APPENDIX A

Assessment of City-Owned Properties

Appendix A1 – East Main Street

Appendix A2 – Huntingdon Avenue

Appendix A3 – South Main Street

Appendix A1

Assessment of City-Owned Properties
East Main Street Parcel

Waterbury, Connecticut
July, 2015

MILONE & MACBROOM

Engineering | Planning | Landscape Architecture | Environmental Science

Assessment of City-Owned Properties
East Main Street Parcel

Waterbury, Connecticut
July, 2015

Prepared for:
City of Waterbury
Waterbury Development Corporation
83 Bank Street, 3rd Floor
Waterbury, Connecticut 06702

MMI #1014-53-3

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203)-271-1773
www.miloneandmacbroom.com

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Overview

Milone & MacBroom, Inc. (MMI) was commissioned by the Waterbury Development Corporation to evaluate the development potential of an approximately 30-acre parcel owned by the City of Waterbury (City) and located on East Main Street. The specific objective was to determine the potential volume and general nature of earth and rock that could be removed from the site in conjunction with such development. This evaluation will serve to assist the City in the preparation of a Plan of Conservation and Development, including determination as to the highest and best use for this parcel.

This 30-acre parcel is located in the southeastern portion of the City on the north side of East Main Street just west of the Cheshire town line. Crosby High School, located on City-owned property, abuts this parcel at its west side. Retail uses including Costco Wholesale and Kohl's department store are located in the vicinity on the south side of East Main Street.

It is understood or assumed that the site can be effectively served by public water supply and public sewers. Available utility capacity and any need for water and municipal sewer agreements must be verified before proceeding with the development of this site. Significant earthwork operations are expected for development of the site including, in some instances, large-scale rock quarry excavation efforts. Stormwater management requirements and utility and wetland setbacks may impact the design and density of development. Any potential development will be subject to review and approval by local land use commissions, the outcome of which cannot be predicted.

1.2 Topography and Geology

Currently a vacant lot, existing terrain is wooded and generally steep and hilly. Boulders and cobble stone walls are present indicating glacial till soils and evidence of historical agricultural land use. No surface water features were observed within the on-site areas investigated although a small area of inland wetlands exists in the western portion of the site and along the eastern boundary. Bedrock geology described herein is based upon the Bedrock Geological Map of Connecticut (Rodges, 1985) and surficial geology based on the Surficial Materials Map of Connecticut (Stone, J.R., Schafer, 2005). Soil designations are based on mapping using the National Resources Conservation Service (NRCS) Soil Survey Geographic database (SSURGO).

1.3 Subsurface Investigations

MMI completed subsurface investigations on the site on May 28 and 29 of 2015. The investigation included multiple overburden soil borings completed to top of bedrock and a single 5-foot bedrock core sample. The results were used to classify the overburden geology, determine the general depth to bedrock, confirm mapped geologic information, and aid in general classification of materials for the City's or prospective buyers' use in estimating associated value in terms of reuse or sale. Test boring locations were selected based upon an assumed development footprint and building pad elevation. Subsurface explorations included borings advanced at specific locations within the site, which reflect conditions strictly at those locations. No guarantee is being stated or implied regarding the consistency of subsurface conditions over the entirety of the site.

MMI retained the services of Soil Testing, Inc. of Oxford, Connecticut to complete the borings with oversight by MMI personnel. MMI personnel used a handheld GPS (geographic positioning system) unit to locate and record boring locations. MMI maintained geologic logs that included soil descriptions, standard penetration testing results, and bedrock lithology. The borings were performed using hollow-stem methodology; split spoon samples were collected where changes in lithology were observed or to collect samples for sieve analysis. A 5-foot bedrock core was completed using a 2-inch diamond bit at one location per parcel to confirm bedrock lithology. Appendix A includes Existing Conditions figures of the parcel depicting the boring locations and assumed area of excavation/filling. A copy of the geologic logs is found in Appendix B. At least one representative soil sample was submitted to Material Testing Laboratories, Inc. of New Haven, Connecticut for sieve analysis. The results of the sieve analysis are provided in Appendix C.

2.0 FINDINGS

2.1 Geologic and Subsurface Exploration

The majority of the soils across the site are mapped as Hollis-Chatfield-Rock outcrop complex, 3-15% and 15-45% slopes, and the Charlton-Chatfield complex, 3-15% slopes. Both soil series are described as very rocky melt-out (glacial) till shallow to bedrock. The eastern portion of the site contains regulated wetlands and is mapped as Ridgebury, Leicester, and Whitman soils that are described as extremely stony, poorly drained, and hydric.

