ConTest Consultants, Inc

Providing Inspection/Testing & Consulting Services

January 3, 2020

Ms. Patricia Shogren Town of Danville 210 Main Street Danville, NH 03819

Geotechnical Recommendations Re: **Danville Police Station 67 Hersey Road** Danville, New Hampshire CTC Project No. 219252

Dear Ms. Shogren:

As per your request and our proposal # 170-19, ConTest Consultants, Inc. is pleased to submit the Geotechnical Recommendations for the proposed Police Station at 67 Hersey Road in Danville, New Hampshire by our Geotechnical Consultant – Civil Connection. The investigation included performing test boring at the site, site visit and an evaluation of the conditions as they relate to foundation design and earthwork construction for the project.

We trust the contents of this report are satisfactory to your needs at this time. Should have any questions or require further assistance, please do not hesitate to contact our office or Mr. Richard Bushnell, P.E. at Civil Connection. Thank you for this opportunity to assist you and your design team on this phase of the project.

Best Regards,

CONTEST CONSULTANTS, INC.

Donald C. Walden

President

Civil Connection, LLC

38 Edwards Drive
Gilmanton IW, New Hampshire 03837
Tel: 603-393-9842

December 31, 2019

ConTest Consultants, Inc. Attn: Mr. Don Walden 18 Cote Avenue Goffstown, New Hampshire 03045

RE: Geotechnical Recommendations

Danville Police Station 67 Hersey Road Danville, New Hampshire Project: No. 19-294

Dear Mr. Walden:

As requested, Civil Connection, LLC (CC) has conducted a geotechnical investigation for the above-referenced project. This report presents the findings of a subsurface exploration program and an evaluation of the conditions encountered as they relate to foundation design and earthwork construction for the project. The work was performed in general accordance with our proposal. The contents of this report are subject to the attached *Limitations*.

PROJECT & SITE DESCRIPTION

The proposed site development and focus of this geotechnical investigation is located at a vacant parcel of land located at 67 Hersey Road in Danville, New Hampshire. The project site abuts the existing Danville Highway Department property. The proposed project consists of developing the parcel for use as the Danville Police Department. The proposed building will be a single-story structure with a Mechanical attic over part of it. At this time no below-grade space is proposed. Proposed site development includes the construction of access roads and parking lots. The existing area has been used as storage by others with pile of debris, concrete pipe, manholes, asphalt, brush, timber, scattered throughout the upper area. The remaining is lightly wooded with underlying brush, and exposed boulders/bedrock outcrops observed.

SUBSURFACE EXPLORATION PROGRAM

The subsurface exploration program consisted of the advancement of soil borings within the proposed building footprint. The soil borings were advanced at six locations with additional attempts at two of them due to shallow refusals. Borings were advanced on December 23, 2019 by SoilX Corporation, utilizing a CME75 ATV Mounted drilling rig, under the observation of a representative from CC. Borings were advanced to refusal with depths ranging from 7.5 to 11.0 feet depth utilizing 4-1/2 inch inside diameter (I.D.) hollow-stem augers. Soil samples were typically taken at five foot intervals or strata changes with a 2 inch standard split-spoon sampler in accordance with ASTM D1586. Standard penetration resistance was measured in six inch increments for two feet, using a 140 pound hammer falling 30 inches as part of the sampling procedure.

The borings were located in the field by CC by referencing staked locations by others. Boring locations are shown on the attached Boring Location Plan. Materials encountered during the exploration program were sampled and visually classified in the field by a Geotechnical Engineer from our office. Field descriptions of the soils encountered, the observed groundwater conditions upon completion of each test boring, as well as other pertinent observations are contained on the subsurface exploration logs attached to this report.

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SUBSURFACE CONDITIONS

In general, the test borings were advanced through either 2 to 5 feet of existing fill or 4 to 9-inches of Forest Mat/Subsoil. The fill was comprised of a brown/grey, fine to medium SAND, little to some Gravel, trace to little Silt and contained pieces of asphalt. The fill appears to have been placed during prior use as a storage yard and the fill would be expected to potentially contain other debris not recovered within the split-spoon sampler. The underlying native material consisted of a brown, dense to very dense, fine to medium SAND, little Gravel, little Silt (Glacial Till) overlying apparent bedrock or large boulders.

