FACILITY ASSESSMENT REPORT
FOR

Swimming Pool
and
Bathhouse
at
Horowitz Pool at Henry Park

VERNON, CONNECTICUT

PREPARED BY:

TLB Architecture, LLC
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and

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December 18, 2006

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I. Introduction

I. INTRODUCTION

A. PURPOSE AND INTENT:

TLB Architecture was retained by the Town of Vernon, Department of Parks and Recreation to evaluate the existing conditions of the swimming pool and bathhouse at their municipal swimming pool, known as Horowitz Pool at Henry Park. The primary objectives of this report are as follows:

a. assess the current structural conditions of the pool and bathhouse
b. provide a general description of the facility and its components
c. perform a geotechnical analysis of the soils around the pool to evaluate groundwater elevation, types of soils and their permeability and frost susceptibility
d. report potential upgrades or repairs that may be considered

Other aspects of the pool that were not evaluated in this report, but may be required for a complete analysis of the facility are as follows:

a. Water Chemistry Reports
b. Swimming Pool Equipment and Pipe

B. PROCESS:

In developing the recommendations for this report, it was necessary to assess the swimming pool visually and through physical testing. To this end, a structural analysis was required. TLBA retained the services of GNCB Consulting Engineers to coordinate and evaluate the results of physical and visual testing. The result of this effort was a "Structural Condition Assessment, Survey and Report" included in Chapter III of this report.

With the condition of the facility known, options for its redevelopment can be explored. Some options are briefly described in Section II, Executive Summary, and include a variety of approaches depending on available funding.

II. Executive Summary

II. EXECUTIVE SUMMARY

A. RECOMMENDATIONS and OPTIONS

TLBA and its consultants have evaluated the information compiled during the investigation of this pool and bathhouse and we have concluded the facility, with some degree of repair and /or reconstruction is capable of supporting the City's current aquatic programs for a limited period of time. This period of time will depend on several factors, including the level of repair / replacement, weather, water chemistry, maintenance, etc.

The existing pool has significant cracking and deterioration, virtually all of which is near the tops of walls and at the copings and skimmers. This deterioration has contributed to water penetration of the walls and further damage to the pool shell. If minimal repairs are made to the areas in the worst condition, the pool will likely continue to be serviceable for a period of 3-5 years, again depending on the factors noted above. More extensive repair or replacement of the top of the pool wall and decks will extend the pool life for additional time, likely 8-15 years.

Over the past several years, and in particular over the last spring and summer, considerable effort was expended by the Parks and Recreation staff to repair large areas of the pool walls. This effort has prevented further deterioration and has extended the life of the pool by reducing water infiltration from the pool side. However, any long-term solution for the continued use of the pool will need to address the water on the outside of the pool, particularly the constant presence of water and moisture below the decks and at the back of pool walls. The geotechnical analysis, included within Chapter III of this report, characterizes the current soils types and groundwater level. As is often the case, groundwater levels and surface water runoff change over time as a result of development or natural changes. As such, it is unknown whether current conditions are the same as when the pool was built, but without addressing the water issues, no long-term repair can be considered.

The bathhouse was also evaluated as part of this report, and we have concluded that the bathhouse structure needs both immediate and long-term repairs. Of immediate concern is the spalling and deterioration of structural concrete planks, which make up the floor system. This condition poses a potential danger not only to the building occupants on the main floor level, but also maintenance staff in the lower level, where the filter plant is located. This condition requires immediate attention. The long-term solution would include the addition of structural supports to increase the load-carrying capacity of the structure. After all building elements are repaired and brought back to their original load-carrying capacity, the building's capacity will be half of what current Codes would require for a building of this use group (Assembly).

Given these findings, coupled with the need to make significant improvements to the pool mechanical systems, not evaluated in this report but observed during the fieldwork, the

II. EXECUTIVE SUMMARY

Town has a variety of options for the short and long-term planning of this facility, including, but not necessarily limited to the following.

OPTION A

This option includes complete removal of the top of the pool walls, including skimmers and copings, and the installation of a new perimeter stainless steel gutter. It also includes the elimination of the diving hopper by filling the deep end and installing a new slab. This affords the opportunity to install new main drains, and eliminates the currently non-conforming diving hopper. It should be noted that the size of the existing diving area, if reduced to five foot depth, is adequate for the installation of a water-slide feature, to replace the diving feature lost by reduction in pool depth, but would limit the deep-water training currently performed at the facility. If deep water is maintained for program purposes, the removal of the diving board is recommended, as the hopper geometry is non-compliant.

A new surge tank and piping is also required in this scenario, and virtually all other below grade piping would be eliminated. Since the installation of the gutter would constitute a long-term solution, it would be necessary to implement various concrete pool shell repairs to ensure the pool will be serviceable for an extended period of time. The plaster finish would also need to be completely removed and replaced.

Complete removal and replacement of the decks, as well as approximately two to three feet of fill material below the decks would also likely be recommended. New free draining fill, drainage pipe and concrete decks would be installed.

This option would likely extend the life of the pool another 12-15 years and needs to be evaluated in the context of the relatively high cost of the gutter system, for a relatively short life.

OPTION B

A less costly variation of Option A is the installation of skimmers and weirs in lieu of the gutter. A significant disadvantage to this approach is that underground pool piping would remain part of the facility. It should also be noted that skimmers and weirs are far less effective at removing surface water contaminants and recirculating pool water than the gutter system. The only advantage is initial cost, as the gutter and the construction of a concrete surge tank would not be required.

With significant on-going maintenance, this option would likely provide an 8-10 year life, provided underground piping does not fail.

II. EXECUTIVE SUMMARY

OPTION C

This option would constitute the minimum repair and includes the patching of the existing pool, replacement or removal of loose plaster and a new pool coating. This solution is short-term (3-5 years), but may bridge the gap between currently available funds and a capital expenditure.

OPTION D

A long-term solution to meeting the needs of the community may be to construct a new facility. As there appears to be ample space adjacent to the existing pool or in other areas within the park, it is likely that a new facility could be constructed while the existing facility is operating, and as such there will be no time where aquatic programs are interrupted. Variations of this scenario are as follows:

1. Construct new pool and bathhouse and demolish the existing pool. Existing bathhouse could be demolished, or reused for a non-assembly occupancy.
2. Renovate existing pool and construct a new bathhouse. Existing bathhouse could be demolished, or reused for a non-assembly occupancy. Since a new bathhouse would have a greater life expectancy than the renovated pool, there should be a master plan for the construction of a new pool in the future.

While these options were not budgeted during the course of this structural analysis, recent experience with similar facilities would indicate that the potential construction costs might range from approximately $150,000 for the minimum required work (Option C) to in excess of $1.5 Million, depending on the program features, for a new facility (Option D). Options A and B, which represent a middle ground in terms of cost and longevity, would likely be in the range of $1 Million dollars to $500,000, respectively. In any scheme that reuses the bathhouse, additional funds should be allocated for both short and long-term repairs and upgrades to the building. Maintenance and operating costs should also be considered when deciding how to proceed, as continued use of the existing pool and bathhouse will result in increased annual maintenance and operating costs.

As a next step for the Town of Vernon, we recommend that a Master Plan of aquatic programs and facilities be performed, so that the Town can better assess the value of investing dollars into the current pool and bathhouse, against the value of a new facility.

III. Structural Conditions Assessment Survey and Report

Horowitz Pool and Bathhouse
Henry Park
Vernon, Connecticut

Structural Condition Assessment Survey and Report

December 18, 2006

Prepared By:
Gibble Norden Champion Brown Consulting Engineers, Inc.
Old Saybrook, Connecticut

Prepared For:
TLB Architecture, LLC
Chester, Connecticut

GNCB
Gibble Norden Champion Brown
Consulting Engineers, Inc.

December 18, 2006

Michael P. Fortuna, AIA
Principal
TLB Architecture, LLC
92 West Main Street
Chester, Connecticut 06412

Re: Horowitz Pool and Bathhouse
Henry Park
Vernon, Connecticut

Dear Michael:

Enclosed please find the accompanying report of our structural condition survey, documentation and recommendations. Our work was undertaken in accordance with our proposal, as authorized. We have analyzed our field observations and data and present it here for your review.

Section VI. of our report contains our Structural Observations and Section VII. summarizes our Conclusions and Recommendations. Please call if you need any additional information or have any questions.

Very truly yours,

Charles C. Brown, P.E.
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GNCB

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I. INTRODUCTION:

TLB Architecture, LLC (TLBA) retained Gibble Norden Champion Brown Consulting Engineers, Inc. (GNCB) to conduct a structural condition assessment survey and report of Horowitz Pool and Bathhouse. The pool facility is located in, and owned by, the Town of Vernon, Connecticut. **See Drawing 1: "Project Locus"** for the site location.

II. PURPOSE:

The investigation work was undertaken at the request of the Owner for the purpose of evaluating the current condition of the existing seasonal, municipal recreational in-ground pool and bathhouse building. The Owner's maintenance personnel reported that in recent years, the pool has required frequent repairs to keep it in operation. They have also noted wet conditions in the grass area at the base of the north slope near the pool. Concrete joists that support the first floor, in the building show visual deterioration.

Based upon survey findings, this report summarizes GNCB's assessment of the extent of deteriorated conditions and overall condition. The report makes recommendations for proposed repair, and develops conclusions as to the serviceable life of the pool and bathhouse building, with the intent to assist the Owner to plan for maintenance of the existing pool and building structures and/or to plan for future replacement construction.

III. SCOPE OF WORK:

GNCB developed an investigation program to provide information regarding the structure of the pool walls and slab, condition of the concrete and reinforcing, together with the bathhouse building structure.

To achieve the objectives described above, GNCB planned and completed the following scope of work:

A. POOL:

- Make a site visit to investigate the pool surface for cracks, irregularities and visible signs of distress. Sound out the pool's walls and slab with a mallet, to identify areas of delaminations. Document findings with digital photographs and annotation recorded on base drawings. Base drawings consist of prints of existing available drawings prepared by R.K. White associates, 445 West Queen St., Southington, CT dated February, 1989.

- Retain the services of Independent Materials Testing Laboratory, (ITML), to complete concrete core and chloride testing of the existing pool walls and floor slab to provide test data necessary to further determine current condition and extent of deterioration of the structure.

- Coordinate, monitor and evaluate seven concrete core borings through the pool walls and slab for compressive strength analysis.

- Coordinate, monitor and evaluate four chloride tests to determine potential for reinforcing bar corrosion.

- Coordinate and evaluate exploration to expose the location of existing reinforcing bars.

- Develop, monitor and evaluate a program of seven geotechnical test borings and one groundwater observation well.

B. BATHHOUSE:

- Visually investigate and document the bathhouse building structure and condition to note representative structural framing sizes and make structural analysis of the floor and roof framing capacity to carry loads.

- No existing drawings are known to be available, to determine if the building was constructed according to plans, or to use as a base drawing for field investigation. Accordingly, GNCB documented bathhouse survey findings with digital photographs, field notes and hand drawn sketches. GNCB prepared hard-lined AutoCAD framing drawings to include in this report. **(See Drawings 4 and 5)**.

C. REPORT:

- Prepare a structural engineering/geotechnical engineering report to summarize the survey work completed and formulate conclusions for the Owner's use to consider in maintaining the facility and/or for planning future construction to replace the structure(s).

IV. PROJECT DESCRIPTION:

The existing L-shaped gunite pool at Henry Park is believed to have been constructed in 1990 to replace an earlier 1953's pool. The original pool was built at the time when the flat roof brick veneer bathhouse building was constructed, 1953. **(See Photos P-1 and P-2)**. The gunite material from which the pool is constructed, is a pneumatically spray-applied concrete that can achieve high strength.

The pool is oriented as shown on **Drawing 2- "Pool Plan".** The approximate location of the original 1953 pool, based upon available information, is also shown. Town personnel had drained the pool at the end of the recreation season and prior to site visits for GNCB to review the condition of the pool walls and slab, obtain concrete core, chloride and soil samples. The 3.5 feet depth shallow end is approximately 60 feet wide and slopes down for a length of about 75 feet to the east, to 5 feet deep.

The south east leg of the pool narrows to a width of approximately 22 feet wide and slopes down to a maximum depth of 9.7 feet at the diving board end. A one-level concrete deck surrounds the pool perimeter. The entire pool area is enclosed by a chain link fence. There is access down into the pool with steps inset into the side of the pool wall.

The 2-level flat-roof bathhouse, with 1 story above grade and a basement below grade, is constructed south of the pool area. The pool deck leads directly to the upper floor level of the bathhouse. The bathhouse building dimensions are 64 feet long by 30 feet wide. The building contains changing areas and showers at the upper level at grade. The lower level contains mechanical equipment to service the pool and building. The building lower level is 10.1 feet below the finish upper level (note: for purposes of this report, the finished upper building level and concrete pool deck, is assumed to be at El. 100.)

