





*Department of Housing*



*Rebuilding Together*

*Owner Occupied and Scattered Site Rehabilitation Programs*

Addendum #2– Attachment 1

Geotechnical Engineering Report

**Geotechnical Engineering Report**

by

**The Geotechnical Department, LLC**

for

**Soiltesting, Inc.**

**Dated: July 7, 2014**

**Martinez Couch & Associates**

**G119-9751-14**

# The Geotechnical Department, LLC

Consulting Engineers

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July 7, 2014  
Project No. 2059

Martinez Couch & Associates, LLC  
1084 Cromwell Avenue, Suite A-2  
Rocky Hill, Connecticut 06067

Attn: Matthew Ranando

Re: Geotechnical Engineering Report  
Proposed Alterations to Raise House  
44 Washington Parkway  
Stratford, Connecticut

This report is submitted as per our agreement with Soiltesting Inc. and the attached "Geotechnical Limitations." It includes our findings, conclusions and recommendations related to the geotechnical aspects of design and construction for raising the house for future flood protection.

One (1) test boring was performed by Soiltesting Inc. on June 23, 2014. The location plan and record sheet are attached as part of this report. This information was used in preparation of this report.

Based on our interpretation of field conditions and the scope of the project it was deemed unnecessary to perform laboratory soil tests to assist with the identification of soil and the evaluation of their engineering properties.

Subsurface conditions include soil fill consisting of loose sand with silt to a depth of eight (8) feet. Soft organic silt and sand with peat then exists to a depth of fifteen (15) feet. Medium dense fine sand with traces of silt and gravel continues the soil profile to the maximum depth of exploration, thirty-seven (37) feet.

Water was observed in the borehole at a depth of six (6) feet at the time the boring was completed.

The following were considered in developing the conclusions and recommendations of this report:

1. An aerial photograph showing the house plan and boring location.
2. The proposed work is to raise the existing building foundation for flood protection.
3. Differential settlement should not be greater than three-quarters (3/4) of an inch across the house footprint.
4. Design and construction shall be in accordance with the Connecticut Building Code (Code).

The in-place sand fill and organic layer are not suitable for the support of conventional spread footings. Spread footings bearing on the suitable soil below the fill and organics or on quality compacted soil fill placed after removal of the fill and organics are foundation alternatives. These alternatives, however, are considered impractical due to equipment access constraints, the quantity of excavation and backfill and the need for dewatering the excavation to allow construction.

Deep foundations are deemed a more appropriate foundation alternative. Drilled-in piles could be installed with the tips bearing in the undisturbed medium dense sand system below the in-place fill and organic silt and peat. Driven piles are not an option due to equipment access issues.

The following geotechnical design and construction recommendations are offered:

1. Use drilled-in pile foundations for support of the existing and/or altered house foundation.
2. Tabulated below are design recommendations for several typical pile sections. The capacities refer to the soil/pile interaction, not the structural capacity of the section performing as a column.

<b>Drilled-In Pile Type</b>	<b>Design Capacity (tons)</b>	<b>Installed Capacity* (tons)</b>
Grouted Pipe: 7" diameter	17	20
Auger (Helical)	9	12
Resistance Pier	8	10

*\* These values consider downdrag on the pile due to settlement of surrounding miscellaneous fill and organics.*

3. The pile tips should penetrate to a minimum depth of fifteen (15) feet below the existing site grades.
3. One (1) drilled-in pile should be load-tested in accordance with the ASTM D1143 Standard prior to installing the production piles.
4. The piles should be delivered to the project with a design-test-install type contract/ agreement. The design, testing and installation should be performed under the direction and signature of the subcontractor's licensed engineer.
5. The project structural and geotechnical engineer should review the design, test results and installation records.

We trust these recommendations will allow you to complete the design and construction of the alterations.

Very truly yours,  
THE GEOTECHNICAL DEPARTMENT, LLC



Thomas H. Otto, P.E.

Attachments: Geotechnical Limitations  
Boring Location Plan  
Boring Record Sheet

Cc: Soiltesting Inc.

# GEOTECHNICAL LIMITATIONS

## Explorations

- The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between and apart from these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.
- The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic.
- Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time measurements were made. More precise determinations of groundwater levels would require the installation of groundwater observation wells and water level readings taken over an extended period of time.

## Review

- In the event that any changes in the nature, design or location of the proposed building 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 this firm. Further, 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.

## Construction

- It is recommended that this firm be retained to provide geotechnical engineering services during construction of the excavation and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

## Use of Report

- This report has been prepared for the exclusive use of Martinez Couch & Associates, LLC, for specific application to construction at 44 Washington Parkway, Stratford, Connecticut, in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
- This report is for *design* purposes only and is not sufficient to prepare construction cost estimates or bids.

<b>SOILTESTING, INC.</b> 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: <b>Martinez Couch &amp; Associates</b>	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. <b>G119-9751-14</b>	HOLE NO. <b>B-1</b>
FOREMAN - DRILLER <b>RW/ad</b>	PROJECT NAME <b>44 Washington Parkway</b>	BORING LOCATIONS as directed
INSPECTOR	LOCATION <b>Stratford, CT</b>	OFFSET
GROUND WATER OBSERVATIONS AT <u>6</u> FT AFTER <u>0</u> HOURS AT <u>  </u> FT AFTER <u>  </u> HOURS	CASING    SAMPLER    CORE BAR TYPE            HSA            SS SIZE I.D.        4 1/4"    1 3/8" HAMMER WT.        140#        BIT HAMMER FALL        30"	DATE START            6/23/14 DATE FINISH            6/23/14 SURFACE ELEV. GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC.	DEPTH @ BOT	0-6	6-12	12-18				
5	1	ss	24"	11"	2'0"	2	3			dry loose	8'0"	6" TOPSOIL brn FM SAND, lit silt, tr C sand lt brn FM SAND, lit C sand, tr silt  SAME dark brn F SAND, sm silt brn F SAND, sm M sand, tr silt	
	2	ss	24"	13"	4'0"	8	11			dry compact			
	3	ss	24"	15"	6'0"	8	6			wet loose			
	4	ss	24"	12"	8'0"	5	5			wet loose			
	5	ss	24"	24"	10'0"	5	3			wet loose			
10	6	ss	24"	24"	12'0"	1	1			wet soft	15'0"	dark brn organic SILT, tr F sand, peat  dark brn VF SAND & organic SILT, tr M sand, roots	
						2	3			wet loose			
20	7	ss	24"	20"	17'0"	5	8			wet compact	15'0"	brn VFF SAND, tr silt  gry brn FM SAND, tr C sand, silt	
						8	9						
	8	ss	24"	23"	22'0"	7	19			wet dense			
25	9	ss	24"	24"	27'0"	8	10			wet dense	15'0"	brn FMC SAND, tr F gravel	
						23	36						
30	10	ss	24"	22"	32'0"	7	11			wet compact	15'0"	gry brn VFF SAND, tr M sand brn FMC SAND, tr F gravel, silt	
						17	32						
35	11	ss	24"	24"	37'0"	8	10			wet compact	37'0"	SAME	
						19	35						
40												E.O.B. 37'0"	

**NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.**

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. <b>B-1</b>
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE



JOB NO.

**G119-9751-14**

**SOILTESTING, INC.**

90 Donovan Road

Oxford, CT 06478