PRELIMINARY GEOTECHNICAL REPORT

PRE-DEVELOPMENT PLANNING STUDY
UNITED STATES COURT OF APPEALS FOR VETERANS CLAIMS (USCAVC)
49 L STREET SE, WASHINGTON, DC

Schnabel Reference # 10212006
May 18, 2010

Schnabel
ENGINEERING

May 18, 2010

Ms. Amy Stein, AIA, LEED AP
MGA PARTNERS Architects
234 Market Street
Philadelphia, Pennsylvania 19106

Subject: **Project 10212006, Preliminary Geotechnical Engineering Report, Pre-Development Planning Study, United States Court of Appeals for Veterans Claims (USCAVC), 49 L Street SE, Washington, DC**

Dear Ms. Stein:

SCHNABEL ENGINEERING, LLC (Schnabel) is pleased to submit our preliminary geotechnical engineering report for this project. This report includes attached figures and appendices with relevant data collected for this study. This study was performed in accordance with our proposal dated December 10, 2009, as authorized by you on February 25, 2010.

SCOPE OF SERVICES

Our scope of services includes the following:

1. Description of terrain.
2. Brief geological history.
3. Brief seismic history
4. Comments on groundwater conditions and associated design and construction problems, including groundwater levels as encountered in the borings and general subdrainage requirements.
6. Description of exploration and sampling methods and outline of testing methods.
7. Narrative of soil identification and visual classification, by stratum.
8. Narrative of difficulties and/or obstructions encountered during the subsurface investigation.
9. Description of soil test borings and results from laboratory testing on selected soil samples.
10. Plot plan, drawn to scale, showing locations of the test borings.
11. Perform radon tests at two locations, at existing grade level.
12. Soils resistivity testing (to include pH of soils, resistivity testing, sulfates and reduction-oxidation potential) on two selected samples to aid in identifying resistivity of soil for corrosion protection of underground metals and electrical grounding design.
13. Boring logs, which identify sample number and sampling method, as well as other pertinent data deemed necessary by the Geotechnical Engineer.

14. Comments on foundation conditions for support of the proposed structure.
15. Comments regarding lateral earth pressure for use in design of building walls below-grade.
16. Comments concerning groundwater conditions at the site and the need for special subdrainage.
17. Comments concerning earthwork issues that could impact the development.
18. Comments concerning other geotechnical issues that could affect the pricing or development of the property.

Services not described in our proposal/agreement are not included in this study. We would be happy to provide additional geotechnical-related support services to the design team as the project demands, including final foundation recommendations, construction dewatering, removal, treatment and disposal of contaminated soil or groundwater, design of excavation sheeting and shoring, design of temporary slopes, design of flexible and rigid pavement sections, review of geotechnical aspects of the project plans and specifications; construction phase observation and testing services and environmental services, etc.

SITE DESCRIPTION AND PROPOSED CONSTRUCTION

We understand that a feasibility study is proposed to evaluate the property at 49 L Street in southeast Washington, DC for future housing of the United States Court of Appeals for Veterans Claims (USCAVC). Based on conversations with your office, we understand that the proposed structure is preliminarily estimated to be between five- and seven-stories above grade with one- to two-levels of below-grade parking.

Based on our site visits and topographic plans provided by your office, the majority of the site is currently occupied by a two- to three-story red brick building with a basement level below the eastern portion of the building. The site is bounded by L Street to the north, Cushing Place to the east, a privately owned parking lot (Parking Lot J for Nationals Stadium) to the south and Half Street to the west. The site is generally level with existing grades varying between about El 28 and El 27 from north to south. The building is bordered by grass along the west side and asphalt and concrete driveways along the north. There appears to be about 10 ft between the building and the public sidewalks on the west and north sides of the building. The south side of the building abuts the privately owned parking lot and the east side of the building extends up to about 2 ft to 3 ft off Cushing Place. The metro runs along M Street, parallel to the south side of the site. Based upon the Washington Metropolitan Area Transit Authority (WMATA) boring data available to us, we believe that the top the metro rail is at about El -43.

We obtained the site information through our site visits and information provide by your office. A Site Vicinity Map is included as Figure 1.

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SUBSURFACE CONDITIONS

Data Collection Techniques

Our firm drilled three soil test borings inside the existing building at the site. The soil test boring logs and groundwater observation data are included in Appendix A. For our analysis, we have considered one nearby WMATA boring included in Appendix D. The soil boring locations are included on Figure 2.

Our geotechnical laboratory conducted tests on selected samples obtained during our investigation. This testing aided in the classification of the soils encountered in the subsurface exploration. Soil laboratory test results are included in Appendix B. The logs in Appendix A show the natural moisture content values, sieves and Atterberg limits results of selected soil samples. We will retain soil samples for up to 45 days beyond the issuance of this report, unless you request other disposition.

Generalized Subsurface Stratigraphy

The subsurface data indicated the following generalized soil strata underlie the site to the depth investigated at the recent soil boring locations. The strata designations do not imply continuity of materials described, but reflect the general description and characteristics of the subsurface materials at the site:

Ground Cover (Concrete):

Between 6 inches and 8 inches of concrete was encountered at the soil test boring locations.

Stratum A: Fill

Existing fill generally consisting of sandy lean clay and sandy fat clay, containing mica, brick fragments, gravel and slag was encountered below the ground surface to a depth of between about 3.5 ft and 8.5 ft. Based on the Standard Penetration Test (SPT) results, this stratum is variable in consistency (SPT values varied from 6 blows per ft to 18 blows per ft).

Stratum B1: Pleistocene Terrace (Cohesive)

Below the fill soils of Stratum A and interbedded with Stratum B2, the boring encountered a terrace deposit generally consisting of various shades of brown and gray sandy FAT CLAY (CH), sandy LEAN CLAY (CL), LEAN CLAY with sand (CL), LEAN CLAY (CL) and sandy ELASTIC SILT (MH), containing trace amounts of mica, organics, gravel, sand seams and shell fragments to a depth of about 58.5 ft. One sample of the lean clay material was tested in our soil laboratory. The results indicated a liquid limit of 38, a plasticity index of 23 and a natural moisture content of 22.3 percent. About 96 percent of the material tested passed the No. 200 sieve. Based on the SPT results, this stratum is generally soft to very stiff (SPT values varied from 4 blows per ft to 20 blows per ft).

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Stratum B2: Pleistocene Terrace (Granular)

Interbedded with Stratum B1, the boring encountered a terrace deposit generally consisting of various shades of brown, gray and white clayey SAND (SC), SILT (ML), silty SAND (SM), poorly-graded SAND (SP-SM) with silt and well-graded GRAVEL (GW-GM) with silt, with various amounts of gravel and sand and trace amounts of mica, organics, clay pockets and wood to a depth of between about 48.5 ft and 53.5 ft. One sample of the silt material was tested in our soil laboratory. The results indicated a liquid limit of 46, a plasticity index of 13 and a natural moisture content of 30.5 percent. About 86 percent of the material tested passed the No. 200 sieve. Based on the SPT results, this stratum is generally loose to very dense (SPT values varied from 8 blows per ft to 58 blows per ft).

Stratum C: Cretaceous

Below Strata B1 and B2, the borings encountered granular Cretaceous age soils consisting of dark gray, gray and brown silty SAND (SM), with various amounts of gravel and trace amounts of mica, lignite and clay pockets to a depth of about 70.0 ft. Based on the SPT results, this stratum is generally loose to very dense (SPT values varied from 6 blows per ft to 132 blows per ft).

The above stratification is shown in detail on the boring logs in Appendix A. The sampling procedures used to determine SPT values are also presented in Appendix A.

The soil group symbols indicated on the boring logs and in the generalized subsoil stratum descriptions above represent the Unified Soil Classification System (USCS) group symbols and are based on visual identification of soil specimens recovered, per ASTM D-2488. The criteria for visual identification of soil specimens are presented in Appendix A. It should be noted that there may be a differences between visual classifications and laboratory classifications based on ASTM D-2487.

