GEOTECHNICAL REPORT

BRADLEY FULLER FIELD NEWBURYPORT, MASSACHUSETTS

January 5, 2016

GSI Project No. 215300

Prepared for:

Mr. Chris Huntress Huntress Associates, Inc. 17 Tewksbury Street Andover, MA 01810

Prepared by:

Geotechnical Services, Inc. 55 North Stark Highway Weare, NH 03281





🔺 Geotechnical Engineering 🔺 Environmental Studies 🔺 Materials Testing 🤺 Construction Monitoring 🔺

January 5, 2016

Mr. Chris Huntress Huntress Associates, Inc. 17 Tewksbury Street Andover, MA 01810

Advanced via Email: chris@huntressassociates.com

RE: Geotechnical Investigation Report Bradley Fuller Field Newburyport, Massachusetts GSI Project No. 215300

Dear Mr. Huntress:

Geotechnical Services, Inc. (GSI) is pleased to submit this report on the proposed design-redevelopment of the track and grass turf athletic field at the Bradley Fuller Field off of Low Street in Newburyport, MA. The report consists of the subsurface data obtained through implementation of an exploration program, evaluation of the subsurface data, a summary of our understanding of the proposed development, and the results of an assessment for earthwork design options. The content of this report is subject to the **Limitations** stated in Appendix A.

PROJECT UNDERSTANDING

The project site is located at 89 to 107 Low Street in Newburyport, MA (See Figure 1, Project Locus). We understand that the planned redevelopment will include the renovation of both the existing grass turf field located within the limits of the track and replace and reconfigure the existing track.

SUBSURFACE INVESTIGATION

Thirteen (13) soil probes, designated as GP-1 to GP-13, were performed at the site on December 14, 2015 by New England Boring Contractors, Inc. located in Derry, NH. The probes were conducted using a Geoprobe soil probing machine which collects continuous 5-ft long soil samples. Soil samples were collected to depths ranging from 5 to 10-ft below the existing grade. The Geoprobes were observed by the GSI engineer and the soils encountered were classified in accordance with the Burmister Classification system. The approximate locations of the Geoprobes are shown on Figures 2, Exploration Location Plan. The finalized logs for the Geoprobes are included in Appendix B. Representative portions of each sample retrieved were saved in plastic bags with identification, and delivered to the GSI Soils Laboratory. The samples were re-examined and field classifications were reviewed.

SUBSURFACE CONDITIONS

The subsurface conditions encountered in the investigation indicate that the site is underlain by the following soil units/deposits, described in order of increasing depth:

Topsoil: All of the probes encountered the Topsoil layer at the ground surface. The Topsoil layer generally consists of organic silty soils. The thickness of this soil unit varies from less than 6-in in proximity to the existing track to 8 to 18-in. within the limits of the grass turf field.

Sand Fill: The Sand Fill was encountered with all the geoprobes immediately beneath the topsoil layer. The Sand Fill generally consists of brown fine to medium SAND with varying amounts of gravel and coarse sand. The thickness of the Filter Sand layer varies from about 12-in. (GP-6) to 38-in. (GP-13) and was about 24-in. (on average) in thickness across the project site.

Fill: Fill soils, consisting of gray, CLAY and fine to coarse SAND with little gravel, was encountered in GP-6 between 1.8 to 5.5-ft below the existing grade.

Silt Deposits: An isolated pocket of Silt was encountered in GP-9 from 2.5 to 5.5-ft below the existing grade which generally consists of brown Silt.



Marine Deposits: Marine Deposits were encountered in all of the geoprobes beneath the Sand Fill, Fill and Silt Deposits. The Marine Deposits generally consist of gray, CLAY with varying amounts of silt or fine to medium sand. All the geoprobes were terminated within this soil unit at depth of 5 to 10-ft below the existing grade.

Groundwater: Groundwater was not encountered upon completion of the probes. Groundwater levels should be expected to vary with season, precipitation, snowmelt, and other factors. As a result, groundwater levels encountered during construction may differ from those encountered in the explorations. It should be anticipated that perched groundwater above the Marine Deposits should be anticipated during construction due to seasonal groundwater conditions and weather.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

As a general guideline, foundation design and construction must conform to the applicable provisions of the Massachusetts Building Code, 8th Edition (Building Code).

Track and Grass Field Subgrades

We anticipate that the construction of the new track and renovation of the existing grass field will involve the following; stripping off the track pavement, stripping off or amending the existing Topsoil, removing/relocating any existing utilities (irrigation, drainage pipes, electric utilities and any other utilities), grading the field to the planned rough grade, proof-rolling the subgrade and reconstructing the turf system, and construction of the re track to the planned configuration. The existing Sand Fill, Fill, Silt and Marine Deposit soils are suitable for support of the grass turf field and track provided the subgrade is prepared using the recommendation provided herein. It should be anticipated that the new track configuration will require some additional engineered fill beneath the track where the footprint of the track extends beyond the area where the geoprobe investigation was conducted where Sand Fill may not be present.

CONSTRUCTION CONSIDERATIONS

General

In general, all excavation work, any construction dewatering, and other construction activities should conform to the requirements of OSHA and all other applicable regulations. The site soils would typically be classified as Type C based on OSHA 29 CFR 1926.

