Foundations

Due to the presence of miscellaneous construction debris, organics and possible large voids within the existing surficial fill soils, deep foundations are recommended for support of buildings designated on drawing C3.0 of Attachment A. Considering the subsurface conditions and feasible foundation alternatives, we believe the designated buildings should be supported on deep foundations extending to a the underlying sound bedrock, which may range from approximately 10 to 50 feet below proposed foundations. Drilled piers would most likely require permanent casing to maintain stable excavations during installation and are not recommended due to their relatively high associated costs.

Economically feasible deep foundation options considered for this site are driven timber, pre-cast concrete and steel piles. Timber piles are considered to be the most economical for this site given the anticipated foundation loads, depth of suitable bearing stratum, and subsurface conditions. Accordingly, Oak recommends that the designated buildings be supported on timber piles driven to refusal on sound bedrock. It should be noted that pre-drilling or spudding may be required to penetrate through subsurface obstructions if driving stresses exceed the recommended values stated below.

On the basis of our analysis of subsurface conditions and the proposed construction, the following foundation design recommendations are provided:

| | | |
|---|---|---|
| 1. | Pile Section: | Timber, ASTM D25 |
| 2. | Species: | Southern Pine |
| 3. | Preservative Treatment: | AWPA C3 |
| 4. | Maximum Driving Stress: | 3,000 psi |
| 5. | Maximum Design Capacity: | 15 Tons/pile |
| 6. | Maximum Effective Driving Energy: | 18 Kip-Ft./blow (Single-acting hammer) |
| 7. | Maximum Vertical Batter | 1H:10V |
| 8. | Minimum Pile Spacing | 2.5 x pile diameter |

Piles should be designed and installed according to *Standard Guidelines for the Design and Installation of Pile Foundations* (ASCE 20-96) published by ASCE. For the purposes of bidding, construction documents should require a base-bid pile length equal to 35 feet, and unit prices should be provided to adjust for the final in-place pile length. The final pile tip depth should be determined in the field by using an acceptable driving formula or through dynamic pile load testing methods according to ASTM D 4945 (CASE) corresponding to the above allowable load capacity including a factor of safety equal to 2.0. Protective pile tips should be used to prevent damage due to driving through fill, obstructions, or into bedrock.

Floor Slabs

In buildings designated for deep pile foundation support, we recommend that both the living area and garage floors be designed and constructed as fully supported on foundation grade beams and timber piles as recommended above. The remaining building floor slabs may be designed and constructed as slab on grade and specified in the previous geotechnical report.

Construction Quality Control

The geotechnical engineer should be provided the opportunity to review the final design and specifications to ensure recommendations presented herein have been properly interpreted and applied. It is recommended that all backfill and compaction be inspected and tested by a qualified firm to ascertain that the proper materials are placed and adequately compacted. The geotechnical engineer should review all soil inspection and testing reports and monitor site development and foundation subgrade preparation to determine the necessity for additional cut and backfill beneath building subgrades. The geotechnical engineer should also review the contractor's subgrade settlement survey and monitoring program during the placement of fill and, on the basis of this survey, determine the time-rate of settlement and recommended sequence for installation of structures, utilities, and pavements in Area 3.

## CLOSURE

This report has been prepared to assist the Site and structural engineers in the design and construction of foundations, pavements, and Site structures related to the proposed development at 7 to 13 Depot Street, South Windham, Maine. The recommendations have been presented on the basis of an understanding of the project as described herein, and through the application of generally accepted foundation engineering practices. No other warranties, expressed or implied, are made.


VIL_RESP02524

an acceptable driving formula or through dynamic pile load testing methods according to ASTM D 4945 (CASE) corresponding to the above allowable load capacity including a factor of safety equal to 2.0. Protective pile tips should be used to prevent damage due to driving through fill, obstructions, or into bedrock.

Floor Slabs

In buildings designated for deep pile foundation support, we recommend that both the living area and garage floors be designed and constructed as fully supported on foundation grade beams and timber piles as recommended above. The remaining building floor slabs may be designed and constructed as slab on grade and specified in the previous geotechnical report.

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The geotechnical engineer should be provided the opportunity to review the final design and specifications to ensure recommendations presented herein have been properly interpreted and applied. It is recommended that all backfill and compaction be inspected and tested by a qualified firm to ascertain that the proper materials are placed and adequately compacted. The geotechnical engineer should review all soil inspection and testing reports and monitor site development and foundation subgrade preparation to determine the necessity for additional cut and backfill beneath building subgrades. The geotechnical engineer should also review the contractor's subgrade settlement survey and monitoring program during the placement of fill and, on the basis of this survey, determine the time-rate of settlement and recommended sequence for installation of structures, utilities, and pavements in Area 3.

## CLOSURE

This report has been prepared to assist the Site and structural engineers in the design and construction of foundations, pavements, and Site structures related to the proposed development at 7 to 13 Depot Street, South Windham, Maine. The recommendations have been presented on the basis of an understanding of the project as described herein, and through the application of generally accepted foundation engineering practices. No other warranties, expressed or implied, are made.