Geology

The upper soils at the site consist of existing fill that is believed to be associated with construction of the existing building and previous grading at the site. The fill soils are underlain by Pleistocene Age upland terrace deposits that overlie Cretaceous age sediments that belong to the Potomac Group. Potomac Group soils are the oldest sedimentary deposits in the Washington, DC area.

Groundwater

Long-term groundwater level measurements were taken in the borings up to about 24 hours after completion of drilling. Long-term readings indicated groundwater at a depth of about 38 ft below the ground surface (El -11). Boring sidewalls caved to depths of between 37 ft and 40 ft below the ground surface (or between El -10 and El -13). Groundwater in the nearby WMATA boring was at about El -5. The final design should anticipate fluctuations in the groundwater level depending upon variations in precipitation, surface runoff, pumping, adjacent metro tunnel, nearby buildings, leaking utilities, time of year and other similar factors.

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Radon Testing

A total of four radon canisters (Model AT-200), two at each test location, were buried below existing (exterior) grades around the existing building. The radon testing locations are included on Figure 2. The canisters were buried at these locations on March 31, 2010 at a depth of about 1 ft below existing grades. The canisters were recovered on April 7, 2010, after remaining in the ground for about 7 days, and were submitted to a radon-testing laboratory for analysis.

The radon tests indicated radon gas concentrations of 63.0 pCi/L to 109.0 pCi/L. A summary of the recent test results is included in the table below. The laboratory radon test results are included in Appendix C.

Location	Installed		Removed		Radon Level (pCi/L)
	Date	Time	Date	Time	
R-1 (West)	3/31/2010	10:10 AM	4/7/2010	7:10 AM	63.0
R-1 (West)	3/31/2010	10:10 AM	4/7/2010	7:10 AM	80.0
R-2 (East)	3/31/2010	10:25 AM	4/7/2010	7:20 AM	109.0
R-2 (East)	3/31/2010	10:25 AM	4/7/2010	7:20 AM	90.0

The Environmental Protection Agency (EPA) suggests that remedial actions be considered if the average radon level in the work areas of an office or plant is above 4 pCi/L. The results of the radon gas testing indicate that current radon levels in the soil exceed the recommended level. We recommend that additional radon testing be performed once lowest levels have been established to determine if a radon mitigation system is necessary.

Corrosion Potential

Two samples of the Stratum B1 material recovered from boring B-2 at depths of 8.5 ft and 18.5 ft below the existing ground surface were submitted for corrosion potential testing consisting of resistivity, redox potential, sulfides, and pH. The test results indicated a resistivity of between 2,900 ohm-cm and 3,800 ohm-cm, a redox potential of between 223 mV and 258 mV, and a pH of between 5.9 and 6.3. No sulfides were detected in the samples. The corrosion potential test results are included in Appendix B on the *Summary of Laboratory Tests*.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

This preliminary geotechnical engineering evaluation is based on the data obtained from the soil test borings and preliminary information provided to us. Based on the preliminary information provided to us, we have considered a maximum column load of about 1,000 kips. Details of our preliminary recommendations are provided herein.

Foundations

We considered spread footings for support of the proposed building; however, considering a maximum column load of about 1,000 kips with one- to two-levels of below-grade parking (or about 10 ft or 20 ft below existing grade) and an allowable soil bearing pressure of between 2,000 psf and 3,000 psf, spread

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footing foundations would be too large to be considered feasible. A mat foundation founded on the stiff natural soils of Stratum B1 may be considered suitable for support of the building. We anticipate that a mat foundation will likely be feasible if the two-story below-grade option is chosen; however, a mat may also be feasible considering one-story below-grade. This will depend on the actual column loads, column spacing and final lowest level. A mat foundation is expected to have the fewest problems during construction, but may be more expensive than the other systems particularly if wide column spacing is used. The mat foundation may be designed using a preliminary average subgrade reaction of about 100 kcf to 150 kcf with an average bearing pressure of about 2,000 psf to 3,000 psf. We recommend that consolidation testing be performed during the final study to determine specific consolidation characteristics of the clay layers, along with additional soil borings and soil laboratory testing.

We have also considered augercast piles for support of the proposed building. Augercast piles, 16 inches in diameter, may be considered for an allowable capacity of about 80 to 100 tons when extending into the very dense sand of Stratum C. Augercast piles will generally need to extend to depths of between about 50 ft and 60 ft below the lowest level considering a building with one-story below-grade and about 40 ft to 50 ft below the lowest level considering a building with two-stories below grade. Some obstructions may be encountered in the soils of Strata B1 and B2, due to the presence of gravel layers. We also considered other deep foundation systems such as driven piles; however, we expect them to be less economical then the other systems discussed and they may not be feasible due to vibrations concerns affecting the adjacent metro tunnels. Alternatively, spread footings founded on Geopiers® designed for about 4,000 psf to 6,000 psf are expected to be feasible for support of the proposed building, considering both options.

Floor Slabs

Earth supported floor slabs are considered feasible. The lowest level floor slabs-on-grade may be supported on the firm natural soils of Stratum B1. Undercutting and replacement with compacted soil may be required where soft or unsuitable material is encountered. A 4-inch washed gravel or crushed stone base layer should be placed below floor slabs as a moisture barrier. The crushed stone or washed gravel should meet requirements for the AASHTO No. 57 coarse aggregate. An appropriate vapor barrier, meeting ASTM E-1745-97 standards, should be installed over the crushed stone. This vapor barrier would also prevent concrete intrusion into the stone.

Lateral Earth Pressures on Below-Grade Walls

We understand that the building will have up to two below-grade levels; therefore, the basement walls should be designed to withstand lateral earth pressures from surrounding backfill soils and any surcharge loads. The basement walls should be designed to withstand an equivalent fluid pressure of about 50H. Final lateral earth pressures will be provided in the final investigation. Drainage behind basement walls is recommended.

Subdrainage

Long-term groundwater readings indicated groundwater at about 38 ft below existing surface grades; however, some perched water may be encountered at higher elevations. Based on the preliminary pattern of borings, we do not anticipate special underfloor subdrainage; however, one or two interior

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subdrainage lines may be considered. Drainage behind the exterior walls below-grade will however, be required to release any hydrostatic pressure that may develop due to heavy rains. Perimeter drains should be installed and will likely consist of 4 inch slotted PVC pipe surrounded by crushed stone and geotextile filter fabric. Collected water will require pumped discharge into the storm sewer system from sump pits installed in the lowest levels.

Earthwork

The excavated soils of Strata A and B1 are generally not considered suitable for re-use as compacted fill. Stratum B2 soils, if available, are considered suitable for re-use. Laboratory tests should be performed to better classify subsoil conditions. In addition, some of the natural soil may be wet and may require drying prior to reuse.

Corrosion Considerations

The results of the corrosion series testing were used to evaluate the corrosion potential per American Water Works Association (AWWA) Specification C105. AWWA Specification C105 includes a procedure for ranking soils on a 10-point scale to evaluate whether the soils are potentially corrosive to cast iron and recommends that cast iron pipes installed within soils with a ranking of 10 or greater have corrosion protection. Ferrous materials (i.e. cast iron and steel) behave similarly when exposed to corrosive environments. The AWWA ranking system is widely used to evaluate corrosion potential in ferrous metals.

The results of the corrosion series testing were used to rank the corrosion potential of the fine grained soils of Stratum B1 at the site. A soil ranking of between 2 and 3 was obtained for the Stratum B1 samples. Based on our evaluation of the corrosion series testing and the AWWA ranking system, the soils tested were found to be non-corrosive.