Excavation

Construction will involve clearing and grubbing of vegetation, stripping off the Topsoil and Track Asphalt, adding or cutting fill to achieve design grades (if needed), and constructing the planned turf field and track improvements. We anticipate that most of the site grading can be accomplished with conventional earth-moving equipment.

Construction Dewatering

Based on the available subsurface data it is anticipated that during the general site work, no significant dewatering measures will be necessary to conduct the construction "in-the-dry." The Contractor should take measures to prevent stormwater from entering into excavated areas, and be prepared to remove ponded surface water by means of localized sumps and pumps. The Contractor should select whichever dewatering procedures may be effective to maintain dry, stable excavation bottoms.

Existing Utilities and Foundations of Former Structures

Unknown and/or undocumented subsurface features, structures, and utilities may be present within the project site. The unknown structures and piping, should be anticipated during excavation work, and will need to be carefully removed to limit disturbance to underlying soil deposits and backfilled with compacted Granular Fill prior to construction of the planned field and track.

Preparation and Protection of Bearing Surfaces

Final excavation should be conducted in a manner that minimizes disturbance to the subgrade soils when excavating for bearing surfaces. All final excavation and footing construction should be conducted in-the-dry. We recommend that the exposed subgrade soils be observed in the field by a geotechnical engineer to confirm the projected soil



bearing conditions. It may be necessary to over-excavate and replace weak, disturbed or otherwise unacceptable foundation bearing materials.

Following excavation to bearing grades, exposed soil surfaces should be re-compacted (proof-rolled) prior to placing engineered fill, or constructing foundations, with a minimum of four passes with a heavy vibratory roller or other heavy vibratory compaction equipment.

If subgrade protection difficulties are encountered due to surface or groundwater, various methods can be utilized:

- Leave subgrades high until immediately before forming and concreting to minimize the time the subgrade is exposed.
- Over excavate footings by 8 in. using a smooth edged bucket and backfill to the design bearing elevation using compacted Granular Fill.

Each such encounter is probably best resolved individually in the field upon observation of the subgrade conditions.

Compaction

Minimum compaction requirements refer to percentages of the maximum dry density determined in accordance with ASTM D1557. Recommended compaction requirements are as follows:

Location	Minimum Compaction Requirements
Beneath the track & field	95 %
Landscaped areas	90 % nominal compaction

Filling and Backfilling

Placement of compacted soil fills should not be conducted when air temperatures are low enough (approximately 30 degrees F, or below) to cause freezing of the moisture in the fill during or before placement. Fill materials should not be placed on snow, ice or uncompacted frozen soil. Compacted fill should not be placed on frozen soil. No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil.

CONSTRUCTION MONITORING

It is recommended that a geotechnical engineer or technician qualified by training and experience be present during construction to:

- Confirm that soils used as fill and backfill are in accordance with the contract requirements.
- Observe and test placement and compaction of Granular Fill and other compacted fills.
- Observe preparation of field and pavement bearing surfaces.

Monitoring by experienced personnel will be important to the efficiency and integrity of the geotechnical aspects of the project construction. It is recommended that GSI be retained to provide the recommended monitoring services during construction. This will enable us to observe compliance with the design concepts, help resolve construction problems and to facilitate design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

PLAN REVIEW

It is recommended that GSI be provided the opportunity to review the final plans in order to confirm that the recommendations made in this report were interpreted and implemented as intended.



CLOSURE

GSI appreciates the opportunity for participating in this early phase of the project, and looks forward to our continuing association during its subsequent phases towards its successful completion. In the mean time, please do not hesitate to contact us, if you have any questions on the content of this report.

Very truly yours,

GEOTECHNICAL SERVICES, INC.

Glen V. Zoladz, P.E.

Project Manager

Harry K. Wetherbee, P.E. *Principal Engineer*

Figure 1.Project LocusFigure 2.Exploration Location Plan

Appendix A.LimitationsAppendix B.Geoprobe Logs







FIGURE 1-PROJECT LOCUS

BRADLEY FULLER FIELD NEWBURYPORT, MA GSI PROJECT NO. 215300





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O GP-1 $\hfill Geoprobe i.d. and approximate location$



FIGURE 2-EXPLORATION LOCATION PLAN

BRADLEY FULLER FIELD NEWBURYPORT, MA GSI PROJECT NO. 215300 APPENDIX A

LIMITATIONS



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 Geotechnical Services, Inc.

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 Huntress Associates, Inc. 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 Geotechnical Services, Inc. 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.



