP (4,500 MIN. GAL.)

SIGHT GLASS: EXISTING - INTEGRAL COMPONENT WITH FILTER

MAKE-UP WATER/PLACE OF INTRODUCTION: VIA 4" AIR GAP INTO STANDPIPE TO SURGE TANK

BROMINATOR: BIOLAB #CR13-54 192.5 LBS. N.F.S. LISTED

~~XXXXXXXXXX~~ ~~XXXXXXXXXX~~ ~~XXXXXXXXXX~~

CHEMICAL FEED (If Provided, Other Than Disinfectant Feeder): CO2

TESTING EQUIPMENT: PADDOCK #2814 TEST KIT D.P.D. REAGENTS FOR BROMINE AND pH

UNDERWATER LIGHTS: NONE

SHOWERS & TOILETS:

1. MALE: 5 Toilets, 3 Urinals, 4 Lavatory Sinks, 49 Showers
2. FEMALE: 6 Toilets, 5 Lavatory Sinks, 53 Showers

BATHER ROUTING & FENCING (Specify Fence Materials and Height): N/A

DECK AND DECK DRAINS (Specify Deck Materials and Width): CONCRETE - CERAMIC TILE NON-SLIP FINISH/EXISTING PER PLAN

TOILET AND SHOWER WASTE DISPOSAL: SANITARY SYSTEM

FILTER BACKWASH WATER DISPOSAL: FILTERED AND THEN INTO STORM SYSTEM VIA AIR GAP

DRY WELL SIZE AND CAPACITY: N/A

POOL DRAINAGE: PORTABLE PUMP/STORM SYSTEM
SAME AS EXISTING



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH
January 12, 1997

APPROVAL OF SWIMMING POOL
PLANS AND SPECIFICATIONS FOR THE RENOVATION
OF AN EXISTING SWIMMING POOL
LOCATED AT
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

Frederick P. Baker, Director of Operations
Greenwich Public Schools
Havemyer Building
290 Greenwich Avenue
Greenwich, CT 06830

Dear Mr. Baker:

The State Department of Public Health (DPH) is in receipt of an application together with plans and specifications requesting approval of plans for the renovation of an existing indoor swimming pool located at Greenwich High School, 10 Hillside Road, Greenwich, CT. The existing swimming pool is rectangular in shape; will have a water capacity of 304,555 gallons; will have a water surface area of 4,500 square feet; and is to be provided with additional high rate sand filtration and new automatic erosion feed bromination equipment.

A review of the plans and specifications indicates that the proposed swimming pool renovation meets the DPH Regulations and Guidelines in accordance with the Public Health Code Section 19-13-B33b. Therefore, the application is hereby approved by the Commissioner of DPH subject to the following provisions.

The swimming pool and appurtenances are to be renovated in accordance with the details thereof as shown on such approved plans dated December 1, 1997 and as outlined in the summary specifications form attached to this letter.

Upon completion of the subject swimming pool renovation a STATEMENT OF CONFORMANCE shall be signed by the pool construction supervisor and an official of the pool construction firm. The signed statement shall be forwarded to the DPH prior to use of the swimming pool or obtaining a certificate of occupancy from local municipal officials.

Adequate pool maintenance shall be provided in accordance with Section 19-13-B33b of the Public Health Code to secure good operation. If necessary in the future, changes in operational procedure and/or equipment shall be made to produce satisfactory conditions.

Written authorization shall be obtained from the DPH for any construction or installation of equipment not shown on the plans or stated in the specifications.



Phone:

Telephone Device for the Deaf (860) 509-7191
410 Capitol Avenue - MS # _____
P.O. Box 340308 Hartford, CT 06134
An Equal Opportunity Employer

APPROVAL OF SWIMMING POOL
PLANS AND SPECIFICATIONS FOR THE RENOVATION
OF AN EXISTING SWIMMING POOL
LOCATED AT
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

The subject swimming pool prior to opening shall be provided with a minimum of one unit of safety equipment for each one-hundred running feet of perimeter of the pool consisting of the following: A ring buoy not more than fifteen inches inside diameter to which shall be attached a fifty-foot length of one-quarter inch line and a shepherd's crook or reach pole with blunted ends, a minimum of twelve feet in length, such poles to be mounted in permanent sockets on opposite sides toward the deep area of the pool. A first aid kit (American National Red Cross standard 24 unit kit or the equivalent) shall be provided and kept stocked and ready for use. A telephone which is readily available for emergency use shall be provided on the premises.

The operating instructions and isometric diagram of the pool equipment shall be mounted at a location in the filter room which is readily accessible for reading and is well illuminated. These instructions and diagram shall be mounted in a durable manner so as to resist damage from normal conditions in the filter room.

No diving boards or diving platforms shall be installed or erected at the pool which are 16 feet or greater in length and/or more than one (1) meter above the level of the water in the pool.

No construction shall be undertaken until the connection to the sanitary sewer is approved by the sewer authority.

Starting blocks/platforms shall be installed at the deep end of the pool and shall not exceed 30 inches above the water level. Starting blocks/platforms shall be removable and shall be in place only during competitive swimming meets or training.

Sincerely,



William Sawicki
Supervising Environmental Sanitarian
Environmental Engineering Program
Division of Environmental Health

WS/lms/grnwchsp

cc: Director of Health - Greenwich
Building Official - Greenwich
Scott Swimming Pools, Inc., 75 Washington Road, Woodbury, CT 06798
Pool File ✓

SUBJECT: GREENWICH, CT: EXAMINATION OF PLANS AND SPECIFICATIONS
FOR THE PROPOSED RENOVATION OF AN EXISTING PUBLIC
SWIMMING POOL LOCATED AT GREENWICH HIGH SCHOOL

TO: Thomas Furgalack, Acting Director
Division of Environmental Health

FROM: William Sawicki
Supervising Environmental Sanitarian
Environmental Engineering Program

ORIGINAL APPROVAL: October 4, 1967

LOCATION: 10 Hillside Road

ENGINEER OR ARCHITECT: Robert Keating, Registered Architect

POOL CONSTRUCTION FIRM: Scott Swimming Pools, Inc.

APPLICANT: Frederick P. Baker, Director of Operations
Greenwich Public Schools, Havemeyer Building, 290 Greenwich Avenue
Greenwich, CT 06830

PROPOSED CONSTRUCTION: Existing indoor swimming pool; rectangular in shape; constructed of steel reinforced concrete; to be provided with high rate sand filtration and automatic erosion feed bromination equipment.

WATER SUPPLY: Municipal

RECOMMENDED MAXIMUM BATHING LOAD: $\frac{4,500 \text{ Ft}^2}{25 \text{ Ft}^2} = 180 \text{ Bathers}$

PLAN DIMENSIONS & CAPACITY: 60 Ft x 75 Ft; 4,500 Ft²; 304,555 Gallons

SLOPE OF BOTTOM IN SHALLOW AREA: 4 feet to 6 feet water depth in 30 feet linear = 1:15

SLOPE OF BOTTOM 6 FEET TO MAXIMUM DEPTH: 6 Feet to 11 Feet 6 Inches Water Depth
in 18 feet linear = 1:3.3

VERTICAL WALLS (Deep End): Existing

DIVING BOARD: (1) Duraform Model #70-231-524; (1) Meter; Length = 16 Feet; Overhang = 6 Feet;
existing deck behind diving board

EFFECTIVE DEPTH AT DIVING AREA: Minimum 11 feet 6 inches water depth at plummet;
minimum 11 feet 6 inches water depth provided for 21 feet linear beyond plummet

STARTING PLATFORMS: (8) Existing

MINIMUM HEIGHT OF CEILING ABOVE DIVING BOARD: Existing - 16 feet

RECIRCULATING INLETS: Integral component with perimeter overflow gutter system; spaced 36 inches on center around entire pool perimeter.

