

Geotechnical Report
For the Proposed
Newport Community Center
Meadow Road
Newport, NH

PREPARED FOR: Breadloaf Corporation
1293 Route 7 South
Middlebury, VT 05753

PREPARED BY: M & W Soils Engineering, Inc.
PO Box 1466
Charlestown, NH 03603

January 25, 2019

January 25, 2019

Breadloaf Corporation
1293 Route 7 South
Middlebury, VT 05753
attn: John Dale

re: Proposed Newport Community Center, Newport, NH
Geotechnical Report

Dear Mr. Dale,

Thank you for the opportunity to provide Geotechnical Engineering services on the above referenced project. Work to be performed was described in a proposal dated July 6, 2018, with a contract signed around October 15.

[Project Information](#)

A 20,000 square foot Community Center has been proposed for the Town of Newport, to be located on municipally owned land on the west side of downtown. This will be a single story (partial high ceiling), slab on grade building. The slab will be an average of about 1.5' above existing grades over the building footprint.

We were asked to provide geotechnical information for structural design. This report will summarize the subsurface exploration and laboratory testing which was done, and will provide recommendations for design and construction.

[Site Description](#)

The project site is located on the east side of Meadow Road in Newport. The north end of the property is currently used as an auxiliary ambulance facility by the Town, the address on that building is 15 Meadow Road. In addition to the ambulance building, there is a shed used by the cemetery department and a concession stand within the building footprint. The ground surface around the buildings is generally gravel parking lot, with a paved apron in front of the ambulance building. The south end of the proposed building will occupy an area currently used as ballfields. New parking areas for the project will generally occupy areas already used for parking lots. Much of the existing ball field will remain, with the field direction swapped so that home plate will be about 180 degrees from existing.

The site topography is fairly level across most of the site. There is a sharp rise at the northeast corner of the proposed building footprint. The site currently drains to a municipal stormwater collection system along Meadow Road. The nearest point in the river to the west is about 400 feet south of the south end of the building.

The approximate center of the project is located at 43°21'52"N, 72°10'36"W.

Subsurface Conditions

Soil Borings

We proposed 9 test boring locations during our initial discussions, based on the expected work that could be accomplished in two drilling days. The borings were labeled as B-1 through B-9. I marked out the borings in the field, and arranged for utility marking by Dig-Safe and the Town. I have no knowledge of any other subsurface exploration on the site.

Two full days of drilling were done, on October 16 and 17, 2018. Our office contracted with T & K Drilling of Troy, NH, to conduct the test borings on the site. Boring locations are shown on the attached map, which can be found in Appendix A. Test borings were conducted with a truck mounted drill rig, using 3-1/4" hollow stem augers. I was on site with the drill crew for the first day, to oversee drilling activities, maintain field logs, select boring depths and sampling schedules, and to select the soil samples to be retained for future inspection. On the second day, our firm was represented by Marco Vangemerren, a geologist. Field Boring Logs are presented in Appendix B.

Boring B1 was the deepest boring completed, issues with flowing sands led to the termination of this boring at 47 feet. Flowing sands are a drilling description for clean sands beneath the groundwater table that flow into the drilling augers and plug them up, slowing work and preventing accurate sampling. The other borings were terminated at or above this sand layer. Refer to either the boring logs or the summary table at the front of the logs for the depth of each of the borings. The structural borings (B-1 to B-8) were generally advanced to either 17 or 22 feet (B-5 went to 12' and B-1 to 47'). B-9 was a parking lot boring, advanced to 10 feet.

Standard Penetration Tests (SPT) are the standard method of obtaining blow count values (N-values) and representative soil samples for classification and laboratory testing. 2-inch outside diameter split spoon samplers were used to obtain the blow counts and soil samples. N-values are directly proportional to soil density, densities are provided on the

boring logs. We selected representative soil samples from each split spoon, these samples were transferred to sealed sample jars for laboratory analysis or further inspection.

Continuous soil sampling was conducted from the ground surface to at least 8 feet at all of the borings except B-3 (cobbles prevented some sampling intervals at that location), and to 12' at several of the locations. The depth of continuous sampling was extended due to the uncertainty regarding footing depths at the time of drilling.

All of the boring locations found at least some fill or disturbed soils near the surface. Most of these areas have between 2 and 3 feet of previously placed or disturbed soils, a depth which will be normally removed in footing excavation. The deepest fill pockets were at B-7 and B-9, with only B-7 being in the building footprint. At that location, a layer of black silty sand with traces of brick and glass was found from about 5.5 to 7.5 feet. This material had an odor that I described as creosote or old oil. A similar soil layer was found from 2 to 4 feet at B-9, almost 300 feet away, but wasn't noticed in the other borings.

Native soils are generally sands, with pockets or layers of silty sand or gravel. Soil densities are typically medium dense to dense above the water table, and loose to medium dense below. A description of "clean sand" on the boring logs is used when the apparent silt content is less than 6%. As shown in the soil gradations below, much of the sand has a silt content of between 6 and 12 %.

There is a significant area of silt or clayey silt which extends through the center of the building in an east-west direction. This area is described by boring logs B-2 and B-6. Soil profiles for the east and west sides of the building were developed to show the approximate extent of the silt. These soil profiles are included in Appendix D. While different than the surrounding soils, this silt layer appears to have similar density characteristics as the adjacent sandy soils. It appears that the development area was formerly part of the floodplain of the adjacent river, the silty section may have been a stream channel leading to the river.

Bedrock was not encountered. The only refusal found was at B-3, and this seems to be a cobble or boulder.