Notable conditions and areas of the pool were photographed to document existing conditions and to provide information for later use to identify items of structural concern, and to compile recommendations in this report. Digital photographs of representative conditions are located in **Appendix A: Photo Documentation** at the end of this report.

V. SUBSURFACE CONDITIONS:

GNCB prepared a subsurface exploration program consisting of seven test borings (B-101 through B-107). GNCB monitored the drilling and located the test borings in the field by taping from corners of the existing pool. **Drawing 2** shows the approximate locations of each test boring. Logs of test borings, prepared by the Contractor and reviewed by GNCB, are included in **Appendix B. Table 1** summarizes the test boring data.

General Borings, Inc. of Prospect, Connecticut, under contract to GNCB, drilled the test borings on October 3, 2006, using a drilling unit mounted on the frame of a rubber tired backhoe. Each borehole was advanced with 3-1/4 inch diameter hollow stem augers. Near continuous standard split spoon samples were obtained in accordance with ASTM D1586; at each test boring the material directly below the concrete deck was sampled by hand. The borings terminated at depths ranging from 6.5 to 14.0 feet below the existing concrete pool deck surface. Except for B-105 which terminated in a man-placed fill, the test borings terminated within natural granular soils or weathered bedrock. Rock core samples were not obtained to determine if test boring refusal represented the top of bedrock.

Subsurface soils revealed by the test borings consist of a surface man-placed fill underlain by natural sand, glacial till, and decomposed bedrock. These conditions are described below, progressing downward from ground surface:

MAN-PLACED FILL: The concrete surface through which the test borings were drilled ranged from 4 to 5.5 in. thick; the concrete was generally a sound material, however the bottom 1 to 1.5 in. of concrete at B-106 and B-107 was easily broken and of poor quality. The surface man-placed fill extended from 2.1 to 9.5 ft. below the concrete deck; B-105 terminated within the fill at a depth of 8.0 ft. below ground. The man-placed fill generally consisted of a red-brown coarse to fine sand, little silt to a fine sand, with varying amounts of silt and gravel.

Samples obtained from test boring B-105 revealed pieces of concrete; we understand that this boring is located within an area where demolition debris from the original 1953 pool was placed.

Grain size analysis tests **(refer to Appendix C for graphic plots)** were completed on near surface soil samples of the fill obtained at B-103, B-104, and B-106. These tests which were, completed by Angus MacDonald/Gary Sharpe of Old Saybrook, Connecticut in general conformance of ASTM D422, indicated that the fill material directly below the concrete deck ranges from a brown coarse to fine sand, little silt (about 6 in. thick) underlain by a red-brown silty fine sand, trace sand (up to about 16 in. thick). These materials, which have a percent finer by weight passing the No. 200 sieve form 10 to 30 percent, are considered a frost susceptible material.

The laboratory tests also indicated that this upper fill had a water content that ranged from about 5 to 12 percent, considered to be a typical range for these in-place soils; none of the man-placed fill samples were noted to be saturated or to have an excessive amount of moisture.

SAND: At B-103, B-106, and B-107, a natural inorganic sand consisting of red-brown medium to fine sand, little silt, to a brown coarse to fine sand (at B-107), was encountered below the fill. The test borings terminated from 1 to 3 ft. into this deposit, however B-103 penetrated through the deposit, indicating it to be 3 ft. thick.

GLACIAL TILL: Below the man-placed fill (at B-101, B-102 and B-104), or the natural sand (at B-103), the test borings encountered a heterogeneous material, known locally as glacial till. The till, which typically consisted of a red-brown silty fine sand, trace gravel, was less than 3 ft. thick.

DECOMPOSED BEDROCK: Test borings B-101 through B-104 terminated from 1.0 to 6.0 ft. into decomposed bedrock. The bedrock, which generally consisted of schist, was easily sampled with the standard split spoon sampler.

A groundwater observation well was installed at the completion of B-103. The well extended to a depth of 14 ft. below ground surface; the bottom 5 ft. of the well was slotted. Five hours after well installation, groundwater was measured at the well at a depth of 10.9 ft., however on October 31, 2006, the water level was measured at a depth of 12.3 ft. Groundwater levels however fluctuate due to precipitation, season, and construction activity in the area. As such, the water level at the site before or after any construction may vary from the water levels made at the observation well.

VI. STRUCTURAL INVESTIGATION AND OBSERVATIONS:

During the survey, GNCB noted findings of the pool and bathhouse construction and conditions that are discussed as follows:

A. POOL:

To initiate the survey, GNCB spoke with TLBA and municipal personnel to discuss general concerns and problems with the pool and made overall observation to visually investigate the pool walls and floor surface. **(See Photo P-3)**. Beginning at the shallow end of the pool at the southwest corner and advancing clockwise, the turquoise painted plaster surface appears to have been patched along half the north wall where paint was peeling. The walls appear to be in satisfactory condition for a pool constructed about 16 years ago. The walls are darker along the waterline and fade with depth to the floor. The floor is scuffed from use, particularly at either end of the swimming lanes.

GNCB "sounded" the pool walls to listen for hollow pockets that indicate areas of subsurface delamination or voids. This was done by using a hammer to strike the wall at 2 feet intervals along the wall. The striking was done in a vertical line while listening for a change in tone of the concrete. **(See Drawing 3: Results of Wall Soundings)** for a graphic representation of results. The wall soundings results are described as follows:

Along the majority of the length of the west wall, at about 1 foot below the waterline, the concrete consistently sounded hollow. At 40 feet from the southwest corner, water was leaking out of the wall. At the northwest corner, the hollow sound dropped down to 2 feet for a 4 feet long section.

Along the north wall, there was a hollow pocket area at the inset stairs. The north wall sounded solid until approaching the pool mid-length where there was a water leak 8-inches down from the waterline. This is the beginning of the patched area noted above. From mid-length to the northeast corner, hollow sound was detected about 8 to 12-inches below the waterline.

Turning the corner to the east wall, the wall is patched and sounds hollow to a 12-inch depth below the waterline, extending about 30 feet. In the next 20-feet wall length, the central east wall portion, the wall rang hollow extending down about 2 feet. After that the hollow sound disappeared and the wall seemed to be in good condition. At the transition between the level 5 feet deep section to the 9.7-feet diving end, there is a pocket of hollow sound.

The east wall at the deep end, had a 3 to 4-inch band of hollow sound near the waterline. The narrow hollow sound band continues around to the deep diving board end, south wall. At the deep diving board end, west wall, the hollow sound drops down to 2-1/2 feet down below the waterline. At the south wall where the pool depth begins to return to the shallow starting point depth, the hollow sound remains constant at 12 to 16-inches below the waterline, gradually decreasing to only 6-inches below the waterline. Similarly, the pool floor slab was sounded. Only a small floor area about 1-foot in diameter, at the center of pool, sounded suspect.

Concurrent with sounding the walls, GNCB monitored IMTL's concrete core and chloride sampling. **(See Appendix D: IMTL Pool Plan and Photo P-4)**. The plan shows locations where IMTL cored through the concrete pool walls and slab at GNCB's direction. The purpose of the coring was to obtain samples for testing to determine concrete compressive strength. The core sample compressive strength ranged from 2,480 to 5,600 psi and cores were free of obvious defects. The cores also document concrete thickness at various locations within the pool and we were able to observe the quality of concrete retrieved.

Chloride samples are analyzed to determine the chloride content in the concrete. Low levels of chloride were detected. The levels are below the amount allowed by the American Concrete Institute ACI 222. If chloride levels were greater, in combination with air and water, reinforcing steel would be subject to an environment conducive for corrosion to occur.

The results of material testing can be found in IMTL's report included in **Appendix D**. After the floor slab core at the deep end of the pool was taken, ground water released into the pool.

Also during GNCB's presence and direction, IMTL located size and/or spacing of steel reinforcing embedded in the concrete using an R-meter. During this investigation, the R-meter was used initially to locate reinforcing for the exploration windows to be cut. It was not necessary to cut exploratory windows to view rebar as the steel reinforcement was noted to be in good condition in the vicinity where cores were made.

B. BATHHOUSE:

Below grade, the bathhouse building is constructed of concrete foundation walls and a concrete floor slab. Foundation walls appear to be plumb and not cracked, although the north wall appears to have retained moisture and paint is peeling. **(See Photo P-5 and Drawings 4 and 5)**. Maintenance personnel indicated to GNCB that during periods of heavy rain, water enters the basement area at the base of the wall; water drains to a sump and drainage outlets. The floor slab has minor cracks and stains, yet continues to serve its function. **(See Photo P-6)**.

Steel columns, 5-inches in diameter, support the first floor framing. The columns are spaced along the length of the building, up to 13-feet on center to support the steel beam. The column located closest to mechanical equipment has corroded at the base. **(See Photo P-7)**. The column cap plates are bolted to the underside of the centerline steel beam. **(See Photo P-8)**. The painted wide flange steel beam is 8-inches wide by 8-1/8-inches deep and spans east/west. The flange thickness is 7/16-inches. This corresponds most closely to a W8x31 or W8x35 shape.

Pre-cast concrete joists span north/south. The joist ends are supported by the steel beam at the interior and the foundation wall at the exterior perimeter. The joists are post-World War II, AASHTO shaped, measuring 3-1/2-inches wide by 8-1/4-inches deep. See **Drawings 4 and 5** for the floor framing and AASHTO shape section. The joists are spaced at 3-feet on center. In the center portion of the building, the pairs of joists are offset from each other.

At the east end, the joists align across from each other where they connect to the beam. The connection to the beam consists of a steel angle bolted through the joist. The angle was not welded to the steel beam to complete the connection, but the joists bear onto the bottom flange of the steel beam. **(See Photo P-9)**.

The steel reinforcing was exposed where concrete has spalled off. This revealed 2-No. 6 bars to reinforce the bottom of the joist and 2 No. 5 bars at the top. Steel tie rods run perpendicular to the joists at midspan for joist bridging. **(See Photo P-10)**.

At the basement ceiling level, the underside of the main level concrete floor is exposed. The 2-inch thick pre-cast floor planks are 16-inches wide and span perpendicular to the joists that support them. The floor planks are reinforced with steel strands. There are 5 wires in each plank, 1/8-inches in diameter. The main floor slab has experienced water intrusion, particularly in areas where there are showers and/or toilets above. Water leaking through the floor has caused the underside of the concrete floor plank to spall off, exposing steel reinforcing. Moisture corrodes the exposed steel reinforcing. The concrete has spalled on the north side enough to require installation of netting to catch the falling concrete. **(See Photo P-11).**

Above grade, the walls are constructed of 4-inch concrete masonry units finished with brick veneer, making the wall 8-inches thick, nominal. The walls support concrete roof beams that span north/south. The roof beams are rectangular shaped, 5-1/4-inches wide by 14-inches deep spaced at 5-feet on center. The beams overhang the masonry walls by 2-1/2 feet. **(See Photos P-12 and P-13).** The roof beams support 23-inch wide concrete roof planks, 2-inches thick, nominal. The planks have tongue and groove edges. The strand reinforcing at the bottom of the plank has minimal concrete cover. Just as the level below, there are tie rods at midspan.

At the interior, there is a central lobby area. Dressing rooms and shower rooms are on either side of the lobby where water leaks through the floor. **(See Photos P-14, P-15, P-16).**

VII. CONCLUSIONS AND RECOMMENDATIONS:

A. POOL:

The existing pool, in its present condition, appears to be functional and should continue to be serviceable as long as maintenance repairs are made on a regular basis and as necessary. The investigation findings and analysis of test results determined that reinforcing was in good condition and the concrete strengths for a pool of this type of construction seem reasonable. Based on the findings of these items, we have determined the pool structure is adequate to support the imposed loads.

However, there are some areas of concern that should be evaluated to determine if corrections should be made, or if the present condition will be left. There are hollow sounding pockets that indicate delamination described in **Section VI** above. Water seems to be present behind the pool walls in some areas. We believe this is surface runoff that is not properly draining away from the pool, since groundwater is at, or below a depth of 10.9 feet.

The present pool, if left as is, will deteriorate. Our estimation is that the present pool will last 3 to 5 years if left in its present state with continued maintenance with the present plan. If there is interest in prolonging the life of the pool and reducing present maintenance costs we recommend the following: This repair will also remove some of the frost susceptible soil material which currently exists below the concrete deck.

1) Remove the concrete deck around the pool.

2) Cut away the top of the pool wall which shows signs of delamination. Removing 1'-0" of the top of the pool wall will address most of the areas that are suspect based upon the soundings.

3) Replace the top of the wall with new concrete and possibly a new gutter system.