OUTLETS/MAIN DRAINS: (4) Existing main drains; 6 inch pipe

OVERFLOWS/SURFACE SKIMMERS: Paddock Model #9210ASC-W Stainless Steel Perimeter overflow gutter system; recessed at end walls; 12 inch converter pipe

SUCTION CLEANER: (1) Paddock Model #3180 portable 1/2 H.P. vacuum system

CIRCULATING PUMP: (1) Marlow Model #4SP10EC, 10 H.P.; Rated at 635 G.P.M. at 55 feet T.D.H.

TIME FOR POOL TURNOVER: $\frac{304,555 \text{ Gallons}}{635 \text{ G.P.M.} \times 60 \text{ Min./Hr.}} = 8.0 \text{ Hours}$

FLOW GAUGE: (1) Signet Model #MK515; 6 inch pipe; scale = 0 to 1,000 G.P.M.

HAIR CATCHER: Integral with pump

FILTER: (6) PAC FAB Model #TR140 high rate sand

FILTER AREA: $7.06 \text{ Ft}^2 \times 6 = 42.36 \text{ Ft}^2$ Total Filter Area

FILTRATION RATE: 15.0 G.P.M./ Ft^2 of Filter Area When Operating at 635 G.P.M.

BALANCE/SURGE TANK: 10 Ft x 14 Ft x 4.5 Ft; Capacity = 4,712 gallons

SIGHT GLASS: Integral with filters

MAKE-UP WATER/PLACE OF INTRODUCTION: via a automatic fillpipe into surge tank; fillpipe provided with minimum 3 inch air gap at fill connection to surge tank

BROMINATOR: (1) Vantage Model #CR 13-54 with flowmeter; capacity = 192.5 lbs.

CHEMICAL FEED: Carbon Dioxide for pH control

TESTING EQUIPMENT: (1) Paddock Model #2814 test kit with D.P.D. reagents for bromine analysis and pH

UNDERWATER LIGHTS: None

SHOWERS & TOILETS:

1. MALE: 5 Toilets, 3 Urinals, 4 Lavatory Sinks, 49 Showers
2. FEMALE: 6 Toilets, 5 Lavatory Sinks, 53 Showers

BATHER ROUTING & FENCING: Existing

DECK AND DECK DRAINS: Non-slip ceramic tile deck minimum 5 feet wide around entire pool periphery; perimeter deck drainage system to be provided

TOILET AND SHOWER WASTE DISPOSAL: To sanitary sewer

FILTER BACKWASH WATER DISPOSAL: To sanitary sewer - existing backwash with air gap

DRY WELL SIZE AND CAPACITY: N/A

POOL DRAINAGE: Existing - via portable pump to storm drain system

pool\grnwchsp

STATEMENT OF CONFORMANCE

TO: Commissioner of Health

FROM: SCOTT SWIMMING POOLS, INC.

Name of Pool Contractor

75 WASHINGTON ROAD, WOODBURY, CT 06798

Address

RE: GREENWICH HIGH SCHOOL

Name of Pool

10 HILLSIDE ROAD, GREENWICH, CT

Address

DATE OF PLAN APPROVAL JANUARY 12, 1997

DATE OF COMPLETION SEPTEMBER 16, 1998

THIS IS TO CERTIFY THAT THE SUBJECT SWIMMING POOL WAS CONSTRUCTED
IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE
COMMISSIONER OF HEALTH IN ACCORDANCE WITH THE PUBLIC HEALTH CODE
REGULATIONS SECTION 19-13-B33a.



Robert Tata
Signature of Construction Supervisor



Don Vanden Bosch
Signature of Official, Pool Contractor

NOTE: Upon completion of construction of the pool, the responsible official (applicant) of the organization or municipality or municipal subdivision or owner or lessee of swimming pool shall have this STATEMENT OF CONFORMANCE signed by the pool construction supervisor and an official of the pool construction firm. The signed statement shall be forwarded to the State Department of Health, 450 Capitol Ave, Hartford, Conn. 06134 prior to use of pool or obtaining a certificate of occupancy from the local municipal officials.



January 14, 1998

RECEIVED
98 JAN 15 PM 12:48
DEPT. OF HEALTH SERVICES
ENVIRONMENTAL HEALTH

Mr. William Sawicky, Supervising Environmental Sanitarian
Recreational Health and Safety Program
State of Connecticut Department of Health Service
450 Capital Avenue MS # 51 REC
P.O.Box 340308
Hartford, Connecticut 06134-0308

Re: Greenwich High School

Dear Mr. Sawicky,

This letter is to confirm our telephone conversation concerning your approval of the swimming pool renovation at Greenwich High School.

The two items that you are requesting to be added are (1) a safety line with floats at the 5 foot break and (2) the addition of 5 foot depth markers in the deck where this depth takes place.

We will change our drawings and advise the architect of the above. It is our understanding that your approval will be mailed in a few days.

Sincerely,

SCOTT SWIMMING POOLS, INC.

Donald Vanden Bosch

Vice President, Commercial Division

cc: R.N. La Rosa, Corporation
Antinozzi Associates

Scott Swimming Pools, Inc.

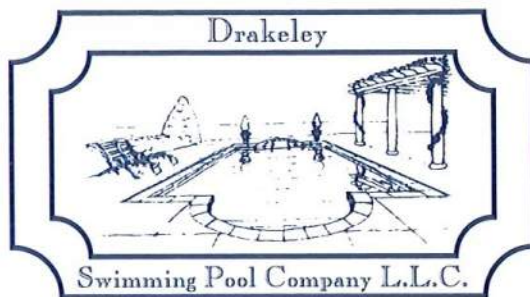
Distinguished Swimming Environments Since 1937®

75 Washington Road, Woodbury, Connecticut 06798

(203) 263-2108 Fax: (203) 266-0822

Westport 227-7559

2008 NOV 12 PM 3 39



October 30, 2008

State of Connecticut
Department of Public Health
Attention: Pam Scully
P.O. Box 340308
Hartford, CT 06134

Dear Ms. Scully,

This letter is to inform you that Drakeley Pool Company, LLC is currently seeking compliance solutions in regards to the Virginia Graeme Baker bill. On the following list are some of the commercial facilities that we service on a periodic basis:

Greenwich Water Club	49 River Road, Cos Cob, CT 06807
Falls Village Town Pool	Falls Village, CT 06031
Plainfield Town Pool	Plainfield, CT 06374
Holiday Hill C. C.	Candee Road, Cheshire, CT 06410
Pleasant View Estates	Ridgefield, CT 06877
New Haven Lawn Club	193 Whitney Avenue, New Haven, CT 06512
Greenwich High School	Greenwich, CT
Ballantine Park	Southbury, CT 06488
Canterbury High School	101 Aspetuck Avenue, New Milford, CT 06776
Simsbury Farms	West Simsbury, CT 06092

Knowing the age and very different metal drain boxes at all the different facilities, we are going to be utilizing the Paddock Equipment Company to custom make the covers. Paddock Pools has received NSF approvals for the new anti-entrapment design. I, personally, will be traveling to the Rock Hill plant in South Carolina on behalf of these facilities. Since each pool's main drain configuration is different, there will be many variables to successful implementations.