Seismic Site Classification

The site lies within the relatively stable mid-eastern region. Based on the recent subsurface investigation, we anticipate that a Site Class D may be used for preliminary seismic design on this project. This Site Class was evaluated based on Standard Penetration Test N-values and will need to be re-evaluated during the final phase of this project once proposed lowest-levels have been established. Seismic CPT and/or Shear Wave Velocity methods may be used to more accurately determine the seismic site class.

RECOMMENDATIONS FOR ADDITIONAL STUDIES

Once design drawings and structural loadings are set, a final geotechnical engineering analysis for the proposed building is recommended. Additional borings are considered necessary to further evaluate subsurface soil and groundwater conditions at the site. Additionally, we recommend obtaining relatively undisturbed Shelby tube samples from the clay layers to aid in the final analysis. The final geotechnical engineering analysis should include evaluating foundation requirements for the building and floor slab support, lateral earth pressures, subdrainage, earthwork and compacted fill requirements.

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LIMITATIONS

We have endeavored to prepare this report for the use of your office and the design professionals for preliminary planning purposes in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are made as to the professional services included in this report.

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,

SCHNABEL ENGINEERING, LLC

Matthew D. Grzelak, EIT
Senior Staff Engineer

Bill Khouri, PE
Principal

MG:JB:BK:nv
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Figures
Figure 1: Site Vicinity Map
Figure 2: Approximate Test Boring and Radon Testing Location Plan

Appendices
Appendix A: Subsurface Exploration Data
Appendix B: Soil Laboratory Test Data
Appendix C: Radon Testing Data
Appendix D: WMATA Subsurface Exploration Data

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FIGURES

Site Vicinity Map, Figure 1
Approximate Test Boring and Radon Testing Location Plan, Figure 2

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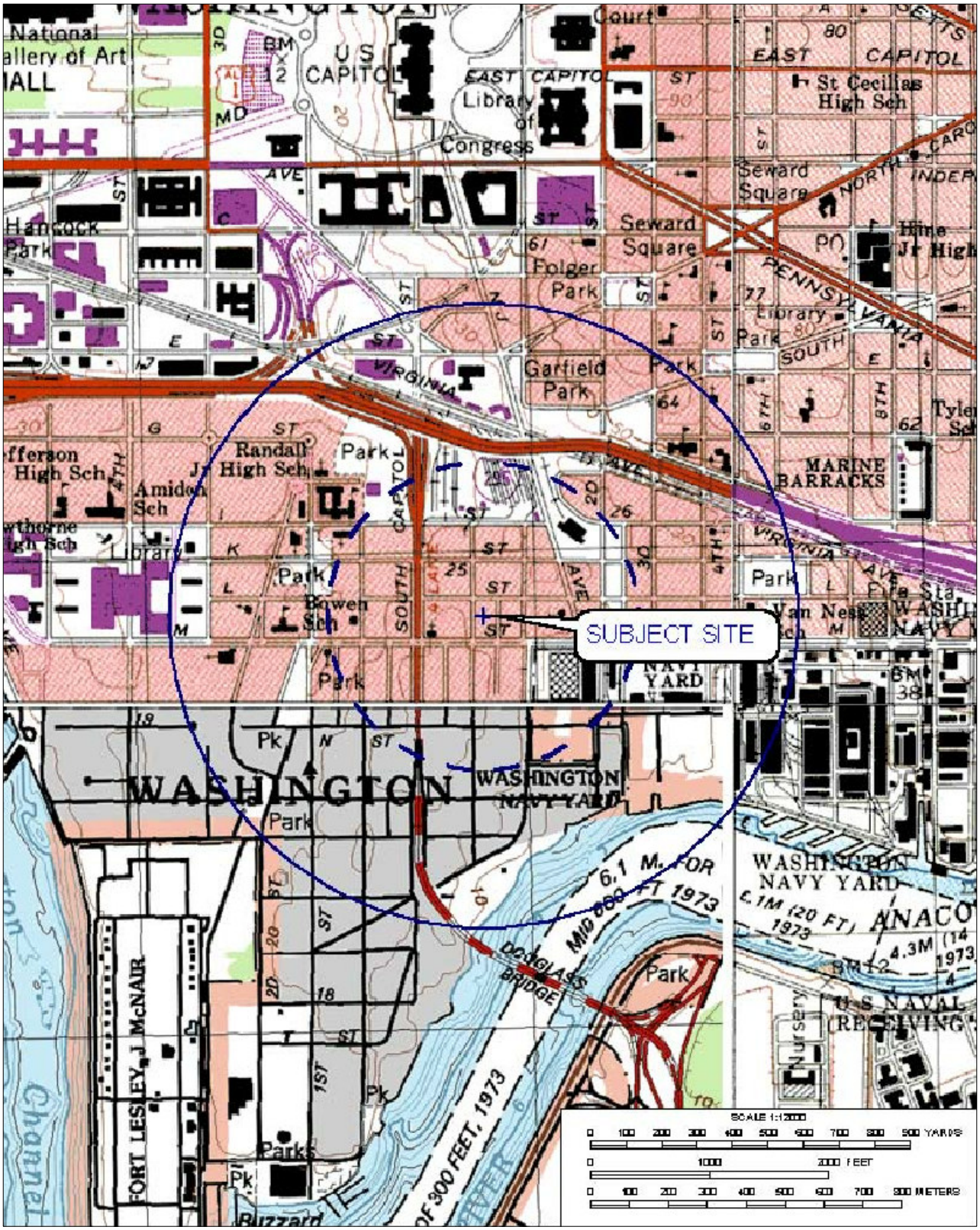

LEGEND

1 MILE RADIUS

½ MILE RADIUS

REFERENCE: 7.5-Minute Series Topographic Map 1985 Washington West Quadrangle

Schnabel ENGINEERING	PRE-DEVELOPMENT PLANNING STUDY - USCAVC 49 L STREET SE WASHINGTON, DC	SITE VICINITY MAP PROJECT NO.: 10212006 MARCH 2010 | FIGURE NO.: 1

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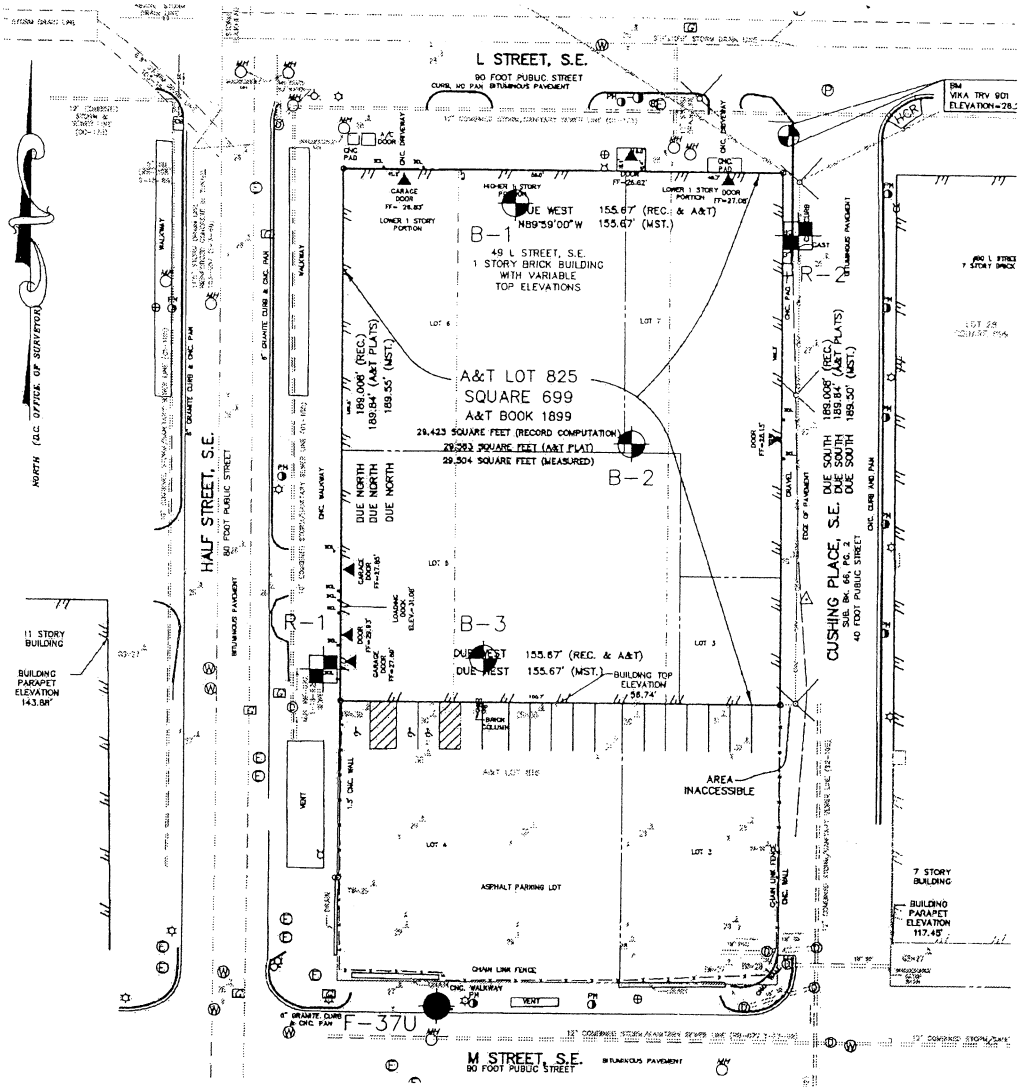