4) Within the area of new concrete wall, replace the material behind the pool walls with a free draining sand and gravel, or

crushed stone, and a perimeter drainage system to eliminate the water behind the tops of the pool walls.

5) Replace concrete pool deck slabs placed on a well compacted free draining fill to avoid future settlement.

6) Install a drainage system on site which will direct any run-off water from the site, away from the pool. This will also aid in directing water away from the bathhouse building.

Provided this work is performed in accordance with specified documents, prepared by a design professional, we believe this could extend the life of the pool from between 10 to 15 years. We suggest the cost of this work be evaluated in relation to the number of additional years of use anticipated and in relation to the overall life expectancy of the original pool.

B. BATHHOUSE:

The existing bathhouse is functional in its present condition for certain user groups. During the on-site investigation, there were areas in the building that were observed to be in need of repair. Repairs could be made to restore the building to its original ability to support the loads imposed on the building structure.

GNCB analyzed the existing structure for gravity loads and determined that the live load capacity of the main level floor framing is 50 pounds per square feet (psf). This is based upon the beam and joist size, spacing and span and assuming acceptable condition of the members. The Connecticut Building Code requires a place of assembly such as a bathhouse, to be designed for a live load of 100 psf. The existing capacity is well below this requirement.

In addition to the repairs to the structure and the deficient loading requirements, there are reports of water entering the building through the foundation. Presently, this issue is being dealt with by use of a sump pump to eject water. This condition needs to be corrected to prevent water from entering the building.

There are a number of options to consider with respect to the existing bathhouse, as follows:

OPTION 1:

- Repair the areas where concrete is spalling from the planks and joists. We recommend contacting a concrete repair specialist, who could specify the proper product and perform the repairs. This could be incorporated into the specifications for the project and performed under the direction of the Architect.
- Provide site drainage to direct water away from the building.
- Provide a drainage system at the perimeter of the building.
- Damp proof the existing foundation wall.
- Maintain the existing sump pump in the building for any water that does enter in spite of the repairs.
- Repair the leaks from above that are seeping through the floor and damaging the concrete floor plank and joist system.

Option 1 restores the building to its original condition with regard to load carrying capacity and corrects water intrusion and migration into and within the building. Once Option 1 repairs are made, the building could be used for another use that only requires a live load of 50 psf.

OPTION 2:

- Provide the above listed repairs to the structure, add drainage systems and repair water leaks.
- Reinforce the existing structure to achieve a live load capacity of 100 psf for assembly loading. This could be achieved by adding additional

  lines of support for the joists, by adding columns and reinforcing the existing steel beam.

OPTION 3:

- Provide a new bathhouse building that meets the requirements of the present Building Code. Either demolish or abandon the existing bathhouse or provide minimal repairs and change the use of the building.

In summary, GNCB recommends the following:

- The Town of Vernon to review this report and consider the options to either repair or replace the pool and bathhouse building at Henry Park.
- Prior to any actual construction work, consult with the Architect and Engineer design professionals to discuss how to proceed.
- Obtain a preliminary budget cost estimate for repairs from a qualified concrete repair contractor, based upon recommendations contained in this report.
- Develop preliminary plans with the design professionals and proceed to produce biddable documents for construction work to be completed by a contractor.

VIII. REPORT LIMITATIONS:

This report is based upon visual observations, limited sampling data, and test boring results. It is intended as an assessment of the pool and bathhouse structure elements as noted. This report is not intended to serve as construction documents for recommended repair work, we recommend that full documents, including specifications, be prepared prior to any actual repair work.

GNCB

TABLE I

SUMMARY OF TEST BORINGS

INVESTIGATION OF HOROWITZ POOL
VERNON, CONNECTICUT

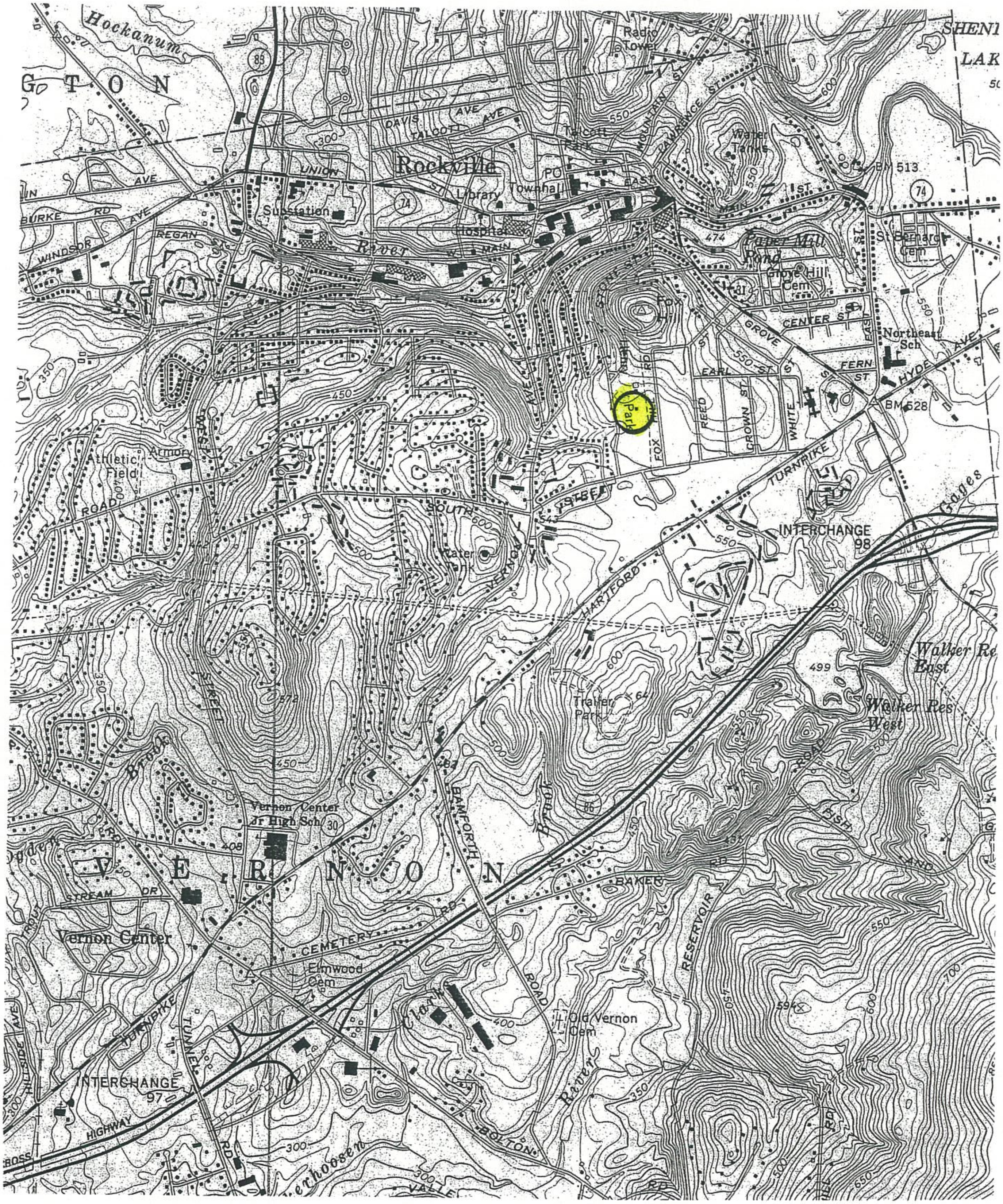
TEST BORING NO.	TOTAL DEPTH (FT.)	APPROX. ELEV. GROUND SURFACE (FT.)	THICKNESS STRATA (FT.)					ELEV. TOP NATURAL SOIL (FT.)
			CONCRETE	MAN-PLACED FILL	SAND	GLACIAL TILL	DEC . ROCK	
B-101	10.5	100.0	0.3	5.7	-	3.0	1.5+	94.0
B-102	9.0	100.0	0.5	6.0	-	1.5	1.0+	93.5
B-103/OW	14.0	100.0	0.3	7.7	3.0	3.0+	6.0+	92.0
B-104	6.5	100.0	0.4	2.1	-	-	4.0+	97.5
B-105	8.0	100.0	0.4	7.6+	-	-	-	Below 92.0
B-106	11.0	100.0	0.4	7.6	3.0+	-	-	92.0
B-107	11.0	100.0	0.5	9.5	1.0+	-	-	90.0

NOTES

1. Refer to Drawing 2 for locations of test borings.

2. Elevations are in feet and refer to an assumed El. 100 for top of pool deck.

3. GNCB located test borings in the field based on tape measurement from the existing pool and pool deck features.



PROJECT NO. 06109.09

SITE COORDINATES: 41° 51' 28" N 72° 26' 47" W

U.S.G.S QUADRANGLE: ROCKVILLE, CT

GNCB

Gibble Norden Champion Brown Consulting Engineers, Inc.

130 ELM STREET
POST OFFICE BOX 802
OLD SAYBROOK
CONNECTICUT 06475
PHONE: 860 388 1224
FAX: 860 388 4613
GNCBENGINEERS.COM

HOROWITZ POOL
VERNON, CONNECTICUT

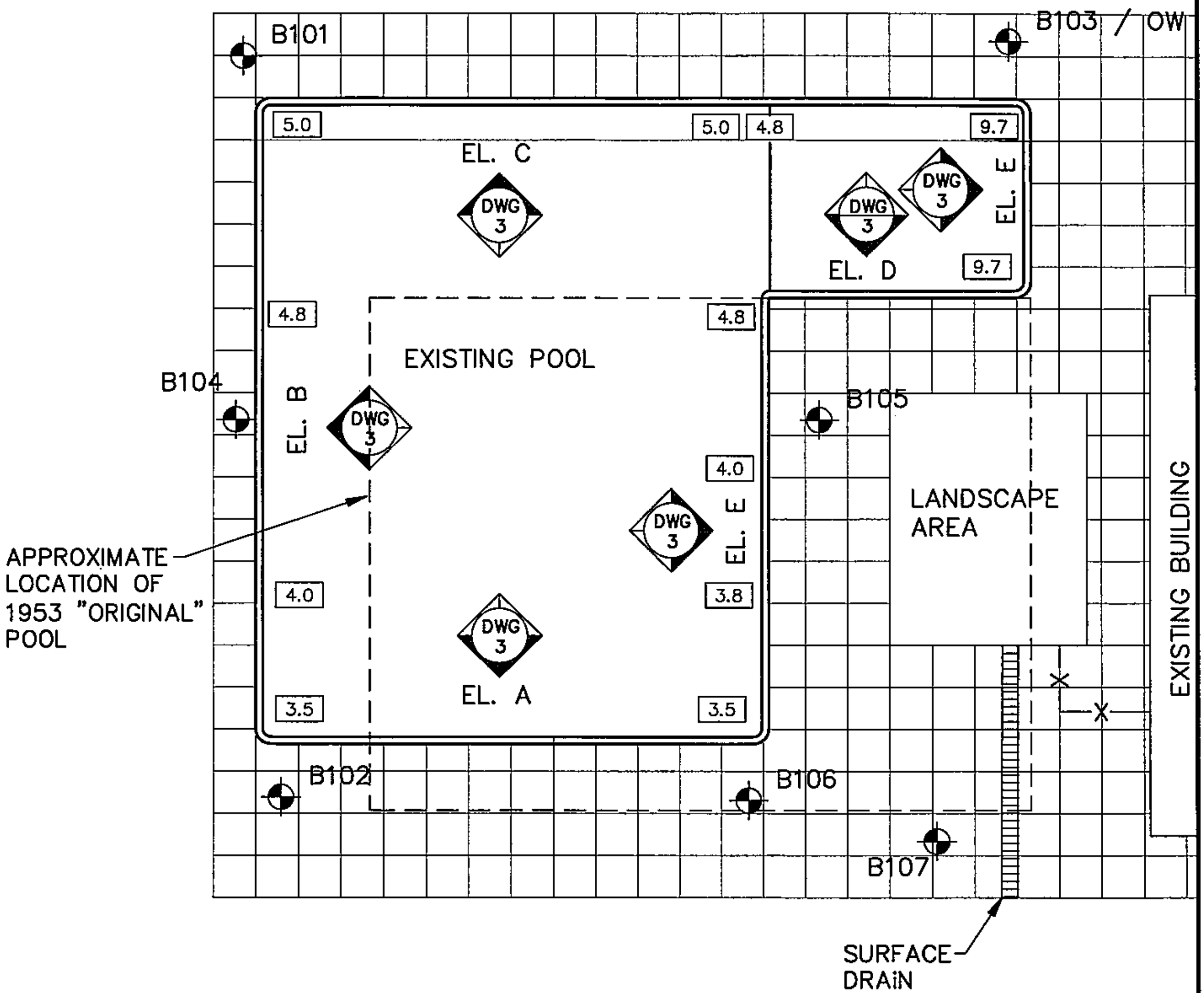
PROJECT LOCUS

APPROX SCALE 1"=2000'

