Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Trinity Conservation LLC Blast Plan

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

We have enclosed a proposed blast program, prepared by Maine Drilling and Blasting, Inc for the proposed Trinity Conservation Sand and Gravel operation at Green Hill Road. Based on our discussions with Maine Drilling and Blasting, we understand that the NH Department of Safety regulates the use of explosives/blasting agents. Saf-C 1625.04 regulates vibration limits such that blasting "shall be conducted so that vibrations adjacent to any structure, not controlled by the blaster, or for which the blaster has received the owner's written permission, do not exceed the limits cited in Saf-C 1625.04. We further understand that the Town of Barrington currently does not have a Blasting Ordinance, and that the Fire Chief is responsible for enforcement of the state regulations administered through Saf-C1600, and that he advises the criteria in Article 7.2 applies to the excavation work itself, not to the ancillary blasting.

Per Saf-C 1625.04, a peak particle velocity of 2.0 inches per second shall be the maximum of any one of the 3 mutually perpendicular ground motion velocity components of a vibration. These components shall be measured in directions vertical, longitudinal, and transverse to the vibration source. Any ground vibration over peak particle velocity of 2.0 inches per second shall be reported to the director (of NH Department of Safety) within 24 hours.

As such, Maine Drilling & Blasting has detailed a typical blast scenario and corresponding Peak Particle Velocities that may be expected (or as determined by the blasting contractor to maintain vibration (Peak Particle Velocities) acceptable to NH Department of Safety):

Construction site projects/quarry:
Pattern (burden & spacing): 9' x 9'
Borehole size: 4''
Avg. hole depth (cut + sub drill): 40'
Explosive type: Bulk emulsion
Explosives load: 34'
Stemming load: 5' – 8'
Yards/borehole (minus sub drill): 111 cu/yd.
Total yards (including sub drill): 120 cu/yd.
Max pounds per borehole: 235.24 lbs.
Powder factor: 1.96 lbs. /yd.

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Distance(ft.):	500	750	1000	1250	1500	1750	2000	2250
Predicted Peak Particle Velocity:	.61	.32	.20	.14	.10	.08	.07	.05

The proposed blast plan indicates that the Predicted Peak Particle Velocity at the nearest properties, which are over 700 feet from the blasting, will be approximately 0.4 inches/second, which is below the limits of 2.0 inches/ second established in Saf-C 1625.04.

The blasting contractor will monitor ground vibrations produced by each blast and will produce printed seismograms of vibrations that are recorded in unites of particle velocity in inches/seconds. These printed measurements will be retained by the blasting contractor for a period of at least six months and will be made available to the town and state officials upon request.

The proposed blast plan is contained within the Excavation Site Plans for the Trinity Conservation LLC Sand and Gravel Operation, prepared by this office. Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Stone Crushing / sound abatement

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

The purpose of this letter is to provide a narrative that outlines the details of the stone crushing operation and the noise control device proposed at the Greenhill Road Trinity Conservation site. The stone crushing at the site will be an ancillary activity in support of the main sand and gravel operation. The operation would be crushing granite rocks into smaller pieces, usually ¾ inch to 1 ½ inches, for building /road aggregates product. The crushing would be supported by one day of blasting every two months and followed up by crushing as needed during a period of 5 to 7 work days in that two month period.

Crushing would be accomplished by a mobile cone crusher, which is a small convenient granite crushing machine. It is a complete crushing unit, uniting crusher, belt conveyor and screening machinery. It is anticipated in the initial staging period of the operation of 12 to 18 months that the mobile crusher would not be permanently located at the site.

We have enclosed materials from a firm, Acoustical Solutions, Inc that consults/designs/installs specific sound solutions and among their areas of activity is outdoor commercial/industrial noise control. For example, we have researched that the average mobile crusher at the source, depending on the level of operation develops 80 to 92 dba. One of Acoustical's designs is a mobile sound curtain/ wall (a 14 foot tall sound mitigation screen) which has an STC rating of 27 or a reduction of approximately 22.6 dba's. We have enclosed the Estimated Noise Barrier Reduction, prepared by Acoustical Solutions, indicating the reduction of 22.6 dB produced using a 14 foot high moveable wall located at 20 feet from the crusher. Consequentially, the original levels would be reduced to below the 75dba level in the area of the source. The operator will focus on the source at the crusher and source of other activity in the excavation at ground level, where sound control is accomplished by the 14 foot tall sound curtain / wall as well as the embankment at the edge of the site, which will be 15 to 20 feet high at phase 3. Specific design will be accomplished when the operator sets up the operation site. Dealing with the source and path in general is superior than trying to mitigate the sound as it nears the receiver.

The attached information from Acoustical Solutions Inc has been submitted for the board's understanding of sound/noise and examples of systems engineered to mitigate sound in commercial and industrial sounds in outdoor applications. It is our understanding that this technology is currently widely used and we are confident that it can effectively deal with sound relative to the proposed operations and meet the town's ordinance that restricts the sound levels at the property line to not greater than 75 dba's.

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The applicant would agree, as a condition of approval, that the operations will use a 20 foot sound mitigation screen. Additionally, testing of sound levels (3 times a year) by the operator will be performed, and the Town will be notified of such tests, so that a representative of the Town can be present.

Mobile Cone Crusher

Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

Acoustical SOLUTIONS, INC.
ENVIRONMENTAL DIVISION

2420 Grenoble Road
Richmond, Virginia, 23294
Telephone: (800) 782-5742
Fax: (804) 346-8808

Estimated Noise Barrier Reduction

Date: 2/25/13
Project Name: NH Crusher
Project Location: Barrington, NH
Contact: Jason Hill, TF Moran

Noise Level Chng. w/ Barrier	
Delta A-wt=	22.6 dB

Elevations	(feet)
Source:	14
Receiver:	5
Top of Barrier 1:	14
Top of Barrier 2:	0
Distances	**(feet)**
Receiver & Source:	25
Barrier 1 & Source:	20
Barrier 2 & Source:	0
STC** of Barrier:	27
NRC† of Barrier:	0.70

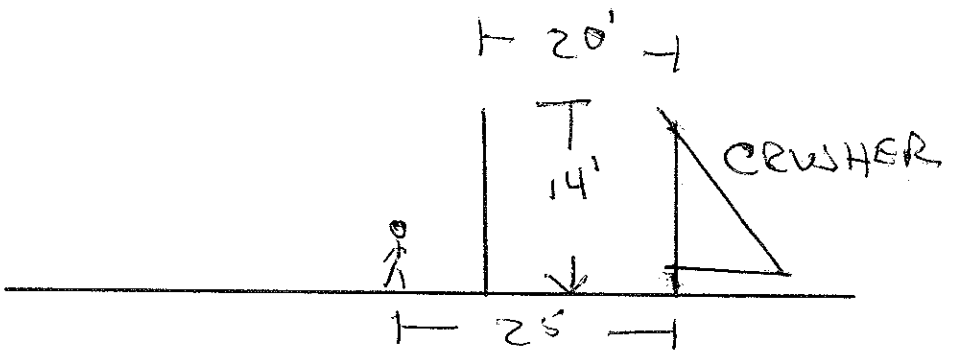
ΔdB	Sound Pressure Loss	Realative Loudness
0	0%	Reference
-3	50%	Perceptable Change
-6	75%	Noticeable Change
-10	90%	1/2 as Loud
-20	99%	1/4 as Loud
-30	99.9%	1/8 as Loud

1 #/1" BBC-EXT-13

85 dBA - 22.6 = ±62.4

** Sound Transmission Class (STC)
† Noise Reduction Coefficient (NRC)

The estimated change in sound level "with barrier" as given here was calculated based on elevation(s) and distance(s) data as provided to Acoustical Solutions, Inc.
This is not a guaranteed reduction only an expected estimate based on provided dimensions and estimated conditional data.



Civil Engineers
Structural Engineers
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Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Proposed Hours of Operation
Trinity Conservation LLC Sand and Gravel Operation

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

The purpose of this letter is to define and reaffirm the proposed hours of operation at the Trinity Conservation sand and gravel operation. The operation is proposed to be run year-round, excluding major holidays and as otherwise indicated in this letter. Normal business hours are proposed to be Monday through Friday from 8:00AM to 5:00 PM, where the business will be open to the public. Routine maintenance may be performed on the grounds on Saturday from 8:00 AM to 5:00 PM; however the business will be closed to the public on Saturday. Routine maintenance shall consist of cleaning equipment, reclamation, inspection and maintenance of storm water treatment and conveyance practices, maintenance of the access roadway and related activities.

Blasting and crushing are limited to normal business hours. The crushing would be supported by one day of blasting every two months and followed up by crushing as needed during a period of 5 to 7 work days in that two month period.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

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Civil Engineers
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February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Excavation Site Plan
Map 210 Lot 57
Green Hill Road, Barrington, NH

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

I am writing to you on behalf of Trinity Conservation LLC in response to Dubois & King Inc.'s comment letter, dated February 4, 2013. The purpose of this letter is to address those concerns. The following outlines our response to these comments:

1. The stormwater report lists the elevation of the seasonal high water (ESHWT) table for boring #4 (the only boring within the confines of the sedimentation basin) as 171.8. However, the design criteria sheet states the ESHWT as 168. We would recommend that this discrepancy be addressed and the bottom of the basin be adjusted accordingly to provide an appropriate separation from the groundwater table.

We have attached a Test Borings Report, prepared by H.T.E Northeast, to accompany this letter. At boring H.T.E-1, groundwater was encountered at elevation 171. H.T.E-1 is located within the approximate limits of the infiltration basin. Accordingly, the design floor elevation of the infiltration basin has been raised to elevation 174 to provide the required separation to the water table. Attached please find summary for pond 1xP, Sediment Basin.

2. The proposed vehicle maintenance pad (sheet 11) does not appear to meet the best management practices for fueling and maintenance of excavation and earthmoving equipment in accordance with NHDES regulations. Specifically, secondary containment equipment used during mobile fueling should be sized to contain the most likely volume of fuel to be spilled during a fuel transfer. Containment examples would be a rigid or flexible "pop-up" pool or berm.

Based on our research we have found that most fleet trucks, which would likely access the site, have a fuel tank capacity of 240 to 280 gallons. As such, we have added secondary containment provisions to the proposed vehicle maintenance pad (sheet 11) detail, requiring the use of a flexible pool / berm during fueling. We have attached the product data sheet of a suitable product, manufactured by ChemTex Inc, intended for use on this project.

3. A sightline plan (sheet 6A) was submitted via email separate from the plan set. The plan has a January 30,2013 date. The sight distance is based on the driver's eye (7'6") for a large truck. However, the

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sight distance for a standard vehicle would appear to be much less based on the profile shown. We would recommend that the plan/profile be revised to include a standard vehicle.

We have added the sight line information relative to a passenger vehicle. See enclosed plan.

4. A resilient modulus of 38,500 psi was used in the analysis of the roadway. This number was obtained from Special Report 99-14, Resilient Modulus for New Hampshire Subgrade Soils for Use in a Mechanistic AASHTO Design, U.S. Army Corps of Engineers, 1999. In Table 16 of the Report, five (5) different module are presented for varying soil types, and the H.T.E. has used the value for soil NH3. The modulus for the NH3 soils is much higher than any other modulus in the Table, and is based on soil containing high amounts of sand and gravel. Upon review of the boring logs, it appears that many of the samples contained more than a trace of fine sands, and therefore, soil type NH3 may not be representative of the soils found under Green Hill Road, specifically the eastern portion. We suggest that a more conservative resilient modulus be chosen, and that the analysis be rerun with the new value. It should also be noted that the resilience modulus values are based upon relatively dry soil conditions and that at times when there is more moisture in the road base the road will be more susceptible to damage due to the reduced strength of the soils. Based on the above, we do not agree that the typical Barrington Subdivision Regulations road construction standards are suitable for the east end of Green Hill Road. Specifically, Article 15.8 (Road Construction Standards) states "these are minimum standards" and "the amount of base course materials shall be increased in areas of poor soils and for roads carrying commercial/ industria1 traffic."

We have enclosed HTE Northeast's, Inc. (HTE's) addendum to their January 3, 2013 letter report of a generalized pavement section analysis for Green Hill Road. This letter considers the comments of DuBois & King dated February 4, 2013.

We trust these responses address your concerns. Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

EXHIBIT A : PROPOSED SECONDARY CONTAINMENT

Item Number: 8610

Item Name: Containment Berm

Containment Capacity: 269 Gallons

Color: Black

SPCC COMPLIANT

Amount	Length	Width	Height	Depth	Int. Dia.	Ext. Dia.	Weight
1 Each	6'	6'	1'	—	—	—	39 lbs.

Features and Benefits

- Protect heavy equipment from spills during filling, discharging, cleaning, and maintenance
- Smaller sizes provide total containment of drums, tanks, generators, compressors, and other equipment prone to leaks and spills
- Sidewalls lower quickly to allow drive-in/drive-out
- No inflation required

PDS Generated: 6/12/12

Chemtex Inc • 1 Front Street • Cumberland RI 02864

Phone: 1-877-431-0200• Fax: 401-305-3033

EXHIBIT B: 100YEAR HYDROCAD SUMMARY OF SEDIMENT BASIN.