74 Hickory Lane, Bethlehem, Connecticut 06751 • (860) 274-7903 • Fax: (860) 274-7902

HIC #567297 • PLM. #280149

www.drakeleypools.com



We are working diligently to satisfy the needs of conformance. However, at this time, the December 19, 2008 date is unrealistic considering the actual new grating systems for each facility will not be available by that date. We anticipate the summer of 2009 for total conformance of the above facilities. Please respond to any of the above mentioned facilities with concerns.

Thank you in advance for your continued co-operation and support of all these facilities.

Sincerely,
WDSPC LLC

A handwritten signature in blue ink, appearing to read "William T. Drakeley, Jr.", with a stylized flourish at the end.

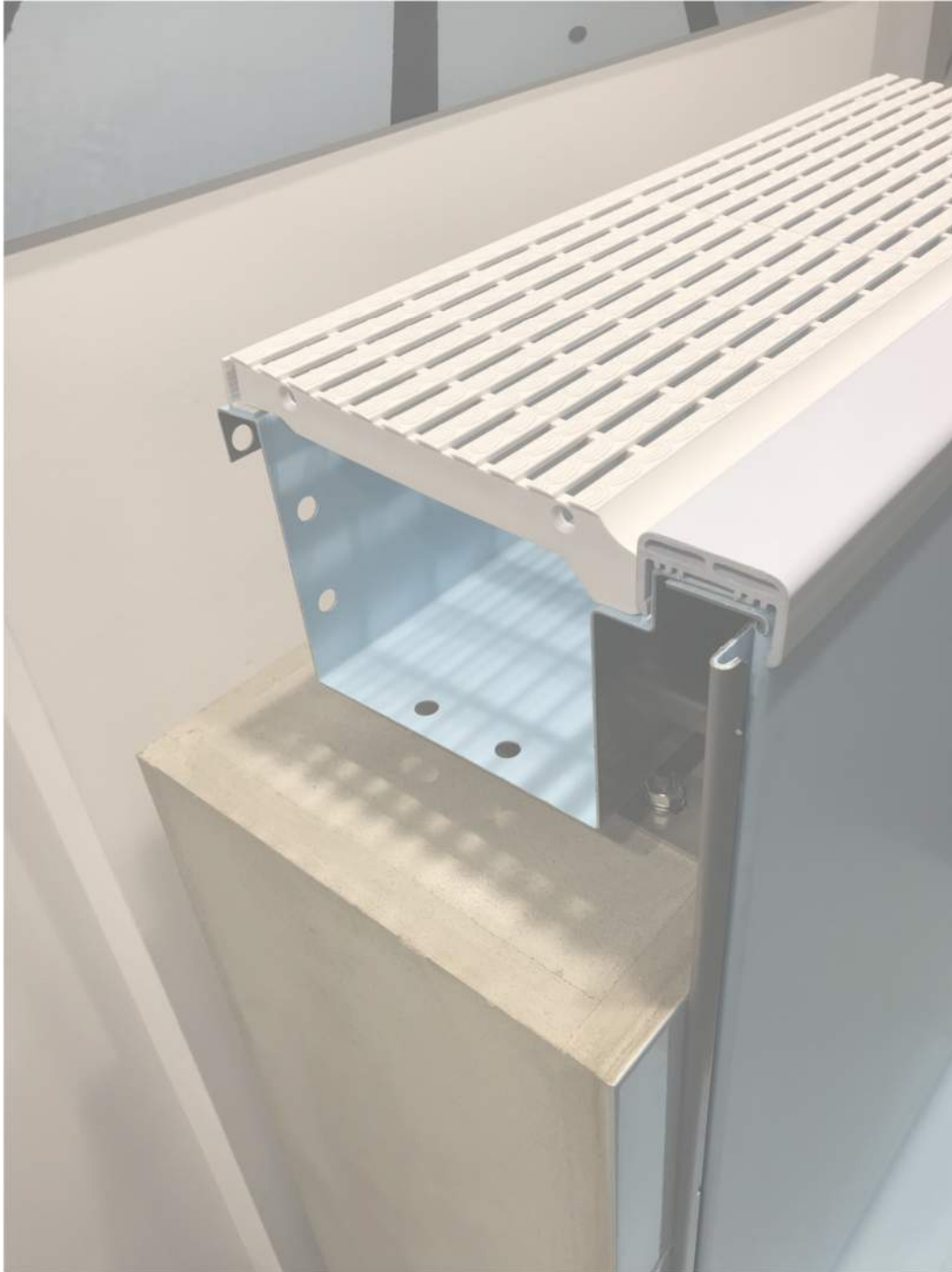
William T. Drakeley, Jr.
Owner

cc: John Frangione, Greenwich Board of Education

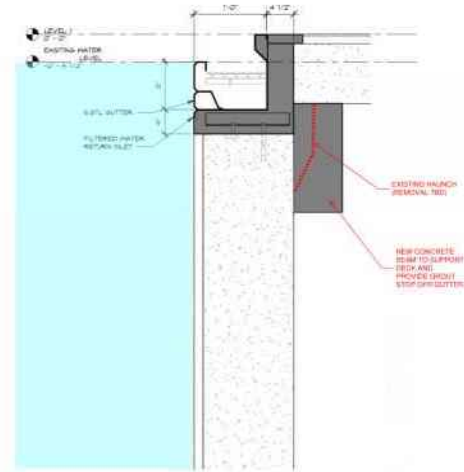
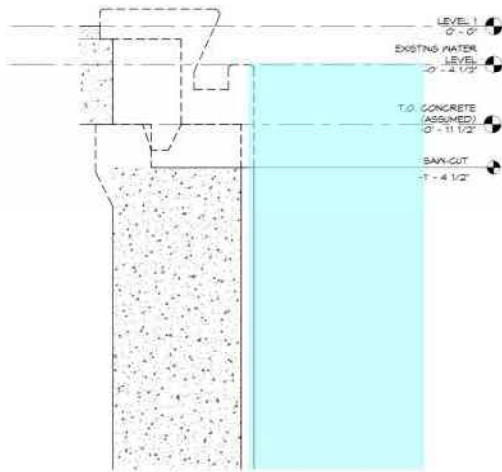
WTD: bak

V. APPENDICES

APPENDIX 04: Potential Pool Tile, Membrane or Stainless Steel Gutter “Myrtha” Retrofit Pool Options