Refusal conditions were encountered in all the subsurface explorations advanced at the site. Based on the salient conditions observed at the site and observations made during the test borings the refusals are probably a result of bedrock.

Groundwater— Groundwater was encountered during the subsurface exploration program at depths ranging from 5 to 9 feet below existing grade. Additionally, perched water was encountered atop the glacial till due to the fine-nature of the material. Groundwater conditions were observed during the advancement of explorations, while sampling and immediately upon completion and should be anticipated to vary in response to equilibration time, rainfall, snowmelt, seasonal fluctuations, site development and other factors not present during the time that the explorations were performed. Additionally, perched water may be encountered due to the undulating bedrock/glacial till surface, which may potentially trap run-off.

FOUNDATION DESIGN RECOMMENDATIONS

Foundation Design - The subsurface conditions are suitable for supporting the proposed building atop shallow spread footings with a concrete slab-on-grade. Prior to construction, the surficial material and other unsuitable material should be removed from beneath the entire building footprint and from within the perimeter footings' zone of influence. The footing zone of influence is defined as that area encompassed by a 1V:1H splay originating from 1 foot beyond the edge of the footing and projecting downward and outward. If required the removed material may be replaced with compacted structural fill.

The potential exists for bedrock to be encountered during construction depending upon final development grade. Should the bedrock to be located higher than proposed finish floor elevations, CC has included detailed rock excavation recommendations hereon below. It is expected that footings will bear on either the native material or compacted structural fill, it is recommended that the bedrock be removed to a depth of 1 foot below proposed subgrade and replaced with structural fill to allow for proper uniform drainage.

Bearing Capacity & Settlement Evaluation - Based on our explorations and foundation design recommendations the footings will bear atop the native glacial deposit. Provided the subgrade is prepared as outlined hereon below it is recommended the footings be proportioned for a net allowable bearing capacity of 2.0 tsf. The foregoing allowable bearing pressure for soil is predicated by footing geometry and depth below grade. With regards to footing geometry, the minimum footing width of column and strip footings should be 4 ft and 2 ft respectively.

Based on the net allowable bearing pressure for footings placed on prepared subgrades, total footing settlement is not expected to exceed 1 inch with differential settlement between adjacent columns being less than 3/4 inch. The majority of the settlement is expected to occur during construction and long term settlements are anticipated to be negligible.

Frost Protection—Exterior footings should be protected from frost at a minimum depth for the locality in which the structure is located. Based on local code and building practice, the exterior footing should be protected with at least 4 ft of earthen embedment. Interior footings should be placed at least below finish floor grade provided the interior area is to be heated, otherwise a minimum 4 ft of earthen cover is required. If foundation construction is to occur during cold weather, the foundation elements should be protected against frost.

Seismic Design Considerations – Based upon a review of the observed site conditions in general accordance with IBC, the project site does not contain soil strata and groundwater conditions susceptible to earthquake-induced liquefaction. Based on the subsurface conditions the Site Class for the project would be C. For Site Coefficient, which reflects the potential site amplification of the traveling seismic waves, it is recommended that S = 1.2 be considered in design of the proposed building.

Slab-On-Grade— A concrete slab-on-grade is deemed suitable for the proposed building. Our recommendations are based on the provisions for floor slab design outlined in ACI 302.1. Based on the observed material from the subsurface exploration programs, the subgrades have been classified as a medium support soil. CC recommends that a minimum 8-inch layer of structural fill, meeting the gradation requirements outlined hereon below, be utilized above a properly prepared subgrade. The structural fill provides uniform support for the slab and improved drainage of water from beneath the slab.

The structural fill should be compacted to at least 95 percent relative compaction as determined by the Modified Proctor Test (ASTM D1557). Based upon the foregoing floor slab base preparation, a modulus of subbase reaction (K_s) of 200 pounds per cubic inch (pci) may be used for design.

