Appendix C

WHITESTONE ASSOCIATES, INC.
ENVIRONMENTAL & GEOTECHNICAL ENGINEERS & CONSULTANTS

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June 30, 2006

via email and U.S. Mail

COSTCO WHOLESALE, INC.
45940 Horseshoe Drive, Suite 150
Sterling, Virginia 20166

Attention: Erich J. Brann
Real Estate Development Manager

Regarding: REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED COSTCO WHOLESALE
OLD COUNTRY ROAD (CR 58)
DISTRICT 600, SECTION 101, BLOCK 01, LOT 3
DISTRICT 600, SECTION 119, BLOCK 01, LOT 6
TOWNSHIP OF RIVERHEAD, SUFFOLK COUNTY, NEW YORK
WHITESTONE PROJECT NO.: WJ06-8805

Dear Mr. Brann:

Whitestone Associates, Inc. (Whitestone) has completed a preliminary geotechnical investigation of the subsurface conditions at the above referenced site. The results of the limited evaluation and preliminary recommendations presented below are based on the soil conditions disclosed from a limited number of borings conducted during Whitestone's June 23, 2006 field investigation. Assuming consistent subsurface soil conditions are encountered during a future comprehensive geotechnical investigation (in accordance with *Costco Wholesale Development Requirement, Version 2005.1.1*, revised June 30, 2005), these soils should be adequate for shallow foundations and should have a high permeability for stormwater infiltration contingent upon the application of recommendations presented herein and further subsurface investigation.

1.0 PROJECT INFORMATION

The project site is located on Old Country Road (CR 58) in the Township of Riverhead, Suffolk County, New York. The subject property is situated northwest of the intersection of Old Country Road and Mill Road in Riverhead, Suffolk County, New York. Based on a visual site inspection, the subject property presently is a vacant, heavily wooded parcel. The site apparently slopes downward in the eastern direction with the difference between the highest and lowest elevation being approximately 20 to 25 feet. Final grading information was not available at the time of this report, however, based on a visual site inspection and existing grades, Whitestone anticipates that site development will require up to approximately 10 feet of cut and fill placement within the building pad and pavement areas.

Based on a December 5, 2005 *Alignment Plan* prepared by Nelson & Pope, a February 23, 2006 *Preliminary Site Plan* prepared by Mulvanny G2 Architects (MG2), and recent telephone conversations with Bohler Engineering, P.C. (Bohler), Whitestone understands that the proposed Costco facility development will

consist of construction of an approximately 153,368 square feet Costco Wholesale building and tire center, and associated utilities and paved areas. The building structure will consist of a combination of load-bearing masonry walls with steel joist and column framing and a concrete slab-on-grade. Whitestone understands that the proposed building and structural load data are consistent with the aforementioned *Costco Wholesale Development Requirements*.

2.0 SCOPE OF SERVICES

While the scope of this preliminary investigation may not be sufficient to formulate detailed design recommendations, and a more comprehensive geotechnical investigation including additional soil borings, and/or test pits, ultimately may be required, this preliminary investigation will be useful in assessing potentially development impacting geotechnical issues to support preliminary studies regarding the feasibility of developing the property. The primary goal of this preliminary subsurface soils investigation was to assess soil bearing capacity, soil re-use options, depth to groundwater, and impact of potentially problematic soils.

2.1 Field Exploration

Whitestone's preliminary geotechnical investigation of the project site was conducted by means of three soil test borings (identified as B-1 through B-4) which were drilled with a portable tri-pod sampling equipment. Borings B-1 through B-4 were drilled within or near the proposed Costco Wholesale building pad area to depths ranging between approximately 15 feet below ground surface (fbgs) and 18 fbgs. Soil borings subsequently were backfilled to the surface with excavated soils from the investigation and surficially patched with asphaltic concrete cold patch. The locations of the soil borings are shown on the accompanying *Boring Location Plan* included as Figure 1. Records of subsurface exploration are provided in Appendix A.

The soil borings were conducted in the presence of a Whitestone engineer who performed field tests, recorded visual classifications, and collected samples of the various soil strata encountered. The boring locations were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet.

Soil borings and standard penetration tests (SPTs) were conducted in general accordance with ASTM designation D 1586. The SPT resistance value (N) can be used as an indicator of the consistency of fine-grained soils and the relative density of coarse-grained soils. The N-value for various soil types can be correlated with the engineering behavior of earthworks and foundations.

Groundwater level observations were recorded during and at the completion of field operations prior to backfilling the borings. Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitoring wells may not be representative of true groundwater levels.

2.2 Laboratory Testing Program

In addition to the field investigation, a supplemental laboratory testing program was conducted to determine additional, pertinent engineering characteristics of representative samples of on-site soils. The laboratory testing program was performed in general accordance with applicable ASTM standard test methods and included physical testing.