Groundwater

Observations of soil moisture can be found in the "moisture, density, or consistency" column of the logs. A notation of "wet" in this column generally denotes the first soil

sample that appears to be saturated, and is often taken as an indication of the presence of groundwater when a measurement can't be obtained. Most of the boring locations had wet soil in the 6 to 8 foot range, B-3 seemed to be elevated (just below 4'). Most of the boreholes collapsed before open hole readings could be taken. B-3 was left open overnight, with water at 3 feet below the ground surface the following morning. As this appears unusual compared to the observations in the immediate area, I believe this may have something to do with water trapped in the coarse gravel or rock pockets found at shallow depths at this location. Groundwater was measured at B-1 soon after the hole was completed, with a measured depth of 8'9". This made sense when compared to the moisture observations of the soil samples.

Considering the relatively shallow excavations required for footings on the proposed building, it appears that groundwater on this site will remain below footing excavations. If isolated dewatering is required, water should be able to be discharged elsewhere on the site.

Soils Laboratory Testing

Soil gradations were performed by our lab on seven discrete soil samples obtained during the subsurface investigation. Soil gradations can be found in Appendix C. Laboratory soil descriptions, based on the gradation results, vary from the terminology used in field soil descriptions. For instance, a soil described as "fine sand, little silt and gravel" in the field may be a "well graded sand with silt and gravel" when compared to the Unified Classification System used in the lab. Soil samples were selected to represent soil conditions beneath footings, primarily between 4 and 8 feet below grade.

A summary of results from the laboratory gradations are provided in the following table;

Table 1, Summary of Laboratory Soil Gradations

Boring #	<u>Sampling Depth</u>	<u>Soil Classification</u>	<u>Silt Content, %</u>	<u>Moisture Content, %</u>	<u>N-value from Boring Log</u>
B-2	6-8'	ML, Silt	98.4	34.1	17
B-3	4-5'3"	SP-SM, Poorly graded sand with silt and gravel	7.7	9.5	82

B-4	6-8'	Borderline SW-SM or SP-SM, either with silt and gravel	8.0	7.3	69
B-5	4-6'	SM, Silty sand	35.8	46.4	5
B-6	4-6'	SM, Silty sand	29.9	37.2	6
B-7	7.5-8'	SP-SM, Poorly graded sand with silt and gravel	5.4	8.9	50
B-8	4-6'	SP, Poorly graded sand	2.4	4.0	19

The soil classifications are in general agreement with the field descriptions, although with the differences in nomenclature described above. These sample results illustrate several points made above. The layer of silty sand from 4 to 6 feet at B-5 and B-6 is consistent, but the soil profile for what I refer to as the east side of the building shows that it doesn't extend any deeper than 6 feet. These two samples reflect the soil likely to be encountered in the footing excavation in these areas. The moisture contents reflect the ability of the silty soils to retain much more water than the sandy soils.

Environmental Concerns

We have no knowledge of previous environmental studies or concerns on this site. We did identify some limited areas with soils that smelled of oil or creosote. These are not of a concern from the geotechnical standpoint to any greater degree than other fill soils, but they could have an impact on construction. Further investigation by the Owner would be warranted.

Recommendations for Design and Construction:

1) This site will have an IBC Seismic Site Class of "D", per the 2009 through 2015 IBC Code, based on average blow counts. There is a concern about liquefaction potential of the underlying native soils. Clean saturated sands in thick layers with relatively shallow non-liquefiable soils above them are most prone to liquefaction. Lateral spreading due to liquefaction is not likely, due to the depth to the saturated clean sands and the local topography, potential damage would be the result of liquefaction causing sand movement from within the bearing zones beneath footings. This area is not prone to the magnitude of earthquake that would cause this type of movement, and this commentary may have no effect on the structural design.

2) We have been provided with the current conceptual site plan and schematic floor plan for reference in preparing this report.

The building slab will be at a single elevation, 788.0'. The ground elevations around most of the building are just below that elevation, there are multiple entries which require walks to begin at 788 at the edge of the building. It appears that the northern tip of the building will integrate a retaining wall to tie into the bank at that corner. The current ground elevations are generally in the 786 to 787 range. I was assuming a bottom of footing elevation of 783.5' for my calculations and recommendations, so the average cut to footing grade will be between 3 and 3.5'. There may need to be some lower elevations along the front of the building to accommodate sidewalk elevations, and at column footings. The profile sheets in Appendix D show the footing subgrade based on the 783.5' elevation.

As illustrated by the blow counts directly beneath the footings on either side of the building, footings will bear in compact sands or silty sands in almost all locations. Boring B-7 was the only boring within the building footprint where undesirable soils were found within the footing range, it is possible that other isolated areas will be encountered.

My recommendations for site preparation and foundation design are as follows:

a) Strip all organic or otherwise deleterious soils from within the building footprint and all exterior improvements (future walks, roadways, etc.). This includes current structures, pavement, and loam.

b) Excavate to footing subgrade. Where unsuitable soils (organics, loose or industrial fill) are found, over excavate to undisturbed solid ground if the layer is relatively shallow (<24") or consult with the Geotechnical Engineer. In these over excavated areas, use ¾" crushed stone to fill to footing subgrade. If groundwater is present, wrap the crushed stone with filter fabric.

Where the subgrade is firm sand, gravel, or gravelly sand, footings may be placed directly on the re-compacted subgrade. Final excavation shall be done with a smooth bucket or by hand digging. Use a plate compactor to recompact any disturbed areas. Where footings bear on moist silty sand or other saturated soils, over excavate and place a layer of filter fabric and a minimum of 6" of ¾" crushed stone beneath footings. The Geotechnical Engineer should field verify all footing subgrade before crushed stone or concrete is placed.