Foundation Waterproofing/Damproofing Recommendations— Based on the encountered depth to groundwater and the proposed finish grades, underslab and perimeter foundation drains will not be required. However, CC recommends that a subslab vapor retarder be placed beneath the proposed slab-on-grade. The recommended retarder should be a 8-mil polyethylene with joints lapped a minimum of 12 inches across joints. As recommended in ACI 360R-92, *Design of Slabs on Grade*, paragraph 9.8, the vapor retarder should not be placed in direct contact with slabs on grade. The retarder should be placed atop a properly prepared subgrade beneath the floor slab base course material. This will allow excess bleed water to pass out the bottom of the slab, allowing faster finishing and prevent slab curling.

CONSTRUCTION CONSIDERATIONS

Foundation and Floor Slab Subgrade Preparation - Prior to foundation construction, all traces of surficial material and other unsuitable materials should be removed from the entire building footprint and within the footing zone of influence as previously discussed. Footings should bear directly upon a competent subgrade comprised of the natural deposit or compacted structural fill.

After removing the unsuitable soils, the exposed foundation and floor slab subgrade soils should be proofrolled prior to foundation construction to densify disturbed soils resulting from the excavation and to preload the subgrade. Recommended proofrolling should include 4 coverages with a 2-ton double-drum vibratory roller or 8 coverages with a ½ ton vibratory plate compactor. During the proofrolling process the subgrade should be observed by a qualified engineer to identify areas exhibiting weaving or excessive reaction. It may be necessary to remove such loose and unstable soils and replace with a free draining granular fill or crushed stone, at the direction of the Engineer.

Proofrolling upon soils that become saturated due to precipitation or within 1 foot of the groundwater table may be detrimental to the competency of the foundation subgrade. Under these circumstances, proofrolling is not recommended. However, the final excavation should be monitored to assess disturbance to prepared subgrades.

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Rock Excavation - Based on the proposed plan and the subsurface exploration program, the building and potential site work improvements are within the vicinity of explorations which encountered shallow refusal depths. Based on our observations and study of the bedrock in the area and the condition of the bedrock encountered during the exploration program it is expected that the uppermost portions of the bedrock surface are slightly weathered and therefore may be rippable with a large excavator or bulldozer equipped with ripping tooth. Should fresh zones of bedrock be encountered, that are not rippable, they may require excavation by a backhoe-mounted ram or controlled drilling and blasting.

It is recommended that the contractor familiarize himself with the expected bedrock excavation prior to construction. Additionally, project specifications should clearly outline bedrock excavation particularly as it pertains to the contractor's means and methods. Lastly, the blasting specifications should account for Town of Danville requirements.

Preparation of Bedrock Surface – CC recommends that the bedrock surface be removed to a minimum of 1 foot below footing subgrade. The bedrock surface should be level and free from loose soil or rock. Minor irregularities in the level of the rock surface may be filled with crushed stone or concrete to provide a level working surface. Following preparation of the surface a 1 foot lift of structural should be placed and compacted to 95% of the maximum dry density determined in accordance with ASTM D1557.

Construction Dewatering - Based on the subsurface explorations, construction dewatering may be required during foundation construction to account for surficial run-off, perched water, or encountered groundwater. It is anticipated that construction dewatering may be accomplished using filtered sumps and pumps. In addition the contractor should be prepared to remove any ponded surface water or run-off by means of localized sumps and pumps. A lift of crushed stone at excavation grade may be desired to facilitate dewatering during construction and provide a dry/stable subgrade during construction.

The Contractor should select whichever dewatering method is most familiar and cost-effective to him while, at the same time, meeting the performance criteria of maintaining dry, stable excavation bottoms at all times. The responsibility for a properly designed and executed dewatering program must remain with the Contractor.