OCTOBER 2006

P:\+PROJECTS\+Active Projects\2006 Projects\06109 Horowitz Pool\CAD\1 Current\06109.dwg - 10/16/06 - 10:46 AM

DRAWING 1



LEGEND:

B–3 LOCATION OF TEST BORING DRILLED ON OCTOBER 3, 2006

O.W. OBSERVATION WELL INSTALLED IN TEST BORING

5.0 POOL WATER DEPTH, (FEET)

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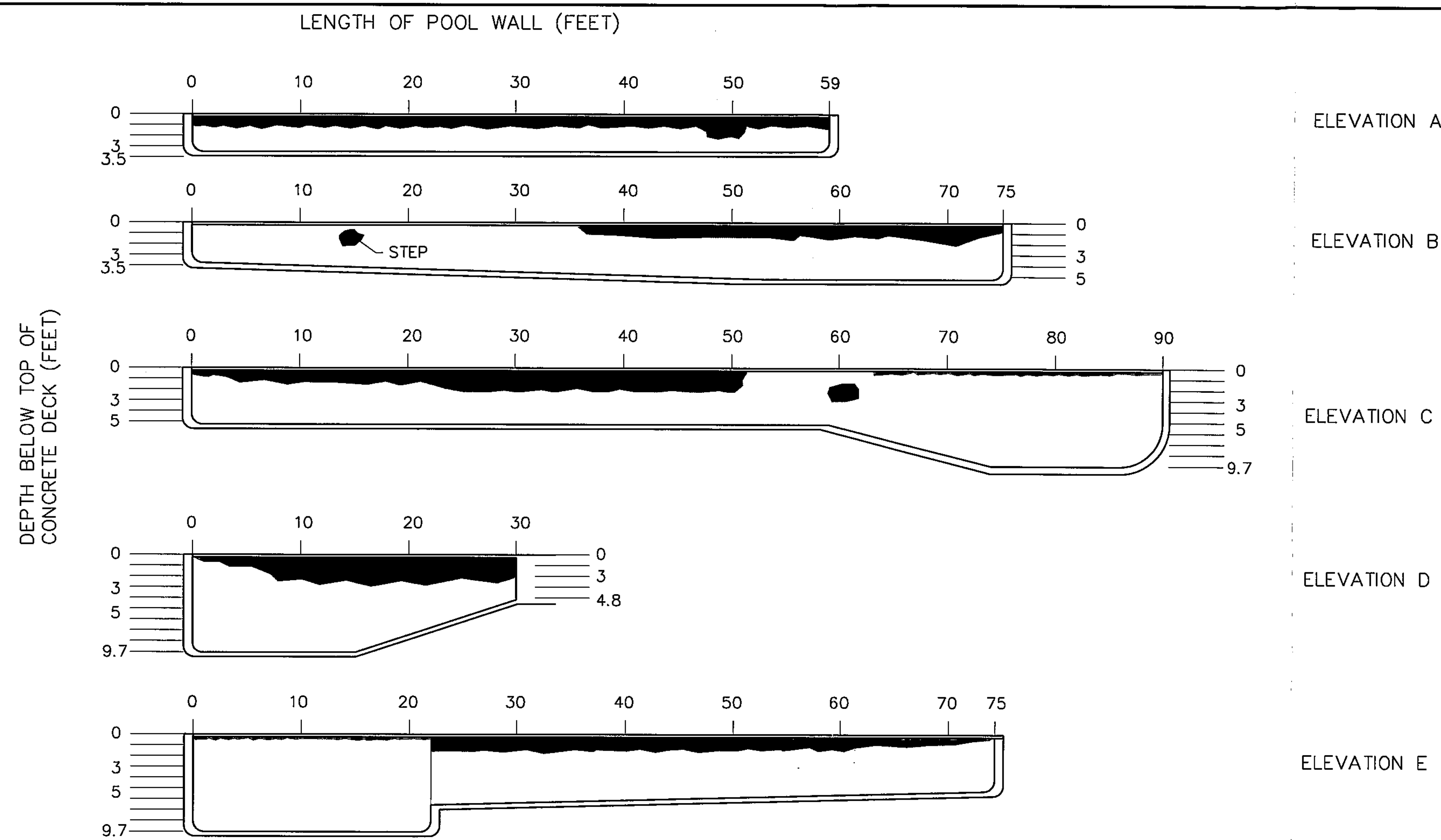
HOROWITZ POOL
VERNON, CONNECTICUT
POOL PLAN

SCALE: 1 IN = 20 FT

OCT. 2006



NOTES:
1. SEE DRAWING 2 FOR KEY PLAN FOR ELEVATION IDENTIFICATION.
2. HATCHING SHOWN IS APPROXIMATE AREA WHERE WALLS SOUNDED HOLLOW.

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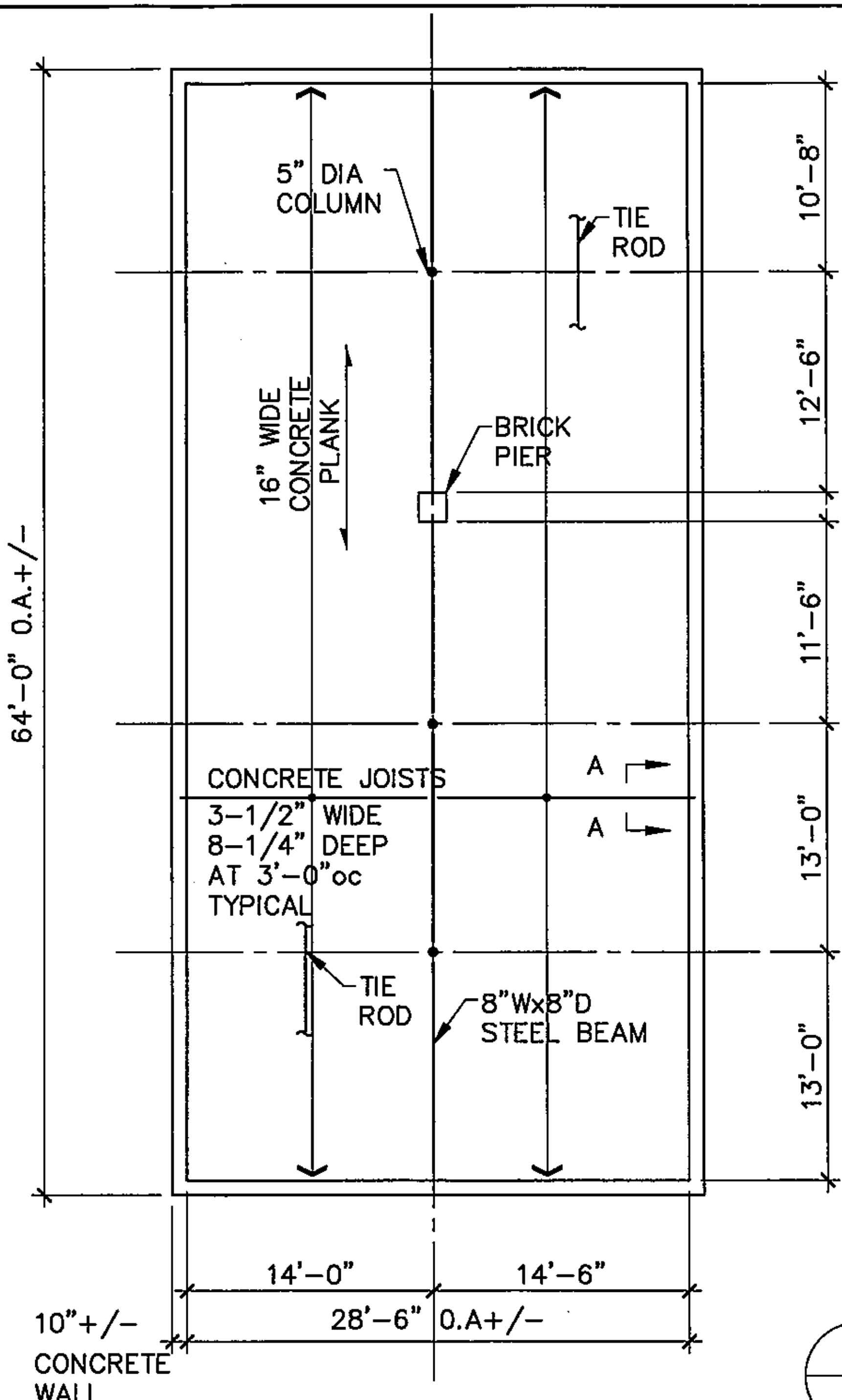
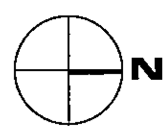
RESULTS OF
WALL SOUNDINGS
HOROWITZ POOL
VERNON, CONNECTICUT

SCALE: 1 IN = 20 FT
OCTOBER 2006
DRAWING 3

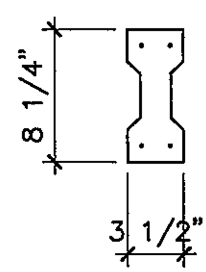


BASEMENT PLAN WITH FIRST FLOOR FRAMING PLAN

SCALE: 3/32"=1'-0"



PROJECT NORTH



PRECAST CONCRETE JOIST SECTION A-A

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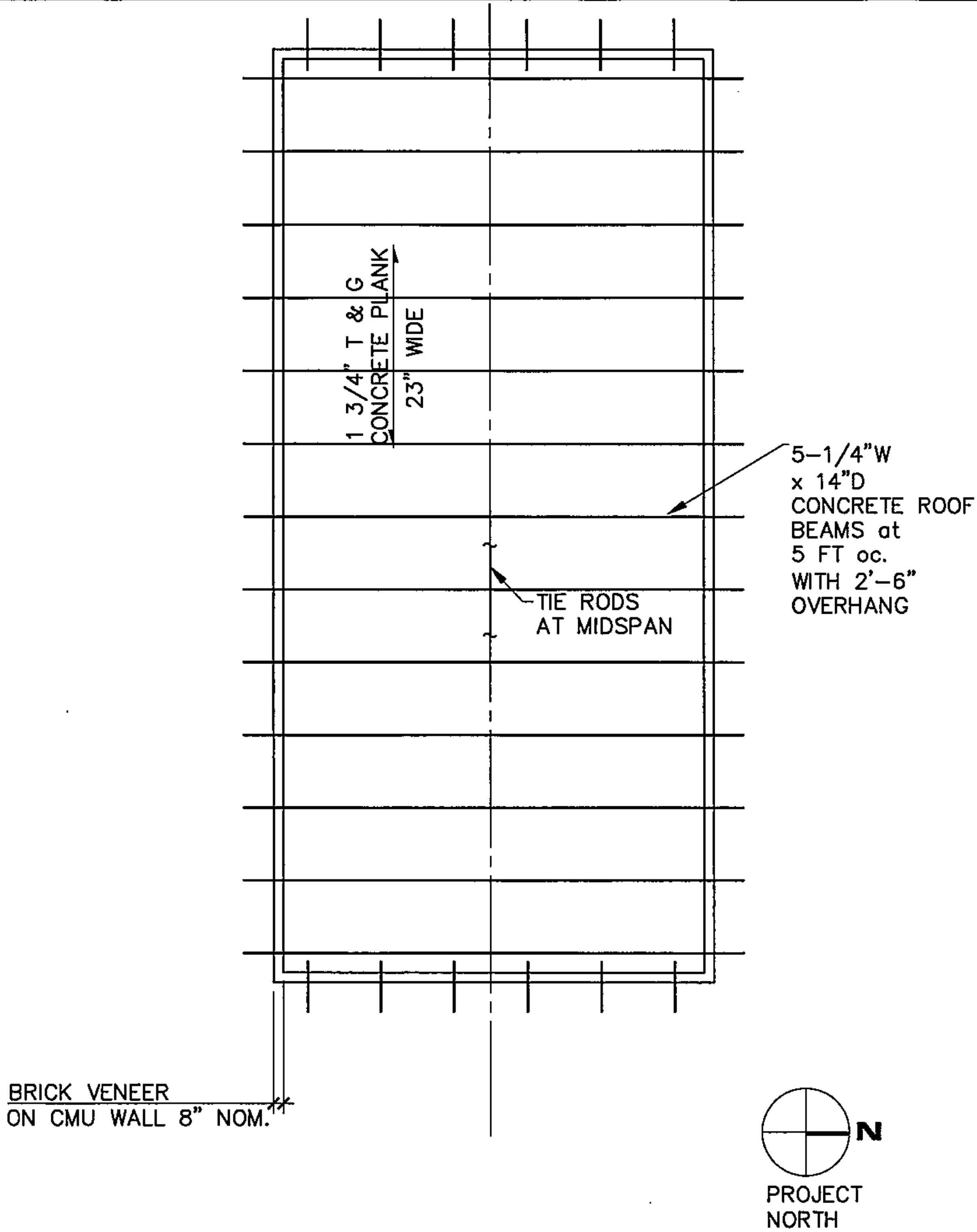
HOROWITZ POOL BATHHOUSE VERNON, CONNECTICUT 06109	DRAWING REF:	
	SCALE: 3/32"=1'-0"	
	DATE: 11/6/06	SHEET
BASEMENT PLAN WITH FIRST FLOOR FRAMING	DRW: GSG	DWG. 4
	CHK: RB	