Interior footings and column bases will likely be shallow compared to the frost protected exterior footings, with subgrade elevations close to existing grades. In these areas, provide a minimum of 12" of compacted crushed gravel beneath concrete, extending at least 12" beyond each face of the footing. Additional fill beneath this layer, if needed, should be Granular Backfill.

c) Backfill footings and foundation walls with Granular Backfill. Existing soils may be used provided they meet the backfill specification or are close enough for the Geotechnical Engineer to approve their use. There should be room on site to stockpile clean sands and gravels for mixing and compliance sampling.

d) In the interior of the building, the existing ground surface will be 1 to 1.5 feet below slab subgrade in most locations. Much of this area is currently gravel parking surface. Little would be gained by removing this soil layer and replacing it with new fill. In areas which are currently paved, buildings, or loam, this material will need to be stripped to a suitable base. Place Granular Fill to within 12" of the bottom of slab, and then use fine crushed gravel to form the slab base.

I would recommend that an allowable bearing capacity of 3,000 psf (3 ksf) be used for foundation design.

3) All backfill of footings and foundation walls shall consist of Granular Backfill, following the material specification provided below. Backfill shall be brought up to the level of the base material for concrete slabs, assumed to be crushed gravel. All backfill shall be compacted in maximum 12" thick lifts, to a minimum dry density of 95% of the maximum determined by ASTM D 1557. We would recommend that Granular Backfill be extended at least 3 feet beyond foundation walls and around isolated column footings.

4) With no sub slab structures, a foundation drain is not necessary. Most of the foundation will be several feet above the groundwater table, in free draining soil. A vapor barrier is still required beneath slab on grade sections.

5) Recommendations for materials to be used for construction are as follows;

a) Granular Backfill – A bank run or crushed gravel, or crushed ledge product, free of organics or other impurities, meeting the following gradation requirements;

<u>Sieve Size</u>	<u>% Finer by weight</u>
3"	100
1"	60-90
#4	45-75
#100	0-12
#200	0-6

b) Fine Crushed Gravel for Slab base – A fine crushed gravel or crushed ledge product, free of organics or other impurities, meeting the following gradation requirements;

<u>Sieve Size</u>	<u>% Finer by weight</u>
2"	100
1-1/2"	90-100
#4	30-60
#100	0-12
#200	0-6

c) Crushed stone – A crushed, washed, hard, durable stone which meets the gradation requirements of ASTM C-33 for the maximum stone size specified.

6) It is our understanding that the Owner will have an Environmental Consultant looking into the possibility of contaminated soils on the site. For the type of urban fill we noted, there should be no need to chase it out unless it is encountered in a foundation excavation. In that case, disposal elsewhere on site or at a disposal facility may be required.

7) The recommendations provided in this report should not be considered as project specifications unless they are adopted in part or in whole into the design drawings or documentations. Any discrepancies between Earthwork specifications on Structural

drawings and in the written project specifications should be brought to our attention for resolution or clarification. Drawings were still preliminary at the time of this report, final drawings should be submitted to our office for review with regards to the recommendations provided above.

Conclusion and Limitations

Soil conditions are assumed to be uniform between test boring locations, but conditions may vary with the spacing involved. If soil conditions are found which vary significantly from those described in this report, please notify our office immediately so that we may make appropriate changes to our recommendations. The presence of a Geotechnical Engineer during final excavation and subgrade preparation is recommended. Some field decisions may be required with regards to subgrade preparation.

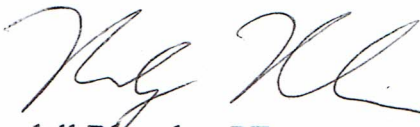
No environmental sampling or analysis was performed as part of our investigation, refer to work to be done by others.

The recommendations presented in this report should be provided to the Civil, Structural and Architectural professionals for incorporations in their designs. Any questions from these disciplines may be directed to our office.

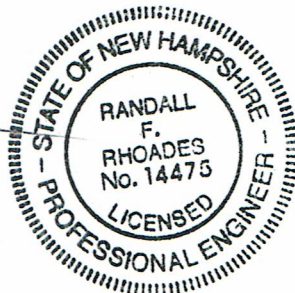
The findings, conclusions, and recommendations of this report are presented in a manner consistent with the standards of practice typical of this profession in this geographic region. Descriptive terms may be of a regional nature, clarification should be requested of any term not familiar to the reader. No warranty or other commitment, expressed or implied, is made. This report was prepared for the exclusive use of Breadloaf Corporation, their clients, and their authorized agents for the above named project.

Thank you for the opportunity to be of service on this project. We would appreciate the opportunity to perform follow up inspections during construction.