Mr. Lee D. Allen, P.E.
Northeast Civil Solutions

We have enjoyed working with you on this phase of your project. Should you have any questions regarding this report or require additional assistance, please do not hesitate to call.

Sincerely,

OAK ENGINEERS, LLC.

Diane Gagnon

Diane Gagnon
Project Engineer

STATE OF MAINE
PAUL D. DESTEFANO
8025
LICENSED
PROFESSIONAL ENGINEER

Paul D. DeStefano, Ph.D., P.E.
Director, Geotechnical and Structural Services

DEG/PDD:sh
Attachments

cc: Steve Etzel, Questor, Inc.



VIL_RESP02526

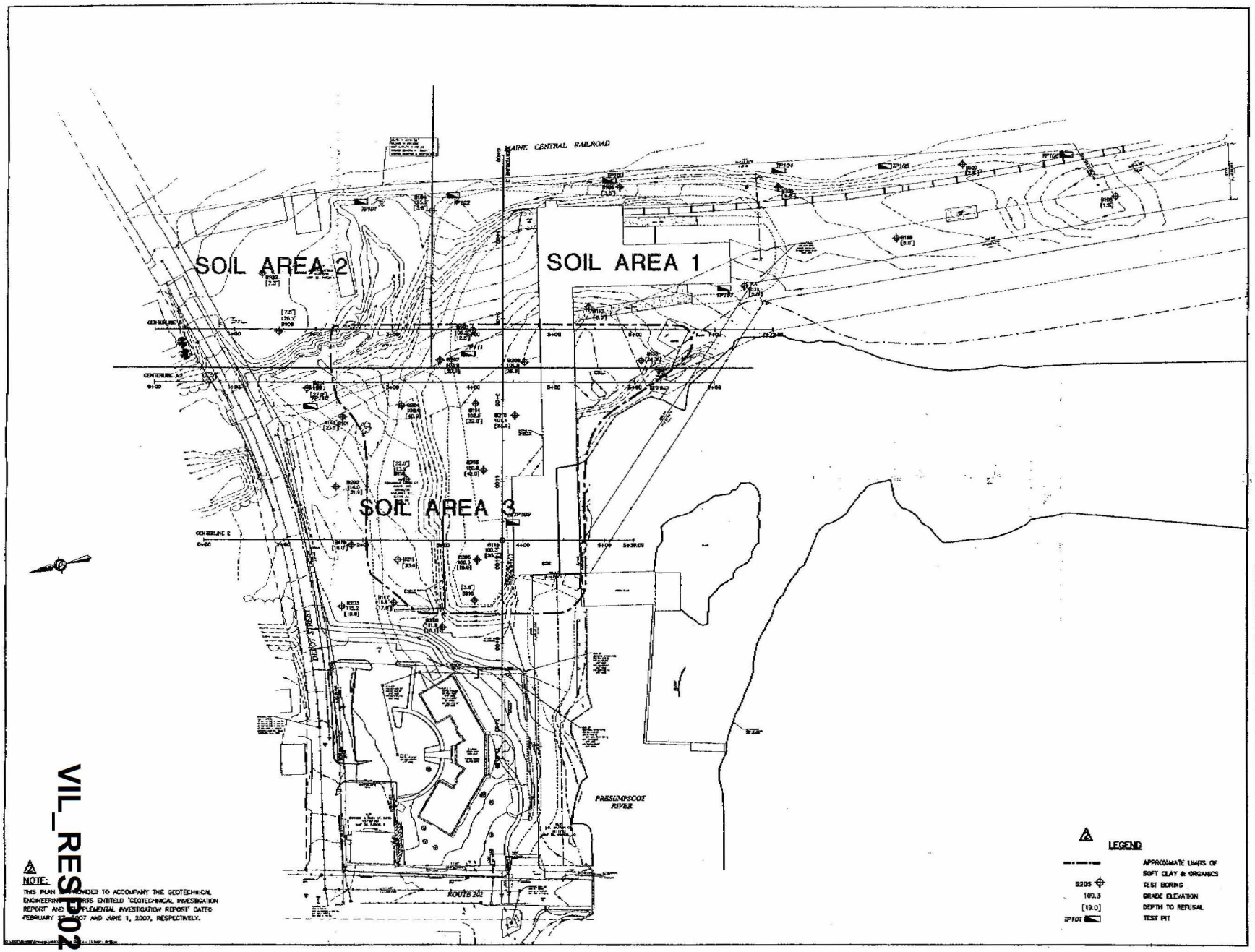
**ATTACHMENT A**

Figures

Supplemental Geotechnical Investigation
Village at Little Falls, LLC
7 to 13 Depot Street
South Windham, Maine



VIL_RESP02527




NOTE:
THIS PLAN IS INTENDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITLED "GEOTECHNICAL INVESTIGATION REPORT" AND "SUPPLEMENTAL INVESTIGATION REPORT" DATED FEBRUARY 27, 2007 AND JUNE 1, 2007, RESPECTIVELY.

