3 Existing Conditions Evaluation

- Revised Building Conditions Analysis - Gymnasium
- Revised Existing Conditions Structural Report
- Environmental Site Assessment Report
- Hazardous Materials Report
- Geotechnical Report
- Site Survey

Introduction

Please refer to April 1, 2011 Preliminary Design Program for evaluation of existing conditions. Additional site and building evaluation was performed since the PDP was submitted as new information was necessary in analyzing the Options. Additional information in this section includes: revised building conditions analysis for the existing gymnasium, revised structural evaluation of the building, and new evaluations for the Phase 1- Environmental Site Assessment, Hazardous Materials, and Geotechnical. In addition, an updated Topographic Site Survey has been included.

Revised Building Conditions Analysis - Gymnasium

See attached revised Building Conditions Analysis for the Gymnasium buildings dated June 8, 2011. Further analysis was performed as the final alternatives included the potential for reusing the existing gymnasium spaces. The existing upper gymnasium and the existing lower gymnasium have been re-analyzed and it has been determined that neither has the proper ceiling height to meet requirements for regulation size, high school basketball and volleyball courts. If these spaces were to be reused, the roof structure would need to be raised to accommodate a performance gymnasium in the upper gym, and additional appropriate height spaces in the lower gym. These costs have been addressed in options 14A and 14B.

Revised Existing Conditions Structural Report

Refer to the revised Existing Conditions Final Structural Report dated June 14th, 2011 which provides additional information in regards to current and updated code compliance for the existing structure. Additional structural information is provided in the structural comments in section 7 of this report.

Environmental Site Assessment Report

Attached is the Phase I Preliminary Site Assessment relative to Oil and Hazardous Materials dated May 2011. CDW Consultants, Inc. (CDW) has conducted an investigation of the Concord Carlisle High School located at 500 Walden Street (“Site”) in Concord, Massachusetts. The investigation consisted of a site reconnaissance, document research of the site to identify potential environmental concerns, an environmental database review, and interviews with local officials, the current site owner, and agency employees. This site investigation was conducted in April and May 2011 and concludes that there is no visible evidence of releases of oil or hazardous materials at the Site, but there is possible presence of contaminated subsurface conditions. Additional soil and groundwater sampling and analysis will need to be performed in the DD phase as part of a Phase II Subsurface Investigation.

Hazardous Materials Report

Attached is the Hazardous Material Summary Report dated May 13, 2011. CDW Consultants, Inc. (CDW) reports on the findings of the pre-renovation and/or demolition testing and hazardous materials survey of Concord-Carlisle High School ("Site") in the town of Concord, Massachusetts. The scope of work was to identify and quantify asbestos containing building materials (ACM), lead-based paint (LBP), mercury switches, transformers, light ballasts, fluorescent tubes, and other visible hazardous materials.

Their conclusions state that the material that will need to be removed during demolition, through hazardous materials procedures, includes: floor tile, mastic, pipe fittings and insulation, window glaze and caulk, door frame and column caulk, expansion joints, roofing materials, ceiling tile and glue, fire doors, stage curtain, fume hoods, vapor barrier and popcorn ceilings. PCBs were detected in caulk at levels below EPA PCB regulated wastes; however the substrates (brick, metal) need testing during later phases to ensure these do not contain PCBs at concentrations at or above 1 part per million EPA level for unrestricted use. Elevated levels of lead were detected in the green paint at the hall columns, thus a sample should be collected for Toxicity Characteristic Leaching Procedure (TCLP) to determine if there are any special hazardous waste disposal requirements. Furthermore, mercury is present at elevated concentrations in the gym floor and should be tested for TCLP to determine if there are special hazardous waste disposal requirements. For mercury, the EPA recommends, in schools, conducting baseline mercury vapor testing of the air to determine if mercury vapors are being released and at what concentrations. Additional air and TCLP sampling work will need to be performed on the green paint on the hall columns during the DD phase and PCB substrate sampling will need to happen during CA.

Geotechnical Report

Refer to the attached Preliminary Geotechnical Recommendations dated June 6, 2011 by Nobis Engineering. The proposed sites for option 6 and 12 were determined to be feasible locations for new construction. On June 8th two additional borings were drilled on the Option 13/14 site. The attached draft report dated June 16, 2011 from Nobis Engineering provides additional information regarding the conditions at the 13/14 site. Below is a summary describing these site conditions.

The proposed finished floor elevation (FFE) of Option 13/14 is approximately El. 170. The borings encountered 25' to 35' of medium dense sand, with a few 6" or less silty, clay layers. Below this was approximately 20' of hard, varved silt, clay and fine sand, and below that was sand. Groundwater was encountered at approximately El. 142. Soil above the FFE consisted of sand or sand and gravel. A final geotechnical report will be submitted to the MSBA upon completion.

The advantages to this Option 13/14 site include:

- cuts 3' to 30' thick which will reduce the load on the clay as opposed to Option 12 which includes the need to bring in 12' of new fill, which would significantly increase the load on the clay,
- and, deeper clays, which reduce the increase of stress to that layer from the building loads.

This information has been and will continue to be used by the A/E team.

Site Survey

In May 2011, a topographic site survey was completed by Nitsch Engineering. The site information has been used to develop the preferred options. A site survey is attached at the end of this section.

Building Conditions Analysis – Gymnasium
(Revised final report for Existing Gymnasium June 8, 2011)

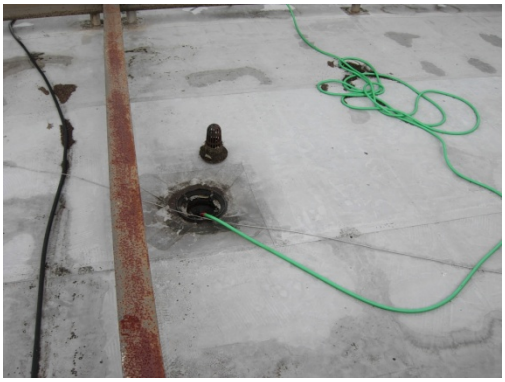
Gymnasium

The performance gym has the existing curtain wall system with single pane glass and metal panels. The Building envelope is poorly insulated with a weak air barrier. The paint finish on the metal panels is peeling in many locations on the east wall. Fiberglass doors were installed at the east entry. The structure of the gym is exposed on the outside of the building causing thermal bridging, the exposed steel is beginning to rust and deteriorate in many locations. The roof is PVC and needs to be replaced.


Exterior entry to performance gym


Exposed performance gym structure & curtain wall


Deteriorating steel structure


Failing roof drains and thermal bridging of exposed structural steel

The performance gymnasium has two floor levels, the gymnasium and weight room are on the main level and the locker rooms are on the lower level. Corridors in upper gym have a mix of new and old VCT flooring. The corridor ceilings are exposed steel/Tectum deck and surface mounted strip fluorescent fixtures. The walls are existing brick and painted CMU. Wood doors and wood panels are worn in the gym and the wood floor has been sanded and refinished many times. The performance gym ceiling has exposed steel and Tectum deck; the walls are a combination of painted block and wood panels. The large folding partition in the gym appears to be in-operable. The locker rooms have exposed concrete floors and new lockers on original CMU plinths. There are original tile walls in shower area. The locker room walls are a mix of painted CMU

and glazed CMU; the ceilings are 12x12 perforated metal panels (stainless steel). Painted metal dividers at changing area with fixed wood benches. Corridors have exposed insulated piping, wiring, and mechanical ducts.

The ceiling height in the upper gymnasium is approximately 20'-8 ½" clear from the finish floor to the underside of the deck. A regulation size high school basketball court requires 25'-0" clear ceiling height and a regulation size high school volleyball court requires 23'-0" of clear ceiling height. The existing steel structure would need to be raised and/or reframed in order to provide the proper clearance in this space for a performance gymnasium.

Performance gym


Girls locker room showers

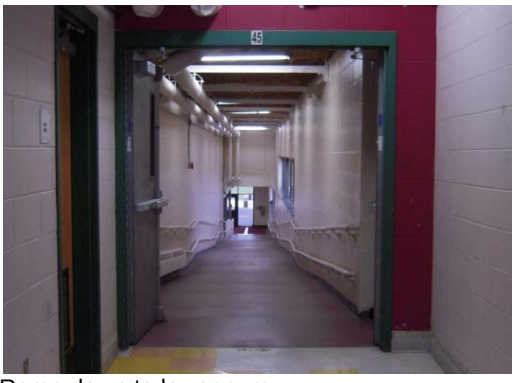
The building envelope for the lower gym is the existing 1970's split faced ribbed block. The building envelope system is poorly insulated and does not provide an air tight barrier. The window units are an aluminum storefront system with single pain glass. Fiberglass doors were installed at the east entry. The building has anodized aluminum fascias. The EPDM roof is in poor condition.


North and west wall at lower gym


Lower gym entry and ramp to performance gym

The lower gym has a worn and faded rubber floor, painted CMU walls, an applied acoustical ceiling with exposed steel trusses and pendant lights. There is a roll up curtain divider that appears to be functioning and batting cage nets that are hung from the roof structure.


Rubber floor in lower gym


Ramp down to lower gym

Storms during this past winter have uplifted the EPDM membrane off of the roof deck. It is believed that the heavy winds entered under the flashing at the openings in the fluted block and lifted the roof membrane. The school has mechanically fastened the membrane back down, but the wind is still able to get under the flashing


Strong winds have entered between fluted block and flashing and lifted the EPDM off of the roof


EPDM blistering and failing roofing adhesives.

The ceiling height in the lower gymnasium is 20'-0" clear from the finish floor to the underside of the steel joists. A regulation size high school basketball court requires 25'-0" clear ceiling height and a regulation size high school volleyball court requires 23'-0" of clear ceiling height. The existing steel structure would need to be raised and/or reframed in order to provide the proper clearance for a high school competition gymnasium. This space may be adequate as a practice gymnasium and a physical education space.

+ Wood floor appears to be in good shape in performance gym
+ Bleachers appear to be new in the performance gym
+/- Most door hardware meets ADA/MAAB requirements
+/- Rubber floor in the lower gym is durable but outdated
+/- Boys'/girls' and men's / women's toilet rooms meet some ADA standards (not all clearances are code compliant)
- Door hardware to weight room does not meet ADA/MAAB regulations
- Threshold at weight room is not code compliant
- Many drinking fountains are not accessible; they project into corridors and do not meet cane detection clearances

- Unappealing ceiling in lower gym
- Folding partition in the performance gym is broken
- Ramp down to lower gym and locker rooms do not meet ADA/MAAB requirements
- Boys locker room has gang showers
- Stair railings and guardrails do not meet building code regulations (in all four stairwells)
- Drinking fountains in stairwell (not compliant and not accessible)
- Steps up to locker room offices are not accessible
- Some doors do not have proper accessible maneuvering clearances and/or proper door widths
- Exterior single pain glass windows and existing exterior masonry envelope
- Water damage on existing masonry
- Paint peeling off of exterior metal panels, panels are not insulated
- Ponding on roof (PVC roof needs to be re-done)
- Exterior doors from lower gym are not accessible

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CONCORD CARLISLE REGIONAL HIGH SCHOOL
Concord, MA

Final Existing Structural Conditions Report
June 14, 2011

INTRODUCTION

Foley Buhl Roberts & Associates, Inc. (FBRA) is collaborating with The Office of Michael Rosenfeld, Inc., *Architects* (OMR) to review and analyze structural conditions and issues at the Concord Carlisle Regional High School in Concord, MA. The purpose of this report is to identify and to describe the structural systems of the various sections of the school and to comment on the structural conditions/issues observed. General comments relating to potential renovations, alterations and additions to the facility are presented as well. A new edition of the Massachusetts State Building Code (780 CMR – 8th Edition) has been issued since the original report was completed in November, 2009; this final report includes comments relating to current code requirements.

Structural conditions at the Concord Carlisle Regional High School were observed at the site on November 9, 2009 and again on March 8, 2011.

The following documents were reviewed in the preparation of this Existing Conditions Structural Report:

- *Structural Drawings S-1 to S-13*, prepared by A. B. Onderdonk Consulting Engineer, Glastonbury, CT, dated July 7, 1958 (Includes soil boring logs on Drawing S-1).
- *Architectural Drawings A-1 to A-9,* prepared by Warren H. Ashley, AIA Architect, West Hartford, CT, dated August 31, 1964 (Science Building addition - Structural Drawings not available).
- *Structural Drawings S-1 to S-10,* prepared by Korslund, LeNormand & Quann, Inc. Architects and Engineers, Norwood, MA, dated October 11, 1973 (Includes soil boring logs on Drawing G-3).
- *Concord Carlisle High School Existing Conditions Report* (Structural Section), prepared by Symmes Maini & McKee Associates, Cambridge, MA, dated March 18, 2005.
- *Preliminary Phase Geotechnical Studies,* prepared by The Geotechnical Group, Inc., Needham, MA, dated June 20, 2005.

The November 14, 2000, *Concord-Carlisle High School Space Utilization Study,* prepared by HMFH Architects, Inc. was not reviewed, as this particular report did not address structural issues.

No exploratory demolition or structural materials testing was conducted in conjunction with this existing conditions review.

CONCORD CARLISLE REGIONAL HIGH SCHOOL
Concord, MA

Final Existing Structural Conditions Report
June 14, 2011

I. GENERAL

The Concord Carlisle Regional High School is located at 500 Walden Street in Concord, MA. The school has an enrollment of over 1260 students. The total area of the complex is approximately 228, 550 gross square feet.

The original high school was constructed in 1960 and included a science building (S - Building), a humanities – administration building (H - Building), a theater arts building (A – Building (includes the Auditorium)), a dining building (Cafeteria) and a Gymnasium/Locker Room building. All buildings/wings are one-story, with the exception of the (1960) Gymnasium and the (1975) Library. There are (partial) basement Mechanical Rooms below the First Floor in the A – Building, the H – Building, the I – Building (originally constructed with the 1965 S – Building addition) and the Gymnasium. Sump pits have been provided in all basement Mechanical Rooms.

A one-story addition to the original science building was constructed in 1965.

In 1975, several new buildings/wings were added to the complex. The I – Building (Industrial Arts) was constructed to the south of the original S – Building. The L – Building (Language) was constructed on the north side of the S – Building. A multi-level Library structure with a lobby was also constructed, providing an internal connection between the A – Building and the Cafeteria. The Cafeteria was expanded (to the east) at this time as well. An additional Gymnasium (the Lower Gym) was constructed to the west of the original gym. All buildings/wings are interconnected by interior or exterior walkways/corridors. A significant portion of the buildings were re-clad during the 1980's, eliminating the areas of original, floor-to-ceiling glazing. Since that time, there have been repairs and renovations involving little or no structural work (1990 and 1992).

The First (Main) Floor elevation of the buildings varies, in some cases. Internal ramps and exterior connectors transition between buildings where the First Floor elevations do not align.

The original (1960) buildings and subsequent (1965 and 1975) additions are steel framed, as described below and as summarized in the 2005 Symmes Maini & McKee Associates report. Typical 1960 roof construction consists of manufactured, cementitious wood fiber (Tectum) roof decking with steel bulb tees (sub-purlins), supported by wide flange steel purlins spanning to steel beams that are supported by steel columns ("W", "T", "L" or Tube shape). The roof of the 1965 S – Building addition appears to be similarly framed (Structural Drawings not available). 1975 roof construction typically consists of 1½" deep steel roof deck spanning to open web steel joists. Steel joists are supported by steel beams and steel columns.

Second Floor construction at the (1975) Library is steel framed, with a concrete slab on open web steel bar joists, supported by steel beams and columns.

First (Main) Floor construction is typically a concrete slab on grade, except precast concrete plank was installed over MEP tunnels and basement Mechanical Rooms below the First Floor level. At the original Gymnasium building, the floor is structured with either precast plank (over the Mechanical Room) or a reinforced concrete slab supported by steel beams and columns (over the Locker Rooms).

Foundations at all buildings/wings are conventional spread footings.

II. STRUCTURAL SYSTEMS DESCRIPTION

Structural Materials:

Original Construction – 1960:

Concrete is noted to be 2,500 psi typically, with 3,000 psi used at the Gymnasium Building (structural slab at the First Floor). Structural Steel specifications are not noted on the Structural Drawings; however, structural steel is likely ASTM A7, with a minimum yield strength of 33,000 psi.

1975 Additions:

Concrete is noted to be 3,000 psi, generally. Reinforcing bars are typically intermediate grade (40,000 psi). Structural Steel is noted to be ASTM A36, with a minimum yield strength of 36,000 psi.

Allowable Soil Bearing Pressure:

Original Construction – 1960:

Spread footings were proportioned for a maximum allowable bearing pressure of two (2) tons per square foot (tsf). Representative structural calculations generally confirm this design bearing pressure. The bottom of exterior footings is typically a minimum of 4 feet below finished grade.

1975 Additions:

Spread footings were proportioned for a maximum allowable bearing pressure of two (2) tons per square foot (tsf). Representative structural calculations generally confirm this design bearing pressure. The bottom of exterior footings is typically a minimum of 4 feet below finished grade.

Design Roof and Floor Loads:

Original Construction – 1960:

Roof construction has typically been designed for a 40 psf live (snow) load. Representative structural calculations generally confirm this design load. The current building code would require that flat roofs be designed for a minimum snow load of 42.4 psf (based on a ground snow load of 55 psf in Concord). It does not appear that low roofs adjacent to higher roofs (e.g. surrounding the Auditorium) have been designed for increased loading due to snow drifting. These areas will need to be evaluated and reinforced (as appropriate) in conjunction with future renovations to the facility.

The design live loads for framed floor construction (over MEP tunnels and the First Floor of the Gymnasium Building) are not noted on the Structural Drawings. The determination of design live loads for framed floor construction is beyond the scope of this report.

1975 Additions:

Roof construction has typically been designed for a 40 psf live (snow) load. Representative structural calculations generally confirm this design load. The current building code would require that flat roofs be designed for a minimum snow load of 42.4 psf (based on a ground snow load of 55 psf in Concord). It appears that low roofs adjacent to higher roofs (e.g. between the original and lower Gymnasiums) have been designed for increased loading due to snow drifting. Original low roof areas adjacent to the higher, 1975 Library construction were reinforced when the Library was built.

The design live loads are noted to be 50 psf at typical classrooms and laboratories, with a 100 psf live load at corridors and storerooms and 150 psf at the Library. With the exception of the Library Second Floor, most floor areas are slab on grade construction.

Roof Construction:

Original Construction – 1960:

Roof construction of the S – Building consists of a 2½" thick, manufactured cementitious wood fiber (Tectum) decking supported by steel bulb tees. Steel bulb tees are typically spaced at 2'-8" o.c. and span to wide flange steel purlins. Interior columns (typically 5" WF) are generally arranged in a double-loaded corridor fashion, with 28'-2", 10'-10" (corridor) and 32'-6" typical spans. Perimeter columns/mullions (typically structural tees) are spaced at 6'-6" o.c. and are integrated with the exterior wall construction. The top of steel is 10'-4½" above the floor. Roof construction at the 1965 addition to this building is likely similar.

Roof Construction at the H – Building is similar, with typical purlin spans of 26'-0" and beam spans varying across the width of the building. Interior columns are typically square tubes. Perimeter columns/mullions (typically structural tees) are spaced at 6'-6" o.c. and are integrated with the exterior wall construction. The top of steel is 10'-4½" above the floor.

The roof of the Gymnasium is suspended from six (6), external, 36" deep wide flange steel rigid frames, clear spanning the space (approximately 106 feet). The frames are spaced at 21'-1½" on centers. The roof is suspended from the frames by 3½" diameter steel pipes and consists of a 2½" deep Tectum deck with steel bulb tees, typically spanning 9'-9" to the suspended steel beams. Perimeter columns/mullions (typically structural tees) are spaced at 6'-6" o.c. and are integrated with the exterior wall construction. The top of steel beam is approximately 21'-10" above the floor.

Roof construction at the Cafeteria is similar, Tectum deck/steel bulb tee construction, spanning to wide flange steel purlins. Purlins typically span 19'-6" and are supported by 27" deep, wide flange steel rigid frames. Steel frames clear span the space, approximately 79 feet. Perimeter columns/mullions (typically structural tees) are spaced at 6'-6" o.c. and are integrated with the exterior wall construction. The top of steel is 10'-4½" above the floor.

The roof of the A – Building is also constructed with Tectum decking and steel bulb tees. At the high roof, bulb tees span 6½ +/- feet to 52 inch deep longspan steel joists, which clear span the space. At the lower, surrounding roofs, Tectum Deck/steel bulb tee construction is supported by wide flange steel purlins and beams. Perimeter columns/mullions (typically structural tees) are spaced at 6'-6" o.c. and are integrated with the exterior wall construction. The top of low roof steel is approximately 13 feet above the floor; the top of high roof steel is approximately 9'-4½" higher.

1975 Additions:

1975 roof construction typically consists of a 1½" steel deck spanning to open web steel joists. Steel joists are supported by steel beams and steel columns.

At the L – Building, steel roof deck typically spans approximately 5 feet, to 20" deep, open web steel joists. Steel joists typically span 33'-6" and are supported by wide flange steel beams (14" to 21" deep). Interior and perimeter columns are typically 6" wide flange sections. Roof steel pitches to provide drainage; the high point is approximately 12'-10½" above the floor.

Roof construction at the I – Building is similar, with 14" or 16" deep steel joists spanning approximately 19 to 25 feet to wide flange steel beams (14" to 18" deep). Interior and perimeter columns are typically 6" wide flange sections. Roof steel pitches to provide drainage; the high point is approximately 13'-10½" above the floor.

At the Library, steel roof deck typically spans approximately 5 feet to 16" deep, open web steel joists. Steel joists typically span 26 feet and are supported by wide flange steel beams (16" to 18" deep). Beam spans vary from 25'-9" to 32'-6". Interior and perimeter columns are typically 8" square tube and 8" wide flange sections, respectively. Roof steel pitches to provide drainage; the high point is approximately 13'-10½" above the Second Floor.

The roof of the Lower Gymnasium is framed with steel roof deck spanning 6'-6" to 48 inch deep, long span open web steel bar joists. Steel joists clear span the space (approximately 92'-5") and are supported by W21 inch deep, wide flange steel beams. Steel beams span 19'-6" to 21'-6½" and are supported by wide flange steel columns.

The expanded Cafeteria roof matches the original roof construction, as described above.

Second Floor/Mezzanine Floor Construction:

1975 Additions:

The Second Floor of the Library is framed with a 3" concrete slab, on 26 gauge steel form deck, spanning 2'-0" to 16" or 18" deep open web steel bar joists. The joists typically span 26 feet and are supported by 24" deep, wide flange steel beams and square tubular steel columns. The top of steel beam is 11'-6½" above the First Floor. The design live load is 150 psf.

A small Mezzanine Floor (600+/- square feet) was constructed in the I – Building. Floor construction consists of a 5½" thick, one-way reinforced concrete slab spanning 11+/- feet to masonry bearing walls. The top of slab is approximately 7'-6" above the First Floor.

Typical First (Main) Floor Construction:

Original Construction - 1960:

Typical First Floor construction for all buildings (except at the Gymnasium) consists of a 4" thick, concrete slab on grade, reinforced with welded wire fabric.

First Floor construction over the various MEP tunnels consists of a 2" concrete topping slab on 6" thick, precast, prestressed concrete (Dox) plank. Tunnels are typically 5'-8" deep, with a 4" concrete slab on grade floor. Floor construction over the basement Mechanical Rooms in the A – Building, the H – Building and the Gymnasium is similar, with 8" thick precast plank.

At the east side of the Gymnasium, 8" thick Dox planks, with a 2" concrete topping slab spans 21+/- feet over the Mechanical Room below. The Gymnasium floor is framed with a one-way, reinforced concrete slab (5" to 7½" thick) typically supported by 12" deep wide flange steel beams.

1975 Additions:

Typical First Floor construction for all buildings (including the Lower Gymnasium) consists of a concrete slab on grade, reinforced with welded wire fabric. The slab thickness is 4" at the L - Building and at the northern half of the I – Building. Elsewhere, the slab is 5" thick. First Floor construction at the Library is split between a high and low level, with concrete retaining walls retaining soil at the changes in elevation.

Typical Basement Floor Construction:

Original Construction – 1960:

Typical Basement Floor construction in the Mechanical Rooms consists of a 6" thick concrete slab on grade, reinforced with welded wire fabric. The Locker Room floor is a 4" thick slab.

Expansion Joints:

Original Construction – 1960:

Internal expansion joints were provided in the S – Building, The H – Building and the A – Building to reduce the overall length of the structural steel frame. The joints are typically 1" or 2" in width.

1975 Additions:

No internal expansion joints were provided in the 1975 Buildings; however, each building is separated from the original construction by an expansion joint (typically 1").

Foundations:

Original Construction – 1960:

Foundations for all buildings are typically continuous strip footings at the perimeter and basement foundation walls and individual spread footings at interior column supports. As noted above, footings at all buildings have been proportioned on the basis of a 2+/- tsf allowable bearing capacity. Typical foundation walls are 10" thick, but wall thicknesses vary from 8" (tunnel walls) to 16" (Mechanical Room walls at the Gymnasium).

1975 Additions:

Foundations for all buildings are typically continuous strip footings at the perimeter and basement foundation walls and individual spread footings at interior column supports. As noted above, footings at all buildings have been proportioned on the basis of a 2+/- tsf allowable bearing capacity. Typical foundation walls are 10" thick, but wall thicknesses vary from 8" to 16".

Drainage:

It does not appear that perimeter foundation drains or underslab drainage was provided for any of the original buildings or the 1965 and 1975 additions. Further review is required to determine if any drainage provisions were made. Facilities personnel report that there are no groundwater issues in the basements or in other areas.

Exterior Wall Construction:

Original Construction – 1960:

Original exterior wall construction was brick veneer with an unreinforced masonry backup, or floor to ceiling glazing. Most of the 1960 facades were removed and replaced in the 1980's, with brick veneer cavity wall construction and new window units. Control joints and weep holes were provided. Additional details of the 1980's wall construction are not known.

1975 Additions:

Exterior wall construction typically consists of a 4" split face block veneer with a pumice block backup. An insulated cavity was provided. Control joints and weep holes are present in this construction.

Fire Resistance:

Steel framing at the original buildings and at the 1965 and 1975 additions is typically unprotected and has no fire resistance rating. The construction is classified as Type 2B, Non-Combustible, Unprotected.

Sprinklers have been installed in the H – Building only.

Fire rating issues will need to be evaluated in conjunction with potential, future additions and/or renovations to the complex. Fire protection of the existing floor and roof construction and/or the introduction of new building joints with fire walls may be required to meet current code requirements.

Lateral Load Resistance:

Original Construction – 1960:

The means by which lateral (wind and seismic) forces are resisted is not defined on the original (1958) structural drawings (typical for buildings of this era). However, the non load bearing masonry walls (at the building perimeter, at corridors and between classrooms, etc.) serve as shear walls and provide a degree of lateral force resistance. Rigid steel frames at the Cafeteria and the Gymnasium provide lateral stability in the direction of the frame spans.

1975 Additions:

The 1975 additions were also designed prior to the introduction of seismic codes; however, (per the Structural Drawings) these buildings were designed for a 20 psf wind load. The lateral (wind) force resisting system is not clearly defined on the Structural Drawings; it is expected that interior and perimeter (unreinforced) masonry walls serve as lateral load resisting shear walls.

III. SUBSURFACE SOILS/FOUNDATION CONSIDERATIONS

Boring logs were included on the 1958 and 1973 Structural Drawings. Four (4) additional borings (shallow depth) were taken by The Geotechnical Group in June, 2005. Subsurface conditions generally consist of loose to medium dense natural sands. Groundwater was encountered at the northern end of the site at a relatively shallow depth in two of the 2005 borings (approximately 5 feet below the existing ground surface). Based on their (limited) exploration/evaluation of the site, The Geotechnical Group concluded that the potential for liquefaction of the subsurface soils during a seismic event may be present (potentially affecting foundation design and construction for all options).

Additional borings were taken at the site by Nobis Engineering during the weeks of May 9, 2011 (four borings) and June 6, 2011 (two borings). A preliminary Geotechnical Report was issued on June 6, 2011. It was determined that the soils at the site are not susceptible to liquefaction. The site has been classified as Site Class D. Foundations can be conventional spread footings, proportioned on the basis of a 2 tons per square foot allowable bearing pressure. Perimeter and underslab drainage is generally not required; however a perimeter drain should be provided behind foundation walls at below grade spaces. Lowest level floors can be slab on grade construction.

Compressible, varved silts and clays were encountered at the western part of the site (May 2011 borings). New construction at this part of the site (particularly those options which would require additional fill) will experience additional, long term settlement, due to the presence of this compressible layer. Preloading of the site (4 to 6 month duration) would be required to mitigate long term settlements. A hard, varved clay and silt layer was encountered in the more recent (June 2011) borings to the south of the existing facility. New construction in this location would require cuts into the existing hillside (no fill), which would reduce the load on the clay/silt layer and decrease the potential for additional long term settlements.

IV. STRUCTURAL CONDITION/COMMENTS

Structural conditions at the Concord Carlisle Regional High School were reviewed (to the extent possible) during a visit to the site on November 9, 2009 and again on March 8, 2011. Floor and roof construction was obscured by finishes (hard ceilings) and could not be viewed in a number of areas. However, the roof and floor construction of the original building and the subsequent (1965 and 1975) additions generally appears to be in satisfactory condition. Foundations appear to be performing adequately; there is no evidence of excessive, total or differential settlements. Essentially, there has been no significant change in the condition and/or the performance of the superstructure and the foundations over the past 16 months. There was no visible evidence that the roof structure had been compromised by the relatively heavy snow loads of January and February of 2011.

It appears that the buildings were constructed in general accordance with the original Structural Drawings.

Facilities personnel continue to report that there are no structural problems/concerns and that there are no groundwater related issues in any of the buildings. There is evidence of moisture in the basement Mechanical Rooms; however it is not clear if this is related to equipment/piping or groundwater. Sump pumps have been provided, which presumably control peak groundwater levels.

Several areas of the slab on grade have settled over time. At the northwest corner of the S – Building, settlement was observed in the floor of the 1965 Chemistry Lab/Classroom. A similar condition was observed at the interface of the original S – Building and the 1975 I – Building. In each case, the settlement observed is likely related to inadequate soil material and/or compaction against the original S – Building foundation wall, prior to placing the new slab. There are no structural concerns related to this condition.

Existing roofs are adhered membrane and are in need of replacement, according to Facilities personnel.

Exterior wall construction generally appears to be in satisfactory construction. Areas of the original (1960) wall construction still remain – the condition of these walls was not determined.

Additional structural/structurally related conditions that should be reviewed and evaluated during Schematic Design and the subsequent design phases include the following (all buildings, unless otherwise noted):

1. Floor Live Loads: Additional structural calculations should be run to confirm the live load capacity of the structured floor in various areas of the complex. Based on our preliminary calculations, however, if the proposed use(s) of the buildings remain essentially the same throughout, floor live load capacity is not expected to be an issue.
2. Snow Load: Roof design loads are typically 40 psf (confirmed by representative structural calculations). The Eighth Edition of the Massachusetts State Building Code (780 CMR) currently requires that flat roof construction for new structures in Concord be designed for a 42.4 psf minimum snow load (plus drifting snow), based on a 55 psf Ground Snow Load (P_g). It does not appear that low roof areas surrounding the higher, Auditorium roof were designed for drifting snow. This issue will need to be evaluated and addressed in conjunction with future renovations to this building. Local reinforcing at potential snow drift areas will likely be required. Future additions (if planned) should be located and massed in a manner to minimize/avoid drifting snow on the existing roof construction.
3. As previously noted, fire resistance rating issues will need to be evaluated with respect to proposed, future renovations and/or additions to the complex.

V. RENOVATIONS AND ADDITIONS – MASSACHUSETS EXISTING BUILDING CODE

General comments relating to potential renovations, alterations and additions to the Concord Carlisle High School are presented in this section. Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (MSBC – 8th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2009 *International Building Code (IBC)* and the 2009 *International Existing Building Code (IEBC)*, respectively.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods.

The *Prescriptive Compliance Method* (IEBC Chapter 3) duplicates Sections 3403 through 3411 of Chapter 34 in the IBC and prescribes specific minimum requirements for construction related to additions, alterations, repairs, fire escapes, glass replacement, change of occupancy, historic buildings, moved buildings and accessibility. A complete structural evaluation of the building is not required, if the impact of the proposed alterations and additions to structural elements carrying gravity loads and lateral loads is minimal (less than 5% and 10% respectively). Seismic upgrades to the existing building are generally not required. An exception is buildings with unreinforced masonry (URM) walls (applicable to Concord-Carlisle High School). Buildings with unreinforced masonry walls are required to be evaluated with respect to the provisions of Appendix A1 of the IEBC (applies to all compliance methods). An assessment of masonry shear stresses, wall slenderness, parapets, wall anchorage, etc. is required; and the existing building must be capable of resisting at least 75% of the seismic loading required by the code for new construction.

The *Work Area Compliance Method* (IEBC Chapters 4 through 12) is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations, in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings. A complete seismic evaluation of the existing building is required for the following: Level 2 alterations where the demand to capacity ratio of lateral load resisting elements has been increased by more than 10%, all Level 3 alterations, a change in occupancy to a higher category and where structurally attached additions (vertical or horizontal) are planned.

The *Performance Compliance Method* (IEBC Chapter13) duplicates Section 3412 of Chapter 34 in the IBC and provides for evaluating a building based on fire safety, means of egress and general safety (19 parameters total). This method allows for the evaluation of the existing building to demonstrate that proposed alterations, while not meeting new construction requirements, will maintain existing conditions to at their current levels (at a minimum) or improve conditions, as required. A structural investigation and analysis of the existing building is required to determine the adequacy of the structural systems for the proposed alteration, addition or change of occupancy. A report of the investigation and evaluation, along with proposed compliance alternatives must be submitted to the code official for approval.

Additions:

The design and construction of proposed additions will be in accordance with the code for new construction. Additions should be structurally separated from the existing building by an expansion (seismic) joint to avoid an increase in gravity load or lateral loads to existing structural elements.

Renovations/Alterations:

Where proposed alterations to existing structural elements carrying gravity loads result in a stress increase of over 5%, the affected element will need to be reinforced or replaced to comply with the code for new construction. Proposed alterations to existing structural elements carrying lateral load which result in an increase in the demand - capacity ration of over 10% should be avoided, if possible; otherwise, a complete lateral load evaluation and seismic upgrades/reinforcing will be required. Essentially, this means that the removal or major alterations to the existing, unreinforced masonry bearing/shear walls at the facility should be minimized.

END OF FINAL EXISTING STRUCTURAL CONDITIONS REPORT

CDW CONSULTANTS, INC.

CIVIL & ENVIRONMENTAL ENGINEERS

PRINCIPALS AND ASSOCIATE
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PHASE I PRELIMINARY SITE ASSESSMENT RELATIVE TO OIL AND HAZARDOUS MATERIALS

Concord Carlisle High School
500 Walden Street
Concord, MA

May 2011

Prepared for:

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APPENDICES

I. PRELIMINARY PHASE I SITE ASSESSMENT SUMMARY

CDW Consultants, Inc. (CDW) has conducted an investigation of the Concord Carlisle High School located at 500 Walden Street ("Site") in Concord, Massachusetts. The investigation consisted of a Site reconnaissance, document research of the Site to identify potential environmental concerns, an environmental database review and interviews with local officials, the current Site owner, and agency employees. This Site investigation was conducted in April and May, 2011.

1.0 General Site Conditions

1.1 Location and Site Description

The subject Site is located at 500 Walden Street, Concord, Massachusetts and consists of the Concord-Carlisle High School. Additional facilities, the Beede Swim and Fitness Center and school bus transportation facility, are also within the campus but are outside of the scope of this assessment. The campus is comprised of a parcel of land that totals approximately 94 acres and is located on the Town of Concord Assessor's Map 11H, Block 298. The campus is located on the United States Geological Survey (USGS) Concord, MA (1987) Quadrangle Map (Refer to Figure 1 in Appendix A for the Locus Map) at approximate UTM coordinates 307325.4 mN, 4702042.0 mE and latitude 42° 265' 55.3'' N, longitude 71° 20' 34.4'' W. Figure 2 in Appendix A is an Assessor's map showing the property limits.

On April 21, 2011, CDW performed a Site reconnaissance to observe the interior of the existing building, general surficial condition of the Site, and documented existing and observable land uses of the Site and adjacent properties. The interior inspection was conducted in the presence of custodian Chris Johnson. Mr. Steve Wall, Building Supervisor, was also interviewed.