Base plan provided by VIKA.

GRAPHIC SCALE

LEGEND

B-1 APPROXIMATE TEST BORING LOCATION

F-37U APPROXIMATE WMATA TEST BORING LOCATION PERFORMED BY OTHERS

R-1 APPROXIMATE RADON TESTING LOCATION

APPROXIMATE SCALE: AS SHOWN	DATE: MARCH 2010
DRAWN BY: M. GRZELAK	REVIEWED BY: B. KHOURI

APPROXIMATE TEST BORING AND RADON TESTING LOCATION PLAN

PROJECT NO. 10212006
FIGURE 2

PRE-DEVELOPMENT PLANNING STUDY - USCAVC
49 L STREET SE
WASHINGTON, DC

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APPENDIX A

SUBSURFACE EXPLORATION DATA

Subsurface Exploration Procedures (1 sheet)
General Notes for Test Boring Logs (1 sheet)
Identification of Soil (1 sheet)
Boring Logs, B-1 through B-3 (6 sheets)

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SUBSURFACE INVESTIGATION PROCEDURES

1. Test Borings - Hollow Stem Augers

The borings are advanced by turning an auger with a center opening of 2 ¼ or 3 ¼ inches. A plug device blocks off the center opening while augers are advanced. Cuttings are brought to the surface by the auger flights. Sampling is performed through the center opening in the hollow stem auger, by standard methods, after removal of the plug. Usually, no water is introduced into the boring using this procedure.

2. Standard Penetration Tests

Numbers after description of the soil strata indicate the minimum and maximum penetration resistance, or N value, recorded in each stratum. The N values indicate the penetration resistance in blows per foot of a standard 2 inch O.D., 1-⅜ inch I.D. sampling spoon driven with a 140-pound hammer falling 30 inches per ASTM D-1586. After an initial set of 6 inches to assure the sampling spoon is in undisturbed material, the number of blows required to drive the sample an additional 12 inches is generally taken as the N value. In the event that 30 or more blows are required on the initial 6-inch interval, the sampling spoon is driven to a total penetration resistance of 100 blows or 18 inches, whichever occurs first.

3. Boring Locations and Grades

The geotechnical soil test borings were located in the field by our office at the approximate locations indicated on Figure 2. The ground surface elevations included on the boring logs were estimated from topographic plans provided by your office.

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TEST BORING LOG GENERAL NOTES

1. Numbers in the sampling data column indicate the number of blows required to drive a 2-inch O.D., 1-3/8 inch I.D. split spoon sampler through three 6-inch intervals, or as indicated, using a 140-pound hammer falling 30 inches, according to ASTM D-1586. The sum of the second and third 6-inch blow count intervals is the N value of the Standard Penetration Test (SPT).

2. Strata descriptions are based on visual inspection and are in accordance with the Unified Soil Classification System, ASTM D-2488.

3. Refusal at the surface of rock, boulder, or obstruction is defined as a penetration resistance of 100 blows for 2 inches penetration or less.

4. Disintegrated rock is defined as residual earth material with a penetration resistance between 60 blows per foot and refusal.

5. Key to abbreviations and symbols:

w %	= Moisture Content	3T	= 3 inch Tube Sample
☒	= Area Sampled	24/20	= Tube Sample Pushed 24 inches, 20 inches Recovered
⧅	= Rock Coring	REC	= Rock Core Recovery
WOR	= Weight of Rod	RQD	= Rock Quality Designation
WOH	= Weight of Hammer	WOW	= Water Observation Well

6. The boring logs and related information depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions at the boring locations. Also, the passage of time may result in a change in the subsurface soil and groundwater conditions at the boring locations.

7. The stratification lines represent the approximate boundary between soils and/or rock types as estimated in the drilling and sampling operation. Some variation may be expected vertically between samples taken. The soil profile, water level observations, and penetration resistances presented on the boring logs have been made with reasonable care and accuracy, but must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.

8. Estimated groundwater levels are indicated on the logs. These are only estimates from available data and may vary with variations in environmental conditions, precipitation, surface drainage, time of the year, evaporation, adjacent construction, porosity of the soil, site topography and other similar factors.

IDENTIFICATION OF SOIL

DEFINITION OF SOIL GROUP NAMES (ASTM D-2487)

			SYMBOL	GROUP NAME
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels – More than 50% of coarse fraction retained on No. 4 sieve Coarse, ¾" to 3" Fine, No. 4 to ¾"	Clean Gravels Less than 5% fines	GW	WELL GRADED GRAVEL
			GP	POORLY GRADED GRAVEL
		Gravels with fines More than 12% fines	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	Sands – 50% or more of coarse Fraction passes No. 4 sieve Coarse, No. 10 to No. 4 Medium, No. 40 to No. 10 Fine, No. 200 to No. 40	Clean Sands Less than 5% fines	SW	WELL GRADED SAND
			SP	POORLY GRADED SAND
		Sands with fines More than 12% fines	SM	SILTY SAND
			SC	CLAYEY SAND
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays – Liquid Limit less than 50 Low to medium plasticity	Inorganic	CL	LEAN CLAY
			ML	SILT
		Organic	OL	ORGANIC CLAY
				ORGANIC SILT
	Silts and Clays – Liquid Limit 50 or more Medium to high plasticity	Inorganic	CH	FAT CLAY
			MH	ELASTIC SILT
		Organic	OH	ORGANIC CLAY
				ORGANIC SILT
Highly Organic Soils	Primarily organic matter, dark in color and organic odor		PT	PEAT

DEFINITION OF SOIL COMPONENT PROPORTIONS (ASTM D-2487)

			Examples
Adjective Form	GRAVELLY SANDY	>30% to <50% coarse grained component in a fine-grained soil	GRAVELLY LEAN CLAY
	CLAYEY SILTY	>12% to <50% fine grained component in a coarse-grained soil	SILTY SAND
"With"	WITH GRAVEL WITH SAND	>15% to <30% coarse grained component in a fine-grained soil	FAT CLAY WITH GRAVEL
	WITH GRAVEL WITH SAND	>15% to <50% coarse grained component in a coarse-grained soil	POORLY GRADED GRAVEL WITH SAND
	WITH SILT WITH CLAY	>5% to <12% fine grained component in a coarse-grained soil	POORLY GRADED SAND WITH SILT

GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS ..... Unified Soil Classification Symbols are shown above as group symbols. A dual symbol "-" indicates the soil belongs to two groups. A borderline symbol "/" indicates the soil belongs to two possible groups.