Summary for Pond 1xP: Sediment Basin

Inflow Area =	49.357 ac,	0.00% Impervious,	Inflow Depth = 1.04"	for 100 event	
Inflow =	26.1 cfs @	12.46 hrs,	Volume=	4.259 af	
Outflow =	6.0 cfs @	14.93 hrs,	Volume=	4.259 af,	Atten= 77%, Lag= 148.0 min
Discarded =	6.0 cfs @	14.93 hrs,	Volume=	4.259 af	
Secondary =	0.0 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 174.97' @ 14.93 hrs Surf.Area= 51,852 sf Storage= 40,600 cf

Plug-Flow detention time= 71.3 min calculated for 4.254 af (100% of inflow)
Center-of-Mass det. time= 71.2 min (1,035.9 - 964.7)

Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	255,000 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
174.00	32,000	0	0
176.00	73,000	105,000	105,000
177.80	76,500	134,550	239,550
178.00	78,000	15,450	255,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	174.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Secondary	177.80'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=6.0 cfs@ 14.93 hrs HW=174.97' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 6.0 cfs)

Secondary OutFlow Max=0.0 cfs@ 5.00 hrs HW=174.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
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Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Green Hill Road Pavement Section Analysis

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

I have attached the pavement section analysis completed by H T E Northeast Inc., relative to the proposed borrow pit and an addendum letter/recommended pavement section by H T E Northeast in response to comments from the town's engineer Dubois & King dated February 4, 2013.

Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

NORTHEAST, INC.
Environmental Engineering
Geotechnical Engineering
Water Resources
Hydrogeology

February 11, 2013
Project No. 4895A

Mr. Jason Hill, Project Manager
T. F. Moran, Inc.
48 Constitution Drive
Bedford, New Hampshire 03110

RE: Pavement Section Assessments - Addendum
Proposed Roadway Use Change
Proposed Borrow Pit: #204 Green Hill Road
Barrington, New Hampshire

Dear Jason:

This correspondence presents HTE Northeast's, Inc. (HTE's) addendum to our January 3, 2013 letter report of a generalized pavement section analysis for Green Hill Road. This letter considers the comments of DuBois & King dated February 4, 2013.

As a general comment, while the proposed activity results in a significant increase in traffic for the road, the traffic loading still remains low overall relative to ESALs (Equivalent Single Axle Loads).

Except for the B-1/B-2 portion of the project, the conclusions of the January 3, 2013 report are still considered appropriate.

Relative to the east portion of the road, it is recommended that the east 1,250± feet of roadway (includes in the vicinity of test borings B-1 and B-2) should have full box reconstruction to Town specifications. The recommended pavement section is as follows:

	HEAVY DUTY PAVEMENT SECTION (i.e. Truck Traffic) for East Portion
BITUMINOUS CONCRETE:	
Top Course Thickness	1.0 inches
Binder Course Thickness	2.5 inches
SUPPORT MATERIALS:	
Base Course Thickness (NHDOT Item No. 304.3)	8 inches
Subbase Course Thickness (NHDOT Item No. 304.2)	16 inches

2 Cote Lane, Suite 1
Bedford, New Hampshire
Telephone: (603) 668-1654 • Fax: (603) 668-0608

NORTHEAST INC

It should be noted that it will be necessary for the field engineer, at the time of construction, to verify that adequate removal of unsuitable subgrade soils is achieved and to assess for the need to place a layer of geotextile stabilization fabric over inundated and/or sensitive silty subsoil, marine clay or till subgrade surfaces prior to the placement of pavement support materials. All organic soils should be removed.

This revised recommended pavement section for the east area considers: 1) the subgrade as noted in the borings and 2) the more shallow groundwater conditions in this area.

We trust that your office will find this additional information helpful. Please do not hesitate to contact the undersigned for further information as necessary.

Very truly yours,

HTE NORTHEAST, INC.

Roger B. Keilig

Roger B. Keilig, PE, PG, CPESC
Sr. Project Manager

STATE OF NEW HAMPSHIRE
ROGER B. KEILIG No. 7630 LICENSED
PROFESSIONAL ENGINEER

NORTHEAST, INC.
Environmental Engineering
Geotechnical Engineering
Water Resources
Hydrogeology

January 3, 2013
Project No. 4895A

Mr. Jason Hill, Project Manager
T. F. Moran, Inc.
48 Constitution Drive
Bedford, New Hampshire 03110

RE: Pavement Section Assessments
Proposed Roadway Use Change
Proposed Borrow Pit: #204 Green Hill Road
Barrington, New Hampshire

Dear Jason:

This correspondence presents HTE Northeast's, Inc. (HTE's) letter report of a generalized pavement section analysis for Green Hill Road. This work was performed in general accordance with our proposal No. P-9581A dated December 13, 2012. The analyses also consider the in-place subgrade soils information presented in out 'Nov. 6, 2012 Test Borings Results Tables' correspondence dated November 12, 2012. The test boring data indicated that, except for the east 1,250± feet of the road, the in-place support soils were medium dense to dense inorganic granular materials to depths ≥3'±. Subgrades for the east 1,250± feet of the road included intermittent organic soils and relatively shallow groundwater.

We were requested to perform analyses and provide recommendations for the Green Hill Road pavement section considering school bus loads as well as to support trailer-dump trucks from the borrow pit, assuming that the tractor trailer dump trucks will be transporting from the pit (23 CY maximum load). We have been informed to assume a maximum 30 hauls / day each way (60 trips total) with each haul as 18 CY gravel (generally).

Green Hill Road outlets to Route 202 to the west and Route 125 to the east. It is understood that paving (binder course only) was performed for the east portion of Green Hill Road in 2009 and for the west portion of Green Hill Road in 2010. Full box re-construction to Town specification did not occur. NHDOT traffic count data indicates a traffic volume of 1800 vehicles per day (vpd) for 2011 for Green Hill Road over Isinglass River (up from 1700 vpd in 2008). Dale Transportation indicated the following relative to school bus traffic: three AM runs per day for pickup (1 each for elementary/ middle/ and high school) and correspondingly three PM runs per day for drop-offs (all with full-size school bus).

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Bedford, New Hampshire
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Information on existing heavy truck traffic was not available; for our analyses, we assumed that less than ten (10) heavy trucks (5-axel) travel the road per day.

A) SUMMARY of ANALYSES

Our assessment of pavement section performance was based on softwares based on the 'mechanistic/empirical' method of pavement support analysis. Analyses were performed using the 'MnPave' program developed by Minnesota Department of Transportation (MNDOT) and the SW-1 Asphalt Pavement Thickness Design Software program developed by the Asphalt Institute.

SW-1 was used to model traffic conditions before and after the construction of the borrow pit and subsequent addition of thirty 5-axle trailer-dump trucks a day to the existing traffic volume. MnPave is a program created by the MN DOT for asphalt reliability calculations based on traffic volume, subsurface conditions, and asphalt thickness. Given the existing and proposed traffic conditions, MnPAVE was used to calculate the reliability of the existing Green Hill Road. The following information or assumptions were considered for our analyses:

1) ESALs (Equivalent Single Axle Loads) derived from SW-1 Asphalt Pavement Thickness Design Software (refer to two attached SW-1 analyses results printouts):

    a. ESALs Existing: 127,000 / 20 years
    b. ESALs Proposed: 411,000 / 20 years
    c. Traffic volume estimates for the existing Green Hill Road were 1800 vpd with an estimated 5% trucks.
    d. Traffic volume estimates for the proposed Greenhill Road were 1830 vpd with 6.6% trucks. Additional trailer-dump trucks were categorized as 5-Axle Multiple Unit Trucks.
    e. SW-1 recommends 4 inches minimum of asphalt, this is the program minimum. Three inches (3"), asphalt thickness per the specifications of the Town of Barrington, was used in the Reliability Analysis.
    f. Resilient Modulus of 38500 psi obtained from Special Report 99-14, Resilient Modulus for New Hampshire Subgrade Soils for Use in Mechanistic AASHTO Design, US Army Corps of Engineers, 1999.

2) Reliability Estimates generated using MnPAVE from the MN DOT (refer to six attached MnPave analyses results printouts):

    a. Houston County (MN) was selected for its similar climate to Barrington (NH), average, max and min temps.

b. Calculations based on assumption final wearing course of asphalt is installed to bring the total thickness to >3 inches.
c. Green Hill Road was analyzed considering the east 1,250± feet of road and then the remainder (west section) based on subsurface explorations and the presence of unsuitable road base material observed under the east (1,250'±) portion of the road.
d. Road structure based on Town of Barrington Road Design and Construction Standards and
e. MNDOT Class 7 gravel is most similar to NHDOT 304.3 based on gradation requirements and was used in the analysis.

Table 1 – Tabulated Results Based on MnPave

Reliability Estimates (Fatigue, Rutting) %	Existing Rd. East	Existing Rd. West
Existing ESAL		
127,000 / 20 years		
Fatigue	100%	100%
Rutting	99.8%	100%
Proposed ESAL		
411,000 / 20 years		
Fatigue	96.8%	99.7%
Rutting	76.5%	100%
Maximum ESAL	340,000 / 20 years	880,000 / 20 years
Fatigue	85.8%	85.4%
Rutting	85.8%	99.9%

Note: Acceptable reliability is >85%.

B) CONCLUSIONS

Based on our generalized pavement section analyses, the following conclusions are offered:

Existing Roadway Traffic

- It is considered, that with the addition of a 1" thickness wearing course, that the existing roadway can support the current traffic with limited impact (overall) to the road condition.

- Except that the section of road (east portion) in the vicinity of test borings B-1 and B-2 was constructed over unsuitable organic and/or silty materials (groundwater also appeared to be more shallow in this area), and this section of road is already showing signs of wear and cracking.

<u>With the Proposed Borrow Pit</u>

- The majority of the existing Green Hill Road, if completed with addition of a 1.5" wearing course, would be suitable to support the projected increase in heavy truck traffic resultant from the activation of the borrow gravel pit and subsequent increase of thirty 5-axle trailer-dump trucks.

- The entrance to the borrow pit will see approximately 50% more ESALs from the heavy trucks as well as the additional wear from turning vehicles. Accordingly, two inches of wearing course is recommended for the 100 feet of Green Hill Road to either side of the proposed borrow pit entrance.

- It is recommended that the east 1,250± feet of roadway (includes in the vicinity of test borings B-1 and B-2) should have full box reconstruction to Town specifications.

We trust that your office will find this information helpful. Please do not hesitate to contact the undersigned for further information as necessary.

Very truly yours,

HTE NORTHEAST, INC.

Roger B. Keilig

Roger B. Keilig, PE, PG, CPESC
Sr. Project Manager

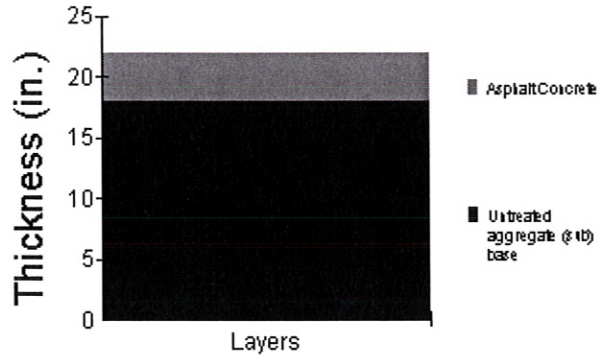
STATE OF NEW HAMPSHIRE
ROGER B. KEILIG
No. 7630
LICENSED
PROFESSIONAL ENGINEER

Attachments: A) SW-1 analyses results printouts (2); b) MnPave analyses results printouts (6)

Asphalt Institute

Pavement Design Detail Report

SW-1 Thickness Design Software version 1.0



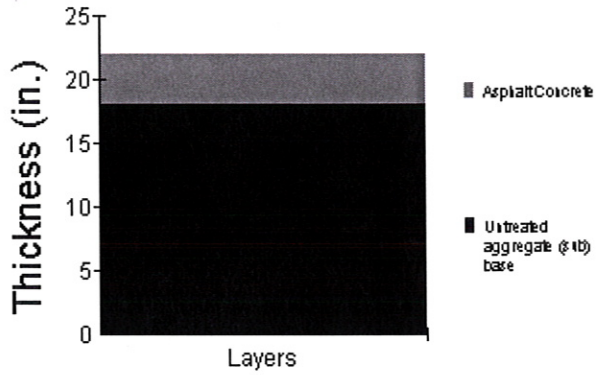
User:	sdoherty	Date:	1/3/2013	Time:	10:06
Project Information					
Project Name:	Green Hill Rd. Existing				
Description:	Green Hill Rd. ESALs under current conditions.				
Pavement Use:	General Roadway				
Problem Type:	New Pavement Design				
Design Input Summary					
Climate:	45° F				
Design Traffic (ESAL):	126,627				
Subgrade M_r (psi):	38,500				
Design Traffic Details					
Design Life (years):	20				
Design Lane Factor:	0.8				
Initial Average Annual Daily Traffic (AADT):	1800				
Truck Volume, as a percentage of AADT:	5				
Annual Compound Growth Rate (%):	2				
Type of usage:	Rural				
Truck Classification	% Trucks	Truck Factor			
TRUCK(2-AXLE,4-TIRE)	70	0.01			
TRUCK(2-AXLE,6-TIRE)	15	0.30			
TRUCK(3-AXLE or MORE)	10	0.90			