Excavation Support - Deep excavations (greater than 5 ft) are not anticipated for foundation construction. They may be required for utility installation. It is envisioned that such excavations may be accomplished with slope laybacks. For stable excavation designs, the on-site soil deposits should be considered Type C soils in accordance with Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926). This preliminary soil classification should be verified in the field by a competent person as defined by OSHA.

The maximum temporary slopes for Soil Type C soils is 1.5H:1V provided the groundwater is lowered below the bottom of the excavation and the height of the cut is a maximum 20 feet. The foregoing slope requirement does not consider surcharge loads (stockpiled soils, equipment, materials) which may be situated at the crest of the slope and vibration loads (blasting, soil compaction). It should be noted that these slope requirements are minimums required by OSHA regulations and that any excavation which exceeds the minimum requirements must be designed by a registered professional engineer. Furthermore, it must be stressed the contractor is ultimately responsible for stability of temporary slopes associated with construction activities.

Structural Fill/Use of On-Site Soil for Backfill—Structural fill to be used below the building for foundation support should conform to the following gradation requirements. The specified gradation is based on consideration of the recommended allowable bearing pressure and estimated settlement of a spread footing foundation as presented in the **Foundation Considerations Section.**

Sieve Size	Percent Finer by Weight
3"	100%
#4	45-85
#40	10-50
#200	0-8

Structural fill should be placed in maximum loose lifts of 12-inches and be compacted to 95 percent of maximum dry density as determined by the modified proctor test (ASTM-D1557). The adequacy of the compaction efforts should be verified by field density testing.

Construction Monitoring—It is recommended that the construction activity be monitored by your office in conjunction with engineering oversight by CC to ensure conformance with contract requirements, documents and design concepts. Prior to construction, CC would be pleased to provide a review of the earthwork specifications and structural design as they relate to geotechnical issues.

Closure - It has been a pleasure to assist you on this project, and I look forward to its successful completion. In the meantime, if you have any questions on the content of this report, please do not hesitate to contact me.

Very truly yours,

CIVIL CONNECTION, LLC

Richard E. Bushnell, P.E. Principal Engineer

Enclosures

c:\Danville Police Station.geotechnical



LIMITATIONS

Explorations

- 1. The analyses, recommendations and designs submitted in this report are based in part upon the data obtained from preliminary subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.
- 2. 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 interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.
- 3. Water level readings have been made in the test pits and/or test borings under conditions stated on the 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 differing from the time the measurements were made.

Review

- 4. It is recommended that this firm be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the recommendations provided herein.
- 5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Civil Connection, LLC.

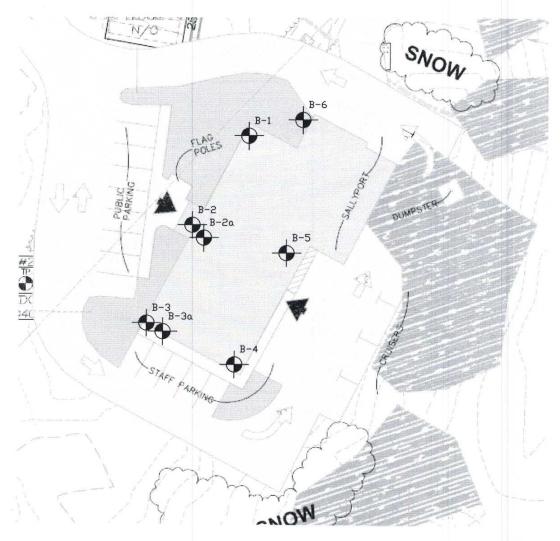
Construction

6. It is recommended that this firm be retained to provide geotechnical engineering services during the earthwork 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 the start of construction.

Use of Report

- 7. This report has been prepared for the exclusive use of ConTest Consultants, Inc. and their assigned in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
- 8. This report has been prepared for this project by Civil Connection, LLC. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to evaluation considerations only.

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B-1 Test Boring Number & Location (TYP)

NOTES:

Test Borings were advanced on December 23, 2019 by Soil X Corporation under the direction of Civil Connection, LLC. Test borings were located based on staked locations in the field by others and should be considered accurate to the degree implied by the survey method.

