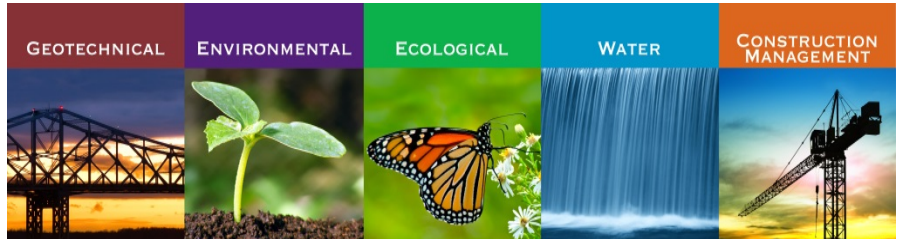




Proactive by Design



GEOTECHNICAL REPORT

1400 WEST MAIN ROAD MIDDLETOWN, RHODE ISLAND

January 2019

File No. 03.0034385.35



PREPARED FOR:

Carpionato Group, LLC
Johnston, Rhode Island

GZA GeoEnvironmental, Inc.

181 Valley Street, Suite 300 | Providence, RI 02909
401-421-4140

31 Offices Nationwide
www.gza.com

Copyright© 2019 GZA GeoEnvironmental, Inc



Known for excellence.
Built on trust.

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION
MANAGEMENT

188 Valley Street
Suite 300
Providence, RI 02909
T: 401.421.4140
F: 401.751.8613
www.gza.com



January 21, 2019
GZA File No. 03.0034385.35

Mr. David Chamberland
Carpionato Group, LLC
1414 Atwood Avenue
Johnston, Rhode Island 02919

Re: Geotechnical Report
1400 West Main Road
Middletown, Rhode Island

Dear Mr. Chamberland

GZA GeoEnvironmental, Inc., (GZA) is pleased to provide Carpionato Group, LLC (Carpionato) with this geotechnical report for the above-referenced project. This report was prepared in accordance with our proposal dated November 6, 2018. This report and the recommendations are subject to the Limitations provided in **Appendix A**.

BACKGROUND

The site is located at a former Benny's retail property along West Main Road in Middletown, Rhode Island. **Figure 1, Locus Plan**, presents the site location. There are four one-story buildings on the site ranging in size from 5,507 to 43,679 square feet (ft²). The site is bounded to the east by West Main Road, to the north and west by residential properties, and to the south by commercial retail buildings. Site plans showing elevations and utilities were not available at the time of this report.

It is our understanding that Carpionato Group, LLC proposes to demolish the existing structures and construct six new one-story buildings ranging in size from 3,000 to 28,395 ft² throughout the property. We have assumed finished floor elevations will be at or near existing grades.

Historical aerial photographs from 1939 to present were reviewed. The site appears unchanged since the initial development of four buildings between 1972 and 1981. Prior to development, the area appears to have been farm fields.

REVIEW OF UNITED STATES GEOLOGICAL SURVEY (USGS) PUBLICATIONS

The 1964 USGS Groundwater map of the Prudence Island and Newport Quadrangles and the 1994 Bedrock Geologic Map of Rhode Island were reviewed for geology information. A summary of the geologic conditions described on the above-mentioned maps at the site is presented in the following paragraphs.

SURFICIAL GEOLOGY

The groundwater map indicates that the surficial soils for the site are glacial till. The deposit is described as a compact, unstratified, poorly sorted mixture of clay, silt, sand, gravel, and boulders. The map indicates that groundwater depths near the site vary from 3 to 17 feet below ground surface and the bedrock depths vary from 4 to 20 feet below ground surface.



BEDROCK GEOLOGY

The bedrock geologic map indicates the bedrock at the site is Rhode Island Formation. Rhode Island Formation for southern Rhode Island is described as meta-sandstone, meta-conglomerate, schist, carbonaceous schist, and graphite.

SUBSURFACE INVESTIGATIONS

Nine test borings, designated GZ-1 through GZ-9, were drilled for the proposed redevelopment. The exploration locations were determined using tape measurements, as well as “line-of-sight”, from existing site features. The exploration locations should be considered accurate only to the degree implied by the methods used. The test borings were drilled from December 28, 2018 to January 3, 2019 by Hoffman Environmental Services of North Kingstown, Rhode Island. Logs of the explorations are included in **Appendix B**, and the locations are shown on attached **Figure 2, Exploration Location Plan**.

A track-mounted drill rig was utilized to advance the borings to depths ranging from 14 to 27 feet below existing ground surface. The borings were advanced utilizing 4-inch hollow stem augers. Split spoon samples were generally obtained continuously or at 5-foot intervals in conformance with ASTM D-1586, the Standard Penetration Test (SPT). The test consists of driving a 1-3/8 inch inside diameter standard split spoon sampler at least 18 inches with a 140-pound hammer dropping from a height of 30 inches. The standard penetration value (N-value) is the number of blows required to drive the split spoon sampler from 6 to 18 inches of penetration and is a commonly used indicator of relative density and consistency. The borings were observed and logged by a representative of GZA. Refer to the boring logs in **Appendix B** for further information.

GENERALIZED SUBSURFACE CONDITIONS

The generalized subsurface profile consists of asphalt, underlain by fill, glacial till, and weathered bedrock. Unweathered bedrock was not encountered in the borings. The subsurface conditions are described below. Refer to the boring logs in **Appendix B** for more specific information.

ASPHALT

A 4-inch thick layer of asphalt was encountered in the borings.

FILL

Approximately 4 inches to 3 feet of fill was encountered below the asphalt in borings GZ-1 through GZ-8. The fill generally consisted of fine to coarse sand with varying amounts of gravel, and silt. SPT N-values ranged between 13 to 40 blows per foot (bpf), indicating relative densities of “medium dense” to “dense”. The depth of the fill extended up to 3 feet below the existing ground surface.

GLACIAL TILL

Naturally deposited glacial till was encountered below the fill or asphalt in all borings except GZ-5. The glacial till is comprised of a heterogenous mixture of silt, sand, gravel, cobbles, and boulders. SPT N-values ranged from 12 to greater than 100 bpf, indicating relative densities of “medium dense” to “very dense” with a typical relative density of “dense” to “very dense”.

WEATHERED BEDROCK

Weathered shale bedrock was encountered in borings GZ-2 through GZ-9. SPT N-values ranged from 70 to greater than 100 bpf, indicating a relative density of “very dense”. The top of weathered bedrock was encountered between 2 to 20 feet below existing ground surface.



GROUNDWATER

Groundwater was encountered from 8 to 17.4 feet below existing ground surface in borings GZ-1 through GZ-4, GZ-7 and GZ-8 immediately after termination of the test borings. Therefore, the groundwater level readings should be considered unequibrated.

Fluctuations in groundwater levels are anticipated to occur due to variations in rainfall and other factors different than those prevailing at the time the explorations were performed. It should also be noted that the seasonally lowest groundwater levels typically occur during summer and early fall months, and the highest levels typically occur during the spring months. It should also be noted that annual groundwater level fluctuations in glacial till can be on the order of 10 to 15 feet.

LABORATORY TESTING PROGRAM

Four soil samples obtained from split spoon samples from the test borings were submitted for laboratory testing to Thielsch Engineering's soil laboratory in Cranston, Rhode Island for grain size analysis in general accordance with ASTM D6913. The results are included in **Appendix C** and summarized in the table below:

BORING NO.	SAMPLE NO.	DEPTH (FT)	MODIFIED BURMISTER CLASSIFICATION
GZ-1	S-2	2-4	Brown fine to coarse SAND, some fine Gravel, some Silt
GZ-2	S-1	0-2	Light Brown fine to coarse SAND, some fine to coarse Gravel, little Silt
GZ-4	S-1	0-2	Light Brown fine GRAVEL, some fine to coarse Sand, little Silt
GZ-8	S-1A	0-2	Light Brown fine to coarse SAND, some fine Gravel, some Silt
GZ-8	S-3	4-6	Dark Brown SILT, some fine to coarse Sand, some fine to coarse Gravel

IMPLICATIONS OF SUBSURFACE CONDITIONS

The undisturbed naturally deposited glacial till and weathered bedrock are considered competent bearing material for support of shallow spread footing foundations. The existing fill is not considered suitable for direct support of new structure foundations in its current state due to the undocumented placement and compaction history. The fill was observed to extend to depths between 4 inches to 3 feet below existing ground surface.