MULT.TRUCK(<=4-AXLE)	2	0.64
MULT.TRUCK(5-AXLE)	2	1.36
MULT.TRUCK(>=6-AXLE)	1	1.63
TOTAL:	100	N/A
Calculated Equivalent Single Axle Loads (ESAL)		
Initial Year Traffic (ESAL):	5,211	
Design Life (ESAL):	126,627	
Subgrade Information		
Type of Measurement:	Resilient Modulus (M_r)	
Correlation Equation:	N/A	
Recommended Design Strength Percentile	75.0	
Design Strength Percentile:	N/A	
Individual M_r Values	M_r	
	38,500	
Average:	38,500	38,500
Std Dev:	0	0
Design M_r	38,500	
Design Results		
HMA Thickness (in)	4.0	
Aggregate Base Thickness (in)	18.0	

Asphalt Institute

Pavement Design Detail Report

SW-1 Thickness Design Software version 1.0



User:	sdoherty	Date:	1/3/2013	Time:	10:51
Project Information					
Project Name:	Green Hill Rd. Proposed				
Description:	Green Hill Rd. ESALs under proposed conditions.				
Pavement Use:	General Roadway				
Problem Type:	New Pavement Design				
Design Input Summary					
Climate:	45° F				
Design Traffic (ESAL):	411,885				
Subgrade M_r (psi):	38,500				
Design Traffic Details					
Design Life (years):	20				
Design Lane Factor:	0.8				
Initial Average Annual Daily Traffic (AADT):	1830				
Truck Volume, as a percentage of AADT:	6.6				
Annual Compound Growth Rate (%):	2				
Type of usage:	Rural				
Truck Classification	% Trucks	Truck Factor			
TRUCK(2-AXLE,4-TIRE)	53	0.01			
TRUCK(2-AXLE,6-TIRE)	12	0.30			

TRUCK(3-AXLE or MORE)	7	0.90
MULT.TRUCK(<=4-AXLE)	1	0.64
MULT.TRUCK(5-AXLE)	26	1.36
MULT.TRUCK(>=6-AXLE)	1	1.63
TOTAL:	100	N/A
Calculated Equivalent Single Axle Loads (ESAL)		
Initial Year Traffic (ESAL):	16,950	
Design Life (ESAL):	411,885	
Subgrade Information		
Type of Measurement:	Resilient Modulus (M_r)	
Correlation Equation:	N/A	
Recommended Design Strength Percentile	75.0	
Design Strength Percentile:	N/A	
Individual M_r Values	M_r	
	38,500	
Average:	38,500	38,500
Std Dev:	0	0
Design M_r	38,500	
Design Results		
HMA Thickness (in)	4.0	
Aggregate Base Thickness (in)	18.0	

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill East Existing

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence.
Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
>50 years	46 years	100%	99.8%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Green Hill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG52-34	3.00
2	Aggregate Base	FDR / Class 7	12.00
3	Engineered Soil	Silt	6.00
4	Engineered Soil	Silt Loam (plastic)	12.00
5	Engineered Soil	Silty Clay	

Traffic Information

Load Type	Total Repetitions
ESALs	127,000

Notes

Reliability Statistics for Green Hill Road east of the proposed gravel pit under current conditions.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:02:51

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill East Max

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence. Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
37 years	20 years	98.5%	86.7%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Greenhill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG52-34	3.00
2	Aggregate Base	FDR / Class 7	12.00
3	Engineered Soil	Silt	6.00
4	Engineered Soil	Silt Loam (plastic)	12.00
5	Engineered Soil	Silty Clay	

Traffic Information

Load Type	Total Repetitions
ESALs	340,000

Notes

Maximum load Reliability Statistics for Green Hill Road east of the proposed gravel pit.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:07:19

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill East Proposed

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence. Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
31 years	17 years	95%	77.2%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Greenhill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG52-34	3.00
2	Aggregate Base	FDR / Class 7	12.00
3	Engineered Soil	Silt	6.00
4	Engineered Soil	Silt Loam (plastic)	12.00
5	Engineered Soil	Silty Clay	

Traffic Information

Load Type	Total Repetitions
ESALs	412,000

Notes

Reliability Statistics for Green Hill Road east of the proposed gravel pit under propused conditions.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:11:09

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill West Existing

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence.
Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
>50 years	>50 years	100%	100%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Greenhill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG58-34	3.00
2	Aggregate Base	FDR / Class 7	6.00
3	Aggregate Base	MNDOT Class 6	12.00
4	Engineered Soil	Sand	

Traffic Information

Load Type	Total Repetitions
ESALs	127,000

Notes
Reliability Statistics for Green Hill Road west of the proposed gravel pit under current conditions.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:13:06

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill West Max

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence.
Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
22 years	49 years	85.4%	99.9%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Greenhill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG58-34	3.00
2	Aggregate Base	FDR / Class 7	6.00
3	Aggregate Base	MNDOT Class 6	12.00
4	Engineered Soil	Sand	

Traffic Information

Load Type	Total Repetitions
ESALs	880,000

Notes

Maximum Load Reliability Statistics for Green Hill Road west of the proposed gravel.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:14:08

MnPAVE Design Summary

MnPAVE 6.210 Simulation Input File: Greenhill West Proposed

Confidence and Reliability do not necessarily agree. All layer values are reduced based on Confidence. Monte Carlo Reliability randomly selects values for each layer. Use Reliability for final design.

Preliminary Life Estimate		20-Year Reliability	
Fatigue	Rutting	Fatigue	Rutting
41 years	>50 years	99.8%	100%

Project Information

District	County	City
6	Houston	Barrington

Project Number	Route	Reference Post
4895A	Greenhill Rd	from to

Letting Date	Construction Type
12/27/12	

Designer	Soils Engineer
Sean Doherty	Roger Keilig

Climate Information

Season Mode	Location
Days	43˚ 44' Latitude, 91˚ 25' Longitude

Structural Information (Design Level: Intermediate)

Layer	Type	Subtype	Height (in.)
1	Hot-Mix Asphalt	PG58-34	3.00
2	Aggregate Base	FDR / Class 7	6.00
3	Aggregate Base	MNDOT Class 6	12.00
4	Engineered Soil	Sand	

Traffic Information

Load Type	Total Repetitions
ESALs	412,000

Notes

Reliability Statistics for Green Hill Road west of the proposed gravel pit under proposed conditions.

20 Year Reliability of > 85% recommended for ESALs <1,000,000
Houston County MN selected for climate similarities with Barrington NH

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Printed Thursday, January 03, 2013 at 11:16:43

HTE
NORTHEAST, INC.
Environmental Engineering
Geotechnical Engineering
Water Resources
Hydrogeology

November 12, 2012
Project No. 4895

Mr. Jason Hill, Project Manager
TF Moran, Inc.
48 Constitution Drive
Bedford, New Hampshire 03110

RE: Nov. 6, 2012 Test Borings Results Tables
Proposed Roadway Use Change
Green Hill Road & Hansonville Road
Barrington, New Hampshire

Dear Jason:

Submitted herewith is HTE Northeast's, Inc. (HTE's) tabulation of test borings performed along Green Hill Road and Hansonville Road. This work was performed in general accordance with our proposal No. P-9581 dated October 18, 2012. It is understood that a borrow pit is proposed for a parcel to the north side of Green Hill Road and east of Hansonville Road. All of the Greenhill Road test borings were performed within the west-bound travel lane.

It is understood that paving (binder course only) was performed for the east portion of Green Hill Road in 2009 and for the west portion of Green Hill Road in 2010. Hansonville Road was last paved about 10± years ago.

Relative to the proposed borrow pit activities it is understood that up to 15 dump-truck or trailer-dump trips are proposed each for outlet to Route 202 to the west and Route 125 to the east.

A) SUMMARY of TEST BORINGS

The test borings were performed with an Acker Soil Sentry truck-mounted test boring drill rig. The split spoon sampling was by the hammer free-fall (not auto-hammer) method.

The test borings were advanced by the continuous split spoon sample method to depths of down to 6± feet. Standard Penetration Tests (SPTs) were performed in each test boring in general accordance with ASTM D 1586 at 5-foot intervals. The SPT consists of driving a 1⅜ inch I.D. split spoon sampler with a 140 pound hammer falling 30 inches. The blows for each 6 inches of penetration are recorded for a total of 18 to 24 inches. The sum of the blows required to drive the sampler from 6 inches to 18 inches penetration is referred to as the Standard Penetration Resistance, or N-value, which is an index measure of in-situ soil density or consistency.

For the soil sampling, the #1 split-spoon was generally driven (starting from beneath pavement) from 0.3'± to 2.3'± and the #2 split-spoon was generally driven from 2.3'± to 4.3'± The following tables present a summary of the borings:

Table 1 – Green Hill Road Test Borings

LOCATION & NOTES	ASPHALT THICKNESS	BLOWS/6": 0.3'± to 2.3'±	BLOWS/6": 2.3'± to 4.3'±	SOILS: #1 SPOON	SOILS: #2 SPOON
B-1; #33	2½±	20-16-8-6	7-10-7-6	9" S&G/4" Silt	Silt/ 2" Org./m-c Sand; wet @3.3'
B-1		Blows 4.3' – 6.3' 6-9-8-11		Spoon #3: Marine clay + silt	
B-2; #47 Hse	3±	15-13-5-6	7-11-13-20	10" S&G/Silt/ Org. Silt	f-m Sand; wet @ 3.6'
Note on B-1/B-2 areas: Cracks prevalent these areas.					
B-3; #98 Dr.	3±	9-10-13-13	19-18-17-19	6" S&G/ f-m Sand	F to f-c Sand; little Gravel
B-4;#144 Hse	3½±	9-10-13-13	14-13-9-10	4" S&G/ f-m Sand; Li. Gravel	f-c Sand; little Gravel
B-5; Nte 1	3½±	10-26-24-16	13-11-14-16	S&G	Poor recovery
B-5A; Nte 1A	3½±	13-9-5-7	6-6-13-11	S&G	Gravelly Sand
B-6; #195 Dr.	2±	13-12-11-15	19-21-25/0"	S&G	Sandy Till
B-7;#232 E	3±	29-27-17-13	13-10-14-23	S&G	Sandy Till
B-8; #251 W	2½±	27-30-18-24	14-8-5-4	S&G	S&G/Org. Silt/f Sand
B-9; UP 35NET&T	3½±	20-16-9-6	4-3-5-4	S&G	Topsoil/subsoil
B-10; Nte 2	2±	20-16-8-8	5-6-8-13	S&G/m Sand	Silty f-m Sand
B-11; #348 W	2½±	27-20-21-16	13-14-6-6	S&G	Sand/Slight Org. Sand; wet @3.8'
B-12; #382 Hse	3±	21-23-21-16	20-18-30-28	Gravelly Sand	Gravelly Sand
B-13; at Mahala	3±	27-20-18-17	11-16-12-12	Gravelly Sand/Till	Glacial Till
B-14; #484 E 100'	3±	27-20-12-12	9-12-4-14	Gravelly Sand	Sand/Org. Silt; wet @3.5'
B-14A	3±	15-20-16-9	8-13-4-3		
B-15; UP 622/46 E; Nte 3	2±	20-21-22-16	13-12-7-25/0"	Gravelly Sand	Gravelly Sand

Hse = Front of house; Dr. = at driveway; E = east of; W = west of; S&G = Sand & Gravel (generally); Org. = organic; Till = Glacial till (native); f = fine; m = medium; c = coarse. Nte = Note; UP = utility pole. Nte 1 = East of Seavey bridge road at 20 mph sign. Nte 2 = at Brooks Road intersection. Nte 3 = 200'± east of Rte 202.