TEST BORING LOCATION PLAN		IL CONNECTION DRIVE GILMANTON IW, NEW TEL. (603) 393-9842	
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Standard Penetration Test (SPT) = 140# hammer falling 30", Blows are per 6" taken with an 18" long x 1.5" I.D. split spoon sampler in accordance with ASTM D 1586, unless otherwise noted.

REMARKS: The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test borings at times and under conditions stated on the test boring logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were

Notes:		

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Standard Penetration Test (SPT) = 140# hammer falling 30", Blows are per 6" taken with an 18" long x 1.5" LD. split spoon sampler in accordance with ASTM D 1586, unless otherwise noted.

REMARKS: The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test borings at times and under conditions stated on the test boring logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.

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Notes:			

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12-23

UC

7'-11"

7'-6"

Boring No. Civil D TEST BORING LOG 3 B -Page 1 of Project Danville Police Station Project No. 19-294 Elevation Danville, New Hampshire Project Mgr. Location Richard Bushnell Datum Client ConTest Consultants, Inc. Inspector Richard Bushnell Date Started 12-23-19 Contractor Soil X Corp Checked By Richard Bushnell Date Finished 12-23-19 Driller Pat Goodale Rig Make & Model **CME 75** Casing Core Barrel Item: Auger Sampler Truck Skid Hammer Type: Split Spoon Type **HSA** Safety Hammer Track ATV Inside Diameter (in). 4.5 Bomb Geoprobe Doughnut Hammer Weight (lb) 140 Tripod Other X Automatic Hammer Fall (in.) 30 Winch Cat Head Roller Bit Cutting Head Sample Data SOIL AND ROCK CLASSIFICATION-DESCRIPTION PID Depth Rec SPT Rock Casing (Blows/ft) BURMISTER SYSTEM (SOIL) (ft) (in.) (Blows/ RQD Rdg U.S. CORPS OF ENGINEERS SYSTEM (ROCK) 6-in.) (%) (ppm) 0 - 20 S-1 13 5-9 Brown, medium-dense to dense, f-m SAND, some Gravel, little Silt, (FILL) 36-31 1 2 3 4 5 S-2 5-7 19 39-24 Brown/grey, very dense, f-m SAND, some Gravel, little Silt. 6 60 Approximate 2" layer of f-m SAND, little Silt embedded in sample 7 50/4" 8 Auger Refusal - 7'-11" 9 Reset Drill Rig 5' to assess depth of refusal. 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 Water Level Data Sample Identification Cohesive Soils N-Value Granular Soils N-Value Depth (ft) to: O = Open Ended 0 to 2: Very Soft 0 to 4: Very Loose Date Bott. of Bott of Water U = Undisturbed2 to 4: Soft 4 to 10: Loose Casing Hole S = Split Spoon4 to 8: Medium Stiff 11 to 30: Medium Dense

Standard Penetration Test (SPT) = 140# hammer falling 30", Blows are per 6" taken with an 18" long x 1.5" I.D. split spoon sampler in accordance with ASTM D 1586, unless otherwise noted

C = Rock Core

G = Geoprobe

REMARKS: The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test borings at times and under conditions stated on the test boring logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.

Trace (0 to 5%) Little (10 to 20%) Some (20 to 35%) And (35 to 50%)

8 to 15: Stiff

15 to 30: Very Stiff

Over 30: Hard

31 to 50: Dense

Over 50: Very Dense

Notes:		