Sincerely,



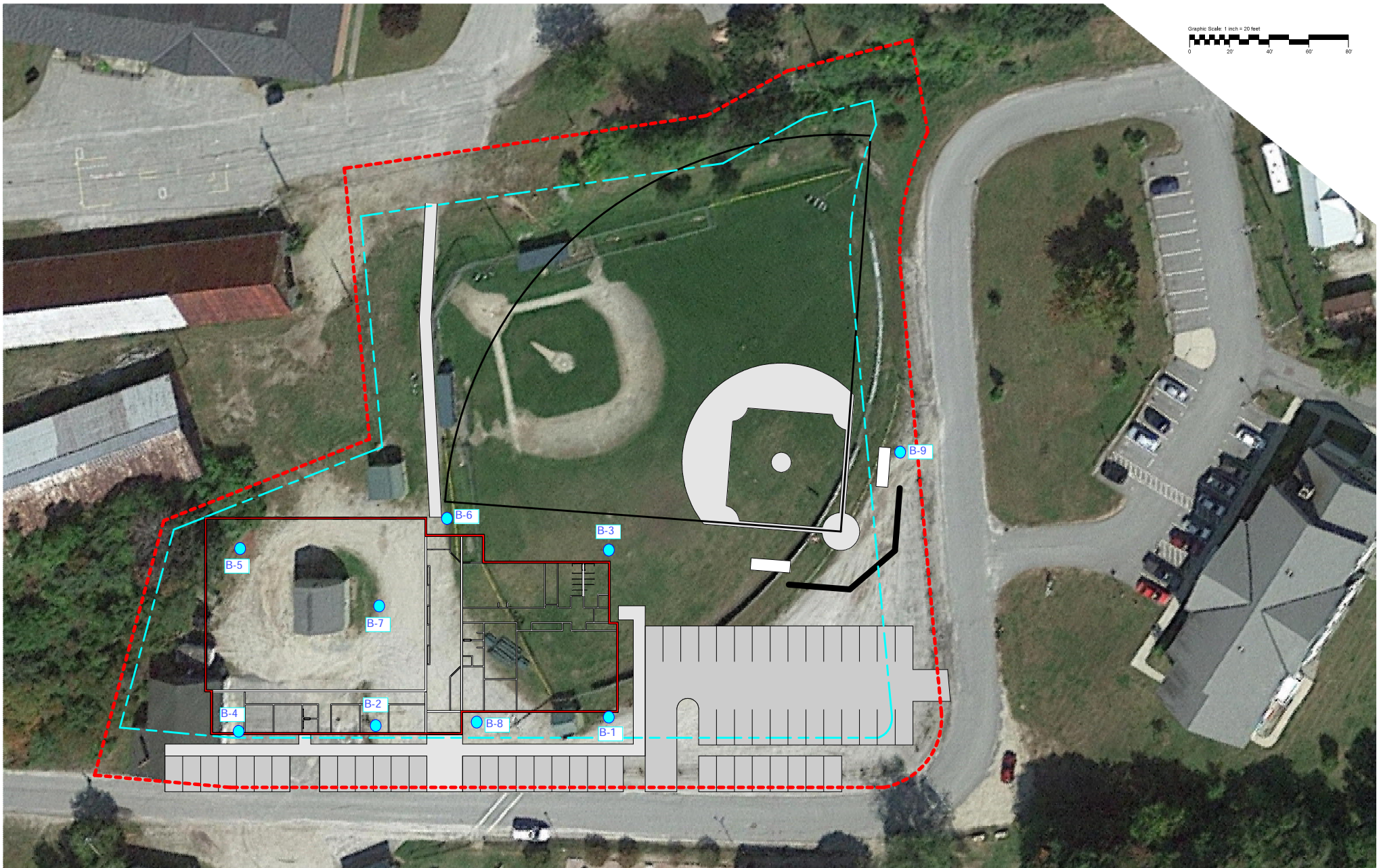
Randall Rhoades, PE
Principal



APPENDIX A

Test Boring Locations Map Overlain on Aerial Photo

Newport Community Center
Meadow Road, Newport, NH



SCHEMATIC ARCHITECTURAL SITE PLAN
NEWPORT COMMUNITY CENTER

APPROXIMATE TEST BORING LOCATIONS, 10/2018

NOT FOR
CONSTRUCTION

1" = 20'-0"
10/3/2018

BreadLoaf
ARCHITECTS
PLANNERS
ENGINEERS

APPENDIX B

Test Boring Field Logs & Summary of Blow Counts and Boring Depths

Newport Community Center
Meadow Road, Newport, NH

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-16-2018 HOLE #: B-1 LINE & STA. OFFSET:
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Ground Water Observations 8'9" at Immed. hours	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-16-2018 Date Completed: 10-16-2018 Boring Foreman: T & K Drilling Inspector: Soils Engineer: R.Rhoades
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LOCATION OF BORING: In front of ball field sign, 4' into gravel parking

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	11/6/5/4			Clean sandy gravel	1	24	18
2-4'	4/4/4/10		12"	Brown mixed sand fill	2	24	3
4-6'	11/19/18/15		4'	Clean light brown gravelly sand	3	24	18
6-8'	13/15/14/15	Dry	6.25' 7'	Light grey to light brown sandy silt Clean light brown medium sand	4	24	20
10-12'	5/8/9/9	Wet	10'	Clean brown medium to coarse sand	5	24	22
15-17'	3/4/5/6		15'	Light brown medium sand	6	24	24
25-27'	2/2/5/6		28'	Same, some coarse sand layers Clean coarse sand, little fine gravel	7	24	24
35-35.5'	NA		35'	Same, flowing sands rose 2' in auger, blow counts not reliable	8	6	24
			47'	Flowing sands terminated further progress			

Ground Surface to 47' Used: HSA

Earth Boring 47'
Rock Coring
Samples: 8
HOLE NUMBER B-1

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-16-2018 HOLE #: B-2 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-16-2018 Date Completed: 10-16-2018 Boring Foreman: T & K Drilling Inspector: Soils Engineer: R.Rhoades
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LOCATION OF BORING: Near center of front of proposed building

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	10/8/8/7		6" 12"	Crushed gravel Gravelly sand fill Light brown sand	1	24	20
2-4'	13/17/17/18		28"	Brown gravel	2	24	8
4-6'	6/7/7/8		4.25'	Olive silt, trace clay	3	24	24
6-8'	7/8/9/10				4	24	20
8-10'	5/7/7/10		8'	Olive clayey silt, occasional sand lens	5	24	20
10-12'	3/6/6/9		15'	Grey silt, little fine sand	6	24	22
15-17'	3/3/3/3		18'	Grey to orange-brown clean medium sand, trace coarse sand	7	24	20
20-22'	WH/7/16/25			Same	8	24	22
			22'	Terminated boring			

Ground Surface to 20' Used HSA casing: Then drove SS to 22'

Earth Boring 22'
Rock Coring
Samples: 8
HOLE NUMBER B-2

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-16-2018 HOLE #: B-3 LINE & STA. OFFSET:
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Ground Water Observations 3' at 18 hours	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-16-2018 Date Completed: 10-16-2018 Boring Foreman: T & K Drilling Inspector: Soils Engineer: R.Rhoades
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LOCATION OF BORING: In ballfield, near proposed building corner