Table 2 – Hansonville Road Test Borings

LOCATION & NOTES	ASPHALT THICKNESS	BLOWS/6": 0.3'± to 2.3'±	BLOWS/6": 2.3'± to 4.3'±	SOILS: #1 SPOON	SOILS: #2 SPOON
H-1; Near Green Hll Rd	3½±	18-17-13-7	6-5-13-15	5" S&G/m Sand (Gravelly)	Silty Sand /f-m Sand; wet@ 3'
H-2; #47 Hse	4±	13-20-21-19	23-8-8-14	Gravelly f-m Sand	Gravelly f-m Sand/f Sand; wet @3'
H-2A; at wtlds.	3½±	15-16-11-9	7-5-11-7	Silty Sand fill; Li. Gravel	Slight Org. Sand/m sand
H-3; Nte 5	3½±	20-23-16-19	14-5-5-6	Gravelly Sand	f-m Sand/Marine; wet @3'
H-3A; #51 MB	3½±	13-17-16- 14	16-16-15-26	7" S&G/m Sand	Sandy Till
H-4	3±	16-20-6-6	7-6-7-13	Gravelly f-m sand/silty Sand	Silty Sand fill' Sandy Till

MB = mailbox; Wtlds = wetlands. Nte 4: South of UP 607A/46. Nte 5: 200'± south of Sonia Way.

Representative soil samples and photographs taken of soil samples and of roadway areas in the vicinities of test borings and of roadway cracks are on file at HTE.

We trust that your office will find this information helpful and we appreciate the opportunity to be of continued service to your office. Please do not hesitate to contact the undersigned for further information as necessary.

Very truly yours,

HTE NORTHEAST, INC.

Roger B. Keilig, PE, PG, CPESC
Sr. Project Manager

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Green Hill Road Pavement Section Analysis

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

We have completed an engineer's cost estimate for the proposed improvements to Green Hill Road. The total cost of the project can be broken down into two components; a western overly of 10,750 feet (Task 1) and an eastern 1,250 feet of full box reconstruction (Task 2). Condition 1 includes a general pavement overlay where an additional one inch of pavement is necessary to support existing traffic loads. Condition 2 represents the additional ½ inch of pavement required to support anticipated traffic loads from the sand and gravel operation (for a total overlay depth of 1 ½ inches. Condition 3 is the additional pavement required to support traffic loads within 100 feet of the driveway intersection. The estimated total cost to improve the full length of Green Hill Road from Route 125 to Route 202 is $268,034.

Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

Revised 02/11/13

Total Road Length of Need	12000	LF
Average Road width	20	LF
	22	LF (Eastern 1250 LF only)

Task 1: Pavement Overlay West		
Condition 1: Existing Roadway Traffic		
1" Wearing coarse Overlay	10750	LF
Tonnage	1314	TON
Cost per ton	$70	
Bare Cost	$91,980	
Engineering & Contingencies add 15%	$13,797.00	
Total Cost	$105,777.00	
Condition 2: With Proposed Borrow Pit		
1.5" Wearing coarse Overlay	10550	LF
Tonnage	1934	TON
Cost per ton	$70	
Bare Cost	$135,380	
Engineering & Contingencies add 15%	$20,307.00	
Total Cost	$155,687.00	
Condition 3: Additional pavement (2" overlay) within 200 feet of site driveway		
Tonnage	54	TON
Cost per ton	$70	
Bare Cost	$3,780	
Engineering & Contingencies add 15%	$567.00	
Total Cost	$4,347.00	

Task 2: Full Box Reconstruction 22' wide (Eastern 1250 feet less 250 feet at NHDOT 16201)	1000	LF
3 1/2" HBP/8" Crushed Gravel/16" BR Gravel	$108.00	$/ LF
Total Cost	$108,000.00	

Overall Project Cost Summary	**Total Cost**
Task 1	$160,034.00
Task 2	$108,000.00
Net	$268,034.00

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: NHDOT Correspondence
Excavation Site Plan
Map 210 Lot 57
Green Hill Road, Barrington, NH

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

At the request of Marcia Gasses, town planner, we have contacted Kevin Russell, District Engineer at NH Department of Transportation (NHDOT) who has suggested we provide the Board with turning template plans for the US 202 intersection at Green Hill Road. As such we have prepared the enclosed turning movement plan based on a WB-62design vehicle and NHDOT as built plans at the US202/ Greenhill Road intersection. The plan indicates minor tire off-tracking may occur for trucks turning right (North) from Greehill Road onto US202 and for trucks turing right (East) from US202 onto Greenhill Road. Based on our projected peak of 15 trips to Route 202 it is probable that a max. of 25% of the 15 will be semi trailer dump. This means that we expect 3-4 WB62+ worst case scenario day. Given the existence of limited WB62+ traffic on the road today I would not anticipate a minor increase to warrant any pavement widening/flaring at the Route 202 intersection.

Additionally, we have coordinated with William Oldenburg, administrator, at NHDOT regarding the planned Route 125 / Greenhill Road/ Tollend Rd. intersection project. As such, NHDOT has modified their intersection design to account for the additional truck traffic. I have attached relevant correspondence with NHDOT regarding the matter.

Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

Jason S. Hill
Project Manager

Jason Hill

From: William Oldenburg [WOldenburg@dot.state.nh.us]
Sent: Tuesday, January 08, 2013 3:13 PM
To: Jason Hill
Subject: Barrington NH 125 at Greenhill Road
Attachments: 16201POP0001.TIF; 16201POP0011.TIF; 16201POP0012.TIF; 16201POP0013.TIF; 16201POP0014.TIF

Jason -

Attached are the general plans and pavement marking layout for the Barrington project. We have received some limited correspondence from the regional planning commission concerning your project.

After discussing internally the proposed gravel pit operation and the types of trucks that are anticipated we are in the process of meeting to discuss possible changes to the turning radii from NH 125 to Greenhill Road. The current design will not accommodate a WB-62 sized gravel truck. Since it is our understanding this type of vehicle will be used quite a bit on this site we are looking at changes to the design to accommodate the large tractor trailer sized dump trucks. With our initial review we anticipate increasing the radii and relocating one of the signal mast arms.

Out internal meeting is tomorrow, we can discuss after that if necessary.

Thanks,
Bill

Bill Oldenburg, Administrator
NH Department of Transportation
Bureau of Highway Design
P.O. Box 483
7 Hazen Drive, Concord, NH 03302
Phone: (603) 271-2171

DRIVING TOWARD ZERO
One Death Is Too Many

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Green Hill Road over Isinglass River (NHDOT Bridge No. 109/162)

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

At the request NH Department of Transportation (NHDOT), we have provided the design specifications of the anticipated trucks to Marcia Gasses for coordination with Stephen Liakos PE, bridge engineer with NHDOT. Subsequently, we have received an email from Stephen Liakos stating that the vehicles appear to be in compliance with the bridge posting. I have attached relevant correspondence with NHDOT regarding the matter.

Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

DuBois & King inc.
18 Constitution Drive, Suite 8
Bedford, NH 03110
Tele: (603) 637-1043
Fax: (866) 783-7101

Scott M. Bourcier, P.E.
Project Manager

ENGINEERING • PLANNING • MANAGEMENT • DEVELOPMENT

MEMORANDUM

TO: Marcia Gasses, Town Planner

RE: Green Hill Road Bridge (NHDOT bridge No. 109/162)

DATE: October 24, 2012

The purpose of this memorandum is to document the above-referenced project's on-site meeting held on October 10, 2012.

Attendees

Stephen Liakos	NHDOT, District 6 Bridge Engineer
John Scruton	Barrington Town Manager
Marcia Gasses	Barrington Town Planner
Peter Cook	Barrington Road Agent
Richard Conway	Barrington Police Chief

Minutes

1. **Bridge Review**
   A. Per the request of the Town of Barrington, the above-listed group met on-site to review the existing condition of Green Hill Road bridge.

   B. Stephen Liakos provided the Town with the New Hampshire Department of Transportation's (NHDOT) Bridge Inspection Report related to the Green Hill Road Bridge (NHDOT bridge No. 109/162). Stephen informed the group that the bridge is eighteen (18) feet in width, measured from face of curb to face of curb, which categorizes the bridge as a two-lane bridge. Stephen continued by stating that although the bridge is categorized as a two-lane, it is on the smaller side of a two-lane bridge definition. Stephen reported that the bridge structure is currently in satisfactory condition, but is concerned with the 6-inch concrete deck. According to Stephen, bridges should consist of an eight (8) inch concrete bridge deck, at a minimum. That stated, Stephen continued by noting the deck is in satisfactory conditions.

   C. Peter Cook inquired from Stephen if the existing bridge structure would have the capacity to handle truck traffic with gravel loads. Stephen responded that the bride structure is currently rated as a C2, which indicates Caution Crossing Bridge. Therefore, Certified Vehicles (both Single Unit and Combination Vehicles) are required to wait until they can cross the bridge with no other trucks on the bridge. With respect to determine the impact of the new truck route over Green Hill Road Bridge, Stephen recommended that the Town request specifications of the proposed truck that will be utilizing the bridge. Once truck information is obtained, Stephen noted to the Town that the District could perform a structural calculation to determine the anticipated impacts on the bridge structure.

2. **Traffic Maintenance**
   A. Peter inquired from Stephen if there were any postings that should be added within the vicinity of the bridge to prolong the life of the structure during the period of the added truck traffic. Stephen reported that the speed limit of Green Hill Road is posted at 45 m.p.h. and

recommended that the speed be reduced to 20 or 30 m.p.h. Stephen stated that the reduction in speed would minimize the impact force of the vehicles (especially trucks) on the bridge. The last recommendation that Stephen made is probably post "One Lane Bridge Ahead" signs on either side of the bridge structure, located approximately 100 feet from the structure.

B. Richard Conway requested to the group that a stop bar pavement marking be installed at both sides of the bridge. Scott Bourcier added to Richard's request by recommending that in replace of a stop bar installing a "Yield" (R1-2) sign and yield pavement markings (in accordance with Section 3B.16 of the Federal Highway Administration Manual on Uniform Traffic Control Devices). Peter noted that centerline pavement striping should be removed from the bridge to the yield location.

3. Roadway Subsurface Investigation

A. Peter requested from Scott for a recommended soil program. Scott responded by recommending soil borings at 800-foot intervals, plus at areas of concern, as marked by the Town from the proposed project site to a NH Route road of every truck route identified by the Applicant. Peter agreed with the recommended boring program.

Jason Hill

From: Planning Department [barrplan@metrocast.net]
Sent: Wednesday, October 31, 2012 1:33 PM
To: Jason Hill
Subject: FW: Notes from Bridge Meeting

Jason

I just received the following response back from Stephen.

Marcia

Marcia J. Gasses
Town Planner & Land Use Administrator
P.O. Box 660
333 Calef Hwy
Barrington, NH 03825
(O) 603.664.0195
(C) 603.312.4468
barrplan@metrocast.net
barrplan@gmail.com

From: Steve Liakos [mailto:SCLiakos@dot.state.nh.us]
Sent: Wednesday, October 31, 2012 10:33 AM
To: 'Planning Department'
Subject: RE: Notes from Bridge Meeting

Hi Marcia,

The vehicles mentioned appear to be in compliance, which the stipulation that they truly do not exceed legal load limits. If the vehicles have the capacity to hold more than legal loads..., they probably will. Bottom line is that it comes down to enforcement.

Through the string of e-mails below, I was unable to extract a copy of the meeting minutes. Could you please send me a copy either electronically or a hard copy? I would like to have a copy for my file, as I do not have a photographic memory of all that we discussed! Thank you.

Feel free to contact me if you have any further questions.

Stephen C. Liakos, PE
Bridge Engineer
NHDOT-Bureau of Planning & Community Assistance
Tel: 603-271-4420
Fax: 603-271-8093
E-mail: scliakos@dot.state.nh.us

> -----Original Message-----
> **From:** Planning Department [mailto:barrplan@metrocast.net]
> **Sent:** Wednesday, October 31, 2012 9:23 AM
> **To:** Steve Liakos
> **Subject:** FW: Notes from Bridge Meeting
>
> Stephen,

The response to your question at our meeting at the Green Hill Road Bridge has been provided by Jason Hill. Please let me know if you need more information from the applicant or the Town.

Marcia

Marcia J. Gasses
Town Planner & Land Use Administrator
P.O. Box 660
333 Calef Hwy
Barrington, NH 03825
(O) 603.664.0195
(C) 603.312.4468
barrplan@metrocast.net
barrplan@gmail.com

From: Jason Hill [mailto:jhill@tfmoran.com]
Sent: Tuesday, October 30, 2012 4:50 PM
To: 'Planning Department'
Subject: RE: Notes from Bridge Meeting

Marcia.
I wanted to respond to the request in these minutes for specifications on the proposed truck that will be utilizing the bridge.
Truck traffic from the new development will be either a standard tri axle SUV dump truck or a standard tri axle semi trailer loaded not to exceed the legal load limits in accordance with RSA 266:18-a. Please provide this to Steve Liakos as requested in the minutes you forwarded 10/25. Please do not hesitate to contact me with any questions or comments.
Regards.

Jason S. Hill
Project Manager
TFMoran, Inc.
48 Constitution Drive
Bedford, NH 03110
Tel: (603) 472-4488 Fax: (603) 472-9747
jhill@tfmoran.com

From: Planning Department [mailto:barrplan@metrocast.net]
Sent: Thursday, October 25, 2012 9:52 AM
To: Jeff Kevan; Jason Hill
Subject: FW: Notes from Bridge Meeting

Jason & Jeff

The notes from the Town meeting with Dubois & King and the DOT on the Green Hill Road Bridge are attached.