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Project			Dany	ille Pol	ice Stati	on		Project No	is.	10	9-294		Fle	evation	
Locatio										_		ushnell	-		
Client			HSASplit SpoonTrackATVXSafety Ham4.5BombGeoprobeDoughnut140TripodOtherXAutomatic									12-23-19			
Contra	ctor		Soil 2	Danville, New Hampshire ConTest Consultants, Inc. Inspector Checked By Richard Bushnell Date Started Date Finished Rig Make & Model CME 75 Auger Casing Sampler HSA Split Spoon Solit Spoon Track Bomb Geoprobe Doughnut 140 Tripod Other X Automatic 30 Sample Data Depth (fi) Rec (fi) Rec (fi) (76) (76) (76) (76) Concepted Richard Bushnell Date Finished CME 75 Truck Skid Hamme Truck Skid Hamme Track ATV X Safety Ham Tripod Other X Automatic Cat Head Roller Bit Geoprobe BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROC									1 12-23-19		
Driller											ME 75	1			
Item:				r	asing	1000	_	ore Barrel					37		nmer Type:
	Diameter	(in).				эриг эроо	-						X		
	er Weigh		_					F 75 4 1 1					X	-	
Hamme	er Fall (ir	1.)	30							-					Cutting Head
	1	No.	Donth			D = al.	DIF		SOII	LANE	ROCK	CLASSIFI	CATIO	ON-DESC	CRIPTION
(f)	ng s/ft)	INO.													
Depth (ft)	Casing (Blows/ft)				6-in.)	(%)	(ppn	1)		U.S. C	CORPS	OF ENGINE	ERS SY	STEM (ROCK)
	0														
0								Drill	Rig Res	et 5' fi	rom B-3	to Assess D	epth of	Refusal	
2	-				-										
3															
4															
5															
6															
7								Aug	er Refusa	ıl – 7'-	-6"				
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	1	Water L	evel Data			Sample	e Ident	ification		C	ohesive S	Soils N-Value		Granula	r Soils N-Value
Date	Time	Bott.		of (ft) to:	Wester	O = 0)pen Er	nded		-	0 to 2:	Very Soft		0 to 4	: Very Loose
Date	Time	Casi		ott. of Hole	Water	1000	Jndistu plit Spo					4: Soft edium Stiff			10: Loose
						C = R	lock Co	ore				15: Stiff			Medium Dense 50: Dense
						G = C	eoprob	e				Very Stiff			0: Very Dense
					Trace (0	to 5%) Li	ttle (10	to 20%)	Some (20	to 35%		30: Hard 35 to 50%)			
Standard otherwise	Penetratio noted.	n Test (SP	T) = 140#									n sampler in acc	ordance w	vith ASTM	D 1586, unless
REMARK at times a made.	(S: The sind under c	tratificatio conditions	n lines repr stated on th	resent the	approxim	ate boundary Fluctuations	between	n soil types a evel of the gr	nd the trans	sition ma	ay be gradeur due to o	ual. Water level other factors than	readings those pre	have been n	nade in the test borings time measurements were
Notes	:														

Boring No.

CIVIL CONNECTION, LLC • 38 Edwards Drive, Gilmanton IW, NH 03837 μ (603) 393-9842 •