Excavated fill and glacial till may be able to be recompacted and used for support of spread footing foundations or as backfill around new foundations. Soils with percentages of fines greater than 10 percent by weight may be difficult to work with if wet and the moisture content is above the optimum compaction water content. The samples from the borings represent a small portion of the variable existing fill and glacial till. It is anticipated that the fill and the glacial till will contain cobbles and boulders. The earthwork specifications for the project should reflect the need to cull and/or process cobbles, bricks, or other large debris should the existing soils be unsuitable for placement and compaction during construction. The weathered bedrock should be excavatable with normal excavation equipment. The silty soils encountered in the fill and glacial till will likely be difficult to work with and compact if they become wet during construction. Wet soil excavated from below the water table, or soil saturated from precipitation, will not likely be able to be properly compacted for reuse as structural fill without drying it first to a workable water content. Special measures such as discing or harrowing may be required to facilitate drying of wet soils prior to compaction, which may result in construction delays. This will be difficult if construction occurs during the winter or spring months. The excavated subgrade will be susceptible to disturbance if subjected to construction activity when it is wet.

Groundwater levels inferred at the site were observed from 8 to 17.4 feet below existing grade. We have assumed the finished floor elevations will be near existing grade and therefore it is not anticipated that dewatering will be needed for construction of shallow spread footing building foundations. Should excavations extend only marginally (1 to 2 feet) below groundwater, dewatering can likely be accomplished using sumps and open pumping techniques.



CONCLUSIONS AND RECOMMENDATIONS

The following sections present recommendations for foundation design earthwork and construction associated with the above-referenced project. The following recommendations are based on the subsurface exploration data collected during this study.

BUILDING FOUNDATIONS AND SLABS

Spread footing foundations bearing on undisturbed, naturally deposited glacial till, weathered bedrock or on properly placed and compacted "Granular Fill" are recommended. Unsuitable materials, including topsoil, undocumented fill, asphalt, existing utilities, and former foundations may need to be removed from below new foundations. These materials should be removed to a limit defined by a 1 horizontal to 1 vertical slope extending downward and outward from two feet outside the edges of the footings to suitable bearing soils. Any structures (buildings, foundations, retaining walls, utilities, etc.) within this zone of influence should be designed to carry the load of the new footings. If the structures cannot adequately support the load of the new footings, they should be relocated outside of the zone of influence of the new footings.

In areas requiring over-excavation of fill or other unsuitable soils and placement of structural fill within footing areas, the exposed subgrade should be heavily surface compacted with a minimum of six passes of a vibratory roller having a drum weight of at least 10,000 pounds and a dynamic force of at least 20,000 pounds. All areas not accessible to large vibratory rollers should be compacted with ten passes of a walk-behind plate compactor having a centrifugal force rated not less than 1,000 pounds (Mikasa MVH-306 or equivalent). Care must be taken if the soils are wet so as not to cause weaving and softening of the subgrade. Backfill within these areas should be free-draining "Granular Fill" and compacted to at least 95 percent of the maximum dry density (ASTM D 1557).

If construction schedules require earthwork during the winter or spring months, it may be advantageous to initially over-excavate all footing excavations in silty soils by six inches and place a working mat of 3/4-inch crushed stone enveloped by a layer of filter fabric (Mirafi 140N). The crushed stone will protect the subgrade from becoming disturbed due to groundwater, rain or snow which may saturate the silty soils before concrete can be placed and may eliminate the need to re-excavate areas which become disturbed. It is recommended that contract specifications and budgeting reflect the need for the use of crushed stone and filter fabric to stabilize wet subgrades.

Placement of "Granular Fill" in the building areas should be performed in horizontal lifts and compacted with vibratory equipment to at least 95% of the maximum dry density as determined by ASTM D1557 (the modified Proctor test). The maximum loose lift thickness should be 12 inches for vibratory rollers and 6 inches for hand-operated equipment. Fill within building areas should be compacted in horizontal lifts to 6 inches below the slab elevation, and then excavated for foundations. Fill placed outside building areas, beyond the 1H:1V slope defined above, should consist of "Granular Fill" compacted to 92 percent of the modified Proctor density, except where it is placed as either the subbase or base course for pavement, or as structural backfill for the retaining walls.

A net allowable bearing pressure of 6,000 pounds per square foot (psf) should be used for design of footings on undisturbed glacial till. This allowable bearing pressure should be reduced to 4,000 psf for compacted "Granular Fill". For footings less than three feet wide, the allowable bearing pressure should be reduced proportionately, and in no case should continuous footings be less than 18 inches wide, nor isolated footings be less than 24 inches wide.

In accordance with the Rhode Island State Building Code (SBC-1-2013, latest edition), exterior footings should extend at least 3 feet 4 inches below final exterior grade for frost protection. Interior footings should be constructed at least 18 inches below the bottom of the slab to develop sufficient bearing capacity. Interior footings should be protected against frost if construction occurs in the winter. If freezing weather occurs during construction, measures should be taken to protect exposed footings.



Total settlement of foundations bearing on natural undisturbed soils or compacted "Granular Fill" are anticipated to be less than 1-inch and may be expected to occur during construction. The maximum differential settlement between adjacent column bays is expected to be less than ½-inch.

Interior slabs-on-grade can be supported on compacted "Granular Fill", following removal of undocumented fill. Asphalt, topsoil, subsoil, and other deleterious materials should be removed from below slab areas and the subgrade should be heavily surface compacted as described above. A minimum 6-inch-thick base course of "Sand-Gravel Fill" should be placed directly below the slab. The base course should be compacted to 95% of the maximum dry density as determined by ASTM D-1557 (modified Proctor test). For slab design, a subgrade modulus value of 150 pounds per cubic inch can be used for both natural soils and structural fill subgrades.

Boulders encountered within excavations for foundations should be removed to a depth of at least 12 inches below the bottom of footings. Voids that result from boulder excavations should be filled with compacted "Granular Fill", or crushed stone if the subgrade is wet. Should the subgrade soils at footing bearing grades become disturbed during or after excavation, the subgrade should be over-excavated and replaced with a minimum of 1-foot of compacted "Sand-Gravel Fill" if the subgrade is dry, or six inches of "¾-inch Crushed Stone" if the subgrade is wet, in order to stabilize the subgrade and facilitate pumping of groundwater. Depending on the condition of the in-situ soils, a layer of filter fabric, similar to Mirafi FW700, may be required between the natural soils and "Sand-Gravel Fill" or enveloping the "Crushed Stone". It may be advantageous to over-excavate all footings by 6 inches and backfill with crushed stone to limit the potential for subgrade disturbance due to precipitation and freeze-thaw action while the subgrade is exposed.

SEISMIC DESIGN CRITERIA

Site soils are not considered susceptible to seismic liquefaction. In accordance with the Rhode Island State Building Code (SBC-1-2013) and Section 1613 of the 2012 International Building Code (IBC 2012), and ASCE 7-10, the following seismic design parameters should be used at the site:

Definition	Values
Site Class (Stiff Soil)	C
Design Spectral Response Acceleration for 0.2-second period (SDS)	0.13 g
Design Spectral Response Acceleration for 1-second period (SD1)	0.07 g

TEMPORARY EARTH SUPPORT FOR EXCAVATIONS

Excavations for foundations and utilities should be sloped back in accordance with the Occupational Safety Health Administration (OSHA) Construction Industry Standards. In areas where sloping is not possible, excavation support should be designed in accordance with OSHA 29 CFR Part 1926 Occupational Safety Health Standards – Excavations, latest edition.

DEMOLITION OF EXISTING FOUNDATIONS AND UTILITIES

Prior to the removal of existing flexible and rigid pavements, contractors should review the project site and familiarize themselves with available historical drawings, to estimate the effort required for demolition of existing subsurface structures and utilities.

All soils disturbed during the demolition and removal of the existing foundations, roadways, and utilities should be excavated and replaced with compacted lifts of structural fill. The backfilling and compaction of the disturbed areas should be performed in accordance with the recommendations provided in this report. It is recommended that a geotechnical engineer be retained during the demolition phase of the project to observe the remediation of the disturbed soils.



UNDERGROUND UTILITIES AND TRENCH BACKFILL

Underground pipes and utilities should be placed on bedding in accordance with the manufacturer's specifications. Where utility trenches or other trenches resulting from utility demolition are backfilled within the bearing zone of building footings (limit defined by a 1 horizontal to 1 vertical slope extending downward and outward from two feet outside the edges of the exterior footings), trench backfill material should consist of soil materials meeting the gradation requirements of "Granular Fill".

"Granular Fill" should be placed in lifts on the sides and above the utilities and compacted to at least 92% of the maximum dry density as determined in accordance with ASTM D-1557 (modified Proctor test). Compaction should be performed with hand-operated equipment with lift thickness depending on the size of equipment used. On-site excavated fill materials may not conform to "Granular Fill" specifications. The use of this material may still be permissible, at the discretion of the Geotechnical Engineer, upon the successful demonstration of satisfactory compaction.