Marcia J. Gasses
Town Planner & Land Use Administrator
P.O. Box 660
333 Calef Hwy
Barrington, NH 03825

(O) 603.664.0195
(C) 603.312.4468
barrplan@metrocast.net
barrplan@gmail.com

From: Scott M. Bourcier [mailto:sbourcier@dubois-king.com]
Sent: Thursday, October 25, 2012 9:34 AM
To: 'Planning Department'
Cc: 'Jeffrey Adler'; 'Peter Cook'
Subject: RE: Notes from Bridge Meeting

Attached is a copy of the NHDOT Bridge Inspection Report of Green Hill Road Bridge (NHDOT Bridge No. 109/162). Please retain for your file.

------Original Message------
From: Scott M. Bourcier [mailto:SBourcier@dubois-king.com]
Sent: Thursday, October 25, 2012 9:30 AM
To: 'Planning Department'
Cc: 'Jeffrey Adler'; 'Peter Cook (peterccook123@gmail.com)'
Subject: RE: Notes from Bridge Meeting

Marcia:

Sorry about the tardiness of the meeting minutes; please see attached. At your convenience, please review and let me know if there are any modifications that you would like to make on these minutes. If not, please accept these minutes as final.

Thank you,

Scott

Scott Bourcier, P.E.
Project Manager

DuBois & King INC.
18 Constitution Drive, Suite 8
Bedford, New Hampshire 03110
Tel: (603) 637-1043 ext.13
Fax: (888) 783-7101
Cell: (603) 828-8788

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Please consider the environment before printing this email.

Linked profile

------Original Message------
From: Planning Department [mailto:barrplan@metrocast.net]
Sent: Tuesday, October 23, 2012 2:51 PM
To: sbourcier@dubois-king.com
Subject: Notes from Bridge Meeting

Scott

Have you had a chance to put together the notes from our meeting on the Green Hill Road Bridge?

Marcia

Marcia J. Gasses
Town Planner & Land Use Administrator
P.O. Box 660
333 Calef Hwy
Barrington, NH 03825
(O) 603.664.0195
(C) 603.312.4468
barrplan@metrocast.net
barrplan@gmail.com

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Planners

February 22, 2013

Planning Board
Town of Barrington
333 Calef Highway
Barrington NH 03825

Re: Excavation Site Plan
Map 210 Lot 57
Green Hill Road, Barrington, NH

Dear Chairman Huckins and Members of the Town of Barrington Planning Board:

Enclosed please find a letter report on the observation of ten test borings conducted in January 2013 by H T E Northeast Inc. at the Trinity Conservation sand and gravel site on Greenhill Road, as well as Con-Tec Inc boring logs performed on March 6, 2000 at the subject property. We have recently completed borings and observation wells as requested by town planner Marcia Gasses in order to re-affirm the groundwater levels recorded in 2000. Please do not hesitate to contact me with any questions or comments.

Sincerely,
TFMoran Inc.

Jason S. Hill
Project Manager

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

NORTHEAST, INC.
Environmental Engineering
Geotechnical Engineering
Water Resources
Hydrogeology

February 6, 2013
Project No. 4895B

Mr. Jason Hill, Project Manager
T. F. Moran, Inc.
48 Constitution Drive
Bedford, New Hampshire 03110

RE: Test Borings/Observation Wells
And Groundwater Water Table Assessment
Proposed Borrow Pit: #204 Green Hill Road
Barrington, New Hampshire

Dear Jason:

This correspondence presents HTE Northeast's, Inc. (HTE's) letter report of an assessment of the groundwater table for the above-referenced site ('Site'). This work was performed in general accordance with our proposal No. P-9581.2 dated December 13, 2012. The analyses consider review of four test borings performed March 6, 2000 by Con-Tec, Inc. and the performance/observation of ten test borings (six with groundwater observation well installations) by Great Works Test Boring, Inc. on January 28 and 29, 2013. Stabilized groundwater levels were measured in the six observation wells by HTE on January 30, 2013. A Site locus plan is presented as Figure 1. This report is subject to the limitations in Appendix A.

1.0 TEST BORINGS & OBSERVATION WELLS

HTE observed the drilling of ten test borings (HTE-1 through HTE-12, but no #7 or #8). The test borings were performed in general accordance with ASTM D 1452 by Great Works Test Boring, Inc. of Rollinsford, New Hampshire, on January 28 and 29, 2013. Groundwater level observation wells (1' Ø) were installed in borings HTE- 2, 3, 5, 6, 9 and 11. The test borings were drilled using standard hollow stem auger (HSA) techniques to depths ranging from 22± feet to 42± feet each; refusal was not encountered these borings. Logs of these explorations, as prepared by HTE, are enclosed as Appendix B.

Standard Penetration Tests (SPTs) were performed in each test boring in general accordance with ASTM D 1586; with split spoon (SS) samples recovered generally at five-foot intervals. The SPT consists of driving a $1^3/_8$ inch I.D. split spoon sampler using a 140 pound hammer falling 30

2 Cote Lane, Suite 1
Bedford, New Hampshire
Telephone: (603) 668-1654 • Fax: (603) 668-0608

inches. The blows for each 6 inch interval of penetration are recorded for a total of 24 inches. The sum of the blows required to drive the sampler from 6 inches to 18 inches of penetration is

referred to as the Standard Penetration Resistance, or N-value, which is an index measure of in-situ soil density or consistency.

The test borings were performed under the observation of a HTE geotechnical engineer. Soil samples from the test borings were classified in the field by HTE in general accordance with the Burmister Soil Classification System. A copy of the Burmister Soil Classification system is enclosed with the HTE exploration logs in Appendix B.

1.1 Prior Test Borings

Four test borings (B-1 to B-4 were performed (also apparently in general accordance with ASTM D 1452) by Con-Tec, Inc. of Concord, New Hampshire, on March 6, 2000. Based on the available information, B-1 was performed near/to the east of HTE-5, B-2 was performed near HTE-4, B-3 was performed near HTE-6 and B-4 was performed near HTE-3. Logs of these explorations, as prepared by Con-Tec, Inc., are enclosed as Appendix C.

2.0 SUBSURFACE CONDITIONS

The subsurface soil data from the Contest, Inc. test borings (2000) and the current test borings were similar. Based on the fourteen test borings, the subsurface soil conditions consisted of 1) glacial outwash fine to fine to medium and occasional coarse sands, underlain by 2) layered fine sand and silts marine clay & silt (which were not encountered in all of the test borings). Table 1A presents a summary of the current test boring data and Table 1B presents a summary of the March 6, 2000 test boring data.

2.1 Bedrock

The test borings were terminated after verified encounter with groundwater. Bedrock was not encountered above groundwater for the test borings performed.

2.2 Groundwater Levels

The groundwater level data from the Contest, Inc. test borings (2000) and the current test borings were also similar. The noted variation for B-1/HTE-5 is likely due to the pronounced change in soil conditions (sloping downward trend – toward the river - of the 'silt' soils) in this area. Table 1A also presents a summary of the groundwater level and approximate groundwater elevation

data. The January 2013 groundwater level information was used to develop estimated groundwater level contour information presented on Figure 2.

We trust that your office will find this information helpful. Please do not hesitate to contact the undersigned for further information as necessary.

Very truly yours,

HTE NORTHEAST, INC.

Roger B. Keilig, PE, PG, CPESC
Sr. Project Manager

Attachments: a) Tables 1A and 1B b) Figure 1 – Locus Plan; c) Figure 2 - Groundwater Elevation Plan; d) Appendix A – Limitations; e) Appendix B – HTE Test Boring Logs and f) Con-Tec, Inc. Test Boring Logs

HTE NORTHEAST INC

TABLE 1-A
SUMMARY OF TEST BORING SUBSURFACE EXPLORATIONS
PROPOSED GREEN HILL ROAD BORROW PIT
BARRINGTON, NEW HAMPSHIRE
PROJECT NO. 4895B

TEST BORING DESIGNATION	APPROX. GROUND SURFACE ELEVATION	BOTTOM OF OUTWASH	TOP OF SILT or MARINE DEPOSIT	BOTTOM OF EXPLORATION DEPTH	GROUNDWATER DEPTH IN OBSERVATION WELL	OBSERVED GROUNDWATER LEVELS DURING DRILLING OPERATIONS	APPROXIMATE GROUNDWATER ELEVATION
	ELEVATION (FT)	DEPTH (FT)	DEPTH (FT)	DEPTH (FT)	DEPTH (FT)	DEPTH (FT)	ELEVATION (FT)
HTE-1	205 ±	41.0 ±	41.0 ±	42.0 ±	±	34.0 ±	171.0 ±
HTE-2	195 ±	10.0 ±	10.0 ±	22.0 ±	6.6 ±	6.0 ±	188.4 ±
HTE-3	205 ±	>42 ±	6.2 ±	42.0 ±	32.6 ±	31.1 ±	172.4 ±
HTE-4	205 ±	40.0 ±	40.0 ±	42.0 ±	±	29.5 ±	175.5 ±
HTE-5	206 ±	24.0 ±	24.0 ±	27.0 ±	18.5 ±	18.5 ±	187.5 ±
HTE-6	206 ±	40.5 ±	40.5 ±	42.0 ±	30.3 ±	28.9 ±	175.7 ±
HTE-9	206 ±	>36.5	NE ±	36.5 ±	23.1 ±	24.0 ±	182.9 ±
HTE-10	206 ±	35.5 ±	35.5 ±	36.5 ±	±	24.0 ±	182.0 ±
HTE-11	206 ±	>37	NE	37.0 ±	25.3 ±	24.0 ±	180.7 ±
HTE-12	205 ±	>37	NE	37.0 ±	±	28.0 ±	177.0 ±

Notes:

1) Borings were performed January 28 and 29, 2013 by Great Works Test Boring, Inc of Rollinsford, New Hampshire under HTE observation. Borings #7 & #8 were deleted.
2) Groundwater levels were measured during exploration advancement and therefore are not indicative of stabilized groundwater conditions.
3) Groundwater levels were measured in observation wells installed in 2, 3, 5, 6, 9 & 11.
4) 'NE' indicates 'not encountered'. 'R" indicates a refusal.

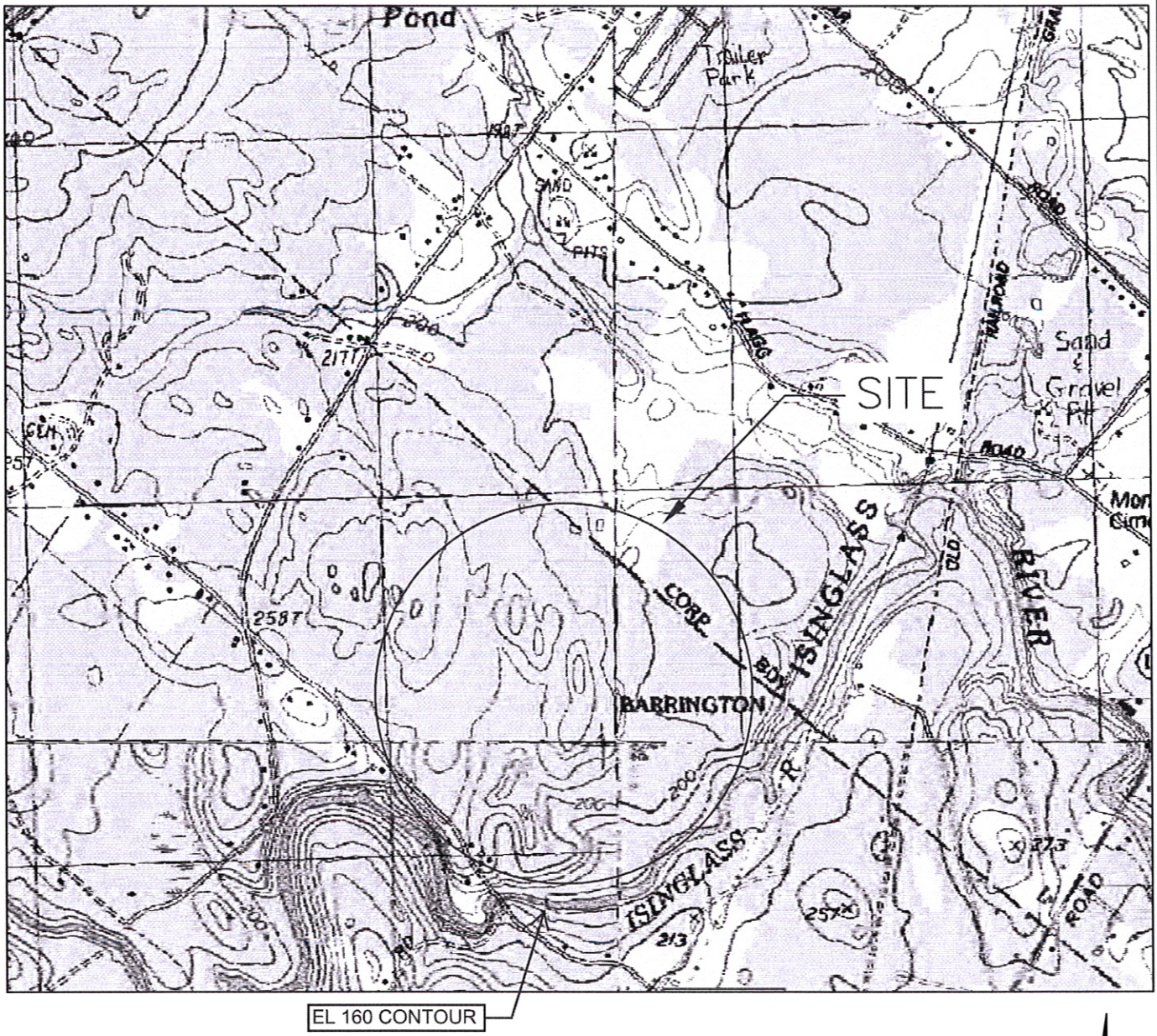
HTE NORTHEAST INC

TABLE 1-B
SUMMARY OF 2000 TEST BORING SUBSURFACE EXPLORATIONS
PROPOSED GREEN HILL ROAD BORROW PIT
BARRINGTON, NEW HAMPSHIRE
PROJECT NO. 4895B