Site:
VILLAGE AT LITTLE FALLS
63 DEPOT STREET
SOUTH WINDSOR, MAINE

Prepared for:
NORTHEAST CIVIL SOLUTIONS
153 US ROUTE 1
SCARBOROUGH, ME 04074

SCALE in FEET
1"=50'

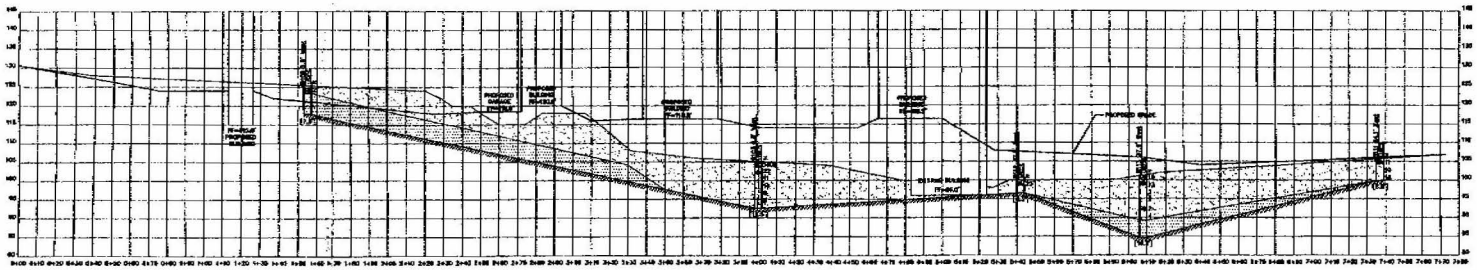
OAK ENGINEERS
Brown's Wharf
Newburyport, MA 01950
Tel. (978) 465-9677
Fax (978) 465-2866
www.oakengineers.com

SUBSURFACE EXPLORATION PLAN

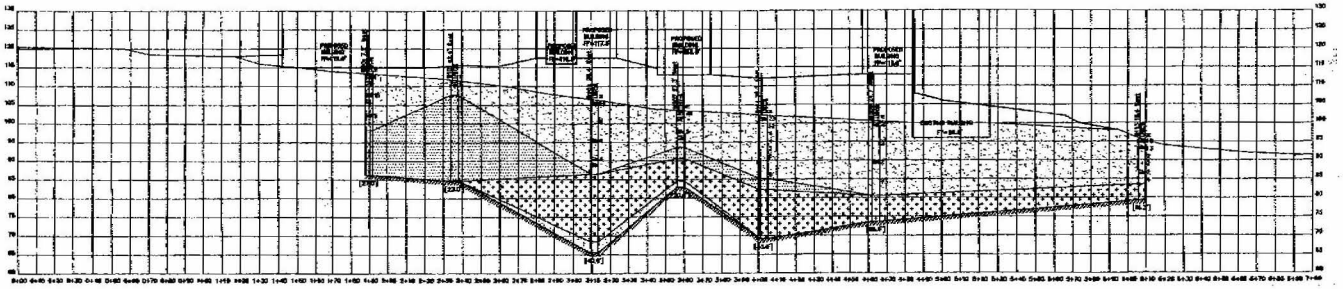
| No. | Revision/Issue | Date |
|---|---|---|
| 2 | REVISED PER DEP | 6/07 |
| 1 | SUPPLEMENTAL INVESTIGATION | 5/07 |

Design by: DEC
Checked by: PDD
Drawn by: DEC
Approved by: PDD
Project: 054006
Date: MAY 2007
Sheet: C1.0

VIL_RESP02528



PROFILE 1



PROFILE 1.2 (REVISED MAY 2007)

## LEGEND

| | |
|---|---|
| | APPARENT BEDROCK |
| | SILTY SAND OR GRANULAR FILL |
| | MEDIUM TO STIFF CLAY/SILT |
| | ORGANICS/SOFT MARINE CLAY |
| N | STANDARD PENETRATION VALUE |
| USC | UNIFIED SOIL CLASSIFICATION (ASTM D-2487) |

NOTE:
THIS PLAN IS PROVIDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITLED 'GEOTECHNICAL INVESTIGATION REPORT' AND 'SUPPLEMENTAL INVESTIGATION REPORT' DATED FEBRUARY 27, 2007 AND JUNE 1, 2007, RESPECTIVELY.