Should utilities be placed below building slabs and foundations, backfill material should be compacted to at least 95% of the maximum dry density. The 95% compaction should also be carried out on the base and subbase courses, where utilities are placed below pavements.

If construction occurs during the winter months, utility trenches should be excavated and backfilled before saturated materials on the bottom of the trench can freeze. If frost develops in disturbed saturated soils, these soils may not be able to be properly compacted, and post-construction settlement of the subgrade may occur upon thawing of the frost.

DRAINAGE

It is not expected that groundwater will be encountered during utility installation and spread footing excavation based on existing site grades and measured groundwater depths. It is anticipated that groundwater levels will fluctuate seasonally. It may be advantageous to perform earthwork construction during the period of lowest groundwater elevations. This is typically during the summer and early fall months.

Roof drain and surface water runoff should be directed away from the building areas. During construction, run-off from precipitation should be diverted away from excavations to avoid ponding. Sumping of ponded rainfall from excavations may be required. Should bearing soils exposed in foundation excavations become saturated and disturbed, it should be removed and replaced with compacted "Granular Fill" or "Crushed Stone", as discussed previously.

PAVED AREAS

All existing topsoil, asphalt, miscellaneous fill, or other unsuitable materials in paved areas, within 3 feet of the proposed final grade should be removed prior to filling. The subgrade should then be surface compacted with a minimum of six passes of a vibratory roller having a drum weight of at least 10,000 pounds and a dynamic force of at least 20,000 pounds. Caution will have to be used when compacting wet subgrades in order to avoid weaving and disturbance from vibrations.

For paved areas where only light car traffic is anticipated, a minimum of 10 inches of compacted free draining "Granular Fill" subbase should be placed immediately below a 6-inch-thick "Sand-Gravel Fill" base course. The subbase course should be increased to 12 inches for areas with truck traffic. Subbase and base courses should be compacted in 1-foot (maximum) lifts to at least 95% of the maximum dry density as determined in accordance with ASTM D1557. Fill below the subbase should be compacted to at least 92% of the maximum dry density. It is recommended that at least 3 inches (1-1/2 inches binder and 1-1/2 inches surface) of asphalt pavement be provided for parking areas, and 4 inches (2-1/2 inches binder and 1-1/2 inches surface) for access roadways. The following are the recommended flexible layered pavement sections:



Pavement Layer	Flexible Pavement Layer Thickness	
	Standard Duty (Cars)	Heavy Duty (Trucks)
Finish Course	1-1/2 inches	1-1/2 inches
Binder Course	1-1/2 inches	2-1/2 inches
Base Course	6 inches	6 inches
Subbase Course	10 inches	12 inches

Asphalt finish and binder materials should conform to section M.03 of the Rhode Island Standard Specifications for Road and Bridge Construction, latest edition.

For areas to be paved with Portland cement-based concrete, 6-inch-thick slabs on grade are recommended, with a minimum 8-inch-thick "Sand-Gravel Fill" base course and a 12-inch-thick "Granular Fill" subbase. The concrete should have a minimum unconfined compressive strength of 4,000 pounds per square inch, with air entrainment of 4 to 6 percent. The thickness is based on a modulus of subgrade reaction of 150 pounds per cubic inch. Grade-60 six-inch by six-inch W5.5 x W5.5 welded wire fabric (As = 0.11 inches²/foot) reinforcement is recommended to control crack openings.

Concrete pavement should have expansion joints at a maximum spacing of 80 feet with a joint filler thickness based on the thermal expansion. All expansion joints should be sealed with an AASHTO approved elastomeric joint sealer. Slabs separated by an expansion joint should be tied together with dowels that are 2-foot 6-inches long at a spacing of 18 inches. Dowels must be sleeved on one side of the joint to allow for movement without cracking. In addition to expansion joints, contraction (crack control) joints should be constructed at a spacing of approximately 15 feet in both directions.

BORROW MATERIALS

All fill should be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter. Gradation requirements for the above-mentioned fills should meet the requirements described below.

Percent Finer by Weight				
Sieve Size	Sand-Gravel Fill	Granular Fill	¾-Inch Crushed Stone	1½-Inch Crushed Stone
*	100	100	-	-
1½-Inch	-	-	-	100
1¼-Inch	-	-	-	85-100
¾-Inch	-	-	90-100	10-40
½-Inch	50-85	-	10-50	0-8
No. 4	40-75	-	0-5	-
No. 10	30-60	30-95	-	-
No. 40	10-35	10-70	-	-
No. 100	5-20**	-	-	-
No. 200	0-8	0-10	-	<1

* The maximum recommended stone size is 4 inches where used as a base course below slabs and pavement; elsewhere, maximum stone sizes should be 2/3 of the loose lift thickness.

** The amount passing the No. 100 sieve should be between forty percent (40%) and seventy percent (70%) of that amount passing the No. 40 sieve.

The on-site soils are anticipated to be generally silty in nature and may not meet the gradation requirements for "Granular Fill". Other materials not meeting the above gradation specifications may be re-used as structural fill, at the discretion of the



Geotechnical Engineer, provided they are culled of wood, organic soils, construction debris, and other deleterious materials, and can be compacted to the recommended percent of the maximum dry density. These soils may be difficult to work with when wet, and may require drying to reduce the moisture content prior to compaction.

CONTRACT DOCUMENTS AND CONSTRUCTION MONITORING

It is recommended that GZA be retained to work with the design team to develop the earthwork specification and review foundations design. It is also recommended that GZA be considered to provide submittal reviews and Special Inspections services related to Soils and Foundations during the earthwork and foundation construction phases of the project. Construction services may include verification of subgrade soils, observation of support of excavation system installation, observation of proof rolling operations and placement of fill, performance of field density tests, and in general observe compliance with recommendations in this report and the contract documents. Construction oversight is considered an important part of obtaining quality site improvements.

We trust that this report addresses the pertinent geotechnical issues for this project. Please do not hesitate to contact the undersigned if there are any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Doug Le Do'.

Doug Le Do
Senior Project Manager

A handwritten signature in black ink, appearing to read 'Thomas E. Billups'.

Thomas E. Billups, P.E.
Consultant Reviewer

A handwritten signature in black ink, appearing to read 'David R. Carchedi'.

David R. Carchedi, Ph.D. , P.E.^R
Senior Principal



FIGURES

FIGURE 1	LOCUS
FIGURE 1	EXPLORATION LOCATION PLAN

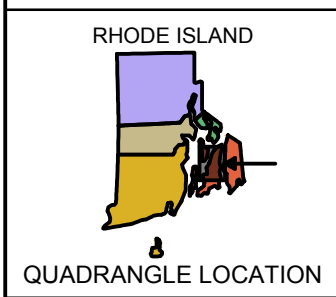
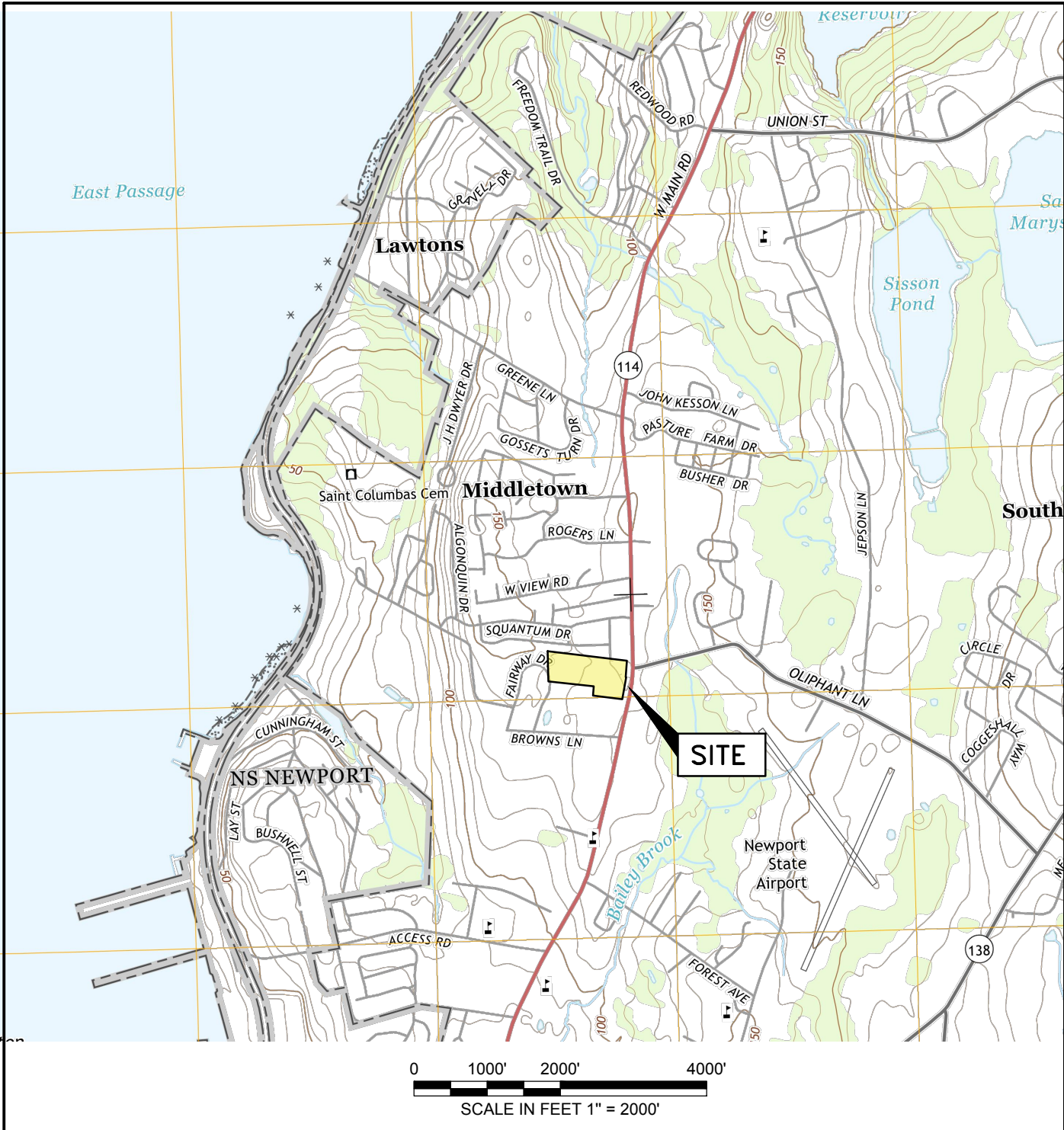
APPENDICES