APPENDIX B

GEOPROBE LOGS



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Geotechr	Date		Time	Bott. Casi	Of E	oth (ft) to Bott. of Hole	V	Vater		O = Ope U = Und S = Split C = Roc GP = Ge	en En isturb t Spoo k Cor eopro	ded oed on re be		0 to 2 4 to 8 8 15 to 0	2 2: Very Soft 2 to 4: Soft 3: Medium Stiff to 15: Stiff o 30 Very Stiff ver 30: Hard	0 t 11 to 3 Ove	o 4: ' 4 to 1 30: N 1 to 9 er 50:	Very 0: Lo Iediu 50: D Very	Loose Dose Im Dense Iense I Dense
	Notes	s:		Trace	(0 to 5%), Littl	e (10	0 to 20%	%),	Some (2	20 to 3	35%), Ar	nd (35	to 50%)				GP-4

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8	2																		Paç	ge	1 of	1
.430	Pro	ject			Bradley F	Fuller Fiel	d		P	roject No			2153	00			EI	evation			N/A	
745	Loc	ation			Newbury	port, MA			lr	nspector			G. Zo	oladz			Da	atum		Ċ,	See Plar	ı
317.	Clie	ent			Huntress	Associat	es		P	roject Ma	Inager	r	G. Zo	oladz			St	art		12	2/14/201	5
х. б	Co	ntractor			NEBC				C	hecked E	By						Fi	nish		12	2/14/201	5
Ea	Dril	ler			C. Downi	ng		_		orill Rig			Geop	orobe		-	Μ	odel				
1248	Iter	n:			Auger	Casin	g	Samp	ler	Core Ba	rrel	ןד	ruck			Skid			lamn	ner	ype:	
55.4	I yp			<u>\</u>	-	-		-		-		Ľ	rack		Ļ	ATV			Safe	ety F	lammer	
7.4		nmor W	lieter (III.)	-	-		-		-		<u></u> в	omp. Tripod		\vdash] Geopnon] Other	ie		Dou	ighn	ut	
l. 61	Hai	mmer F:	all (in)	')	-	-						<u> </u>	" I									-
Tel	Tia		an (m.)		-	Sample D	ata	_				N	linch		Cat	Head		Roller Bit		Cut	ting Hea	d
MA 02116	Depth (ft)	Casing (Blows/ft)	No.	Depth (ft)	n Rec. (in.)	SPT (Blows/ 6-in.)	Rock RQD (%)	k P Ro (pr	ID dg. om)	Stratum Change (ft)			Soil-F	Rock	Vis (S - U	sual Class Soils - Burr I.S. Corps	nister of En	i on and D System) gineers Sy	escri	iptic	'n	
ston,	- 0 -		G1	0-5	48						Tops	oil										
Bos										1.5												
eet,											Brow	n, f/r	n SAN	JD, liti	tle	c-sand		 l _				
Str										0.5								- -				
oury										3.5	Gray,	, CL7	τ Υ									
lew	F															-MARINE	DEPO	DSITS-				
30 N	- 3 -														Bo	ttom of Ex	plorat	ion at 5-ft.				
:														I	No	groundwa	ter en	countered.				
080	- 7															-						
29.7																						
3.5																						
<. 6C	- 10 -																					
Гay																						
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29.7																						
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cal	- 20 -		۱ ۱	Nater L	evel Data	1			S	ample Ide	l entifica	ation		Cohes	sive	<u>soil</u> s N-V	/alue	Gran	ular S	Soils	N- Valu	le
chni	_				De	oth (ft) to:			1	O = Ope	en End	ded		0 1	to 2	2: Very So	ft	0 t	o 4: \	Very	Loose	-
ete	Dat	e	lime	Bott	of E	Bott. of	Wa	ıter		U = Und	listurbe	ed		4 to	2 t 8.	o 4: Soft Medium S	Stiff	11 to 2	⊦ to 1 30• M	0:Lo 1edio	oose Im Deng	se
ğ				Cas	шų				1	C = Roc	k Core	л e		- 10	8 to	5 15: Stiff		3	1 to 5	50: E	ense	
										GP = Ge	eoprob	ре		15	to 3	30 Very St	tiff	Ove	r 50:	Ver	y Dense)
				Trace	e (0 to 5%). Littl	e (10 †	o 20%).	Some (2	20 to 3	35%)	. A	nd (3!	Jve 5 tr	50%)	l	1	Т		05.5	
	Note	es:				,, Litt			11	(2		- , .)	, ,			/ • /					GP-5	