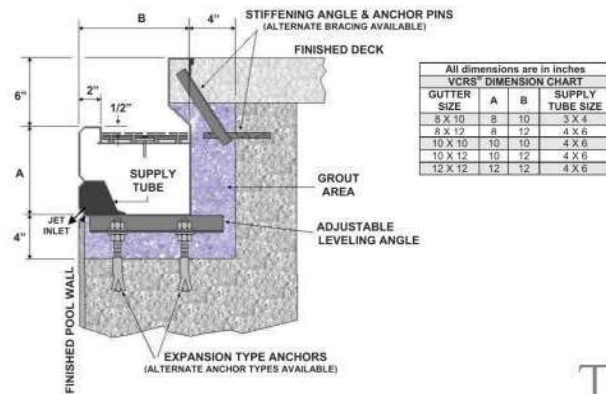


TILE RESTORATION

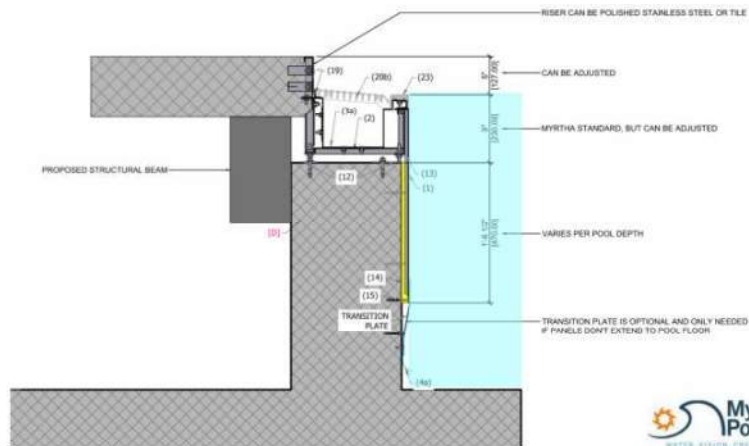
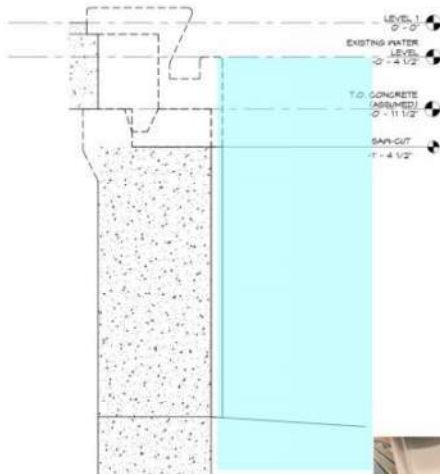


Option 1: Stainless Steel Overflow Gutter and Tile Restoration

- Requires regular tile maintenance to maintain watertightness
- Not clear whether tile has a waterproofing membrane. If not it will not be possible to eliminate seepage, even with a re-grout.
- New tile decks:
 1. Was a waterproofing membrane present?
 2. Was the new tile and grout sealed?
 3. Deck was virtually flat in some areas. Drainage is key to protecting concrete from damage.



TLBA



Option 2: Stainless Steel Panelized Liner

- Warranted watertight pool
- Stops seepage through tile and concrete
- Eliminates tile repair and maintenance
- Integral pool walls and gutter
- Chemically welded floor membrane



TLBA

PVC LINER

RenoSys PVC Liner



RenoSys PVC Pool Shell (liner)

If your pool leaks or needs a better surface, [RenoSys PVC Pool Shells](#) are the perfect solution to resurfacing any commercial pool. Commonly referred to as liners or membranes, PVC Pool Shells are crafted from a 60 mil. thick, custom-textured, reinforced PVC material designed to make your pool watertight.

RenoSys PVC Pool Liner Shells are specifically formulated and designed to provide an effective water containment membrane for use in any public pool application. RenoSys commercial pool liners have been successfully employed in pools constructed of concrete, steel, fiberglass and aluminum. RenoSys offers special electrical isolation benefits for problem aluminum pools and other metallic pools. RenoSys custom pool liner may also be used to line fountains, water features, or for site built potable water containment applications - virtually anywhere that water needs to be contained.



Durable, Flexible, Low Maintenance and Watertight

RenoSys is the ideal surface for the interior lining of new or existing commercial pool structures. Constructed on-site of a 60 mil reinforced membrane of specially formulated PVC, RenoSys is textured to provide a nonabrasive, slip resistance surface. The RenoSys Pool Shell liner is pore free for ease of maintenance and offers dependable water containment for deteriorated pools that are experiencing water loss. RenoSys offers remarkably cost effective options for new pool construction and is typically less expensive than conventional renovation options.

Aluminum and Metallic Pool Problems Solved

The special problems experienced in aluminum and mild steel pools due to galvanic or electrolytic corrosion are effectively eliminated when RenoSys is installed. Since PVC is an excellent insulator, the electrical currents in the body of water are prevented from contacting the metal wall by the 60 mil PVC barrier. Hundreds of aluminum installations have proven that RenoSys prevents pool side corrosion in metallic pools.

Total Design Flexibility

A significant benefit of the RenoSys PVC Pool Shell liner is the creative flexibility it allows pool designers. The RenoSys system easily spans crack and eliminates leakage at cold joints transforming any pool modification into a completely watertight structure. The RenoSys sales team will be happy to suggest specific solutions and show how our liner materials can be employed to allow alternative construction techniques for your project.

WHY PVC LINER?

The reason PVC liners (membranes) are so successful at solving pool problems is because they are flexible, durable, and compatible with any type of pool environment whether it is concrete, plaster, gunite, fiberglass, aluminum or steel. The RenoSys PVC Pool Shell is custom installed on site with trained industry professionals to create a proven, watertight system with total design flexibility.

MORE ABOUT PVC...

A membrane of reinforced PVC is hot air welded together inside the old pool completely eliminating: leaks, the need to paint, plaster, caulk, sandblast, scrape or hassle with the old shell's problems. Because the membrane system is completely suspended inside the old shell and does not depend on a bond with the old pool, PVC is unaffected by expansion/contraction and freeze/thaw problems like conventional renovation options. PVC has a non-porous surface making it difficult for algae to adhere thus reducing the amount of seasonal and daily cleanup. PVC also makes concrete construction cold joints watertight allowing reuse of significant portions of existing infrastructures. Pools can be renovated, recycled, repurposed and reconfigured in a way never thought possible before because a PVC liner installation can make them watertight after they've been altered or renovated.

STAINLESS STEEL POOL SHELL



1800 Second Street, Suite 758
Sarasota, Florida 34236
Tel: (941) 955-2591



(Meyers Municipal Pool, Winooski, VT)

(Nassau County Aquatic Center, NY)



PROJECT:

Sample Information
Only

CLIENT:



(Princeton Municipal Pool, NJ)

REFERENCE:

TLB-Dimensions



We are

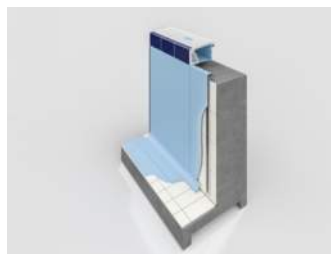
Myrtha Pools is pleased to present a narrative, approach and budget proposal to perform a true RenovAction renovation with the outcome of an outstanding swimming facility and consistent with the top facilities around the world.