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	2/4/16/18		4"	Loam Loamy gravelly sand fill Drilling on rock 2-3' Native boney gravel, apparent cobbles	1	24	12
4-5'3"	6/32/50/3"	Wet	5'	Same	2	15	14
6'	25/0"				3	24	24
8-10'	10/18/19/20		8'	Clean brown gravelly coarse sand	4	24	16
10-12'	25/13/14/16			Same	5	24	16
15-17'	7/17/22/35		15'	Same, but very light brown			
			17'	Refusal, likely boulder			

Ground Surface to 15' Used HSA casing: Then drove SS to 17'

Earth Boring 17'
Rock Coring
Samples: 5
HOLE NUMBER B-3

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-16-2018 HOLE #: B-4 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-16-2018 Date Completed: 10-16-2018 Boring Foreman: T & K Drilling Inspector: Soils Engineer: R.Rhoades
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LOCATION OF BORING: In front of center overhead door of 15 Meadow Road

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
.5-2'	9/10/12		2"	Asphalt Gravelly sand fill 12" Clean light brown medium sand, trace fine gravel	1	18	18
2-4'	7/4/12/11		3' 3.5'	Old asphalt over native loamy sand Clean gravel	2	24	12
4-6'	11/20/28/30		5.5'	Clean light brown medium sand	3	24	20
6-8'	29/33/36/35	Wet 7.5'	6'	Clean light brown gravelly medium to coarse sand	4	24	16
10-12'	6/3/7/13		10'	Light brown medium sand	5	24	20
15-17'	1/4/5/8		17'	Terminated boring, flowing sands	6	24	20

Ground Surface to 15' Used HSA casing: Then drove SS to 17'

Earth Boring 17'
Rock Coring
Samples: 6
HOLE NUMBER B-4

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-17-2018 HOLE #: B-5 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-17-2018 Date Completed: 10-17-2018 Boring Foreman: T & K Drilling Inspector: M.G. Soils Engineer:
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LOCATION OF BORING: NE of Fire Department building

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2	5/7/11/15		4"	Dark brown medium sand Medium brown sand to gravel	1	24	17
2-4'	14/14/8/5			Brown gravelly medium sand	2	24	9
4-6'	3/3/2/2		4'1"	Dark brown silty sand, trace coarse sand	3	24	24
6-8'	2/4/9/15	Wet 6'8"		Brown medium sand, some gravel	4	24	16
8-10'	15/8/6/6		11'	Medium brown sand	5	24	14
10-12'	10/3/6/6				6	24	24
			15'	Light grey to light brown medium sand, clean			
			20'	Flowing sands plugging augers, terminated			

Ground Surface to 20' Used HSA

Earth Boring 20'
Rock Coring
Samples: 6
HOLE NUMBER B-5

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-17-2018 HOLE #: B-6 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-17-2018 Date Completed: 10-17-2018 Boring Foreman: T & K Drilling Inspector: M.G. Soils Engineer:
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LOCATION OF BORING: 50 feet southeast of 2 car garage building

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	8/8/12/8			Medium brown gravel	1	24	14
2-4'	5/2/6/8			Stone, no sample returned	2	24	1
4-6'	6/3/3/11			Brown fine to medium gravelly silty sand	3	24	8
6-8'	17/40/42/47		7'	Medium to coarse gray sand Dense medium sandy gravel	4	24	16
8-10'	38/17/10/8		9'6"	Gray to light brown clay	5	24	15
10-12'	5/5/5/7			Gray to light brown silty clay	6	24	16
12-14'	1/1/2/3			Same	7	24	12
14-16'	1/1/4/5			Gray to light brown fine sandy clay, silty at bottom	8	24	18

Ground Surface to 14' Used HSA casing: Then drove SS to 16'

Earth Boring 16'
Rock Coring
Samples: 8
HOLE NUMBER B-6

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-17-2018 HOLE #: B-7 LINE & STA. OFFSET:
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Ground Water Observations None	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-17-2018 Date Completed: 10-17-2018 Boring Foreman: T & K Drilling Inspector: M.G. Soils Engineer:
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LOCATION OF BORING: 15 feet South of 2-car garage building

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	9/8/5/4		3"	Gravel Brown medium sand, trace coarse sand	1	24	18
2-4'	3/2/2/1		3'11"	Dark brown silty fine sand	2	24	16
4-6'	4/6/6/25		5'6"	Black silty fine sand, minor brick and glass, odor of creosote or old oil	3	24	7
6-8'	26/27/25/25	Wet 7.5'		Brown orange coarse sandy gravel	4	24	17
10-12'	3/4/2/6			Gray clay and fine sand	5	24	17
15-17'	2/2/5/5		17'	Gray clay and fine sand to brown rusty fine sand	6	24	19
20-22'	2/4/5/5		22'	Red-brown fine sand, boring terminated at 22'	7	24	16

Ground Surface to 20" Used HSA casing: Then drove SS to 22'

Earth Boring 22'
Rock Coring
Samples: 7
HOLE NUMBER B-7

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TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-17-2018 HOLE #: B-8 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-17-2018 Date Completed: 10-17-2018 Boring Foreman: T & K Drilling Inspector: M.G. Soils Engineer:
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LOCATION OF BORING: 150 feet southeast of Fire Dept building

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	17/16/13/10		8"	Light gray gravelly sand Medium brown gravelly sand	1	24	16
2-4'	7/11/15/25		2'8"	Brown orange medium sand, some gravel	2	24	13
4-6'	8/8/11/18			Light brown to yellow medium sand, trace coarse sand	3	24	18
6-8'	40/29/16/12	Damp		Gravelly coarse sand, light brown to yellow-brown	4	24	16
10-12'	4/4/5/7	Wet		Clean, med to fine light brown sand	5	24	16
15-17'	5/3/5/5			Clean light brown medium fine sand	6	24	15