APPENDIX A	LIMITATIONS
APPENDIX B	TEST BORING LOGS
APPENDIX C	LABORATORY TEST DATA



FIGURES

© 2016 - GZA GeoEnvironmental, Inc. GZA-J:\GEO\34385.35.DLD\FIGURES\CAD\DWGS\34385.35_RO_F.DWG LOCUS JUNE 12, 2014 CARL BERGDEN



SOURCE:
BASE MAP FROM THE PRUDENCE ISLAND, RI (2015),
USGS QUADRANGLE MAP
 DIGITAL TOPOGRAPHIC MAPS PROVIDED BY USGSSTORE.GOV.

CONTOUR ELEVATIONS REFERENCE NAVD 88,
 CONTOURS ARE SHOWN IN FEET AT 10' INTERVALS

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

FORMER BENNY'S
 1400 WEST MAIN ROAD
 MIDDLETOWN, RHODE ISLAND

LOCUS

PREPARED BY:
GZA GeoEnvironmental, Inc.
 Engineers and Scientists
 www.gza.com

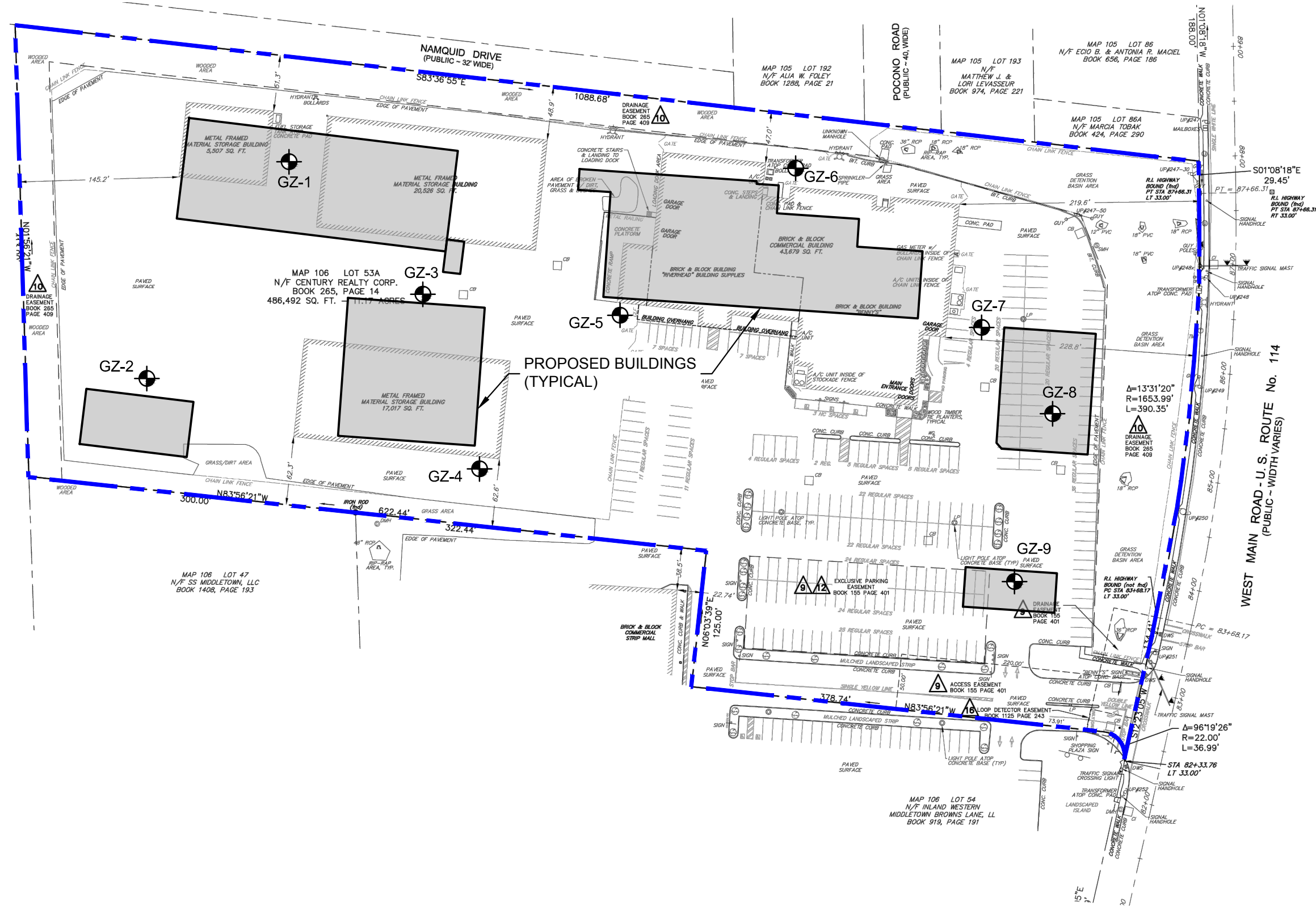
PROJ MGR: DLD
 DESIGNED BY: OJC
 DATE: JANUARY, 2019

REVIEWED BY: MAH
 DRAWN BY: CRB
 PROJECT NO. 34385.35

PREPARED FOR:
 CARPIONATO GROUP, LLC

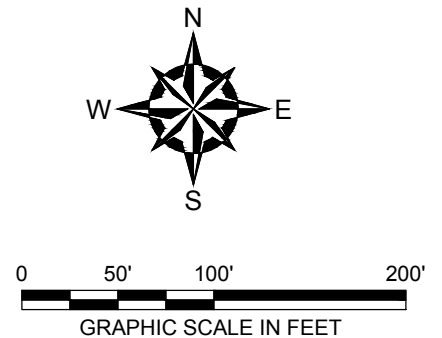
CHECKED BY: MEA
 SCALE: AS NOTED
 REVISION NO. 0

FIGURE 1



- REFERENCE NOTES:**
1. BASE MAP PDF IMAGE BY GAROFALO & ASSOCIATES TITLED ALTA/NSPS LAND TITLE SURVEY FOR BENNEY'S, AP 106, LOT 53A, SCITUATED ON 1400 WEST MAIN ROAD, MIDDLETOWN, RHODE ISLAND SHEET 1 OF 2, ORIGINAL SCALE 1"=50', AND PROPOSED BUILDING LOCATIONS FROM AN ELECTRONIC FILE TITLED "PROPOSED REDEVELOPMENT OF CENTER 1400 W. MAIN ROAD, MIDDLETOWN, RI SITE PLAN" RECEIVED FROM CARPIONATO GROUP, LLC.
 2. SITE BOUNDARIES ARE APPROXIMATE.
 3. THE LOCATION OF THE EXPLORATIONS WERE APPROXIMATELY DETERMINED USING TAPE MEASUREMENTS BY GZA PERSONNEL.