		ß	s,					TE	IST	г вог	RING	LOG				Bori G	ng No. P-6
80	4	1													Paç	ge	1 of 1
.43	Pro	oject		E	Bradley F	uller Fiel	d		F	Project No		215300		Elevation			N/A
745	Loc	cation		N	lewburyp	ort, MA			lı	nspector		G. Zolad	Z	Datum		S	ee Plan
317.	Clie	ent		F	luntress	Associat	tes		F	Project Ma	inager	G. Zolad	Z	Start		12	/14/2015
×.	Co	ntractor		N	IEBC .				0	Checked E	By	0		Finish		12	/14/2015
щ	Dri	lier		(. Downii	ng		0				Geoprob	e	Model			
1248	Iter	n:			Auger	Casin	ıg	Samp	Dier	Core Ba	rrei	Truck	Skid		lamn	ner 1	ype:
55.4	l yr	be ide Diem		、 、	-	-		-		-		Track			Safe	ety H	ammer
7.4		nde Dian	leter (In.)	-	-		-		-		BOMD. Tripod	Geophone			ighni omot	ut ic
. 61	На	mmer E)	-	-				-							
Tel	1 la		an (n.)		-	- ample D	ata	-				Winch	Cat Head	Roller Bit		Cutt	ing Head
, MA 02116	Depth (ft)	Casing (Blows/ft)	No.	Depth (ft)	Rec. (in.)	SPT (Blows/ 6-in.)	Ro RC (%	ick F QD R 6) (p	PID Idg. pm)	Stratum Change (ft)		Soil-Roc	k Visual Classifie (Soils - Burmis k - U.S. Corps of	cation and Deter System) Engineers Sy	escr sterr	iptio	n
ton	0 -		G1	0-5	47						Topsoil						
Bos										0.8	Brown.	fine SAND					
eet,										1.8	,		-SAND	FILL-			
ewbury Str											Gray, C	LAY and f/c	SAND, little grav -FIL	el L-			
Ň 0	- 5 -		G2	5-10	51					5.5							
ო :											Gray, C	LAY					
529.7080													-MARINE DE	EPOSITS-			
Inc. 755 North Stark Highway Tel. 603.529.7766 Fax. 603	- 10 - - 15 - 												Bottom of Explor	ration at 10-ft.			
Geotechnical Services,	_ 25 _	e -	Time	Water Le Bott. Casir	vel Data Dep of E	oth (ft) to: Fott. of Hole	- V	Vater		$\frac{\text{ample Ide}}{O = Ope}$ $U = Und$ $S = Split$ $C = Roc$ $GP = Ge$ $Some C$	entification en Endeo listurbed t Spoon k Core eoprobe	<u>on</u> <u>Coh</u> 1 (4 1 6) And (esive Soils N-Vali) to 2: Very Soft 2 to 4: Soft 8 to 15: Stiff 5 to 30 Very Stiff Over 30: Hard 35 to 50%)	<u>ue Granu</u> 0 tr 4 11 to 3 3 Ove	ular S o 4: \ to 1 30: M 1 to 5 r 50:	Soils Very 0: Lo 1ediu 50: D Very	<u>N- Value</u> Loose Jose Im Dense ense v Dense
ŀ	Note	es:		nace	10 10 0 %	/, ∟וננו		5 10 207	0),	50me (2	-0 10 30	, Anu (00 10 00 /0)				GP-6

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œ	4		I																		Pag	je	1 of	1
430	Pro	oject			Bradl	ey Fi	uller Fiel	d		Р	Project No		T	2153	00				Eleva	ation		-	N/A	
745.	Loc	cation			Newb	ouryp	ort, MA			Ir	nspector			G. Zo	oladz				Datu	m		S	ee Plai	n
17	Clie	ent			Huntr	ress	Associat	es		P	Project Ma	Inager		G. Zo	oladz				Start			12	/14/201	15
tx. 6	Co	ntractor			NEBO	<u> </u>				C	Checked E	By	_						Finis	h		12	/14/201	15
B Fa	Dri	ller			C. Do	ownin	ig				Drill Rig		_	Geop	orobe				Mode	el				
124	Iter	n:			Auge	er	Casin	g t	Sampl	er	Core Ba	rrei	_ T	ruck			kid				lamn	ner I	<u>ype:</u>	
55.4	l yr	ido Dian	actor (in)	-		-		-		-			rack			TV				Safe	ety H	ammer	
17.4	Ha	mmer W	leight (Ih	·)			-		-		-			Trinod			eopnoi ther	ne			Dou	ighni Smat	it ic	
9	Ha	mmer Fa	all (in.)	')	-		-		-			l l l l		Vinch			and			lor Bit		Cutt		
S Te		-	a ()			Sa	ample Da	ata					V	VILICIT			eau		KU			Cull		<u>u</u>
i, MA 02116	Depth (ft)	Casing (Blows/ft)	No.	Dept (ft)	th Re (ii	ec. n.)	SPT (Blows/ 6-in.)	Rock RQD (%)	PI Ro (pp	ID dg. om)	Stratum Change (ft)			Soil-F	Rock	Visua (Soil - U.S	ll Clas s - Bur . Corps	sific rmist s of E	ation er Sy Engin	and Dorstem) eers Sy	escr sterr	iptio 1)	n	
stor	- 0 -		G1	0-5	i 3	39					0.8	Topso	il _F	~ C/N				aand	- 1	а.				
, Bo												DIOMI	, 1/	III SAN	ID, IIII	ie gra	ivei, c-	sanu	i, tr. s	IIL				
y Street						3						-SAI	ND F	ill-										
Newbur																-M	ARINE	E DE	POSI	ITS-				
30															I	Botto	m of E	xplor	ation	at 5-ft.				
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otec	Dat	e	Time	Bo	tt. of	B	ott. of	Wat	er		U = Und	listurbe	d			2 to 4	I: Soft	_		4	to 1	0: Ĺc	ose	
Gec				Ca	sina		Hole	val			S = Split	t Spoor	n		4 to	8: Me	dium S	Stiff		11 to 3	30: N	lediu	m Den:	se
-											GP – G4	K Core	9		ہ 15 ا	5 10 13 to 30	o. Stiff Verv S	Stiff		Ove	ເບະ r 50:	Verv	ense Dense)
													-		0	over 3	0: Har	d						
	Not			Trac	ce (0 to	o 5 %)	, Littl	e (10 to	20%),	Some (2	20 to 35	5%), Ai	nd (35	5 to 50	0%)						GP-7	
		JO.																						