Ground Surface to 15' Used HAS casing: Then drove SS to 17'

Earth Boring 17'
Rock Coring
Samples: 6
HOLE NUMBER B-8

M&W SOILS ENGINEERING, INC
PO Box 1466 ° Charlestown, NH 03603 ° 603-826-5873

TO: Breadloaf Corporation 1293 Route 7 South Middlebury, VT 05753	PROJECT NAME: Newport Community Center LOCATION: Meadow Road Newport, NH MW JOB #: 11936-18	SHEET: 1 of 1 DATE: 10-17-2018 HOLE #: B-9 LINE & STA. OFFSET:
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Ground Water Observations NONE	Augers-Size I.D. 3.25" Split Spoon 1.5" Hammer Wt. 140# Hammer Fall 30"	Surface Elevation: Date Started: 10-17-2018 Date Completed: 10-17-2018 Boring Foreman: T & K Drilling Inspector: M.G. Soils Engineer:
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LOCATION OF BORING: Parking lot south of center field

Sample Depths From/To (Feet)	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample		
					No.	Pen. Inches	Rec. Inches
0-2'	15/20/23/23		6"	Gray to brown gravel Brown medium sand, trace gravel 1'6" Gravelly medium sand with clay	1	24	24
2-4'	15/16/19/16			Very dark brown medium sand, trace coarse sand, apparent creosote odor	2	24	13
4-6'	4/1/2/10		5'8"	Dark brown to black silty clay Brown to yellow medium sandy gravel	3	24	18
6-8'	22/19/33/41			Brown sandy gravel	4	24	16
8-10'	10/11/16/29	Wet		Dark gray medium sandy gravel, clean	5	24	20

Ground Surface to 8' Used HSA casing: Then drove SS to 10'

Earth Boring 10'
Rock Coring
Samples: 5
HOLE NUMBER B-9

Summary of Blow Counts and Boring Depths
Proposed Newport Community Center

Depth	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9
0-1'	17	18	6	9	12	16	17	33	35
1-2'	9	15	34	22	26	20	9	23	46
2-3'	8	30		11	28	7	5	18	31
3-4'	14	35		23	13	14	3	40	35
4-5'	30	13	38	31	5	9	10	16	5
5-6'	33	15		58	4	14	31	29	12
6-7'	28	15		62	6	57	53	69	41
7-8'	29	19		71	24	89	50	28	74
8-9'		12	28		23	55			21
9-10'		17	39		12	18			45
10-11'	13	9	38	9	13	10	7	8	
11-12'	18	15	30	20	12	12	8	12	
12-13'						2			
13-14'						5			
14-15'						2			
15-16'	7	6	24	5		9	4	8	
16-17'	11	6	57	13			10	10	
20-21'		7					6		
21-22'		41					10		
25-26'	4								
26-27'	11*								

* B-1 was terminated at 47' with no further sampling beyond 27'

Values in bold are the last sample taken on that boring.

APPENDIX C

Laboratory Gradation Reports

Newport Community Center
Meadow Road, Newport, NH

M&W SOILS ENGINEERING, INC

SOILS AND CONCRETE LABORATORIES

159 East Street
PO Box 1466
Charlestown, NH 03603
603-826-5873

38 "A" Street
PO Box 928
Wilder, VT 05088
802-295-6692

MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Silt	Sample #:	B2_6to8
Source of Material: Boring B-2	Date in Lab:	10-16-18
Sample from: 6-8'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	N. Adams

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"	0.0	0.0	0.0	100.0	
1/2"	0.0	0.0	0.0	100.0	
3/8"	0.0	0.0	0.0	100.0	
4	0.0	0.0	0.0	100.0	
10	0.0	0.0	0.0	100.0	
20	0.0	0.0	0.0	100.0	
40	0.2	0.3	0.3	99.7	
100	0.5	0.6	0.9	99.1	
200	0.6	0.8	1.6	98.4	
pan	77.8	98.4	100.0	0.0	

Moisture Content: 34.1 %

Sample was washed.

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802-295-6692

MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Gravelly sand	Sample #:	B3_4to6
Source of Material: Boring B-3	Date in Lab:	10-16-18
Sample from: 4-5'3"	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"	18.4	5.5	5.5	94.5	
1/2"	61.6	20.1	25.6	74.4	
3/8"	13.2	4.3	29.9	70.1	
4	35.1	11.4	41.3	58.7	
10	27.8	9.1	50.4	49.6	
20	35.4	11.5	61.9	38.1	
40	38.2	12.5	74.4	25.6	
100	37.0	12.1	86.5	13.5	
200	17.9	5.8	92.3	7.7	
pan	23.5	7.7	100.0	0.0	

Moisture Content: 9.5 %

Soil classifies as Poorly graded sand with gravel and silt

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MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Gravelly sand	Sample #:	B4_6to8
Source of Material: Boring B-4	Date in Lab:	10-16-18
Sample from: 6-8'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"	11.2	3.1	3.1	96.9	
1/2"	30.2	9.0	12.1	87.9	
3/8"	22.7	6.8	18.9	81.1	
4	36.7	11.0	29.9	70.1	
10	20.8	6.2	36.1	63.9	
20	46.0	13.8	49.9	50.1	
40	58.0	17.4	67.2	32.8	
100	54.7	16.4	83.6	16.4	
200	28.1	8.4	92.0	8.0	
pan	26.6	8.0	100.0	0.0	

Moisture Content: 9.0 %

Soil is borderline Poorly graded or Well graded sand with gravel and silt

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MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Silty sand, trace gravel	Sample #:	B5_4to6
Source of Material: Boring B-5	Date in Lab:	10-16-18
Sample from: 4-6'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	N. Adams

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"	0.0	0.0	0.0	100.0	
1/2"	0.0	0.0	0.0	100.0	
3/8"	3.0	2.7	2.7	97.3	
4	10.6	9.4	12.1	87.9	
10	4.9	4.4	16.5	83.5	
20	12.3	11.0	27.4	72.6	
40	12.8	11.4	38.8	61.2	
100	15.9	14.2	53.0	47.0	
200	12.6	11.2	64.2	35.8	
pan	40.2	35.8	100.0	0.0	

Moisture Content: 46.4 %

Sample was washed.