VIL_RESP02529

VILLAGE AT LITTLE FALLS
13 DEPOT STREET
SOUTH WINDHAM, MAINE

Prepared for:
NORTHEAST CIVIL SOLUTIONS
153 US ROUTE 1
SCARBOROUGH, ME 04074

VERTICAL SCALE
0 30 60 120
SCALE in FEET
1"=60'

HORIZONTAL SCALE
0 15 30 60
SCALE in FEET
1"=30'

OAK ENGINEERS
Brown's Wharf
Newburyport, MA 01950
Tel. (978) 465-9977
Fax (978) 465-2866
www.oakengineers.com

APPARENT SUBSURFACE PROFILES

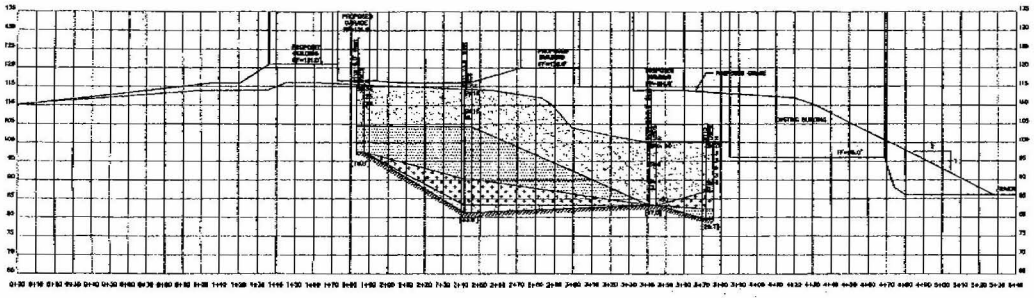
| No. | Revision/Issue | Date |
|---|---|---|
| 2 | REVISED PER DEP | 6/07 |
| 1 | SUPPLEMENTAL INVESTIGATION | 5/07 |

| | |
|---|---|
| Design by: DEG | Checked by: PDD |
| Drawn by: DEG | Approved by: PDD |
| Project: 06-0005 | Date: MAY 2007 |

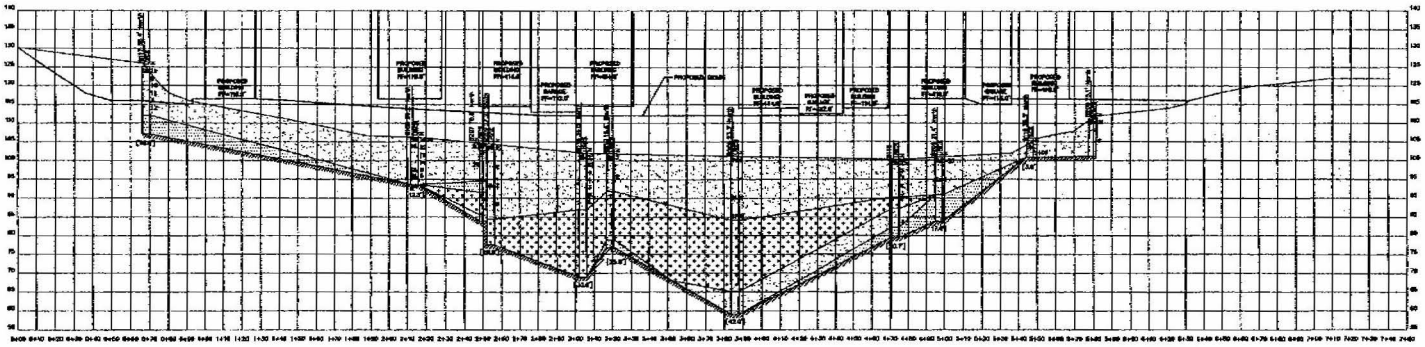
Sheet: C2.0

## LEGEND

- APPARENT BEDROCK
- SILTY SAND OR GRANULAR FILL
- MEDIUM TO STIFF CLAY/SILT
- ORGANICS/SOFT MARINE CLAY
- N — STANDARD PENETRATION VALUE
- USC — UNIFIED SOIL CLASSIFICATION (ASTM D-2487)



PROFILE 2 (REVISED MAY 2007)



PROFILE 3 (REVISED MAY 2007)

**NOTE:**
THIS PLAN IS PROVIDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITLED "GEOTECHNICAL INVESTIGATION REPORT" AND "SUPPLEMENTAL INVESTIGATION REPORT" DATED FEBRUARY 2007 AND JUNE 1, 2007, RESPECTIVELY.

VIL_RESP02530

VILLAGE AT LITTLE FALLS
13 DEPOT STREET
SOUTH WINDHAM, MAINE

NORTHEAST CIVIL SOLUTIONS
153 US ROUTE 1
SCARBOROUGH, ME 04074

STATE OF MAINE
PAUL D. DESTEFANO
9135
8/13/07

VERTICAL SCALE
0 30 60 120
SCALE in FEET
1"=60'