~	G	s J					TE	S	T BOP	RIN	G	LOG				Do	Bori G	ng No P-8). e 4
_		-	<u> </u>	Dradier	Tuller Etc.	4		.	Dural (M			045000				Ра	ge		1 1
Pr	oject			Bradley I	-uller Fiel	d			Project No).		215300	-		Elevation			N/A	
	iont			Huntross		00			Inspector Project Mc			G. Zolad			Datum		10		10
Cr	ontractor			NEBC	ASSOCIAL	.03				anage	;1	G. Zulau	Z		Sidil Finich		12	/14/20	115
Dr	rillor			C. Down	ina				Drill Rig	зу		Geoprob			Model		12	/14/20	15
	m.			Auger	Casin	a	Samr	ler	Core Ba	rrol] ci : i	Woder	Lom	mor T	vno:	
Tu	/m.			- Auger	Gasin	g	oun						F		Г		<u></u>	<u>ype.</u>	
Inc	side Diar	notor (in)									rack	F			_ Sai	ety H	amme	r
H	ammor M	loight (lh	.) N								H	Trinod	F				tomat	ic	
H	ammer F	all (in)	,,						-	ŀ									
110		an (n.)		-	Sample D	ata				<u>г</u>		Vinch	Ca	t Head	Roller Bit		Cutt	ing He	ad
Depth (ft)	Casing (Blows/ft)	No.	Dep (ft)	th Rec. (in.)	SPT (Blows/ 6-in.)	Ro RC (%	ck F QD R 6) (p	PID dg. pm)	Stratum Change (ft)			Soil-Rock	k Vi (; k - l	sual Classific Soils - Burmis J.S. Corps of	cation and I ter System) Engineers S	Desc yster	r iptio n)	n	
) -		G1	0-5	5 36					<u> 0.4 </u>	<u>Tops</u> Brov	<u>soil</u> vn, f/	m SAND, s	som	e c-sand, tr. g -SAND i	ravel FILL-				
-									2.2										
-										Gray	, CL	AY little to	trac	e f/m sand					
-	-																		
5.	4	<u> </u>	F 1	0 50						C	. 0		1	-MARINE DE	POSITS-				
		G2	5-1	0 58						Gray	/, UL	AY IIIIIe to	trac	e i/m sand					
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-	1																		
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0																			
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25.	4																		
_	•	<u>ا</u>	Water	Level Data	a	·		5	Sample Ide	entific	atior	n <u>Coh</u>	esiv	e Soils N-Valu	ue <u>Gra</u> i	nular	Soils	N- Val	ue
D	ato .	Time		De	pth (ft) to:			-	O = Ope	en En	ded	(0 to	2: Very Soft	0	to 4:	Very	Loose	
υа	ate	rinte	BO	asing	סננ. 01 Hol≏	V	Vater		U = Unc S = Splice	iisturk t Sno	on	4 t	∠ to 8:	Medium Stiff	11 to	4 10 30: I	Vediu	m Der	nse
				GING		L			C = Roc	k Co	re		8 t	o 15: Stiff		31 to	50: D	ense	
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			Trad) [;++]	o /1/) to 200		Somo (20 +0	320/) And (0V6	er 30: Hard			1		
			iid	ບອຸບເບິວ%	շյ, ∟ուս	פוו	, iu ∠07	<i>v</i>],		-ບເບ	00%	, ∧nu(ບບເ	0 00 /0]					,