FILL ..... Man-made deposit containing soil, rock and often foreign matter.

PROBABLE FILL ..... Soils which contain no visually detected foreign matter but which are suspect with regard to origin.

DISINTEGRATED ROCK (DR) ..... Residual materials with a standard penetration resistance (SPT) between 60 blows per foot and refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.

PARTIALLY WEATHERED ROCK (PWR) ..... Residual materials with a standard penetration resistance (SPT) between 100 blows per foot and refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.

BOULDERS & COBBLES ..... Boulders are considered rounded pieces of rock larger than 12 inches, while cobbles range from 3 to 12 inch size.

LENSES ..... 0 to ½ inch seam within a material in a test pit.

LAYERS ..... ½ to 12 inch seam within a material in a test pit.

POCKET ..... Discontinuous body within a material in a test pit.

MOISTURE CONDITIONS ..... Wet, moist or dry to indicate visual appearance of specimen.

COLOR ..... Overall color, with modifiers such as light to dark or variation in coloration.

Schnabel ENGINEERING TEST BORING LOG	Project: Pre-Development Planning Study - USCAVC 49 L Street SE Washington, D.C.	Boring Number: **B-1** Contract Number: 10212006 Sheet: 1 of 2

Contractor: Recon Drilling

Contractor Foreman: W. Rodas

Schnabel Representative: M. Grzelak

Equipment: Diedrich D-50 (ATV)

Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 3/2/10 **Finished:** 3/2/10

Location: See Location Plan

Ground Surface Elevation: 27± (ft) **Total Depth:** 70.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/2	---	42.0'	---	---
Completion	3/2	---	39.9'	---	---
Casing Pulled	3/2	---	38.6'	---	39.5'
After Drilling	3/3	---	38.2'	---	36.9'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	Concrete		26.5					
	FILL, sampled as sandy lean clay; moist, brown and dark purplish gray, contains mica, trace orangish brown	FILL		A		SS 2+4+8 REC=18", 100%		
3.5	SANDY LEAN CLAY; moist, brown and dark purplish gray, estimated <5% mica, trace orangish brown	CL	23.5	B1	5	SS 2+3+6 REC=18", 100%	MC = 22.6% PP = 1.75 tsf	
	Change: light brownish gray, trace orangish brown					SS 2+3+5 REC=18", 100%	PP = 1.00 tsf	
8.5	SANDY FAT CLAY; moist, gray and orangish brown, estimated <5% mica	CH	18.5		10	SS 4+4+6 REC=18", 100%	MC = 23.2% PP = 1.75 tsf	
13.5	CLAYEY SAND; moist, orangish brown to yellowish brown, estimated <5% mica	SC	13.5	B2	15	SS 4+5+5 REC=18", 100%	PP = 2.00 tsf	
18.5	LEAN CLAY WITH SAND; moist, light grayish brown, estimated <5% mica	CL	8.5	B1	20	SS 4+2+3 REC=18", 100%	PP < 0.25 tsf	Odor
23.5	SILT; moist, dark gray, estimated <5% mica, estimated <5% organics, estimated 5 - 10% sand	ML	3.5	B2	25	SS 2+3+5 REC=18", 100%	LL = 46 PL = 33 MC = 30.5% % Passing #200 = 86.1	Odor
28.5	SANDY LEAN CLAY; moist, gray, estimated <5% gravel	CL	-1.5	B1	30	SS 5+4+5 REC=18", 100%	PP = 0.75 tsf	
33.5	SILTY SAND; moist, dark gray, estimated <5% clay pockets, estimated <5% wood, estimated <5% mica	SM	-6.5	B2	35	SS 5+11+11 REC=18", 100%		

(continued)

TEST BORING LOG L STREET 10212006.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/17/10

Schnabel ENGINEERING TEST BORING LOG	Project: Pre-Development Planning Study - USCAVC 49 L Street SE Washington, D.C.	Boring Number: **B-1** Contract Number: 10212006 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
38.5	POORLY GRADED SAND WITH SILT AND GRAVEL; wet, gray, white and brown	SP-SM	-11.5	B2	40	SS 13+19+21 REC=18", 100%		
	Change: gray				45	SS 7+7+10 REC=18", 100%		
48.5	LEAN CLAY WITH SAND; moist, gray and greenish brown, estimated <5% mica	CL	-21.5	B1	50	SS 1+1+3 REC=18", 100%	PP = NA tsf	
	Change: dark gray, estimated 5 - 10% sand seams, estimated <5% organics, estimated <5% shell fragments				55	SS 2+3+5 REC=18", 100%	PP = 0.75 tsf	
58.5	SILTY SAND; moist, dark gray, estimated <5% mica	SM	-31.5	C	60	SS 1+3+3 REC=18", 100%		
	Change: WITH GRAVEL				65	SS 18+44+70 REC=18", 100%		
	Change: estimated <5% lignite, estimated <5% clay pockets				70	SS 25+33+52 REC=18", 100%		
70.0			-43.0					

Bottom of Boring at 70.0 ft.
Concrete cored before drilling (8 inch diameter).
Boring backfilled with spoils upon completion and concrete patched.
Excess spoils removed from site.
Elevation estimated from publicly available topography maps.
PP = pocket penetrometer (unconfined compressive stength)
NA = reading could not be obtained

TEST BORING LOG L STREET 10212006.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/17/10

Schnabel ENGINEERING	TEST BORING LOG	Project: Pre-Development Planning Study - USCAVC 49 L Street SE Washington, D.C.	Boring Number: **B-2** Contract Number: 10212006 Sheet: 1 of 2

Contractor: Recon Drilling

Contractor Foreman: W. Rodas

Schnabel Representative: M. Grzelak

Equipment: Diedrich D-50 (ATV)

Method: 2-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 3/1/10 **Finished:** 3/1/10

Location: See Location Plan

Ground Surface Elevation: 27± (ft) **Total Depth:** 70.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/1	---	39.5'	---	---
Completion	3/1	---	52.5'	---	---
Casing Pulled	3/1	---	Dry	---	40.6'
After Drilling	3/2	---	Dry	---	40.1'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.7	Concrete		26.3					
	FILL, sampled as sandy fat clay; moist, brown and orangish brown, trace grayish brown, contains brick fragments, gravel and slag	FILL				SS 3+4+4 REC=18", 100%		
3.5			23.5	A				
	FILL, sampled as sandy lean clay; moist, light grayish brown, contains mica, trace orangish brown	FILL			5	SS 4+8+10 REC=18", 100%	MC = 21.7%	
6.0			21.0					
	FILL, sampled as sandy fat clay; moist, light grayish brown, contains brick fragments, trace orangish brown	FILL				SS 2+3+3 REC=18", 100%		
8.5			18.5					
	SANDY FAT CLAY; moist, orangish brown and gray, estimated <5% mica	CH			10	SS 3+6+8 REC=18", 100%	MC = 19.6% PP = 4.00 tsf	
					15	SS 6+8+9 REC=18", 100%	PP = 3.00 tsf	
18.5			8.5					
	SANDY LEAN CLAY; moist, light brownish gray, estimated <5% mica, trace orangish brown	CL		B1	20	SS 3+4+6 REC=18", 100%	MC = 27.0% PP = 0.50 tsf	
23.5			3.5					
	SANDY ELASTIC SILT; moist, dark gray, estimated <5% mica, estimated <5% organics	MH			25	SS 3+4+6 REC=18", 100%	PP = NA tsf	
28.5			-1.5					
	SANDY LEAN CLAY; moist, purplish gray, estimated <5% mica, estimated <5% shell fragments	CL			30	SS 2+3+6 REC=18", 100%	PP < 0.25 tsf	
33.5			-6.5					
	SILTY SAND; moist, gray, estimated <5% mica, estimated <5% clay pockets, trace black	SM		B2	35	SS 4+7+9 REC=18", 100%	MC = 16.4%	