ROOF FRAMING PLAN

SCALE: 3/32"=1'-0"

GNCB

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HOROWITZ POOL BATHHOUSE
VERNON, CONNECTICUT

06109

ROOF FRAMING PLAN

DRAWING REF:

SCALE: 3/32"=1'-0"

DATE: 11/6/06

DRW: GSG

CHK: RB

SHEET

DWG. 5

Appendix A: Photo Documentation

Photos P-1 to P-16

Photo P-1: Existing Pool and Surrounding Site

Photo P-2: Existing Bathhouse Building

Photo P-3: Exposed Pool Walls and Floor

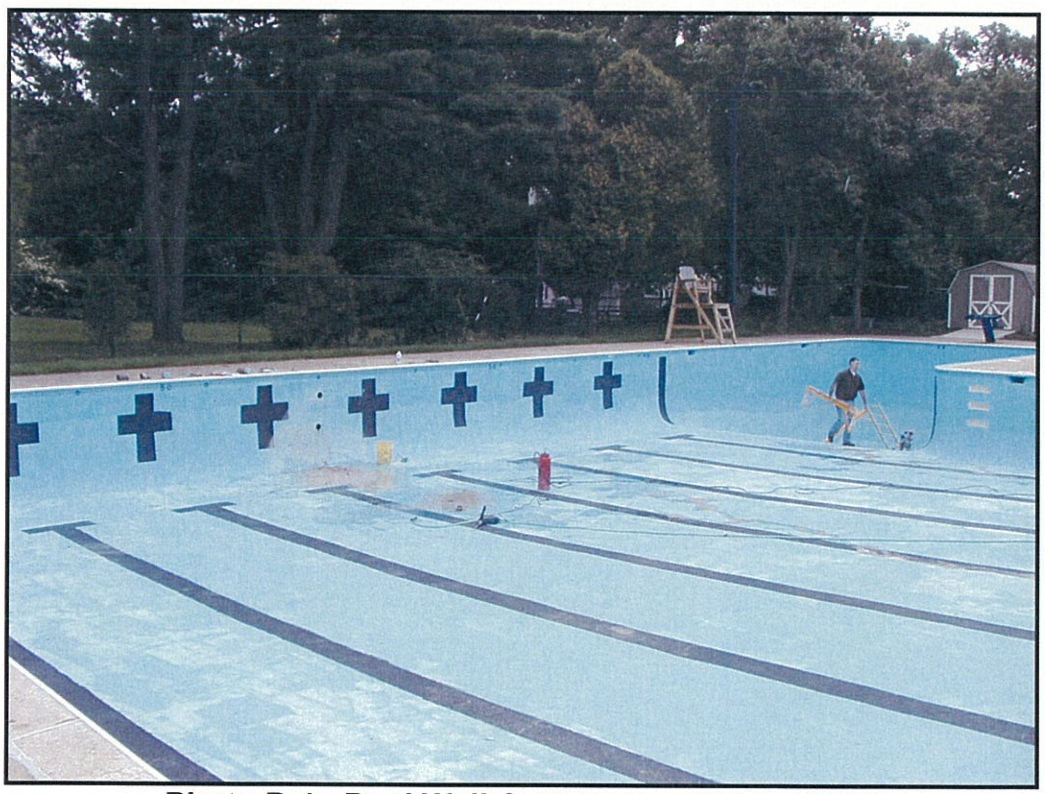


Photo P-4: Pool Wall Core Boring At East Wall

Photo P-5: Bathhouse Basement North Wall

Photo P-6: Bathhouse Concrete Floor Slab

Photo P-7: Bathhouse Column Corrosion

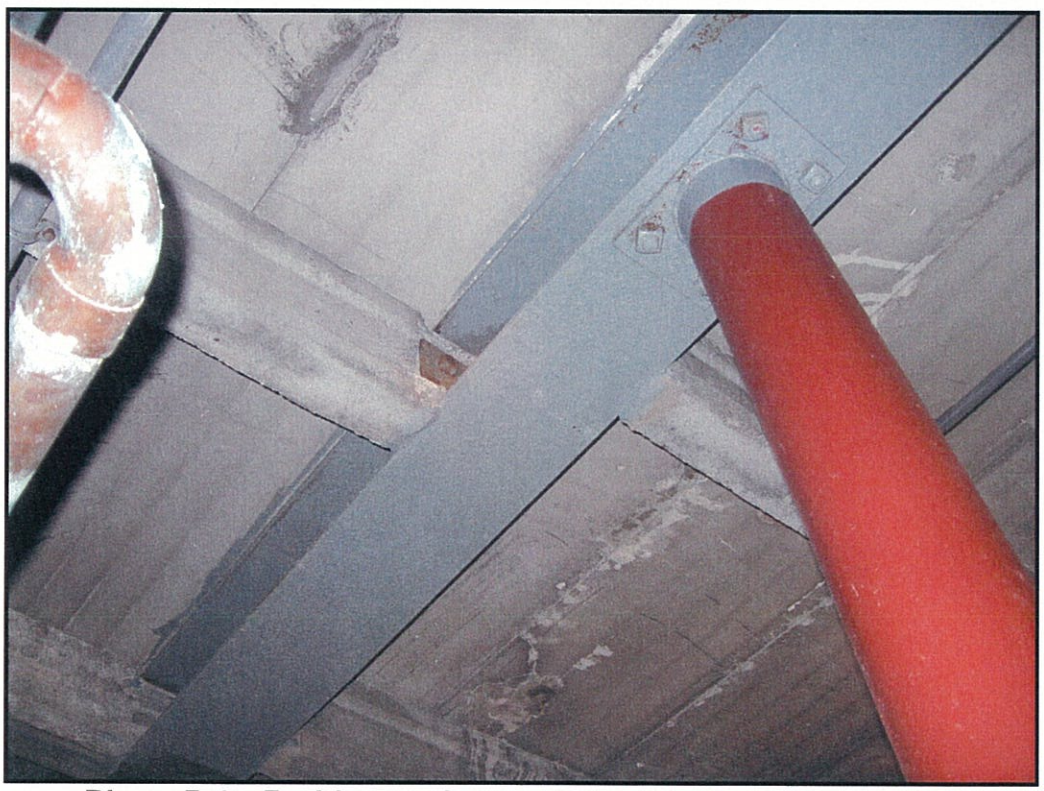


Photo P-8: Bathhouse Steel Beam Supported on Column


Photo P-9: Bathhouse Concrete Floor Joist Reinforcement Exposed


Photo P-10: Bathhouse Floor Framing Structure

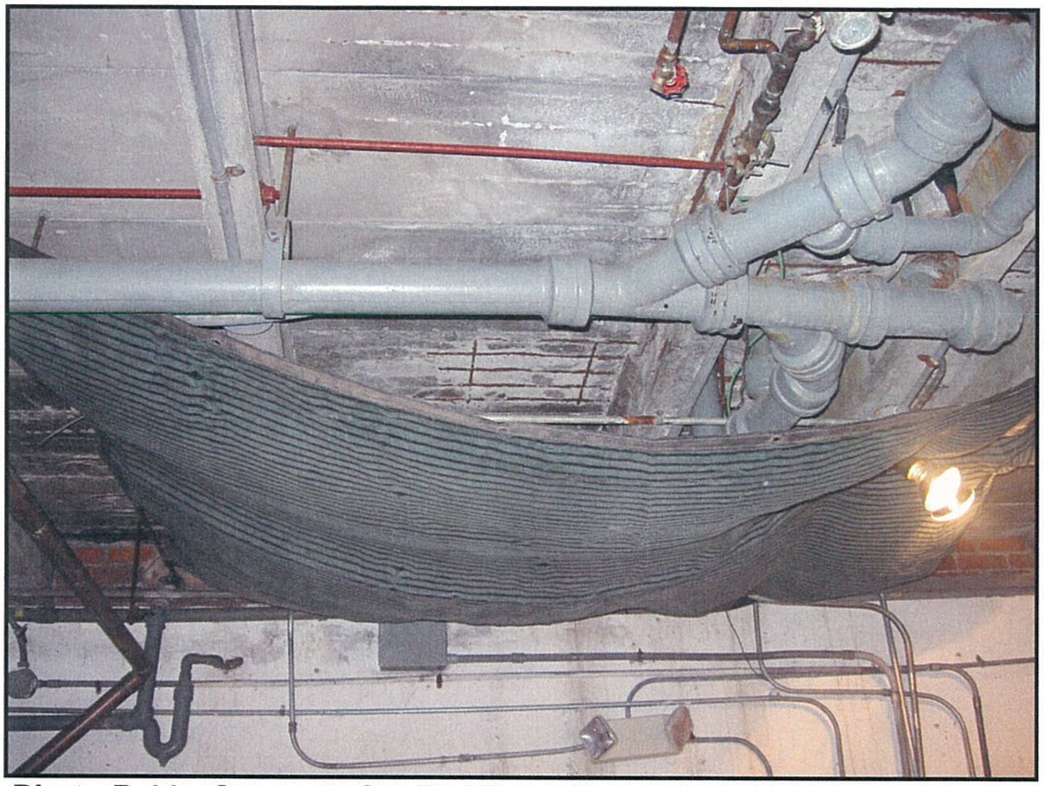


Photo P-11: Concrete Spalled From Underside of Bathhouse Floor

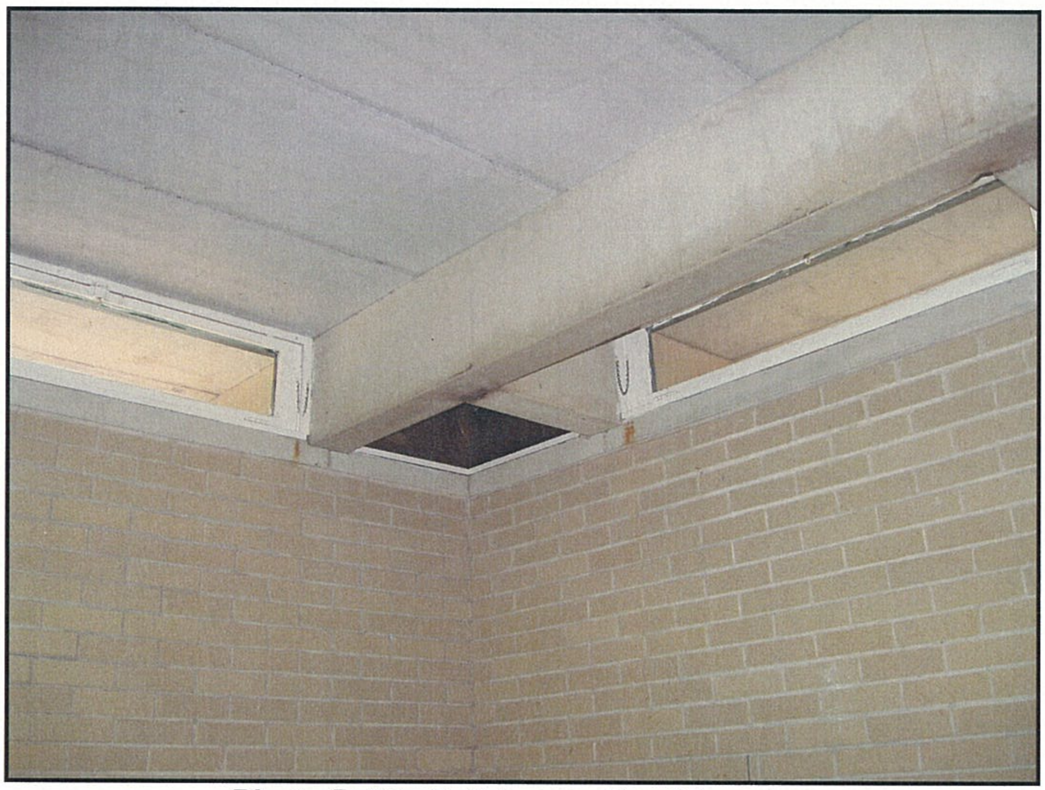


Photo P-12: Bathhouse Roof Framing

Photo P-13: Bathhouse Wall and Roof Overhang

Photo P-14: Bathhouse Lobby Floor

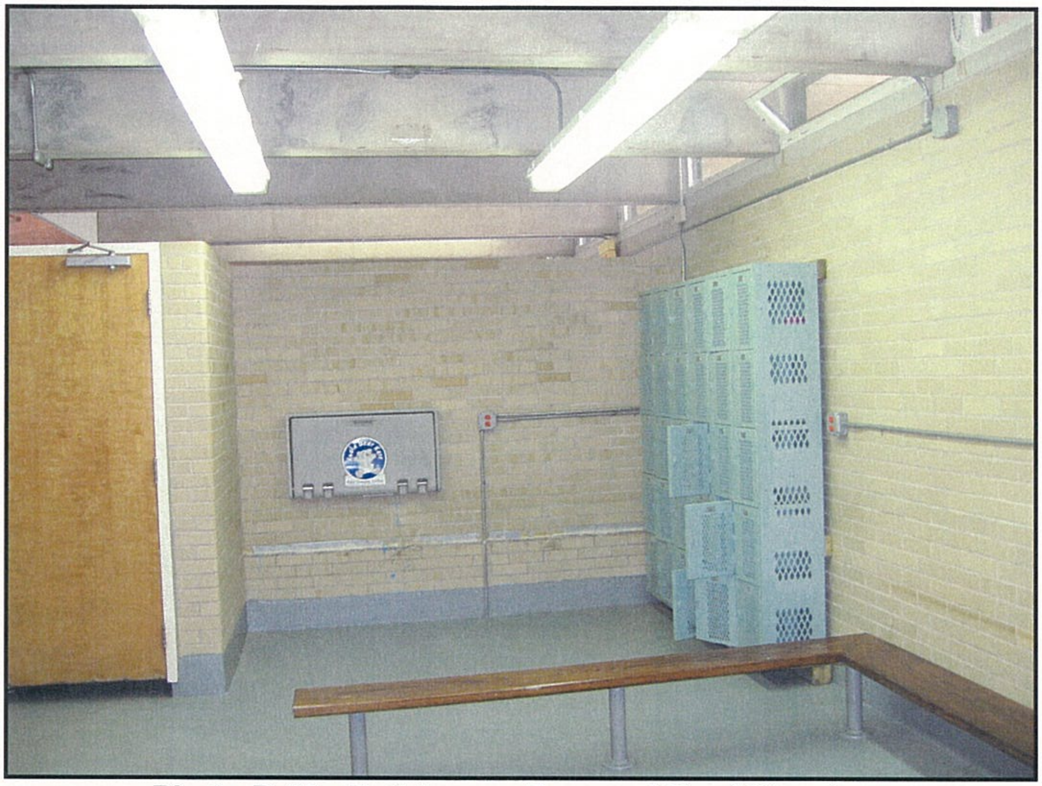


Photo P-15: Bathhouse Exposed Roof Structure

Photo P-16: Bathhouse Shower Area

GNCB

Appendix B:

Test Boring Logs: B-101 to B107

CLIENT: Gibble Norden Champion Brown	**General Borings, Inc.** P. O. BOX 7135 PROSPECT, CT 06712	SHEET 1 OF 1
FOREMAN/DRILLER: Richard Posa		SOIL ENGINEER
INSPECTOR: David Freed	PROJECT NAME: Investigation of Horowitz Pool	DESIGN ENGINEER
Surface Elevation: Concrete Deck	LOCATION: Vernon, CT	
	GBI JOB NO. 293-06	

Date Started: 10/3/06	TYPE	S Auger / H Auger	Casing	Sampler	Core Bar	**Hole No.** B-101
Date Finished: 10/3/06			HA	S . S.		Line & Station
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"		Offset L R
AT None AFTER 0.0 HRS	Hammer			140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall			30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.3-.8	1	5		A					FILL	4" Concrete
		.8-2.8	1	24	13	SS	7	9	9	14	2.0'	A1) Brown medium-fine SAND, trace gravel.
		2.8-4.8	2	24	16	SS	9	15	28	34	FILL	1) Medium-Red-brown medium-fine SAND.
5												
		5.0-7.0	3	24	18	SS	23	33	40	39	6.0'	2) Dense-Red-brown silty fine SAND, little gravel, with 4" layer red-brown medium-fine sand at 5.5'
											TILL	
		7.0-8.5	4	18	12	SS	23	40	48			
											9.0'	3) Very dense-Red-brown silty fine SAND, trace gravel.
10		9.0-10.5	5	18	12	SS	28	57	54		10.5'	4) Very dense-Same as S-3
											EOB	5) Very dense-Brown decomposed SCHIST.
												END OF BORING 10.5'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 10.5 Feet in Rock 0 No. of Samples 5 **Hole No.** B-101

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

General Borings, Inc.
P. O. BOX 7135 PROSPECT, CT 06712

SHEET 1 OF 1

SOIL ENGINEER

DESIGN ENGINEER

CLIENT:	Gibble Norden Champion Brown	PROJECT NAME:	Investigation of Horowitz Pool
FOREMAN/DRILLER:	Richard Posa	LOCATION:	Vernon, CT
INSPECTOR:	David Freed	GBI JOB NO.	293-06
Surface Elevation:	Concrete Deck		
Date Started:	10/3/06		
Date Finished:	10/3/06		

TYPE		Casing	Sampler	Core Bar
	S Auger			
	H Auger	HA	S . S.	
Size I. D.		3-1/4"	1-3/8"	
Hammer			140 LBS.	Bit
Fall			30"	

Hole No. B-102
Line & Station
Offset L R
N Coordinate
E. Coordinate

Groundwater Observations

AT None AFTER 0.0 HRS
AT AFTER HRS

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-.8'	1	4		A					1.0'	5.5" Concrete
		.8-2.8	1	24	18	SS	12	15	10	8	1.3'	Brown coarse-fine SAND, little silt.
		2.8-4.8	2	24	16	SS	7	6	18	32		Red-brown medium-fine SAND.
5											4.5'	1) Medium-Red-brown fine SAND, little silt.
		5.0-7.0	3	24	18	SS	5	11	9	11	6.5'	2) Medium-Same as S-1
												3) Medium-Red-brown fine SAND, little silt.
		7.0-9.0	4	24	18	SS	14	19	45	62	8.0'	
10											9.0'	4) Very dense-Red-brown silty fine SAND, trace gravel.
											EOB	Bottom 8" Brown weathered SANDSTONE.
												END OF BORING 9.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet
Feet in Earth 9 Feet in Rock 0 No. of Samples 4 **Hole No.** B-102

SAMPLE TYPE CODING:	SS = DRIVEN	C = CORE	A = AUGER	U = UNDISTURBED PISTON
PROPORTIONS USED:	TRACE = 1-10%	LITTLE = 10-20%	SOME = 20-35%	AND = 35-50%

CLIENT: Gibble Norden Champion Brown	**General Borings, Inc.** P. O. BOX 7135 PROSPECT, CT 06712	SHEET 1 OF 1
FOREMAN/DRILLER: Richard Posa		SOIL ENGINEER
INSPECTOR: David Freed	PROJECT NAME: Investigation of Horowitz Pool	DESIGN ENGINEER
Surface Elevation: Concrete Deck	LOCATION: Vernon, CT	
	GBI JOB NO. 293-06	

	TYPE		Casing	Sampler	Core Bar	
Date Started: 10/3/06		S Auger				**Hole No.** B-103/OW