1.2 Interior Building Inspection

The Concord-Carlisle Regional High School is a one and two story brick and concrete flat roof structure that was build in 1959. The gymnasium, auditorium, and library are located in the two story section of the building.

The high school services students grades 9-12, and houses classrooms, offices, bathrooms, storage closets, custodian closets, boiler room, mechanical room, gymnasium, auditorium, library, cafeteria, kitchen, and maintenance department. Laboratory chemicals for the science classrooms were observed in a locked central storage room. A flammable storage cabinet and an acid storage cabinet were also observed in the storage room. The visual arts classrooms (including photography and ceramics) and the woodworking classroom were not accessible. Potential hazardous materials associated with those subjects, such as film developing chemicals, ceramic glazes, paints, etc., may be stored in those classrooms. The bathrooms have floor drains that discharge to the sewer system. The custodial rooms have small quantities of cleaning products.

Mr. Steve Wall provided access to the kitchen for observation. There are two walk in freezers and one walk in refrigerator, as well as floor drains and a grease trap that discharge to the sewer system. Mr. Wall stated that the school is hooked up to public water and public sewer. The grease traps are regularly cleaned, however he did not indicate when the last cleaning occurred.

The maintenance department has a concrete floor and exterior bay door to allow for vehicle and landscaping equipment access and maintenance. Small quantities of automotive chemicals and lubricants are stored on shelves and a 5 gallon gasoline container is stored on the floor. The concrete floor has minor cracking and oil stains. No floor drains were observed.

The boiler room located near the gymnasium is below grade and has a concrete floor. Two natural gas fired boilers, one air compressor, air handling units for the HVAC system, two wall mounted and one floor mounted dry transformers, and electrical panels were observed. The concrete floor was in relatively good condition, with no observable cracks. Two floor drains were observed with no liquid and appear to be plugged. There were minor oil stains and oil absorbent material observed under the air compressor.

The mechanical room located in the math/science wing is below grade and has a concrete floor, which is in good condition with no observable cracks. Two sumps, an air handling unit, dry transformer, one floor drain, and crawl space pipe chase were observed. One sump contained water, with no oily sheen observed. The second sump was no longer in use, dry, and had no oil staining. The floor drain was dry and no staining was observed around the drain. Access to a crawl space with a dirt floor was observed that contained piping.

The mechanical room located near the auditorium is below grade and has a concrete floor, which is in good condition with no observable cracks. A chiller unit, compressor, sump, and two floor drains were observed. The floor drains were dry and appear to be plugged. The sump contained water of which no oily sheen was observed. Minor oil stains on the concrete floor were observed underneath the compressor.

Mr. Johnson had no information on the discharge locations of the floor drains in the boiler room and mechanical rooms.

1.3 Exterior Building Inspection

The parcel of land that the Site is located within is bounded by wetlands and residential housing on the northeast, by residential housing on the southeast, by State Highway Route 2 and an active railroad operated by MBCR on the southwest, and by a wooded area and residential housing on the northwest. The Site is accessed by two paved driveways that connect to Walden Street and Thoreau Street. Stormwater catch basins were observed in these driveways.

Improvements to the Site include the high school building, two temporary buildings that house classrooms, grassed landscaped areas, asphalt paved access roads and parking lots. Outside of the subject Site and scope of this assessment are the Beede Swim and Fitness facility, school bus transportation facility, athletic fields, tennis courts, and wooded areas.

A paved loop drive is located in front of the main entrance to the building with a grassed area within the loop. There is also a paved access road that encircles the school building. Stormwater catch basins were observed in these access roads.

To the west and down slope of the school building are the school athletic fields, with a paved access road leading to the fields. To the south of the building are steep grassed slopes and beyond are tennis courts and a wooded area. Stemming south from the access road that encircles the school building is a paved access road to the recreational turf field parking lot and a paved access road leading to the school bus transportation facility. Both are up slope of the school building.

In front of bay doors on the southern side of the building is a concrete pad. Mr. Wall stated that a waste oil UST was removed from this location in 1998. No fill port or staining was observed to suggest that there is a UST currently being used. Additional information regarding USTs for the Site is found in Section 4.0. To the east of the building is asphalt paved parking.

There are three courtyards, two partially and one fully surrounded by the building. The fully surrounded courtyard has a man-made pond and shed that is used as a teaching tool. The other courtyards have grassed landscaped areas, walk ways and benches. Catch basins were observed in these courtyards.

Two back up generators, with sub-base diesel storage tanks, on concrete pads were observed; one outside of the cable television room and the other outside of the computer room. Both are surrounded by a chain link fence. No rust or staining was observed on the surface of the generators and there was no distressed vegetation surrounding the generators. The natural gas meter was observed on the southeast side of the building. A solid waste trash dumpster and recycling carts were located on a paved area at the southern side of the building. No evidence of inappropriate dumping was observed.

There was no evidence of suspect waste disposal pits or areas of oil staining observed during the Site inspection. Additionally, there were no areas of disturbed soil or distressed vegetation, or monitoring wells observed on the exterior of the Site.

2.0 Additional Site and Surrounding Area Information

2.1 Massachusetts GIS Data

The following is additional research pertaining to the Site that was conducted using the Massachusetts Geographical Information System (MassGIS) online data viewer.

Hydrography

According to the MADEP Wetlands and USGS data layers, there are wetlands present immediately adjacent to the north side of the athletic fields. There are wetlands located across Walden Street, to the east of the subject parcel. Located with a ½ mile of the Site is Fairy Land Pond to the east and Walden Pond to the south. (Figure 3 in Appendix A).

Open Space

The MassGIS open space data layer shows that a portion of the Site is open space that is owned by the Town of Concord for recreation and has a limited level of protection. Additionally, there are four parcels of open space adjacent to the Site, located to the east, north, west, and south (Figure 4 in Appendix A). The following parcels are:

Name	Owner	Purpose	Level of Protection
Hapgood Wright Forest	Municipal	Conservation	In Perpetuity
Emerson Playground	Municipal	Recreation	None
Arena Farmland	Municipal	Conservation	In Perpetuity
Walden Pond State Reservation	State	Conservation	In Perpetuity

Natural Heritage Atlas

A review of the 13th Edition of the Massachusetts Natural Heritage Atlas data layer shows that there is a Priority Habitat of Rare Species within a one-half mile south of the Site. There are no Areas of Critical Environmental Concern (ACECs) at the Site or within a one-half mile radius of the Site. (Figure 5 Appendix A).

Resource Areas

The MassGIS regulated areas data layers (Figure 6 Appendix A) show that within a one-half mile radius of the Site there is a MADEP Permitted Solid Waste Facility to southeast; there are three Certified Vernal Pools, one to the east and two to the south; and public water supply groundwater wells to the north. Additionally, the Site does lie within an area classified as a medium yield aquifer and Public Water Supply Protection Area Zone II. There are no Massachusetts Contingency Plan (MCP or Chapter 21E) sites within the one-half mile radius.

2.2 Physical Setting

According to the USGS Topographic Map, the Site is located at an elevation of 154 feet mean vertical datum. The entire Site is steeply sloped. The groundwater flow direction is estimated to be towards the north but could also be influenced by local wetlands and water bodies.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Panel 25017C0378E), the Site is located within a Zone X, which is classified as an area outside of the 0.2% annual chance floodplain (Figure 7 Appendix A).

CDW did not perform any subsurface investigations as part of this Preliminary Phase I. According to the U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS), the Site soil component is predominantly Urban Land (Udorthents), which may include very deep, nearly level to moderately steep, loamy and sandy soils that have been altered. The surrounding soil types are steeply sloped sandy-loam or loamy-sand soils and include Hinckley loamy sand (15-25% slopes), Windsor loamy sand (3-8% and 8-15% slopes), and Merrimac fine sandy loam (3-8% slopes).

CDW reviewed the Bedrock Geologic Map of Massachusetts (Zen, 1983). The bedrock beneath the Site is "SOagr" that is part of the Avalon Belt, which consists of muscovite-biotite granite.

The storm water on the site collects in catch basins. According to Mr. Steven Ventresca of Nitsche Engineering, there are two storm drain systems on the Site. One storm drain system is located along the access road off Walden Street and discharges directly to an outfall in the wetland across Walden Street. The other storm drain system is located along the access road off Thoreau Street and discharges directly to an outfall on Town property across Thoreau Street.

3.0 Site and Surrounding Area History

CDW reviewed available aerial photographs and records at local and state agencies and the local historic archives, and conducted interviews for information regarding historical uses of the Site and surrounding area.

According to the Concord Assessor's Department, the current owner of the Site is the Town of Concord. The school building was built in 1959. There is no Sanborn Fire Insurance Map for this Site.

CDW reviewed aerial photographs of the Site and surrounding area dated 1938, 1952, 1960, 1969, 1978, 1980, 1985, 1995 and 2006. The 1938 aerial photograph of the Site shows an access road leading to disturbed areas. To the north of the Site is agricultural land and to the west wooded areas to the south and east. The 1952 aerial photograph of the Site shows that area of disturbance increased. The 1960 aerial photograph shows the newly constructed high school building and athletic fields. From the 1960s through to 2006, the aerial photographs show single family homes constructed on the once agricultural land to the north and west of the Site. The wooded areas to the south and east continued to remain undeveloped and are now protected open space. The 1952, 1969, 1980 and 2006 aerials are provided in Appendix B.

CDW reviewed historic maps that are archived at the Concord Free Public Library. An 1830 map of Concord depicts the Site as wooded hills with only one house to the east. An 1852 map of Concord depicts the Site as woodland and the newly constructed Fitchburg Railroad. The 1942 Planning Board map of Concord shows the newly constructed State Highway Route 2 to the south of the Site.

CDW interviewed Ms. Leslie Wilson, Curator of the Concord Free Public Library Special Collections, regarding the history of the Site. Ms. Wilson provided oral history of the possible historic uses of the Site. According to Ms. Wilson, a gravel pit occupied the site during the 1920s. Additionally she stated that the town dump was also located on this property. She provided a photo dated 1936 of the intersection of Walden and Thoreau Streets that included the "old town dump" in the caption of the photo.

4.0 Records Review

CDW reviewed records from various local and state offices, and obtained an environmental database report from Environmental Data Resources, Inc. (EDR) for information pertaining to the Site and the surrounding area. The Site is listed on the FINDS and MANIFEST databases. The Site is not listed as a leaking underground storage tank (LUST) site, RELEASE site (MA Release Tracking Database), and SHWS site (database of releases of oil and hazardous materials to MA DEP) as a federal National Priority List (NPL), Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) site, Resource Conservation and Recovery Act (RCRA) corrective action report, large or small quantity generator or transporter. Also the Site is not listed as a Federal Emergency Response Notification System (ERNS) site, or above ground storage tank (AST) site. The EDR Report Executive Summary is provided in Appendix C. A summary of the information follows.

4.1 Registered Underground Storage Tank (UST)

CDW reviewed the state database for registered USTs. According to the MassDEP database (as of April 2011), there are no currently registered USTs on the Site, however there was one (1) registered UST located at the Site that was removed in 1998. The UST was a 275 gallon steel tank that contained waste oil.

4.2 Massachusetts SHWS List

CDW reviewed the SHWS database published by the MassDEP (April 2011), which contains information on releases of oil and hazardous materials that have been reported to the MassDEP. According to the MassDEP, there are no State Listed Reportable Releases on the Site or within a ½ mile of the Site.

4.3 Massachusetts Leaking Underground Storage Tanks (LUST)

CDW reviewed this database published by the DEP (April 2011) that document releases with one or more underground storage tank(s) as the source of contamination. The subject Site is not listed as a LUST and there are no LUST sites within a ½ mile of the Site.

4.4 Massachusetts Leaking Aboveground Storage Tanks (LAST)

CDW reviewed this database published by the DEP (April 2011) that document releases with one or more above ground storage tank(s) as the source of contamination. The subject Site is not listed as a LAST and there are no LAST sites within a ½ mile of the Site.

4.5 RCRA Hazardous Waste Generators List

The subject site is not listed as a Resource Conservation and Recovery Act (RCRA) Generator. There are no RCRA generators located within one mile of the Site.

4.6 Massachusetts Solid Waste Facilities (SWF) List

CDW reviewed this database published by the DEP (April 2011) which indicated that there is one (1) solid waste facility currently located within ½ mile of the Site. The land fill is closed with required monitoring. The land fill operated from 1959 – 2000.

Site Name	Address	Direction	Distance
Concord Landfill	755 Walden St	S-SE	.47 miles

4.7 U.S. EPA Brownfield Lists

The subject Site is not listed as a United States Environmental Protection Agency Brownfield Site. The EDR Report does not list any Brownfield sites within one mile of the Site.

4.8 National Priority List (NPL)

The subject Site is not listed as a NPL site. The EDR Report does not identify any NPL sites within one mile of the Site.

4.9 CERCLA Sites

The subject Site is not listed as a CERCLA site. The EDR Report does not identify any CERCLA sites within one mile of the Site.

4.10 Other Databases

FINDS (Facility Index System)
The Site is listed under Registry ID: 110036623801. The EDR Report describes this database as Environmental Interest/Information System from the National Center for Education Statistics, the primary entity responsible for collecting and analyzing data pertaining to education in the United States. The Site is listed because it is a school.

MANIFEST
The Site is listed under EPA I.D. MAP000067938. The EDR Report describes this database as the NY Manifest tracking database for hazardous waste shipments. The Site is listed for a one-time shipment of 7 pounds of D003 – Nonlisted Reactive Wastes on 8/18/1992.

4.11 Fire Department Records

On April 25, 2011, CDW reviewed all available records for the subject Site at the Concord Fire Department. A photocopy of FP-290R Notification and a report on the "Removal of Underground Storage Tanks Concord Public Schools and Concord-Carlisle Regional High School" (Attachment D) were obtained. The following records were reviewed:

- Permit FP-290 Part 3: 5,000 gallon aboveground storage tank (AST) at the bus transportation facility for the storage of diesel fuel. Dated 10/17/1998.

- Permit FP-290R: Notification of Removal of a 275 gallon waste oil tank dated 12/14/1998.

- "Report on the Removal of Underground Storage Tanks Concord Public Schools and Concord-Carlisle Regional High School", written by Gemini Geotechnical Associates, Inc. and dated 8/31/1990. The report included the removal and environmental review of three USTs that were removed from the Concord-Carlisle Regional High School. According to the report, two 15,000 gallon and one 10,000 gallon USTs were removed from the Site on July 17 and 18, 1990. All three tanks contained #4 fuel oil. The soils were analyzed for volatile organic compounds and total petroleum hydrocarbon. Results indicated that the soils were not contaminated and were used to backfill the excavation. The report stated that the tanks were satisfactorily removed in compliance with all applicable local and state laws.

No additional permits or closure reports were found at the fire department.

4.12 Building Department Records

On April 25, 2011, CDW reviewed the records of the Concord Building Department and obtained access to all available records pertaining to the subject Site.

The following records were reviewed:

- Original construction plans of the Concord-Carlisle Regional High School indicated the school originally used a septic system. Septic Tank A was adjacent and south of the access road off Walden Street. Septic Tank B was west of the physical education wing of the school. No information was shown on the location(s) of the leach fields.
- Massachusetts ANF-001 Form – Asbestos Abatement Notification forms for the Concord-Carlisle Regional High School for the following years: 1988, 1993, and 2007.
- MassDEP Notice of Noncompliance, January 31, 2002, for accumulating old, unusable laboratory chemicals.

4.13 Water and Sewer Department Records

On April 25, 2011, CDW interviewed the clerk at the Concord Water and Sewer Department regarding the subject Site. She confirmed that the Concord-Carlisle Regional High School is connected to public water and public sewer. No information about when the school connected to public sewer or history of the septic system was available.

4.14 Planning Division and Historical Commission

On May 9, 2011, CDW interviewed Ms. Marcia Rasmussen, Director of the Planning Division and Historical Commission. Ms. Rasmussen stated that a gravel pit operated at the site during the 1920s and then Site was used as the town dump. Furthermore, Ms. Rasmussen contacted Mr. Jim Macone, whose family owned the gravel pit. Mr. Macone stated that the "Macone pit" and then the town dump were located at the site of the current student parking lot.

CDW was also provided records that pertained to the construction of athletic fields located on the subject parcel. A letter from the Massachusetts Historical Commission to the Secretary of Energy and Environmental Affairs, dated May 30, 2007, determined that "the portion of the woods slated for the playing fields is not of great value as an historic landscape since it already has been significantly disturbed" and that "no archaeological site is identified within or proximate to the boundaries of the site of the proposed playing fields."

A report on the "History of the Concord-Carlisle Regional High School Woods" by Mr. Richard O'Connor, 2007, was also reviewed (Excerpts from this report are in Appendix E). This report was presented to the Concord Historical Commission on May 30, 2007. The high school woods are located adjacent and south of the Site. The report indicated that the eastern portion of the current high school lot was used as a gravel-removing operation during the 1920s. Additionally, the report indicated that town dump was located on the subject parcel up through the 1950s. The report also included hand sketched maps depicting the property ownership from the 1800s to 1970s, and showed the location of the town dump and present day high school building in the same proximate area.

II. FINDINGS AND RECOMMENDATIONS

CDW Consultants, Inc. is providing our professional opinions, based upon our findings as detailed in the "Phase I Preliminary Site Assessment Summary." In addition, we have summarized the key observations and findings upon which these opinions are based.

From this study, CDW has made the following observations:

- The subject Site is located on a Town-owned parcel of land totaling approximately 94 acres. The Site occupies a portion of that parcel, and is improved with a one and two-story brick and concrete high school building (Concord-Carlisle Regional High School). The remainder of the Site is occupied by paved parking and vehicle access roadways, athletic fields, and landscaped and wooded areas as well as the school bus transportation facility and Beede Swim and Fitness Center.

- The school building was constructed in 1959. Historic documentation identified prior uses to include a gravel/sand pit and town dump.

- According to the Concord Fire Department, three (3) USTs that contained heating fuel oil were removed in 1990 and the 1 UST that contained waste oil was removed in 1998.

- The Site is not identified as a DEP Waste Disposal Site. No NPL sites and no current CERCLA listed sites are located within one mile of the Site. The Site is not listed as a RCRA small quantity generator of hazardous waste.

Based upon CDW's observations, there was no visible evidence of releases of oil or hazardous materials at the Site. Based upon the Site research conducted, there exist recognized environmental conditions at the Site which include:

- Documented use of the Site as a sand/gravel pit and the Town dump up until the 1950s.

- The possible presence of contaminated subsurface soil or groundwater due to former USTs, disposal into former septic system leaching fields, and/or undocumented discharges from sumps and floor drains.

- Possible subsurface impacts from undocumented on-site disposal of various waste oils, oil based paints, chemicals and solvents associated with laboratories and classrooms.

No conclusions or opinions can be made regarding the subsurface conditions at the Site without the completion of soil and groundwater sampling and analysis. CDW recommends the following to further investigate the environmental condition of the Site:

- CDW recommends that a Phase II subsurface investigation be conducted including the installation of monitoring wells, and comprehensive soil and groundwater analysis. The wells should be installed in areas to investigate the possible presence of contaminants from former uses, USTs, floor drains, sump and floor drain outlets, and septic system leach fields.

- The results of the soil and groundwater testing program should be compared with applicable standards under the Massachusetts Contingency Plan for notification and/or mitigation requirements. The outcome of the initial sampling efforts can be used to determine whether further investigation and/or remediation is warranted to mitigate potential environmental impacts prior to or during construction.

- During any excavation of the subsurface, if any suspect oil or hazardous materials are encountered, CDW recommends that an environmental consultant observe the excavation to determine whether conditions require mitigating measures prior to new construction.

III. LIMITATIONS

The conclusion is limited to the information available at the time of the investigation and the scope of services as defined. No subsurface exploration was performed on this Site; therefore, no conclusions can be made relative to subsurface conditions or the presence of soil or groundwater contamination from either on-site or off-site sources. In addition, where access to portions of the Site or to structures on the Site was unavailable or limited, CDW renders no opinion as to the presence of oil or hazardous material or the presence of indirect evidence related to oil or hazardous material in that portion of the Site or structure. No other conclusions, interpretations, or recommendations are contained or implied in this report other than those expressed. Also, CDW makes no warranty, expressed or implied, on the accuracy of the work and information completed by others and upon which CDW has relied to prepare this report. No other use of this report is warranted without the written consent of CDW Consultants, Inc.

IV. REFERENCES

1. Bedrock Geologic Map of Massachusetts, 1983.
2. Concord, Board of Assessor's, GIS Map Review, April 25, 2011.
3. Concord, Building Departments, Records Review, April 25, 2011.
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11. Massachusetts GIS Online Data Viewer, April 2011.
12. O'Connor, Richard. "History of the Concord-Carlisle Regional High School Woods" - 2007
13. Wall, Steve, Building Supervisor, Concord-Carlisle Regional High School, April 21, 2011.
14. Wilson, Leslie, Curator, Special Collection, Concord Free Public Library, May 9, 2011.
15. United States Geological Survey, Concord, MA Topographic Quadrangle. 1987.

APPENDIX A

Figures

CDW CONSULTANTS, INC.

SITE

CONCORD CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00
SCALE: 1:20,000

FIGURE 1

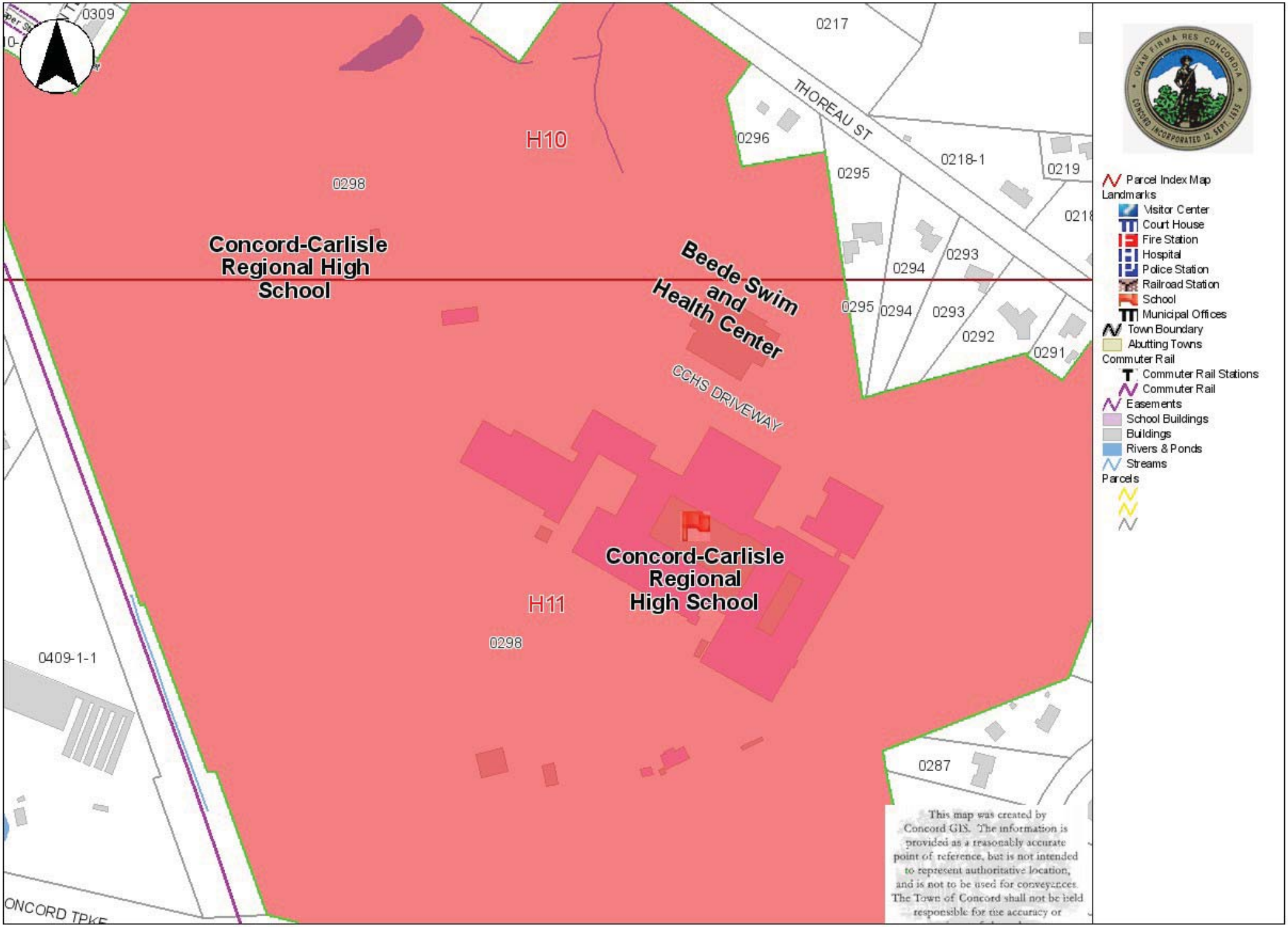
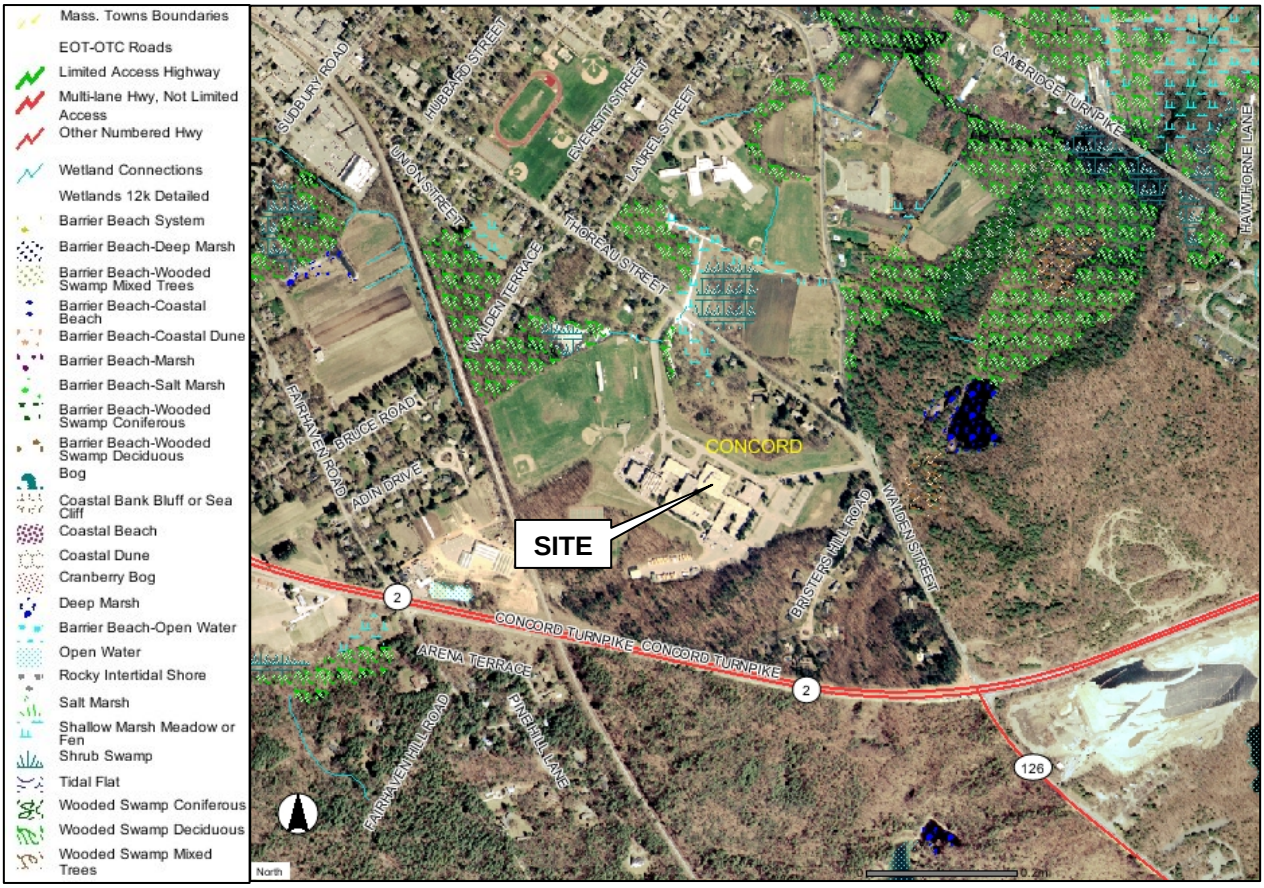


FIGURE 2

MapsOnline



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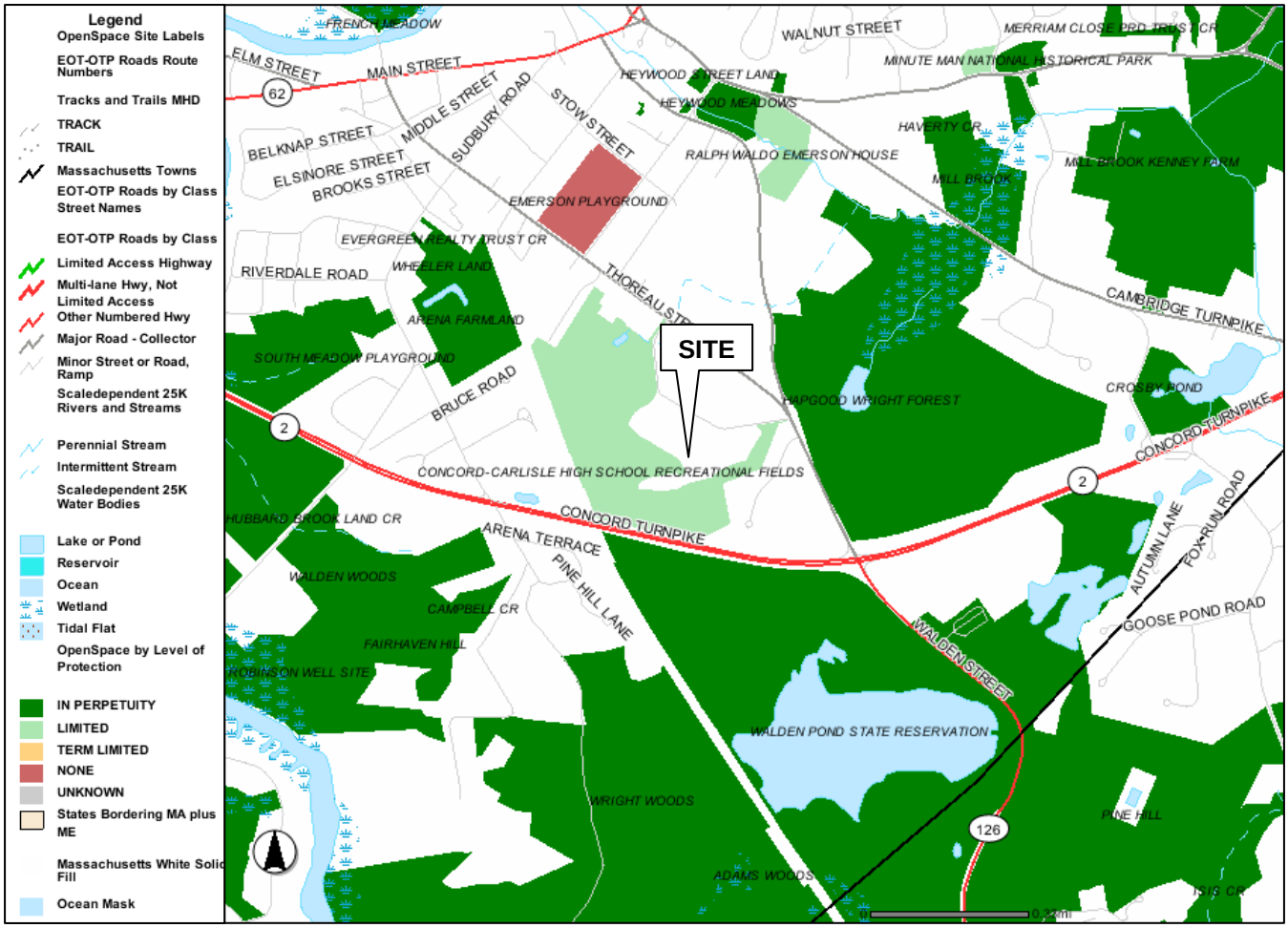
HYDROGRAPHY

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00

FIGURE 3



CDW CONSULTANTS, INC.

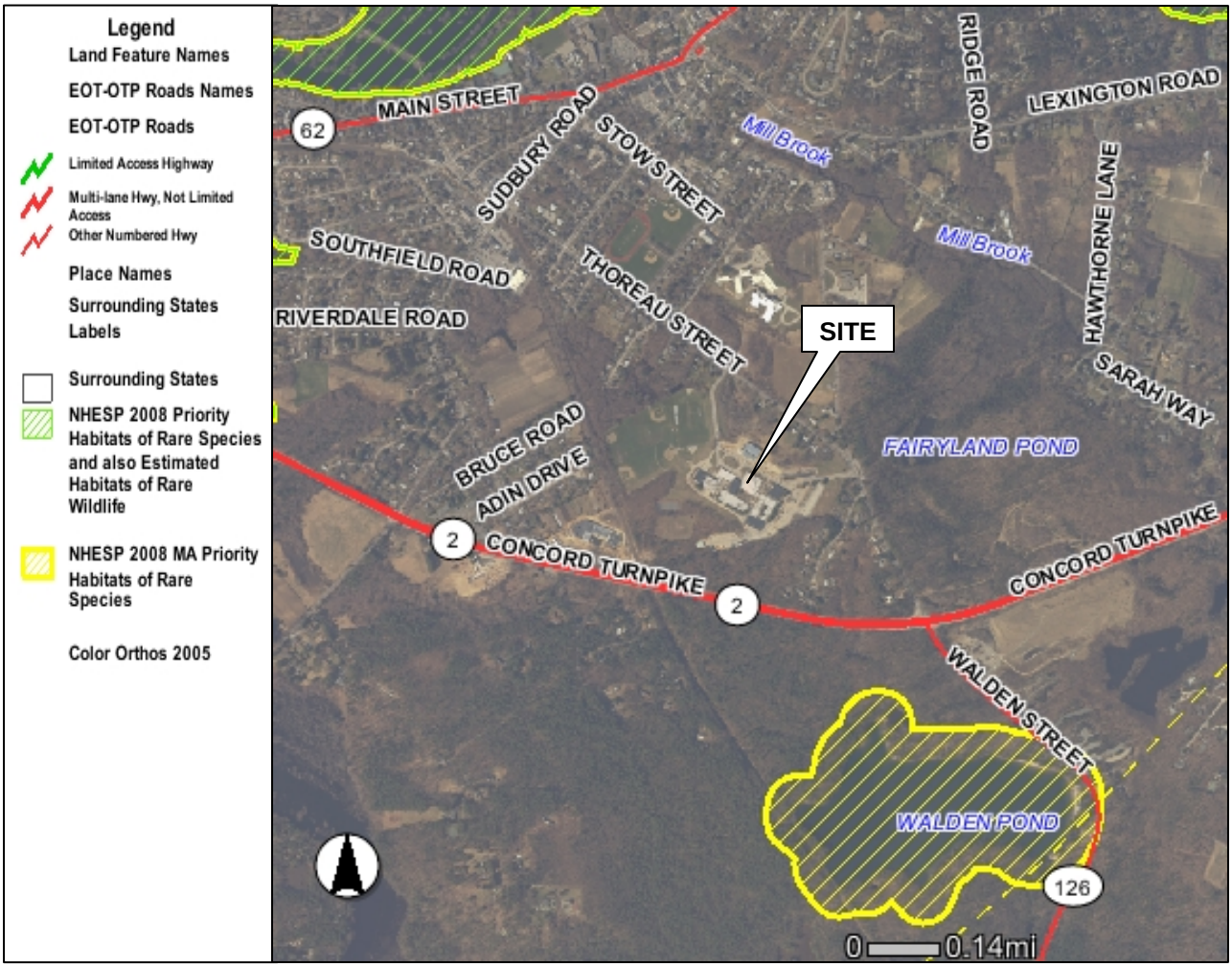
OPEN SPACE

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00

FIGURE 4



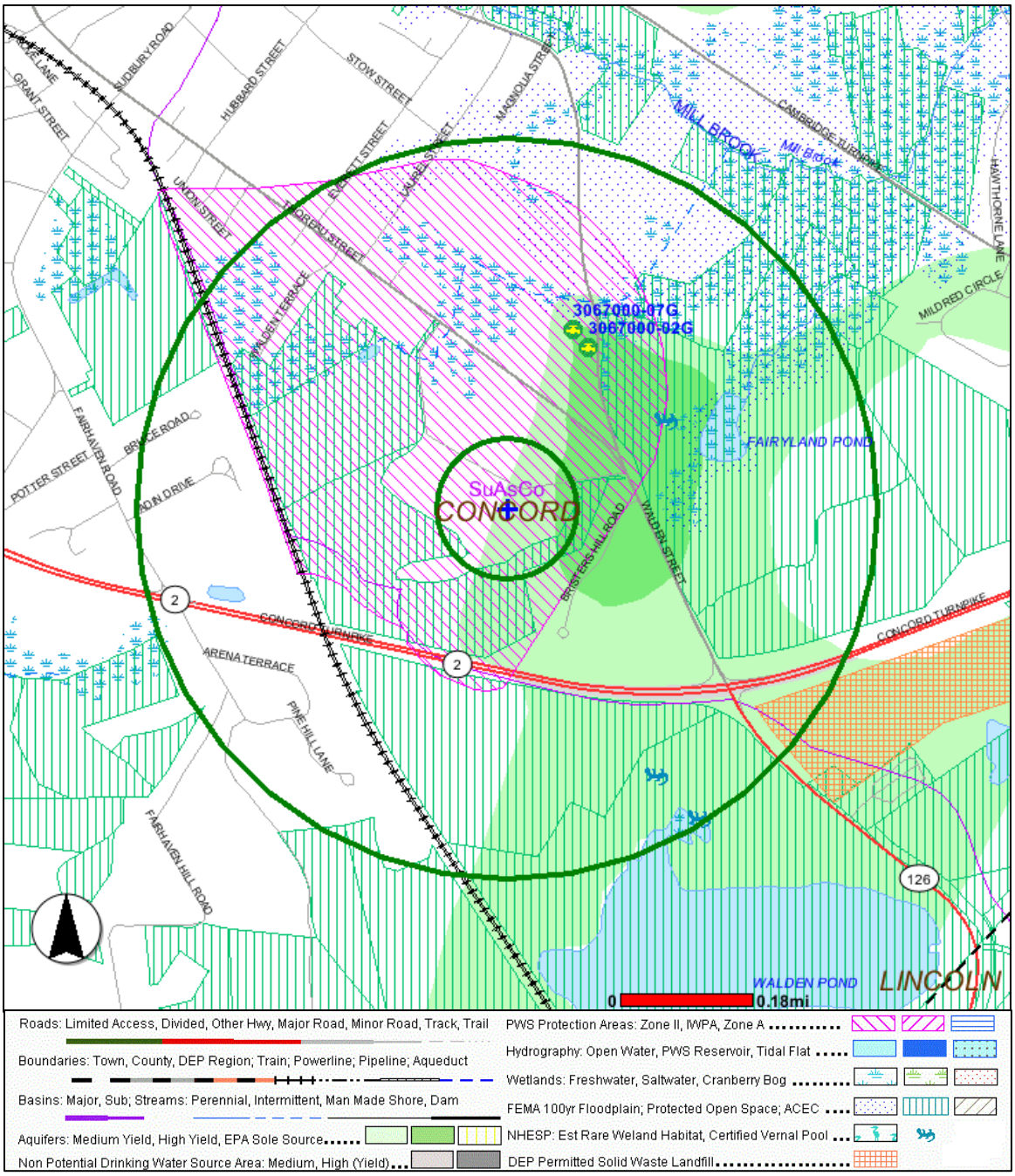
CDW CONSULTANTS, INC.