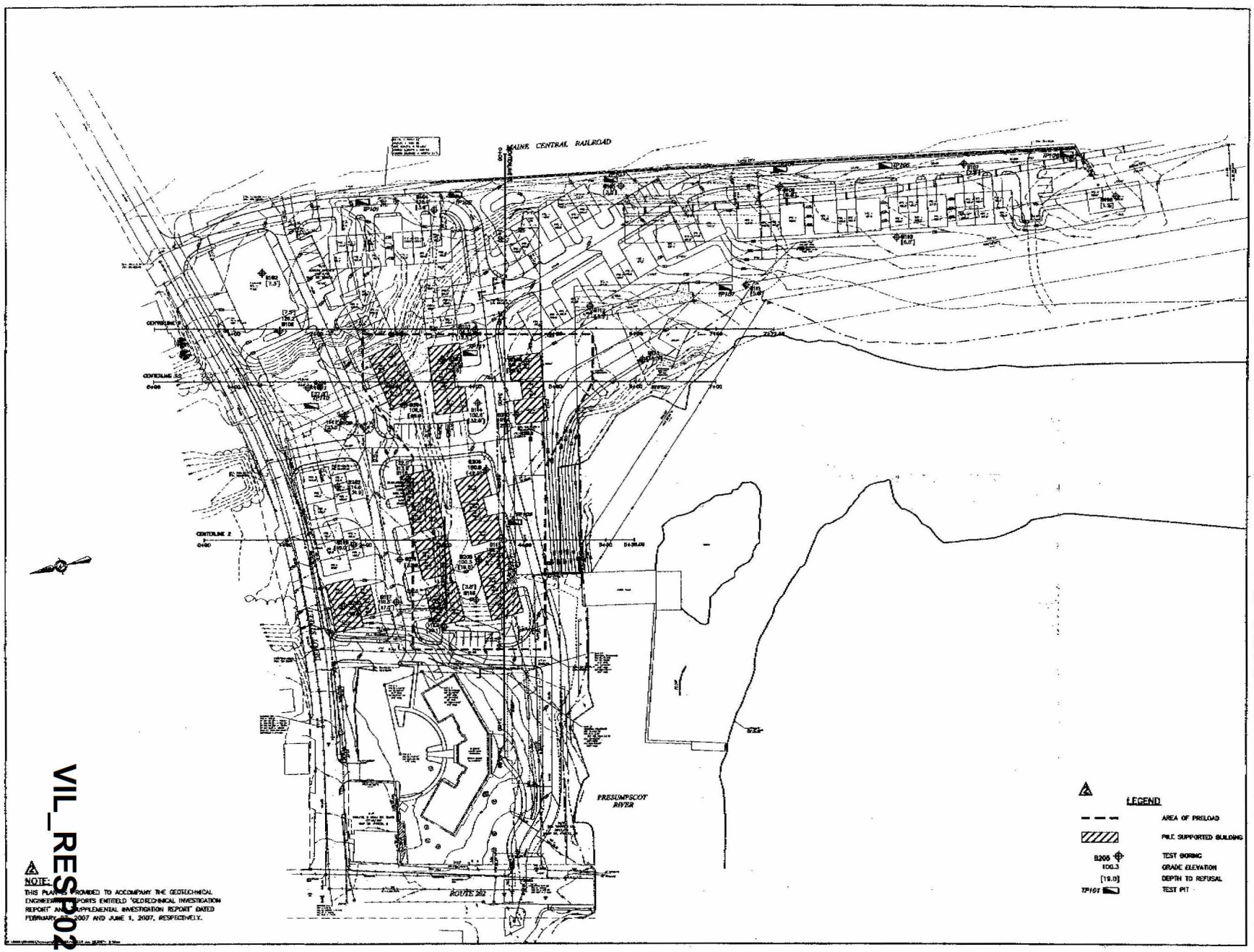
HORIZONTAL SCALE
0 15 30 60
SCALE in FEET
1"=30'

OAK ENGINEERS
Brown's Wharf
Newburyport, MA 01950
Tel. (978) 465-9877
Fax (978) 465-2885
www.oakengineers.com

APPARENT SUBSURFACE PROFILES

| No. | Revision/Issue | Date |
|---|---|---|
| 2 | REVISED PER DEP | 8/07 |
| 1 | SUPPLEMENTAL INVESTIGATION | 5/07 |

Design by: DEG
Drawn by: DEG
Checked by: PDD
Approved by: PDD
Project: 064008
Date: MAY 2007
Sheet: C2.1




NOTE:
THIS PLAN IS PROVIDED TO ACCOMPANY THE GEOTECHNICAL ENGINEERING REPORTS ENTITLED "GEOTECHNICAL INVESTIGATION REPORT" AND "SUPPLEMENTAL INVESTIGATION REPORT" DATED FEBRUARY 2, 2007 AND JUNE 1, 2007, RESPECTIVELY.