Date Finished: 10/3/06		H Auger	HA	S . S.		Line & Station
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"		Offset L R
See Below AFTER HRS	Hammer			140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall			30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-.8	1	4		A					0.8'	4" Concrete
		.8-2.8	1	24	20	SS	7	6	6	6	2.0'	A1) Brown gravelly coarse-fine SAND, little silt.
		2.8-4.8	2	24	14	SS	4	4	2	2	2.5'	1) Medium-Red-brown silty fine SAND, trace medium sand.
5												Brown coarse-fine SAND, trace gravel.
		5.0-7.0	3	24	19	SS	5	10	16	21	FILL	2) Loose-Red-brown-black and gray silty fine SAND, trace gravel.
		7.0-9.0	4	24	18	SS	26	25	30	34	8.0'	3) Medium-Red-brown silty fine SAND.
10		9.0-10.5	5	18	12	SS	30	58	60		SAND AND	4) Very dense-Brown medium-fine SAND, trace gravel, decomposed rock.
		10.5-12.0	6	18	12	SS	46	30	31		decomposed ROCK	5) Very dense-Same as S-4
												6) Very dense-Same as S-5
											14.0'	Hollow auger refused at 14.0'
15											EOB	END OF BORING 14.0'
												Installed 2" dia. PVC Observation Well
												5.0' 2" PVC Screen
												8.8' 2" PVC Riser
20												Well tip at a depth 14.0'
												water reading
25												TIME / DEPTH TO WATER
												10:45 hrs 10.9'
												12:10 hrs 10.9'
												15:40 hrs 10.9'
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 14 Feet in Rock 0 No. of Samples 6 **Hole No.** B-103/OW

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: Gibble Norden Champion Brown			SHEET 1 OF 1
FOREMAN/DRILLER: Richard Posa	PROJECT NAME:	Investigation of Horowitz Pool	SOIL ENGINEER
INSPECTOR: David Freed	LOCATION:	Vernon, CT	DESIGN ENGINEER
Surface Elevation: Concrete Deck	GBI JOB NO.	293-06	

	TYPE		Casing	Sampler	Core Bar	
Date Started: 10/3/06		S Auger				Hole No. B-104
Date Finished: 10/3/06		H Auger	HA	S . S.		Line & Station
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"		Offset L R
AT None AFTER 0.0 HRS	Hammer			140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall			30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.4-.7	1	3		A					FILL	3.5" Sound Concrete
		.7-2.7	1	24	16	SS	4	6	8	19	2.5'	1.5" Poor Concrete
		2.7-4.7	2	24	18	SS	36	100	42	33		A1) Brown coarse-fine SAND, little
											decomposed	gravel and silt.
5											ROCK	1) Medium-Red-brown silty fine SAND,
		5.0-6.5	3	18	14	SS	35	41	64		6.5'	trace coarse-medium sand.
											EOB	2) Very dense-Decomposed ROCK.
												3) Very dense-Decomposed ROCK.
												END OF BORING 6.5'
10												
15												
20												
25												
30												
35												
40												

From Ground Surface to	Feet Used	in. Casing Then	in. Casing For	Feet
Feet in Earth 6.5	Feet in Rock 0		No. of Samples 3	**Hole No.** B-104
SAMPLE TYPE CODING: SS = DRIVEN	C = CORE	A = AUGER	U = UNDISTURBED PISTON	
PROPORTIONS USED: TRACE = 1-10%	LITTLE = 10-20%	SOME = 20-35%	AND = 35-50%	

CLIENT: Gibble Norden Champion Brown	**General Borings, Inc.** P. O. BOX 7135 PROSPECT, CT 06712	SHEET 1 OF 1
FOREMAN/DRILLER: Richard Posa	PROJECT NAME: Investigation of Horowitz Pool	SOIL ENGINEER
INSPECTOR: David Freed	LOCATION: Vernon, CT	DESIGN ENGINEER
Surface Elevation: Concrete Deck	GBI JOB NO. 293-06	

Date Started: 10/3/06	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-105
Date Finished: 10/3/06		H Auger		HA	S . S.		Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"		Offset L R
AT AFTER HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-.8	1	4		A					1.0	5" Concrete
		.8-2.8	1	24	18	SS	5	6	5	4	FILL	A1) Brown fine SAND, some gravel,
		2.8-4.8	2	24	18	SS	9	39	50	18	3.0'	little silt.
											FILL	1) Medium-Red-brown medium-fine
5												SAND, trace silt.
		5.0-7.0	3	24	6	SS	13	7	4	7		2) Very dense-Red-brown silty fine
												SAND, pieces concrete.
		7.0-8.0	4	12	8	SS	24	100			8.0'	3) Medium-CONCRETE and SAND.
											EOB	4) Very dense-Red-brown silty SAND
10												and CONCRETE.
												END OF BORING 8.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to		Feet Used	in. Casing Then	in. Casing For	Feet
Feet in Earth	8	Feet in Rock	0	No. of Samples 4	**Hole No.** B-105
SAMPLE TYPE CODING:	SS = DRIVEN	C = CORE	A = AUGER	U = UNDISTURBED PISTON	
PROPORTIONS USED:	TRACE = 1-10%	LITTLE = 10-20%	SOME = 20-35%	AND = 35-50%	

	General Borings, Inc.		SHEET 1 OF 1
CLIENT: Gibble Norden Champion Brown	P. O. BOX 7135 PROSPECT, CT 06712		
FOREMAN/DRILLER: Richard Posa			SOIL ENGINEER
	PROJECT NAME:	Investigation of Horowitz Pool	
INSPECTOR: David Freed	LOCATION:	Vernon, CT	DESIGN ENGINEER
Surface Elevation: Concrete Deck	GBI JOB NO.	293-06	