Myrtha Pools has grown to be the leading choice in the global commercial pool market through our never-ending commitment to engineering and innovation. Embracing creative and architectural challenges, our hands-on process, and pursuit of excellence has resulted in nationwide and international portfolios that include an enviable range of gold-medal competition venues, exciting community facilities, breathtaking elevated and hospitality & resort style pools, and more.

Our custom swimming pools can be found just about everywhere, including community centers, cruise ships, medical centers, camping grounds and sports clubs all around the world. In addition, our pools are uniquely suited to handle all types of site conditions whether it be unstable soils, hazardous seismic zones, high water tables or corrosive environments.

The Myrtha technology by nature is able to maintain its structural integrity and water tightness under conditions that would crack conventionally constructed pools to pieces. This is one reason why Myrtha is the preferred technology of FINA (global aquatic governing body), USA Swimming, LEN (European Swimming) and virtually every other major aquatic organization worldwide. We accomplish this through dimensional perfection with sub-millimetric manufacturing standards, and the development of proprietary technologies through computational dynamics modeling to improve current free recirculation, while maintaining more efficient filtration. Myrtha Pools are synonymous with the Olympics and the highest level of competition, but we bring the same precision and durability to all of our clients.

The Myrtha RenovAction System



The Myrtha technology is based on modular stainless-steel panels, combined with hot calendared rigid PVC sheets, and fiberglass reinforced composite membranes. Our unique, patented finished product blends the attributes of these materials to create a waterproofed shell that is both strong yet flexible under stress.

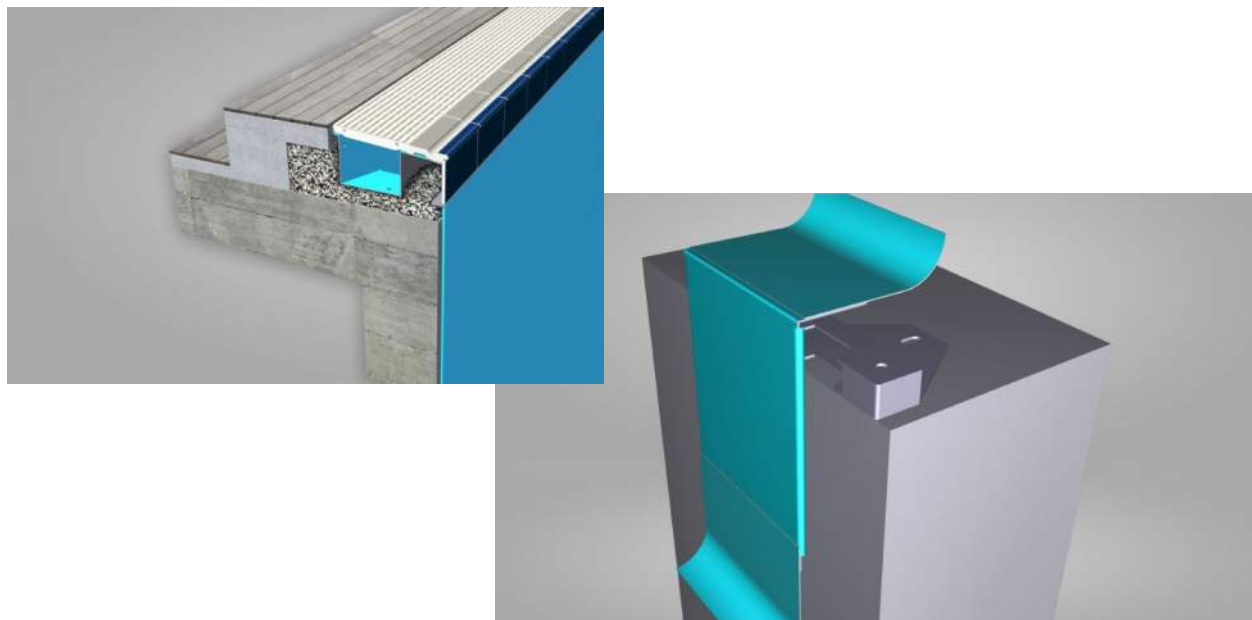
Myrtha has developed the patented RenovAction technology specifically for the refurbishment of existing pools. RenovAction uses the same Myrtha materials as a brand-new installation and comes with the same industry leading warranty (25-years structure / 10-years waterproofing) backed by a company with a 53-year history and endorsed by every major swimming organization in the world. The Myrtha RenovAction solution also allows for minimal demo and prep work prior to installation. The existing concrete can spall, fiberglass can splinter and tile can delaminate behind the steel without affecting the structural integrity or waterproofing.



RenovAction® Solutions

Depending on the existing pool and gutter system, we can create a channel or a recess for the placement of the new Myrtha gutter system by partially removing the existing concrete gutter.

In some cases, when it is not possible to eliminate the existing concrete gutter, RenovAction® offers the possibility of using an adjustable steel profile called a Regulator that is anchored to the existing concrete wall and allows for adjustment to the new overflow level. A reinforced membrane is then welded onto the profile and connected to the old gutter, ensuring a waterproof surface.



Our RenovAction® technology is ideal for swimming pool refurbishment. Our flexible technology allows us to refurbish only the areas that are failing and can often be carried out without any significant demolition.

The Myrtha Benefits

Warranty and Low Life Cycle Costs

A Myrtha pool does not need any special maintenance. As previously mentioned, the Myrtha technology by nature is both strong and elastic. To stand behind this, Myrtha provides a 25-year warranty on structure and 10-year warranty on PVC components. A Myrtha pool has never had to be replaced. These warranties and Myrtha component durability translate to project life cost savings as there is no need for re-plastering, re-painting or re-tiling as would be required in a traditional concrete pool causing consideration down-times of pool operation.



Construction Advantages

- **Speed of Construction.** A Myrtha pool can be built in an extremely short time (about one third the time as traditional concrete pools). Use of large construction equipment is not required as all components can be installed using hand tools. Reducing the construction time means reduced overall construction costs. Installation of a water park in Australia was completed so quickly that they were able to open for business ahead of the planned completion date.
- **Flexibility in Construction Schedule.** Due to the modular design of the Myrtha system, all components can be hand-carried through a standard doorway if needed. This along with the fact that no heavy equipment or machinery is required for installation means that the Myrtha pool installation can be fit most anywhere in the construction schedule. The critical path of construction will rarely, if ever, depend on a Myrtha pool.

Structural Design Advantages

Myrtha pools are able to maintain structurally independent wall and floor systems. This allows for creativity in foundation design that will theoretically eliminate the potential need for deep and complicated foundations or engineered backfill requirements. This also alleviates site specific challenges such as high-water tables and expansive soils. Potential cost savings are dependent on the geotechnical recommendations but could represent significant value engineering opportunities.

Evolution Membrane

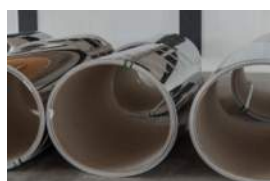
Evolution membrane is exclusive to Myrtha. Evolution is heavily reinforced, and therefore does not stretch like other liners. It is further enhanced by the most chemically, and UV resistant surface treatments available. Evolution will be mechanically fastened to the concrete floor slab or finish, the result of which is a permanent, fully adhered system, averse to any wrinkling or ballooning.