TEST BORING DESIGNATION	APPROX. GROUND SURFACE ELEVATION	BOTTOM OF OUTWASH	TOP OF SILT or MARINE DEPOSIT	BOTTOM OF EXPLORATION DEPTH	OBSERVED GROUNDWATER LEVELS DURING DRILLING OPERATIONS	APPROXIMATE GROUNDWATER ELEVATION
	ELEVATION (FT)	DEPTH (FT)	DEPTH (FT)	DEPTH (FT)	DEPTH (FT)	ELEVATION (FT)
B-1	205.5 ±	36.0 ±	39.0 ±	39.7 ± R	23.0 ±	182.5 ±
B-2	205.5 ±	35.0 ±	37.0 ±	42.0 ±	28.0 ±	177.5 ±
B-3	204.0 ±	40.0 ±	42.0 ±	42.0 ±	30.0 ±	174.0 ±
B-4	205.0 ±	>42 ±	>42 ±	42.0 ±	32.4 ±	172.6 ±

Notes:

1) Borings were performed March 6, 2000 by Con-Tec, Inc.
2) Bottom of Outwash and Top of Silt or Marine Deposit was indicated by the presence of 'clay'.
3) 'NE' indicates 'not encountered'. 'R" indicates a refusal.



LOCATION: N 41.250°
W 70.999°

SOURCE: 1987 USGS ROCHESTER (NH) QUADRANGLE
7.5 X 15 MINUTE SERIES

HTE NORTHEAST INC.
Environmental Engineering
Geotechnical Engineering
Hydrogeology

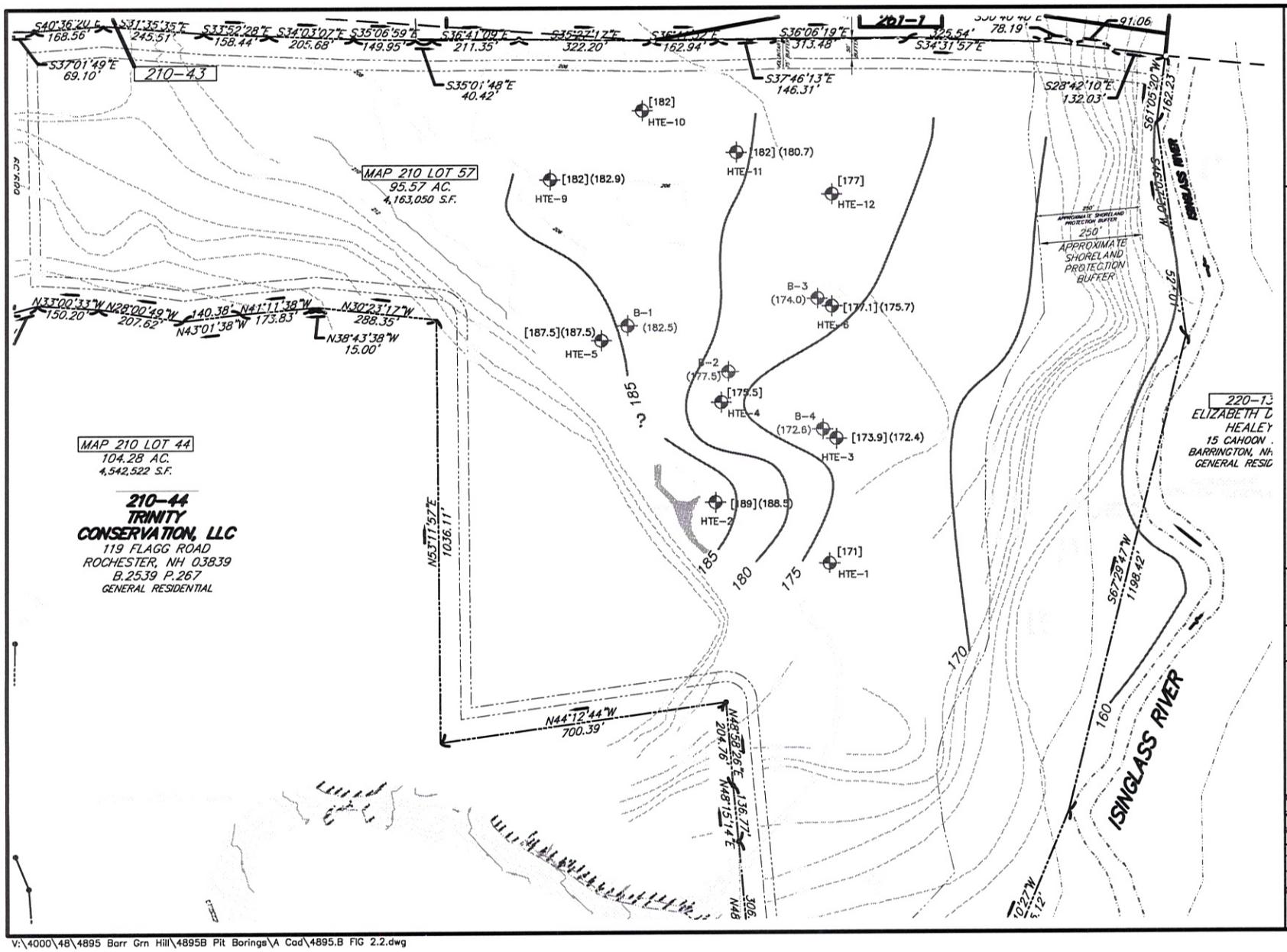
2 Cote Lane, Suite 1
Bedford, New Hampshire
(603) 668-1654

LOCUS PLAN

PROPOSED GRAVEL EXCAVATIORN OPERATION
204 GREEN HILL ROAD
BARRINGTON, NEW HAMPSHIRE

PROJECT NO. 4895.B	FEBRUARY 1, 2013	FIGURE 1

V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\A Cad\4895.F FIG 1.dwg



HTE NORTHEAST INC.

Environmental Engineering
Geotechnical Engineering
Hydrogeology

2 Cote Lane, Suite 1
Bedford, New Hampshire
(603) 668-1654
www.htenortheast.com

LEGEND:

- HTE-2 — DESIGNATION AND APPROX. LOCATION OF TEST BORING AND/OR GW OBSERVATION WELL INSTALLED ON 28 AND 29 JANUARY 2013 BY GREAT WORKS TEST BORING, UNDER OBSERVATION OF HTE.
- B-2 (180.2) — DESIGNATION AND APPROX. LOCATION OF TEST BORINGS ON MARCH 6, 2000 PERFORMED BY CON-TEC, INC. AND ESTIMATED GW ELEVATION BASED ON TIME OF BORING.
- [180.2] — GROUNDWATER ELEVATION BASED ON TIME OF BORING ON JAN. 28, 2013.
- (180.2) — GROUNDWATER ELEVATION BASED ON OBSERVATION WELL ON 30 JAN. 2013
- APPROX. 100 YEAR FLOODPLAIN
- ESTIMATED GROUNDWATER ELEVATION CONTOURS BASED ON THE JAN. 28 TO 30, 2013 DATA

BASE PLAN:

ELECTRONIC PLAN TITLED "47052 00 Site" BY TF MORAN, INC, BEDFORD, NEW HAMPSHIRE, DATED JANUARY 31, 2013

PROJECT NAME
PROPOSED BORROW PIT SITE

LOCATION
204 GREEN HILL ROAD
BARRINGTON, NEW HAMPSHIRE

DRAWING TITLE
SUBSURFACE EXPLORATION LOCATION PLAN & JAN. 2013 GROUNDWATER CONTOURS

DRAWN BY	MEM	DATE	02/04/2013
CHKD. BY	RBK	APVD. BY	RBK
PROJ. NO.	4895.B	SCALE	1"=100'

DATE	REVISION	BY

FIGURE NO.
FIGURE 2

V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\A Cad\4895.B FIG 2.2.dwg

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-1	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 28, 2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	35		
DEPTH (FT)	34		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	16	4		Medium dense yellow-brown coarse to fine SAND trace (-) Silt, frequent oxidation layers, no odor, moist.		
			6				
6			9				
			9				
7							
8							
9							
10	S2	18	5		Medium dense yellow-brown to light brown coarse to fine SAND, trace Silt, frequent oxidation layers, trending to light brown fine sand, no odor, moist.		
			6				
11			7				
			6				
12							
13							
14							
15	S3	18	3		Loose light brown fine SAND, trace Silt, occasional oxidation layers, no odor, moist.		
			4				
16			4				
			5				
17							
18							
19							
20	S4	24	5		Loose light brown fine SAND, trace Silt, occasional oxidation layers, no odor, moist.		
			6				
21			6				
			7				
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-1	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/28/2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	35		
DEPTH (FT)	34		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S5	24	7		Medium dense light brown medium to fine SAND, trace Silt, occasional oxidation layers and mottling, no odor, moist.		
26			9				
			10				
27			12				
28							
29							
30	S6	24	10		Medium dense light brown medium to fine SAND, trace Silt, occasional oxidation layers and mottling, no odor, moist to wet.		
31			12				
			17				
32			18				
33							
34							
35	S7	24	11		Medium dense light brown medium to fine SAND, trace Silt, occasional oxidation layers, no odor, wet.		
36			12				
			14				
37			16				
38							
39							
40	S8	24	5		Medium dense light brown fine SAND, trace Silt, frequent oxidation layers, no odor, wet.	41.0	
41			7		Medium dense olive-grey CLAY & SILT, little fine Sand, layered, no odor, wet.	MARINE 42.0	
			7				
			6				
42					**Bottom of Exploration at 42'**		
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-2	SHEET: 1 of 1
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 29, 2013	GROUND SURFACE ELEVATION:	195 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	26	
CASING AT (FT)	20	In Well	
DEPTH (FT)	6	6.55	
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☒ OBS. WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	13	7		Medium dense light brown medium to fine SAND, trace Silt, occasional grey silty fine sand layers, no odor, moist.		
			8				
6			7				
7			7				
8							
9							
10						10.0	
	S2	17	4		Loose brown fine SAND, little Silt, layered, with frequent oxidized layers, no odor, moist to wet.		
11			3				
			6				
12			6				
13							
14							
15	S3	24	WOR/12"		Very soft grey SILT & CLAY, trace fine Sand, layered, no odor, wet.		
16			2			MARINE DEPOSIT	
17			2				
18							
19					Auger action indicates strata change at 18.9'	18.9	
20	S4	8	10		Dense brown coarse to fine SAND, little Gravel, little (-) Silt; rock matrix visible, no odor, wet.		
21			23				
			17				
22			8			22.0	
					Bottom of Exploration at 22'		

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-3	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 28, 2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS		
ELAPSED TIME (HR)	0	50
CASING AT (FT)	30	In Well
DEPTH (FT)	31.1	32.63
☐ NO GROUNDWATER ENCOUNTERED		

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	22	6, 8, 10, 11		Medium dense yellow-brown medium to fine SAND, trace Silt, frequent oxidation layers, no odor, moist.		
6							
7							
8							
9							
10	S2	16	7, 10, 11, 14		Medium dense, medium to fine SAND, trace coarse Sand, trace Silt, bottom 4" light brown medium to fine SAND, oxidation mottling, no odor, moist.		
11							
12							
13							
14							
15	S3	21	8, 9, 12, 12		Medium dense light brown fine to medium (-) SAND, trace Silt, frequent oxidation partings, no dor, moist.		
16							
17							
18							
19							
20							
21							
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-3	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/28/2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS		
ELAPSED TIME (HR)	0	50
CASING AT (FT)	30	In Well
DEPTH (FT)	31.1	32.63
☐ NO GROUNDWATER ENCOUNTERED		

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S4	24	14		Dense light brown fine SAND, trace Silt, frequent oxidation layers, occasional 1/8" silt layers, no odor, moist.		
26			22				
			27				
27			25				
28							
29							
30	S5	24	11		Medium dense light brown medium to fine SAND, trace Silt, frequent oxidation layers, no odor, moist to wet.		
31			14				
			12				
32			12				
33							
34							
35							
36							
37							
38							
39							
40	S6	24	10		Dense brown medium to fine SAND, trace Silt, no structure, no odor, wet.		
41			15				
			18				
42			18			42.0	
					Bottom of Exploration at 42'		
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

FILE: V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-4	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 29, 2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.	GROUNDWATER OBSERVATIONS			
TYPE	HSA		SS		ELAPSED TIME (HR)	0		
SIZE ID (IN)	2 1/4		1⅜		CASING AT (FT)	30		
HAMMER WT (LB)	--		140		DEPTH (FT)	29.5		
HAMMER FALL (IN)	--		30		☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
5	S1	18	7, 7, 7, 7		Medium dense yellow-brown coarse to fine SAND, trace (-) Silt, oxidized, no odor, moist.		
10	S2	16	5, 8, 11, 15		Medium dense light brown fine SAND, trace Silt, frequent oxidized layers, occasional silty fine sand layers, no odor, moist.		
15	S3	23	11, 16, 23, 26		Dense light brown fine SAND, trace (-) Silt, oxidation mottling, no odor, moist.		
20	S4	18	15, 21, 24		Dense light brown fine SAND, trace (-) Silt, oxidation mottling, no odor, moist.		