Surficial geology at this site is mapped as thin glacial till. Thin glacial till is described as areas where till is generally less than 10 to 15 feet thick. Where bedrock outcrops were observed, glacial till deposits are absent. Glacial till is predominantly a heterogeneous mix of loose to moderately compact mix of sand, silt, and clay deposited directly by glacial ice.

The mapped bedrock beneath overburden at this parcel is the Taine Mountain Formation. The Taine Mountain Formation is described as a gray, medium-grained, generally fairly well-layered to well-laminated ("pin-stripe") gneissic or schistose granofels, composed of quartz, oligoclase, biotite, muscovite, and garnet, and locally staurolite and kyanite or sillimanite.

A total of nine soil borings were completed (B-1 through B-9) from existing grade to the top of the bedrock surface and/or refusal. Sieve analyses were completed on samples collected from B-5 and B-6. A 5-foot bedrock core was collected from test boring B-9. (See Figure 1-1 for Boring Locations, Appendix B for Boring Logs, and Appendix C for Sieve Analysis.)

The depth to bedrock in borings ranged from half a foot to 7 feet below grade (ftbg). In general, the surficial material encountered was comprised of a light to medium brown, fine to medium sand, some silt, some gravel. Boulders and cobbles were present at the surface throughout the parcel but were not represented in the geologic log due to sampling methodology. Significant bedrock outcropping was observed at the central portion of the site.

The subsurface investigation results confirmed the mapped units for surficial geology for the site. The surficial material encountered matches the description of glacial till; a heterogeneous mix of sand, silt, and clay. This material is not suitable for most civil applications but may be reused on site or off site for general fill. Due to the presence of fine sand and silt, the material sampled at the location tested generally does not meet gradation requirements set forth by the Connecticut Department of Transportation Form 816 for roadway base materials, granular or structural fills. It is expected that similar or equivalent standards would be required for these material classifications and applications where nonstate specifications are considered. Further evaluation would be required to determine if a portion of on-site soils could be used as general fill or as bedding material for drainage applications.

The bedrock core sample is entirely one unit described as a gray fine-grained gneiss with some schistic properties. The core has laminated bedding and fine-grained, moderately fractured with iron staining indicating slight weathering at the top few inches of rock. This finding confirmed the mapped bedrock unit for this site. Based on field assessment, the core sample has a hardness category of hard to very hard. The rock quality designation (RQD) for the drill core was logged as 68%, which is considered fair

rock mass quality. The RQD indicates the percentage of intact, sound rock along the core length and is computed as the sum of the core pieces greater than or equal to 4 inches in length divided by the total length of the core, in this case 5-feet total. This is a general indication of rock mass quality. It is important to note that RQD is not a stand-alone parameter but one characteristic in rock mass classification. While typically provided in core logs, how this parameter is applied is beyond the scope of this report.

Due to the weathered and laminated nature of the bedrock encountered in the bedrock core, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Generally, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. However, such material may be crushed and used for general fill, slope stabilization, or drainage on site or off site depending on characteristics after the material has been processed.

2.2 Volumes

For purposes of performing a broad cut-and-fill analysis, an approximate area of anticipated excavation/ filling was assumed, with an anticipated finish and grade ranging from elevation 570 to 580. Based on this scenario, we would approximate earthwork to include in the range of 500,000 cubic yards (CY) of cut, 400,000 CY of which is estimated to be rock, and 120,000 CY of fill for a net total of 380,000 CY of excess material. This estimation is based on subsurface exploration by a limited number of borings at specific locations within the site. (See Figure 1-3 in Appendix A for the assumed area of excavation/filling)

2.3 Value

Excess rock from the site is expected to consist of a slightly weathered to fresh unit of gneiss or schist. The weathered and laminated nature of the bedrock encountered, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Under state Department of Transportation (DOT) and ASTM standards, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. While pockets of material potentially suitable to be processed as DOT roadway base material may be encountered, it is anticipated that the predominant use would be for general fill, slope stabilization, or drainage on site or off site.

Given the above, the value or cost associated with this excess material would be dependent upon the market need for general fill when the excavation would take place. If there is a need for such large quantities of fill nearby, there might be a small value associated with this excess material. However, if no such need is present, there would be a cost associated with removing this excess material from the site.