(continued)

TEST BORING LOG L STREET 10212006.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/17/10

Schnabel ENGINEERING TEST BORING LOG	Project: Pre-Development Planning Study - USCAVC 49 L Street SE Washington, D.C.	Boring Number: **B-2** Contract Number: 10212006 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
38.5	POORLY GRADED SAND WITH SILT AND GRAVEL; wet, gray, off-white and brown	SP-SM	-11.5		40	SS 15+26+32 REC=18", 100%		
43.5	SILTY SAND WITH GRAVEL; wet, gray to brown, estimated <5% clay pockets	SM	-16.5	B2	45	SS 5+19+8 REC=18", 100%		Odor
48.5	WELL GRADED GRAVEL WITH SILT AND SAND; wet, gray and purplish brown	GW-GM	-21.5		50	SS 10+22+27 REC=14", 78%		Odor
53.5	SANDY LEAN CLAY; moist, dark gray, estimated <5% mica, estimated <5% shell fragments	CL	-26.5	B1	55	SS 3+4+6 REC=18", 100%	PP = 0.75 tsf	
58.5	SILTY SAND; moist, gray, estimated <5% mica	SM	-31.5	C	60	SS 5+11+6 REC=18", 100%		
	Change: estimated <5% clay pockets				65	SS 8+17+25 REC=18", 100%		
70.0	Change: WITH GRAVEL; estimated 15 - 25% clay pockets		-43.0		70	SS 18+54+78 REC=18", 100%		

Bottom of Boring at 70.0 ft.
Concrete cored before drilling (8 inch diameter).
Boring backfilled with spoils upon completion and concrete patched.
Excess spoils removed from site.
Elevation estimated from publicly available topography maps.
PP = pocket penetrometer (unconfined compressive stength)
NA = reading could not be obtained

Schnabel ENGINEERING — **TEST BORING LOG**

Project: Pre-Development Planning Study - USCAVC
49 L Street SE
Washington, D.C.

Boring Number: **B-3**
Contract Number: 10212006
Sheet: 1 of 2

Contractor: Recon Drilling
Contractor Foreman: W. Rodas
Schnabel Representative: M. Grzelak
Equipment: Diedrich D-50 (ATV)
Method: 2-1/4" I.D. Hollow Stem Auger
Hammer Type: Auto Hammer (140 lb)
Dates Started: 3/2/10 **Finished:** 3/3/10
Location: See Location Plan
Ground Surface Elevation: 27± (ft) **Total Depth:** 70.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/2	---	18.5'	---	---
Completion	3/3	---	24.3'	---	---
Casing Pulled	3/3	---	38.5'	---	50.6'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.6	Concrete		26.4					
	FILL, sampled as sandy fat clay; moist, orangish brown and gray, contains mica and gravel	FILL		A		SS 3+3+7 REC=18", 100%		
3.5	FILL, sampled as sandy lean clay; very moist, gray and brown, contains gravel and mica	FILL	23.5		5	SS 3+4+6 REC=18", 100%		Odor
6.0	SANDY FAT CLAY; moist, orangish brown, estimated <5% mica, trace black and gray	CH	21.0			SS 4+6+9 REC=18", 100%	MC = 23.1% PP = 3.50 tsf	
8.5	LEAN CLAY; moist, light grayish brown and orangish brown, estimated <5% sand	CL	18.5		10	SS 4+5+8 REC=18", 100%	LL = 38 PL = 15 MC = 22.3% % Passing #200 = 96.2 PP = 2.50 tsf	
13.5	SANDY FAT CLAY; moist, light grayish brown and orangish brown, estimated <5% mica	CH	13.5		15	SS 5+7+13 REC=18", 100%	MC = 20.0% PP = 2.50 tsf	
18.5	SANDY LEAN CLAY; moist, light grayish brown, trace orangish brown	CL	8.5	B1	20	SS 4+6+8 REC=18", 100%	PP = 1.00 tsf	
	Change: dark gray, estimated <5% mica, estimated <5% organics, estimated <5% shell fragments				25	SS 2+2+4 REC=18", 100%	PP = 1.00 tsf	
	Change: light purplish gray				30	SS 7+4+5 REC=18", 100%	PP = 0.25 tsf	
	Change: gray, estimated <5% organics				35	SS 4+4+6 REC=18", 100%	PP = 0.25 tsf	

(continued)

TEST BORING LOG L STREET 10212006.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/17/10

Schnabel ENGINEERING TEST BORING LOG	Project: Pre-Development Planning Study - USCAVC 49 L Street SE Washington, D.C.	Boring Number: **B-3** Contract Number: 10212006 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	Change: estimated <5% organics, estimated <5% shell fragments, trace light brown	CL		B1	40	SS 2+4+4 REC=18", 100%	PP = 0.25 tsf	
43.5	SILTY SAND WITH GRAVEL; moist, gray, off-white and brown	SM	-16.5	B2	45	SS 12+15+14 REC=18", 100%		
	Change: wet				50	SS 19+15+22 REC=18", 100%		Odor
53.5	SANDY LEAN CLAY; moist, dark gray, estimated <5% mica, estimated <5% organics, estimated <5% shell fragments, trace brown	CL	-26.5	B1	55	SS 2+3+4 REC=18", 100%	PP = 0.50 tsf	
58.5	SILTY SAND; moist, dark gray, estimated <5% mica	SM	-31.5	C	60	SS 6+18+20 REC=18", 100%		
	Change: WITH GRAVEL				65	SS 4+20+22 REC=18", 100%		
	Change: brown and gray				70	SS 22+31+27 REC=18", 100%		
70.0			-43.0					

Bottom of Boring at 70.0 ft.
Concrete cored before drilling (8 inch diameter).
Boring backfilled with spoils upon completion and concrete patched.
Excess spoils removed from site.
Elevation estimated from publicly available topography maps.
PP = pocket penetrometer (unconfined compressive stength)

TEST BORING LOG L STREET 10212006.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 5/17/10

APPENDIX B

SOIL LABORATORY TEST DATA

Summary of Soil Laboratory Tests (2 sheets)
Gradation Curves (2 sheets)

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Summary Of Laboratory Tests

Project Number: 10212006.00

Boring No.	Sample Depth ft / Elevation ft	Sample Type	Description of Soil Specimen	Natural Moisture (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	% Retained No. 4 Sieve	pH	Oxidation Reduction Potential (mV)	Resistivity (ohm-cm)	Sulfides
B-1	3.5 - 5.0	Jar		22.6	--	--	--	--	--	--	--	--	--
B-1	8.5 - 10.0	Jar		23.2	--	--	--	--	--	--	--	--	--
B-1	23.5 - 25.0	Jar	SILT (ML), contains sand, dark gray	30.5	46	33	13	86.1	0.0	--	--	--	--
B-2	3.5 - 5.0	Jar		21.7	--	--	--	--	--	--	--	--	--
B-2	8.5 - 15.0	Jar		19.6	--	--	--	--	--	5.9	258	3800	0
B-2	18.5 - 25.0	Jar		27.0	--	--	--	--	--	6.3	223	2900	0
B-2	33.5 - 35.0	Jar		16.4	--	--	--	--	--	--	--	--	--

Notes:
1. Soil tests in general accordance with ASTM standards.
2. Soil classifications are in general accordance with ASTM D2487(as applicable), based on testing indicated and visual classification.
3. Key to abbreviations: NP=Non-Plastic; -- indicates no test performed

Schnabel ENGINEERING

Project: Pre-Development Planning Study - USCAVC

DYNAMIC LAB SUMMARY LAB TEST RESULTS B-1-B-3.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 4/22/10