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-4	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/29/2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.	GROUNDWATER OBSERVATIONS				
TYPE	HSA		SS		ELAPSED TIME (HR)	0			☐ FIELD TESTING
SIZE ID (IN)	2 1/4		1 3/8		CASING AT (FT)	30			☐ LABORATORY TESTING
HAMMER WT (LB)	--		140		DEPTH (FT)	29.5			☐ MONITORING WELL INSTALLED
HAMMER FALL (IN)	--		30		☐ NO GROUNDWATER ENCOUNTERED				☐ PID SCREENING

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S5	24	6		Medium dense brown fine SAND, trace (-() Silt, frequent oxidized layers, no odor, moist.		
			8				
26			8				
			10				
27							
28							
29							
30	S6	20	WOR/12"		Loose light brown fine SAND, frequent oxidation layers, no odor, wet.		
31			5				
			8				
32							
33							
34							
35	S7	24	WOR/12"		Loose light brown fine SAND, frequent oxidation layers, no odor, wet.		
36			8				
			7				
37							
38							
39							
40	S8	20	4		Medium dense brown fine SAND and Silt, layered with frequent oxidized fine sand partings, no odor, wet.		
41			5				
			7		transition to Marine Clay	MARINE 42.0	
42			8		**Bottom of Exploration at 42'**		
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-5	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 29, 2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	25	
CASING AT (FT)	20	In Well	
DEPTH (FT)	18.5	18.45	
☐ NO GROUNDWATER ENCOUNTERED			

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	15	4		Medium dense yellow-brown medium to fine SAND, trace Silt, layered, no odor, frequent oxidized layers, no odor, moist.		
			5				
6			6				
			7				
7							
8							
9							
10	S2	19	8		Medium dense light brown fine to medium (-) SAND, trace Silt moist.		
			10				
11			9				
			8				
12							
13							
14							
15	S3	18	5		Medium dense light brown fine SAND, trace Silt layered, no odor, moist.		
			5				
16			7				
			8				
17							
18							
19							
20	S4	24	WOR/6"		Medium dense light brown fine SAND, trace Silt layered, no odor, wet.		
			7				
21			9				
			9				
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-5	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/29/2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	25	
CASING AT (FT)	20	In Well	
DEPTH (FT)	18.5	18.45	
☐ NO GROUNDWATER ENCOUNTERED			

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24					Auger action indicates strata change at 24'	24.0	
25	S5	24	WOR/12"		Very soft grey SILT & CLAY, no structure, no odor, wet.	MARINE DEPOSIT	
26			3				
27			4		**Bottom of Exploration at 27'**	27.0	
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Grn Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-6	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR: Great Works Test Boring	
PROJ. NO:	4895.B	FOREMAN: Jeff Lee	
CLIENT:	TF Moran, Inc.	INSPECTOR: E. Adler	
DATE:	January 28, 2013	GROUND SURFACE ELEVATION: 206 ±	

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	50	
CASING AT (FT)	30	In Well	
DEPTH (FT)	28.9	30.3	
☐ NO GROUNDWATER ENCOUNTERED			

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	17	4		Medium dense brown medium to fine SAND, trace Silt, occasional oxidized layers, no odor, moist.		
			9				
6			12				
			12				
7							
8							
9							
10	S2	13	6		Medium dense tan to light brown fine SAND, trace Silt, frequent oxidation layers, no odor, moist.		
			8				
11			10				
			12				
12							
13							
14							
15	S3	23	6		Medium dense light brown fine to medium (1) SAND, trace Silt, frequent oxidation layers, no odor, moist.		
			7				
16			8				
			10				
17							
18							
19							
20	S4	21	7		Medium dense light brown fine SAND, trace Silt, frequent oxidation layers, no odor, moist.		
			9				
21			9				
			11				
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-6	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR: Great Works Test Boring	
PROJ. NO:	4895.B	FOREMAN:	
CLIENT:	TF Moran, Inc.	INSPECTOR: E. Adler	
DATE:	1/28/2013	GROUND SURFACE ELEVATION: 206 ±	

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	50	
CASING AT (FT)	30	In Well	
DEPTH (FT)	28.9	30.3	
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☒ OBS. WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25							
26							
27							
28							
29							
30	S5	24	6		Medium dense light brown fine SAND, trace Silt, frequent oxidation layers, no odor, wet.		
31			8				
			9				
32			10				
33							
34							
35							
36							
37							
38							
39							
40	S6	24	8		Medium dense light brown fine SAND, trace Silt, frequent oxidation layers, no odor, wet.	40.5	
41			10		Medium dense grey-brown fine to m (-) SAND, little (-) Silt, occasional Silt seams, oxidation layers, no odor, wet.	SAND & SILT	
			17				
42			22			42.0	
					Bottom of Exploration at 42'		
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-9	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 29, 2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	25	
CASING AT (FT)	25	In Well	
DEPTH (FT)	24	23.12	
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☒ OBS. WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	15	10		Medium dense yellow-brown medium to fine SAND, frequent oxidation layers, no odor, moist.		
			11				
6			14				
			12				
7							
8							
9							
10	S2	16	4		Medium dense yellow-brown medium to fine SAND, frequent oxidation layers, no odor, moist.		
			6				
11			6				
			6				
12							
13							
14							
15	S3	20	8		Medium dense light brown fine SAND, trace (+) Silt, frequent silty sand layers, no odor, moist.		
			8				
16			11				
			12				
17							
18							
19							
20	S4	20	6		Medium dense light brown fine SAND, trace silt, oxidation mottling, no odor, moist.		
			7				
21			9				
			9				
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-9	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR: Great Works Test Boring	
PROJ. NO:	4895.B	FOREMAN:	
CLIENT:	TF Moran, Inc.	INSPECTOR: E. Adler	
DATE:	1/29/2013	GROUND SURFACE ELEVATION: 206 ±	

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	25	
CASING AT (FT)	25	In Well	
DEPTH (FT)	24	23.12	
☐ NO GROUNDWATER ENCOUNTERED			

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S5	24	WOR		Medium dense brown fine SAND, trace (+) Silt, layered with frequent oxidation ottling, no odor, wet.		
26			7				
			7				
27			8				
28							
29							
30	S6	20	2		Loose light brown fine SAND, trace Silt, no structure, no odor, wet.		
31			3				
			4				
32			6				
33							
34							
35	S7	18	2		Loose light brown fine SAND, trace Silt, no structure, no odor, wet.		
36			3				
			5			36.5	
37					**Bottom of Exploration at 36.5'**		
38							
39							
40							
41							
42							
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-10	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 29, 2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	25		
DEPTH (FT)	24		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	14	5, 6, 7, 8		Medium dense yellow-brown medium to fine SAND, trace (-) Silt, occasional oxidation layers, no odor, moist.		
6							
7							
8							
9							
10	S2	16	6, 7, 10, 11		Medium dense yellow-brown medium (-) to fine SAND, trace Silt, occasional oxidation layers, no odor, moist.		
11							
12							
13							
14							
15	S3	22	5, 5, 7, 7		Medium dense yellow-brown medium to fine SAND, trace Silt, occasional oxidation layers, no odor, moist.		
16							
17							
18							
19							
20	S4	19	7, 6, 6, 7		Medium dense yellow-brown medium to fine SAND, trace Silt, occasional oxidation layers, no odor, moist.		
21							
22							

Notes:

2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-10	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/29/2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	25		
DEPTH (FT)	24		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S5	24	6		Medium dense yellow-brown medium to fine SAND, trace Silt, occasional oxidation layers, no odor, wet.		
26			8				
			14				
27			14				
28							
29							
30	S6	18	WOR/12"		Loose medium to fine SAND, trace Silt, no structure, no odor, wet.		
31			4				
32			5				
33							
34							
35	S7	18	5		Medium dense medium to fine SAND, trace Silt, no structure, wet.	35.5	
36			7		Medium dense grey-brown fine SAND and Silt, layered, no odor, wet.		
			11			36.5	
37					**Bottom of Exploration at 36.5**		
38							
39							
40							
41							
42							
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-11	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 28, 2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0	50	
CASING AT (FT)	25	In Well	
DEPTH (FT)	24	25.31	
☐ NO GROUNDWATER ENCOUNTERED			

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	17	7		Medium dense yellow-brown coarse to fine SAND, oxidized, no odor, moist.		
			8				
6			8				
7			8				
8							
9							
10	S2	18	4		Medium dense light brown medium to fine SAND, trace (-) Silt, occasional oxidation layer, no odor, moist.		
			4				
11			5				
12			5				
13							
14							
15	S3	22	8		Medium dense light brown medium SAND, trace (-) Silt, occasional oxidation layer, no odor, moist.		
			11				
16			12				
17			11				
18							
19							
20	S4	21	7		Medium dense light brown medium to fine SAND, trace Silt, occasional silty fine sand partings, occasional oxidized layers, no odor, moist.		
			8				
21			11				
22			14				

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-11	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/28/2013	GROUND SURFACE ELEVATION:	206 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS		
ELAPSED TIME (HR)	0	50
CASING AT (FT)	25	In Well
DEPTH (FT)	24	25.31
☐ NO GROUNDWATER ENCOUNTERED		

- ☐ FIELD TESTING
- ☐ LABORATORY TESTING
- ☒ OBS. WELL INSTALLED
- ☐ PID SCREENING
- ☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S5	24	6		Medium dense grey-brown medium to fine SAND, trace Silt, occasional oxidation layers, no odor, wet.		
26			7				
			6				
27			11				
28							
29							
30	S6	20	WOR/12		Very loose brown medium to fine SAND, trace Silt, occasional oxidation layers, frequent mica fragments, no odor, wet.		
31			3				
32			4				
33							
34							
35	S7	24	WOR/6		Loose brown medium to fine SAND, trace Silt, occasional oxidation layers, frequent mica fragments, no odor, wet.		
36			3				
			5				
37			7			37.0	
					Bottom of Exploration at 37'		
38							
39							
40							
41							
42							
43							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-12	SHEET: 1 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	Jeff Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	January 28, 2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1⅜	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	30		
DEPTH (FT)	28		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
1							
2							
3							
4							
5	S1	23	4		Medium dense yellow-brown medium to fine (-) SAND, oxidized, no odor, moist.		
			6				
6			8				
			10				
7							
8							
9							
10							
11					Auger cuttings indicate similar to above.		
12							
13							
14							
15	S2	18	9		Medium dense light brown fine SAND, trace silt, oxidation mottling, no odor, moist.		
			10				
16			10				
			9				
17							
18							
19							
20	S3	23	6		Medium dense light brown fine SAND, trace silt, oxidation mottling, no odor, moist.		
			6				
21			6				
			7				
22							

Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

TEST BORING LOG

HTE NORTHEAST INC
2 Cote Lane, Suite 1
Bedford, New Hampshire 03110
(603) 668-1654

PROJECT:	Green Hill Road Pit	BORING NO.: HTE-12	SHEET: 2 of 2
LOCATION:	204 Green Hill Road, Barrington, NH	CONTRACTOR:	Great Works Test Boring
PROJ. NO:	4895.B	FOREMAN:	J. Lee
CLIENT:	TF Moran, Inc.	INSPECTOR:	E. Adler
DATE:	1/28/2013	GROUND SURFACE ELEVATION:	205 ±