Date Started: 10/3/06	TYPE	S Auger		Casing	Sampler	Core Bar	Hole No. B-106
Date Finished: 10/3/06		H Auger		HA	S . S.		Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"		Offset L R
AT None AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-.8	1	4		A					1.0'	4" Sound Concrete
		.8-28	1	24	20	SS	12	15	15	11	FILL	1" Poor concrete
		2.8-4.8	2	24	18	SS	9	7	9	6		A1) Brown coarse-fine SAND, some gravel, little silt.
											4.5'	
5												1) Medium-Red-brown coarse-fine
		5.0-5.7	3	8	4	SS	4	2/2"	80/0"		FILL	SAND, trace silt.
												2) Medium-Top 12" Same as S-1
		7.0-9.0	4	24	16	SS	4	8	13	16	8.0'	Bottom 6" Red-brown medium-fine
											SAND	SAND, little silt.
10		9.0-11.0	5	24	20	SS	8	15	12	52		3) Very loose-Same a S-2, obstruction
											11.0'	6.0' -6.5'
											EOB	4) Medium-Red-brown silty fine SAND, trace gravel.
												5) Medium-Same as S-4, (sample wet)
15												END OF BORING 11.0'
20												
25												
30												
35												
40												

From Ground Surface to		Feet Used	in. Casing Then	in. Casing For	Feet
Feet in Earth	11	Feet in Rock	0	No. of Samples	5 Hole No. B-106
SAMPLE TYPE CODING:	SS = DRIVEN	C = CORE	A = AUGER	U = UNDISTURBED PISTON	
PROPORTIONS USED:	TRACE = 1-10%	LITTLE = 10-20%	SOME = 20-35%	AND = 35-50%	

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: Gibble Norden Champion Brown		SOIL ENGINEER
FOREMAN/DRILLER: Richard Posa	PROJECT NAME: Investigation of Horowitz Pool	
INSPECTOR: David Freed	LOCATION: Vernon, CT	DESIGN ENGINEER
Surface Elevation: Concrete Deck	GBI JOB NO. 293-06	

Date Started: 10/3/06	TYPE	S Auger	Casing	Sampler	Core Bar	Hole No. B-107
Date Finished: 10/3/06		H Auger	HA	S . S.		Line & Station
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"		Offset L R
AT AFTER HRS	Hammer			140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall			30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE: DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER: 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-.8	1	3		A					1.0'	4" Sound Concrete
		.8-2.8	1	24	18	SS	6	11	16	21		1-1/2" Poor Concrete
		2.8-4.8	2	24	16	SS	19	16	17	14	3.0'	A1) Brown medium-fine SAND, little silt.
5												1) Medium-Red-brown medium-fine SAND, little silt, trace gravel.
		5.0-7.0	3	24	6	SS	4	4	5	5	FILL	2) Dense-Red-brown medium-fine SAND, trace gravel.
		7.0-9.0	4	24	14	SS	7	3	3	2		3 Loose-Same as S-2
												4) Loose-Brown fine SAND, little silt.
10		9.0-11.0	5	24	12	SS	1	3	5	10	10.0'	5) Loose-Brown silty fine SAND.
											11.0'	Brown coarse-fine SAND, (sample wet).
											EOB	END OF BORING 11.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to	Feet Used	in. Casing Then	in. Casing For	Feet
Feet in Earth 11	Feet in Rock 0		No. of Samples 5	**Hole No.** B-107
SAMPLE TYPE CODING: SS = DRIVEN	C = CORE	A = AUGER	U = UNDISTURBED PISTON	
PROPORTIONS USED: TRACE = 1-10%	LITTLE = 10-20%	SOME = 20-35%	AND = 35-50%	

GNCB

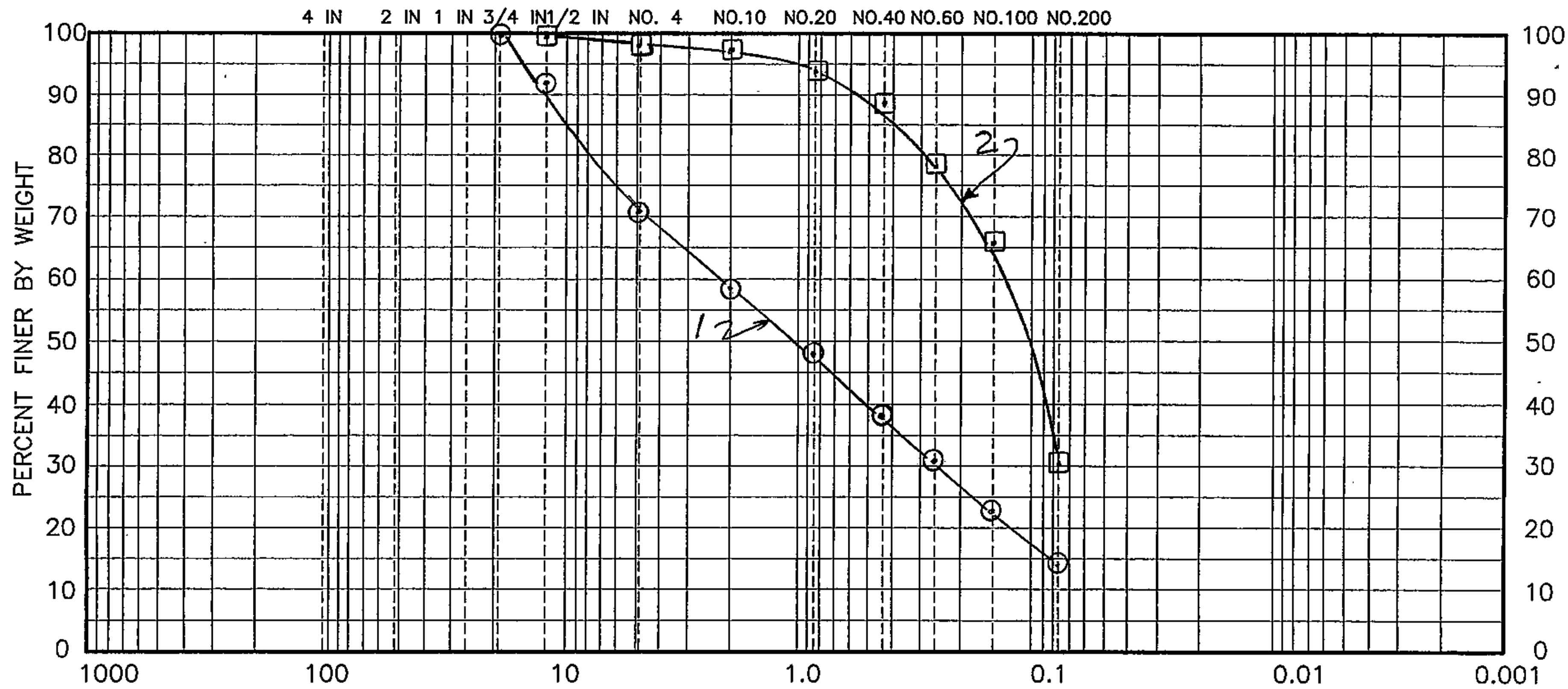
Appendix C:

Grain Size Analysis

FORM G–101 (MARCH 2003)

GRAIN SIZE DISTRIBUTION

U.S. STANDARD SIEVE SIZE



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

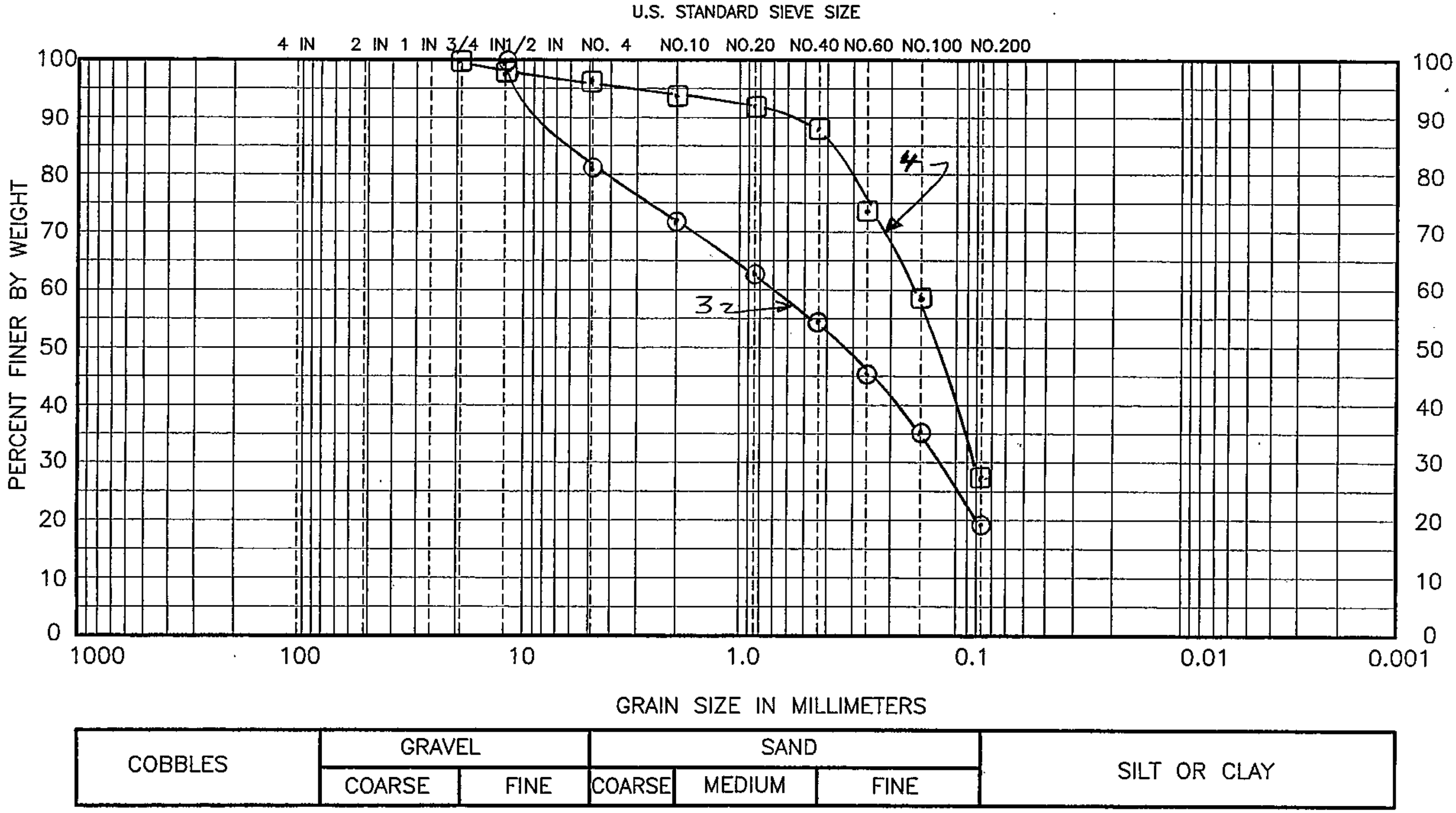
TEST NO.	TEST BORING	SAMPLE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
1	B-103	A1	0.4 – 0.8	5.3	Brown gravelly coarse to fine SAND, little silt.
2	B-103	S1	0.8-2.8	12.3	Red-brown silty fine SAND, trace medium sand.

PROJECT NO. 06109 DATE: OCT 2006
HOROWITZ POOL
VERNON, CONNECTICUT

GIBBLE NORDEN CHAMPION BROWN CONSULTING ENGINEERS, INC. 130 ELM ST. OLD SAYBROOK, CT.