- LEGEND:**
- SITE BOUNDARY
 - APPROXIMATE LOCATIONS OF EXPLORATIONS DRILLED BY HOFFMAN ENVIRONMENTAL SERVICES FROM DECEMBER 28, 2018 THROUGH JANUARY 3, 2019 AND OBSERVED BY GZA PERSONNEL.



NO.	ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.			
FORMER BENNEYS 1400 WEST MAIN ROAD MIDDLETOWN, RHODE ISLAND			
EXPLORATION LOCATION PLAN			
PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		CARPIONATO GROUP, LLC	
PROJ MGR:	DLD	REVIEWED BY:	MAH
DESIGNED BY:	OJC	CHECKED BY:	MEA
DATE:	JANUARY, 2019	SCALE:	AS NOTED
		PROJECT NO.:	34385.35
		REVISION NO.:	0
			FIGURE 2



APPENDIX A
LIMITATIONS



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions .
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.
4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.
7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.
8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.



9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

COST ESTIMATES

11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than Additional Services
12. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



APPENDIX B
TEST BORING LOGS

LOG KEY



GZA
Geo Environmental, Inc.
Engineers and Scientists

BURMISTER SOIL CLASSIFICATION

COMPONENT	NAME	PROPORTIONAL TERM	PERCENT BY WEIGHT	IDENTIFICATION OF FINES		
				Material	PI	Atterberg Thread Dia.
MAJOR	GRAVEL, SAND, FINES*		>50	SILT	0	Cannot Roll
Minor	Gravel, Sand, Fines*	and	35 - 50	Clayey SILT	1-5	1/4"
		some	20-35	SILT & CLAY	5-10	1/8"
		little	10-20	CLAY & SILT	10-20	1/16"
		trace	0-10	Silty CLAY	20-40	1/32"
				CLAY	>40	1/64"

*See identification of fines table.

GRADATION DESIGNATION	PROPORTION OF COMPONENT	PLASTIC SOILS		GRAVEL & SAND	
		Consistency	Blows/Ft. SPT N-Value	Density	Blows/Ft. SPT N-Value
Fine to coarse	All fractions > 10%	Very Soft	< 2	Very Loose	< 4
Medium to coarse	<10% fine	Soft	2 - 4	Loose	4 - 10
Fine to medium	<10% coarse	Medium Stiff	4 - 8	Medium Dense	10 - 30
Coarse	<10% fine and medium	Stiff	8 - 15	Dense	30 - 50
Medium	<10% coarse and fine	Very Stiff	15 - 30	Very Dense	> 50
Fine	<10% coarse and medium	Hard	>30		

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) (ASTM D 2487)

MAJOR DIVISIONS	Group Symbols
Coarse Grained Soils More than 50% of material larger than No. 200 sieve.	Gravel More than 50% larger than No. 4 sieve.
	Clean Gravels (Little or no fines) GW GP
	Gravels with Fines (Appreciable amount of fines) GM GC
	Sand More than 50% smaller than No. 4 sieve.
	Clean Sands (Little or no fines) SW SP
	Sands with Fines (Appreciable amount of fines) SM SC
Fine Grained Soils More than 50% of material smaller than No. 200 sieve.	Silts and Clays Liquid Limit <50 ML CL
	Silts and Clays Liquid Limit >50 MH CH OH
	Highly Organic Soils Pt

ORGANIC SOIL CLASSIFICATION

Fibrous PEAT (Pt) - Lightweight, spongy, mostly visible organic matter, water squeezes readily from sample. Typically near top of deposit.
 Fine Grained PEAT (Pt) - Lightweight, spongy, little visible organic matter, water squeezes readily from sample. Typically below fibrous peat.
 Organic Silt (OL) - Typically gray to dark gray, often has strong H₂S odor. Typically contains shells or shell fragments. Lightweight. Usually found near coastal regions. May contain wide range of sand fractions.
 Organic Clay (OH) - Typically gray to dark gray, high plasticity. Usually found near coastal regions. May contain wide range of sand fractions. Need organic content test for final identification.

ABBREVIATIONS

MR = Mud Rotary HSA = Hollow Stem Auger SSA = Solid Stem Auger SS = Split Spoon Sampler U = Undisturbed Sample (Shelby Tube) MC = Modified California Sampler V = Vibracore M = Macrocore USCS = Unified Soil Classification System (ASTM D2487) NYCBC = New York City Building Code WOR = Weight of Rods WOH = Weight of Hammer SPT = Standard Penetration Test (ASTM D1586) N-Value = Cumulative number of uncorrected blows for the middle two six-inch intervals (blows/foot).	Tv = Field Vane Shear Test (Torvane) Shear Strength PP = Pocket Penetrometer Shear Strength PI = Plasticity Index Wn = Moisture Content CO = Consolidation UC = Unconfined Compression Test UU = Unconsolidated Undrained (Triaxial) Test SI = Sieve Analysis DS = Direct Shear PID = Photoionization Detector ppm = Parts Per Million REC = Recovery RQD = Rock Quality Designation ▼ = Measured Water Level
---	--

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-01
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 22
Date Start - Finish: 12/28/2018 - 12/28/2018

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
12/28/18	15:30	5 Min.	8	20

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:22 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
5		S-1	0.0-2.0	24	16	13 14 18 19	32	S-1: Top 5": Brown, fine to coarse SAND, some Gravel, little Silt Bottom 11": Dark gray, SILT, trace fine Sand, trace Gravel			0.33	ASPHALT	
											1	FILL	
		S-2	2.0-4.0	24	16	8 7 9 8	16	S-2: Medium dense, brown, fine to coarse SAND, some fine Gravel, some Silt					
		S-3	4.0-6.0	24	7	7 10 13 15	23	S-3: Medium dense, dark gray, SILT and FRACTURED ROCK					
		S-4	10.0-12.0	24	16	6 11 11 9	22	S-4: Medium dense, dark gray, SILT, little Gravel, trace fine Sand					
		S-5	15.0-17.0	24	14	10 17 17 16	34	S-5: Dense, dark gray, SILT, trace fine Sand, trace Gravel					
20		S-6	20.0-22.0	24	16	13 24 51 61	75	S-6: Very dense, dark gray, SILT, little Gravel, little fine Sand			22		
							End of exploration at 22 feet						

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-01

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carponato Group LLC
Former Benny's
1400 West Main Road
Middletown, Rhode Island

EXPLORATION NO.: GZ-02
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 27
Date Start - Finish: 12/28/2018 - 12/28/2018

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
12/28/18	12:00	5 Min.	9.5	25

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:22 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)	
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)								
5		S-1	0.0-2.0	24	17	13 19 20 18	39	S-1: Top 8": Brown, fine to coarse SAND, some fine to coarse Gravel, little Silt Bottom 9": Gray, FRACTURED ROCK	1		0.33	ASPHALT FILL		
		S-2	2.0-4.0	24	22	8 8 12 26	20	S-2: Medium dense, gray, SILT					GLACIAL TILL	
		S-3	4.0-6.0	24	15	19 110 30 23	>100	S-3: Top 11": Gray, FRACTURED ROCK Bottom 4": Very dense, gray/brown, SILT				4.5	INFERRED BOULDER	
10		S-4	10.0-12.0	24	11	6 9 8 11	17	S-4: Medium dense, gray, SILT, wet				GLACIAL TILL		
15		S-5	15.0-17.0	24	17	8 13 19 29	32	S-5: Dense, gray, SILT, some fine to coarse Sand, some fine to coarse Gravel, wet				GLACIAL TILL		
20		S-6	20.0-22.0	24	17	18 19 21 25	40	S-6: Dense, SILT, some Gravel, little fine to coarse Sand, wet				GLACIAL TILL		
25		S-7	25.0-25.3	3	3	75 /3"		S-7: Gray, WEATHERED BEDROCK	1		23	WEATHERED BEDROCK		
30								End of exploration at 27 feet			27			

REMARKS
1 - Rig chatter from 23'-25'.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-02

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-03
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 20.9
Date Start - Finish: 12/31/2018 - 12/31/2018

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)				
Date	Time	Stab. Time	Water	Casing
12/31/18	10:10	5 Min.	17.4	20