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0) ivil) onnec	<i>41</i>					· ·				Loc	,			Page 1 of
		tcon													
Project Location		-			ice Static			roject No.		_	9-294	1 11	-	evation	8
Client	л				w Hamps sultants,			roject Mgr.			Richard B Richard B		-	tum te Started	12-23-19
Contra	ctor			X Corp				hecked By			cichard B			te Finished	12-23-19
Driller				Goodale				ig Make &			CME 75				
Item:			Aug		Casing	Sampler Split Spoon	350000	e Barrel		ruck		Skid		The state of the later of the l	er Type:
	Diamete	r (in).	HSA 4.5	1		Split Spooli				rack omb	_	ATV Geoprobe	X	Safety Ha Doughnut	
1-0-10-00-00-00-00-00-00-00-00-00-00-00-	er Weigl	A MARKETING	140							ripoc		Other	X	Automatic	
Hamme	er Fall (i	n.)	30							nch		at Head		er Bit	Cutting Head
		No.	Depth	San Rec	ple Data SPT	Rock	PID		SOIL	ANI	D ROCK	CLASSIFIC	ATIC	N-DESCR	
Depth (ft)	Casing (Blows/ft)		(ft)	(in.)	(Blows/ 6-in.)	RQD (%)	Rdg. (ppm)				BUR	MISTER SYS OF ENGINEEI	ТЕМ ((SOIL)	
0		S-1	0-2	3	6-8			Brown	. mediu	ım-de	ense f-m	SAND, some	Grave	l little Silt (FILL)
1					6-4						,	, 001110		., maio ont (
3															
4								-							
5		S-2	5-7	16	20-26			Brown	grev. v	erv c	lense, f-n	n SAND, some	Grav	el little Silt	
6					25-36				6-7,			,	o oru v	ei, mue om	
7															
8				-		-		_							
10		S-3	10-12	2	50/3"			Brown	verv d	ense	f-m SA	ND, some Gra	vel lit	tle Silt piec	e of rock
11								In tip o			, 1 m 57 t	vio, some Gra	vei, iii	tic siit, picc	C OI TOCK
12								Refusa	1-10'-	3"					
13								-							
15								-							
16															
17															
18 19						-		-							
20								-							
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23								-							
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28	-							+							
30															
		Water	Level Da			Sample	Identifi	cation			ohesive S	Soils N-Value		Granular So	nile N Value
Date	Time	Bo		th (ft) to: Bott, of	Water	O = O	pen Ende	ed		-	0 to 2:	Very Soft		0 to 4: Ve	
Date.	1 11110	1 23.00	ising	Hole	water		ndisturbe lit Spoor					4: Soft edium Stiff		4 to 10:	
12-23	UC			10'-3"	9'	C = Rc	ock Core coprobe				8 to 1 15 to 30:	5: Stiff Very Stiff 30: Hard		31 to 50 Over 50: V	: Dense
					Trace (0 to	o 5%) Litt	tle (10 to	20%) Sor	ne (20 to	0 35%			I		
Standard I otherwise	Penetration noted.	on Test (SPT) = 140#									n sampler in accord	dance w	ith ASTM D 15	86, unless
REMARK at times ar made.	CS: The s	tratification	tion lines rep ns stated on	present the the test boo	approximat	e boundary t luctuations i	between s n the leve	oil types and l of the groun	the transi	tion m	ay be gradu	ial. Water level re ther factors than th	adings l	nave been made sent at the time	in the test borings measurements were

Project		tion			ice Static	on	ND	Proj	BO ect No.		INC	19-29	94		-	evation	Boring No. B - 5 Page 1 of
Location	on					ampshire			Project Mgr. Inspector			Richard Bushnell				tum	
Client	otor				sultants.	Inc.						Richard Bushnell Richard Bushnell			_	te Started	12-23-19
Driller		1		X Corp Goodale					cked By Make &		al	CME		shnell	Da	te Finished	12-23-19
Item:			Auge		Casing	Sampler		Core I		IVIOU	Truc	-	13	Skid	1	Llamm	er Type:
Туре			HSA			Split Spoon					Trac			X			
	Diamete	r (in).	4.5								Bom		Geoprobe		X Safety Hammer Doughnut		
Hamm	er Weig	ht (lb)	140							Tri				Other	X	Automatic	
Hamm	er Fall (in.)	30								Winch		Cat	Head	_	er Bit	Cutting Head
Depth (ft)	Casing (Blows/ft)	No.	Depth (ft)	Rec (in.)	SPT (Blows/ 6-in.)	Rock RQD (%)	PI Ro (pp	ig.	SOIL AND ROCK CLAS BURMISTEI					HSTER SYS	SIFICATION-DESCRIPTION SYSTEM (SOIL) NEERS SYSTEM (ROCK)		
0		S-1	0-2	17	4-8				Brown	ı/Gre	ey, me	dium-	dense.	f-m SAND.	little-	some Gravel	, trace-little Silt
1					23-13				(FILL								
2																	
3																	
4		G 2		1.0													
5		S-2	5-7	19	12-30				Brown/grey, very dense, f-m SAND, some Gravel, little Silt.								
7					38-43	-	_										
8								_									
9								-									
10		S-3	10-12	1	50/4"				Wet R	ock	Fraom	ents re	ecover	ed – minima	l soil		
11											146			ed minina	1 3011		
12									Refusa	al – 1	1'-0"						
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		Water	Level Dat	a		Carrel 1	La	416					100				
Depth (ft) to:					Sample Identification Cohesive Soils N-Value O = Open Ended 0 to 2: Very Soft						Granular So	oils N-Value					
Date	Time		ising	of Bott. of Water			U = Undisturbe S = Split Spoon			2 to 4: Soft 4 to 10				4 to 10:			
2-23	UC			11'-0"	8'-6"	C = Ro G = Ge	ck Ċ	ore				15 1	8 to 15	: Stiff Very Stiff		31 to 50 Over 50: V	: Dense