Softwalk

Myrtha's SoftWalk® technology has become very popular for recreational municipal pools, swim schools and facilities with therapy pools. This is a proprietary system that incorporates a fully adhered poly extruded mesh (PEM), integrated with our Evolution membrane as previously described. The result is a slip resistant, yet smooth floor that is extremely comfortable for users and dramatically improves safety. In fact, SoftWalk® meets ASTM standards for head impact mitigation of up to a three-foot fall with no water in the pool.

Myrtha Skin

Myrtha Skin is an exciting development engineered to provide the owner with a cost-effective complete steel pool solution. The product consists of the same Myrtha steel/pvc technology, but with a thickness of 0.5mm(25 Gauge) and is supplied in rolls. The installation follows a similar procedure as the Myrtha Evolution membrane, with expansion joints to allow for any future potential movement of the floor.



Shape Versatility & Project Adaptation

Myrtha technology adapts to any type of technological and aesthetical requirement, giving the client ample options to choose from. Myrtha's freeform technology allows for pools of almost any shape and size, so we can match most any radius in the project design. Myrtha can also be customized to accommodate any type of theming or play features. Additionally, thanks to our sturdy PVC laminate, virtually all tile, glass and stone finishes that are appropriate for pool environments can be used to customize pool design. For a "wow" factor, our acrylic wall panels, which are similar to glass in appearance but much more appropriate for a pool environment, more transparent and lighter, create a stunning finish.

Myrtha Green

Myrtha has been involved in LEED projects certified through the USGBC for almost two decades. Sustainability is at our core. We were a pioneer in developing a variety of advanced technologies for aquatic amenities. Myrtha displays a markedly lower carbon footprint than any other pool construction system on the planet. Myrtha has inhouse LEEP APs to support your project and can positively impact over 40 points in a LEED certification process. We even have experience helping clients seek innovation credits when integrating our system and its attributes into the overall project sustainable criteria.

(Northeast ISD Bill Walker Pool RenovAction, San Antonio, Texas)



V. APPENDICES

APPENDIX 05: NCAA Diving Rules (as Referenced by DPH)

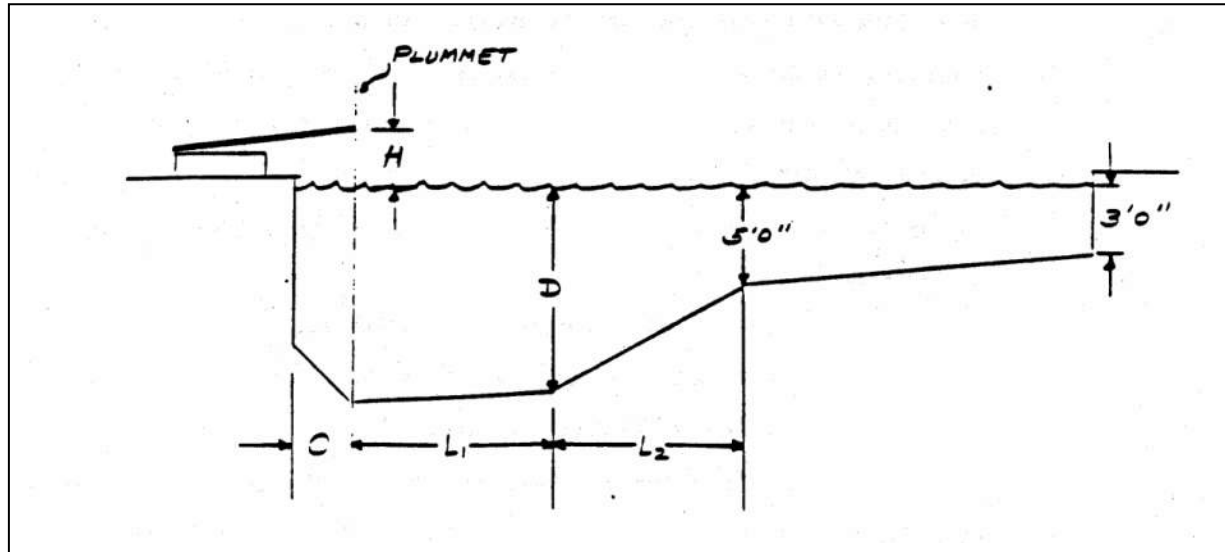
CONNECTICUT PUBLIC SWIMMING POOL MANUAL



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Diving Areas

- 18.1: The dimensions of the diving area in all public swimming pools shall conform to the following minimum dimensions:



Height of Diving Board	Minimum Water Depth Throughout Diving Well	Overhang	Length of Diving Well	Runout
H	D	O	L1	L2
1/2 M	10 feet	3 feet	12 feet	15 feet
3/4 M	10 feet	3 feet	12 feet	15 feet
1 M	10 feet	4 feet	12 feet	15 feet
1.1-3.0 M	12 feet	5 feet	20 feet	21 feet

Diving boards less than 1/2 meter in height are not allowed.

- 18.2: There shall be no obstruction extending from the wall or floor into the clear area of the diving portion of the pool. There shall be a completely unobstructed clear distance of 15 feet above the diving board measured from the center of the front end of the board, and this area shall extend at least eight feet (8 ft.) behind, eight feet (8 ft.) to each side and sixteen feet (16 ft.) ahead of the measuring point.
- 18.3: Horizontal separation of ten feet shall be provided between one-meter diving boards and side walls. The separation to the side walls for boards greater than 1.0 meter shall be at least 15 feet. The horizontal separation between boards shall be at least 10 feet.

- 18.4: Supports, platforms, and steps for diving boards shall be of substantial construction and of sufficient structural strength to safely carry the maximum anticipated loads.

Diving boards 1.0 meter or greater in height shall be equipped with steps or ladders.