Physical and Textural Analyses: Representative samples of selected strata encountered were subjected to a laboratory testing program which included moisture content determinations (ASTM D 2216) and washed gradation analyses (ASTM D 422) in order to perform supplementary engineering soil classifications in general accordance with ASTM D 2487. The soil strata tested were classified by the Unified Soil Classification System (USCS). The results of the laboratory testing program are presented in tabular form below and quantitative results are provided in Appendix B.

Boring	Sample	USCS Classification	Atterberg Limits		Natural Moisture (w_n)
			Liquid Limit	Plastic Limit	
B-2	S-1	SP-SM	-	Non-Plastic	3.4
B-3	S-2	SP	-	SP	2.58

3.0 DESCRIPTION OF SUBSURFACE CONDITIONS

Surface Cover: The borings encountered approximately two inches of topsoil at the surface.

Natural Sand: Underlying the topsoil, the borings encountered natural coastal plain deposits that generally consisted of either yellowish brown, relatively loose dense, medium to fine sand (USCS: SM) with variable amounts of silt and gravel; and brownish yellow, relatively medium dense, medium to fine sand (USCS: SP, and SP-SM) with a trace amount of silt and variable amounts of gravel. The borings were terminated within these materials at depths of approximately 15 to 18 feet below ground surface (fbgs). SPT N-values ranged from four blows per foot (bpf) to 22 bpf and averaged approximately 12 bpf, generally indicating loose to medium dense relative densities.

Groundwater: Groundwater was encountered in boring B-3 and B-4 at depths of approximately 7.5 fbgs and 10.5 fbgs respectively, as part of this investigation. Groundwater conditions likely will fluctuate seasonally with tidal effects and following periods of rain.

4.0 FINDINGS AND RECOMMENDATIONS

The following preliminary recommendations are based on the assumption that consistent conditions will be encountered when a comprehensive geotechnical investigation compliant with Costco's criteria is conducted. These findings and preliminary recommendations may be used to evaluate the feasibility of site development.

Surface Cover Stripping: Prior to the start of construction, all utilities should be identified and secured. Surface cover materials such as topsoil, grass, shrubs and trees should be removed from within, and at least five feet beyond, the limits of the proposed construction areas.

Surface Preparation/Proofrolling: Prior to placing any fill or subbase materials to raise or restore grades to the desired building pad subgrade elevations, the existing exposed soils should be compacted to a firm and unyielding surface with several passes in two perpendicular directions of a minimum 10-ton static drum roller for coarse grained soils or a kneading (sheep's foot) roller for fine grained soils. The surface then should be proofrolled with a loaded tandem axle truck in the presence of the geotechnical engineer to help identify

soft or loose pockets which may require removal and replacement or further investigation. Proofrolling should be conducted after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade. Any fill or backfill should be placed and compacted in accordance with recommendations made herein.

Subgrade Protection and Inspection: Every effort should be made to minimize disturbance of silty sand site soils by construction traffic and surface run-off. Positive drainage should be maintained to avoid ponding water which would increase the amount of softening and subgrade disturbance. The stability of the subsoils and any alternative stabilization measures must be carefully evaluated by a geotechnical engineer during the construction phase.

Preliminary Shallow Foundation Design Criteria: Based on the conditions encountered, Whitestone preliminarily anticipates that the proposed building can be supported on conventional, shallow spread and continuous wall footings designed to bear either within the natural sands or properly evaluated and compacted imported structural fill. Foundations bearing within these materials may be designed to exert a maximum allowable net bearing pressure of 3,000 pounds per square foot (psf). However, due to the low SPT N-values indicating relatively loose dense soils in approximately the upper five feet of the natural sands encountered, limited overexcavation and recompaction of soils below the footings should be anticipated. Footing excavation bottoms should be compacted in place by hand-operated vibratory equipment and proofrolled in the presence of the geotechnical engineer to compact loose or disturbed soils and identify soft pockets of sand. Whitestone estimates post-construction settlements of proposed building foundations to be less than one inch if the recommendations outlined in this letter report are properly implemented. Differential settlements should be less than one-half inch. Footings subject to frost action should be placed at least 42 inches below adjacent exterior grades or deeper if required by local building codes to provide protection from frost penetration. Interior footings not subject to frost action may be placed at a shallower depth of 18 inches below the slab subgrade. Regardless of loading conditions, proposed foundations should be sized no less than minimum dimensions of 24 inches for continuous wall footings and 36 inches for isolated column footings.