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308	4]	-	<u> </u>	D		uller 51 1	-		- T			1 -							Pag	je	1 of	: 1
5.4	Pro	oject			Bradle	ey Fu	Iller Fiel	d		P	Project No		2	15300)			Elevat	tion			N/A	
7.74	Clie	alion			Huntr	ess A	Associat	95			Ispector Project Ma	nager	G	. 2018 Zola	adz			Start	n		12	e Pla	10 15
61	Col	ntractor			NFBC	;	10000101	00			Checked F	Rv		. 2016	102			Finish	1		12/	14/20	15
ax.	Dril	ler			C. Do	wnin	a				Drill Rig	Jy	G	eopro	obe			Model			12/	14/20	15
8	lter	n:			Auae	r	Casin	a	Samp	ler	Core Ba	rrel			<u>гос</u> Г	Chid			Ha	amm	ier Ti	/ne [.]	
42	Tvr	be					-	5	-	-	-			.к •						Safe		mme	r
155	Ins	ide Dian	neter (in	.)	-		-		-		-			h.	Ē	Geor	hone				ahnu	+	1
17.4	Hai	mmer W	eight (lb))	-		-		-				Trip	od		Othe	r			Auto	omati	c	
el. 6	Hai	mmer Fa	all (in.)	,	-		-		-				Wind	-h		_ t Head	ΙΓ	Rolle	or Rit	\square	Cutti	na He	ad
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, MA 02110	Depth (ft	Casing (Blows/ft	No.	Dept (ft)	h Re: (ir	ес. 1.)	SPT (Blows/ 6-in.)	Rock RQD (%)	P Re (pr	'ID dg. om)	Stratum Change (ft)		So	oil-Ro (Ro	ock Vi () ock - l	sual C Soils - J.S. Co	lassific Burmis orps of	cation a iter Sys Engine	and De stem) eers Sys	scri stem	ptior)	1	
ston	0		G1	0-5	3	9					0.3	Topso	il										
Bo												Brown	, f/m S	SAND	, tr. g	ravel, c -	coarse s SAND I	sand FILL-					
eet,											25						-						
Stre												Brown	, SILT										
ury																-SIL	T DEP	OSITS	; -				
awe	- 1																						
Ž 0	- 5 -		G2	5-10	5 5	8					5.5												
ლ :												Grav.	CLAY										
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Бâ															Во	ttom of	t Explor	ration a	tt 10-ft.				
766															No	groun	dwater	encour	ntered.				
9.7																							
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. 60	4.5																						
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chni						Dept	h (ft) to:			1	O = Ope	en Ende	ed		0 to	2: Very	/ Soft	-	0 to	4: \	/ery l	oose	
ote	Dat	e	Time	Bot	tt. of	Bo	ott. of	Wat	er	1	U = Und	listurbe	d		2 4 to 9	to 4: S	ott ım Stiff		4 11 to 2	to 1 0· M	0: Lo Iediuu	ose n Dor	בפר
g				Ca	sing		1016			1	S = SpinC = Roc	k Core	'	-	8 t	o 15: S	Stiff		31	to 5	i0: De	ense	196
				1						1	GP = Ge	eoprobe			15 to	30 Ver	ry Stiff		Over	50:	Very	Dens	е
				Troo		50/1	;++1	o (10 +o	200/		Some /	20 to 25	(v/_)	٨٣٩	0ve	er 30: H	Hard			Т			
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	-	G	, S					TE	ST	BOF	RIN	G	LO	G							Bori GF	ng No P-10	1_
5.4308	Pro	ject	1		Bradley F	uller Fiel	d		Ρ	roject No			215	300				Elev	ration	Pa	ge	1 of N/A	f 1
317.745	Loc	ation ent			Newbury Huntress	oort, MA Associat	es		In P	ispector roject Ma	inager	r	G. Z G. Z	Zoladz Zoladz	z z			Datu Star	um t		S 12	ee Pla /14/20	an)15
Fax. 6	Cor Dril	ler			NEBC C. Downi	ng			C D	hecked E rill Rig	By		Geo	prob	е			Finis Mod	sh Iel		12	/14/20)15
55.4248	Iter Typ	n: De de Dian	neter (in)	Auger -	Casin -	g S	Sample -	er	Core Ba	rrel [~	Truck Track] Skid] ATV				<u>lamr</u>] Safe	n <u>er T</u> ety H	<u>ype:</u> amme	r
il. 617.4	Har	nmer W nmer Fa	/eight (Ib all (in.))	-	-		-					Tripoc	1] Geopi] Other			llor Bit] Dol] Aut		it iC	
Te	1101				S	ample D	ata						winch		Ca	і пеац		K0	nier bil		Cull	Ing He	au
, MA 02116	Depth (ft)	Casing (Blows/ft)	No.	Depth (ft)	Rec. (in.)	SPT (Blows/ 6-in.)	Rock RQD (%)	PI Rd (pp	D lg. m)	Stratum Change (ft)			Soil	- Rock (Rocl	k Vi (: k - l	sual Cl a Soils - E J.S. Coi	assific Burmis rps of	ter Sy Engir	n and D ystem) neers Sy	escr vstem	iptio 1)	n	
Boston,	0		G1	0-5	40					0.3	<u>Tops</u> Brow	<u>oil</u> 'n, f	/m SA	ND, li	ittle	c-sand							
Street,										3.1						-S	AND I	FILL-					
lewbury											Gray	CL	AY			-MARI	NE DE	EPOS	SITS-				
. 30 N															Bo	ottom of	Explo	ratior	n at 5-ft.				
inical Services, Inc. [°] 55 North Stark Highway Tel. 603.529.7766 Fax. 603.529.7080	- 10 - - 10 - 								Si	ample Ide	entifica	atic	<u>n</u>	Cohe		<u>e Soils</u>	<u>N-Vali</u>		Grani		Soils	<u>N- Va</u>	
Geotech	Dat	e .	Time	Bott Cas	of E	Bott. of Hole	Wate	er		U = Und S = Split C = Roc GP = Ge	listurb t Spoo k Core eoprot	ed on e oe		4 t 15	2 0 8: 8 t 5 to Ove	to 4: So Mediur o 15: St 30 Very er 30: H	oft n Stiff tiff / Stiff ard		11 to 3 3 Ove	4 to 1 30: N 1 to 50: r 50:	0: Lo lediu 50: D Very	m Der ense Dense	nse ie
ŀ	Note	s:		Trace	; (0 10 5%	y, ∟itti	e (10 l0	20%),	Some (2	20 10 3	55%	o), A	-inu (i	JO [0 00%)					(GP-1	0