Standard Penetration Test (SPT) = 140# hammer falling 30", Blows are per 6" taken with an 18" long x 1.5" LD. split spoon sampler in accordance with ASTM D 1586, unless otherwise noted.

REMARKS: The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Water level readings have been made in the test borings at times and under conditions stated on the test boring logs. Fluctuations in the level of the groundwater may occur due to other factors than those present at the time measurements were made.

Trace (0 to 5%) Little (10 to 20%) Some (20 to 35%) And (35 to 50%)

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0) vivil) vonnec	rtion														Page 1 of 1		
Projec				wills Da	l: C4-4:	2007		D 1	I -		10.0	0.4		Lev				
Locati	~		_		lice Static ew Hamp			Project N			19-294 Richard Bushnell				vation			
Client	011				nsultants		-	Inspecto		_		ard Bu ard Bu		-	tum te Started	12 22 10		
Contra	ictor			I X Corp		, me.	_	Checked				ard Bu		-	te Finished	12-23-19		
Driller				Goodale			_	Rig Mak		del	CME		Silicit	Date	ic i illisticu	12-23-19		
Item:				ger	Sampler C		ore Barre	re Barrel Ti		ick Skid			Hamm	er Type:				
Type			HS	A		Split Spoon	olit Spoon			Tra			ATV	X	Safety Ha			
	Diamete		4.5							Bor	nb		Geoprobe		Doughnut			
	er Weig	1.55 A. C. C. C.	140)					T		pod		Other	X	Automatic			
Hamm	er Fall (in.)	30							Winc	h	Cat	Head	Rolle	er Bit	Cutting Head		
Depth (ft)	Casing (Blows/ft)	No.	Depth (ft)		nple Data SPT (Blows 6-in.)	Rock RQD (%)	PIE Rdg (ppn	ţ.	S		1	BURM	CLASSIFIC USTER SYS F ENGINEE	ТЕМ (SOIL)			
0	-	S-1	0-2	15	1-8			9"	– Fores	t Mat	Subso	il						
1					7-9			Bro	Brown/grey, loose, f-m SAND, little Silt, trace Gravel									
2																		
3 4	-		-															
5	-	S-2	5-7	16	15-53			D			1	C	CAND		1 11 1 011			
6	1	3-2	3-7	10	49-57		-	Bro	own/gre	y, ver	y dens	e, 1-m	SAND, some	e Grav	el, little Silt.			
7					1751													
8																		
9								Au	ger Ref	usal –	9'							
10																		
11						1.												
12					-			_										
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26						+ +												
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28								-										
29																		
30																		
Date	Water Level Data Depth (ft) to:				O = Op	Sample Identification O = Open Ended								Granular So				
Date	Time	1	tt. of sing	Bott. of Hole	Water	U = Ur						2 to 4:	Soft		4 to 10:	Loose		
12-23	-23 UC 9'-0" $6'-6$ " $C = Rc$				= Rock Core						11 to 30: Me 31 to 50: Over 50: V	Dense						
		1			Trace (0 t	to 5%) Litt	le (10	to 20%)	Sama (20 to 2		Over 30						

Standard Penetration Test (SPT) = 140# hammer falling 30", Blows are per 6" taken with an 18" long x 1.5" L.D. split spoon sampler in accordance with ASTM D 1586, unless otherwise noted.

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