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MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Silty sand, trace gravel	Sample #:	B6_4to6
Source of Material: Boring B-6	Date in Lab:	10-17-18
Sample from: 4-6'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	N. Adams

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"	0.0	0.0	0.0	100.0	
1/2"	5.0	4.2	4.2	95.8	
3/8"	5.6	4.7	8.9	91.1	
4	2.4	2.0	10.9	89.1	
10	8.0	6.7	17.6	82.4	
20	11.9	10.0	27.5	72.5	
40	16.2	13.6	41.1	58.9	
100	22.9	19.2	60.3	39.7	
200	11.8	9.9	70.1	29.9	
pan	35.7	29.9	100.0	0.0	

Moisture Content: 37.2 %

Sample was washed.

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MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Gravelly sand	Sample #:	B7_7.5to8
Source of Material: Boring B-7	Date in Lab:	10-16-18
Sample from: 7'6"-8'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"+	86.5	20.8	20.8	79.2	
1/2"	23.1	6.0	26.8	73.2	
3/8"	21.0	5.5	32.3	67.7	
4	51.8	13.6	45.9	54.1	
10	32.9	8.6	54.5	45.5	
20	52.2	13.7	68.2	31.8	
40	45.0	11.8	79.9	20.1	
100	40.9	10.7	90.6	9.4	
200	15.1	4.0	94.6	5.4	
pan	20.5	5.4	100.0	0.0	

Moisture Content: 8.9 %

Soil is classified as Poorly graded sand with gravel and silt

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MECHANICAL ANALYSIS OF AGGREGATES AND GRANULAR MATERIAL

Project: **NEWPORT COMMUNITY CENTER**

Type of Material: Clean sand	Sample #:	B8_4to6
Source of Material: Boring B-8	Date in Lab:	10-17-18
Sample from: 4-6'	Date Tested:	10/30/2018
Report To: Breadloaf	Technician:	E. Harty

Sieve	Weight	% Retained	Cumulative % Retained	Cumulative % Finer	Specification
3/4"+	0.0	0.0	0.0	100.0	
1/2"	0.0	0.0	0.0	100.0	
3/8"	2.6	0.8	0.8	99.2	
4	24.0	7.8	8.7	91.3	
10	31.5	10.3	18.9	81.1	
20	73.9	24.0	43.0	57.0	
40	100.9	32.8	75.8	24.2	
100	58.9	19.2	95.0	5.0	
200	8.1	2.6	97.6	2.4	
pan	7.3	2.4	100.0	0.0	

Moisture Content: 4.0 %

Soil is classified as Poorly graded sand with gravel and silt

APPENDIX D

Soil Profiles based on Boring Logs

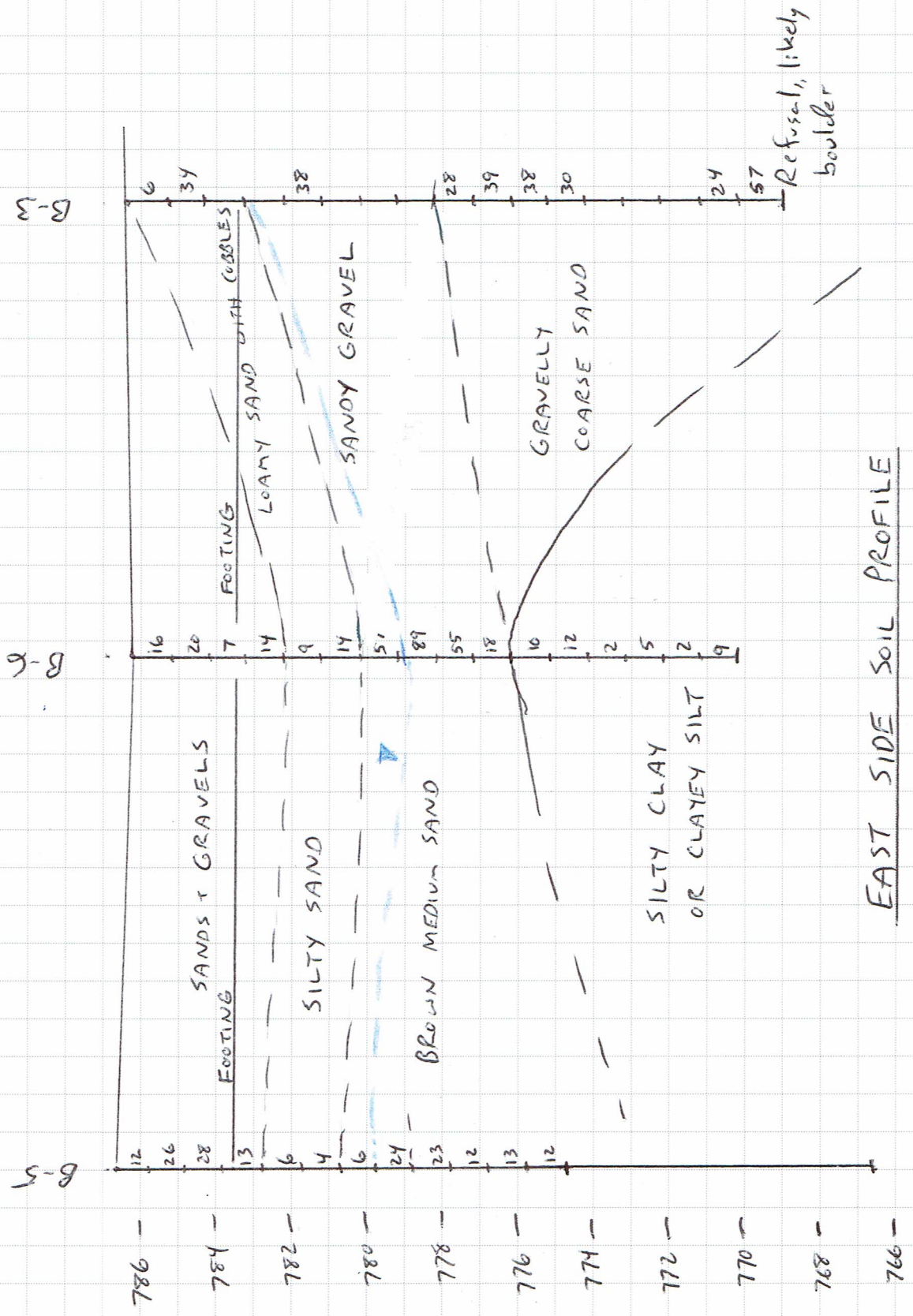
Newport Community Center
Meadow Road, Newport, NH