		S	, S					TE	ST	BOF	RING	i LOG					Borin GP	g No. -11
8	2															Pa	ge 1	of 1
.430	Pro	oject			Bradley F	Fuller Fiel	d		Pr	roject No		215300)		Elevation			N/A
745	Loc	cation			Newbury	port, MA			In	spector		G. Zola	ldz		Datum		Se	e Plan
317.	Clie	ent			Huntress	Associat	es		Pr	roject Ma	nager	G. Zola	ldz		Start		12/1	4/2015
ax. 6	Co	ntractor							Cł	hecked E	By	0	h .		Finish		12/	4/2015
В Н 2 2 2 2 2 2 3 2 2 3 2 3 2 3 2 3 2 3 2	Dri	lier			C. Downi	ng Ossia			Dr			Geopro			iviodei			
t24	Iter	n:			Auger	Casin	g S	ample	er	Core Ba	rrei	Truck	Ski	d		<u>-lamr</u>	ner Ty	<u>pe:</u>
55.4	l yr	je ido Dian	notor (in)	-	-		-	_	-		Track		V] Saf	ety Ha	mmer
17.4	Ha	mmer W	leight (lh	·)	_	-		_	-	_		Trinod		opriorie			ignnut omatic	
l. 6	Ha	mmer Fa	all (in.)	<i>''</i>	-	-		-	-			Winch					Cuttin	
S Te	- Iu	-			5	Sample D	ata					winch			Koller Bil		Cuttir	у пеац
, MA 02116	Depth (ft	till 						PI Rd (pp	D lg. m)	Stratum Change (ft)		Soil-Roo (Ro	ck Visual (Soils ock - U.S. (Classific - Burmist Corps of E	ation and D er System) Engineers Sy	escr	iption າ)	
ston	- 0 -		G1	0-5	34					0.3	Topsoil							
Bos											Brown,	f/m SAND,	, little coar	se sand, f -SAND F	tr. gravel ILL-			
eet,										2.0				-				
Str									-	2.0	Gray C	LAY						
oury	_																	
lew	F	G1 0-5 34 G2 5-10 53 10-											-MA	RINE DE	POSITS-			
30 N	- 5 -	G1 0-5 34 G1 0-5 34 G2 5-10 53 G2 5-10 53									Gray, C	LAY with s	seams of s	ilt (wet fro	om 5 to 6-ft k	below	grade)
:		5 - G2 5-10 53 																
8																		
.70																		
529																		
603	- 10 -								Ļ									
ax.	-												Bottom	of Explora	ation at 10-fi			
96 F		5 G2 5-10 53											No arou	undwater e	encountered			
.77													Ū					
529																		
<u> 503.</u>																		
el.	- 15 -																	
ay T																		
ghw.																		
Ηi																		
itar																		
th 9																		
No	- 20 -																	
. 55																		
2																		
s, Ir																		
vice																		
Sen	25				1													
cal	- 23 -		L	L Water Lo	evel Data	<u> </u>		L	Sa	ample Ide	entificati	on Col	hesive Soi	ils N-Valu	e Gran	ular	Soils N	- Value
chni					De	oth (ft) to:				0 = Ope	n Ende	d <u>201</u>	0 to 2: Ve	ery Soft	01	0 4:	Very L	oose
ote	Dat	te	Time	Bott.	of E	Bott. of	Wate	er			isturbec	1	2 to 4:	Soft	11 to	4 to 1 30• №	0: Loc	
Ge				Casi	ng					C = Roc	k Core	4	8 to 15:	Stiff	3	1 to !	50: De	nse
										GP = Ge	eoprobe		15 to 30 V	ery Stiff	Ove	er 50:	Very I	Dense
				Trace	(0 to 5%	.). I ittl	e (10 to	20%).	Some (2	20 to 35). And	Over 30	Hard			-	-
	Note	es:			,0 10 0 /0	,, L itti	- (1010	_0/0	,,	20110 (2		, , , , , , , , , , , , , , , , , , ,		1			G	P-11