NATURAL HERITAGE ATLAS

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA PROJECT NO.: 1234.00

FIGURE 5



CDW CONSULTANTS, INC.

RESOURCE AREAS

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA PROJECT NO.: 1234.00

N

FIGURE 6

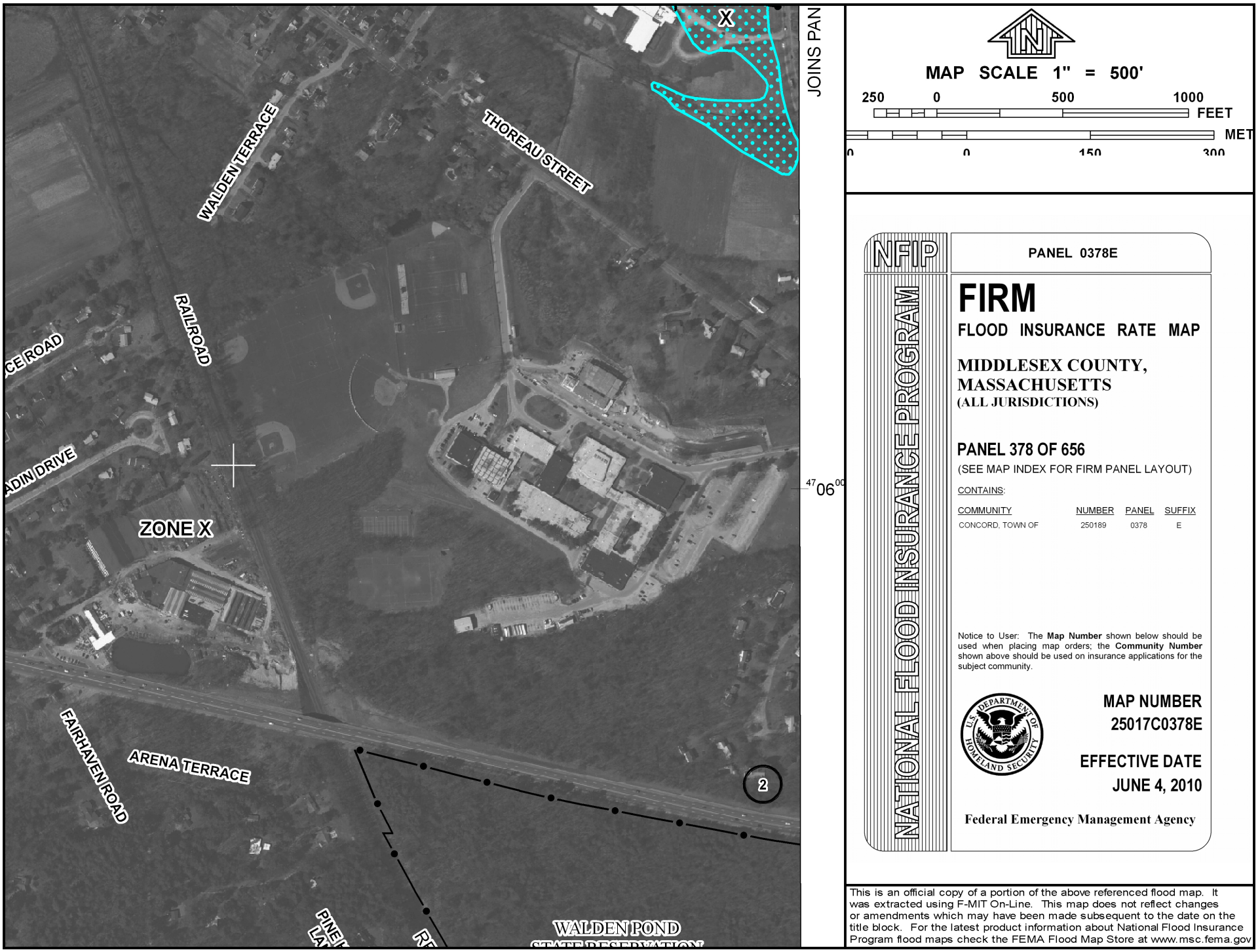
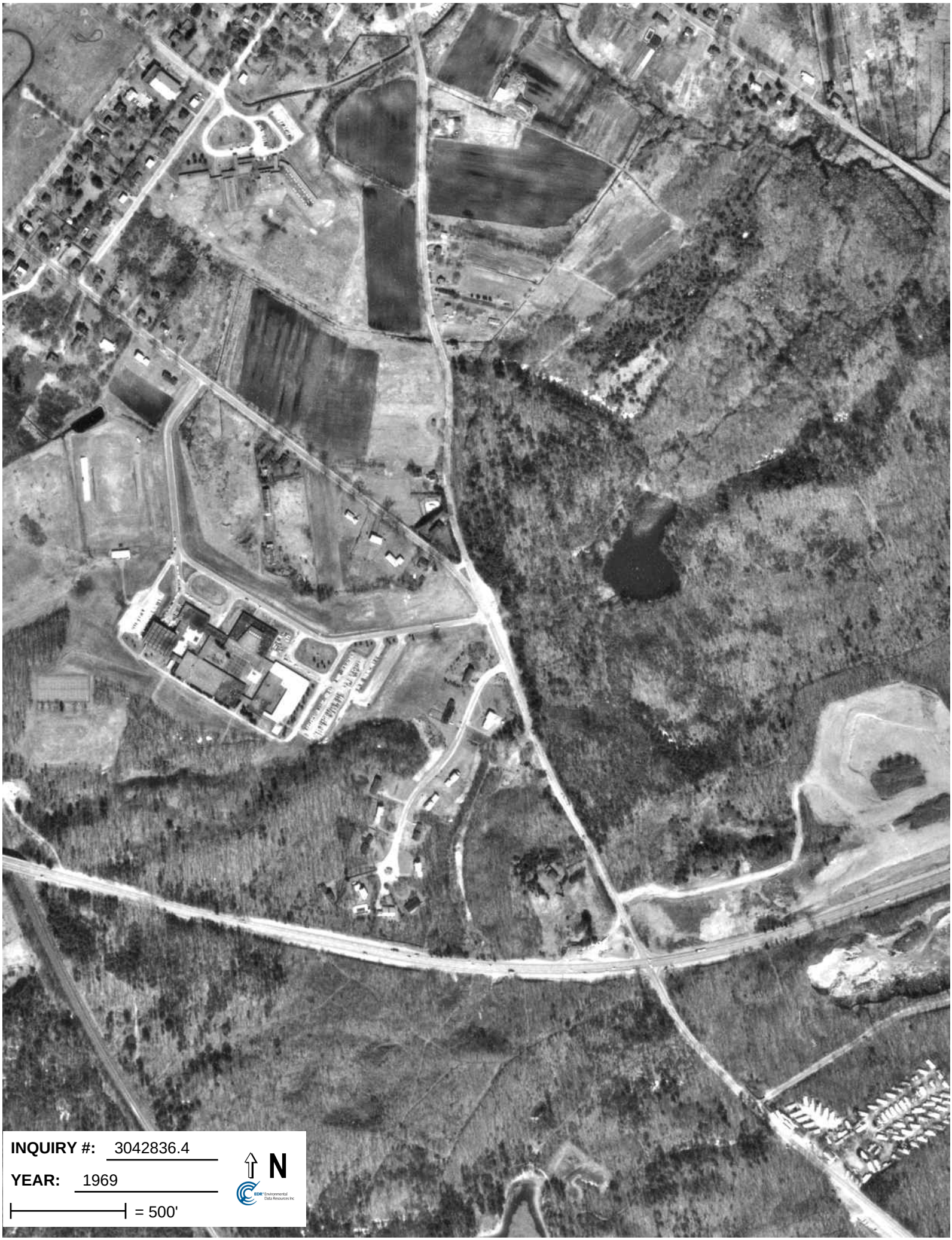

X
JOINS PAN
WALDEN TERRACE
THOREAU STREET
RAILROAD
CE ROAD
ADIN DRIVE
ZONE X
4706.00
FAIRHAVEN ROAD
ARENA TERRACE
2
WALDEN POND
MAP SCALE 1" = 500'
250 0 500 1000
FEET
MET
0 0 150 300
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0378E
FIRM
FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)
PANEL 378 OF 656
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
CONCORD, TOWN OF 250189 0378 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
25017C0378E
EFFECTIVE DATE
JUNE 4, 2010
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 7

APPENDIX B
Aerial Photographs


INQUIRY #: 3042836.4
YEAR: 1952
= 250'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3042836.4
YEAR: 1969
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3042836.4
YEAR: 1980
= 750'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3042836.4
YEAR: 2006
= 604'
N

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX C
Environmental Database Report Executive Summary

CDW CONSULTANTS, INC.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

500 WALDEN STREET
CONCORD, MA 01742

COORDINATES

Latitude (North):	42.448700 - 42° 26' 55.3''
Longitude (West):	71.342900 - 71° 20' 34.4''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	307325.4
UTM Y (Meters):	4702042.0
Elevation:	154 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	42071-D3 CONCORD, MA
Most Recent Revision:	1987

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2006, 2008
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 7 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
CONCORD CARLISLE REGIONAL HIGH SC 500 WALDEN STREET CONCORD, MA 01742	FINDS	N/A
CONCORD CARLISLE REGIONAL SCHOOL 500 WALDEN STREET CONCORD, MA 01742	MANIFEST	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal leaking storage tank lists

LUST ---------- Leaking Underground Storage Tank Listing

LAST ---------- Leaking Aboveground Storage Tank Sites
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

AST ---------- Aboveground Storage Tank Database
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL ---------- Sites With Activity and Use Limitation

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information
LUCIS ---------- Land Use Control Information System

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Historical Spill List

Other Ascertainable Records

RCRA-NonGen ---------- RCRA - Non Generators
DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
FUDS ---------- Formerly Used Defense Sites
CONSENT ---------- Superfund (CERCLA) Consent Decrees
ROD ---------- Records Of Decision
UMTRA ---------- Uranium Mill Tailings Sites
MINES ---------- Mines Master Index File

TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
RAATS	RCRA Administrative Action Tracking System
NPDES	NPDES Permit Listing
DRYCLEANERS	Regulated Drycleaning Facilities
ENF	Enforcement Action Cases
AIRS	Permitted Facilities Listing
LEAD	Lead Inspection Database
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
FINANCIAL ASSURANCE	Financial Assurance Information Listing
GWDP	Ground Water Discharge Permits
COAL ASH DOE	Sleam-Electric Plan Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

SHWS: Contains information on releases of oil and hazardous materials that have been reported to DEP.

A review of the SHWS list, as provided by EDR, and dated 01/11/2011 has revealed that there are 10

SHWS sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
TUTTLES LIVERY	***35-45 WALDEN ST***	***NNW 1/2 - 1 (0.800 mi.)***	***9***	***33***
Compliance Status: No Further Action (DEP Determined)				
NO LOCATION AID	***1089 CONCORD TPKE***	***W 1/2 - 1 (0.804 mi.)***	***B10***	***34***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
CONCORD SUNOCO	***1089 CONCORD TURNPIKE***	***W 1/2 - 1 (0.804 mi.)***	***B11***	***40***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***41 MAIN ST REAR***	***NNW 1/2 - 1 (0.837 mi.)***	***12***	***61***
Compliance Status: Release Action Outcome				
PROPERTY	***211 SUDBURY RD***	***WNW 1/2 - 1 (0.850 mi.)***	***14***	***67***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
MILL BROOK	***34 MAIN ST (NEAR)***	***NNW 1/2 - 1 (0.859 mi.)***	***15***	***77***
Compliance Status: Release Action Outcome				
STATION 2169 CUMBERLAND FARMS	***120 THOREAU ST***	***NW 1/2 - 1 (0.887 mi.)***	***C16***	***79***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
BEHIND COLONIAL INN	***48 MONUMENT SQ***	***NNW 1/2 - 1 (0.938 mi.)***	***18***	***90***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***50 BELKNAP ST***	***NW 1/2 - 1 (0.962 mi.)***	***D19***	***93***
Compliance Status: Response Action Outcome Not Required				
SERVICE STATION FMR	***48 THOREAU ST***	***NW 1/2 - 1 (0.992 mi.)***	***21***	***109***
Compliance Status: Release Action Outcome				

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Department of Environmental Protection's Solid Waste Facility Database/Transfer Stations.

A review of the SWF/LF list, as provided by EDR, and dated 01/03/2011 has revealed that there is 1 SWF/LF site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CONCORD LANDFILL	755 WALDEN ST	SSE 1/4 - 1/2 (0.468 mi.)	4	9

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Protection's Summary Listing of all the Tanks Registered in the State of Massachusetts.

A review of the UST list, as provided by EDR, and dated 03/04/2011 has revealed that there is 1 UST

site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CONCORD-CARLISLE REGIONAL SCHO	*300 WALDEN ST*	*N 1/8 - 1/4 (0.230 mi.)*	*3*	*9*

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

RELEASE: MA Release Tracking Database.

A review of the RELEASE list, as provided by EDR, and dated 01/11/2011 has revealed that there are 17 RELEASE sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CONCORD FIRE DEPARTMENT Facility Status: Response Action Outcome	*209 WALDEN ST*	*N 1/2 - 1 (0.548 mi.)*	*5*	*10*
Not reported Facility Status: Response Action Outcome	*105 EVERETT ST*	*NW 1/2 - 1 (0.552 mi.)*	*6*	*15*
NYNEX COMMUNICATIONS OFFICE Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*111 WALDEN ST*	*NNW 1/2 - 1 (0.683 mi.)*	*7*	*19*
NO LOCATION AID Facility Status: Response Action Outcome	*148-150 HUBBARD ST*	*NW 1/2 - 1 (0.707 mi.)*	*8*	*27*
TUTTLES LIVERY Facility Status: DEP No Further Action	*35-45 WALDEN ST*	*NNW 1/2 - 1 (0.800 mi.)*	*9*	*33*
NO LOCATION AID Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*1089 CONCORD TPKE*	*W 1/2 - 1 (0.804 mi.)*	*B10*	*34*
CONCORD SUNOCO Facility Status: Response Action Outcome	*1089 CONCORD TURNPIKE*	*W 1/2 - 1 (0.804 mi.)*	*B11*	*40*
NO LOCATION AID Facility Status: Response Action Outcome	*41 MAIN ST REAR*	*NNW 1/2 - 1 (0.837 mi.)*	*12*	*61*
MOBIL STATION	*143 SUDBURY ST*	*NW 1/2 - 1 (0.840 mi.)*	*13*	*65*
PROPERTY Facility Status: Response Action Outcome Facility Status: Response Action Outcome **Additional key fields are available in the Map Findings section*	*211 SUDBURY RD*	*WNW 1/2 - 1 (0.850 mi.)*	*14*	*67*
MILL BROOK Facility Status: Response Action Outcome	*34 MAIN ST (NEAR)*	*NNW 1/2 - 1 (0.859 mi.)*	*15*	*77*
STATION 2169 CUMBERLAND FARMS Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*120 THOREAU ST*	*NW 1/2 - 1 (0.887 mi.)*	*C16*	*79*
NO LOCATION AID Facility Status: Response Action Outcome	*120 THOREAU ST*	*NW 1/2 - 1 (0.887 mi.)*	*C17*	*85*
BEHIND COLONIAL INN Facility Status: Response Action Outcome	*48 MONUMENT SQ*	*NNW 1/2 - 1 (0.938 mi.)*	*18*	*90*
NO LOCATION AID Facility Status: Response Action Outcome Not Required	*50 BELKNAP ST*	*NW 1/2 - 1 (0.962 mi.)*	*D19*	*93*

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAIN STREET	***50 BELKNAP ST***	***NW 1/2 - 1 (0.962 mi.)***	***D20***	***101***
Facility Status: Response Action Outcome				
SERVICE STATION FMR	***48 THOREAU ST***	***NW 1/2 - 1 (0.992 mi.)***	***21***	***109***
Facility Status: Response Action Outcome				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
CONCORD MIDDLE SCHOOL SANBORN BLDG	FTTS,HIST FTTS INSP,FINDS
FACILITY #62	HWS,RELEASE
CROSBY CORNER	HWS,RELEASE
ACROSS FROM STATE HWY GARAGE	HWS,RELEASE
MCI BUILDING F	HWS,RELEASE
HAYES PUMP SITE FMR	HWS,RELEASE
NEAR INTERSECTION WITH RTE 2 AND R	HWS,RELEASE
SITE 6 NEAR CONCORD LINE	HWS,RELEASE
SITE 3 BEHIND SMITH HOUSE	HWS,RELEASE
OLD SANITARY LANDFILL	HWS,RELEASE
LINCOLN TRANSFER STATION	LF
EXECUTIVE FLYERS AVIATION	INST CONTROL,RELEASE,LUST
TEXACO SERVICE STATION	RCRA-CESQG
LINCOLN SCHOOL	FINDS
LINCOLN SCHOOL DEPT	FINDS
CONCORD SANITARY LANDFILL	ODI
SWANSON PONTIAC	MANIFEST
CONCORD SUBARU	MANIFEST
CONCORD SUBARY	MANIFEST
WALDEN POND STATE RESERVATION	MANIFEST

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX D

Excerpts from “Report on Removal of Underground Storage Tanks”

CDW CONSULTANTS, INC.

GG GEMINI GEOTECHNICAL ASSOCIATES, INC.
875 Greenland Road • Portsmouth, NH 03801 • (603) 427-0141

August 31, 1990
Project No. 89035MA

Concord Public Schools
Concord - Carlisle Regional School District
120 Meriam Road
Concord, Massachusetts 01742

Attn: Dr. Gerald E. Missal

Re: Report on Removal of Underground Storage Tanks
Concord Public Schools and Concord - Carlisle Regional High School
Concord, Massachusetts

Dear Dr. Missal:

In accordance with your approval of our proposal GGA89.127.0, dated September 19, 1989, Gemini Geotechnical Associates, Inc. has performed engineering design services and environmental review for the removal of thirteen underground storage tanks in the Town of Concord during 1990. These tanks include :

Facility	Size	Installed	Fuel
Alcott School	5,000 gal.	1951	No. 2
Alcott School	8,000 gal.	1955	No. 2
Willard School	10,000 gal.	1958	No. 4
Willard School	500 gal.	1965	No. 4
Sanborn School	10,000 gal.	1966	No. 4
Peabody School	10,000 gal.	1970	No. 4
Thoreau School	5,000 gal.	1951	No. 2
Thoreau School	5,000 gal.	1955	No. 2
Concord - Carlisle High School	15,000 gal.	1960	No. 4
Concord - Carlisle High School	15,000 gal.	1965	No. 4
Concord - Carlisle High School	10,000 gal.	1960	No. 4
Ripley Administration Building	10,000 gal.	1958	No. 2
Ripley Administration Building	500 gal.	1969	No. 2

The tanks were removed by Zenone, Inc. of Leominster, Massachusetts between July 10 and July 19, 1990. All removals were monitored by Gemini Geotechnical Associates, Inc., who retrieved samples for laboratory testing and screened soils for volatile organic compounds during the excavation.

Description of Sites

A site location plan is attached as Figure 1. The schools are located as follows:

School	Street	Coordinates
Alcott School	Laurel Lane	42°27'14"N, 71°20'53"E
Willard School	Powder Mill Road	42°25'47"N, 71°22'55"E
Sanborn School	Marlboro Road	42°26'30"N, 71°23'39"E
Peabody School	Old Marlboro Road	42°26'01"N, 71°24'14"E
Thoreau School	Prairie Street	42°27'07"N, 71°23'49"E
Concord - Carlisle High School	Thoreau Street	42°26'51"N, 71°20'42"E
Ripley Administration Building	Meriam Road	42°27'53"N, 71°19'53"E

There are five public drinking water wells in Concord. Four of these wells, the Hugh Cargiol Well, the White Pond Well, the Jennie Dugan Well, and the Second Division Well, are located within 1 mile of schools where the tank removals took place. The Hugh Cargiol Well, located near the intersection of Thoreau and Walden Streets, is approximately one quarter of a mile east of the Concord - Carlisle High School. The White Pond Well is located in the Dover Street area, just south of White Pond, and is located approximately one quarter of a mile southwest of the Willard School. The Jennie Dugan Well, located on Old Marlboro Road, is within one-half mile east of the Peabody School and within one-half mile southwest of the Sanborn School. The Second Division Well, which is located in the area of Border Road in West Concord, is approximately three quarters of a mile northwest of the Peabody School.

Tank Excavation and Removal

General

The finished tank excavation areas and the excavated soils were inspected and screened for total volatile organic compounds (VOC's) with a portable Organic Vapor Meter (OVM). The OVM is used to measure concentrations of total volatile

organic compounds in air, which include benzene, toluene and xylenes which are compounds contained in gasoline and petroleum products. The air in the headspace of soil samples is continuously fed into the OVM by a positive displacement pump, and is introduced into a high energy ultraviolet photoionization detector, where a small portion of the sample is ionized. The amount of ions reaching the electrode is proportional to the concentration of organic molecules. The OVM 580A is manufactured by Thermo Environmental Instruments, Inc. of Franklin, MA, and has a detection limit of 0.1 parts per million. Soils were tested by analyzing the air from the head space developed in jar soil samples, and also by screening the soils in-situ.

Alcott Elementary School

Two underground storage tanks, with storage capacities of 5,000 and 8,000 gallons, were removed at the Alcott School on July 10, 1990 by Zenone, Inc. of Leominster, Massachusetts. The 5,000 gallon tank, referred herein as Tank #1, was located on the north side of the school, approximately 15 ft. south of the boiler room, aligned north to south. The 8,000 gallon tank, referred to as Tank #2, was located approximately 20 ft. north and 50 ft. west of Tank #1, and was aligned east to west. Photographs of the site are included in Appendix A.

The soils within the area excavated during removal of the 5,000 gallon tank consisted of a cobbley and bouldery sand, which was mostly fine and contained a fairly high silt content. Soils from the excavation were visibly stained with petroleum product and exhibited an odor characteristic to petroleum products. Excavated soils and soils at the bottom of the excavation were sampled in glass jars and screened for VOCs with the portable OVM. Results of the screenings ranged from non-detectable to concentrations up to 42.8 ppm.

The 5,000 gallon tank excavation was approximately 30 ft. long and 10 ft. deep. Groundwater was encountered at 8 ft. below the surface grade. The most contaminated soils were located under the tank where the fill pipe end of the tank had been located. Upon removal, the tank was somewhat rusted and pitted, but no holes were obvious. Laboratory analysis of the soils remaining in the excavation following the removal of the three loads of heavily contaminated soils revealed a petroleum hydrocarbon concentration of 420 ppm for a soil sample obtained in the fill end area, and a petroleum hydrocarbon concentration of 85 ppm for soil samples obtained at the opposite end of the excavation. Laboratory results are included as Appendix B.

Mike Garrosi of the Massachusetts Department of Environmental Protection was contacted by telephone in regards to management of the contaminated soils. Mr.

ft. long and 15 ft. deep and the area occupied by Tank #2 was approximately 10 ft. long and 10 ft. deep. The removal of Tank #1 was complicated by underground utility wires and piping located to the top and north side of the tank, but the tank was eventually removed without incident. Tank #2 was found to contain some oil at the time of removal, and a small amount (1 - 5 gallons) was spilled onto the grass near the excavation at the time of removal. This small spill was promptly contained and removed by Zenone, Inc. personnel.

Soils around the tanks were collected in glass jars and screened with the OVM. Insitu OVM readings were also taken from soils surrounding the tank. Soils sampled from the sides of Tank #1 showed volatile organic compound concentrations ranging from 5.6 to 24.1 ppm. In-situ readings taken from a pile of soils which had been located on the west side of the tank ranged from 1 to 2 ppm. There was no visible discoloration of the soils excavated, nor in the excavation, and only a very slight petroleum odor could be detected. Laboratory analysis of soils which were directly underneath Tank #1 indicated that a Total Petroleum Hydrocarbon concentration of 74 ppm was detected in soils sampled under the end of the tank opposite the fill end. Soil samples obtained from underneath the fill end of the tank and underneath the middle of the tank were found to be below detection limits.

Upon excavation, Tank #2 was observed to be situated on a concrete base and surrounded by concrete walls. Soils under the concrete and soils in the area of the tank were sampled and screened with the OVM, and no volatile organics were detected. A laboratory analysis was performed on a single soil sample obtained from the bottom of this excavation. The results indicated that the Total Petroleum Hydrocarbon concentration level of the soils sampled was below detection limits.

Upon excavation, both tanks were found to be in good condition with some rusting and very little pitting. No holes were evident in either of the two tanks. The excavations were backfilled with the existing soils, which consisted of a brown, cobbley, mostly fine sand with a small amount of silt.

Sanborn Middle School

A 10,000 gallon underground No. 4 fuel oil storage tank was removed at the Sanborn Middle School on July 12, 1990. The tank was located approximately 20 ft. off the southwest wall of the school, near the southern corner of the building. The tank was aligned northwest to southeast. Soils at the site consisted of a mostly fine sand with some silt, and traces of gravel and cobbles. Photographs of the excavated area and the removed tank are included in Appendix A.

jars and screened with the OVM. VOC concentrations of 4.0 and 0.6 ppm were detected for these samples. In addition, three samples obtained from soils at the bottom of the excavation, and one sample composited from soils which had been removed from the sides of the tank, were collected and sent to the laboratory to be analyzed for Total Petroleum Hydrocarbons. Lab results indicated that a sample taken from soils under the middle section of the tank, as well as the soils sampled from the sides of the tank showed no detectable concentrations of petroleum hydrocarbons. Soils underneath the fill end of the tank exhibited a petroleum hydrocarbon concentration of 67 ppm; soils underneath the opposite end of the tank showed a petroleum hydrocarbon concentration of 66 ppm.

The excavation was backfilled with the soils which originally filled the excavation.

Thoreau Elementary School

Two 5,000 gallon underground #2 fuel oil tanks were removed at the Thoreau School on July 16, 1990. The tanks were located side by side approximately 5 ft. from the north wall of the building and were aligned north to south. Soils at the site consisted of a coarse to fine, but mostly fine, silty brown sand, which contained some gravel and cobbles.

A strong petroleum odor was noted in the vicinity of the excavation. Initially, no petroleum soaked soils were visible, but after removing soils at the bottom of the excavation, soils heavily soaked with petroleum were found to be situated below the level at which the tanks rested and above a concrete slab on which the tanks were installed. To the left of the excavation, where Tank #1 had been, soils closest to the building in the area of the tank's end were visibly stained with fuel oil.

An inspection of the two tanks following removal revealed oil stains on both tanks. Tank #1, located on the left when viewing the tanks from Prairie Street, was stained at the fill end, near the manhole; Tank #2, located to the right, was stained on the top center, surrounding the manhole. In addition, both tanks were rusted, although there was little to no pitting to the tanks. No holes were evident in the tanks.

In-situ OVM readings taken from soils which had surrounded the top and sides of the tanks ranged from nondetectable to 28.8 ppm. Samples of these soils were also collected in glass jars and screened with the OVM. These soil samples were found to contain VOC's at concentrations of 30.0, 53.3, and 30.0 ppm. In addition, jar soil samples were collected prior to removing the heavily contaminated soils for

stockpiling and sent to the lab to be analyzed for Total Petroleum Hydrocarbons. These samples indicate that contamination underneath the right tank was less extensive than contamination underneath the tank to the left. Laboratory results indicate a petroleum hydrocarbon concentration of 5000 ppm in the area of the piping into the school. A sample taken at the end opposite the fill end on the right tank was found to contain 220 ppm of petroleum hydrocarbons; a sample taken from the end of the tank closest to the fill was found to contain a concentration of hydrocarbons of 310 ppm. Lab results showed a petroleum hydrocarbon concentration of 350 ppm at the end of the left tank closest to the fill end, and a concentration of 4800 ppm at the opposite end of the tank (closest to the school). According to these results, and visual evidence, the heaviest contamination in the excavation was in the soils closest to the building. It should be noted however, that these lab results reflect the petroleum content of the original soils in the excavation, prior to removal of contaminated soils. The petroleum content of the soils which remain in the excavation may be lower than levels indicated here.

Mike Garrosi of the Massachusetts Department of Environmental Protection was notified of the contamination at the site. Mr. Garrosi stated that the most heavily contaminated soils should be removed and that a site assessment would most likely be required at the site at a later date. Three loads, totalling 48 cu. yds., of the most heavily contaminated soils were removed from the excavation. The excavation was then backfilled with other soils from the excavation as well as off-site loads of fresh fill. The contaminated soils were transported to Town land located near the High School and stockpiled using plastic sheeting.

Concord - Carlisle High School

Two 15,000 gallon and one 10,000 gallon underground storage tanks were removed from the Concord - Carlisle High School on July 17 and July 18, 1990. All three tanks had contained #4 fuel oil. Photographs of the tanks and the excavations are included in Appendix A.

A 15,000 gallon tank located partially under a walkway near the High School Gym was removed on July 17, 1990. The tank was aligned northeast to southwest and extended out from the northeast side of the gymnasium. The tank removal was complicated by the location of the tank. During excavation, it was discovered that the tank extended approximately 6 ft. under an addition to the building subsequent to the tank installation. The addition, which is a walkway to the gymnasium, has a concrete base, and while the tank was not supporting any part of the addition, the concrete base was situated directly over the tank. Concrete support piles located on either side of the tank transferred the wall load to the soils below the tank. At the

completion of the removal, the excavation was approximately 20 x 20 ft. sq. and ten feet deep, as a result of the large amount of soils excavated around the tank in order to facilitate the tank removal.

The tank was eventually removed from the excavation with no apparent structural damage to the surrounding building. No visible or obvious evidence of a petroleum release was noted in the excavation. In-situ OVM readings of soils taken from the top and sides of the tank showed no presence of volatile organic compounds. Soil samples taken from the bottom of the excavation were placed in glass jars and screened with the OVM. These samples were found to have no detectable concentrations of VOC's. Samples analyzed in the lab showed a Total Petroleum Hydrocarbon concentration of 380 ppm for an area at the bottom of the tank between the middle of the tank and the fill end. A sample taken near the opposite end of the tank, near where the tank had extended under the building was below detection limits, and a sample taken from soils which had surrounded the sides of the tank showed a petroleum hydrocarbon concentration of 60 ppm. The tank itself was found to be slightly rusted and pitted, with no holes or staining, with the exception of a crack made near the fill end of the tank during excavation.

The 15,000 gallon tank at the Science Building was removed on July 18, 1990. The tank was located outside the southeast wall of the Science Building, and was situated perpendicular to the building wall. Soils in the vicinity of this tank consisted of a dry, light brown gravelly and cobbley sand. Upon removal of the tank, the soils appeared clean, with no free product or groundwater present. The excavation was approximately 12 ft. deep. The tank was found to be in good shape with no excessive rusting or pitting observed. No holes were found in the tank, with the exception of one hole which was made during excavation.

The soils were screened for volatile organic compounds using the OVM. Soils which had been removed from the excavation were screened in-situ, and eight readings of no VOC detection were obtained, as well of readings of 4.1 ppm, 6.3 ppm, and 7.1 ppm. Four samples were collected from the bottom of the excavation and placed in glass jars. These readings obtained from these samples included one reading below detection limits, a reading of 0.7 ppm, a reading of 3.0 ppm, and a reading of 30.1 ppm, which was obtained from a sample taken near the fill end of the tank. Mike Garrosi, of the Massachusetts Department of Environmental Protection was telephoned and notified of this last, elevated reading. Two samples from the bottom of this excavation were collected and sent to the laboratory for analysis. The samples, taken from soils under each end of the tank, were reported to have concentrations of petroleum hydrocarbons below detection limits.

No soils were removed for stockpile, and the excavation was backfilled with the original soils.

The 10,000 gallon tank at the Arts Building was removed on July 18, 1990. The tank was located on the northeast side of the school, and was situated parallel to the wall of the building. The soils in the area were observed to be dry, light brown, gravelly sand.

The final excavation was 15 ft. wide and 9 ft. deep. No free product or groundwater was encountered during the excavation. Upon removal, the tank was found to be in good condition with no evidence of holes or excessive rusting or pitting. Samples taken from the bottom of the excavation and placed in glass jars were screened with the OVM. Concentrations of volatile organic compounds ranged from non-detectable to 2.7 ppm. These samples were also tested in the laboratory for Total Petroleum Hydrocarbon concentrations. The lab results indicate that these samples, taken from each end of the tank, as well as from the middle of the tank, contain concentrations of petroleum hydrocarbons which are below detection limits. The excavation was backfilled with the original soil material.

Ripley Administration Building

Two underground #2 fuel oil storage tanks, one 10,000 gallons and one 500 gallons, were removed at the Ripley Administration Building on July 19, 1990. The tanks were located on the north side of the school building, perpendicular to the building. The tanks were aligned end to end, with the 10,000 gallon tank closest to the school. Both of the tanks were on top of concrete slabs.

During excavation, groundwater was encountered at approximately 6 to 8 ft. The natural soils in the area were observed to be a fine tan sand, and the fill that had been used to cover the tanks was a medium to coarse sand. No free product or oily soils were observed in the excavation. The soils were monitored with the OVM and only slight values of volatile organic compounds (less than 10 ppm) were found in an area on the north side of the excavation, under the fill and next to the slab for the 500 gallon tank. The tanks were difficult to extricate due to the groundwater, which caused a suction force on the tank.

Jar soil samples were taken from soils located underneath the two tanks, and were tested in the laboratory for Total Petroleum Hydrocarbons. The results of laboratory testing indicates that no detectable amounts of petroleum hydrocarbons

were found for soils under each end of the 10,000 gallon tank, but that a petroleum hydrocarbon concentration of 210 ppm was detected for soils sampled from underneath the 500 gallon tank.