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:22 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
5		S-1	0.0-2.0	24	14	20 14 15 8	29	S-1: Medium dense, dark gray, GRAVEL and fine to coarse SAND, some Silt			0.33	ASPHALT	
		S-2	2.0-4.0	24	17	11 8 5 4	13	S-2: Top 10": Dark gray, GRAVEL, some fine to coarse Sand, some Silt, trace Construction Debris Bottom 7": Dark gray, SILT, trace Gravel			3	FILL	
		S-3	4.0-6.0	24	24	10 12 12 17	24	S-3: Medium dense, gray, SILT				GLACIAL TILL	
		S-4	10.0-12.0	24	19	14 13 9 9	22	S-4: Top 7": FRACTURED ROCK Bottom 12": Dark gray, SILT, trace fine to coarse Sand, trace Gravel			10	TRANSFERRED BOULDER	
		S-5	15.0-17.0	24	20	14 14 15 19	29	S-5: Medium dense, gray/brown, SILT, some Gravel, little fine to coarse Sand				GLACIAL TILL	
		S-6	20.0-20.9	11	9	49 100 /5"		S-6: Very dense, gray, WEATHERED BEDROCK, wet			20	WEATHERED BEDROCK	
							End of exploration at 20.9 feet						

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-03

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-05
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 15.33
Date Start - Finish: 12/31/2018 - 12/31/2018

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
Not Measured				

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:22 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
		S-1	0.0-2.0	24	13	19 18 22 18	40	S-1: Dense GRAVEL, some fine to coarse Sand, little Silt			0.33	ASPHALT	
		S-2	2.0-2.6	7	7	45 35 /1"		S-2: Dense, gray, WEATHERED BEDROCK	1		2	FILL	
5		S-3	4.0-4.3	4	3	65 /4"		S-3: Gray, WEATHERED BEDROCK and SILT					
10		S-4	10.0-10.5	6	4	93/6"		S-4: Gray, WEATHERED BEDROCK and SILT				WEATHERED BEDROCK	
15		S-5	15.0-15.3	4	3	80 /4"		S-5: Gray, WEATHERED BEDROCK and SILT			15.33		
								End of exploration at 15.33 feet					

REMARKS
 1 - Drill rig chatter from 2 to 15' below existing ground surface

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-05

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-06
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 20.25
Date Start - Finish: 1/3/2019 - 1/3/2019

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
1/3/19	10:15	5 Min.	DRY	20

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:23 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
5		S-1	0.0-2.0	24	4	3 7 11 11	18	S-1: Medium dense, brown SILT and GRAVEL, trace fine to coarse Sand			0.33	ASPHALT FILL	
		S-2	2.0-4.0	24	15	8 9 13 24	22	S-2: Medium dense, brown SILT, some Gravel, trace fine to coarse Sand				GLACIAL TILL	
		S-3	4.0-6.0	24	20	17 42 20 20	62	S-3: Top 4": Brown SILT, little Gravel, trace fine to coarse Sand Bottom 16": Gray GRAVEL, little fine to coarse Sand, trace Silt			4.33 5.33	INFERRED BOULDER	
10		S-4	10.0-10.3	4	0	50 /4"		S-4: NO RECOVERY	1		9	GLACIAL TILL	
15		S-5	15.0-17.0	24	21	17 38 32 56	70	S-5: Very dense, gray WEATHERED BEDROCK				WEATHERED BEDROCK	
20		S-6	20.0-20.3	3	3	40 /3"		S-6: Gray WEATHERED BEDROCK			20.25		
								End of exploration at 20.25 feet					

REMARKS
 1 - Drill rig chatter from 9 to 13.5' below existing ground surface

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-06

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-07
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 18.1
Date Start - Finish: 1/2/2019 - 1/2/2019

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
1/2/19	10:20	5 Min.	12.5	18

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:23 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)	
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)								
5		S-1	0.0-2.0	24	0	10 10 14 19	24	S-1: NO RECOVERY			0.33	ASPHALT		
		S-2	2.0-4.0	24	11	28 30 28 32	58	S-2: Very dense, gray SILT and GRAVEL, some fine to coarse Sand			2	FILL		
		S-3	4.0-6.0	24	24	28 24 26 30	50	S-3: Very dense, gray SILT and GRAVEL, some fine to coarse Sand				GLACIAL TILL		
		S-4	10.0-12.0	24	20	10 19 20 37	39	S-4: Dense, dark gray SILT, little Gravel, trace fine to coarse Sand						
		S-5	15.0-17.0	24	18	17 44 46 63	90	S-5: Very dense, gray WEATHERED BEDROCK and SILT, wet				14	WEATHERED BEDROCK	
		S-6	18.0-18.1	1	0	50 /1"		S-6: NO RECOVERY			2	18.1		
20		End of exploration at 18.1 feet												

REMARKS
 2 - Auger refusal at approximately 18 ft.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-07

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
Former Benny's
1400 West Main Road
Middletown, Rhode Island

EXPLORATION NO.: GZ-08
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 20.25
Date Start - Finish: 1/2/2019 - 1/2/2019

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
1/2/19	12:45	5 Min.	9.4	20

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:23 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
5	S-1	0.0-2.0	24	15	6 8	17	S-1: Top 5": Brown, fine to coarse SAND, some fine Gravel, some Silt			0.33	ASPHALT FILL		
					9 10								
	S-2	2.0-4.0	24	16	13 12	24	Bottom 10': Gray SILT, trace Gravel						
					12 16								
	S-3	4.0-6.0	24	18	16 24	64	S-3: Very dense, gray/brown SILT, some fine to coarse Sand, some fine to coarse Gravel						
					40 24								
10	S-4	10.0-12.0	24	16	15 18	33	S-4: Dense, gray SILT, trace Gravel						
					15 28								
15	S-5	15.0-17.0	24	23	12 22	72	S-5: Top 11": Gray SILT, trace fine to coarse Sand, trace Gravel, wet					16	
					50 61								
20	S-6	20.0-20.3	3	2	60 /3"		S-6: Gray WEATHERED BEDROCK, wet					20.25	
End of exploration at 20.25 feet													

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
GZ-08

TEST BORING LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Carpionato Group LLC
 Former Benny's
 1400 West Main Road
 Middletown, Rhode Island

EXPLORATION NO.: GZ-09
SHEET: 1 of 1
PROJECT NO: 34385.35
REVIEWED BY: Doug Le Do

Logged By: O. Cavallini
Drilling Co.: Hoffman Environmental Services
Foreman: Kyle Hoffman

Type of Rig: Tracked ATV
Rig Model: D50
Drilling Method:
 HSA

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 14.1
Date Start - Finish: 1/2/2019 - 1/2/2019

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4/3.25

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Stab. Time	Water	Casing
1/2/19	15:05	5 Min.	DRY	14

GZA TEMPLATE TEST BORING - GZA PLOG DATA TEMPLATE 03-20-18.GDT - 1/18/19 13:23 - J:\GINT PROJECT DATABASES\34385.35-FORMER BENNY'S 1400 W MAIN ROAD MIDDLETOWN.GPJ

Depth (ft)	Casing Blows/ (Core Rate)	Sample					SPT Value	Stratum Description (Modified Burmister Classification)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen (in)	Rec. (in)	Blows (RQD)							
5		S-1	0.0-2.0	24	15	9 9 6 6	15	S-1: Top 4": Tan, fine to coarse SAND, some Gravel, trace Silt Bottom 11": Gray/brown SILT, some Gravel, trace fine to coarse Sand			0.33	ASPHALT	
		S-2	2.0-4.0	24	23	14 41 39 33	80	S-2: Very dense, gray/brown SILT and GRAVEL, trace fine to coarse Sand				GLACIAL TILL	
		S-3	4.0-6.0	24	15	10 20 17 18	37	S-3: Dense, brown/gray SILT, some Gravel, little fine to coarse Sand					
		S-4	10.0-11.3	16	16	15 27 70 /4"	97	S-4: Very dense, gray WEATHERED BEDROCK and SILT			10		WEATHERED BEDROCK
		S-5	14.0-14.1	1	0	45 /1"		S-5: NO RECOVERY			14.1		
								End of exploration at 14.1 feet	1 2				

REMARKS
 1 - Drill rig chatter from approximately 12-14 ft.
 2 - Auger refusal at approximately 14 ft.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