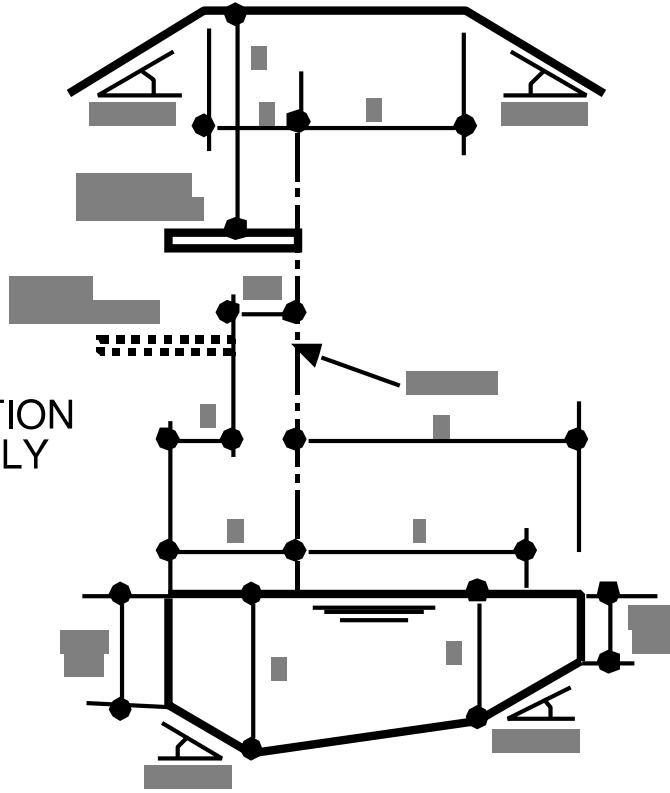
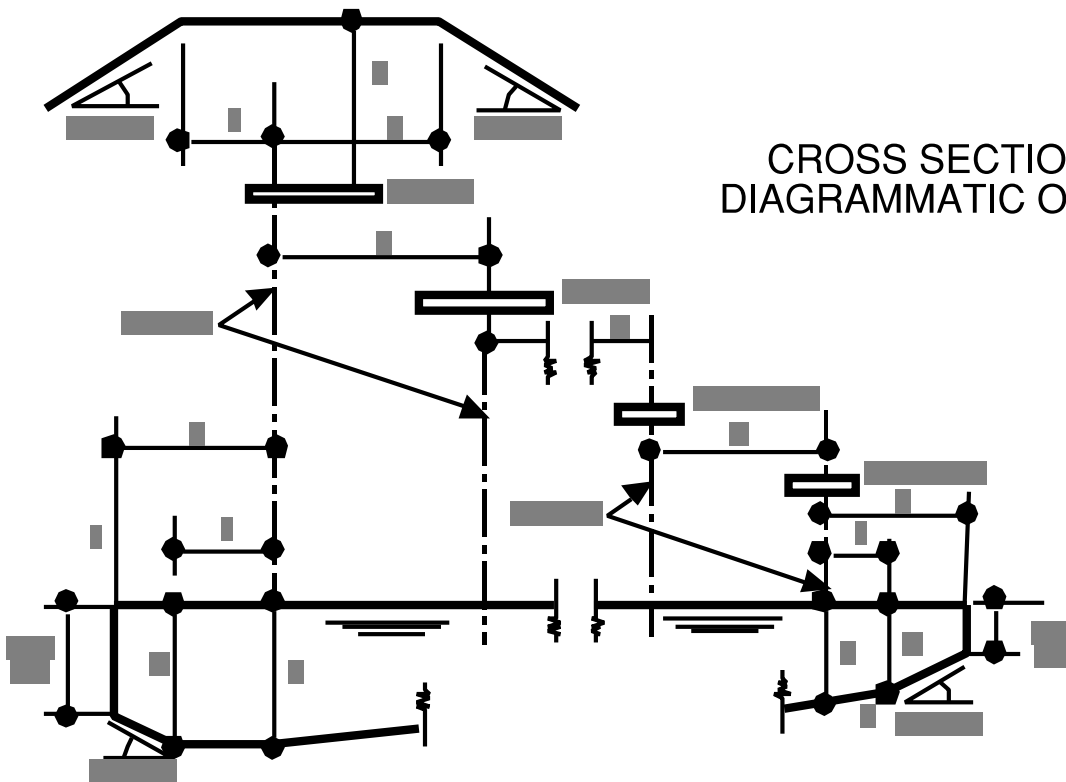
Steps shall be constructed of corrosion-resistant material. Easily cleanable, and non-slip design. Handrail(s) shall be provided at all steps and ladders leading to diving boards.

Platforms and diving boards, which are over one meter high, shall be protected with guard railings.

- 18.5: Where diving boards 14 feet or greater in length are to be installed, diving area dimensions shall comply with the most recent National Collegiate Athletic Association (NCAA) standards.

Disinfectant and Chemical Feeders

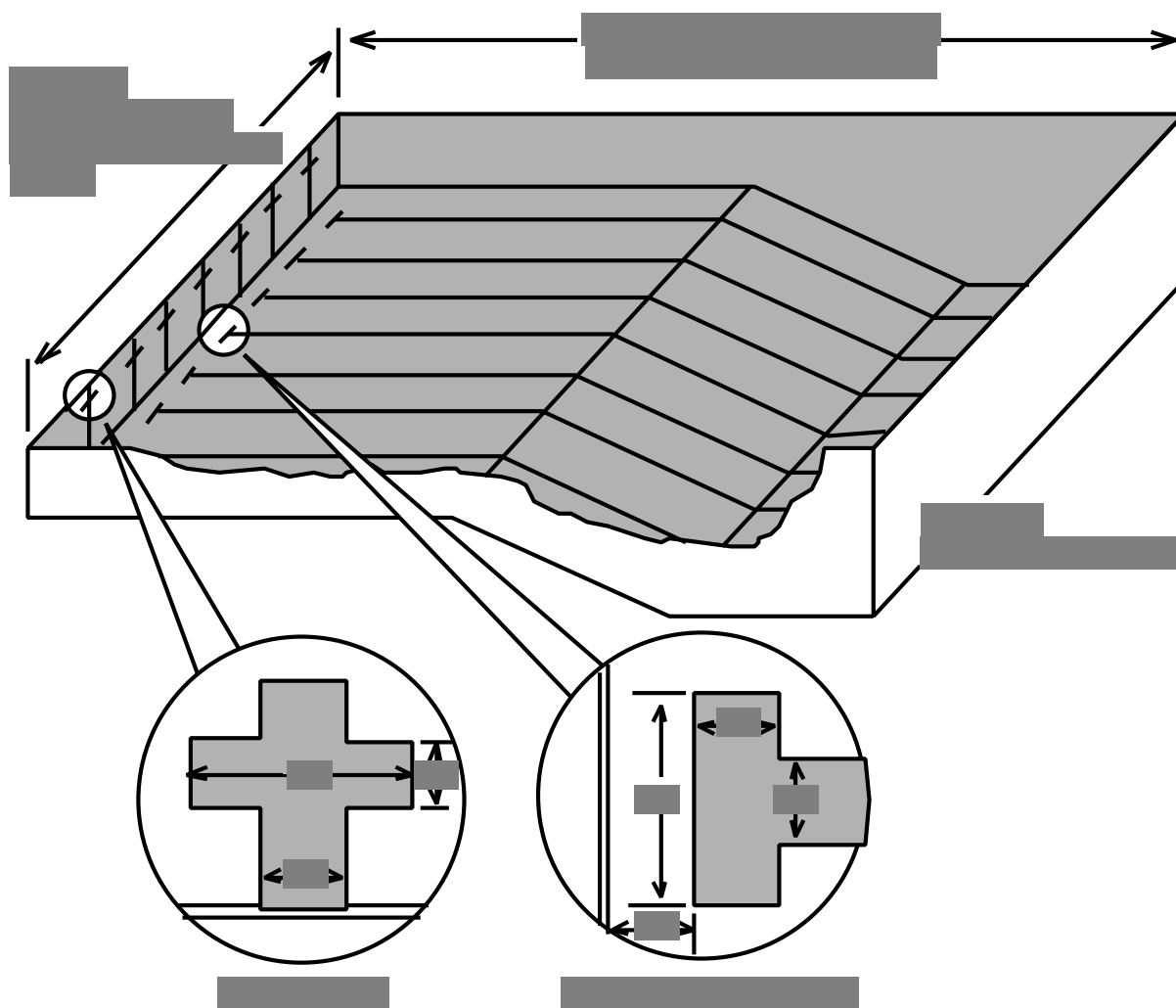
- 19.1: All chemical feeders shall comply in all respects with the standards of the National Sanitation Foundation covering chemical feeders, or other standards that are approved by the commissioner of the Department of Public Health.
- 19.2: The swimming pool shall be equipped with a chlorinator, hypochlorinator, or other disinfectant feeder and all feeders shall meet the following requirements:
- 19.2.1: Shall be sturdily constructed of materials which will withstand wear, corrosion, or attack by chemical solutions or vapors. Shall not be adversely affected by repeated regular adjustments or other conditions anticipated in the use of the device. The feeder shall be capable of being easily disassembled for cleaning and maintenance. The design and construction shall be such as to preclude stoppage from chemicals intended to be used, or foreign materials that may be contained therein. The feeder shall incorporate failure-proof features so that the chemical cannot feed directly into the swimming pool, the pool piping system, water supply system, or the swimming pool enclosure under any type of failure of the equipment or its maintenance.
- 19.2.2: Shall be capable of supplying at least the equivalent of one pound of chlorine per eight hours for each 10,000 gallons of swimming pool capacity under conditions of operation to be anticipated at the proposed installation.
- 19.2.3: When a disinfectant is introduced at the suction side of the pump, a device or method shall be provided to prevent air lock of the pump or recirculation system.
- 19.2.4: When a hypochlorite solution is used to be fed through hypochlorinator equipment, such equipment shall also provide the following additional features:
- (a) Feed shall be positive under all conditions of pressure in the circulating system, and without artificial constriction of pump suction line whether this line is vacuum or pressure head.
 - (b) Regulation shall be provided to insure constant feed with varying supply or back pressure.