Upon excavation the tanks were found to be rusted (the 500 gallon tank more so than the 10,000 gallon tank), but there were no holes or evidence of leakage, with the exception one hole which was made in the 10,000 gallon tank during removal.

Conclusions

Based on the data presented in this report, it is our professional opinion that the tanks were satisfactorily removed in compliance with all applicable local and state laws. Contaminated soils were encountered at two sites, the Alcott and Thoreau Schools. The extent of contamination is expected to be limited because it appears that the release of oil at both sites had occurred as a result of spillage or overfilling. The tanks at the Thoreau School had been set on a concrete slab, which would limit the extent of migration of contaminants. A total of 96 cu. yds. of contaminated soil was removed from the sites and stockpiled for disposal.

The Massachusetts DEP was notified of the contamination in accordance with DEP requirements. In accordance with the Massachusetts Contingency Plan, 310 CMR 40.00 the Alcott and Thoreau schools will be listed as Locations To Be Investigated (LTBI). Additional field investigations may be required by the DEP upon the review of the data presented in this report.

Very truly yours,
GEMINI GEOTECHNICAL ASSOCIATES, INC.

Lisa M. Morgan

Lisa M. Morgan
Environmental Geologist

Frank S. Vetere, P.E., Principal
Director of Technical Services

COMMONWEALTH OF MASSACHUSETTS
FRANK S. VETERE
No. 29834
REGISTERED PROFESSIONAL ENGINEER

FSV:LMM:lm
Attachments

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX E

EXCERPTS FROM HISTORICAL REPORT:
"History of the Concord-Carlisle Regional High School Woods"
2007

CDW CONSULTANTS, INC.

short, "Cut Woods" in his Journal entries of June 21 and 23, 1854, May
and October 14, 1856, and October 22, 1860, later published as part of his
Journals first in 1906. This area was critical to the formulation of his ideas on
st succession presented in The Succession of Forest Trees lecture and essay and in
Dispersion of Seeds (published much later as Faith In A Seed).

In 1887 several leading citizens of Concord recognized the beauty of this woods when they had the four acre parcel of land recently donated to the town by the heirs of Ralph Waldo Emerson for a public playground, drill ground, and ceremonial site landscaped so as to frame it as a "distant view" from the playground. That parcel is still part of Emerson Playground, but the original "distant view" of this fringe of Walden Woods has since been obscured by the construction of houses and growth of trees.

The Concord Turnpike (Route 2) was constructed in 1934 over this hill. It had been supported and lobbied for by most Concordians as it would take major through traffic away from the center of town. It generally followed the route of the old Cambridge – Concord Turnpike west to Crosby Corner, turned southwest up the hill and proceeded northwest through Deep Cut Woods. Most landowners along Route 2 wanted the town to re-zone their land so they could capitalize on the substantial traffic coming through. The selectmen realized they could not let everyone put a business, tearoom, or roadside stand on their land along the highway and, although they considered a number of different propositions (including a buyer who wanted to put a restaurant here), they decided, meeting with the selectmen of other towns along Route 2 in this area, to keep the highway corridor free from business development with the exception of filling stations at intervals and a few local produce stands. H.Whittemore Brown, president of Concord's Board of Trade and a selectman, and fellow selectman Edward Caiger, were instrumental in implementing this decision, which was referred to as the "Gentleman's Agreement" and which remained in effect into the 1960s. Concord's planning board concurred. In 1935 the town purchased the present Town Forest and on March 8, 1943 voted to sell the portion of the Butterfield lot north of the highway (containing all but about 4 acres of it) to West Concord real estate dealer Waldo Lapham – 35.07 acres for $1200 (Middlesex County South deed book 6746 page 545, 2/29/1944). Lapham had owned other land in this area (the eastern portion of the current high school lot) since the mid 1920s and carried out a gravel-removing operation here. The town dump was on his land, for which he started charging the town a rental fee from about 1950. He bought other land in this area as well and was planning a shopping center and a residential development for the future.

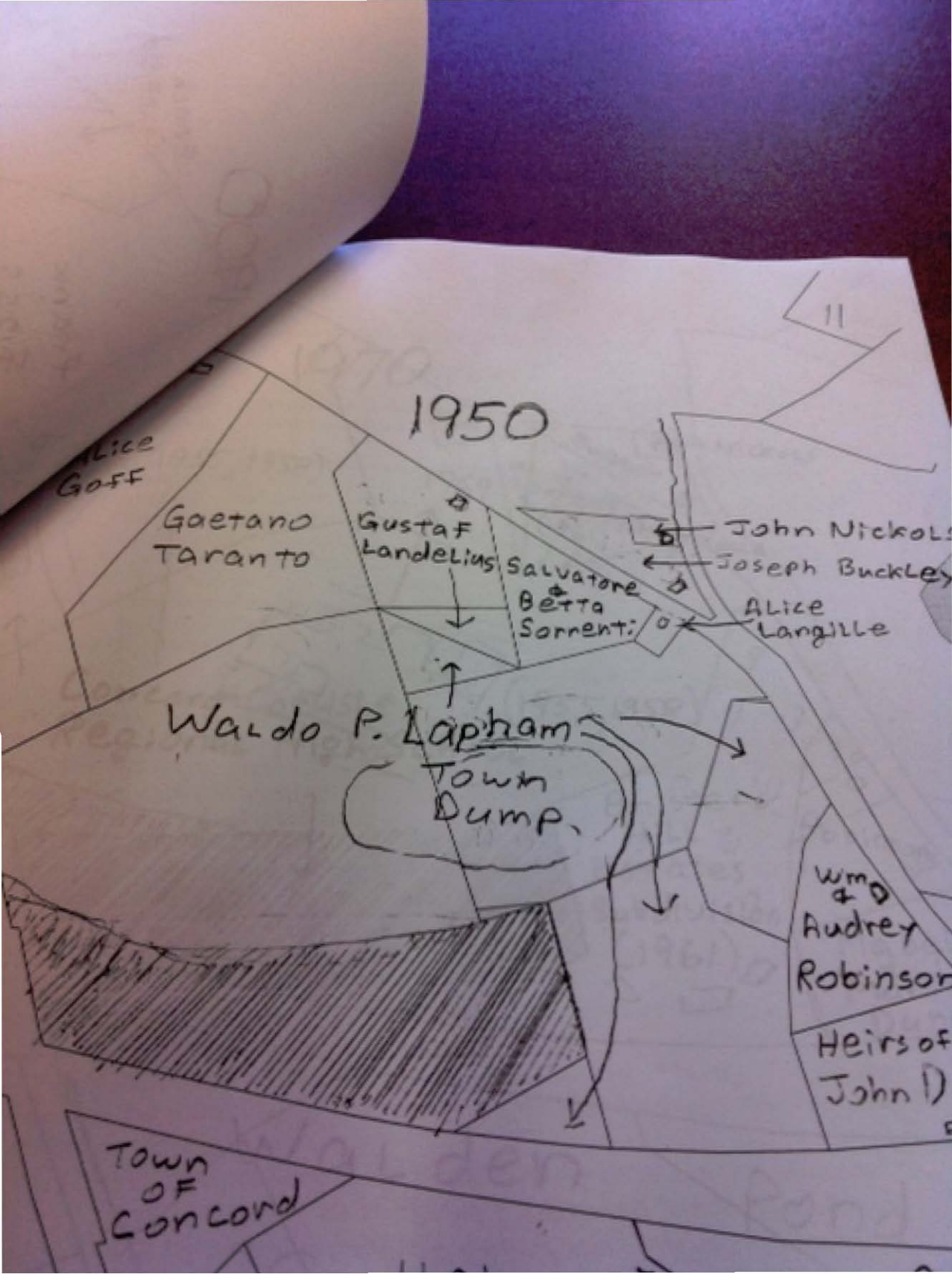
With the significant growth of the town following World War Two it became necessary to build a new high school and after consideration of a number of sites it was decided to build it here. So the town took the land they had let go over a decade earlier, as well as other land owned by Lapham and others to the east and north in November 1955. 56.3 acres were taken from Lapham as smaller amounts from Gaetano Taranto and Theodore and Reed Beharrell (the former holdings of the last two owners now constitutes much of the current playing fields) (M. Cty. South deed book 8637 page 308, 12/6/1955, Taking under the state legislature's Chapter 566 of the Acts of 1955 (under Ch. 79 of the state's General Laws)). The final settlement, in 1957, cost the I believe upwards of $60,000 (see deed Lapham to Town of Concord, Middlesex County South deed book 8997 pg. 108,

7/19/1957 and 8959 pg 522 of 5/28/1957). Concord conveyed the taken land to the Concord-Carlisle Regional School District on 8/18/1958 (bk 9229 pg 160). The new high school was constructed 1958 to 1960 and opened in September of that year. During this construction a small part on the north edge of Deep Cut Woods leveled to create athletic fields. The wooded portion behind the new school was left intact to buffer the school from the noise, fumes, and danger of Route 2. The high school's athletic department laid out a cross country running course through the woods which has been in use since then. School classes and environmental and nature clubs led by football coach Al Robichaud used the High School Woods as a laboratory for study and it soon became a "hangout" for students.

Lapham (and his heirs, as he died in 1960) were allowed to retain several acres in this area which became the Bristers Hill Road housing subdivision of 1961. Homes on this road were built between 1961 and 1964. The new residents and their successors quickly adopted these woods as their own, holding them in high esteem for their aesthetic as well as recreational values.

[illegible] of the High School Woods has been assembled to


1900
Enoch Garfield
man good
Frank Foss
Wm. Buckley
Jerome Gleason
Wm. Chisholm
Dennis Gleason
Town Dump
Patrick O'Riordan
(sold to M. Butterfield)
Lucy (Joseph) Derby
Patrick O'Riordan
Frances & Amelia Prichard
Heirs of Geo. M. Brook
Heirs of George M. Brooks
Bay State Brick Co.
Richard


11
1950
Alice Goff
Gaetano Taranto
Gustaf Landelius
Salvatore & Betta Sorrenti
John Nickols
Joseph Buckley
Alice Langille
Waldo P. Lapham
Town Dump
Wm & D Audrey Robinson
Heirs of John D
Town of Concord

CDW CONSULTANTS, INC.
CIVIL & ENVIRONMENTAL ENGINEERS

PRINCIPALS AND ASSOCIATE

Yee Cho, P.E., L.S.P.
Kathleen Campbell, P.E., L.S.P, LEED, AP
John Goodhall, P.E.

May 13, 2011

Ms. Lisa Pecora-Ryan
Office of Michael Rosenfeld, Inc.
543 Massachusetts Avenue
West Acton, MA 01720

RE: Hazardous Materials Summary Report
Concord-Carlisle High School, Concord, Massachusetts
CDW Project #1135.00

Dear Ms. Pecora-Ryan

CDW Consultants, Inc. (CDW) is pleased to present this letter report summarizing the findings of the pre-renovation and/or demolition testing and hazardous materials survey of Concord-Carlisle High School ("Site") in the town of Concord, Massachusetts. The scope of work was to identify and quantify asbestos-containing building materials (ACM), lead-based paint (LBP), mercury switches, transformers, light ballasts, fluorescent tubes, and other visible hazardous materials.

Smith and Wessel Associates, Inc. Hazardous materials Assessment Report Review

CDW reviewed the Hazardous Materials Assessment Report, prepared by Smith and Wessel Associates, Inc. dated June 6, 2005. Findings of the Smith and Wessel Report are presented in the below table.

Description	Location	Quantity
9" x 9" Floor Tile and Mastic	Auditorium, Classrooms, Storage, Offices, Throughout	25,550 SF
12" x 12" Floor Tile and Mastic Over 9" x 9" Floor Tile	Halls, Administration, Classrooms	26,200 SF
12" x 12" Floor Tile and Mastic	Building L	12,500 SF
Carpet Mastic	Library	3,500 SF
Mudded Pipe Fittings	Throughout	2,000 Each
Pipe Insulation	Behind/Above Fixed Walls and Ceilings	1,400 LF
Ceiling Tile and Associated Glue Daubs	Rear Stage Hall and Storage	300 SF
2' x 4' and 2' x 2' Ceiling Tile	Band Room, Hall, Offices, Orchestra Room	8,425 SF
Fire Doors	Stage and Hall Areas	10 Doors
Stage Fire Curtain	Stage	1 Each

Smith and Wessel Summary (Continued)

Description	Location	Quantity
Fume Hoods	Lab S-14	2 Each
Gym Floor Vapor Barrier	Upper Gym	10,000 SF
Popcorn Ceiling	Main Lobby and Hall	600 SF

Suspect Asbestos Containing Materials

During the month of April 2011, CDW personnel Edwin Morgan (Massachusetts Licensed Asbestos Inspector #51838) conducted a visual inspection of all accessible areas of the site building. A total of 198 bulk samples were collected from materials suspected to contain asbestos. The ACM was categorized by type, location and quantity.

Additionally, accessible areas of the exterior of the site building were inspected to determine the location and estimated quantity of potential ACM.

Suspect ACM were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. The asbestos inspection was conducted in accordance with Massachusetts' regulations 453 CMR 6.00, AHERA guidelines and NESHAP regulations 29 CFR 1926.

The suspect ACM materials that were identified on materials from the site building were sent to ESML Analytical of Woburn, Massachusetts for analysis. The samples were analyzed for asbestos using polarized light microscopy (PLM) and dispersion staining techniques by EPA Method 600/R-93/116. The ACM testing results are presented below in Table 1. The correlating sample locations that are positive for ACM are shown on Figures 1 and 2.

TABLE 1: ACM Testing Results

Sample #	Description	Result	Estimated Quantity
1	Floor Mastic in Café Under Floor Tile	3% Chrysotile	15,000 SF
2	Levelastic in Café Under Sample #1	ND	NA
3	Metal to Metal Window Caulk in Café	ND	NA
4	Older Window Glaze in Café	2% Chrysotile	7 Windows
5A	Joint Compound in Store in Café	ND	NA
5B	Joint Compound in Store in Café	ND	NA
6A	Textured ceiling in the Hall Outside Café	ND	NA
6B	Textured ceiling in the Hall Outside Café	ND	NA

TABLE 1 (Continued)

Sample #	Description	Result	Estimated Quantity
7	Wallboard above Double Café Doors	ND	NA
8A	Spray Applied Fire Proofing Electrical Closet Outside Café	ND	NA
8B	Spray Applied Fire Proofing Electrical Closet Outside Café	ND	NA
9	12”x12” Floor Tile in Electrical Closet	2% Chrysotile	200 SF
10A	1” Hard Fitting on Fiberglass in Electrical Closet	ND	NA
10B	1” Hard Fitting on Fiberglass in Electrical Closet	ND	NA
11A	Steel Column Caulk to Window in Hall	ND	NA
11B	Steel Column Caulk to Window in Hall	ND	NA
12A	Window Glaze in Hall Outside Café	3% Chrysotile	4 Window Banks
12B	Window Glaze in Hall Outside Café	ND	NA
13A	Hard Fitting in Café off Fiberglass	ND	NA
13B	Hard Fitting in Café off Fiberglass	ND	NA
14A	Roof Drain Insulation in Café	ND	NA
14B	Roof Drain Insulation in Café	ND	NA
15A	Gray Duct Sealant in Café	ND	NA
15B	Gray Duct Sealant in Café	ND	NA
16A	Textured Ceiling in Café	ND	NA
16B	Textured Ceiling in Café	ND	NA
17	Cove Base in Café	ND	NA
18	Cove Base Glue in Café	ND	NA
19	Window Sill in Café	ND	NA
20	Window Glaze in Café/ Kitchen	3% Chrysotile	1 Window Bank
21	Door Caulk in Café/ Kitchen	ND	NA
22	Steel Column Caulk Wall	3% Chrysotile	5,000 LF
23	Window Panel Core in Café	ND	NA
24	Door Glaze in Gym	ND	NA

TABLE 1 (Continued)

Sample #	Description	Result	Estimated Quantity
25	9”x9” Floor Tile in Gym Fitness Area	3% Chrysotile	1,500 SF
26	Black Mastic in Gym	ND	NA
27	Black Fabric under Brick - Exterior	ND	NA
28	Joint Compound in Kitchen	ND	NA
29	Cove Base in Kitchen	ND	NA
30	Cove Base Glue in Kitchen	ND	NA
31	9”x9” Floor Tiles in Kitchen	5% Chrysotile	3,000 SF
32	Black Glue in Kitchen	ND	NA
33	Insulation Behind Metal Acoustical Tile in Kitchen	ND	NA
34	12”x12” Tan Floor Tile in Kitchen	ND	NA
35	12”x12” White Floor Tile in Kitchen	3% Chrysotile	Included in Quantity for #31
36	Black Mastic in Kitchen Under #35	10% Chrysotile	Included in Quantity for #31
37	Expansion Joint in Kitchen	ND	NA
38	Gray Duct Sealant in Kitchen	ND	NA
39	2’x2’ SAT in Kitchen	ND	NA
40	Window Panel Core in Dining Room	ND	NA
41	Glue Tab in Boiler Room	20% Chrysotile	200 SF
42	Duct Cloth in Boiler Room	ND	NA
43	Duct Sealant in Boiler room	ND	NA
44	Glue Tab in Boiler Room	30% Chrysotile	Included in Quantity for # 41
45	Wall Tile Grout in Boys Locker Room	ND	NA
46	Glue in Boys locker room	ND	NA
47	Floor Coating in Boys locker room	ND	NA
48	Sheetrock in Boys locker room	ND	NA
49	Window Glaze in Gym	2% Chrysotile	20 Windows
50	2’x2’ SAT in Boys locker room	ND	NA

TABLE 1 (Continued)

Sample #	Description	Result	Estimated Quantity
51	Sheetrock in Boys locker room	ND	NA
52	Hard Fitting in Boys locker room	ND	NA
53	Black Tar Paper Under Wood Floor in Gym	ND	NA
54	Yellow Carpet Glue in Library	ND	NA
55	Textured Ceiling in Library	ND	NA
56	2'x4' SAT in Library	ND	NA
57	12"x12" Floor Tile in Library	2% Chrysotile	3,500 SF
58	Black Mastic in Library Under 12" x 12"	10% Chrysotile	Included in Quantity for #57
59	Interior Window Glaze in Library	2% Chrysotile	4 Window Banks
60	Wall Plaster in Library	ND	NA
60-1	Wall Tile Grout in Hall Near Library	ND	NA
61	Joint Compound in Bathroom Near Library	ND	NA
62	Sheetrock in Bathroom Near Library	ND	NA
63	2'x2' SAT in Bathroom Near Library	ND	NA
64	Glue in Bathroom Near Library	ND	NA
65	Glaze in Classroom H-17	ND	NA
66	12"x12" Floor Tile in Classroom H-16	ND	NA
67	Black Mastic in Classroom H-16	ND	NA
68	Joint Compound in Classroom H-16	ND	NA
69	Cove Base in Classroom H-16	ND	NA
70	Cove Base Glue in Classroom H-16	ND	NA
71	Door Core in Classroom H-16	ND	NA
72	Glue Daub Behind White Board in Classroom H-16	ND	NA
73	Cabinet Top in Classroom H-16	ND	NA
74	Gray Sink Coating in Administrative Office	ND	NA
75	Joint Compound in Administrative Office	ND	NA

TABLE 1: ACM Testing Results (Continued)

Sample #	Description	Result	Estimated Quantity
76	Sheetrock in Administrative Office	ND	NA
77	Red duct sealant in Administrative Office copy room	ND	NA
78	Joint Compound in Administrative Office Copy Room	ND	NA
79	Sheetrock in Administrative Office copy Room	ND	NA
80	Gray Duct Sealant in Administrative Office Copy Room	ND	NA
81	Joint Compound in Administrative Office Copy Room	ND	NA
82	Pipe Insulation in Classroom H-10	ND	NA
83	Interior Window Caulk in Classroom H-10	ND	NA
84	Back Mastic Under 9” x 9” Floor Tile in Classroom H-10	ND	NA
85	Peg Board in Classroom H-9	ND	NA
86	Caulk on Block Wall	3% Chrysotile	5,000 LF
87	Breeching Gasket in Boiler Room	ND	NA
88	Red Gasket in Boiler Room	ND	NA
89	White Gasket in Boiler Room	ND	NA
90	Door Frame Caulk in Classroom H-6	3% Chrysotile	Doors Throughout – 150 @ 25 LF each
91	Joint Compound in Classroom H-6	ND	NA
92	Sheetrock in Classroom H-6	ND	NA
93	Glaze in Classroom H-6	ND	NA
94A	Ceiling Plaster in Auditorium	ND	NA
94B	Ceiling Plaster in Auditorium	ND	NA
94C	Ceiling Plaster in Auditorium	ND	NA
95A	Wall Plaster in Auditorium	ND	NA
95B	Wall Plaster in Auditorium	ND	NA
95C	Wall Plaster in Auditorium	ND	NA
96	Black paper Under Stage in Auditorium	ND	NA

TABLE 1: ACM Testing Results (Continued)

Sample #	Description	Result	Estimated Quantity
97	Column Caulk in the Main Hall Near Office	3% Chrysotile	Included in Quantity for #22
98	Sheetrock in Main Hall	ND	NA
99	Black Sink Coating in Photo Lab	ND	NA
100	Table Top in Photo lab	ND	NA
101A	2'x4' SAT in Photo lab	ND	NA
101B	2'x4' SAT in Photo lab	ND	NA
102	Black Sink Coating in Photo Lab	5% Chrysotile	50 each
103	Kiln Brick in Photo Lab	ND	NA
104	Carpet Glue in Main Office	ND	NA
105	Carpet Glue with Black in Main Office	ND	NA
106	Joint Compound- Wall of Main office	ND	NA
107	Joint Compound- Ceiling of Main office	ND	NA
108A	Black Glue Daub- On 1' x 1' Ceiling Tile Behind Stage	ND	NA
108B	Black Glue Daub- On 1' x 1' Ceiling Tile Behind Stage	ND	NA
109	1'x1' Acoustical Pin Dot Tile in Band Hall	ND	NA
110	Brown Glue Daub in Band Hall	ND	NA
111	1'x1' AT Pin Hole in Band Hall	ND	NA
112	12"x12" Floor Tiles in Band Hall	2% Chrysotile	10,500 SF
113	Black Mastic in Band Hall Under #112	5% Chrysotile	Included in Quantity for # 112
114	2'x4' SAT in Band Hall	ND	NA
115	Glue Daub Residue in Band Hall	ND	NA
116	Duct Sealant in furnace room	ND	NA
117	Metal to Metal caulk on Exterior Window	ND	NA
118	Caulk on Exterior Window	ND	NA

TABLE 1: ACM Testing Results (Continued)

Sample #	Description	Result	Estimated Quantity
119	Corrugated Paper at Weep Holes on Exterior	ND	NA
120	Caulk on Exterior	ND	NA
121	Metal to Metal Caulk on Exterior	ND	NA
122	Caulk on Exterior Metal Roof to Brick	ND	NA
123	Caulk on Exterior Metal Roof to Brick	ND	NA
124	Joint Compound in Hall Near Maintenance Department	ND	NA
125	Sheetrock in Hall Near Maintenance Department	ND	NA
126	12”x12” Floor tiles in Hall Near Maintenance Department	2% Chrysotile	3,500 SF
127	Black Mastic in Hall Near Maintenance Department Under # 126	15% Chrysotile	Included in Quantity for # 126
128	Cove Base in Hall Near Maintenance Department	ND	NA
129	Cove Base Glue in Hall Near Maintenance Department	ND	NA
130	9”x9” Floor Tile in Boiler Room Landing	2% Chrysotile	13,400 SF
131	Black Mastic in Boiler Room Landing Under # 130	10% Chrysotile	Included in Quantity for #130
132	12”x12” Floor Tiles in Hall Near Chorus/Graphics	ND	NA
133	Black Mastic in Hall Near Chorus/Graphics	ND	NA
134	Grout in Hall Near Math Classrooms	ND	NA
135	Caulk in Hall on Steel Column Near Math Classrooms	ND	NA
136	Joint Compound in Hall Near Math Classrooms	ND	NA
137	Interior Hall Window Glaze	2% Chrysotile	Windows Throughout – 250 each
138	Interior Hall Window Glaze	5% Chrysotile	Included in Quantity for #137

TABLE 1: ACM Testing Results (Continued)

Sample #	Description	Result	Estimated Quantity
139	Brown Spray Applied Fire Proofing Above Ceiling	ND	NA
140	Ceramic Tile Glue in Hall Near Foreign Language	ND	NA
141	12”x12” Floor Tile in L2	5% Chrysotile	12,500 SF
142	Black Mastic in L2 Under #141	10% Chrysotile	Included in Quantity for #141
143	Black Countertop in Science classroom	ND	NA
144	Hard Fitting in Science Storage Room	20% Chrysotile	Throughout – 2,000 each
145	Black Material Behind Concrete Block on the Exterior	10% Chrysotile	75,000 SF
146	Black Windowsill LL Gym Ramp	ND	NA
147	Spray applied fire proofing in LL Gym Ramp	ND	NA
148	12”x12” Red Tile in LL Gym Hall	ND	NA
149	Black Mastic in LL Gym Hall Under #148	ND	NA
--	Walk in Refrigerator and Freezer Coating	Assumed	4 each
--	Hidden Pipe Insulation	Assumed	2,000 LF
--	Lab Hoods	Assumed	8 each
--	Fire Doors	Assumed	50 each
--	Subsurface Transite Pipe	Assumed	2,000 LF
--	Hidden Transite Panels	Assumed	10,000 SF
--	Dry Transformer Lining	Assumed	30 each
--	Fire Curtain	Assumed	1 each

TABLE 2: ACM Testing Results Roof and Exterior

Sample #	Description	Result	Estimated Quantity
1	Roof Core – Auditorium Building	ND	NA
2	Roof Core – Auditorium Building	5% Chrysotile	20,000 SF
3	Roof Fabric	ND	NA
4	Roof Curb	ND	NA
5	Roof Core and Tectum	ND	NA
6	Roof Core	ND	NA
7	Back Corner Deck of Roof	ND	NA
8	Back Corner Deck of Roof	ND	NA
9	Roof Core	ND	NA
10	No Sample	-	-
11	Core of Top of Library	ND	NA
12	Core of Main Office	ND	NA
13	Core of Main Office	ND	NA
14	Core of Main Office	ND	NA
15	Core of Steel Braced Gym	ND	NA
16	Core Curb of LL Gym	ND	NA
17A	Curb of LL Gym	ND	NA
17B	Curb of LL Gym	ND	NA
18	Curb of Door # 56	ND	NA
19	Curb of Door # 56	10% Chrysotile	20,000 SF
20	Styrofoam in Main Entrance Roof	ND	NA
21	Styrofoam in Split face L Building Block	ND	NA
22	Styrofoam in Door 14	ND	NA
23	Styrofoam in Door 52	ND	NA
24	Roof of Door 03	ND	NA
25	Door 56 Kitchen Roof	ND	NA
26	Door 12 S Building Roof	ND	NA
27	Wall Insulation in Door 36	ND	NA

TABLE 2: ACM Testing Results Roof and Exterior

Sample #	Description	Result	Estimated Quantity
28	Flashing at Foundation of Exterior	ND	NA
29	Flashing over Windows and Doors	ND	NA

ND = Not Detected
NA = Not Applicable
SF = Square Feet
LF = Linear Feet

A copy of the asbestos laboratory analytical report is provided in Appendix A. The ACM sample locations are shown on Figure 1.

Suspect Lead-Based Paint

CDW collected samples from 20 painted areas throughout the site building. Ten of the samples contained lead above laboratory detection limits. The laboratory results of lead analysis are summarized in Table 3. A copy of the lead paint laboratory report is provided in Appendix B.

TABLE 3: Lead-Based Paint Testing Results

Sample #	Description	Result % Weight
LPB-1	Boiler Room Floor – Gray Paint	0.016
LPB-2	Boys Locker Room Wall – Beige Paint	0.068
LPB-3	Gym Upper Door – Red Paint	0.025
LPB-4	Library Column – Yellow Paint	0.061
LPB-5	Classroom H-16 Wall – White Paint	<0.01
LPB-6	Classroom H-10 Beam – Blue Paint	0.10
LPB-7	Classroom H-9 Wall – Pink Paint	0.028
LPB-8	Stage Wall - Black Paint	<0.01
LPB-9	Main Office Window Frame – Brown Paint	<0.01
LPB-10	Furnace Room Floor - Gray Paint	0.018
LPB-11	Furnace Room Wall – White Paint	0.029
LPB-12	Outside Radio Room Wall – White Paint	<0.01
LPB-13	Hall Column – Green Paint	7.9
LPB-14	Kitchen Window Panel – Pink Paint	<0.01

TABLE 3: Lead-Based Paint Testing Results (Continued)

Sample #	Description	Result % Weight
LPB-15	Kitchen Window Column – Blue Paint	<0.01
LPB-16	Gym Wall Ramp Hand Rail – White Paint	<0.01
LPB-17	LL Gym Hall – White Paint	<0.01
LPB-18	LL Gym Hall – Red Paint	<0.01
LPB-19	Café Steel Frame – Red Paint	0.14
LPB-20	Admin Office Wall – Pink Paint	<0.01

Based upon the elevated lead content in the green paint in the hall columns, a sample should be collected for Toxicity Characteristic Leaching Procedure (TCLP) to determine if there are any there are special hazardous waste disposal requirements.

Suspect PCB Containing Materials

Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1950's and late 1970's is known to have been manufactured with PCBs. The EPA mandates caulking present at concentrations >50 parts per million must be removed under a PCB abatement Plan. CDW collected 10 samples of caulking/expansion joints that may contain PCB compounds. The laboratory results of the PCB study is presented below:

TABLE 4: PCB Analytical Results

Description	Description	Result (mg/kg)
PCB-1	Exterior Double Door Frame Caulk	<1.5
PCB-2	Interior Window Caulk to Sheet Rock	0.89
PCB-3	Column Caulk at Main Hall/Office	6.1
PCB-4	Exterior Door Caulk by Door #7	<1.5
PCB-5	Exterior Caulk on CMC Block	<0.33
PCB-6	Caulk @ Steel Column in Hallway	10
PCB-7	Interior Window Frame Caulk	<0.3

TABLE 4: PCB Analytical Results (Continued)

Description	Description	Result (mg/kg)
PCB-8	Caulk @ Roofline	<0.3
PCB-9	Exterior Expansion Joint	<0.3
PCB-10	Exterior Window Caulk	0.56

Caulk collected from interior locations (PCB-3 and PCB-6) contain total PCBs at concentrations above the 1 parts per million (ppm) standard for adjacent building materials (remediation waste in accordance with §761.61 (c)). The caulking, if removed, does not need to be disposed of as a PCB regulated waste; however the substrates (brick, metal) should be tested to ensure these do not contain PCBs at concentrations at or above 1 ppm. The PCB analytical report is provided in Appendix C.

Suspect Mercury Containing Materials

Mercury has been known to be used as a plasticizer in the manufacturing of rubber floors, mats and stair treads. Mercury has been historically detected in gym floors manufactured by 3M (Tartan® Brand). CDW personnel collected six samples of rubber flooring materials suspected to contain mercury compounds. The samples were analyzed by Phoenix Environmental Laboratories, inc. of Manchester Connecticut. The samples were analyzed for mercury using EPA Method 600/4-79-019. The mercury testing results are presented below.

TABLE 5: Mercury Analytical Results

Description	Description	Result (mg/kg)
HG-1	Rubber Stair Tread	<0.06
HG-2	Rubber Stair Ramp Flooring	<0.06
HG-3	Floor Mat at Exit Door #3	<0.08
HG-4	Ramp Radio Room	<0.07
HG-5	LL Gym Floor	33.9
HG-6	Ramp Hall to LL Gym	0.43

Based upon the positive mercury content in the gym floor, the floor should be tested for TCLP to determine if there are special hazardous waste disposal requirements. Furthermore, the United States Environmental Protection Agency (USEPA) recommends, in schools, conducting baseline mercury vapor testing of the air to determine if mercury vapors are being released and at what concentrations. The mercury analytical report is provided in Appendix D.

Other Hazardous Materials

Throughout the project Site, CDW identified approximately 800 fluorescent light ballasts, 30 small interior wall mounted transformers which are suspect PCB-containing. Fluorescent bulbs contain mercury and should be disposed of properly prior to demolition. Approximately 3,000 fluorescent bulbs were identified throughout the project Site. Compact florescent bulbs also contain mercury and were noted periodically throughout. Items potentially contning lead include approximately 50 emergency light batteries. Other mercury containing items identified include thermostats and switches in the boiler room(s), mercury compounds in laboratory chemicals, and possible mercury in science sink traps. Laboratory chemicals for the science classrooms were observed in a locked central storage room. A flammable storage cabinet and an acid storage cabinet were also observed in the storage room. Other potential hazardous materials noted is film developing chemicals, ceramic glazes, paints, etc., in the visual arts classrooms (including photography and ceramics) and the woodworking classroom. Other hazardous materials for the Site are identified in the Phase I Preliminary Site Assessment (dated May 2011).

Recommendations

Based on the results of the hazardous materials survey, we have the following recommendations:

- Remove each ACM identified prior to construction work activities by a Massachusetts licensed asbestos abatement contractor, and dispose of ACM at an appropriate hazardous non-recycling landfill facility.

- Building materials that tested below one percent asbestos, with the exceptions noted, may be removed and disposed of as regular construction debris.

- Remove or segregate damaged lead-based paint or lead-based paint components for TCLP composite testing in areas slated for demolition in compliance with OSHA lead in construction standards. Furthermore, contractors must comply with EPA's RRP Rule 40 CFR 745.

- Conduct a PCB sampling of brick and metal substrates in areas of elevated PCB concentrations >1 ppm to determine if the substrates meet the EPA criteria for unrestricted use.

- Conduct TCLP sampling of the green column paint to determine if there are special hazardous waste handling requirements.

- Conduct TCLP sampling of the rubber gym floor to determine if there are special hazardous waste handling requirements.

- Conduct air sampling within the area of the mercury containing gym floor in accordance with EPA guidelines to determine if vapors are present.

- CDW recommends that other hazardous materials and items containing hazardous materials be recycled or removed and disposed of appropriately.

Limitations

The conclusions and recommendations are limited to the information available at the time of the field survey and the scope of services as defined. No subsurface soil or groundwater testing was performed. Where access to portions of the Site or to structures on the site was unavailable or limited, CDW renders no opinion as to the presence of hazardous material or the presence of indirect evidence related to hazardous material in that portion of the site or structure. The testing performed forms the basis for conclusions expressed and areas inaccessible for testing limits those conclusions. No other conclusions, interpretations or recommendations are contained or implied in this report other than those expressed. No other use of this report is warranted without the written consent of CDW Consultants, Inc.

CDW appreciates the opportunity to provide our services for your project.

Very truly yours,

CDW CONSULTANTS, INC.