Site
VILLAGE AT LITTLE FALLS
13 DEPOT STREET
SOUTH WINDHAM, MAINE

Prepared for:
NORTHEAST CIVIL SOLUTIONS
153 US ROUTE 1
SCARBOROUGH, ME 04074

SCALE in FEET
1"=50'

OAK ENGINEERS
Brown's Wharf
Newburyport, MA 01950
Tel. (978) 465-9677
Fax (978) 465-2986
www.oakengineers.com

PROPOSED PRELOAD AND PILING PLAN

| No. | Revision/Issue | Date |
|---|---|---|
| 2 | REVISED PER DEP | 6/07 |
| 1 | SUPPLEMENTAL INVESTIGATION | 5/07 |

Design by: DEC
Checked by: PDD
Drawn by: DEC
Approved by: PDD
Project: 064006
Date: MAY 2007
Sheet: C3.0

VIL_RESP02531

**ATTACHMENT B**

Soil Boring Logs

Supplemental Geotechnical Investigation
Village at Little Falls, LLC
7 to 13 Depot Street
South Windham, Maine



VIL_RESP02532

OAK ENGINEERS

# BORING LOG: B201

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 27.0 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings (Mike/ |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | 6" Topsoil<br>Fine to coarse SAND and GRAVEL, trace silt | (moist) Grinding Cobbles and Boulders 2'-4' | X | SS1 | 3,2<br>7,19 | 24/13 | SW-GW | 9 | |
| 5 | (firm)<br>Brown fine to coarse SAND and SILT | (damp) @ 7.6' Auger Refusal (moved hole 5' to west) | X | SS2 | 4,5<br>10,4 | 24/14 | SM-ML | 15 | |
| 10 | (firm)<br>becomes little silt | (wet) | X | SS3 | 3,3<br>2,4 | 24/17 | SM | 5 | |
| 15 | (loose)<br>CLAY and SILT | (moist) | X | SS4 | 3,7<br>10,14 | 24/24 | CL/ML | 17 | |
| 20 | | (wet) | X | SS5 | 6,8<br>5,6 | 24/24 | CL/ML | 13 | |
| 25 | | (wet) | X | SS6 | 7,<br>50/5" | 24/11 | CL/ML | >50 | |
| | (stiff)<br>Spoon Refusal @ 25.9' bgs.<br>Auger Refusal @ 27.0' | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02533

Project No.: 064006 | Page: 1

OAK ENGINEERS

# BORING LOG: B202

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 31.9' Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Mottled, fine to medium SAND, some clay/silt, trace organic fibers | (damp) | ☒ | SS1 | 2,1 2,3 | 24/7 | SM | 3 | |
| 5 | (very loose) Mottled CLAY/SILT, little fine sand | (moist) Petroleum Odor | ☒ | SS2 | 4,4 2,3 | 24/12 | CL/ML | 6 | |
| 10 | | (moist) Petroleum Odor | ☒ | SS3 | 2,3 3,4 | 24/20 | CL/ML | 6 | |
| 15 | (medium) Mottled CLAY | (moist) Petroleum Odor | ☒ | SS4 | 7,8 10,12 | 24/24 | CL/ML | 18 | |
| 20 | | (moist) Petroleum Odor | ☒ | SS5 | 8,10 10,12 | 24/11 | CL/ML | 20 | |
| 25 | | (wet) Petroleum Odor | ☒ | SS6 | 4,5 5,4 | 24/24 | CL/ML | 10 | |
| 30 | (stiff) Gray coarse GRAVEL, some fine to medium Sand, Silt/Clay (firm) Spoon Refusal @ 31.9' bgs. | (wet) | ☒ | SS7 | 15,17 18, 50/4" | 24/14 | GM | 35 | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02534

Project No.: 064006 Page: 1

OAK ENGINEERS

# BORING LOG: B203

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 10.75 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND,some Silt/Clay, trace coal, organic fiber | (moist) | | SS1 | 2,2 2,2 | 24/15 | SM | 4 | |
| 5 | becomes gray | (saturated) | | SS2 | 1,1 1,1 | 24/8 | SM | 2 | |
| 10 | becomes little wood (very loose to very dense) Spoon Refusal @ 10.8' bgs. | (wet) Petroleum Vapor | | SS3 | 4, 50/3" | 24/5 | SM | >50 | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02535

Project No.: 064006 | Page: 1

OAK ENGINEERS

# BORING LOG: B203

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 10.75 Feet | Logged By: | PDD/DEG |
| GW encountered: | 5.0 Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND,some Silt/Clay, trace coal, organic fiber | (moist) | X | SS1 | 2,2 2,2 | 24/15 | 4 | SM | |
| 5 | becomes gray | (saturated) | X | SS2 | 1,1 1,1 | 24/8 | 2 | SM | |
| 10 | becomes little wood (very loose to very dense) Spoon Refusal @ 10.8' bgs. | (wet) Petroleum Vapor | X | SS3 | 4, 50/3" | 24/5 | >50 | SM | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02536