LONGITUDINAL SECTION
DIAGRAMMATIC ONLYCROSS SECTION
DIAGRAMMATIC ONLY

RULE 1-2/POOL DIMENSIONS AND EQUIPMENT

13

NCAA Recommended Dimensions for Diving Facilities		Dimensions are in Feet	SPRINGBOARD				PLATFORM					
			1 meter		3 meters		5 meters		7.5 meters		10 meters	
		LENGTH	16'		16'		20'		20'		20'	
Revised to March 3, 1991		WIDTH	1'8"		1'8"		5'		5'		6'7"	
		HEIGHT	3'4"		10'		16'5"		24'8"		32'10"	
			Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.
A	From plummet BACK TO POOL WALL	Designation	A-1		A- 3		A-5		A-7.5		A-10	
		Minimum	5'		5'		4'2"		5'		5'	
		Preferred	6'1"		6'1"		4'2"		5'		5'	
A/A	From plummet BACK TO PLATFORM plummet directly below	Designation					A/A5		A/A7.5		A/A10	
		Minimum					2'6"		2'6"		2'6"	
		Preferred					4'2"		4'2"		4'2"	
B	From plummet to POOL WALL AT SIDE	Designation	B-1		B-3		B-5		B-75		B-10	
		Minimum	8'3"		11'6"		10'8"		14'		17'3"	
		Preferred	8'3"		11'6"		12'4"		14'10"		17'3"	
C	From plummet to ADJACENT PLUMMET	Designation	C-11		C-331		C-531		C-7.5531		C-107.55531	
		Minimum	6'7"		7'3"		7'5"		8'3"		9'1"	
		Preferred	7'1"		8'3"		8'3"		8'3"		9'1"	
D	From plummet to POOL WALL AHEAD	Designation	D-1		D-3		D-5		D-7.5		D-10	
		Minimum	29'7"		33'8"		33'8"		36'2"		44'4"	
		Preferred	29'7"		33'8"		33'8"		36'2"		44'4"	
E	On plummet from BOARD TO CEILING	Designation	E-1		E-3		E-5		E-7.5		E-10	
		Minimum	16'5"		16'5"		10'8"		10'8"		13'2"	
		Preferred	16'5"		16'5"		11'6"		11'6"		16'5"	
F	CLEAR OVERHEAD behind and each side of plummet	Designation	F-1	E-1	F-3	E-3	F-5	E-5	F-7.5	E-7.5	F-10	E-10
		Minimum	8'3"	16'5"	8'3"	16'5"	9'1"	10'8"	9'1"	10'9"	9'1"	13'2"
		Preferred	8'3"	16'5"	8'3"	16'5"	9'1"	11'6"	9'1"	11'6"	9'1"	16'5"
G	CLEAR OVERHEAD ahead of plummet	Designation	G-1	E-1	G-3	E-3	G-5	E-5	G-7.5	E-7.5	G-10	E-10
		Minimum	16'5"	16'5"	16'5"	16'5"	16'5"	10'8"	16'5"	10'8"	19'9"	13'2"
		Preferred	16'5"	16'5"	16'5"	16'5"	16'5"	11'6"	16'5"	11'6"	19'9"	16'5"
H	DEPTH OF WATER at plummet (minimum required)	Designation	H-1		H-3		H-5		H-7.5		H-10	
		Minimum	11'		12'		12'2"		13'6"		14'10"	
		Preferred	11'6"		12'6"		12'6"		14'10"		16'5"	
J-K	DISTANCE AND DEPTH ahead of plummet	Designation	J-1	K-1	J-3	K-3	J-5	K-5	J-7.5	K-7.5	J-10	K-10
		Minimum	16'5"	10'10"	16'5"	11'10"	19'9"	11'10"	26'3"	13'2"	36'2"	14'
		Preferred	16'5"	11'2"	19'9"	12'2"	19'9"	12'2"	26'3"	14'6"	36'2"	15'7"
L-M	DISTANCE AND DEPTH each side of plummet	Designation	L-1	M-1	L-3	M-3	L-5	M-5	L-7.5	M-7.5	L-10	M-10
		Minimum	5'	10'10"	6'7"	11'10"	9'11"	11'10"	12'4"	13'2"	14'10"	14'
		Preferred	9'11"	11'2"	8'3"	12'2"	11'6"	12'2"	14'10"	14'6"	17'3"	15'7"
N	MAXIMUM SLOPE TO REDUCE DIMENSIONS beyond full requirements											
		Pool depth Ceiling Ht.	30 degrees 30 degrees		Note 1: Dimensions C (plummet to adjacent plummet) apply for plat- forms with widths as detailed. For wider platforms increase C by half the additional width(s). Note 2: All dimensions rounded up, even if only fractionally greater than the next lowest inch.							



Number of Lanes

ARTICLE 2. All championships swimming competition shall be conducted in racing courses having a minimum of six, 6-foot [1.83m] lanes.

Standard Length

ARTICLE 3. All championships swimming competition shall be conducted in racing courses of standard length (75 feet, 1 inch; 25 meters, 2.54 centimeters; or 50 meters, 2.54 centimeters).

Plummet Depth

ARTICLE 4. For all championships and nonchampionships springboard and platform diving competition, the water depths at the plummet may be no less than the minimum standards specified in the table on page 13.

Note: Rule 1-2-4 is an unalterable administrative rule and cannot be changed by mutual consent.

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