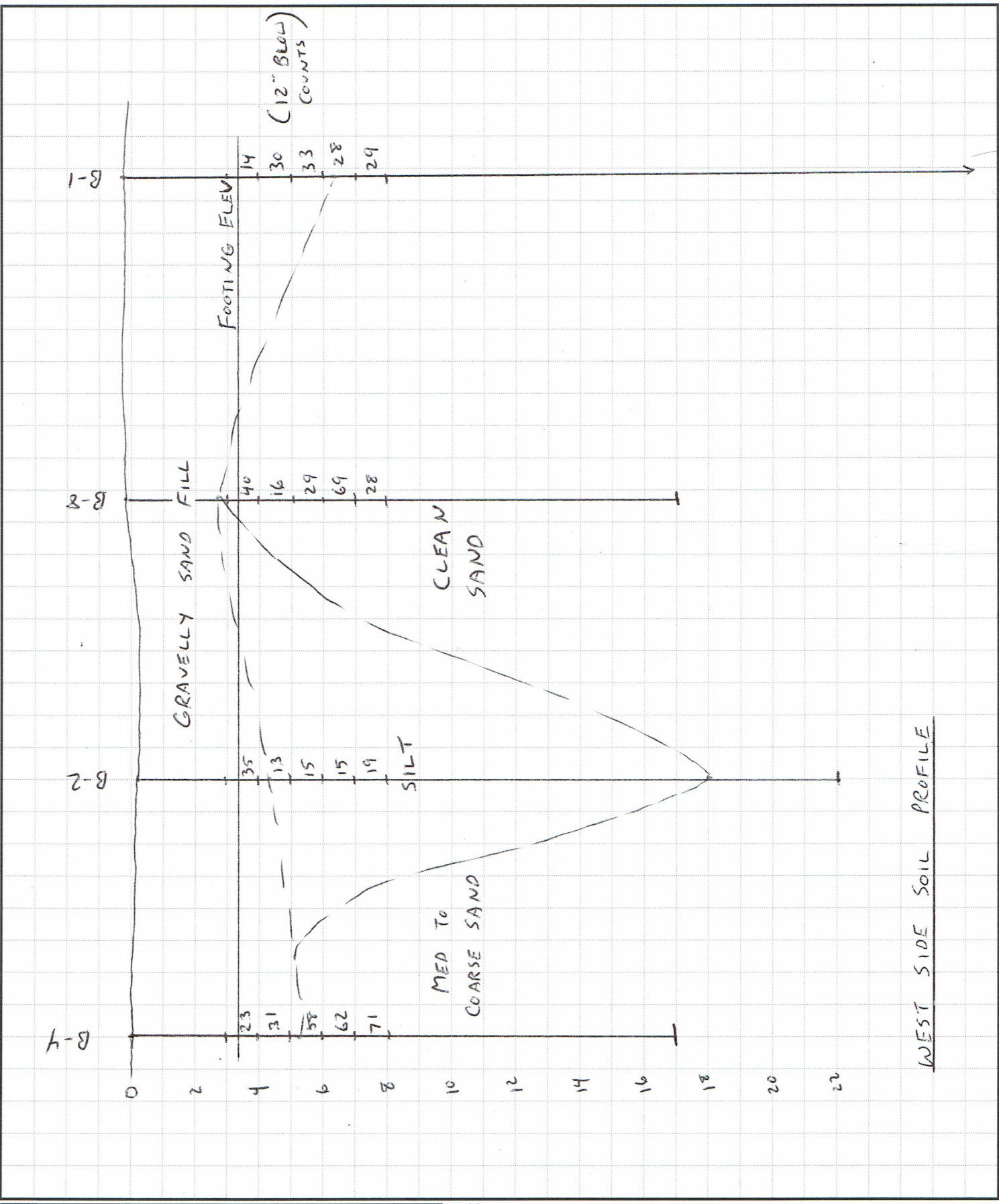
JOB: NEWPORT COMMUNITY CENTER
SHEET NO.:
CALCULATED BY: RE
CHECKED BY:
DATE: 1-22-19
DATE:
SCALE: 1" = 3' HORIZ, 1" = 4' VERT

M & W SOILS ENGINEERING, INC.
159 EAST STREET P. O. BOX 1466
CHARLESTOWN, NEW HAMPSHIRE 03603
(603) 826-5873

- 12 inch blow counts provided
- Water table based on soil moisture observations

EAST SIDE SOIL PROFILE





JOB NEWPORT COMMUNITY CENTER

SHEET NO. OF

CALCULATED BY RE DATE 1-15-19

CHECKED BY _____ DATE _____

SCALE 1"=30' HORIZ, 1"=4' VERT

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