Summary Of Laboratory Tests

Project Number: 10212006.00

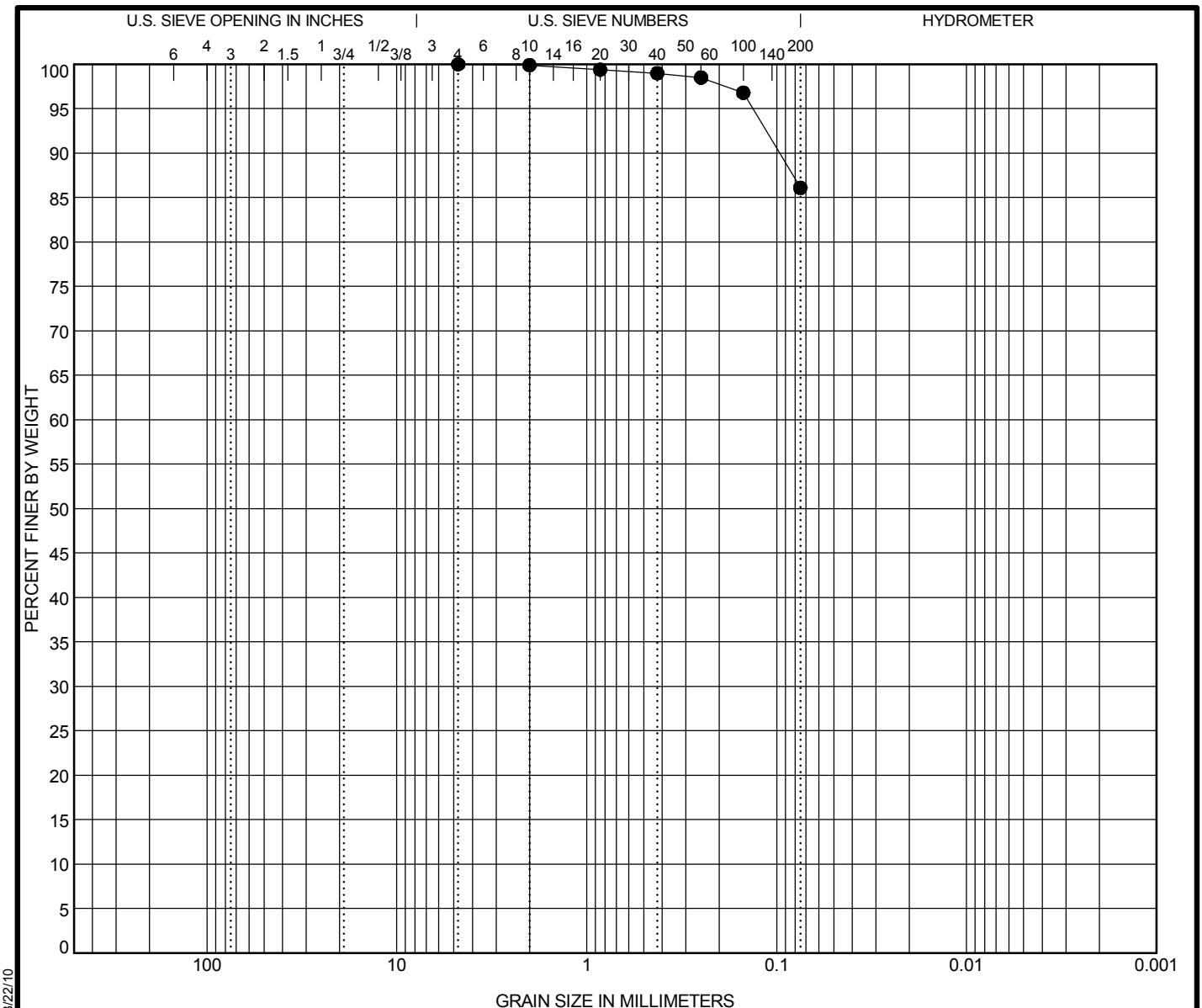
Boring No.	Sample Depth ft / Elevation ft	Sample Type	Description of Soil Specimen	Natural Moisture (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	% Retained No. 4 Sieve	pH	Oxidation Reduction Potential (mV)	Resistivity (ohm-cm)	Sulfides
B-3	6.0 - 7.5	Jar		23.1	--	--	--	--	--	--	--	--	--
B-3	8.5 - 10.0	Jar	LEAN CLAY (CL), contains sand, brown	22.3	38	15	23	96.2	0.0	--	--	--	--
B-3	13.5 - 15.0	Jar		20.0	--	--	--	--	--	--	--	--	--

Notes:
1. Soil tests in general accordance with ASTM standards.
2. Soil classifications are in general accordance with ASTM D2487(as applicable), based on testing indicated and visual classification.
3. Key to abbreviations: NP=Non-Plastic; -- indicates no test performed

Schnabel ENGINEERING

Project: Pre-Development Planning Study - USCAVC

DYNAMIC LAB SUMMARY LAB TEST RESULTS B-1-B-3.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 4/22/10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen		Sample Description	LL	PL	PI		
● B-1	23.5 ft	**SILT (ML), contains sand, dark gray**	**46**	**33**	**13**		

Test Method	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
ASTM D6913	**4.75**				**0.0**	**13.9**	**86.1**	

Percent Finer

Sieve Size (mm)	0.075	0.15	0.25	0.425	0.85	2	4.75
% Finer	86.1	96.8	98.5	99.0	99.4	99.9	100.0