Floor Slab: The natural sand soils or controlled structural fill will be suitable for support of the proposed floor slabs provided these materials are properly evaluated, placed, compacted, and proofrolled. The properly prepared on-site soils are expected to yield a minimum subgrade modulus (k) of 175 psi/in. A minimum four inch layer of stone and vapor barrier should be installed below the floor slabs to provide a capillary break. Post-construction settlements of floor slabs installed in accordance with the recommendations outlined in this report are estimated to be on the order of one quarter inch.

Groundwater: Groundwater was encountered within borings B-3 and B-4 at an approximate depths of 7.5 fbgs and 10.5 fbgs respectively. Depending on the final footing embedment depth, groundwater and or perched conditions may be encountered during excavation, as such construction phase dewatering may be necessary. Excavations extending less than approximately two feet below groundwater typically may be controlled by providing a sufficient number of sump pumps placed at the base of the excavations to allow subsequent construction and backfill placement to occur in-the-dry. Deeper excavations for the placement of footings at greater depths may require more extensive dewatering systems, possibly including watertight sheeting and shoring, sump pits, and a well point system. The site soils typically have a relatively rapid permeability. Such soils will drain rapidly after precipitation and also can accept stormwater recharge by infiltration/drywell systems.

Soil Reusability: Whitestone preliminarily anticipates that the majority of existing on-site natural sand deposits may be reused as structural fill provided that the recommended particle size, moisture and

compaction controls are achieved. The poorly graded sands will dry rapidly and may require re-wetting in summer months to achieve compaction. Stripped surface materials should not be reused as controlled structural fill.

Construction Inspection and Monitoring: The owner's geotechnical engineer should perform inspection, testing, and consultation during construction. Monitoring and testing should also be performed to verify that the existing surface cover materials are properly removed, foundations are bearing on suitable compacted materials, suitable materials are used for controlled fill, and that they are properly placed and compacted over suitable subgrade soils.

Supplemental Investigation: Upon obtaining the required tree clearing permit by the site developer as per the Town of Riverhead ordinance,, a more comprehensive geotechnical investigation including additional borings per *Costco's Wholesale Development Requirement* should be completed to confirm these preliminary findings and provide more detailed recommendations for design.

Whitestone's geotechnical division appreciates the opportunity to be of continued service to Costco Wholesale, Inc. Please contact us at (908) 668-7777 if you have any further questions or comments.

Sincerely,

WHITESTONE ASSOCIATES, INC.

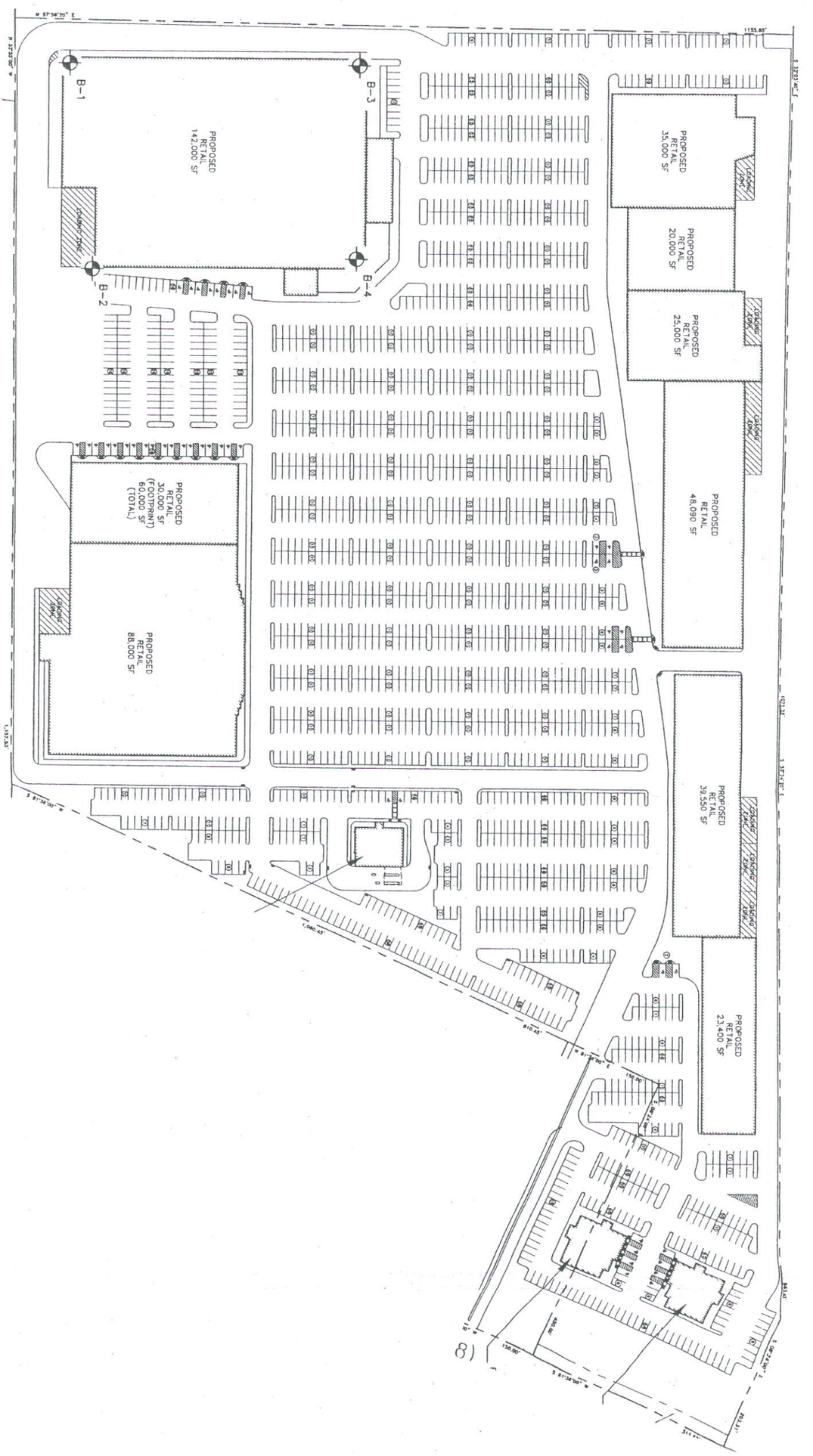
Nejm E. Jundi, P.E.
Geotechnical Engineer