Project No.: 064006 Page: 1

OAK ENGINEERS

# BORING LOG: B204

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 20.8 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND, little organic fibers, fine gravel | (moist) | X | SS1 | 4,5 9,10 | 24/4 | SW | 14 | |
| 5 | becomes some fine to coarse gravel, little coal, trace silt/clay | (moist) | X | SS2 | 3,4 5,7 | 24/7 | SW | 9 | |
| 10 | (firm) Brown fine SAND, little silt | (moist) | X | SS3 | 3,2 2,3 | 24/12 | SM | 4 | |
| 15 | (loose) Fine to coarse GRAVEL and fine SAND/SILT | (moist) | X | SS4 | 1,1 3,5 | 24/1 | SM-GM | 4 | |
| 20 | (loose) Gray CLAY | (saturated) | X | SS5 | 2,1 1,1 | 24/24 | CL | 2 | |
| | | (saturated) | X | SS6 | 2,2 2,2 | 24/24 | CL | 4 | |
| 25 | | (saturated) | X | SS7 | 2,2 2,2 | 24/24 | CL | 4 | |
| | | (saturated) | X | SS8 | 2,1 2,1 | 24/24 | CL | 3 | |
| | | (saturated) | X | SS9 | 1,1 2,1 | 24/24 | CL | 3 | |
| 30 | | (saturated) | X | SS10 | 1,2 2,2 | 24/24 | CL | 4 | |
| | | (saturated) | X | SS11 | 1,1 1,2 | 24/20 | CL | 2 | |
| 35 | | (saturated) | X | SS12 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (saturated) | X | SS13 | 1,2 1,1 | 24/24 | CL | 3 | |
| | (very soft) Gray SILT/CLAY, little fine sand | (saturated) | X | SS14 | 1,2 2,1 | 24/24 | CL | 4 | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02537

Project No.: 064006 Page: 1

OAK ENGINEERS

# BORING LOG: B204

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 20.8 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | (soft) Gray fine SAND, little silt (very dense) Spoon Refusal @ 40.9' bgs. | (wet) | ☒ | SS15 | 7, 50/4" | 24/8 | SM | >50 | |
| 45 | | | | | | | | | |
| 50 | | | | | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| 65 | | | | | | | | | |
| 70 | | | | | | | | | |
| 75 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

CLIENT:
Northeast Civil Solutions

SITE:
Village at Little Falls
Depot Street
South Windham, Maine

VIL_RESP02538

Project No.: 064006 Page: 2

OAK ENGINEERS

# BORING LOG: B205

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 19.0 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Gray fine to medium SAND, little gravel, brick, coal, trace orgainics | (damp) | | SS1 | 7, 50/2" | 24/5 | SW | >50 | |
| 5 | (very dense) becomes some fine to coarse gravel, little silt/clay, trace coal, brick | (moist) | | SS2 | 2,4 4,5 | 24/6 | SM | 6 | |
| 10 | (firm) Gray fine SAND and CLAY/SILT | (wet) | | SS3 | 2,2 2,2 | 24/12 | SM-CL/ML | 4 | |
| 15 | becomes little silt/clay | (moist) | | SS4 | 7,18 32, 50/4" | 24/14 | SM-CL/ML | 50 | |
| | (very loose to very dense) Moderately fractured, very hard, sound, bedded sandstone and quartz. | Run #1: 16.9 - 21.9 FT. Recovery = 100% RQD = 70% | | | | | | | |
| 20 | Boring Terminated @ 21.9' bgs. | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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SITE:
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South Windham, Maine

VIL_RESP02539

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OAK ENGINEERS

# BORING LOG: B206

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 10.1 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND, little silt/clay, fine gravel, brick, organic fiber | (damp) | | SS1 | 3,5 6,4 | 24/6 | SM | 11 | |
| 5 | | (moist) | | SS2 | 2,4 4,5 | 24/4 | SM | 8 | |
| 10 | (firm) BRICK and WOOD (very dense) Spoon Refusal @ 10.1' bgs. | (damp) | | SS3 | 50/1" | 24/2 | - | >50 | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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Project No.: 064006 Page: 1

VIL_RESP02540

OAK ENGINEERS

# BORING LOG: B207

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 20.6 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine SAND and GRAVEL | (moist) | ▨ | SS1 | 6,8 12,10 | 24/20 | SP-GP | 20 | |
| 5 | (firm) becomes some SILT | (moist) | ▨ | SS2 | 1,1 2,3 | 24/8 | SM-GM | 3 | |
| 10 | (loose) Gray CLAY | (saturated) | ▨ | SS3 | 2,1 5,4 | 24/24 | CL | 6 | |
| 15 | | (saturated) | ▨ | SS4 | 2,1 1,2 | 24/24 | CL | 2 | |
| | | (saturated) | ▨ | SS5 | 1,1 1,2 0/12" | 24/24 | CL | 2 | |
| 20 | (medium to very soft) Fine SAND, some Silt (firm) Spoon Refusal @ 20.6' bgs | (saturated) | ▨ | SS6 | 23, 50/1" | 24/24 | SM | 23 | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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Project No.: 064006 Page: 1