		G	s I		TEST BORING LOG														Pac	Borir GP	ig No -12	
308	m					Drodlov Fuller Field																
45.4		cation			Newburyport MA						roject No	•	G 70	00 Jadz			Dati	/ation		Se	N/A	n
7.7	Clie	ent			Hunt	Associat	es		P	Project Ma	inager	G. Zo	oladz			Star	t	_	12/	14/20	15	
61	Co	ntractor			NEB	С				Ċ	Checked E	Bv	0.1 20	S. EVIQUE			Finis	sh		12/	14/20	15
ax.	Dril	ler			C. Downing						rill Rig	,	Geor	Geoprobe			Moc	del		,		
49 148 1	우 Item:					ər	Casin	g	Samp	oler	Core Ba	rrel	Truck]			1	F	lamn	ner Tv	ne:	
.42	Typ			-		-		-		-		Track	L [tv Ha	mme	r	
455	Inside Diameter (in.)				-		-		-		-		Bomb.	[Geor	ohone				ahnu	-	1
17.					-		-		-				Tripod	ĺ	Othe	er			Auto	omati	2	
9I. 6	Hai	mmer Fa	all (in.)	,	-		-		-				Winch		at Head	ιΓ	Ro	ller Bit		Cutti	na He	ad
3 Te						S	ample Da	ata					WINCH							Cutti	IG IIC	uu
i, MA 0211(Depth (ft	Casing (Blows/ft	No.	Dep (ft)	th R (i	ec. n.)	SPT (Blows/ 6-in.)	Rock RQE (%)	k F D R (p	PID dg. pm)	Stratum Change (ft)		Soil-F	Rock V	'isual C (Soils - U.S. Co	Classific Burmis orps of	ter S Engir	n and D ystem) neers Sy	escri ^r stem	ption)		
stor	- 0 -		G1	0-5	5 4	46					0.7	Topsoil		IB								
Bö												Brown,	t/m SAN	ID								
ury Street,											3.8	Grav C	-SAND FILL-									
ewb												-MARINE DEPOSITS-										
30 N	- 5 -								Bottom of Exploration at 5-													
•											No groundwater encountered											
õ										No groundwater en						enco	unterea.					
ces, Inc. 55 North Stark Highway Tel. 603.529.7766 Fax. 603.529.70	- 10 - 																					
	 - 20 - 																					
Serv	25																					
ical	- 20 -		۱	Nater	ater Level Data						ample Ide	<u>entificati</u>	on (n <u>Coh</u> esive Soils N-Va			le	<u>Gr</u> anı	<u>ular</u> S	<u>Soils</u> N	<u>I- V</u> al	ue
Geotechni	Dat	Date Time			Depth (ft Bott. of Bott. c Casing Hole			Wa	ater		O = Ope U = Und S = Split C = Roc GP = Ge	n Ended0 to 2: Very Soft0 to 4isturbed2 to 4: Soft4 toSpoon4 to 8: Medium Stiff11 to 30k Core8 to 15: Stiff31coprobe15 to 30 Very StiffOver 4					o 4: \ l to 1 30: M 1 to 5 r 50:	/ery L 0: Loo lediur i0: De Very	oose ose n Den ense Dense	ise e		
				Trac	ce (0 to	5%)), Littl	e (10 t	to 20%	6),	Some (2	20 to 35°	%), A	nd (35	to 50%)				C.	P-12	2
	Note	es:																				-

		S	s,		TEST BORING LOG														Boring No. GP-13			
08	A														Pa	ge	1 of	1				
.43(Proje	ect		E	3radley F	uller Fiel	d		P	roject No			215300		Elevation			N/A				
745	Loca	ation		١	lewburyp	ort, MA		lr	nspector			G. Zoladz		Datum		Se	e Plan	I				
17.	Clier	nt		F	luntress	es			roject Ma	Inager		G. Zoladz		Start		12/	14/201	5				
ć. 6	Cont	tractor		١	JEBC				С	Checked By							12/	14/201	5			
Fa)	Drille	ər		C	C. Downir	ng			D	rill Rig			Geoprobe		Model							
48	Item	:			Auger	Casin	Samp	ler	Core Barrel			Truck	ruck Skid				Hammer Type:					
5.42	Туре	Э			-	-		-		-		√.	Track		Saf	ety Ha	mmer					
455	Insid	le Diam	neter (in.)	-	-		-		-			Bomb.	Geophone								
317.	Ham	nmer W	eight (lb)	-	-		-					Tripod [Other								
əl. 6	Ham	nmer Fa	r Fall (in.)		-	-		-			Г		Winch C	at Head	Roller Bit		Cutti	na Head	d			
э Те	(S	ample D	ata										Cuttin	ig ricat	-			
, MA 02110	Depth (ft	Casing (Blows/ft	No.	Depth (ft)	Rec. (in.)	SPT (Blows/ 6-in.)	Roc RQI (%)	k P D R) (pi	PID dg. om)	Stratum Change (ft)			Soil-Rock Visual Classification and (Soils - Burmister System (Rock - U.S. Corps of Engineers			Description) System)						
ston	0		G1	0-5	47					0.7	Topso	oil										
eet, Bos											Brow	rown, f/m SAND										
y Sti										3.9												
Newbur											Gray	Gray CLAY -MARINE DEPOSITS-										
30													В	ration at 5-ft								
•											No groundwater encountered.											
cal Services, Inc. 55 North Stark Highway Tel. 603.529.7766 Fax. 603.529.7080				Vater Le						ample Ide	entifica	atio	n Cohesi	ve Soils N-Valu	ue Gran	ular	Soils	J- Value	<u>e</u>			
echr	Date	, -	Time	Bott	Dep of F	oth (ft) to: Bott. of			-	O = Ope	en End	led ed	0 to	U to 2: Very Soft U to 4: Very Loose 2 to 4: Soft 4 to 10: Loose								
Geot				Casir	Casing Hole			Water		S = Split C = Roc GP = Ge	t Spoon k Core eoprobe		4 to 8 8 15 to 0v	4 to 8: Medium Stiff 8 to 15: Stiff 11 to 30: Mediu 31 to 50: D 15 to 30 Very Stiff Over 30: Hard And (05 to 50%)					e			
	Notes	s:		11400	10 10 0 /0	/, LIU	5 (10	.0 20 /0	~/,	20110 (2	_0 10 0		<i>y, r</i> iiu (00				Ģ	iP-13				