Jeffrey W. Schaumburg, P.E.
Director, Geotechnical Services

NEJ/plw L:\WhitestoneOffice\2006\068805\8805Limitrogi.wpd
Enclosures
Copy: J. Scott Normandin, Bohler Engineering, P.C. (NY)

WHITESTONE
ASSOCIATES, INC.

FIGURE 1
Boring Location Plan



LEGEND

B-1 — BORING LOCATION (APPROX.)

— — — — SUBJECT PROPERTY BOUNDARY (APPROX.)

REFERENCE

THIS PLAN IS BASED UPON A DECEMBER 5, 2005 ALIGNMENT PLAN PREPARED BY NELSON & POPE ENGINEERS & SURVEYORS

TITLE:

BORING LOCATION PLAN

CLIENT: COSTCO WHOLESALE CORPORATION

PROJECT: PROPOSED COSTCO WHOLESALE FACILITY
OLD COUNTRY ROAD (CR 58)
RIVERHEAD, SUFFOLK COUNTY, NEW YORK

WHITESTONE ASSOCIATES, INC.
35 TECHNOLOGY DRIVE
WARREN, NEW JERSEY 07059
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PROJECT #:	BY:	PROJ. MGR.:	DATE:	SCALE:	FIGURE:
WJ06-8805	RF	KTD	06/29/06	N.T.S.	1

WHITESTONE ASSOCIATES, INC.

APPENDIX C
Supplemental Information (USCS, Terms and Symbols)

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UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMITS LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMITS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS FOR SAMPLES WITH 5% TO 12% FINES

GRADATION*

% FINER BY WEIGHT

TRACE..... 1% TO 10%
LITTLE..... 10% TO 20%
SOME..... 20% TO 35%
AND..... 35% TO 50%

COMPACTNESS*
Sand and/or Gravel

	RELATIVE DENSITY
LOOSE	0% TO 40%
MEDIUM DENSE	40% TO 70%
DENSE	70% TO 90%
VERY DENSE	90% TO 100%

CONSISTENCY*
Clay and/or Silt

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT..... LESS THAN 250
SOFT..... 250 TO 500
MEDIUM..... 500 TO 1000
STIFF..... 1000 TO 2000
VERY STIFF..... 2000 TO 4000
HARD..... GREATER THAN 4000

* *VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.*

Other Office Locations:

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GEOTECHNICAL TERMS AND SYMBOLS

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N:	Standard Pentration Value: Blows per ft. of a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.
Qu:	Unconfined compressive strength, TSF.
Qp:	Penetrometer value, unconfined compressive strength, TSF.
Mc:	Moisture content, %.
LL:	Liquid limit, %.
PI:	Plasticity index, %.
ôd:	Natural dry density, PCF.
▼:	Apparent groundwater level at time noted after completion of boring.

DRILLING AND SAMPLING SYMBOLS

NE:	Not Encountered (Groundwater was not encountered).
SS:	Split-Spoon - 1 ⅜" I.D., 2" O.D., except where noted.
ST:	Shelby Tube - 3" O.D., except where noted.
AU:	Auger Sample.
OB:	Diamond Bit.
CB:	Carbide Bit
WS:	Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Term (Non-Cohesive Soils)	Standard Penetration Resistance
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Term (Cohesive Soils)	Qu (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

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