FORM G–101 (MARCH 2003)

GRAIN SIZE DISTRIBUTION



UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

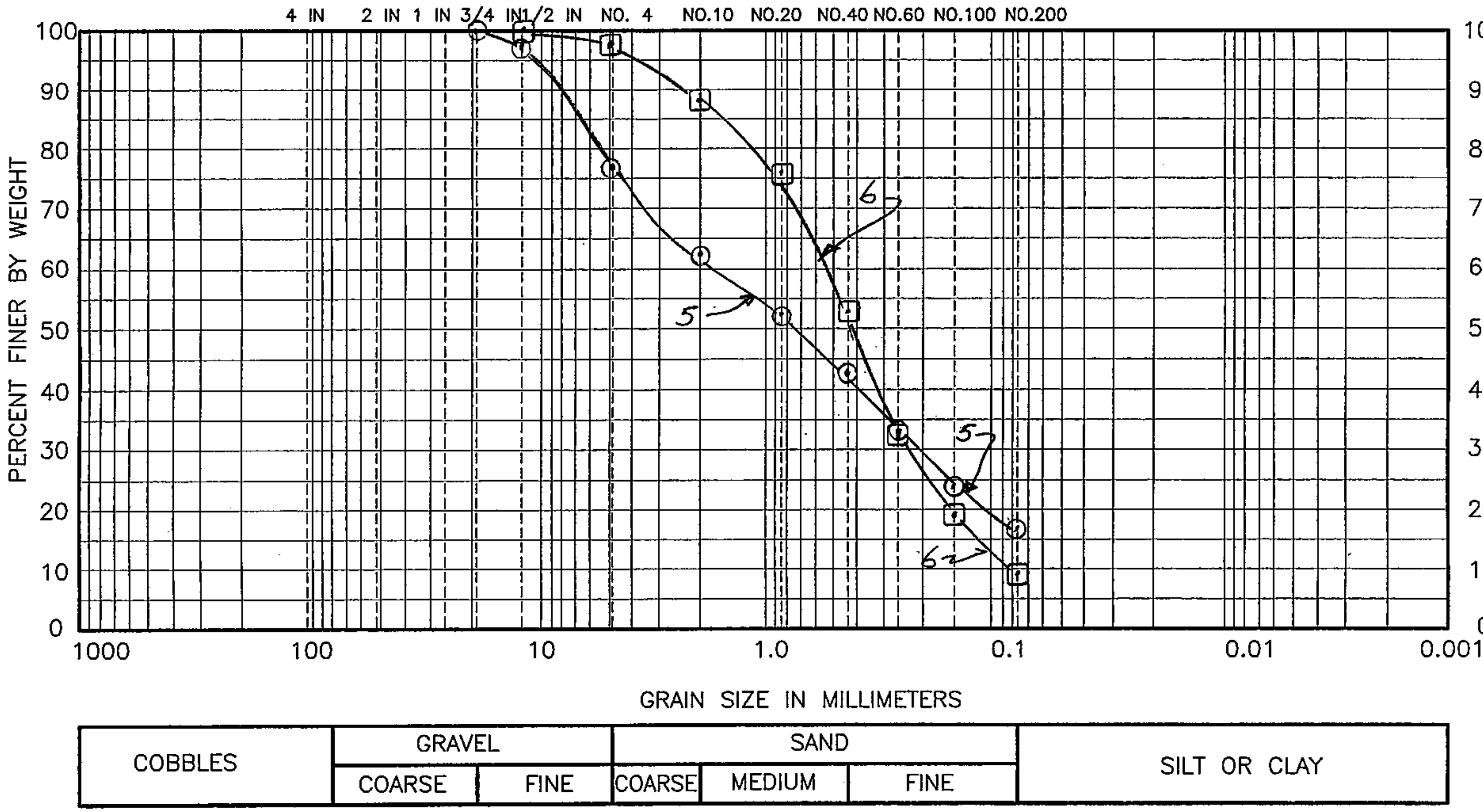
TEST NO.	TEST BORING	SAMPLE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
3	B-104	A1	0.4 – 0.7	5.6	Brown coarse to fine SAND, little fine gravel, little silt.
4	B-104	S1	0.7-2.7	11.0	Red-brown silty fine SAND, trace coarse to medium sand.

PROJECT NO. 06109 DATE: OCT 2006
HOROWITZ POOL
VERNON, CONNECTICUT

FORM G-101 (MARCH 2003)

GIBBLE NORDEN CHAMPION BROWN CONSULTING ENGINEERS, INC. 130 ELM ST. OLD SAYBROOK, CT.

GRAIN SIZE DISTRIBUTION



UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

TEST NO.	TEST BORING	SAMPLE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
5	B-106	A1	0.4 – 0.8	6.7	Brown coarse to fine SAND, some gravel, little silt.
6	B-106	S1	0.8-2.8	5.9	Red-brown coarse to fine SAND, trace silt.

PROJECT NO. 06109 DATE: OCT 2006
HOROWITZ POOL
VERNON, CONNECTICUT

Appendix D:

IMTL Field and Laboratory Reports

IMTL
Accurate information you can rely on.

Coring Report

Client:	Gibble Norden Champion & Brown	Project No.:	7650
Project:	Vernon Swimming Pool	Report No.:	001
Date Core Obtained:	September 13, 2006	Date Gunite Placed:	Unknown
Age of Gunite at Testing:	Unknown	Date Core Tested:	09/18/06
Field Technician:	Shawn Roberts/Chris Karpeichik	Page:	1 of
Lab. Technician:	Jason Norton		

IMTL representatives met with Mr. Doug Alderson and Mr. Mike Fortuna to assist with determining the pools concrete compressive strength, chemical analysis and to evaluate the condition of the reinforcement. The pool is a gunite concrete pool shaped like an L with the deep end at the lower leg.

The objective for IMTL was to extract cores at locations marked out by Mr. Alderson of Gibble Norden Champion & Brown. Some cores were extracted from the walls of the pool and some from the pool floor; see the attached diagram and photographs for locations, pool layout and condition of cores.

Mr. Alderson requested that chloride samples be obtained from four (4) locations around the pool; see the attached analysis performed by IMTL subcontractor, Baron Consulting Co.

Field measurements of core lengths were recorded in the field at the request of Mr. Alderson with results as follows: (measurements are reported to nearest 1/8" based on the average of each half).

Core #1	Length (in)	Comments
1	11-1/4"	N/A
2	6-5/8"	N/A
3	8-3/4"	N/A
4	9P	Contained rebar and came out sheared in half
5	7"	
6	3-3/4"	Stopped at rebar, engineer examined rebar
7		
8	9-3/4"	N/A
9	9-1/2"	Contained rebar
10	7"	N/A

Independent Materials Testing Laboratories, Inc. T 860.747.1000 mail@imtlct.com
57 N. Washington St., P.O. Box 745, Plainville, CT 06062 F 860.747.6455 www.imtlct.com

Vernon Swimming Pool
Project No: 7650 Report No: 001
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IMTL representatives exposed rebar at several locations to facilitate examination by Mr. Alderson.

*Some cores contained reinforcement and some will require a correction factor if they have a length to diameter of less than 2.

Drawing #/Core ID:	Sawed Length (in)	Capped Length (in)	Diameter (in)	Area, Sq. Inches	Failure Load (lbs)	Compressive Strength: (psi)	Corrected Strength (psi)
#1/138810	7.65	7.90	3.99	12.50	29,500	2,260	N/A
#2/138811	5.25	5.55	3.99	12.50	49,500	3,960	3,750
#3/138812	7.00	7.25	4.00	12.56	19,500	1,550	N/A
#5/138814	5.40	5.60	3.99	12.50	66,500	5,320	5,040
#8/138816	7.70	7.95	3.99	12.50	29,000	2,320	N/A
#9/138817	5.95	6.20	3.98	12.44	32,000	2,570	2,480
#10/138818	6.10	6.30	3.99	12.50	72,500	5,800	5,600

Nominal Maximum Aggregate Size: 3/4"; load applied to horizontal plane of concrete as placed.

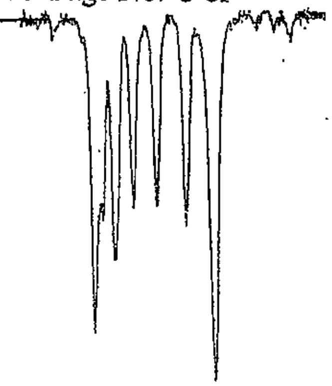
Unless Stated Otherwise:

1. Cores tested in accordance with ASTM C-42; *except Core #3 Lab ID 138812 and #8 Lab ID 138816, which contained reinforcement.
2. Cores fractured normally.
3. Cores were free of obvious defects.

Drawing #/Core ID	Correction Factors Used
#2/138811	1.39/.947
#5/138814	1.40/.948
#9/138817	1.55/.964
#10/138818	1.57/.966

Pc: Doug Alderson, Gibble Norden Champion & Brown
ka

Project No: 7650 Report No: 001
September 14, 2006 Page No: 3 of



BARON CONSULTING CO.

HARRY AGAHIGIAN, Ph.D., DIRECTOR

analytical services

P.O. BOX 3337, MILFORD, CT 06460

September 26, 2006

Mr. Barry Avery
Independent Materials Testing Laboratory Inc.
57 No. Washington Street
Plainville, CT 06062

RE: Analysis of four samples received 9/20/06
PO# 4347
BC# 144919

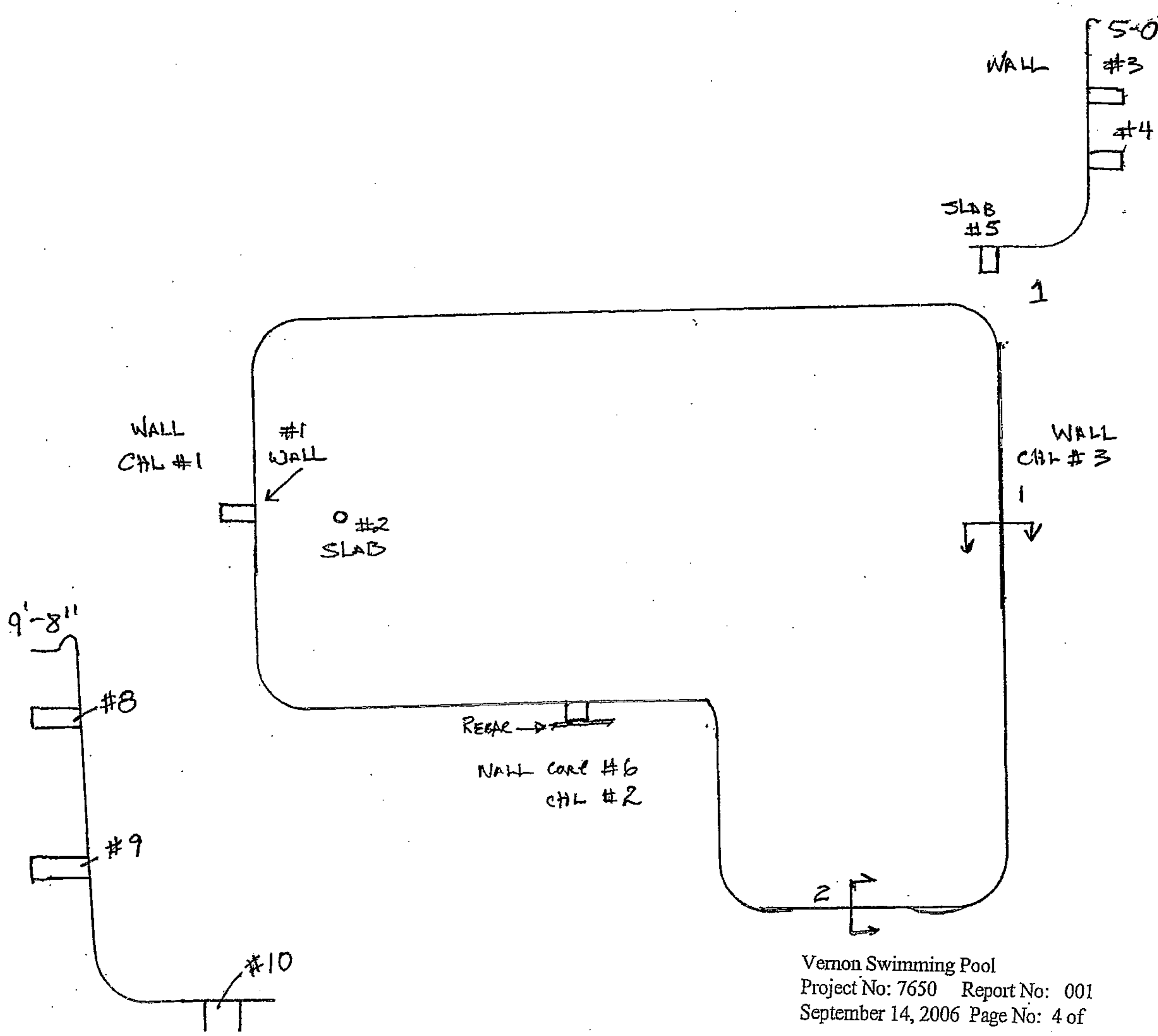
The concrete powder samples were analyzed for water soluble chloride.

Sample#	**Acid Soluble Chloride**
Vernon Pool : 1/wall	440
Vernon Pool : 2	354
Vernon Pool : 3	453
Vernon Pool : Deep End of Pool	753
Analyst:	RR
Date Analyzed	9/25/06

Please review the data and contact me if you have any questions or wish more information.

Barbara Obert
Laboratory Manager

BALO/co
Reviewed by:



Vernon Swimming Pool
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