Susan Cahalan, P.G.
Project Manager

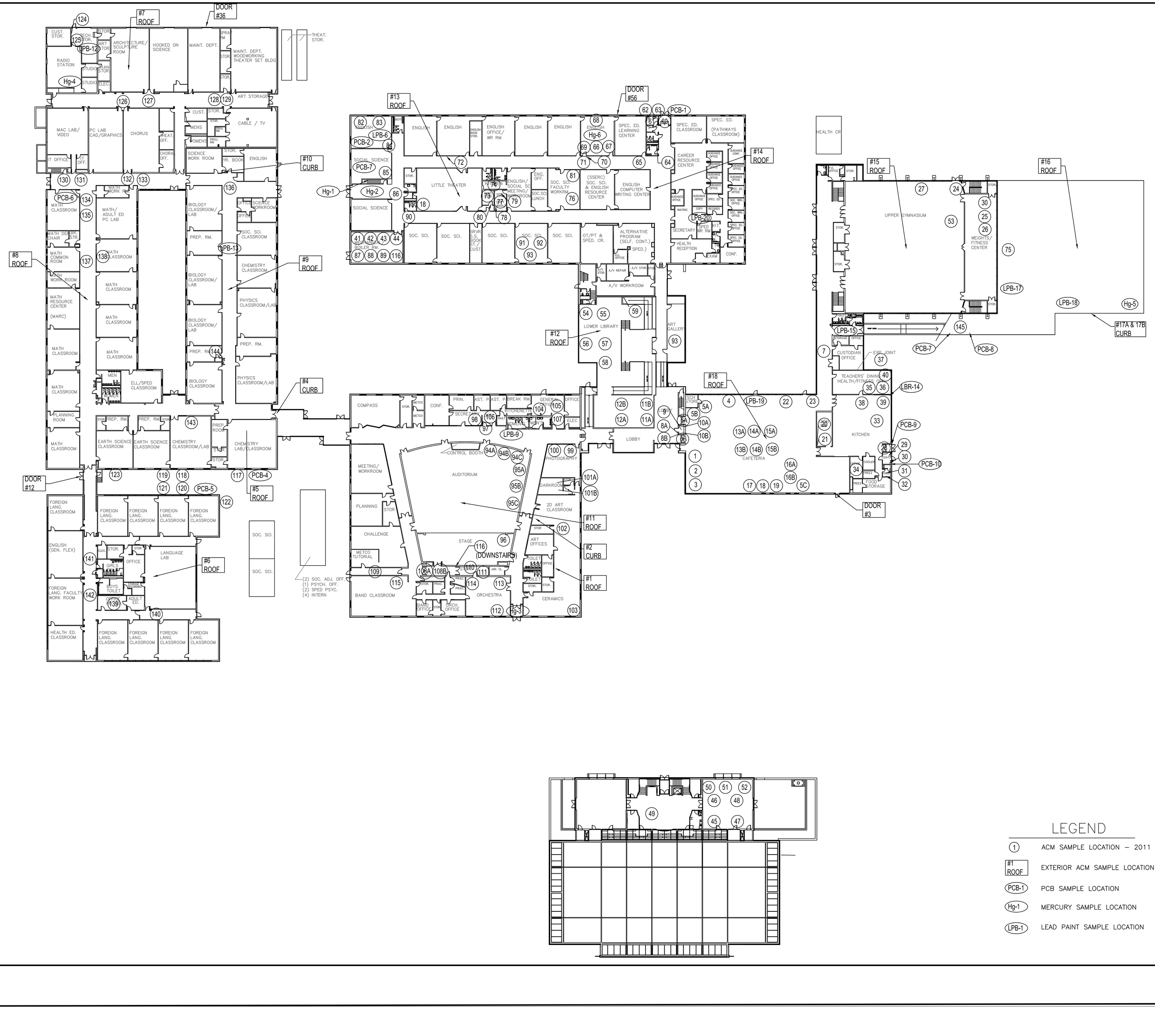
TABLES
Table 1: Summary of Asbestos Analytical Results
Table 2: Summary of Asbestos Analytical Results – Roof and Exterior
Table 3: Summary of Lead Paint Analytical Results
Table 4: Summary of PCB Analytical Results
Table 5: Summary of Mercury Analytical Results

FIGURE
Figures 1: ACM, Paint, PCB and Mercury Sample Locations

APPENDICES

Appendix A: Asbestos Sample Laboratory Reports
Appendix B: Lead Paint Sample Laboratory Report
Appendix C: PCB Sample Laboratory Report
Appendix D: Mercury Sample Laboratory Report

Figures



HAZARDOUS MATERIAL SAMPLING LOCATION PLAN

CONCORD CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

CDW CONSULTANTS, INC.
40 SPEEN STREET, SUITE 301
FRAMINGHAM, MA 01701
TEL. (508) 875-2657
FAX. (508) 875-6617

LEGEND

(1)	ACM SAMPLE LOCATION – 2011
#1 ROOF	EXTERIOR ACM SAMPLE LOCATION
PCB-1	PCB SAMPLE LOCATION
Hg-1	MERCURY SAMPLE LOCATION
LPB-1	LEAD PAINT SAMPLE LOCATION

FIGURE 1

Appendix A

Asbestos Identification Laboratory
165U New Boston St., Ste 271
Woburn, MA. 01801
Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Asbestos Consultants
61 Unity Avenue
Belmont, MA 02478
Suite/Apt

Batch 850

Dear Ed Morgan,
The following correspondence contains two communications:

1. Results of Asbestos project Concord-Carlisle HS
2. Billing Invoice.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration# PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number LB-0078(Bulk) LA-0087(Air)

Asbestos Identification Laboratory
165U New Boston St., Ste 271
Woburn, MA. 01801
Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Results for Client Project: Concord-Carlisle HS, Batch# 850

Work Received: 4/25/2011 Date Sampled: 4/19/2011 Results Sent: 5/2/2011 2:23:47 PM

Field_ID: 1 Material: mastic Color: Black Location: café Sample# 14093 CEL=007 NON=090 ASBESTOS DETECTED CHR=003

Field_ID: 2 Material: levelastic Color: Gray Location: café Sample# 14094 CEL=010 NON=090 None Detected

Field_ID: 3 Material: metal to metal caulk Color: Gray Location: café Sample# 14095 NON=100 None Detected

Field_ID: 4 Material: glaze Color: Gray Location: café Sample# 14096 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 5A Material: stove- JC Color: White Location: café Sample# 14097 NON=100 None Detected

Field_ID: 5B Material: stove- JC Color: White Location: café Sample# 14098 NON=100 None Detected

Field_ID: 6A Material: textured ceiling Color: White Location: hall Sample# 14099 MNW=020 NON=080 None Detected

Field_ID: 6B Material: textured ceiling Color: White Location: hall Sample# 14100 MNW=015 NON=085 None Detected

Field_ID: 7 Material: wall Color: Multi Location: above Sample# 14101 NON=100 None Detected

Field_ID: 8A Material: spray applied fire proofing Color: Gray Location: hall Sample# 14102 MNW=065 NON=035 None Detected

Field_ID: 8B Material: spray applied fire proofing Color: Gray Location: hall Sample# 14103 MNW=070 NON=030 None Detected

Field_ID: 9 Material: 12 x 12 floor tile Color: White Location: elec closet Sample# 14104 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 10A Material: hard fitting Color: Gray Location: elec closet Sample# 14105 MNW=030 CEL=005 NON=065 None Detected

Field_ID: 10B Material: hard fitting Color: Gray Location: elec closet Sample# 14106 MNW=040 CEL=005 NON=055 None Detected

Field_ID: 11A Material: caulk Color: Brown Location: hall Sample# 14107 NON=100 None Detected

Field_ID: 11B Material: caulk Color: Brown Location: hall Sample# 14108 NON=100 None Detected

Field_ID: 12A Material: window glaze Color: Black Location: hall Sample# 14109 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 12B Material: window glaze Color: Black Location: hall Sample# 14110 NON=100 None Detected

Field_ID: 13A Material: hard fitting Color: Gray Location: café Sample# 14111 MNW=035 CEL=005 NON=060 None Detected

Field_ID: 13B Material: hard fitting Color: Gray Location: café Sample# 14112 MNW=035 CEL=005 NON=060 None Detected

Field_ID: 14A Material: roof drain Color: Gray Location: café Sample# 14113 MNW=045 NON=055 None Detected

Field_ID: 14B Material: roof drain Color: Gray Location: café Sample# 14114 MNW=040 CEL=010 NON=050 None Detected

Field_ID: 15A Material: Duct sealant Color: Gray Location: café Sample# 14115 NON=100 None Detected

Field_ID: 15B Material: Duct sealant Color: Gray Location: café Sample# 14116 NON=100 None Detected

Field_ID: 16A Material: textured ceiling Color: Multi Location: café Sample# 14117 CEL=070 NON=030 None Detected

Field_ID: 16B Material: textured ceiling Color: Multi Location: café Sample# 14118 CEL=070 NON=030 None Detected

Field_ID: 5C Material: Joint Compound Color: White Location: café Sample# 14119 NON=100 None Detected

Field_ID: 17 Material: Cove base Color: Gray Location: café Sample# 14120 NON=100 None Detected

Field_ID: 18 Material: Cove base glue Color: Tan Location: café Sample# 14121 NON=100 None Detected

Field_ID: 19 Material: window sill Color: Multi Location: café Sample# 14122 CEL=040 NON=060 None Detected

Field_ID: 20 Material: wndow glaze Color: Gray Location: café/kitchen Sample# 14123 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 21 Material: door caulk Color: Gray Location: café/kitchen Sample# 14124 NON=100 None Detected

Field_ID: 22 Material: caulk Color: Brown Location: wall Sample# 14125 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 23 Material: window panel cove Color: Brown Location: café Sample# 14126 CEL=075 NON=025 None Detected

Field_ID: 24 Material: door glaze Color: Gray Location: Gym Sample# 14127 NON=100 None Detected

Field_ID: 25 Material: 9X9 floor tile Color: Gray Location: Gym Sample# 14128 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 26 Material: black mastic Color: Black Location: Gym Sample# 14129 NON=100 None Detected

Field_ID: 27 Material: black fabric under brick Color: Black Location: exterior Sample# 14130FBG=060 NON=040 None Detected

Field_ID: 28 Material: Joint Compound Color: White Location: kitchen Sample# 14131 NON=100 None Detected

Field_ID: 29 Material: cove base Color: Gray Location: kitchen Sample# 14132 NON=100 None Detected

Field_ID: 30 Material: Cove base glue Color: Yellow Location: kitchen Sample# 14133 NON=100 None Detected

Field_ID: 31 Material: 9X9 floor tile Color: Gray Location: kitchen Sample# 14134 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 32 Material: black glue Color: Black Location: kitchen Sample# 14135 NON=100 None Detected

Field_ID: 33 Material: metal pan insulation Color: Brown Location: kitchen Sample# 14136 MNW=090 NON=010 None Detected

Field_ID: 34 Material: 12 x 12 floor tile Color: Brown Location: kitchen Sample# 14137 NON=100 None Detected

Field_ID: 35 Material: 12 x 12 white floor tile Color: White Location: kitchen Sample# 14138 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 36 Material: black mastic Color: Black Location: kitchen Sample# 14139 NON=090 ASBESTOS DETECTED CHR=010

Field_ID: 37 Material: expansion joint Color: White Location: kitchen Sample# 14140 NON=100 None Detected

Field_ID: 38 Material: Duct sealant Color: Gray Location: kitchen Sample# 14141 NON=100 None Detected

Field_ID: 39 Material: 2 x 2 SAT Color: Gray Location: kitchen Sample# 14142 MNW=030 CEL=060 NON=010 None Detected

Field_ID: 40 Material: window panel cove Color: Brown Location: dinning room Sample# 14143 CEL=090 NON=010 None Detected

Field_ID: 41 Material: glue tab Color: Brown Location: boiler room Sample# 14144 NON=080 ASBESTOS DETECTED CHR=020

Field_ID: 42 Material: duct cloth Color: Gray Location: boiler room Sample# 14145 MNW=020 CEL=070 NON=010 None Detected

Field_ID: 43 Material: Duct sealant Color: Gray Location: boiler room Sample# 14146 NON=100 None Detected

Field_ID: 44 Material: glue tab Color: Brown Location: boiler room Sample# 14147 NON=070 ASBESTOS DETECTED CHR=030

Field_ID: 45 Material: wall tile grout Color: Tan Location: Boys locker room Sample# 14148 NON=100 None Detected

Field_ID: 46 Material: glue Color: Gray Location: Boys locker room Sample# 14149 NON=100 None Detected

Field_ID: 47 Material: flr coating Color: Multi Location: Boys locker room Sample# 14150 NON=100 None Detected

Field_ID: 48 Material: Sheetrock Color: Gray Location: Boys locker room Sample# 14151 CEL=015 NON=085 None Detected

Field_ID: 49 Material: glaze Color: White Location: gym Sample# 14152 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 50 Material: 2x2 SAT Color: Gray Location: Boys locker room Sample# 14153 MNW=045 CEL=045 NON=010 None Detected

Field_ID: 51 Material: Sheetrock Color: Gray Location: Boys locker room Sample# 14154 CEL=020 NON=080 None Detected

Field_ID: 52 Material: hard fitting Color: Gray Location: Boys locker room Sample# 14155 MNW=040 CEL=005 NON=055 None Detected

Field_ID: 53 Material: black tar paper Color: Black Location: gym Sample# 14156 CEL=075 NON=025 None Detected

Field_ID: 54 Material: carpet glue Color: Tan Location: library Sample# 14157 CEL=010 NON=090 None Detected

Field_ID: 55 Material: textured ceiling Color: White Location: library Sample# 14158 MNW=020 NON=080 None Detected

Field_ID: 56 Material: 2x4 SAT Color: Gray Location: library Sample# 14159 MNW=090 NON=010 None Detected

Field_ID: 57 Material: 12 x 12 floor tile Color: Tan Location: library Sample# 14160 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 58 Material: black mastic Color: Black Location: library Sample# 14161 NON=090 ASBESTOS DETECTED CHR=010

Field_ID: 60 Material: wall plaster Color: Multi Location: library Sample# 14162 NON=100 None Detected

Field_ID: 60.1 Material: wall tile grout Color: Tan Location: hall Sample# 14163 NON=100 None Detected

Field_ID: 61 Material: Joint Compound Color: White Location: bathroom Sample# 14164 NON=100 None Detected

Field_ID: 62 Material: Sheetrock Color: Gray Location: bathroom Sample# 14165 CEL=020 NON=080 None Detected
Field_ID: 63 Material: 2x2 SAT Color: Gray Location: bathroom Sample# 14166 MNW=040 CEL=040 NON=020 None Detected

Field_ID: 64 Material: glue Color: White Location: bathroom Sample# 14167 NON=100 None Detected

Field_ID: 65 Material: glaze Color: Black Location: clsrm H-17 Sample# 14168 NON=100 None Detected

Field_ID: 66 Material: 12x12 floor tile Color: Green Location: clsrm H-16 Sample# 14169 NON=100 None Detected

Field_ID: 67 Material: black mastic Color: Black Location: clsrm H-16 Sample# 14170 CEL=002 NON=098 None Detected

Field_ID: 68 Material: Joint Compound Color: White Location: clsrm H-16 Sample# 14171 NON=100 None Detected

Field_ID: 69 Material: cove base Color: Black Location: clsrm H-16 Sample# 14172 NON=100 None Detected

Field_ID: 70 Material: Cove base glue Color: Tan Location: clsrm H-16 Sample# 14173 NON=100 None Detected

Field_ID: 71 Material: door cove Color: Brown Location: clsrm H-16 Sample# 14174 CEL=095 NON=005 None Detected

Field_ID: 72 Material: glue daub behind white board Color: Brown Location: clsrm H-16 Sample# 14175 NON=100 None Detected

Field_ID: 73 Material: cabinet top Color: Multi Location: clsrm H-16 Sample# 14176 CEL=035 NON=065 None Detected

Field_ID: 74 Material: gray sink coating Color: Gray Location: admin office Sample# 14177 CEL=015 NON=085 None Detected

Field_ID: 75 Material: Joint Compound Color: White Location: admin office Sample# 14178 NON=100 None Detected

Field_ID: 76 Material: Sheetrock Color: Gray Location: admin office Sample# 14179 CEL=015 NON=085 None Detected

Field_ID: 77 Material: red duct sealant Color: Red Location: admin office copy room Sample# 14180 NON=100 None Detected

Field_ID: 78 Material: Joint Compound Color: White Location: admin office copy room Sample# 14181 NON=100 None Detected

Field_ID: 79 Material: Sheetrock Color: Gray Location: admin office copy room Sample# 14182 CEL=015 NON=085 None Detected

Field_ID: 80 Material: gray duct sealant Color: Gray Location: admin office copy room Sample# 14183 NON=100 None Detected

Field_ID: 81 Material: Joint Compound Color: White Location: admin office copy room Sample# 14184 NON=100 None Detected

Field_ID: 82 Material: PI Color: Black Location: clsrm H-10 Sample# 14185 NON=100 None Detected

Field_ID: 83 Material: caulk Color: White Location: clsrm H-10 Sample# 14186 NON=100 None Detected

Field_ID: 84 Material: black mastic Color: Black Location: clsrm H-10 Sample# 14187 NON=100 None Detected

Field_ID: 85 Material: peg board Color: Brown Location: clsrm H-9 Sample# 14188 CEL=098 NON=002 None Detected

Field_ID: 86 Material: caulk Color: Brown Location: wall Sample# 14189 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 87 Material: breeching gasket Color: Multi Location: boiler room Sample# 14190FBG=098 NON=002 None Detected

Field_ID: 88 Material: red gasket Color: Red Location: boiler room Sample# 14191 NON=100 None Detected

Field_ID: 89 Material: white gasket Color: White Location: boiler room Sample# 14192 CEL=095 NON=005 None Detected

Field_ID: 90 Material: caulk Color: Brown Location: clsrm H-6 Sample# 14193 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 91 Material: Joint Compound Color: White Location: clsrm H-6 Sample# 14194 NON=100 None Detected

Field_ID: 92 Material: Sheetrock Color: Gray Location: clsrm H-6 Sample# 14195 CEL=015 NON=085 None Detected

Field_ID: 93 Material: glaze Color: Gray Location: clsrm H-6 Sample# 14196 NON=100 None Detected

Field_ID: 94A Material: ceiling plaster Color: Multi Location: Auditorium Sample# 14197 NON=100 None Detected

Field_ID: 94B Material: ceiling plaster Color: Multi Location: Auditorium Sample# 14198 NON=100 None Detected

Field_ID: 94C Material: ceiling plaster Color: Multi Location: Auditorium Sample# 14199 NON=100 None Detected

Field_ID: 95A Material: wall plaster Color: Multi Location: Auditorium Sample# 14200 NON=100 None Detected

Field_ID: 95B Material: wall plaster Color: Multi Location: Auditorium Sample# 14201 NON=100 None Detected

Field_ID: 95C Material: wall plaster Color: Multi Location: Auditorium Sample# 14202 NON=100 None Detected

Field_ID: 96 Material: black paper under stage Color: Multi Location: Auditorium Sample# 14203 CEL=095 NON=005 None Detected

Field_ID: 97 Material: caulk Color: Tan Location: main hall Sample# 14204 NON=097 ASBESTOS DETECTED CHR=003

Field_ID: 98 Material: Sheetrock Color: Gray Location: main hall Sample# 14205 CEL=015 NON=085 None Detected

Field_ID: 99 Material: black sink coating Color: Black Location: Photo lab Sample# 14206 NON=100 None Detected

Field_ID: 100 Material: table top Color: Multi Location: Photo lab Sample# 14207 CEL=070 NON=030 None Detected

Field_ID: 101A Material: 2x4 SAT Color: Gray Location: Photo lab Sample# 14208 MNW=030 CEL=060 NON=010 None Detected

Field_ID: 101B Material: 2x4 SAT Color: Gray Location: Photo lab Sample# 14209 MNW=030 CEL=060 NON=010 None Detected

Field_ID: 102 Material: black sink coating Color: Black Location: Photo lab Sample# 14210 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 103 Material: kiln brick Color: Tan Location: Photo lab Sample# 14211 NON=100 None Detected

Field_ID: 104 Material: carpet glue Color: Tan Location: main office Sample# 14212 CEL=002 NON=098 None Detected

Field_ID: 105 Material: carpet glue w/ black Color: Multi Location: main office Sample# 14213 NON=100 None Detected

Field_ID: 106 Material: Joint compound- wall Color: White Location: main office Sample# 14214 NON=100 None Detected

Field_ID: 107 Material: Joint compound-ceiling Color: White Location: main office Sample# 14215 NON=100 None Detected

Field_ID: 108A Material: black glue daub Color: Black Location: behind stage Sample# 14216 NON=100 None Detected

Field_ID: 108B Material: black glue daub Color: Black Location: behind stage Sample# 14217 NON=100 None Detected

Field_ID: 109 Material: 1X1 AT Color: Gray Location: band hall Sample# 14218 MNW=030 CEL=060 NON=010 None Detected

Field_ID: 110 Material: brown glue daub Color: Brown Location: band hall Sample# 14219 OTH=003 NON=097 None Detected

Field_ID: 111 Material: 1X1 AT Color: Brown Location: band hall Sample# 14220 CEL=095 NON=005 None Detected

Field_ID: 112 Material: 12 x 12 floor tile Color: White Location: band hall Sample# 14221 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 113 Material: black mastic Color: Black Location: band hall Sample# 14222 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 114 Material: 2x4 SAT Color: Gray Location: band hall Sample# 14223 MNW=020 CEL=070 NON=010 None Detected

Field_ID: 115 Material: glue daub residue Color: Brown Location: band hall Sample# 14224 OTH=002 NON=098 None Detected

Field_ID: 116 Material: duct sealant Color: Gray Location: furnance room Sample# 14225 NON=100 None Detected

Field_ID: 117 Material: metal-to-metal caulk Color: Gray Location: exterior window Sample# 14226 NON=100 None Detected

Field_ID: 118 Material: caulk Color: Tan Location: exterior window Sample# 14227 NON=100 None Detected

Field_ID: 119 Material: paper Color: White Location: exterior Sample# 14228 SYN=080 NON=020 None Detected

Field_ID: 120 Material: caulk Color: Gray Location: exterior Sample# 14229 NON=100 None Detected

Field_ID: 121 Material: metal-to-metal caulk Color: Brown Location: exterior Sample# 14230 NON=100 None Detected

Field_ID: 122 Material: caulk Color: Brown Location: exterior Sample# 14231 NON=100 None Detected

Field_ID: 123 Material: caulk Color: Brown Location: exterior Sample# 14232 NON=100 None Detected

Field_ID: 124 Material: Joint compound Color: White Location: hall Sample# 14233 NON=100 None Detected

Field_ID: 125 Material: Sheetrock Color: Gray Location: hall Sample# 14234 CEL=015 NON=085 None Detected

Field_ID: 126 Material: 12x12 floor tile Color: Tan Location: hall Sample# 14235 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 127 Material: black mastic Color: Black Location: hall Sample# 14236 NON=085 ASBESTOS DETECTED CHR=015

Field_ID: 128 Material: cove base Color: Multi Location: hall Sample# 14237 NON=100 None Detected

Field_ID: 129 Material: Cove base glue Color: Tan Location: hall Sample# 14238 NON=100 None Detected

Field_ID: 130 Material: 9X9 floor tile Color: Brown Location: boiler room landing Sample# 14239 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 131 Material: black mastic Color: Black Location: boiler room landing Sample# 14240 NON=090 ASBESTOS DETECTED CHR=010

Field_ID: 132 Material: 12 x 12 floor tile Color: Black Location: hall Sample# 14241 NON=100 None Detected

Field_ID: 133 Material: black mastic Color: Black Location: hall Sample# 14242 CEL=010 NON=090 None Detected

Field_ID: 134 Material: grout Color: Tan Location: hall Sample# 14243 NON=100 None Detected

Field_ID: 135 Material: caulk Color: Tan Location: hall Sample# 14244 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 136 Material: Joint compound Color: White Location: hall Sample# 14245 NON=100 None Detected
Field_ID: 137 Material: glaze Color: Gray Location: at 5.21 Sample# 14246 NON=098 ASBESTOS DETECTED CHR=002

Field_ID: 138 Material: glaze Color: Black Location: at 5.30 Sample# 14247 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 139 Material: brown spray applied fire proofing Color: Tan Location: above ceiling Sample# 14248 CEL=098 NON=002 None Detected

Field_ID: 140 Material: glue Color: Multi Location: hall Sample# 14249 NON=100 None Detected

Field_ID: 141 Material: 12x12 floor tile Color: Tan Location: L2 Sample# 14250 NON=095 ASBESTOS DETECTED CHR=005

Field_ID: 142 Material: black mastic Color: Black Location: L2 Sample# 14251 NON=090 ASBESTOS DETECTED CHR=010

Field_ID: 143 Material: black counter top Color: Black Location: science clsrm Sample# 14252 NON=100 None Detected

Field_ID: 144 Material: hard fitting Color: Gray Location: Science storage room Sample# 14253 MNW=030 CEL=005 NON=045 ASBESTOS DETECTED CHR=020

Field_ID: 59 Material: Interior window glaze Color: Gray Location: library Sample# 14254 NON=098 ASBESTOS DETECTED CHR=002

End of Report

Legend (All sample results represent percentages EX: 001 = 1%) TR(Trace) = < 1%
Asbestos Minerals: Chrysotile=CHR, Amosite=AMO, Crocidolite=CRO, Actinolite=ACT, Tremolite=TRE, Anthophylite=ANT
Fibrous Materials: Fiberglass=FBG, Mineral Wood=MNW, Cellulose=CEL, Hair=HAR, Synthetic=SYN, Other=OTH, Non-Fibrous=NON

Asbestos Identification Laboratory
165U New Boston St., Ste 271
Woburn, MA. 01801
Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Results Table

Sample ID	Lab ID	Material	Sample Location	Analytical Results
1	14093	mastic	café	Chrysotile=3%
2	14094	levelastic	café	No Asbestos Detected
3	14095	metal to metal caulk	café	No Asbestos Detected
4	14096	glaze	café	Chrysotile=2%
5A	14097	stove- JC	café	No Asbestos Detected
5B	14098	stove- JC	café	No Asbestos Detected
6A	14099	textured ceiling	hall	No Asbestos Detected
6B	14100	textured ceiling	hall	No Asbestos Detected
7	14101	wall	above	No Asbestos Detected
8A	14102	spray applied fire proofing	hall	No Asbestos Detected
8B	14103	spray applied fire proofing	hall	No Asbestos Detected
9	14104	12 x 12 floor tile	elec closet	Chrysotile=2%
10A	14105	hard fitting	elec closet	No Asbestos Detected
10B	14106	hard fitting	elec closet	No Asbestos Detected
11A	14107	caulk	hall	No Asbestos Detected
11B	14108	caulk	hall	No Asbestos Detected
12A	14109	window glaze	hall	Chrysotile=3%
12B	14110	window glaze	hall	No Asbestos Detected
13A	14111	hard fitting	café	No Asbestos Detected

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Results Table

13B	14112	hard fitting	café	No Asbestos Detected
14A	14113	roof drain	café	No Asbestos Detected
14B	14114	roof drain	café	No Asbestos Detected
15A	14115	Duct sealant	café	No Asbestos Detected
15B	14116	Duct sealant	café	No Asbestos Detected
16A	14117	textured ceiling	café	No Asbestos Detected
16B	14118	textured ceiling	café	No Asbestos Detected
5C	14119	Joint Compound	café	No Asbestos Detected
17	14120	Cove base	café	No Asbestos Detected
18	14121	Cove base glue	café	No Asbestos Detected
19	14122	window sill	café	No Asbestos Detected
20	14123	wndow glaze	café/kitchen	Chrysotile=3%
21	14124	door caulk	café/kitchen	No Asbestos Detected
22	14125	caulk	wall	Chrysotile=3%
23	14126	window panel cove	café	No Asbestos Detected
24	14127	door glaze	Gym	No Asbestos Detected
25	14128	9X9 floor tile	Gym	Chrysotile=3%
26	14129	black mastic	Gym	No Asbestos Detected
27	14130	black fabric under brick	exterior	No Asbestos Detected
28	14131	Joint Compound	kitchen	No Asbestos Detected
29	14132	cove base	kitchen	No Asbestos Detected

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Results Table

30	14133	Cove base glue	kitchen	No Asbestos Detected
31	14134	9X9 floor tile	kitchen	Chrysotile=5%
32	14135	black glue	kitchen	No Asbestos Detected
33	14136	metal pan insulation	kitchen	No Asbestos Detected
34	14137	12 x 12 floor tile	kitchen	No Asbestos Detected
35	14138	12 x 12 white floor tile	kitchen	Chrysotile=3%
36	14139	black mastic	kitchen	Chrysotile=10%
37	14140	expansion joint	kitchen	No Asbestos Detected
38	14141	Duct sealant	kitchen	No Asbestos Detected
39	14142	2 x 2 SAT	kitchen	No Asbestos Detected
40	14143	window panel cove	dinning room	No Asbestos Detected
41	14144	glue tab	boiler room	Chrysotile=20%
42	14145	duct cloth	boiler room	No Asbestos Detected
43	14146	Duct sealant	boiler room	No Asbestos Detected
44	14147	glue tab	boiler room	Chrysotile=30%
45	14148	wall tile grout	Boys locker room	No Asbestos Detected
46	14149	glue	Boys locker room	No Asbestos Detected
47	14150	flr coating	Boys locker room	No Asbestos Detected
48	14151	Sheetrock	Boys locker room	No Asbestos Detected
49	14152	glaze	gym	Chrysotile=2%
50	14153	2x2 SAT	Boys locker room	No Asbestos Detected
51	14154	Sheetrock	Boys locker room	No Asbestos Detected

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Results Table

52	14155	hard fitting	Boys locker room	No Asbestos Detected
53	14156	black tar paper	gym	No Asbestos Detected
54	14157	carpet glue	library	No Asbestos Detected
55	14158	textured ceiling	library	No Asbestos Detected
56	14159	2x4 SAT	library	No Asbestos Detected
57	14160	12 x 12 floor tile	library	Chrysotile=2%
58	14161	black mastic	library	Chrysotile=10%
60	14162	wall plaster	library	No Asbestos Detected
60.1	14163	wall tile grout	hall	No Asbestos Detected
61	14164	Joint Compound	bathroom	No Asbestos Detected
62	14165	Sheetrock	bathroom	No Asbestos Detected
63	14166	2x2 SAT	bathroom	No Asbestos Detected
64	14167	glue	bathroom	No Asbestos Detected
65	14168	glaze	clsrm H-17	No Asbestos Detected
66	14169	12x12 floor tile	clsrm H-16	No Asbestos Detected
67	14170	black mastic	clsrm H-16	No Asbestos Detected
68	14171	Joint Compound	clsrm H-16	No Asbestos Detected
69	14172	cove base	clsrm H-16	No Asbestos Detected
70	14173	Cove base glue	clsrm H-16	No Asbestos Detected
71	14174	door cove	clsrm H-16	No Asbestos Detected

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Results Table

72	14175	glue daub behind white board	clsrm H-16	No Asbestos Detected
73	14176	cabinet top	clsrm H-16	No Asbestos Detected
74	14177	gray sink coating	admin office	No Asbestos Detected
75	14178	Joint Compound	admin office	No Asbestos Detected
76	14179	Sheetrock	admin office	No Asbestos Detected
77	14180	red duct sealant	admin office copy room	No Asbestos Detected
78	14181	Joint Compound	admin office copy room	No Asbestos Detected
79	14182	Sheetrock	admin office copy room	No Asbestos Detected
80	14183	gray duct sealant	admin office copy room	No Asbestos Detected
81	14184	Joint Compound	admin office copy room	No Asbestos Detected
82	14185	PI	clsrm H-10	No Asbestos Detected
83	14186	caulk	clsrm H-10	No Asbestos Detected
84	14187	black mastic	clsrm H-10	No Asbestos Detected
85	14188	peg board	clsrm H-9	No Asbestos Detected
86	14189	caulk	wall	Chrysotile=3%
87	14190	breeching gasket	boiler room	No Asbestos Detected
88	14191	red gasket	boiler room	No Asbestos Detected
89	14192	white gasket	boiler room	No Asbestos Detected
90	14193	caulk	clsrm H-6	Chrysotile=3%

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Results Table

91	14194	Joint Compound	clsrm H-6	No Asbestos Detected
92	14195	Sheetrock	clsrm H-6	No Asbestos Detected
93	14196	glaze	clsrm H-6	No Asbestos Detected
94A	14197	ceiling plaster	Auditorium	No Asbestos Detected
94B	14198	ceiling plaster	Auditorium	No Asbestos Detected
94C	14199	ceiling plaster	Auditorium	No Asbestos Detected
95A	14200	wall plaster	Auditorium	No Asbestos Detected
95B	14201	wall plaster	Auditorium	No Asbestos Detected
95C	14202	wall plaster	Auditorium	No Asbestos Detected
96	14203	black paper under stage	Auditorium	No Asbestos Detected
97	14204	caulk	main hall	Chrysotile=3%
98	14205	Sheetrock	main hall	No Asbestos Detected
99	14206	black sink coating	Photo lab	No Asbestos Detected
100	14207	table top	Photo lab	No Asbestos Detected
101A	14208	2x4 SAT	Photo lab	No Asbestos Detected
101B	14209	2x4 SAT	Photo lab	No Asbestos Detected
102	14210	black sink coating	Photo lab	Chrysotile=5%
103	14211	kiln brick	Photo lab	No Asbestos Detected
104	14212	carpet glue	main office	No Asbestos Detected
105	14213	carpet glue w/ black	main office	No Asbestos Detected

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NVLAP
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Results Table

106	14214	Joint compound- wall	main office	No Asbestos Detected
107	14215	Joint compound-ceiling	main office	No Asbestos Detected
108A	14216	black glue daub	behind stage	No Asbestos Detected
108B	14217	black glue daub	behind stage	No Asbestos Detected
109	14218	1X1 AT	band hall	No Asbestos Detected
110	14219	brown glue daub	band hall	No Asbestos Detected
111	14220	1X1 AT	band hall	No Asbestos Detected
112	14221	12 x 12 floor tile	band hall	Chrysotile=2%
113	14222	black mastic	band hall	Chrysotile=5%
114	14223	2x4 SAT	band hall	No Asbestos Detected
115	14224	glue daub residue	band hall	No Asbestos Detected
116	14225	duct sealant	furnance room	No Asbestos Detected
117	14226	metal-to-metal caulk	exterior window	No Asbestos Detected
118	14227	caulk	exterior window	No Asbestos Detected
119	14228	paper	exterior	No Asbestos Detected
120	14229	caulk	exterior	No Asbestos Detected
121	14230	metal-to-metal caulk	exterior	No Asbestos Detected
122	14231	caulk	exterior	No Asbestos Detected
123	14232	caulk	exterior	No Asbestos Detected
124	14233	Joint compound	hall	No Asbestos Detected
125	14234	Sheetrock	hall	No Asbestos Detected

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NVLAP®
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Results Table

126	14235	12x12 floor tile	hall	Chrysotile=2%
127	14236	black mastic	hall	Chrysotile=15%
128	14237	cove base	hall	No Asbestos Detected
129	14238	Cove base glue	hall	No Asbestos Detected
130	14239	9X9 floor tile	boiler room landing	Chrysotile=2%
131	14240	black mastic	boiler room landing	Chrysotile=10%
132	14241	12 x 12 floor tile	hall	No Asbestos Detected
133	14242	black mastic	hall	No Asbestos Detected
134	14243	grout	hall	No Asbestos Detected
135	14244	caulk	hall	Chrysotile=5%
136	14245	Joint compound	hall	No Asbestos Detected
137	14246	glaze	at 5.21	Chrysotile=2%
138	14247	glaze	at 5.30	Chrysotile=5%
139	14248	brown spray applied fire proofing	above ceiling	No Asbestos Detected
140	14249	glue	hall	No Asbestos Detected
141	14250	12x12 floor tile	L2	Chrysotile=5%
142	14251	black mastic	L2	Chrysotile=10%
143	14252	black counter top	science clsrm	No Asbestos Detected
144	14253	hard fitting	Science storage room	Chrysotile=20%
59	14254	Interior window glaze	library	Chrysotile=2%

Asbestos Identification Laboratory
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EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Asbestos Consultants
61 Unity Avenue
Belmont, MA 02478
Suite/Apt

Batch 865

Dear Ed Morgan,
The following correspondence contains two communications:

1. Results of Asbestos project Concord Carlisle High School
2. Billing Invoice.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration# PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number LB-0078(Bulk) LA-0087(Air)

Asbestos Identification Laboratory
165U New Boston St., Ste 271
Woburn, MA. 01801
Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP
Lab Code: 200919-0

Results for Client Project: Concord Carlisle High School, Batch# 865

Work Received: 4/29/2011 Date Sampled: 5/3/2011 5:43:05 PM Results Sent: 5/3/2011 5:43:36 PM

Field_ID: 145 Material: Black material behind concrete block Color: Black Location: Exterior Sample# 14365 CEL=020 NON=070 ASBESTOS DETECTED CHR=010

Field_ID: 146 Material: Black windowsill Color: Black Location: LL gym ramp Sample# 14366 NON=100 None Detected

Field_ID: 147 Material: Spray applied fireproofing Color: Tan Location: LL gym ramp Sample# 14367 CEL=095 NON=005 None Detected

Field_ID: 148 Material: 12 x 12 red tile Color: Red Location: LL gym hall Sample# 14368 NON=100 None Detected

Field_ID: 149 Material: Black mastic Color: Black Location: LL gym hall Sample# 14369 CEL=010 NON=090 None Detected

End of Report

Legend (All sample results represent percentages EX: 001 = 1%) TR(Trace) = < 1%
Asbestos Minerals: Chrysotile=CHR, Amosite=AMO, Crocidolite=CRO, Actinolite=ACT, Tremolite=TRE, Anthophylite=ANT
Fibrous Materials: Fiberglass=FBG, Mineral Wood=MNW, Cellulose=CEL, Hair=HAR, Synthetic=SYN, Other=OTH, Non-Fibrous=NON

Asbestos Identification Laboratory
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EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Results Table