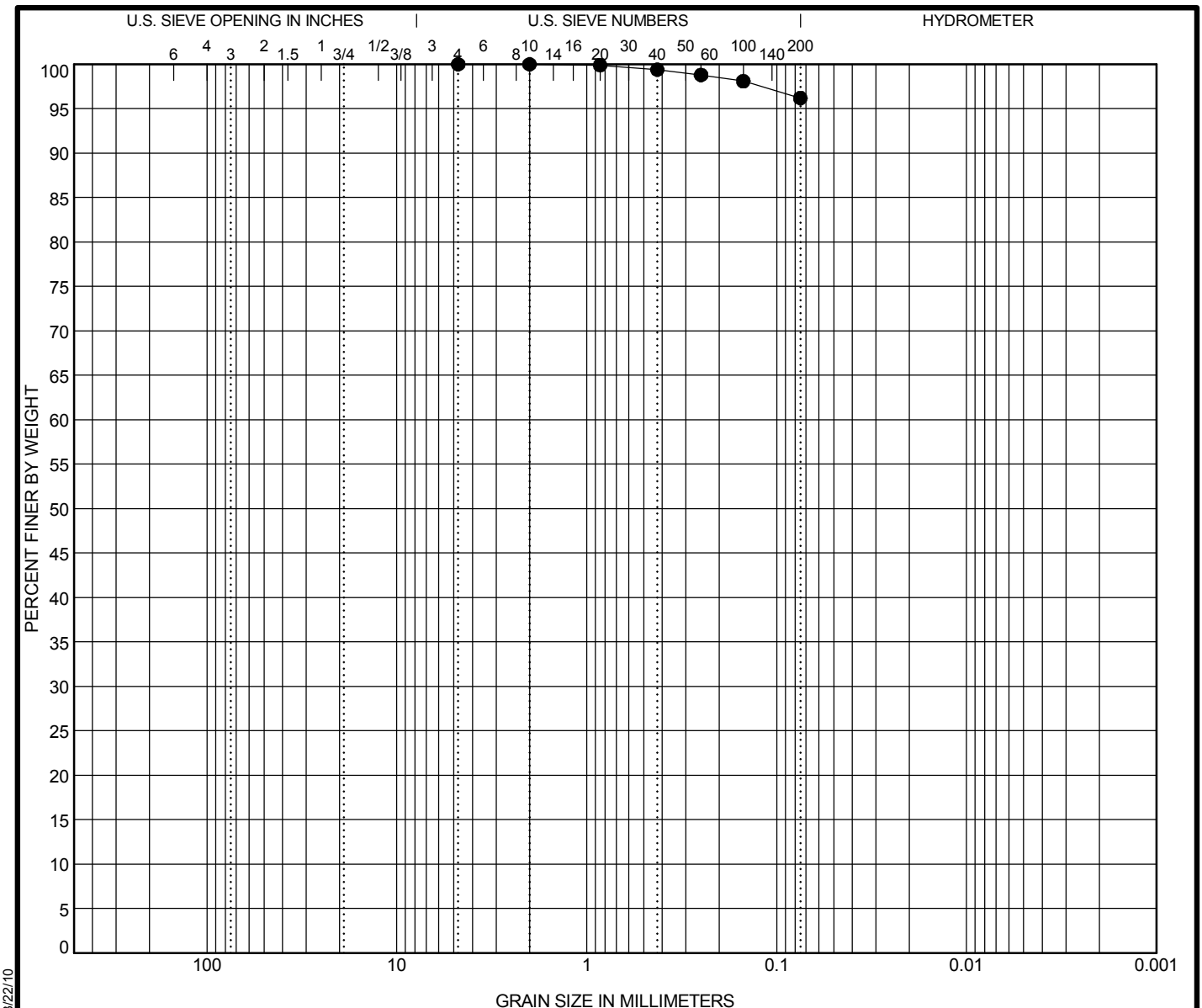
Schnabel ENGINEERING

GRADATION CURVE

Project: Pre-Development Planning Study - USCAVC

Contract: 10212006.00

SIEVE 1/SHEET LAB TEST RESULTS B-1-B-3.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 3/22/10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen		Sample Description	LL	PL	PI		
● B-3	8.5 ft	**LEAN CLAY (CL), contains sand, brown**	**38**	**15**	**23**		

Test Method	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
ASTM D6913	**4.75**				**0.0**	**3.8**	**96.2**	

Percent Finer

Sieve Size (mm)	0.075	0.15	0.25	0.425	0.85	2	4.75
% Finer	96.2	98.1	98.8	99.4	99.9	100.0	100.0

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GRADATION CURVE

Project: Pre-Development Planning Study - USCAVC

Contract: 10212006.00

SIEVE 1/SHEET LAB TEST RESULTS B-1-B-3.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 3/22/10

APPENDIX C

RADON TESTING DATA

Radon Test Results (1 sheet)

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AccuStar Labs — Radon in Air

NEHA NRPP 101193 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NEHA Device Code 8205
NRSB Device Code 12001

Laboratory Report For

Schnabel Engineering Associates-M. Grzelak
656 Quince Orchards Road Suite 700
Gaithersburg MD 20878

Property Tested

Project # 10212006-TASK 1

Pre Development Planning Study
49 L Street Southeast
Washington DC

Log Number	Device Number	Exposure Period		Area Tested	Result (pCi/L)
1154059	2028116	3/31/2010	4/7/2010	Outside West R-1	63.0
1154060	2028117	3/31/2010	4/7/2010	Outside West R-1	80.0
1154061	2028118	3/31/2010	4/7/2010	Outside East R-2	109.0
1154062	2028119	3/31/2010	4/7/2010	Outside East R-2	90.0

Comment: A copy of this report was emailed to mgrzelak@schnabel-eng.com. No test address zip code provided. Your Alpha Track results are valid but do not meet the EPA protocol for long term testing of 91 to 365 days.

Distributed By: Schnabel Engineering Associates

Test Performed By: M. Grzelak

Date Received: 4/9/2010 Date Analyzed: 4/14/2010 Date Reported: 4/14/2010

Report Reviewed By: R. Rossi Report Approved By: Carolyn K. Allen

Carolyn K. Allen President, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 15 %. Factors contributing to uncertainty include, statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques, and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

11 Awl Street Medway MA 02053 888-480-8812 FAX 508-533-8831

APPENDIX D

WMATA SUBSURFACE EXPLORATION DATA

Boring Log, F-37U (1 sheet)

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BORING NUMBER F-37U

Ground surface elevation + 28.9

Depth	Blows	Sample	N	Description	Stratum
0	21, 13, 11, 12	1D	11,9, 4	Dark-brown clayey silt, some fine sand, trace gravel (Fill) (ML)	DK BRN SI, FILL 4.0'
5	9, 18, 21, 37, 71	2D	6,9, 15	Gray-brown silty clay (Fill) (CL)	
0	37, 36, 27	3D	10,14 16	Do 2D (Red-brown & desiccated (CL)	MEDIUM STIFF TO STIFF GRAY-BROWN SILTY CLAY
	38, 40	4U	P	Gray-brown silty clay, trace fine sand (CL)	
15	20, 27, 35	5U	P	Do 4U (CL)	
	46	6U	P	Gray-brown silty clay (CL)	
20	71, 38	7D	6,11, 18	Do 6U (CL)	
	30, 38, 25, 22, 14	8U	P	Stiff yellow-brown medium plastic clay (CH)	24.0'
25	16, 10	9U	P	Gray clay & silt, trace fine sand (CL & MH)	MEDIUM COMPACT GRAY SILT TURNING TO SILTY FINE TO MEDIUM SAND WITH LAYERS DARK-GRAY SILTY CLAY
	21, 31, 36	10D	9,6, 13	Gray fine sandy silt, lense fine to medium sand (ML)	
30	56, 37, 32	11D	7,8,5	Gray silty fine to medium sand, some clay layers (SM)	
	35, 42	12U	P	Gray clay with fine to medium sand layers (CL)	
35	110, 90, 200, 88, 61	13D	6,14, 13	Brown medium to fine sand, some clay (SC)	
40	45, 40, 45	14D	7,7,7	Gray silty clay, some fine sand (CL-ML)	
	47, 83	15U	P	Gray silty fine sand (SM)	45.0'
45	113, 89, 70, 67, 68	16D	26,30 44	Gray coarse to fine sand & gravel, some clay (SM & SC)	COMPACT GRAY-BROWN C-F SAND & GRAVEL, TRACE SILT
50	72, 131, 185, 126, 106	17D	13,13 22	Gray-brown coarse to fine sand & gravel, trace silt (SP)	54.5'
55	79, 75	18D	8,8, 13	Brown-gray organic silty clay, trace gray fine sand seams, decayed wood (OH)	COMPACT GRAY MEDIUM TO FINE SAND & STIFF GRAY SILTY CLAY WITH LAYERS OF DECOMPOSED WOOD
	265, 270, 220	19U	P	Gray silty fine to medium sand, trace silt (SM)	
60	124, 340, 380, 172, 103	20D	31,37 40	Gray medium to fine sand, some silt (SM)	
65	100, 100, 141, 145, 200	21D	18,60 45	Top: Dark-gray organic silty clay, layers decayed wood (OH) Bot: Brown medium to fine sand, trace silt (SP-SM)	71.0'
70		22D	32,42 34	Gray-green plastic clay with lense medium to fine sand (CH)	HARD GRAY-GREEN & GRAY-BROWN MEDIUM PLASTIC CLAY & SANDY CLAY INTER-LENSED WITH GRY-BRN FINE SAND
75		23D	36,52 90	Gray-green & dark-brown silty clay interlensed with gray-brown fine sand (CL)	
80		24D	20,26 41	Do 23D, sandy clay (CL)	
85		25D	24,36 52	Do 23D (CL)	
		26D	36,55 57	Gray to gray-green fine to medium sand & gravel, trace clay (SP-SM)	90.0'
90					

Boring started 7-29-71 , completed 8-4-71
Final depths:
Boring = 90.0' Casing = 70'
Casing diameter =4"
Average depth of ground water =33.5' = El. -4.6

WMATA SUBSURFACE EXPLORATION DATA

PROJECT NO. 10212006

PRE-DEVELOPMENT PLANNING STUDY - USCAVC
49 L STREET SE
WASHINGTON, DC

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