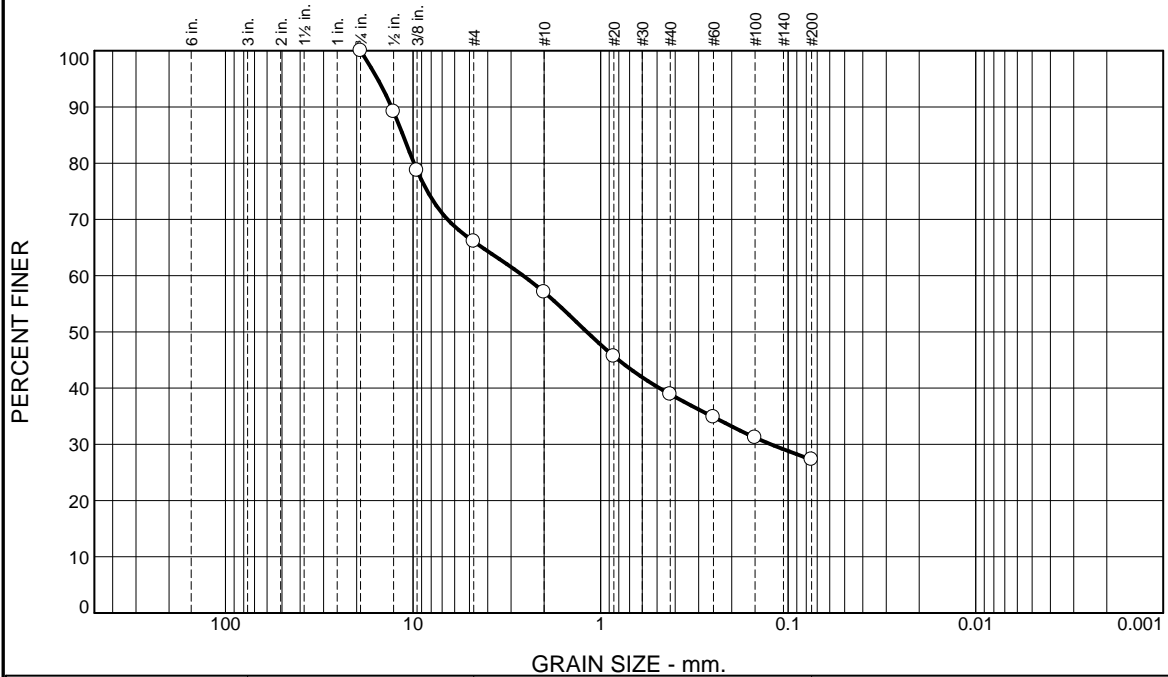
Exploration No.:
GZ-09



APPENDIX C

LABORATORY TEST DATA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	33.9	9.0	18.2	11.6	27.3	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	89.2		
0.375"	78.7		
#4	66.1		
#10	57.1		
#20	45.7		
#40	38.9		
#60	34.9		
#100	31.2		
#200	27.3		

* (no specification provided)

Material Description

Brown f-c SAND, some fine Gravel, some Silt

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 13.0179 D₈₅= 11.3214 D₆₀= 2.5890
D₅₀= 1.1832 D₃₀= 0.1236 D₁₅=
D₁₀= C_u= C_c=

Remarks

Date Received: 1.10.19 Date Tested: 1.16.19

Tested By: MN

Checked By: Rebecca Roth

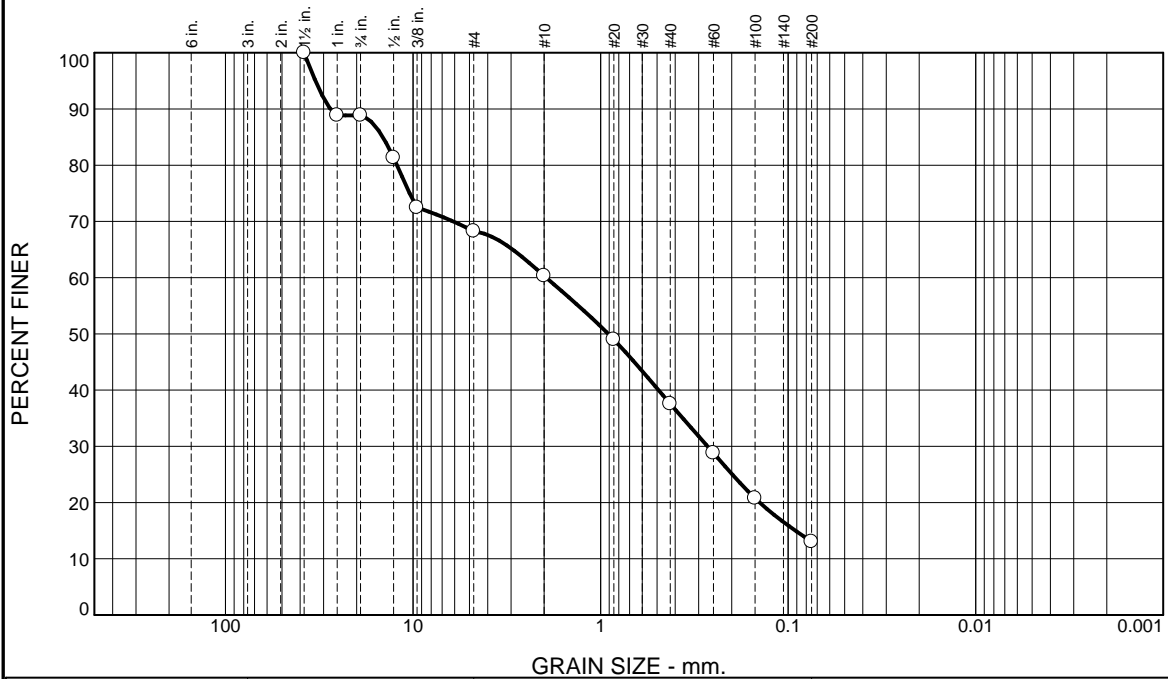
Title: Laboratory Coordinator

Source of Sample: Borings Depth: 2-4'
Sample Number: GZ-1 / S-2

Date Sampled:

Thielsch Engineering Inc.	Client: GZA GeoEnvironmental
Cranston, RI	Project: Former Benny's - 1400 West Main Road Middletown, RI
	Project No: 03.0034385.35 Figure S-1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.1	20.6	8.0	22.7	24.6	13.0	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	88.9		
3/4"	88.9		
1/2"	81.3		
3/8"	72.5		
#4	68.3		
#10	60.3		
#20	49.0		
#40	37.6		
#60	28.8		
#100	20.8		
#200	13.0		

Material Description

Light Brown f-c SAND, some f-c Gravel, little Silt

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D₉₀= 27.5587 D₈₅= 14.4946 D₆₀= 1.9492
D₅₀= 0.9111 D₃₀= 0.2690 D₁₅= 0.0914
D₁₀= C_u= C_c=

Remarks

Date Received: 1.10.19 Date Tested: 1.16.19

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

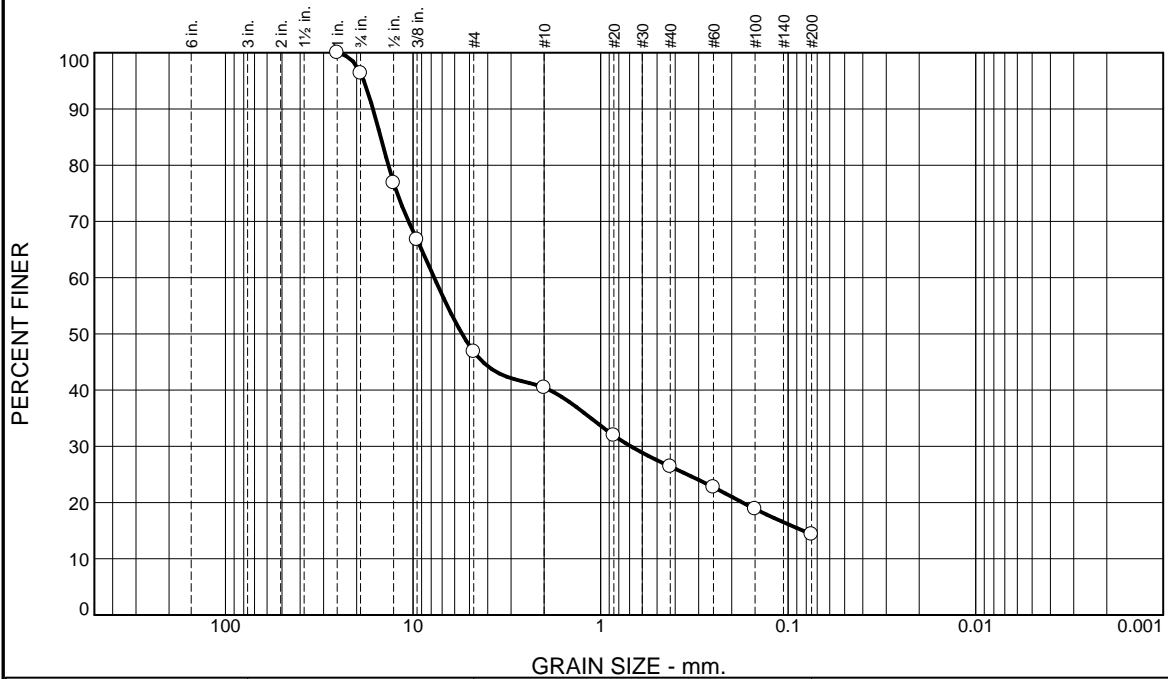
* (no specification provided)