Sample ID	Lab ID	Material	Sample Location	Analytical Results
145	14365	Black material behind concrete block	Exterior	Chrysotile=10%
146	14366	Black windowsill	LL gym ramp	No Asbestos Detected
147	14367	Spray applied fireproofing	LL gym ramp	No Asbestos Detected
148	14368	12 x 12 red tile	LL gym hall	No Asbestos Detected
149	14369	Black mastic	LL gym hall	No Asbestos Detected

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Lab Code: 200919-0

Asbestos Consultants
61 Unity Avenue
Belmont, MA 02478
Suite/Apt

Batch 864

Dear Ed Morgan,
The following correspondence contains two communications:

1. Results of Asbestos project Concord Carlisle roof samples
2. Billing Invoice.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration# PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number LB-0078(Bulk) LA-0087(Air)

Asbestos Identification Laboratory
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Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Results for Client Project: Concord Carlisle roof samples, Batch# 864

Work Received: 4/29/2011 Date Sampled: 4/27/2011 Results Sent: 5/3/2011 5:19:16 PM

Field_ID: 1 Material: Core Color: Multi Location: Roof Sample# 14335 CEL=070 NON=030 None Detected

Field_ID: 2 Material: Core Color: Multi Location: Roof Sample# 14336 CEL=010 SYN=010 NON=075 ASBESTOS DETECTED CHR=005

Field_ID: 3 Material: Fabric Color: Multi Location: Roof Sample# 14337FBG=065 NON=035 None Detected

Field_ID: 4 Material: Curb Color: Black Location: Roof Sample# 14338FBG=015 CEL=060 NON=025 None Detected

Field_ID: 5 Material: Core and tectum Color: Multi Location: Roof Sample# 14339 CEL=065 NON=035 None Detected

Field_ID: 6 Material: Core Color: Multi Location: Roof Sample# 14340 CEL=060 NON=040 None Detected

Field_ID: 7 Material: Back corner block Color: Multi Location: Roof Sample# 14341 CEL=065 NON=035 None Detected

Field_ID: 8 Material: Back corner block Color: Multi Location: Roof Sample# 14342 CEL=070 NON=030 None Detected

Field_ID: 9 Material: Core Color: Multi Location: Roof Sample# 14343FBG=010 CEL=060 NON=030 None Detected

Field_ID: 10 Material: No Sample Color: Location: Sample# 14344 Did Not Analyze

Field_ID: 11 Material: Core Color: Multi Location: Top of library Sample# 14345 CEL=065 NON=035 None Detected

Field_ID: 12 Material: Core Color: Multi Location: Main office Sample# 14346FBG=005 CEL=055 NON=040 None Detected

Field_ID: 13 Material: Core Color: Multi Location: Main office Sample# 14347 CEL=065 NON=035 None Detected

Field_ID: 14 Material: Core Color: Multi Location: Main office Sample# 14348 CEL=065 NON=035 None Detected

Field_ID: 15 Material: Core Color: Multi Location: Steel braced gym Sample# 14349 CEL=070 NON=030 None Detected

Field_ID: 16 Material: Core curb Color: Multi Location: LL gym Sample# 14350 CEL=060 NON=040 None Detected

Field_ID: 17A Material: Curb Color: Multi Location: LL gym Sample# 14351 CEL=060 NON=040 None Detected

Field_ID: 17B Material: Curb Color: Black Location: LL gym Sample# 14352 CEL=005 NON=095 None Detected

Field_ID: 18 Material: Curb Color: Multi Location: Door #56 Sample# 14353 CEL=055 NON=045 None Detected

Field_ID: 19 Material: Curb Color: Multi Location: Door #56 Sample# 14354 NON=090 ASBESTOS DETECTED CHR=010

Field_ID: 20 Material: Styrofoam Color: White Location: Main entrance roof Sample# 14355 NON=100 None Detected

Field_ID: 21 Material: Styrofoam Color: White Location: Split face l bldg block Sample# 14356 NON=100 None Detected

Field_ID: 22 Material: Styrofoam Color: White Location: Door 14 Sample# 14357 NON=100 None Detected

Field_ID: 23 Material: Styrofoam Color: White Location: Door 52 Sample# 14358 NON=100 None Detected

Field_ID: 24 Material: Roof Color: Multi Location: Door 03 Sample# 14359 CEL=060 NON=040 None Detected

Field_ID: 25 Material: Roof Color: Multi Location: Door 56 kitchen Sample# 14360 CEL=050 NON=050 None Detected

Field_ID: 26 Material: Roof Color: Multi Location: Door 12 S building Sample# 14361 CEL=050 NON=050 None Detected

Field_ID: 27 Material: Wall insulation Color: Multi Location: Door 36 Sample# 14362 CEL=045 NON=055 None Detected

Field_ID: 28 Material: Flashing at foundation Color: Black Location: Exterior Sample# 14363FBG=040 NON=060 None Detected

Field_ID: 29 Material: Flashing Color: Black Location: Over windows and doors Sample# 14364FBG=040 NON=060 None Detected

End of Report

Legend (All sample results represent percentages EX: 001 = 1%) TR(Trace) = < 1%
Asbestos Minerals: Chrysotile=CHR, Amosite=AMO, Crocidolite=CRO, Actinolite=ACT, Tremolite=TRE, Anthophylite=ANT
Fibrous Materials: Fiberglass=FBG, Mineral Wood=MNW, Cellulose=CEL, Hair=HAR, Synthetic=SYN, Other=OTH, Non-Fibrous=NON

Asbestos Identification Laboratory
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Woburn, MA. 01801
Bulk Asbestos Analysis by Polarized Light Microscopy
EPA Method: 600/R-93/116

NVLAP®
Lab Code: 200919-0

Results Table

Sample ID	Lab ID	Material	Sample Location	Analytical Results
1	14335	Core	Roof	No Asbestos Detected
2	14336	Core	Roof	Chrysotile=5%
3	14337	Fabric	Roof	No Asbestos Detected
4	14338	Curb	Roof	No Asbestos Detected
5	14339	Core and tectum	Roof	No Asbestos Detected
6	14340	Core	Roof	No Asbestos Detected
7	14341	Back corner block	Roof	No Asbestos Detected
8	14342	Back corner block	Roof	No Asbestos Detected
9	14343	Core	Roof	No Asbestos Detected
10	14344	No Sample		Did Not Analyze
11	14345	Core	Top of library	No Asbestos Detected
12	14346	Core	Main office	No Asbestos Detected
13	14347	Core	Main office	No Asbestos Detected
14	14348	Core	Main office	No Asbestos Detected
15	14349	Core	Steel braced gym	No Asbestos Detected
16	14350	Core curb	LL gym	No Asbestos Detected
17A	14351	Curb	LL gym	No Asbestos Detected
17B	14352	Curb	LL gym	No Asbestos Detected
18	14353	Curb	Door #56	No Asbestos Detected

Asbestos Identification Laboratory
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EPA Method: 600/R-93/116

NVLAP
Lab Code: 200919-0

Results Table

19	14354	Curb	Door #56	Chrysotile=10%
20	14355	Styrofoam	Main entrance roof	No Asbestos Detected
21	14356	Styrofoam	Split face I bldg block	No Asbestos Detected
22	14357	Styrofoam	Door 14	No Asbestos Detected
23	14358	Styrofoam	Door 52	No Asbestos Detected
24	14359	Roof	Door 03	No Asbestos Detected
25	14360	Roof	Door 56 kitchen	No Asbestos Detected
26	14361	Roof	Door 12 S building	No Asbestos Detected
27	14362	Wall insulation	Door 36	No Asbestos Detected
28	14363	Flashing at foundation	Exterior	No Asbestos Detected
29	14364	Flashing	Over windows and doors	No Asbestos Detected

Appendix B

Please Reply To:

AmeriSci Los Angeles
24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4868 • FAX: (310) 834-4772

FACSIMILE TELECOPY TRANSMISSION

To: Ed Morgan
Asbestos Consultants
Fax #:

Email: edmorgan22@verizon.net

From:
AmeriSci Job #: 411051084
Subject: Lead (paint) 48 hour Results
Client Project: Concord - Carlisle HS; Concord, MA

Date: Friday, May 06, 2011
Time: 15:55:17
Comments:

Number of Pages: 3 (including cover sheet)

AMERI SCI

AmeriSci Los Angeles
24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4868 • FAX: (310) 834-4772

AmeriSci Job #: 411051084

Date Received: 05/05/11
Date Analyzed: 05/06/11

Lead Analysis Results

Paint
EPA Method 3050B/7000B

Asbestos Consultants

Job Site: Concord - Carlisle HS; Concord, MA

AmeriSci # 411051084	Client Number	Sample Location	% Lead (w/w)	Lead Content (mg/kg = ppm)
01	LPB - 1	Boiler Room - Floor / Gray Paint	0.016	160
02	LPB - 2	Boys Locker Room - Wall / Beige Paint	0.068	680
03	LPB - 3	Gym Upper - Door / Red Paint	0.025	250
04	LPB - 4	Library - Column / Yellow Paint	0.061	610
05	LPB - 5	Classroom H-16 Wall / White Paint	<0.01	<100
06	LPB - 6	Classroom H10 - Beam / Blue Paint	0.10	1,000
07	LPB - 7	Classroom H-9 - Wall / Pink Paint	0.028	280
08	LPB - 8	Stage - Wall / Black Paint	<0.01	<100
09	LPB - 9	Main Office - Window Frame / Brown Paint	<0.01	<100
10	LPB - 10	Furnace Rm - Floor / Gray Paint	0.018	180
11	LPB - 11	Furnace Rm - Wall / White Paint	0.029	290
12	LPB - 12	Outside Radio Rm - Wall / Yellow Paint	<0.01	<100
13	LPB - 13	Hall - Column / Green Paint	7.9	79,000
14	LPB - 14	Kitchen - Window Panel / Pink Paint	<0.01	<100
15	LPB - 15	Kitchen - Window Column / Blue Paint	<0.01	<100
16	LPB - 16	Gym Wall Ramp Hand Rail / White Paint	<0.01	<100
17	LPB - 17	LL Gym Hall Wall / White Paint	<0.01	<100
18	LPB - 18	LL Gym - Wall / Red Paint	<0.01	<100
19	LPB - 19	Cafe Steelframe / Red Paint	0.14	1,400
20	LPB - 20	Admin Office - Wall / Pink Paint	<0.01	<100

AmeriSci Reporting Limit is 0.01%, or 100mg/kg prior to any dilutions due to high analyte concentrations or matrix interferences. AmeriSci does not correct sample results by the blank value. All analytical batch data met quality control criteria unless otherwise noted. CA ELAP No. 2322. AIHA Lab No. 100530.

Reviewed by: _____

Analyzed by: _____
Minh Phung, Chemist [dsl]

411-051084

Bulk Chain of Custody

AmeriSci Boston
8 School Street
Weymouth, MA 02189
Toll Free: (888) 724-5221
Phone: (781) 337-9334
Fax: (781) 337-7642
www.amerisci.com

Relinquished By: Ed Morgan Date/Time: 4/29/11 - 5:30pm
Received By: RPoletto Date/Time: 5-3-11 1450
Relinquished By: Date/Time:
Received By: Cynthia Hale Date/Time: 5/5/11 09:25

Company: Asbestos Consultants
Street Address:
City: State: Zip:
Phone: Fax:
Cell: 617-775-4688 Fax:
E-mail edmorgan22@verizon.net Verbal Results: Y / N
Results to:
Special Instructions or Comments: Test for lead

Project: Concord - Carlisle HS AmeriSci #: 1105-040
Proj Mgr: Proj #:
Proj Address: Concord, MA Proj State:
Analysis: __PLM; __Positive Stop; __TEM; __NY ELAP PLM/TEM w/ NOB Prep.
ASTM Dust __(Microvac)__(Wipe); __Qualitative; __Other (describe in comments)
Turnaround Time: 48 hr Material Type: ✓ Bulk __Dust __Water
Sampled By: SGM Date Sampled: 4/29/11

Lab ID	Field ID	Location	Sample Description (dust area)	Homogenous Area
	LPB-1	Boiler Rm - floor	gray paint	
	" - 2	Boys locker Room - wall	beige "	
	" - 3	Gym Upper - door	red "	
	" - 4	Library - column	yellow "	
	" - 5	Classroom - H-16 wall	white "	
	" - 6	" H-10 - beam	blue "	
	" - 7	" H-9 wall	pink "	
	" - 8	Stage - wall	black "	
	" - 9	Main office - window frame	brown "	
	" - 10	Furnace Rm - floor	gray "	
	" - 11	" " - wall	white "	
	" - 12	Outside Radio Rm - wall	yellow "	
	" - 13	Main - column	green "	
	" - 14	Kitchen - window panel	pink "	
	" - 15	" " column	blue "	
	" - 16	Gym hall ramp hand rail	white "	
	" - 17	" " wall wall	white "	

411051084

Relinquished By: Ed Mogan Date/Time:

Received By: Date/Time:

Relinquished By: Date/Time:

Received By: Date/Time:

AMERI SCI

WWW.AMERISCI.COM

BULK CHAIN OF CUSTODY

AMERISCI BOSTON
8 SCHOOL STREET
WEYMOUTH, MA 02189
TOLL FREE: (888) 724-5221
PHONE: (781) 337-9334
FAX: (781) 337-7642

Company: Asbestos Consultants

Street Address:

City: State: Zip:

Phone: Fax:

Cell: Fax:

E-mail Verbal Results: Y / N

Results to:

Special Instructions or Comments:

Project: AMERISCI #: 1105-040

Proj Mgr: Proj #:

Proj Address: Proj State:

Analysis: __PLM; __ Positive Stop; __TEM; __ NY ELAP PLM/TEM w/ NOB Prep.

ASTM Dust __ (Microvac) __ (Wipe); __ Qualitative; __ Other (describe in comments)

Turnaround Time: Material Type: __ Bulk __ Dust __ Water

Sampled By: Date Sampled:

Lab ID	Field ID	Location	Sample Description (dust area)	Homogenous Area
	LPB-18	LL Gym -wall	red paint	
	" -19	Cafe steel frame	" "	
	" -20	Admin office -wall	pink "	

Appendix C

PHOENIX
Environmental Laboratories, Inc.

Monday, May 09, 2011

Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Project ID: CONCORD CARLYSLE HS
Sample ID#s: BA26349 - BA26358

This laboratory is in compliance with the QA/QC procedures outlined in EPA 600/4-79-019, Handbook for Analytical Quality in Water and Waste Water, March 1979, SW846 QA/QC and NELAC requirements of procedures used.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26349

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-1

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1221	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1232	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1242	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1248	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1254	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1260	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1262	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1268	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	110		%	05/06/11		MH	3540C/8082
% TCMX	72		%	05/06/11		MH	3540C/8082

Project ID: CONCORD CARLYSLE HS
Client ID: PCB-1

Phoenix I.D.: BA26349

Parameter	Result	RL	Units	Date	Time	By	Reference

Comments:

* For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26350

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-2

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1221	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1232	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1242	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1248	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1254	0.89	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1260	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1262	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1268	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	97		%	05/05/11		MH	3540C/8082
% TCMX	85		%	05/05/11		MH	3540C/8082

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26351

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-3

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1221	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1232	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1242	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1248	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1254	*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1260	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1262	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1268	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
Total PCBs	6.1	1.6	mg/Kg	05/06/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	125		%	05/06/11		MH	3540C/8082
% TCMX	117		%	05/06/11		MH	3540C/8082

Project ID: CONCORD CARLYSLE HS
Client ID: PCB-3

Phoenix I.D.: BA26351

Parameter	Result	RL	Units	Date	Time	By	Reference

Comments:

* For PCBs, as per section 11.9.3, when multiple Aroclor's of PCBs are present and the aroclor is no longer recognizable, quantitation may be performed by comparing the total area of the PCB pattern to that of the aroclor it mostly resembles. The PCB pattern did not resemble any of the standards, but most closely resembles a mixture of the Aroclors 1016 and 1254.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26352

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-4

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1221	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1232	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1242	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1248	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1254	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1260	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1262	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
PCB-1268	ND*	1.5	mg/Kg	05/06/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	80		%	05/06/11		MH	3540C/8082
% TCMX	49		%	05/06/11		MH	3540C/8082

Project ID: CONCORD CARLYSLE HS
Client ID: PCB-4

Phoenix I.D.: BA26352

Parameter	Result	RL	Units	Date	Time	By	Reference

Comments:

* For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26353

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-5

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1221	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1232	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1242	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1248	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1254	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1260	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1262	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
PCB-1268	ND	0.33	mg/Kg	05/05/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	107		%	05/05/11		MH	3540C/8082
% TCMX	92		%	05/05/11		MH	3540C/8082

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26354

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-6

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1221	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1232	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1242	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1248	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1254	*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1260	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1262	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1268	ND	1.6	mg/Kg	05/06/11		MH	3540C/8082
Total PCBs	10	1.6	mg/Kg	05/06/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	134		%	05/06/11		MH	3540C/8082
% TCMX	124		%	05/06/11		MH	3540C/8082

Project ID: CONCORD CARLYSLE HS
Client ID: PCB-6

Phoenix I.D.: BA26354

Parameter	Result	RL	Units	Date	Time	By	Reference

Comments:

* For PCBs, as per section 11.9.3, when multiple Aroclor's of PCBs are present and the aroclor is no longer recognizable, quantitation may be performed by comparing the total area of the PCB pattern to that of the aroclor it mostly resembles. The PCB pattern did not resemble any of the standards, but most closely resembles a mixture of the Aroclors 1016 and 1254.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26355

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-7

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1221	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1232	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1242	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1248	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1254	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1260	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1262	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1268	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	113		%	05/04/11		MH	3540C/8082
% TCMX	95		%	05/04/11		MH	3540C/8082

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26356

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-8

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1221	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1232	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1242	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1248	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1254	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1260	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1262	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
PCB-1268	ND	0.3	mg/Kg	05/04/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	110		%	05/04/11		MH	3540C/8082
% TCMX	89		%	05/04/11		MH	3540C/8082

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26357

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-9

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1221	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1232	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1242	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1248	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1254	0.56	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1260	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1262	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
PCB-1268	ND	0.33	mg/Kg	05/04/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	109		%	05/04/11		MH	3540C/8082
% TCMX	92		%	05/04/11		MH	3540C/8082

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 09, 2011

FOR: Ms.Susan Cahalan
CDW Consultants, Inc
40 Speen Street
Suite 301
Framingham, MA 01701

Sample Information		Custody Information		Date	Time
Matrix:	SOLID	Collected by:		04/27/11	0:00
Location Code:	CDW-PCB	Received by:	LB	04/29/11	16:44
Rush Request:		Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA26349
Phoenix ID: BA26358

Project ID: CONCORD CARLYSLE HS

Client ID: PCB-10

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	100	1	%	05/03/11		JL	E160.3
Caulk Extraction for PCB	Completed			05/03/11		TB/K	SW3540C
PCB (Soxhlet)							
PCB-1016	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1221	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1232	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1242	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1248	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1254	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1260	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1262	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
PCB-1268	ND*	1.6	mg/Kg	05/06/11		MH	3540C/8082
QA/QC Surrogates							
% DCBP	78		%	05/06/11		MH	3540C/8082
% TCMX	51		%	05/06/11		MH	3540C/8082

Project ID: CONCORD CARLYSLE HS
Client ID: PCB-10

Phoenix I.D.: BA26358

Parameter	Result	RL	Units	Date	Time	By	Reference

Comments:

* For PCBs, due to matrix interference from non target compounds in the sample an elevated RL was reported.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 10, 2011

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

QA/QC Report

May 10, 2011

QA/QC Data

SDG I.D.: GBA26349

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS Rec %	MS Dup Rec %	RPD
QA/QC Batch 176114, QC Sample No: BA26332 (BA26349, BA26350, BA26351, BA26352, BA26353, BA26354, BA26355, BA26356, BA26357, BA26358)							
Polychlorinated Biphenyls							
Polychlorinated Biphenyls	79	82	83	1.2			

Comment:

A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria

Phyllis Shiller, Laboratory Director
May 10, 2011

Sample Criteria Exceedences Report

Requested Criteria: CAM

GBA26349

SampNo	LocCode	Acode	Phoenix Analyte	Criteria Units	ST	State Category	Criteria Name	Result	RL	Factored Criteria	Factored RL Criteria	Analysis Units
BA26349	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26349	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	890	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26350	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	*	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	*	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26351	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26352	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1500		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg

Sample Criteria Exceedences Report

Requested Criteria: CAM

GBA26349

SampNo	LocCode	Acode	Phoenix Analyte	Criteria Units	ST	State Category	Criteria Name	Result	RL	Factored Criteria	Factored RL Criteria	Analysis Units
BA26353	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26353	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	*	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	*	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26354	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	1600		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26355	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26356	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	300		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg

Sample Criteria Exceedences Report

Requested Criteria: CAM

GBA26349

SampNo	LocCode	Acode	Phoenix Analyte	Criteria Units	ST	State Category	Criteria Name	Result	RL	Factored Criteria	Factored RL Criteria	Analysis Units
BA26357	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	560	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26357	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND	330		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1016	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1221	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1232	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1242	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1248	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1254	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1260	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1262	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg
BA26358	CDW-PCB	$PCB_SOXR	PCB-1268	ug/kg	MA	Cam Protocol	PCB SOIL RL	ND*	1600		100	ug/Kg

MassDEP Analytical Protocol Certification Form

Laboratory Name: Phoenix Environmental Laboratories, Inc. **Project #:**

Project Location: CONCORD CARLYSLE HS **RTN:**

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]

BA26349, BA26350, BA26351, BA26352, BA26353, BA26354, BA26355, BA26356, BA26357, BA26358

Matrices: ☐ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☑ Other: Solid

CAM Protocol (check all that apply below)

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	8082 PCB CAM V A ☑	9014 Total Cyanide/PAC CAM V1 A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature*) in the field or laboratory, and prepared/analyzed with method holding times? (* see narrative)	☑ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☑ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☑ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements speified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☑ Yes ☐ No
E	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☑ Yes ☐ No

Responses to questions G, H and I below is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☐ Yes ☑ No

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056(2)(k) and WSC-07-350

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	☑ Yes ☐ No
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☑ Yes ☐ No

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Authorized Signature: 

Date: Tuesday, May 10, 2011

Printed Name: Greg Lawrence

Position: Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

MCP Certification Report

May 10, 2011

SDG I.D.: GBA26349

Due to the complexity of the sample matrix several samples did not meet the requested criteria.

PCB Narration

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

Instrument: Au-ecd5 05/04/11-1 (BA26355, BA26356, BA26357)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

Printed Name Michael Hahn
Position: Chemist
Date: 5/4/2011

Instrument: Au-ecd5 05/05/11-1 (BA26350, BA26353)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

Printed Name Michael Hahn
Position: Chemist
Date: 5/5/2011

Instrument: Au-ecd7 05/06/11-1 (BA26349, BA26358)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

Printed Name Michael Hahn
Position: Chemist
Date: 5/6/2011

QC Comments: QC Batch 76114 05/02/11 (BA26349, BA26350, BA26351, BA26352, BA26353, BA26354, BA26355, BA26356, BA26357, BA26358)

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

MCP Certification Report

May 10, 2011

SDG I.D.: GBA26349

A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

QC (Batch Specific)

---------- Sample No: BA26332 ----------

All LCS recoveries were within 30 - 130 with the following exceptions: None.

All LCSD recoveries were within 30 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 6 Pg of

Data Delivery:
☐ Fax #:
☒ Email: scahalan@cdwconsultants.com

Customer: CDW Consultants
Address: 40 Speen St, Suite 301, Framingham MA 01701

Project: Concord-Carlyle Hs (CCHS)
Report to: Susan Cahalan
Invoice to: Company

Project P.O:
Phone #:
Fax #:

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 4-28-11

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=oil
GW=groundwater SL=sludge A=air X=other

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	PCBs via Soxhlet	Baggie	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle
26349	PCB-1	S	4/27/11	—	X	1										
26350	PCB-2			—	X	1										
26351	PCB-3			—	X	1										
26352	PCB-4			—	X	1										
26353	PCB-5			—	X	1										
26354	PCB-6			—	X	1										
26355	PCB-7			—	X	1										
26356	PCB-8			—	X	1										
26357	PCB-9			—	X	1										
26358	PCB-10	↓	↓	—	X	1										

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	4/29/11	11:00
[signature]	[signature]	4/29/11	16:44

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

CT/RI
☐ RCP Cert
☐ GW Protect
☐ GA Mobility
☐ GB Mobility
☐ SW Protection
☐ Res. Vol.
☐ Ind. Vol.
☐ Res. Criteria
☐ Other

MA
☒ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

State where samples were collected: MA

Data Format
☐ Excel
☒ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ ASP-A
☐ NJ Reduced Deliv. *
☐ NJ Hazsite EDD
☐ Phcenix Std Report
☐ Other
Mass Dep

Appendix D

PHOENIX
Environmental Laboratories, Inc.

Tuesday, May 10, 2011

Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Project ID: 1105-042
Sample ID#s: BA28510 - BA28515

This laboratory is in compliance with the QA/QC procedures outlined in EPA 600/4-79-019, Handbook for Analytical Quality in Water and Waste Water, March 1979, SW846 QA/QC and NELAC requirements of procedures used.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28510

Project ID: 1105-042

Client ID: HG-1 RUBBER STAIR TREAD

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	< 0.06	0.06	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28511

Project ID: 1105-042

Client ID: HG-2 RAMP FLOORING

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	< 0.06	0.06	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28512

Project ID: 1105-042

Client ID: HG-3 BLACK FLOOR MAT

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	< 0.08	0.08	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28513

Project ID: 1105-042

Client ID: HG-4 RAMP FLOOR

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	< 0.07	0.07	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28514

Project ID: 1105-042

Client ID: HG-5 RUBBER FLOOR

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	33.9	3.0	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

May 10, 2011

FOR: Asbestos Consultants
61 Unity Ave
Belmont MA 02478-3633

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		04/29/11	0:00
Location Code:	AMERI-SPEC	Received by:	LB	05/05/11	17:00
Rush Request:	RUSH#	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBA28510
Phoenix ID: BA28515

Project ID: 1105-042

Client ID: HG-6 RAMP HALL

Parameter	Result	RL	Units	Date	Time	By	Reference
Mercury	0.43	0.06	mg/Kg	05/06/11		RS	SW-7471
Percent Solid	100	1	%	05/09/11		JL	E160.3
Mercury Digestion	Completed			05/06/11			SW7471

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

Phyllis Shiller, Laboratory Director
May 12, 2011

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

QA/QC Report

May 12, 2011

QA/QC Data

SDG I.D.: GBA28510

Parameter	Blank	Dup RPD	LCS %	LCSD %	LCS RPD	MS Rec %	MS Dup Rec %	RPD
QA/QC Batch 176420, QC Sample No: BA28482 (BA28510, BA28511, BA28512, BA28513, BA28514, BA28515)								
Mercury - Soil	BDL	NC	93.9	84.7	10.3	84.0	86.9	3.4

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria

Phyllis Shiller, Laboratory Director
May 12, 2011

Relinquished By: Ed Morgan Date/Time: 4/29/11 3:30 PM

Received By: R Roberts Date/Time: 5-3-11 1450

Relinquished By: Tom Date/Time: 5/5/11 1300

Received By: [illegible] Date/Time: 5-5-11 13:2[illegible]

AMERISCI

WWW.AMERISCI.COM

BULK CHAIN OF CUSTODY

AMERISCI BOSTON
8 SCHOOL STREET
WEYMOUTH, MA 02189
TOLL FREE: (888) 724-5221
PHONE: (781) 337-9334
FAX: (781) 337-7642

60

Company: Asbestos Consultants

Street Address:

City: State: Zip:

Phone: Fax:

Cell: 617-775-4688 Fax:

E-mail edmorgan22@verizon.net Verbal Results: Y / N

Results to:

Special Instructions or Comments: Test for Mercury

Project: Concord-Carlisle HS AMERISCI #: 1105-042

Proj Mgr: Proj #:

Proj Address: Concord, MA Proj State:

Analysis: __PLM; __Positive Stop; __TEM; __NY ELAP PLM/TEM w/ NOB Prep.

ASTM Dust __(Microvac) __(Wipe); __Qualitative; __Other (describe in comments)

Turnaround Time: 48 hr Material Type: ✓Bulk __Dust __Water

Sampled By: Date Sampled: 4/29/11

Lab ID	Field ID	Location	Sample Description (dust area)	Homogenous Area
	Hg-1	Library	Rubber Stair tread	28510
	" - 2	"	Ramp flooring	28511
	" - 3	Exit door 3	black floor mat	28512
	" - 4	Radio Room I-1	ramp flooring	28513
	" - 5	LL Gym	rubber floor	28514
	" - 6	" "	ramp - hall	28515

SBell 5/5/11 1700

PAGE ___ OF ___

CDW CONSULTANTS, INC.
CIVIL & ENVIRONMENTAL ENGINEERS

PRINCIPALS AND ASSOCIATE

Yee Cho, P.E., L.S.P.
Kathleen Campbell, P.E., L.S.P., LEED, AP
John Goodhall, P.E.

May 17, 2011

Ms. Lisa Pecora-Ryan
Office of Michael Rosenfeld, Inc.
543 Massachusetts Avenue
West Acton, MA 01720

RE: Hazardous Materials Summary Report Cost Memorandum
Concord-Carlisle High School, Concord, Massachusetts
CDW Project #1135.00

Dear Ms. Pecora-Ryan:

CDW Consultants, Inc. (CDW) is pleased to present this cost memorandum for the findings of the hazardous materials survey of the Concord-Carlisle High School, Concord, Massachusetts.

The associated costs for the asbestos abatement and other hazardous materials are presented in the table on the next page.

Please call if you have any questions or require additional information.

Very truly yours,

CDW CONSULTANTS, INC.

Susan Cahalan, P.G.
Project Manager

TABLE 1

Asbestos Containing Material & Other Hazardous Materials Costs

Description	Location	Result	Approximate Quantity	Unit Cost	Total Estimated Cost
Floor Tiles and Mastic – Both 9" x 9" and 12" x 12"	Throughout	2%-3% Chrysotile	70,000 SF	$4/SF	$280,000
Older Window Glaze in Café /Kitchen	Café	2% Chrysotile	8 Window Banks	$275/Each	$2,200
Window Glaze in Hall Outside Café	Hall Outside Café	3% Chrysotile	4 Window Banks	$275/Each	$1,100
Steel Column Caulk Interior	Throughout	3% Chrysotile	5,000 LF	$10/LF	$50,000
Glue Tab in Boiler Room	Boiler Room	20% Chrysotile	200 SF	$15/SF	$3,000
Window Glaze in Gym	Gym	2% Chrysotile	20 Windows	$275 Each	$5,500
Interior Window Glaze in Library	Library	2% Chrysotile	4 Window Banks	$275 Each	$1,100
Caulk on Block Wall	Throughout	3% Chrysotile	5,000 LF	$10/LF	$50,000
Door Frame Caulk	Interior Throughout	3% Chrysotile	3,750 LF	$10/LF	$37,500
Black Sink Coating	Throughout	5% Chrysotile	50 Each	$150/Each	$7,500
Interior Hall Window Glaze	Throughout	2%-5% Chrysotile	250 Each	$275/Each	$68,750
Hard Fittings	Throughout	20% Chrysotile	2,000 Each	$15/Each	$30,000
Black Material Behind Concrete Block on Exterior	Exterior	10% Chrysotile	75,000 SF	$5/SF	$375,000
Walk in Refrigerator and Freezer Coating	Assumed	--	4 Each	$5,000/Each	$20,000
Hidden Pipe Insulation	Assumed	--	2,000 LF	$15/LF	$30,000
Lab Hoods	Assumed	--	8 Each	$150/Each	$1,200
Fire Doors	Assumed	--	50 Each	$150/Each	$7,500
Subsurface Transite Pipe	Assumed	--	2,000 LF	$15/LF	$30,000
Hidden Transite Panels	Assumed	--	10,000 SF	$10/SF	$100,000
Dry Transformer Lining	Assumed	--	30 Each	$100/Each	$3,000
Fire Curtain	Visual	--	1 Each	$2,000/Each	$2,000

TABLE 1

Asbestos Containing Material & Other Hazardous Materials Costs (Continued)

Description	Location	Result	Approximate Quantity	Unit Cost	Total Estimated Cost
Roof Core	Auditorium Building	5% Chrysotile	20,000 SF	$7/SF	$140,000
Roof Curb	Above Door # 56	10% Chrysotile	20,000 SF	$7/SF	$140,000

LF = Linear Foot
SF = Square Foot

Table 2
Other Hazardous Materials

Description	Location	Result	Approximate Quantity	Unit Cost	Total Estimated Cost
Ballasts (PCBs)	Throughout	--	800	$5/ea	$4,000
Florescent Bulbs (Mercury)	Throughout	--	3,000	$2/ea	$6,000
Thermostats and Switches (Mercury)	Throughout	--	70	$20/ea	$1,400
Emergency Light Batteries (Lead)	Throughout	--	50	$20/ea	$1,000
Dry Type Transformers (Possible PCBs)	Throughout	--	30	$100/ea	$3,000
Chemicals in Sinks and Other	Throughout	--	One Drum	$500/ea	$500
Mercury Containing Rubber Floor	LL Gym	33.9 mg/kg	10,000 SF	$10/SF	$100,000
TOTAL ESTIMATED COST					**$1,501,250**

Engineering a Sustainable Future

June 6, 2011
File No. 84890.00
VIA E-MAIL

Lisa Pecora-Ryan, Architect, LEED® AP
OMR Architects
543 Massachusetts Avenue
West Acton, MA 01720
(978) 264-0160 x 235
lpecoraryan@omr-architects.com

Re: Preliminary Geotechnical Recommendations
Concord-Carlisle High School (Options 6R1 and 12)
Concord, Massachusetts
DSA Project No. 11017

Dear Ms. Pecora-Ryan

This report presents Nobis Engineering, Inc.'s (Nobis) preliminary geotechnical engineering recommendations for the Feasibility/Schematic Design Phase of the Concord-Carlisle High School in Concord, Massachusetts. This report is subject to the attached limitations.

We understand that the following two options are currently being considered.

1. Addition/Renovation (Option 6R1): The addition will be a one-story building and have a footprint of approximately 150,000 square feet and a finished floor elevation of 166. The lower gym located on the west side would be at approximately El. 150. This option will include renovations to the north side of the school with an addition along the southern side of the existing school.

2. New School Building (Option 12): A 4-story building with a footprint of approximately 88,500 square feet. The lowest level will be at approximately El. 148. This proposed school is location northwest of the existing school on the slope adjacent to the lower lacrosse and baseball fields.

SITE CONDITIONS

The site consists of the existing school that is at approximately El. 166 with a lower section at El. 155 at the west end. The existing grades general slope down from the school to the north and west down to approximately El. 136; up to the south to approximately El. 200 and is relatively flat to the east. There are sports field to the west of the school on the lower fields and fields to the south west up on the hill.

SUBSURFACE EXPLORATIONS

New Hampshire Boring, Inc. (NHB) of Brockton, Massachusetts drilled four (4) test borings, designated B-101 through B-104. The test borings were observed and logged by Nobis personnel. The borings were drilled to depths of approximately 32 to 47 feet below the ground surface. Generally, the borings were terminated in a dense sand, very dense glacial till or on probable bedrock.

Previously, The Geotechnical Group drilled four borings (B1 through B4) at the Site in June 2005 and Engineering Services drilled 23 borings at the site in May 1958. The location of these previous explorations and the accuracy of those logs have not been verified by Nobis.

Logs for the test borings are attached. The approximate locations of the test borings are shown on Figure 1, Boring Location Plan.

One sample of the sand with an N-value of 10 was tested for grain size distribution analyses. The laboratory report is attached.

SUBSURFACE CONDITIONS

Addition/Renovation (Option 6R1)

Recent borings (B-103 and B-104) encountered 25 feet of sand over till or 25 feet of sand over 10 feet of fine sand and silt over more than 12 feet of sand. The 1958 borings were generally drilled to shallow depths and extended 1 to 9 feet below proposed footing levels. These 1958 borings generally encountered medium dense sand. N-values in the sand generally ranged between 10 and 30 in the upper 10 feet and more than 30 at greater depths.

New School Building (Option 12)

Borings (B-101 and B-102) drilled on the lower fields generally encountered 6 inches of topsoil at the surface overlying approximately 15 to 26 feet of medium dense to dense sand; over approximately 10 feet of stiff to hard, varved, silt and clay; over 7 feet of glacial till; over probable bedrock. Boring B-103 conducted on the top of the slope near the existing school encountered 25 feet of sand; over more than 7 feet of glacial till.

The sand generally consisted of a stratified medium to fine sand with 10 to 20% silt with occasionally 6 to 12 inch thick layers containing approximately 10 to 30% fine gravel. The N-values typically range between 20 and 50, however an N-value of 10 was encountered in B-102 at a depth of 16 feet.