EQUIPMENT:	AUGER	CASING	SAMPLER	COREBRL.
TYPE	HSA		SS	
SIZE ID (IN)	2 1/4		1 3/8	
HAMMER WT (LB)	--		140	
HAMMER FALL (IN)	--		30	

GROUNDWATER OBSERVATIONS			
ELAPSED TIME (HR)	0		
CASING AT (FT)	30		
DEPTH (FT)	28		
☐ NO GROUNDWATER ENCOUNTERED			

☐ FIELD TESTING
☐ LABORATORY TESTING
☐ MONITORING WELL INSTALLED
☐ PID SCREENING
☐

Depth (FT)	SAMPLE NUMBER	RECOVERY (IN)	BLOWS PER 6"	STRATUM SYMBOL	SOIL AND ROCK CLASSIFICATION-DESCRIPTION BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)	STRATUM CHANGE DESCRIPTION	PID (PPM)
22							
23							
24							
25	S4	23	6		Medium dense light brown fine SAND, trace silt, oxidation mottling, no odor, moist.		
26			7				
			10				
27			12				
28							
29							
30	S5	23	WOR/6"		Medium dense light brown fine SAND, trace (+) silt, oxidation mottling, no odor, wet.		
31			8				
			9				
32			12				
33							
34							
35	S6	24	WOR/6"		Medium dense light brown fine SAND, trace (+) silt, oxidation mottling, no odor, wet.		
36			4				
			6				
37			6			37.0	
					Bottom of Exploration at 37'		
38							
39							
40							
41							
42							
43							

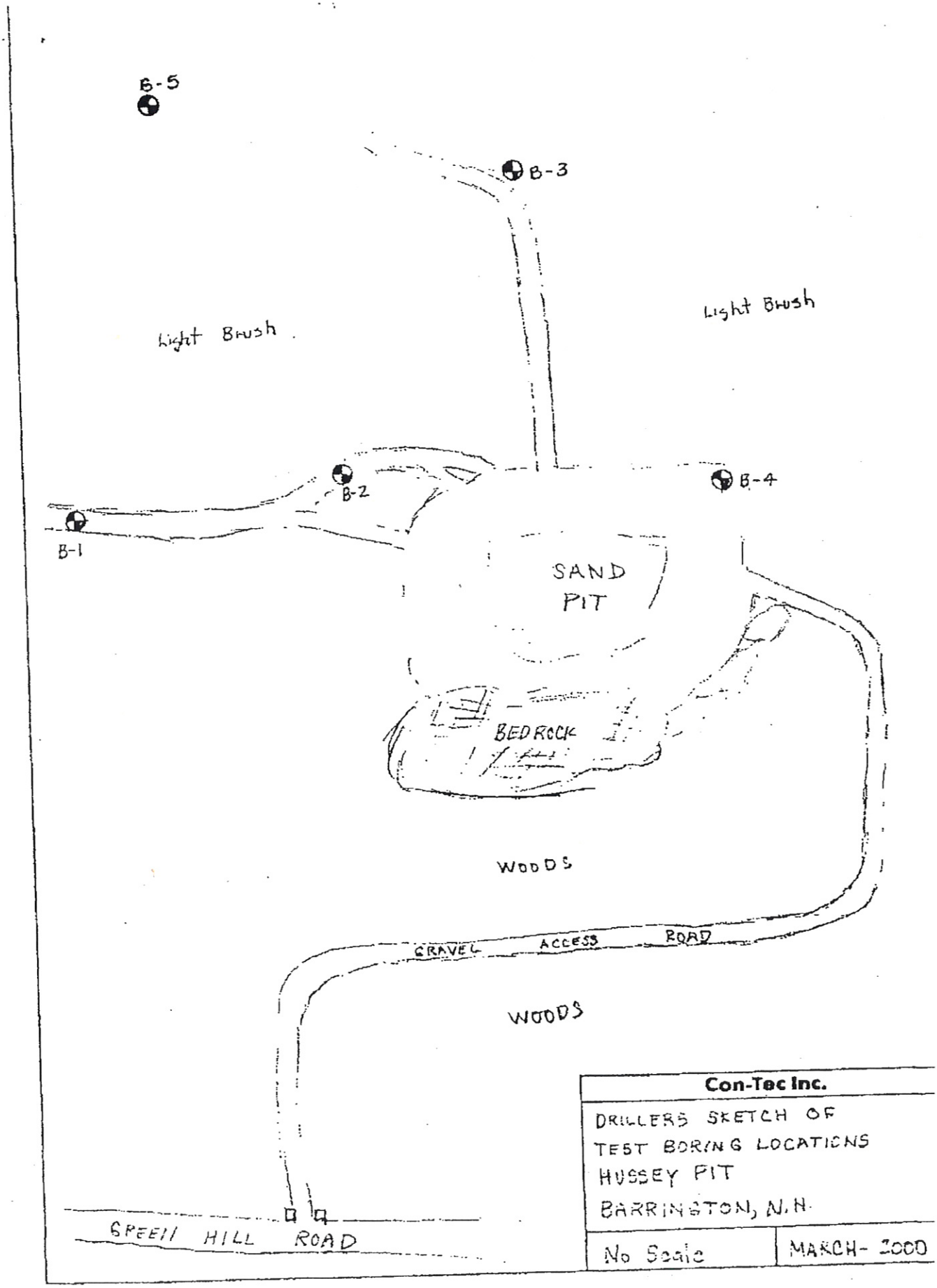
Notes:
1) TYPE OF RIG: Mobile Drill B-53; Track Mounted
2) HAMMER/HOIST TYPE: Safety / Cathead
3) Groundsurface Elevations estimated from TFMoran Plan

FILE: V:\4000\48\4895 Barr Gm Hill\4895B Pit Borings\[4895B TBLogs.xls]HTE 6 (2)

COHESIONLESS SOILS	COHESIVE SOILS	SAMPLE TYPE	PROPORTIONS
N = 0 - 4 = VERY LOOSE	N = 0 -2 = VERY SOFT	C = ROCK CORE	trace = 0% - 10%
4-10 = LOOSE	2 - 4 = SOFT	S = SPLIT SPOON	little = 10% - 20%
10-30 = MEDIUM	4 - 8 = MEDIUM	UP = UNDISTURBED PISTON	some = 20% - 35%
30-50 = DENSE	8 -15 = STIFF	UT = UNDISTURBED THINWALL	and = 35% - 50%
50 + = VERY DENSE	30 + = HARD		

CON-TEC, INC.

HUSSEY PIT, BARRINGTON, NH



Con-Tec Inc.	
DRILLERS SKETCH OF TEST BORING LOCATIONS HUSSEY PIT BARRINGTON, N.H.	
No Scale	MARCH- 2000

PROJECT: HUSSEY PIT
LOCATION: BARRINGTON, NH

JOB NO	2017
HOLE NO.	B-1
SHEET	1 OF 1
START DATE	03/06/00
FINISH DATE	03/06/00
DRILLER	W.Hoeckele
HELPER	F.Howe
INSPECTOR	

	CASING	SAMPLE	CORE
TYPE	HSA	SS	
SIZE ID	4 1/4"	1 3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

GROUNDWATER		DEPTH TO		
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
		23'		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMP NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV.	SOIL DESCRIPTION
						Drilled without sampling to 20'
						0 - .5' TOPSOIL
						.5' - 20' Light brown, dry, f/m SAND
10.0'						
20.0'						
		1	20'-22'	8-10	2.0'	Gray, moist, medium dense, f/SAND
				10-10		
25.0'						
		2	25'-27'	4-7	2.0'	Light brown, wet, medium dense, m/f/c SAND, trace f/gravel
				11-21		
						31.0'
30.0'						
		3	30'-32'	3-2	.7'	Possible start of clay @ 31'
				1-1		
						35.0'
35.0'						
		4A	35'-36'	1-2	2.0'	Yellow-brown, moist, soft CLAY, trace silt
		4B	36'-37'	1-5		Gray, moist, medium stiff CLAY, trace silt
						39.0'
			39.5'-	10/.2	.2'	Light brown, wet, very dense SILT and embedded f/m/c GRAVEL, trace f/m sand
						39.7
		5	39.7'	75/0		Auger Refusal
						39.7
40.0'						BOTTOM OF BORING
						Note: Typed Driller's Field Log.

CON-TEC, INC. TEST BORING LOG

PROJECT: HUSSEY PIT
LOCATION: BARRINGTON, NH

JOB NO	2017
HOLE NO.	B-2
SHEET	1 OF 1
START DATE	03/06/00
FINISH DATE	03/06/00
DRILLER	W.Hoeckele
HELPER	F.Howe
INSPECTOR	

	CASING	SAMPLE	CORE
TYPE	HSA	SS	
SIZE ID	4 1/4"	1 3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

GROUNDWATER		DEPTH TO		
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
		28'		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMP NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV.	SOIL DESCRIPTION
						Drilled without sampling to 20'
						0 - .5' TOPSOIL
						.5' - 20' Light brown, dry, f/m SAND
10.0'						
20.0'						
		1	20'-22'	20-12	2.0'	Light brown, dry, medium dense, f/SAND, trace gray silt in occasional 1/2" layers
				12-14		
25.0'						
		2	25'-27'	19-23	2.0'	Light brown, dry, dense, f/SAND, trace gray silt in occasional 1/2" layers
				21-22		
30.0'						
		3	30'-32'	13-11	2.0'	Light brown, wet, medium dense, f/SAND, trace silt
				10-11		
35.0'						
		4	35'-37'	5-6	2.0'	Light gray-brown, wet, medium dense, f/SAND and SILT
				8-11		
40.0'						
		5	40'-42'	3-5	2.0'	Light brown, wet, medium dense f/SAND
				7-6		
45.0'						

42
42

BOTTOM OF BORING

Note: Typed Driller's Field Log.

PROJECT: HUSSEY PIT

LOCATION: BARRINGTON, NH

	CASING	SAMPLE	CORE
TYPE	HSA	SS	
SIZE ID	4 1/4"	1 3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

GROUNDWATER		DEPTH TO		
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
		30'		

HOLE NO. B-3

SHEET 1 OF 1

START DATE 03/06/00

FINISH DATE 03/06/00

DRILLER R.B.McGlashan

HELPER G.Dean

INSPECTOR

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMP NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV	SOIL DESCRIPTION
						Drilled without sampling to 20'
						0 - .8' TOPSOIL
						.8' - 5' Light brown, dry, f/m/c SAND, trace f/gravel
						5' - 20' Light brown, dry, f/SAND
10.0'						
20.0'		1	20'-22'	10-15 18-17	2.0'	Light brown, dry, dense, f/SAND, trace silt in occasional 1/8" layers
25.0'		2	25'-27'	6-7 7-9	2.0'	Light brown, dry, medium dense, f/SAND
30.0'		3	30'-32'	6-8 8-10	2.0'	Light brown and light gray, wet, medium dense, f/SAND, trace silt in occasional 1/8" layers
35.0'		4	35'-37'	5-7 10-11	2.0'	Light brown, wet, medium dense, f/SAND
40.0'		5	40'-42'	7-8 9-11	1.8'	Light brown, wet, medium dense, f/SAND and SILT
						BOTTOM OF BORING

Note: Typed Driller's Field Log.

PROJECT: HUSSEY PIT
LOCATION: BARRINGTON, NH

	CASING	SAMPLE	CORE
TYPE	HSA	SS	
SIZE ID	4 1/4"	1 3/8"	
HAMMER WT.		140	
HAMMER FALL		30"	

GROUNDWATER		DEPTH TO		
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
		32.4'		

JOB NO.	2017
HOLE NO.	B-4
SHEET	1 OF 1
START DATE	03/06/00
FINISH DATE	03/06/00
DRILLER	R.B.McGlashan
HELPER	G.Dean
INSPECTOR	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMP NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV.	SOIL DESCRIPTION
						Drilled without sampling to 20'
						0 - .5' TOPSOIL
						.5' - 3' Light brown, dry, f/m/c SAND, little f/m gravel
						3' - 20' Light brown, dry, f/SAND
10.0'						
20.0'						
		1	20'-22'	9-12	2.0'	Light brown, dry, medium dense f/SAND
				14-15		
25.0'						
		2	25'-27'	10-12	2.0'	Light brown, dry, medium dense, f/SAND, trace silt in occasional 1/8" to 1/2" layers
				12-13		
30.0'						
		3	30'-32'	6-8	2.0'	Light brown, moist, medium dense, f/SAND, trace silt in occasional 1/8" to 1/2" layers
				8-8		
35.0'						
		4	35'-37'	5-8	1.8'	Light brown, wet, medium dense, f/SAND, trace silt
				8-10		
40.0'						
		5	40'-42'	7-9	1.7'	Light brown, wet, medium dense, f/SAND, trace silt
				13-16		
						BOTTOM OF BORING
						Note: Typed Driller's Field Log.