Source of Sample: Borings Depth: 0-2'
Sample Number: GZ-2 / S-1

Date Sampled:

Thielsch Engineering Inc.	Client: GZA GeoEnvironmental
Cranston, RI	Project: Former Benny's - 1400 West Main Road Middletown, RI
	Project No: 03.0034385.35 Figure S-2

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	49.6	6.3	14.1	12.0	14.4	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	96.4		
0.5"	76.9		
0.375"	66.8		
#4	46.8		
#10	40.5		
#20	31.9		
#40	26.4		
#60	22.7		
#100	18.9		
#200	14.4		

* (no specification provided)

Material Description

Light Brown fine GRAVEL, some f-c Sand, little Silt

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= GM AASHTO (M 145)= A-1-a

Coefficients

D₉₀= 16.3616 D₈₅= 14.8812 D₆₀= 7.7073
D₅₀= 5.4815 D₃₀= 0.6898 D₁₅= 0.0832
D₁₀= C_u= C_c=

Remarks

Date Received: 1.10.19 Date Tested: 1.16.19

Tested By: MN

Checked By: Rebecca Roth

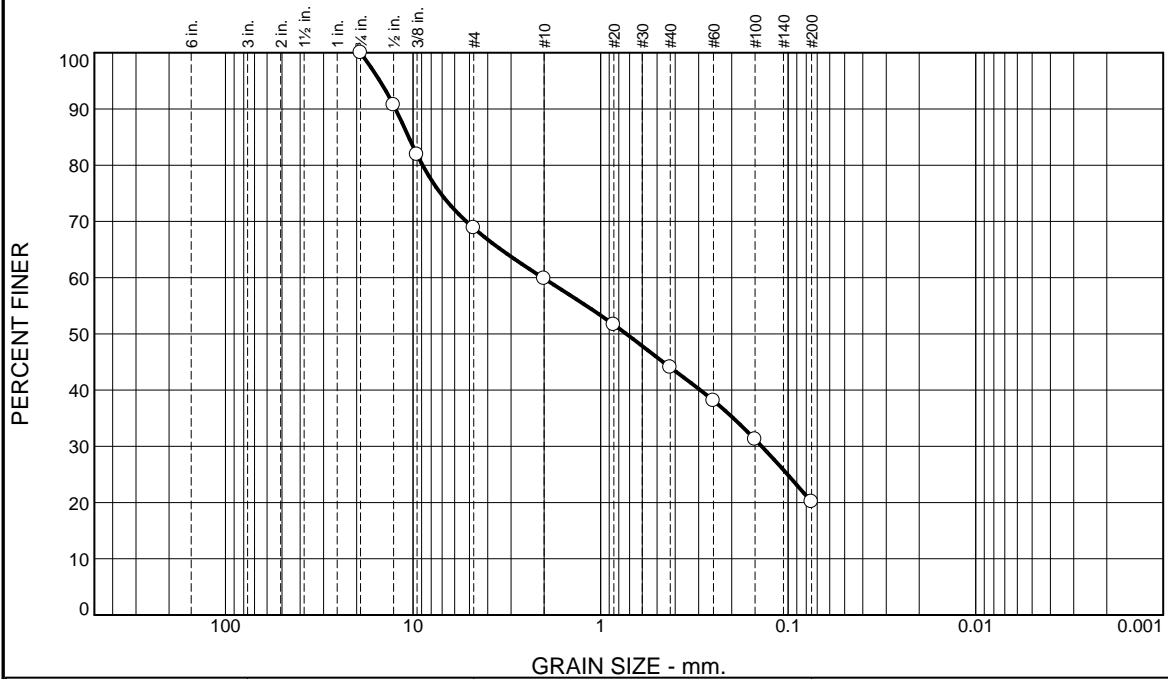
Title: Laboratory Coordinator

Source of Sample: Borings Depth: 0-2'
Sample Number: GZ-4 / S-1

Date Sampled:

Thielsch Engineering Inc. Cranston, RI	Client: GZA GeoEnvironmental Project: Former Benny's - 1400 West Main Road Middletown, RI Project No: 03.0034385.35
Figure S-3	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	31.2	9.0	15.8	23.9	20.1	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	90.7		
0.375"	81.9		
#4	68.8		
#10	59.8		
#20	51.6		
#40	44.0		
#60	38.1		
#100	31.2		
#200	20.1		

Material Description

Light Brown f-c SAND, some fine Gravel, some Silt

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D₉₀= 12.3990 D₈₅= 10.5570 D₆₀= 2.0334
D₅₀= 0.7294 D₃₀= 0.1383 D₁₅=
D₁₀= C_u= C_c=

Remarks

Date Received: 1.10.19 Date Tested: 1.16.19

Tested By: MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

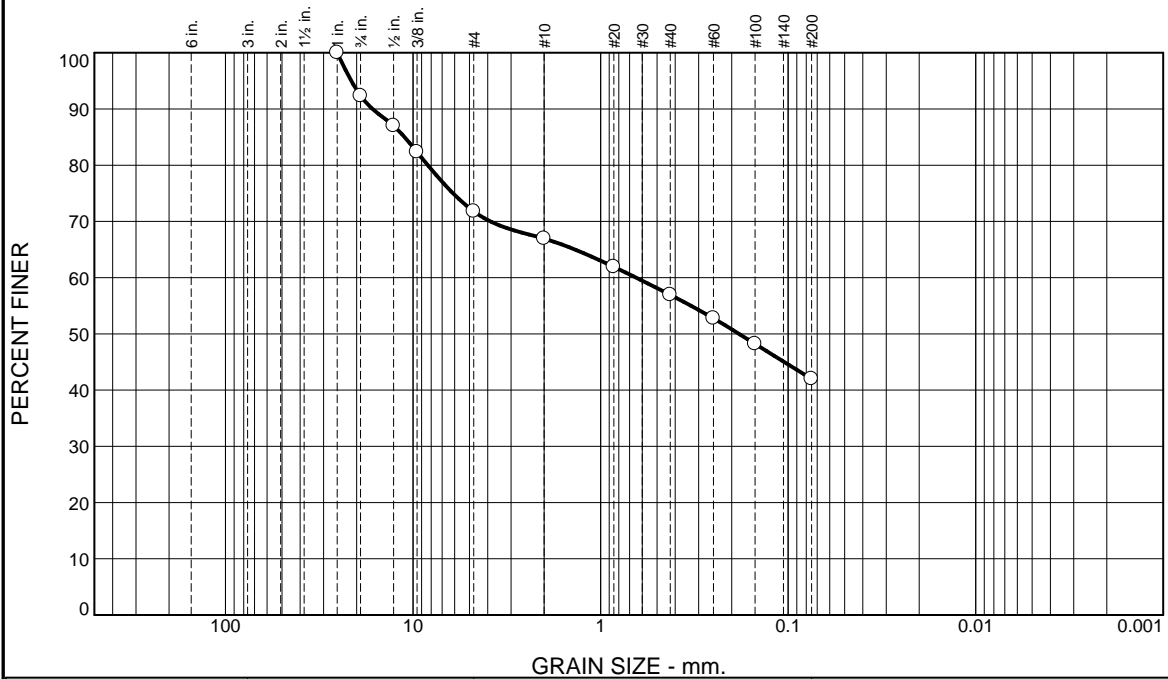
* (no specification provided)

Source of Sample: Borings Depth: 0-2'
Sample Number: GZ-8 / S-1A

Date Sampled:

Thielsch Engineering Inc.	Client: GZA GeoEnvironmental
Cranston, RI	Project: Former Benny's - 1400 West Main Road Middletown, RI
	Project No: 03.0034385.35 Figure S-4

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.7	20.5	4.9	10.0	14.9	42.0	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	92.3		
0.5"	87.0		
0.375"	82.3		
#4	71.8		
#10	66.9		
#20	61.9		
#40	56.9		
#60	52.8		
#100	48.2		
#200	42.0		

* (no specification provided)

Material Description

Dark Brown SILT, some f-c Sand, some f-c Gravel

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4(0)

Coefficients

D₉₀= 16.4664 D₈₅= 11.0990 D₆₀= 0.6468
D₅₀= 0.1825 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 1.10.19 Date Tested: 1.16.19

Tested By: AL / MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

Source of Sample: Borings Depth: 4-6'
Sample Number: GZ-8 / S-3

Date Sampled:

Thielsch Engineering Inc.	Client: GZA GeoEnvironmental
Cranston, RI	Project: Former Benny's - 1400 West Main Road Middletown, RI
	Project No: 03.0034385.35 Figure S-5



GZA GeoEnvironmental, Inc.