The silt and clay layer consists of alternating thin varves of silt, and silty clay. These varves were deposited seasonally as lake bottom deposit in glacial Lake Concord. The silt varves generally vary between 1/8 inch to 1/4 inch in thickness and the silty clay layer were observed to generally be 1/16 to 1/8 of an inch thick.

The glacial till generally consisted of very dense mixture of sand, silt, and gravel with some boulders.

Groundwater

Groundwater was encountered approximately 3 feet below grades at the lower fields and 12 to 18 feet below grades near the existing school. Groundwater will fluctuate with the season and the amount of precipitation, and may be different at the time of construction. Groundwater levels measured during drilling may not reflect stabilized water levels.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

The following paragraphs present: our preliminary geotechnical engineering evaluation of the subsurface conditions relative to the proposed site development; our preliminary recommendations related to design of building foundations, the lowest floor slab, foundation retaining walls, underdrains; and preliminary earthwork and subgrade preparation procedures.

Primary Geotechnical Issues

Addition/Renovation (Option 6R1)

Borings for the addition encountered 25 to more than 47 feet of medium dense to dense sand over very dense sand and gravel. Based on the limited subsurface explorations conducted at the site we are not aware of significant geotechnical issues at this time for this option.

New School Building Location (Option 12)

In summary this building will require up to approximately 12 feet of fill on the north end of the building and a 4 to 6 foot cut on the south end. The northern half of the building is underlain by approximately 15 to 26 feet of sand, over approximately 8 feet of varved silt and clay, over approximately 7 feet of glacial till, over bedrock. On the southern side of the building dense sand over glacial till was encountered.

These varved silts and clays are compressible and will settle up to 7 inches due to the 12 feet of raise in grade planned for approximately half of the building foot print and approximately 2 inch from the building loads for a total of 9 inches of settlement. Approximately 7 inches will occur over first year while an additional 2 inches would occur over the next 50 years. We recommend a preload be placed for approximately 4 to 6 months to induce these settlements prior to construction of the building. Preliminary calculations based on limited information indicate that placing a preload for 4 to 6 months with a 6 foot surcharge load would reduce post construction settlements to less than an 1 inch. Once the building loads, finished floor elevations have been finalized and additional sampling and testing of the clay has been complete these preliminary calculations and recommendations should be revised and updated. Future analysis may indicate that the settlements from the proposed construction are more or less than the estimates above.

Foundation Design (Both Options)

- We recommend that the building be supported by shallow spread footings bearing on the natural sand or compacted structural fill placed above the natural sands. Spread footings for both locations should be designed using a maximum net allowable bearing pressure of 2 tsf for footings bearing on these materials.

- For frost protection, exterior footings exposed to freezing temperatures should bear at least 4 feet below the adjacent exterior grade. Interior footings, in areas not exposed to freezing temperatures, should be at least 18 inches below finished floor grade, while also providing at least 6 inches of soil cushion between the bottom of the slab and the top of the footings.

- Total settlement for both building foundation options is expected to be less than 1 inch after the new school location has been preload as discussed above. Differential settlement between interior columns is estimated to be less than 3/4-inch.

- Based on the groundwater elevations measured in the borings, perimeter and slab underdrains are not required.

- Floor slabs should be designed as slabs-on-grade bearing on at least 6 inches of material that meets the material specifications for Gravel Fill provided below. A modulus of subgrade reaction of at least 150 pounds per cubic inch (pci) should be achieved.

Subgrade Preparation Procedures for Building Areas

It is recommended that building pad areas be prepared as follows:

- The building should be cleared of vegetation and grubbed and existing topsoil, asphalt and concrete should be removed.

- After surface materials have been removed and existing utilities removed or abandoned from within the zone of influence of building areas, subgrades should be densified by intensive Surface Compaction to ensure that the existing fill materials (where encountered) have the required consistency. Surface Compaction should consist of at least 4 passes of a smooth-drum vibratory roller (minimum 20,000 lbs.) under the observation of a Geotechnical Engineer, or his/her representative. Soft or loose zones identified during Surface Compaction should be replaced with compacted Granular Fill or Gravel Fill, as necessary, and as required by the Geotechnical Engineer.

- The zone of influence is defined as that area within a line projecting outward and downward from the outside edges of the exterior footings at a one horizontal to one vertical (1H:1V) slope.

- Gravel Fill to be used as the 6 inch layer beneath the floor slab-on-grade and as backfill behind the site reinforced concrete retaining walls and other areas as appropriate shall consist of hard, inert, durable gravel and sand. It shall be free from ice and snow, roots, surface coatings, sod, loam, clay, rubbish, and other deleterious or organic matter, and shall conform to the following gradation requirements:

Sieve Size	Percent Passing by Weight
3-inch	100
½-inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-10

- Granular Fill to be used for general raises in grade in proposed building and pavement areas shall be free from ice, snow, roots, surface coatings, sod, loam, clay, rubbish, and other deleterious matter, and shall be well-graded within the following gradation requirements:

Sieve Size	Percent Passing by Weight
4-inch	100
1-inch	90-100
No. 10	25-95
No. 40	15-75
No. 200	0-12

- On-Site Fill to be re-used within building and paved areas shall consist of natural inorganic soil free of ice, snow, roots, surface coatings, sod, loam, clay, debris and other deleterious material and shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
6-inch	100
No. 4	50-90
No. 40	10-35
No. 200	0-20

- Excavations will encounter fill and glacial till that may contain significant amounts of silt. These soils will be sensitive to disturbance when wet. Excavations to subgrade in these areas should be performed in such a way as to limit the potential for disturbance to the subgrade. Where encountered the silty subgrade surface should be covered with a minimum of 6-inches of Gravel Fill to protect the material from disturbance and from becoming wet during construction activities.

- Fill material to be placed to raise the grade within the zone of influence of building pad areas should consist of Gravel Fill, Granular Fill, or On-Site Fill that meets the gradation

requirements above. Fill within the building footprint should be placed in loose lifts not to exceed 12 inches thick, and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557, Method C (Modified Proctor).

Seismic Design

It is our opinion that the soils encountered during drilling at the Site are not susceptible to liquefaction as defined in Section 1806.4 of the Massachusetts State Building Code. We recommend using the following design parameters as defined by the Commonwealth of Massachusetts State Building Code (MSBC) and, where applicable, the International Building Code (IBC):

- Site Class: D (IBC Section 1613.5.5);
- MCE spectral response accelerations: S_s = 0.29g and S_1 = 0.07g (MSBC Table 1604.11)
- Site Coefficients: F_a = 1.6 and F_v = 2.4 (IBC Table 1613.5.3(1) and 1613.5.3(2))
- Seismic design parameters: S_{MS} = 0.464 and S_{M1} = 0.168 (IBC 2009 Equation 16-36 and 16-37); S_{DS} = 0.309 and S_{D1} = 0.112 (IBC Equation 16-38 and 16-39).

Lateral Earth Pressures for Below Grade Walls

Foundation walls that will be braced at the top by floor slabs should be designed for a lateral earth pressure based on an equivalent fluid unit weight of soil of 55 pounds per cubic foot (pcf). Unrestrained site retaining walls (active condition) should be designed for a lateral earth pressure based on an equivalent fluid unit weight of soil of 35 pcf for slope angles behind the wall that are relatively level. For walls with slopes behind the wall of 4H:1V use an equivalent fluid unit weight of soil of 40 pcf; and for walls with slopes of 3H:1V use an equivalent fluid unit weight of soil of 45 pcf.

A sliding friction coefficient of 0.6 is recommended for the wall footing bearing on fill and on the natural sand. It should be assumed that there will be no passive resistance at the front of the wall for this analysis.

The walls should be designed assuming that hydrostatic water pressure will not be applied to the wall and constructed to drain.

Temporary Dewatering

Groundwater may be encountered in excavations. Temporary excavation dewatering should be performed so that the work conducted is completed in the dry. It is likely that dewatering may be accomplished by pumping from filtered sumps installed in low points of the excavation. Discharge water should be managed in accordance with local, state and federal government requirements.

Re-Use of On-site Soil

We recommend that the soils excavated at the site be reused as On-site Fill as described above in the *Subgrade Preparation Procedures for Building Areas* section. Soil with with more than

20% silt may be encountered. We recommend those materials be reused in landscape areas or mixed with other soil so that the fines are less than 20%. These material with fines up to 20% will be difficult to reuse if wet. We recommend that these materials be kept dry during construction.

Thank you for the opportunity to be of service. We look forward to providing you with these geotechnical services. Should you require additional information, please contact us.

Very truly yours,

Nobis Engineering, Inc.

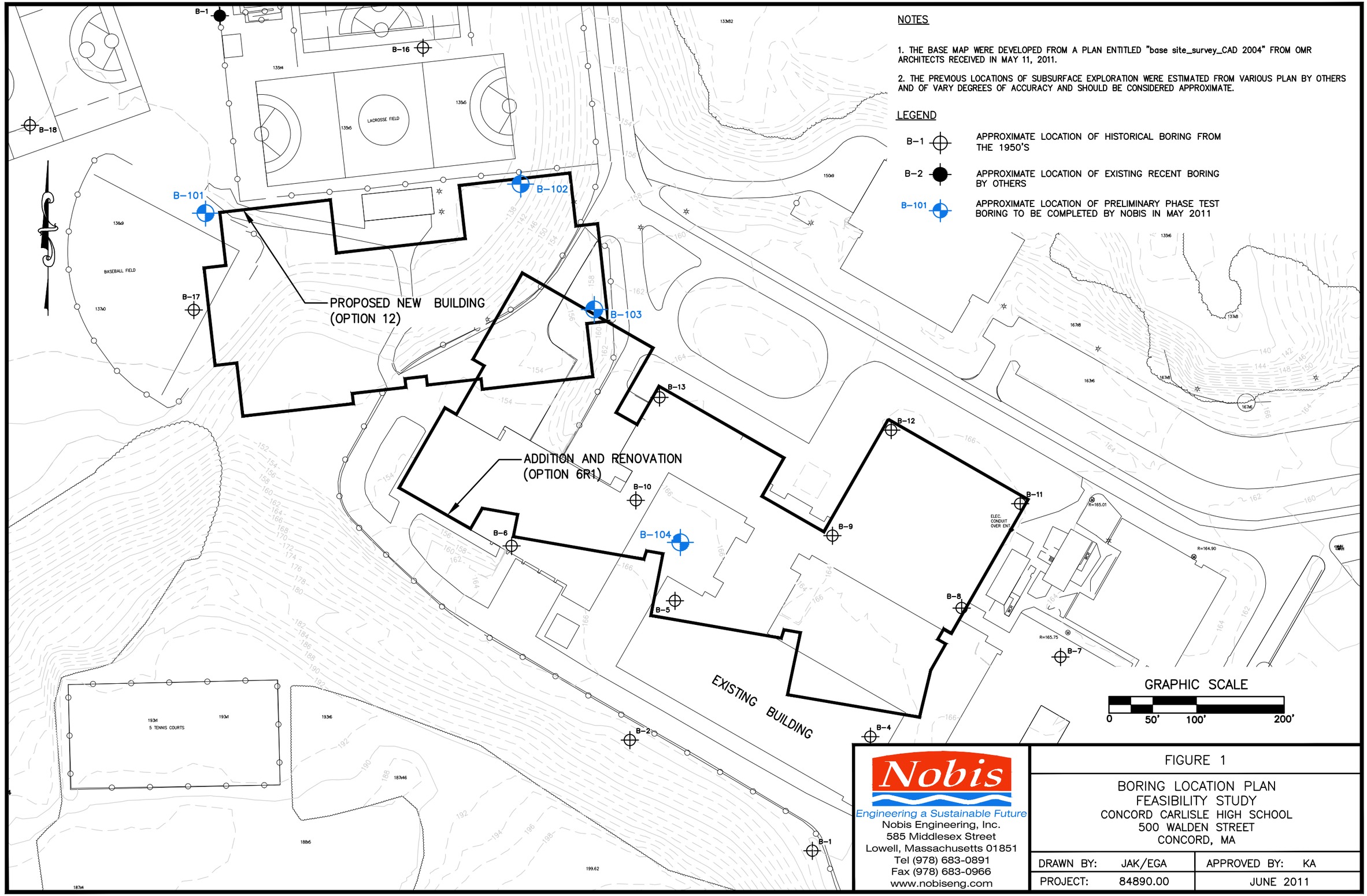
Kurtis Amidon, P.E.
Senior Project Manager

Kurt Jelinek, P.E.
Senior Project Manager

Attachments:

- Figure 1, Preliminary Boring Exploration Plan
- Recent Exploration Logs by Nobis
- Previous Boring Logs by others
- Laboratory Testing
- Limitations

FIGURE 1



NOTES

1. THE BASE MAP WERE DEVELOPED FROM A PLAN ENTITLED "base site_survey_CAD 2004" FROM OMR ARCHITECTS RECEIVED IN MAY 11, 2011.

2. THE PREVIOUS LOCATIONS OF SUBSURFACE EXPLORATION WERE ESTIMATED FROM VARIOUS PLAN BY OTHERS AND OF VARY DEGREES OF ACCURACY AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND

B-1 — APPROXIMATE LOCATION OF HISTORICAL BORING FROM THE 1950'S

B-2 — APPROXIMATE LOCATION OF EXISTING RECENT BORING BY OTHERS

B-101 — APPROXIMATE LOCATION OF PRELIMINARY PHASE TEST BORING TO BE COMPLETED BY NOBIS IN MAY 2011

Nobis
Engineering a Sustainable Future
Nobis Engineering, Inc.
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Lowell, Massachusetts 01851
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www.nobiseng.com

FIGURE 1

BORING LOCATION PLAN
FEASIBILITY STUDY
CONCORD CARLISLE HIGH SCHOOL
500 WALDEN STREET
CONCORD, MA

DRAWN BY:	JAK/EGA	APPROVED BY:	KA
PROJECT:	84890.00		JUNE 2011

C:\Active\84890 Concord-Carlisle HS\CAD\Location Plan.dwg

RECENT EXPLORATION LOGS BY NOBIS

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-101**
Boring Location: Softball Field, 1st base line
Checked by: K. Amidon
Date Start: May 13, 2011
Date Finish: May 13, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~136.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/13/11	15:30	3	10.0	10.0	4 hrs

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	20	0-2	6				S-1: Medium dense, brown/orange, fine to medium SAND, some Silt, moist Weed control fabric at 1' bgs	
1				8					
				11					
2				13					
3					▼				
4									
5									
	S-2	20	5-7	15				S-2: Dense, brown, fine to medium SAND, little Silt, wet	
6				18					
				23					
7				23					
8							SAND		
9									
10									
	S-3	15	10-12	6				S-3: Medium dense, brown, medium to coarse SAND, trace Silt, trace Gravel, wet	
11				8					
				11					
12				12					
13									
14									
15									
	S-4	15	15-17	5			121.0	S-4a: (4") Medium dense, medium to coarse SAND, trace Silt, trace Gravel, wet	
16				6				S-4b: (11") Stiff, gray, SILT & CLAY (varves 1/2" to 3/4" thick) varved with gray, CLAY & SILT (varves 1/2" thick), wet	
				8					
17				9					
18									
19									
20							SILTY CLAY		
	S-5	20	20-22	10				S-5: Very stiff, gray, CLAY & SILT (varves 1/8" thick) varved with dark gray, Silty CLAY (layers 1/16" thick), wet	
21				13					
				13					
22				16					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-101**
Boring Location: Softball Field, 1st base line
Checked by: K. Amidon
Date Start: May 13, 2011
Date Finish: May 13, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~136.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/13/11	15:30	3	10.0	10.0	4 hrs

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
23									
							113.0		
24									
25									
	S-6	22	25-27	35				S-6: Dense, gray, fine to coarse SAND, some Silt, little Gravel, moist	
26				20			GLACIAL TILL		
				19					
27				21					
28									
29									
30									
	S-7	8	30-31.2	21				S-7: Very dense, Gray, fine to coarse Sand, some Silt, little Gravel, moist	
31				70				Rock fragment stuck in spoon nose	
				100/2"			105.3		
32							BEDROCK 104.8	Roller Bit advancement difficult from 31' to 31.3', probable weathered bedrock Roller Bit advancement difficult from 31.3' to 31.7', black flakes in drill wash, probable bedrock	
33								Exploration terminated at 31.7' after roller bit advancement 6" into bedrock	
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
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R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-102**
Boring Location: East End, Football Field
Checked by: K. Amidon
Date Start: May 13, 2011
Date Finish: May 13, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~137.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/13/11	N/A	7			< 5 min

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	24	0-2	2			TOPSOIL	S-1a (18"): Dark brown, medium dense, fine to medium SAND, some Organic Silt, moist	
1				6					
				9			136.0		
2				12				S-1b (6"): Medium dense, orange/brown, fine to coarse SAND, little Silt, trace Gravel, moist	
3									
4									
5									
	S-2	20	5-7	9				S-2: Dense, light brown, fine to medium SAND, trace Silt, moist	
6				13					
				21					
7				15	▼				
8									
9									
10									
	S-3	20	10-12	8				S-3a (3"): Medium dense, brown, coarse SAND, trace Silt, wet	
11				12				S-3b (16"): Medium dense, brown, fine to medium SAND, trace Silt, trace Gravel, wet	
				6					
12				7					
13							SAND		
14									
15									
	S-4	22	15-17	4				S-4: Medium dense, light brown, fine to medium SAND, little Silt, stratified oxidated layers, wet (14% fines, see note 1)	1
16				4					
				6					
17				6					
18									
19									
20									
	S-5	19	20-22	9				S-5: Medium dense, orange/brown, fine to coarse SAND, little Gravel, trace Silt, oxidation, wet	
21				16					
				18					
22				36					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:
1) Based on laboratory testing.

Nobis
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PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-102**
Boring Location: East End, Football Field
Checked by: K. Amidon
Date Start: May 13, 2011
Date Finish: May 13, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~137.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/13/11	N/A	7			< 5 min

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
23							SAND		
24									
25									
	S-6	20	25-27	17				S-6a: (8") Medium dense, orange/brown, fine to coarse SAND, little Gravel, trace Silt, oxidation, wet	
26				18			111.5		
				15				S-6b: (12") Hard, gray, CLAY & SILT (varves 1/2" thick) varved with dark gray Silty CLAY (layers 1/16" thick), occasional 1/32" fine Sand parting, wet	
27				16					
28									
29									
30							SILTY CLAY		
	S-7	23	30-32	12				S-7: Hard, gray, Silty CLAY,occasional 1/32" fine sand parting, wet	
31				16					
				18					
32				19					
33									
34							103.5		
35									
	S-8	6	35-37	33				S-8: Very dense, gray, fine to coarse SAND, some Silt, some Gravel, wet	
36				30					
				45					
37				41					
38							GLACIAL TILL		
39									
40									
	S-9	6	40-41	24				S-9: Very dense, gray, fine to coarse SAND, wet	
41				25			96.5		
				100/0"			BEDROCK 95.5	Roller bit 12" advanced into probable bedrock	
42									
43								Exploration terminated at 42' due to roller bit refusal	
44									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
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PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-103**
Boring Location: Courtyard Area
Checked by: K. Amidon
Date Start: May 16, 2011
Date Finish: May 16, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~158.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/16/11	13:54	12	12.0		During Drilling

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	15	0-2	8			TOPSOIL 158.0	S-1a (6"): Medium dense, dark brown, fine to medium SAND, some Organic Silt, moist	
1				11				S-1b (9"): Medium dense, brown/orange, fine to coarse SAND, trace Silt, trace Gravel, moist	
				7					
2				4					
3									
4									
5									
	S-2	12	5-7	16				S-2: Dense, brown/orange, fine to coarse SAND, little Gravel, little Silt, moist	
6				14					
				17					
7				20					
8									
9									
10							SAND		
	S-3	18	10-12	22				S-3: Very dense, orange.light brown, fine SAND, some Silt, stratified oxidation layers, wet GW probable at 12'	
11				24					
				31					
12				42	▼				
13									
14									
15									
	S-4	16	15-17	12				S-4: Dense, orange/light brown, fine to medium SAND, trace Silt, stratified oxidation layers, wet	
16				20					
				24					
17				26					
18									
19									
20									
	S-5	18	20-22	17				S-5: Dense, orange/brown, fine to medium SAND, little Silt, stratified oxidation layers, wet	
21				20					
				25					
22				27					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-103**
Boring Location: Courtyard Area
Checked by: K. Amidon
Date Start: May 16, 2011
Date Finish: May 16, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~158.5 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/16/11	13:54	12	12.0		During Drilling

Depth (ft.)	Sample Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	Sample Description	Remarks
23							SAND		
24									
25							133.5		
	S-6	12	25-27	85				S-6: Very dense, orange/brown, fine to coarse SAND, some Silt, little Gravel, trace rock fragments, moist	
26				56				Roller through cobble/boulder from 27'-27.5'	
				50					
27				71					
28									
29							GLACIAL TILL		
30									
	S-7	4	30-32	36				S-7: Very dense, coarse SAND, trace Silt, moist	
31				47				pushed rock in split spoon	
				51					
32				49			126.5		
33								Exploration terminated at 32'	
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-104**
Boring Location: Grass Island North of B-202, West Building
Checked by: K. Amidon
Date Start: May 16, 2011
Date Finish: May 16, 2011

Contractor:	New Hampshire Boring, Inc.	Rig Type / Model:	B-53 Mobile Track	Ground Surface Elev.:	~166 ft.
Driller:	James	Hammer Type:	Safety Hammer	Top-of-Riser Elev.:	
Nobis Rep.:	C. Rousseau	Hammer Hoist:	Rope & Cathead	Datum:	

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/16/11	16:00	18	25.0	25.0	3.5 hrs

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	21	0-2	9			TOPSOIL 165.5	S-1a (6"): Dense, dark brown, ORGANIC SILT, little fine Sand, little root fibers, moist	
1				15				S-1b (15"): Dense, orange, fine to coarse SAND, some Gravel, trace Silt, dry	
				18					
2				19					
3									
4									
5									
	S-2	15	5-7	15				S-2: Medium dense, light brown, fine to coarse SAND, trace Silt, moist	
6				14					
				15					
7				17					
8									
9									
10							SAND		
	S-3	16	10-12	18				S-3: Dense, orange, fine to medium SAND, little Silt, stratified oxidation layers, wet	
11				15					
				18					
12				19					
13									
14									
15									
	S-4	14	15-17	20				S-4: Very dense, orange/brown, fine to coarse SAND, litte Silt, litte Gravel, oxidation, wet	1
16				24					
				30					
17				25					
18					▼				
19									
20									
	S-5	15	20-22	22				S-5: Dense, orange/brown, fine to medium SAND, trace Silt, <0.5 inch lense of Silty CLAY layer at ~21', wet	
21				20					
				23					
22				18					
23									
24							SAND 142.0		

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:
1) Installed temporary well with screened pvc from 10' to 15'.

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.00

Boring No:. **B-104**
Boring Location: Grass Island North of B-202, West Building
Checked by: K. Amidon
Date Start: May 16, 2011
Date Finish: May 16, 2011

Contractor: New Hampshire Boring, Inc.
Driller: James
Nobis Rep.: C. Rousseau

Rig Type / Model: B-53 Mobile Track
Hammer Type: Safety Hammer
Hammer Hoist: Rope & Cathead

Ground Surface Elev.: ~166 ft.
Top-of-Riser Elev.:
Datum:

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	2 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 05/16/11	16:00	18	25.0	25.0	3.5 hrs

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
25									
	S-6	18	25-27	15				S-6: Dense, orange/brown, SILT, some fine to medium Sand, 0.5 inch lense of Silty CLAY layer at ~26', wet	
26				13					
				17					
27				18					
28									
29									
30							SAND AND SILT		
	S-7	22	30-32	18				S-7: Dense, light brown, fine SAND, some Silt, stratified oxidation layers, wet	
31				20					
				27					
32				22					
33									
34									
35							131.0		
	S-8	23	35-37	24				S-8: Dense, light brown, fine to medium SAND, litte Silt, stratified oxidation layers, wet	
36				25					
				23					
37				27					
38									
39									
40							SAND		
	S-9	13	40-42	21				S-9: Dense, gray, fine to coarse SAND, trace Silt, red oxidation, wet	
41				23					
				24					
42				27					
43									
44									
45									
	S-10	23	45-47	18				S-10: Dense, light brown, fine to medium SAND, litte Silt, stratified oxidation layers, wet	
46				20			SAND		
				22					
47				19			119.0		
48								Exploration terminated at 47'	

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

PREVIOUS BORING LOGS BY OTHERS

THE GEOTECHNICAL GROUP, INC

Test Boring Log

PROJECT		Boring No.	B-1
Concord-Carlisle Regional High School Concord, MA		Sheet	1 of 1
		File No.	W1912
		Review by	James Handanyan

Boring By	Subsurface Drilling	Boring Location	See Exploration Location Plan
Foreman	John	Ground Elev'n	NA
TGTG Observer	Jason Mammone	Date Start - Fin	6/15/05

Sampling Protocol

Unless otherwise noted, borings were accomplished using 4" inch inside diameter hollow stem augers. Samples were recovered using a 2-inch O.D. split spoon sampler, driven by blows of a 140 Lb. safety hammer falling 30 inches.

Ground Water Readings (See Notes)

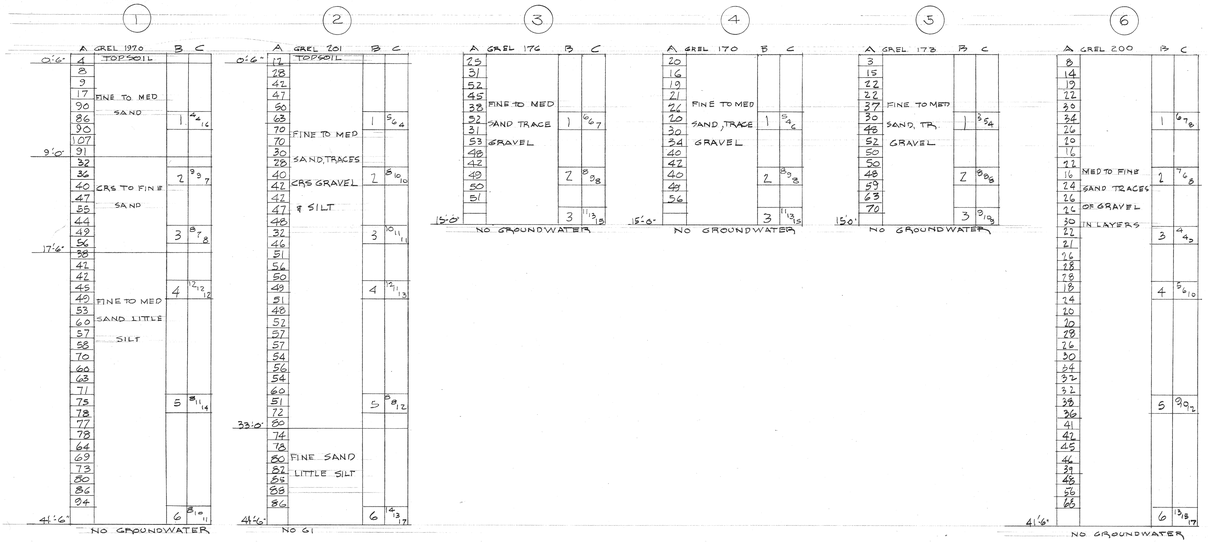
Date	Time	Depth to Bottom	Depth to Water	Rem
6/15	Drilling	17±'	5±'	1

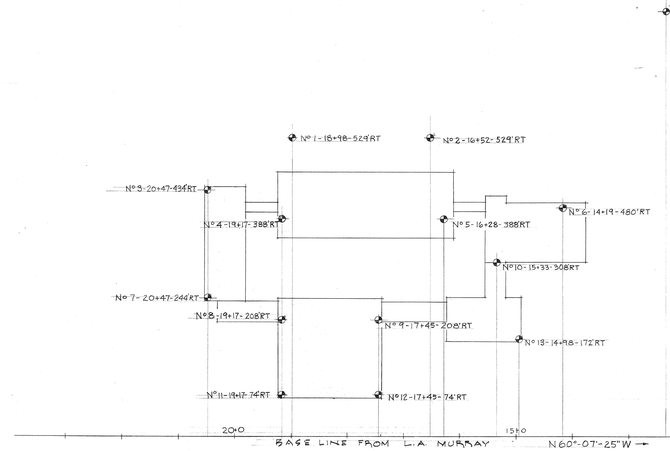
Sample Data

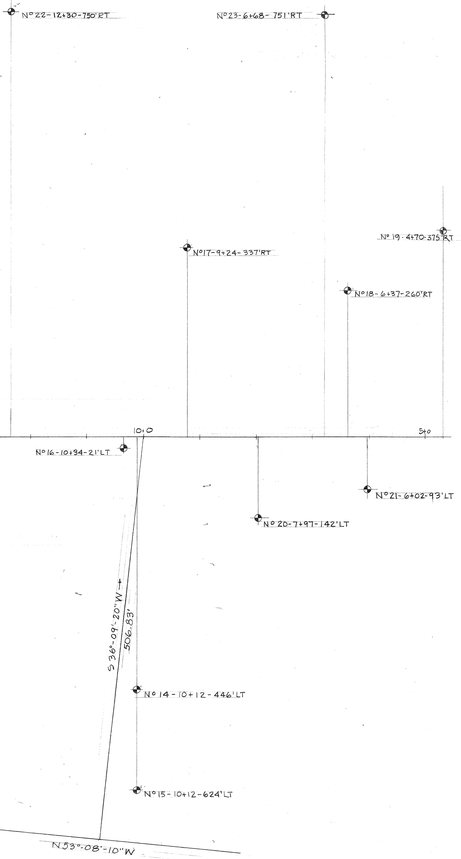
No	Depth (ft)	Blows per 6 inch	Pen	Rec	Rem
S-1	0-0.5	1	6	6	
S-1A	0.5-2	4-7-12	18	10	
S-2	2-4	10-13-10-9	24	18	
					1
S-3	5-7	8-18-15-14	24	18	
S-4	7-9	10-14-12-10	24	20	
S-5	10-12	3-7-10-12	24	12	2
S-6	15-17	7-7-7-8	24	12	3

Strata Change	Sample Description
Topsoil Fill 0.5	Dry, dark brown, fine SAND and SILT, little (+) Organics.
Sand	Medium dense, dry, orange-tan, fine to medium SAND, trace (+) coarse Gravel, trace Silt. Medium dense, dry, orange-tan, fine to medium SAND, little (-) fine to coarse Gravel, trace Silt. Dense, wet, grayish-brown, fine to medium SAND, little fine to coarse Gravel, trace Silt. Medium dense, wet, grayish-brown, fine to medium SAND, trace (+) fine Gravel, trace Silt Medium dense, wet, grayish-brown, fine to coarse SAND, little (+) fine to coarse Gravel, trace (-) Silt. Medium dense, wet, brown, fine to coarse SAND, little fine to coarse Gravel, trace (-) Silt.
17.0	Bottom of boring at 17.0± feet.

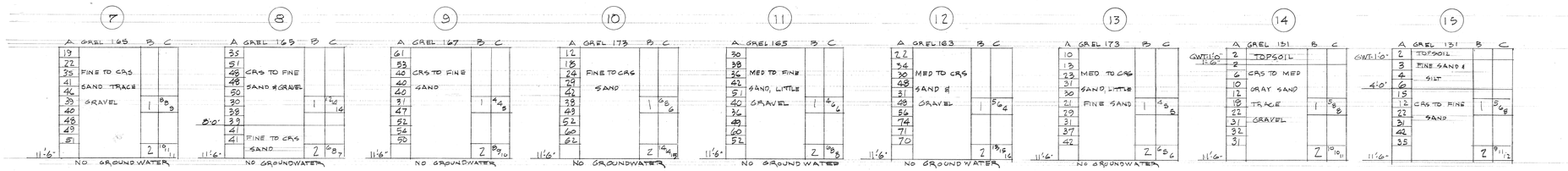
Remarks:
1. Groundwater was encountered at about 5± feet at the time of the boring.
2. About 6± inches of "blow-in" encountered within the augers.
3. About 12± inches of "blow-in" encountered within the augers.

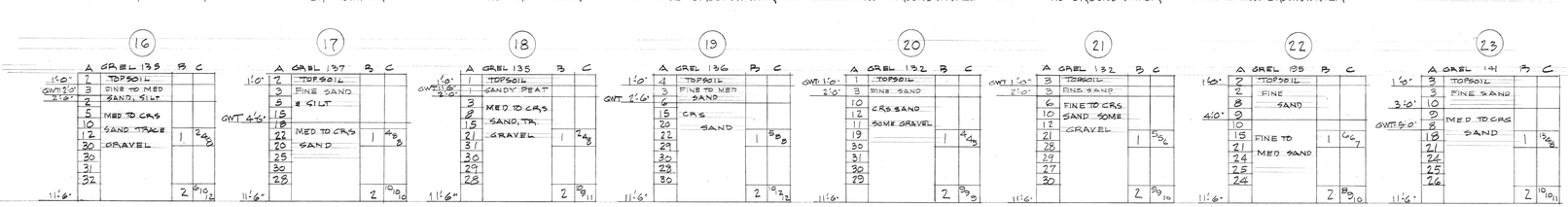






BORING LOCATION PLAN
SCALE: 1"=100'





BORING NOTES

1. COL "A": BLOWS / FT ON 2½" CASING
2. COL "B": SAMPLE N°
3. COL "C": BLOWS / 6" ON 2" O.D. SAMPLER
4. HAMMERS: CASING, 300#, 24" FALL; SAMPLER, 140#, 30" FALL
5. GWT = GROUNDWATER TABLE
6. BORINGS TAKEN MAY 1958 BY ENGINEERING SERVICES, INC.

A. B. ONDERDONK
CONSULTING ENGINEER
ROBERT P. LATHROP, Associate
2512 MAIN STREET
GLASTONBURY, CONN.

CONCORD - CARLISLE HIGH SCHOOL
CONCORD, MASSACHUSETTS

WARREN H. ASHLEY, A.I.A., ARCHITECT
740 NORTH MAIN STREET, WEST HARTFORD, CONNECTICUT

BORING PLAN

SCALE 1" = 100'
DATE July 7 1958

SASAKI, WALKER & ASSOCIATES, INC. SITE PLANNERS
FRED S. DUBIN ASSOCIATES MECHANICAL ENGINEERS
ARTHUR BRUCE ONDERDONK STRUCTURAL ENGINEER
ENGELHARDT, ENGELHARDT, LEGGETT & CORNELL EDUCATIONAL CONSULTANTS

DRAWN C.W.W.
CHECKED R.P.L.
APPROVED A.B.O.