VIL_RESP02541

OAK ENGINEERS

# BORING LOG: B208

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 42.0 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND, trace fine gravel, organic fibers, brick | (moist) | X | SS1 | 2,3 3,8 | 24/10 | SW | 6 | |
| 5 | becomes little coal, brick, cement | (moist) | X | SS2 | 2,2 2,2 | 24/5 | SW | 4 | |
| 10 | (loose) becomes little wood, clay/silt, trace fine gravel | (wet) | X | SS3 | 1,1 5,7 | 24/12 | SM | 6 | |
| 15 | becomes gray, fine SAND, trace organic fibers (loose) | (wet) | X | SS4 | 2,2 3,3 | 24/15 | SP | 5 | |
| | Gray CLAY | w=35% | X | T-1 | | | CL | | |
| 20 | | (wet) | X | SS5 | 2,1 1,1 | 24/24 | CL | 2 | |
| | | (wet) | X | SS6 | 1,1 1,1 | 24/24 | CL | 2 | |
| 25 | | (wet) | X | SS7 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (wet) | X | SS8 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (wet) | X | SS9 | 1,1 1,1 | 24/24 | CL | 2 | |
| 30 | | (wet) | X | SS10 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (wet) | X | SS11 | 1,2 1,1 | 24/20 | CL | 3 | |
| 35 | | (wet) | X | SS12 | 1,1 2,1 | 24/24 | CL | 3 | |
| | (soft/very soft) Gray fine SAND, some Clay/Silt | (moist) | X | SS13 | 2,2 3,4 | 24/24 | SM | 5 | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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OAK ENGINEERS

# BORING LOG: B208

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 42.0 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | (loose) Gray fine to medium SAND | (wet) | | SS15 | 7,7 10,12 | 24/8 | SM | 17 | |
| | (firm) Boring Terminiated @ 42.0' bgs. | | | | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| 65 | | | | | | | | | |
| 70 | | | | | | | | | |
| 75 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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OAK ENGINEERS

# BORING LOG: B209

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 26.9 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown/black fine to medium SAND, little fine gravel, coal, trace brick | (moist) | X | SS1 | 17,15 7,5 | 24/24 | SW | 22 | |
| 5 | | (damp) | X | SS2 | 1,1 1,1 | 24/8 | SW | 2 | |
| 10 | (firm to very loose) Gray fine to mediums SAND, some Silt/Clay, trace organic fiber | (wet) | X | SS3 | 1,1 1,3 | 24/10 | SM | 2 | |
| 15 | | (saturated) | X | SS4 | 4,4 5,7 | 24/12 | SM | 9 | |
| 20 | (very loose to firm) Gray CLAY | (saturated) | X | SS5 | 2,1 1,1 | 24/20 | CL | 2 | |
| | | (saturated) | X | SS6 | 1,1 1,1 | 24/24 | CL | 2 | |
| 25 | | (saturated) | X | SS7 | 1,1 1,3 | 24/24 | CL | 2 | |
| | becomes some fine Sand (very soft) Spoon Refusal @ 26.9' bgs. | (saturated) | X | SS8 | 7, 50/4" | 24/10 | CL | >50 | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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OAK ENGINEERS

# BORING LOG: B210

| | | | | | |
|---|---|---|---|---|---|
| Ground Elevation: | See Plan | Total Depth: | 25.0 Feet | Logged By: | PDD/DEG |
| GW encountered: | N.M. Feet | Boring Diameter: | 4 Inches | Date Drilled: | 4/24/07 to 4/24/07 |
| GW @ completion: | N.M. Feet | Well Stickup: | 0 | Driller: | Northern Test Borings |

| DEPTH | DESCRIPTION | REMARKS | SAMPLE | SAMPLE NUMBER | BLOW COUNTS (per 6 inches) | PENETRATION/ RECOVERY (in.) | USCS SYMBOL | N | WELL |
|---|---|---|---|---|---|---|---|---|---|
| | Brown fine to medium SAND, little silt/clay, coal, trace organic fibers, brick | (damp) | X | SS1 | 2,5 2,2 | 24/18 | SM | 7 | |
| 5 | becomes little fine gravel | (moist) | X | SS2 | 1,1 1,1 | 24/4 | SM | 2 | |
| 10 | (loose to very loose) Brown fine to medium SAND and BRICK | (saturated) Petroleum Odor | X | SS3 | 1,1 2,2 | 24/4 | SW | 3 | |
| 15 | (very loose) Gray CLAY | (saturated) | X | SS4 | 2,1 1,1 | 24/10 | CL | 2 | |
| 20 | | (saturated) | X | SS5 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (saturated) | X | SS6 | 1,1 1,1 | 24/24 | CL | 2 | |
| | | (saturated) | X | SS7 | 2,8 5,7 | 24/22 | CL | 13 | |
| 25 | (very soft to stiff) Boring Terminated @ 25.0' bgs. | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

NOTES:
1. Drilling Method: Automatic Hammer with 2-1/4" i.d. Hollow Stem Auger (HSA)
2. Soil Sampling: 2-inch Split Spoon Sampler driven with 140 lb. hammer falling 30 inches (Auto-Hammer).
3. N.M.= Not Measured, N.O.= Not Observed, N.T.= Not Tested,

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