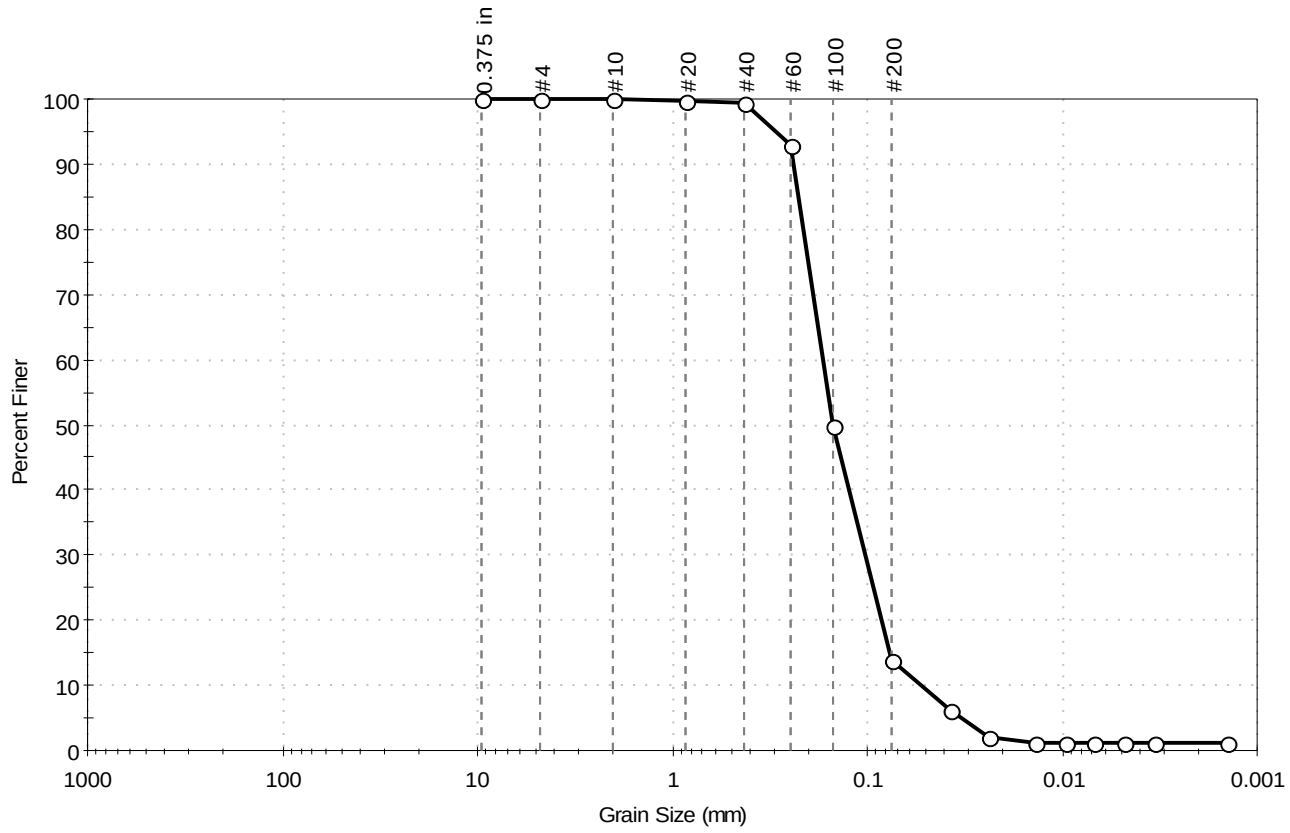
SHEET NO.
35
S-1

LABORATORY TESTING

Client:	Nobis Engineering, Inc.				
Project:	Concord Carlise H.S.				
Location:	Concord, MA			Project No:	GTX-10809
Boring ID:	B-202	Sample Type:	jar	Tested By:	jbr
Sample ID:	---	Test Date:	05/19/11	Checked By:	jdt
Depth :	15-17 ft	Test Id:	208583		

Test Comment: ---
Sample Description: Moist, olive silty sand
Sample Comment: ---

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.1	86.1	13.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	93		
#100	0.15	50		
#200	0.075	14		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0378	6		
---	0.0241	2		
---	0.0138	1		
---	0.0097	1		
---	0.0069	1		
---	0.0049	1		
---	0.0034	1		
---	0.0014	1		

Coefficients

D_{85} = 0.2276 mm D_{30} = 0.1024 mm
D_{60} = 0.1692 mm D_{15} = 0.0768 mm
D_{50} = 0.1502 mm D_{10} = 0.0532 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

printed 5/25/2011 10:12:02 AM

LIMITATIONS

LIMITATIONS

Subsurface Conditions

1) The analyses and conclusions in this report are based in part upon data obtained from subsurface explorations completed by others. Nobis has not verified the accuracy of the test boring logs. The nature and extent of variations between these explorations may not become evident until further exploration. If variations appear evident, it will be necessary to re-evaluate the conclusions and recommendations of this report.

2) The generalized soil conditions described in the text are intended to convey trends in subsurface conditions and have been developed from widely spaced test borings. Actual soil conditions are likely to vary. Refer to the test boring logs for more specific information.

3) Water level readings have been made in the test borings at the times and under the conditions stated on the boring logs. Fluctuations in the level of groundwater will occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.

Review

1) In the event that any changes in the nature, design, or location of the proposed project are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by Nobis Engineering, Inc. It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Use of Report

1) This report provides the details of the preliminary geotechnical recommendations prepared for the Concord-Carlisle High School (Options 6R1 and 12), in Concord, Massachusetts. This work has been completed in accordance with generally accepted geotechnical engineering practices and is for design purposes. Contractors reviewing this report should do so with the understanding that its scope is limited to design considerations only. No other warranty, expressed or implied, is made.

Engineering a Sustainable Future

June 16, 2011
File No. 84890.01
VIA E-MAIL

Lisa Pecora-Ryan, Architect, LEED® AP
OMR Architects
543 Massachusetts Avenue
West Acton, MA 01720
(978) 264-0160 x 235
lpecoraryan@omr-architects.com

Re: Option 14 Preliminary Borings
Concord-Carlisle High School
Concord, Massachusetts
DSA Project No. 11017

Dear Ms. Pecora-Ryan

This letter presents Nobis Engineering, Inc.'s (Nobis) preliminary boring information collected for Option 14 as part of the Feasibility/Schematic Design Phase of the Concord-Carlisle High School in Concord, Massachusetts.

We understand that Option 14 includes a 4-story building with a footprint of approximately 88,500 square feet with the lowest level at approximately El. 170. This proposed school option is location south of the existing school on the hill. The proposed building would be 2 to 29 feet below existing grades.

TEST BORINGS

New Hampshire Boring, Inc. (NHB) of Brockton, Massachusetts drilled two (2) test borings, designated B-201 through B-202. The test borings were observed and logged by Nobis personnel. Previously, The Geotechnical Group drilled boring B3 in June 2005 and Engineering Services drilled Borings B-1 and B-2 in 1958 near the Option 14 location. The location of these previous explorations and the accuracy of those logs have not been verified by Nobis. Test boring logs are attached. The approximate locations of the test borings are shown on Figure 1, Boring Location Plan with is attached.

SUBSURFACE CONDITIONS

Borings B-201 and B-202 were drilled to 62 and 77 feet below grade and encountered approximately 47 feet of medium dense to dense sand, over 7 to 9 feet of a very stiff to hard varved silt and clay, over 8 to 9 feet of dense sand, over a very stiff to hard varved silt and clay. Boring B-3 was drilled to 27 feet and encountered 25 feet of dense sand and gravel over more than 7 feet of medium dense fine sand. B-1 and B-2 were drilled to 41.5 feet and encountered

more than approximately 41.5 feet of sand with varying amounts of silt. The borings by others were terminated above or near proposed footing levels.

Groundwater was encountered approximately 30 to 47 feet below grade between approximate El. 140 and 142 in B-201 and B-202. Groundwater was not encountered in the previous borings in this area. Groundwater will fluctuate with the season and the amount of precipitation, and may be different at the time of construction. Groundwater levels measured during drilling may not reflect stabilized water levels.

PRELIMINARY GEOTECHNICAL COMMENTS

This building will require a cut of approximately 2 to 29 feet. More than 20 feet of very stiff to hard varved silt and clay was encountered more than 20 feet below the proposed building location. We anticipate that the increase of stress on the clay layers will be minor due to the planned cuts and significant settlements are not anticipated. Additional borings and an analysis are needed to better define the estimated settlement from the building loads.

We recommend that the building be supported by shallow spread footings bearing on the natural sand. Spread footings should be designed using a maximum net allowable bearing pressure of 2 tsf for footings bearing on these materials.

Based on the groundwater elevations measured in the borings, perimeter and slab underdrains are not required.

Thank you for the opportunity to be of service. We look forward to providing you with these geotechnical services. Should you require additional information, please contact us.

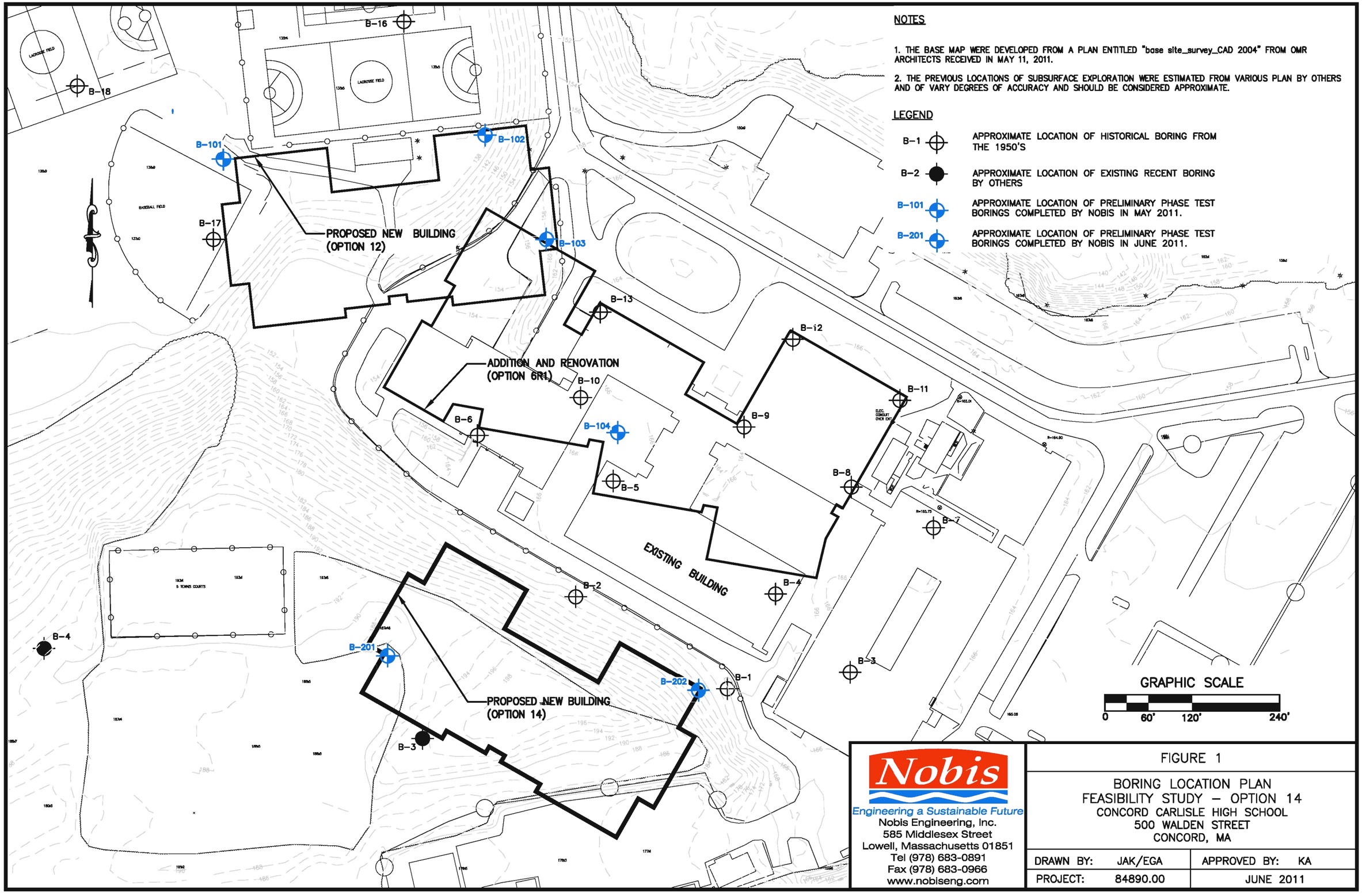
Very truly yours,

Nobis Engineering, Inc.

Kurtis Amidon, P.E.
Senior Project Manager

Kurt Jelinek, P.E.
Senior Project Manager

Attachments:
Figure 1, Preliminary Boring Location Plan
Recent Exploration Logs by Nobis
Previous Boring Logs by others



NOTES

1. THE BASE MAP WERE DEVELOPED FROM A PLAN ENTITLED "base site_survey_CAD 2004" FROM OMR ARCHITECTS RECEIVED IN MAY 11, 2011.

2. THE PREVIOUS LOCATIONS OF SUBSURFACE EXPLORATION WERE ESTIMATED FROM VARIOUS PLAN BY OTHERS AND OF VARY DEGREES OF ACCURACY AND SHOULD BE CONSIDERED APPROXIMATE.

LEGEND

B-1	APPROXIMATE LOCATION OF HISTORICAL BORING FROM THE 1950'S
B-2	APPROXIMATE LOCATION OF EXISTING RECENT BORING BY OTHERS
B-101	APPROXIMATE LOCATION OF PRELIMINARY PHASE TEST BORINGS COMPLETED BY NOBIS IN MAY 2011.
B-201	APPROXIMATE LOCATION OF PRELIMINARY PHASE TEST BORINGS COMPLETED BY NOBIS IN JUNE 2011.

GRAPHIC SCALE

0 60' 120' 240'

Nobis
Engineering a Sustainable Future
Nobis Engineering, Inc.
585 Middlesex Street
Lowell, Massachusetts 01851
Tel (978) 683-0891
Fax (978) 683-0966
www.nobiseng.com

FIGURE 1

BORING LOCATION PLAN
FEASIBILITY STUDY – OPTION 14
CONCORD CARLISLE HIGH SCHOOL
500 WALDEN STREET
CONCORD, MA

DRAWN BY:	JAK/EGA	APPROVED BY:	KA
PROJECT:	84890.00		JUNE 2011

O:\Active\84890 Concord-Carlisle HS\CAD\Location Plan.dwg

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-201**
Boring Location: Soccer Field, Northeast Corner
Checked by: K. Amidon
Date Start: June 7, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 188 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	07:05	47.8	47.0	48.3	15.5 hrs

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	15	0-2	1			TOPSOIL 187.5	S-1A (4"): Topsoil.	
1				4				S-1B (11"): Loose, brown fine to medium SAND, little Silt, trace roots, moist (Subsoil).	
				5			SUBSOIL		
2				8			186.0		
3									
4								Drill Chatter at about 3.5 feet bgs.	
5									
6									
7									
8									
9									
10									
	S-2	12	10-12	5				S-2: Medium dense, brown fine to medium SAND, trace Silt, wet (with a piece of gravel in top of sample).	
11				7					
				10			SAND		
12				9					
13									
14									
15									
16								Wash from about 10 feet to 19 feet bgs consists of coarse sand size particles.	
17									
18									
19									
20									
	S-3	13	20-22	8				S-3A (4"): Medium dense, brown fine to medium SAND, little Silt, moist (stratified).	
21				9				S-3B (9"): Medium dense, brown fine to medium SAND, trace Silt, moist.	
				12					
22				15					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-201**
Boring Location: Soccer Field, Northeast Corner
Checked by: K. Amidon
Date Start: June 7, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 188 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	07:05	47.8	47.0	48.3	15.5 hrs

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
23									
24									
25									
	S-4	13	25-27	11				S-4: Medium dense, brown fine to medium SAND, trace fine Gravel (sub-angular), trace Silt, moist.	
26				12					
				14					
27				14				Wash from about 25 feet to 30 feet bgs consist of coarse sand size particles.	
28									
29									
30									
	S-5	13	30-32	13				S-5A (2"): Medium dense, brown fine GRAVEL, little fine to coarse SAND, trace Silt, wet. S-5B (11"): Medium dense, brown fine to medium SAND, trace Silt, moist.	
31				9			SAND		
				10					
32				12				Wash from about 32 feet to 35 feet bgs consists of coarse sand size particles.	
33									
34									
35									
	S-6	12	35-37	9				S-6A (2"): Medium dense, olive fine SAND, little Silt, wet. S-6B (10"): Medium dense, orange/brown fine to medium SAND, trace Silt, moist (stratified).	
36				9					
				13					
37				15					
38									
39									
40									
	S-7	12	40-42	11				S-7A (6"): Medium dense, olive fine SAND, little Silt, moist.	
41				13					
				16					
42				18				S-7B (3"): Very stiff, olive clayey SILT, some fine Sand (stratified), moist. S-7C (3"): Medium dense, orange/brown fine to medium SAND, trace Silt, moist.	
43									
44									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-201**
Boring Location: Soccer Field, Northeast Corner
Checked by: K. Amidon
Date Start: June 7, 2011
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Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 188 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	07:05	47.8	47.0	48.3	15.5 hrs

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
45									
	S-8	15	45-47	12				S-8A (12"): Dense, orange/brown fine to medium SAND, little Silt, moist (stratified).	
46				15			SAND		
				22					
47				25			141.3		
					▼			S-8B (3"): Hard, gray SILT & CLAY , trace fine SAND (varves 1/16" to 1/8" thick) varved with orange fine SAND (varves 1/16" thick), moist.	
48									
49								Wash at about 49 feet bgs consists of cohesive material.	
50									
	S-9	21	50-52	10				S-9: Very stiff, gray SILT & CLAY (varves 1/4" thick) varved with gray CLAY & SILT (varves 1/4" thick), moist.	
51				13			Varved SILT & CLAY		
				14					
52				20					
53									
54									
55									
	S-10	19	55-57	6				S-10A (4"): Very stiff, gray SILT & CLAY (varves 1/4" thick) varved with gray CLAY & SILT, trace (-) Sand (varves 1/4" thick), moist.	
56				9			132.3	S-10B (15"): Medium dense, gray fine SAND, trace Silt, moist.	
				11					
57				20					
58									
59									
60									
	S-11	11	60-62	14				S-11A (1"): Dense, orange fine SAND, little Silt, moist.	
61				14			SAND	S-11B (4"): Dense, brown/orange fine to medium SAND, trace Silt, moist (stratified).	
				17				S-11C (6"): Dense gray fine to medium SAND, trace Silt, moist.	
62				23					
63									
64									
								Drill chatter observed at about 64 feet bgs.	
65							123.0		
	S-12	18	65-67	9				S-12: Very stiff, gray SILT & CLAY (varves 1/4" to 3/4" thick) varved with gray CLAY & SILT (varves 1/4" to 1/2" thick), occasional gray fine Sand parting, moist.	
66				10					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-201**
Boring Location: Soccer Field, Northeast Corner
Checked by: K. Amidon
Date Start: June 7, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 188 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	07:05	47.8	47.0	48.3	15.5 hrs

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
67				14 15					
68									
69									
70									
71	S-13	18	70-72	10 12			Varved SILT & CLAY	S-13: Very stiff, gray Clayey SILT and fine SAND, wet.	
72				16 20					
73									
74									
75									
76	S-14	19	75-77	16 20				S-14: Hard, gray SILT & CLAY (varves 1/2" to 1" thick) varved with gray CLAY & SILT (varves 1/8" to 1/4" thick) varved with black Silty Clay (varves 1/16" to 1/8" thick), moist.	
77				21 30			111.0		
78								Exploration terminated at 77 feet bgs.	
79									
80									
81									
82									
83									
84									
85									
86									
87									
88									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-202**
Boring Location: Grass hill, behind southwast corner of existing building
Checked by: K. Amidon
Date Start: June 8, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 172 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	14:55	30	0.0	58.0	0.4

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
	S-1	20	0-2	1			TOPSOIL 170.7	S-1A (12"): Topsoil.	
1				3					
				4			SUBSOIL 170.0	S-1B (8"): Loose, brown fine to coarse SAND, little Silt, trace fine Gravel, trace roots, dry (Subsoil).	
2				5					
3									
4									
5								Drill chatter observed from about 4 feet to 5 feet bgs. Wash consists of coarse sand size particles.	
	S-2	9	5-7	5				S-2: Medium dense, light brown fine to medium SAND, little Silt, moist (stratified).	
6				6			SAND		
				8					
7				8					
8									
9									
10									
	S-3	16	10-12	4				S-3A (2"): Medium dense, light brown fine to medium SAND, little Silt, moist (stratified).	
11				4					
				9				S-3B (6"): Stiff, gray CLAY & SILT (top 4" gray, bottom 2" brown), moist.	
12				10				S-3C (4"): Medium dense, light brown fine to medium SAND, little (-) Silt, moist (stratified). S-3D (4"): Medium dense, olive fine SAND, trace Silt, moist.	
13									
14									
15								Driller reported transition from fine sand to coarse sand at about 14.5 feet bgs.	
	S-4	10	15-17	7				S-4: Medium dense, brown fine to coarse SAND, trace fine Gravel, trace Silt, wet.	
16				10			SAND		
				11					
17				13					
18									
19									
20									
	S-5	11	20-22	5				S-5: Medium dense, brown fine to medium SAND, trace Silt, moist.	
21				9					
				12					
22				12					

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-202**
Boring Location: Grass hill, behind southwast corner of existing building
Checked by: K. Amidon
Date Start: June 8, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 172 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	14:55	30	0.0	58.0	0.4

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
23									
24									
25									
	S-6	11	25-27	6				S-6: Medium dense, orange/brown fine to medium SAND, trace Silt, moist.	
26				9					
				10					
27				12				Wash from about 27 feet to 30 feet bgs consists of coarse sand size particles.	
28									
29							SAND		
30					▼				
	S-7	9	30-32	9				S-7: Medium dense, light brown fine SAND, little Silt, moist (stratified, rust color at ~4" from bottom of spoon).	
31				8					
				11					
32				14					
33									
34									
35									
	S-8	16	35-37	7				S-8A (7"): Medium dense, orange/brown fine SAND, little Silt, moist.	
36				8					
				16				S-8B (2"): Gray CLAY & SILT, moist.	
37				21				S-8C (7"): Medium dense, gray fine to medium SAND, little Silt, wet (stratified).	
38									
39									
40									
	S-9	15	40-42	13				S-9: Medium dense, orange fine to coarse SAND, trace Silt, trace Gravel (subround), wet.	
41				14			SAND		
				15					
42				19					
43									
44									

SAMPLE IDENTIFICATION
G - Geoprobe
S - Split Spoon
U - Undisturbed Sample
R - Core Run

REMARKS:

Nobis
Engineering a Sustainable Future

PROJECT

Concord Carlisle High School
Concord, MA

Nobis File No:. 84890.01

Boring No:. **B-202**
Boring Location: Grass hill, behind southwast corner of existing building
Checked by: K. Amidon
Date Start: June 8, 2011
Date Finish: June 8, 2011

Contractor: New Hampshire Boring, Inc.
Driller: Bob Thompson
Nobis Rep.: BTW

Rig Type / Model: CME 550 ATV
Hammer Type: Automatic Hammer
Hammer Hoist: Automatic

Ground Surface Elev.: 172 ft.
Top-of-Riser Elev.:
Datum: NGVD1929

	Drilling Method	Sampler
Type	Drive and Wash	Split-Spoon
Size (in.)	4"	1-3/8 ID
Advancement	Drive and Wash	140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
▼ 06/08/11	14:55	30	0.0	58.0	0.4

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft)	Blows/ 6 in.	Ground Water	LITHOLOGY Graphic	Stratum / Elev.(ft.)	SAMPLE DESCRIPTION	REMARKS
45									
	S-10	14	45-47	12				S-10A (6"); Dense, orange/brown fine to medium SAND, trace Silt, wet.	
46				14			SAND	S-10B (6"): Dense, gray fine SAND, trace Silt, wet.	
				18					
47				30			125.2		
48								S-10C (2"): Hard, gray SILT & CLAY (varves 1/4" to 1/2" thick) varved with gray Silty CLAY (varves 1/8" to 1/4" thick), moist. (Piece of 1/2" diameter Gravel in tip of spoon).	
49									
50								Wash at about 49 feet bgs consists of clumps of cohesive material and coarse sand size particles.	
	S-11	21	50-52	8				S-11: Hard, gray SILT & CLAY (varves 1" to 3" thick) varved with gray CLAY & SILT (1/4" to 1/2" thick) and black Silty CLAY (varves 1/4" thick), moist.	
51				17			Varved SILT & CLAY		
				17					
52				22					
53									
54							118.0		
55									
	S-12	15	55-57	12			SAND	S-12A (3"): Dense, gray fine SAND, trace Silt, wet.	
56				23				S-12B (2"): Gray SILT & CLAY, wet.	
				26				S-12C (10"): Dense, gray fine SAND, trace Silt, wet.	
57				27					
58									
59							SAND		
60									
	S-13	15	60-62	10				S-13A (12"): Dense, gray fine SAND, trace Silt, wet.	
61				16					
				18			110.3		
62				24			110.0 SILT & CLAY	S-13B (3"): Hard, gray SILT & CLAY, moist. Exploration terminated at 62'.	
63									
64									
65									
66									

SAMPLE IDENTIFICATION
G - Geoprobe
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U - Undisturbed Sample
R - Core Run

REMARKS:

THE GEOTECHNICAL GROUP, INC.

Test Boring Log

PROJECT
Concord-Carlisle Regional High School
Concord, MA

Boring No.	B-3
Sheet	Sheet 1 of 1
File No.	W1912
Review by:	James Handanyan

Boring Co.	Subsurface Drilling
Foreman	John
T.G.G. Observer	Marc Fyrberg
Boring Location	See Exploration Location Plan
Ground Elev.	NA
Date Start / End	6/15/05

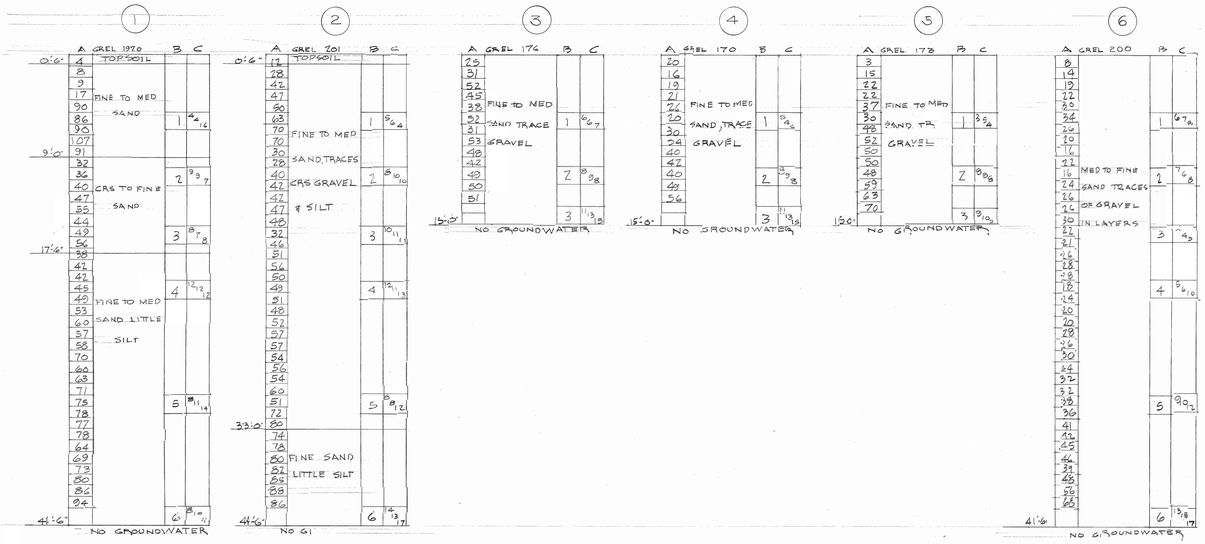
Sampling Protocol
Unless otherwise noted, borings were accomplished using 4 inch inside-diameter hollow stem augers. Samples were recovered using a 2-inch O.D. split spoon sampler driven by blows of a 140 lb. safety hammer falling 30 inches.

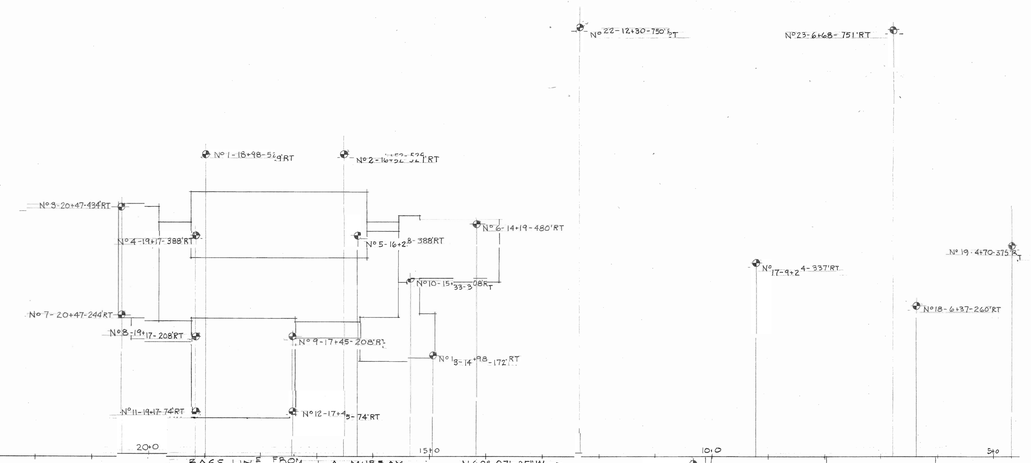
Ground Water Readings (See Notes)

Date	Time	Depth to Bottom	Depth to Water	Rem.
6/15	Drilling	27±'	NE	1

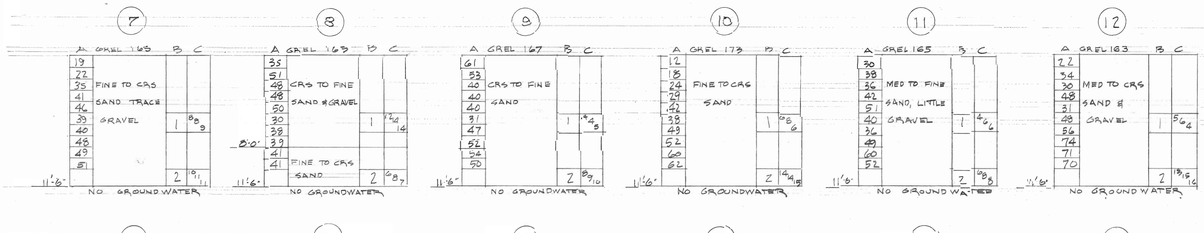
Sample Data						Strata Change	Sample Description
No.	Depth (ft)	Blows per 6 in	Pen.	Rec.	Rem.		
S-1	0-0.5	1	6	6		Forest Mat 0.5	Dry, dark brown, fine SAND and SILT, some Organics.
S-1A	0.5-2	1-1-1	18	12		Subsoil 2.0	Very loose, dry, tan-orange, fine to coarse SAND, some (-) Silt, trace (+) fine to coarse Gravel.
S-2	2-4	6-10-12-16	24	12			Medium dense, dry, orange-tan, fine to coarse SAND, some (-) fine to coarse Gravel, trace (-) Silt.
S-3	4-6	5-15-15-18	24	18			Medium dense to dense, dry, orange-tan, fine to coarse SAND, some fine to coarse Gravel, trace Silt.
S-4	6-8	24-20-21-22	24	18			Dense, dry, tan-orange, fine to coarse SAND, little (+) fine to coarse Gravel, trace (-) Silt.
S-5	8-10	23-34-28-27	24	12			Very dense, dry, tan-orange, fine to coarse GRAVEL, some (+) fine to coarse Sand, trace (-) Silt.
S-6	10-12	7-10-8-9	24	16		Gravelly Sand	Medium dense, moist, tan-orange, fine to coarse SAND, little (+) fine to coarse Gravel, trace (-) Silt.
S-7	12-14	16-24-20-15	24	15			Dense, moist, tan-orange, fine to coarse SAND and fine to coarse GRAVEL, trace (-) Silt.
S-8	14-16	10-27-32-14	24	15			Very dense, moist, tan to orange, fine to coarse SAND, little (-) fine to coarse Gravel, trace (+) Silt.
S-9	16-18	19-12-13-11	24	18			Medium dense, moist, tan to orange, fine to coarse SAND, little (+) fine to coarse Gravel, trace (-) Silt.
S-10	18-20	8-11-21-26	24	18		20.0	Dense, moist, tan to orange, fine to coarse SAND, little (-) fine to coarse Gravel, trace (-) Silt.
S-11	20-22	21-14-9-10	24	16			Medium dense, dry, tan, fine SAND, trace Silt.
S-12	22-24	14-10-9-9	24	18		Fine Sand	Medium dense, dry, tan, fine SAND, trace Silt.
S-13	25-27	9-8-10-8	24	24	1	27.0	Medium dense, dry, tan, fine SAND, trace Silt.
							Bottom of boring at 27.0± feet.

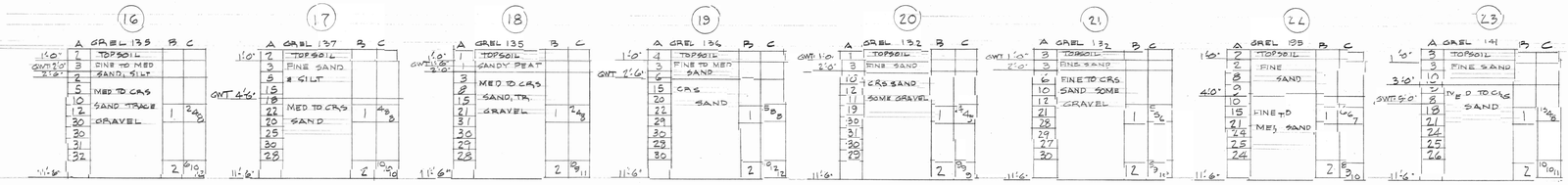
Remarks:
1. Groundwater was not encountered at the time of the boring.





BORING LOCATION PLAN
SCALE: 1"=100'





BORING NOTES

1. COL "A" BLOWS/FT ON 2½" CASING
2. COL "B" SAMPLE Nº
3. COL "C" BLOWS/6" ON 2" O.D. SAMPLER
4. HAMMERS, CASING, 300#, 24" FALL; SAMPLER, 140#-30" FALL
5. GWT= GROUNDWATER TABLE
6. BORINGS TAKEN MAY 1958 BY ENGINEERING SERVICES, INC.

CONCORD - CARLISLE HIGH SCHOOL
CONCORD MASSACHUSETTS

WARREN H. ASHLEY A.I.A., ARCHITECT
740 NORTH MAIN STREET, WEST HARTFORD, CONNECTICUT

BORING PLAN

SCALE 1"=100'
DATE JULY 7 1958

SASAKI, WALKER & ASSOCIATES, INC. SITE PLANNERS
FRED S. DUBIN ASSOCIATES MECHANICAL ENGINEERS
ARTHUR BRUCE ONDERDONK STRUCTURAL ENGINEER
ENGELHARDT, ENGELHARDT, LEGGETT & CORNELL EDUCATION CONSULTANTS

DRAWN C.D.W.
CHECKED C.N.L.
APPROVED A.B.O.

SHEET NO. 35
S-1

ARTHUR B. ONDERDONK
CIVIL ENGINEER
ROBERT B. LATHROP, ASSOC.
2957 MAIN STREET
STRATFORD, CONN.

LEGEND

- CB — CATCH BASIN
- CATV — CABLE TELEVISION MANHOLE
- D — DRAIN MANHOLE
- E — ELECTRIC MANHOLE
- M — MISCELLANEOUS MANHOLE
- S — SEWER MANHOLE
- T — TELEPHONE MANHOLE
- W — WATER MANHOLE
- GSO — GAS SHUT-OFF
- WSO — WATER SHUT-OFF
- GG — GAS GATE
- WG — WATER GATE
- BWW — BOSTON WATER WORKS
- FH — FIRE HYDRANT
- DS — DOWN SPOUT
- UP — UTILITY POLE
- UP/C — UTILITY POLE WITH CONDUIT LINE TO GROUND
- LP — LIGHT POLE
- LB — LIGHT BOLLARD
- LL — LANDSCAPE LIGHT
- HH — HAND HOLE
- TC — TRASH CAN
- FA — FIRE ALARM CALL BOX
- MP — METAL POST
- CP — CONCRETE POST
- PM — PARKING METER
- SP — SIGN POST
- DECIDUOUS TREE WITH TRUNK DIAMETER
- CONIFEROUS TREE WITH TRUNK DIAMETER
- HANDICAP PARKING
- SE — SPOT ELEVATION
- CLF — CHAIN LINK FENCE
- BB — BITUMINOUS CONCRETE BERM
- SGC — SLOPED GRANITE CURB
- VGC — VERTICAL GRANITE CURB
- VCC — VERTICAL CONCRETE CURB
- WCR — WHEELCHAIR RAMP
- LT — LANDSCAPE TIMBER
- RIM — RIM ELEVATION EQUALS
- INV — INVERT ELEVATION EQUALS
- TOH — TOP OF HOOD ELEVATION EQUALS
- NVP — NO PIPES VISIBLE
- TW — TOP OF WATER
- TOW — TOP OF WALL ELEVATION
- CATV — UNDERGROUND CABLE TELEVISION LINE
- D — UNDERGROUND DRAIN LINE
- E — UNDERGROUND ELECTRIC LINE
- G — UNDERGROUND GAS LINE
- S — UNDERGROUND SEWER LINE
- T — UNDERGROUND TELEPHONE LINE
- W — UNDERGROUND WATER LINE
- OHW — OVERHEAD WIRES
- MW — MONITORING WELL
- BM — BENCH MARK

GRAPHIC SCALE

0

SCALE: 1"=100'

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- Civil Engineering
- Land Surveying
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- Sustainable Consulting
- Planning
- GIS

PREPARED FOR:

REV.	COMMENTS	DATE
	REVISIONS	

PROJECT #

FILE: version2004_TOP01_06-06-11r

SCALE: 1"=

DATE:

DES./COMP:

FIELD BOOK:

DRAFTED BY:

CHECKED BY:

SHEET:

EX-1

OF REV.