APPENDIX A

EXISTING CONDITIONS AND BORING LOCATIONS

LEGEND

B-1 BORING-NO.
7 FT DEPTH TO BEDROCK

CROSBY HIGH SCHOOL
BASKETBALL COURTS
BENCH
ATHLETIC FIELD
ATHLETIC .FIELD
PARKING AREA
PARKING AREA
PARKING AREA
PARKING AREA
PARKING AREA
PARKING AREA

EAST MAIN STREET
PARCEL
±30 ACRES

B-1 5 FT
B-2 4 FT
B-3 2.5 FT
B-4 2.5 FT
B-5 3 FT
B-6 5 FT
B-7 6 FT
B-8 3 FT
B-9 (CORE) 0.5 FT

WETLANDS
ROCK OUTCROP (TYP.)
E. MAIN ST.
E. MAIN ST.
AUSTIN RD
PARKING AREA
PILE
PILES
ROCK OUTCROP

0' 100' 200'
0 1/2" 1"

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

EXISTING CONDITIONS
EAST MAIN STREET
WATERBURY, CONNECTICUT

– DESIGNED	TEB DRAWN	– CHECKED

SCALE: 1"=200'
DATE: JULY, 2015
PROJECT NO.: 1014-53
FIGURE NO.: 1-1

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

AERIAL MAPPING

EAST MAIN STREET

WATERBURY, CONNECTICUT

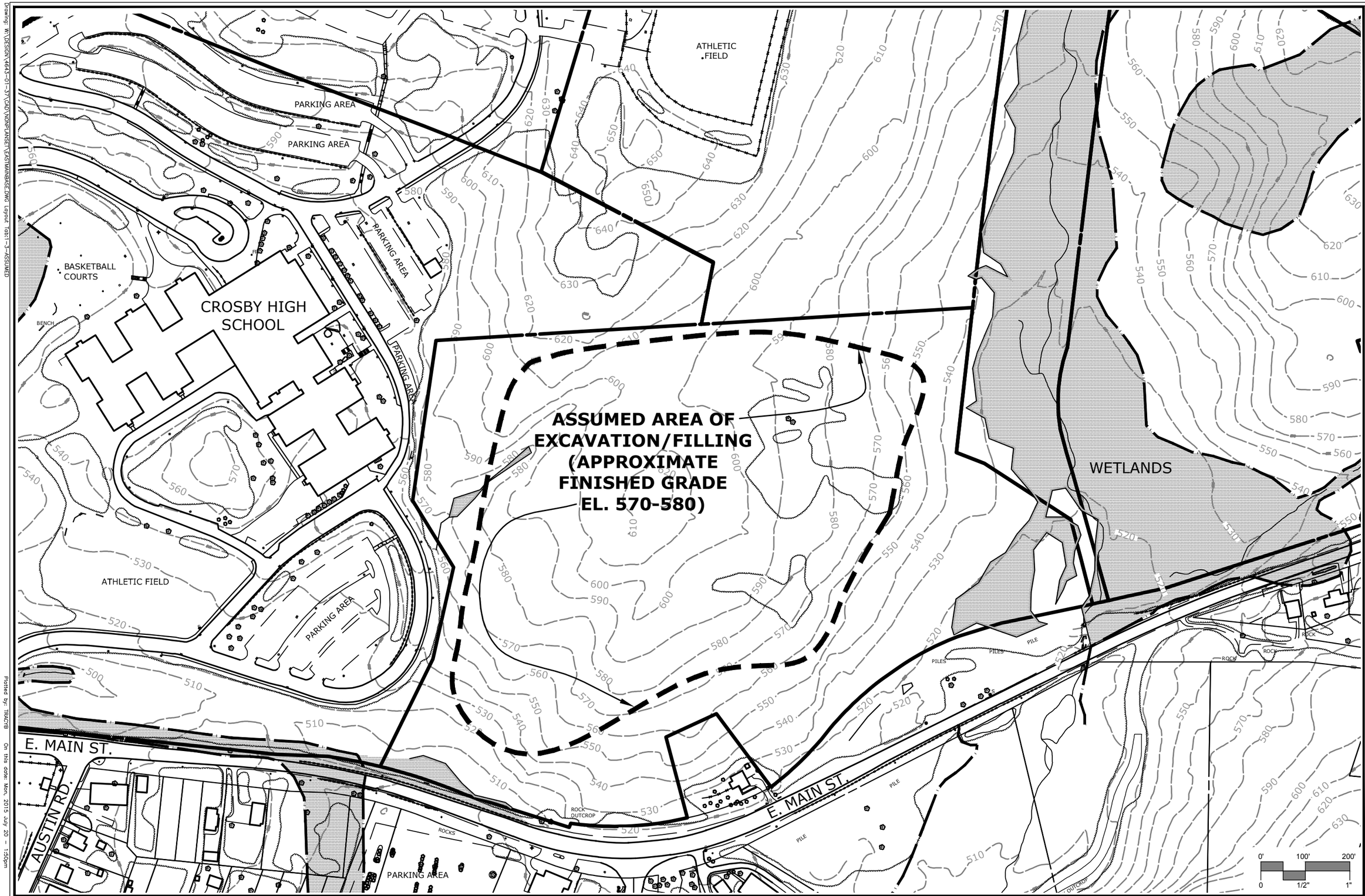
–	TEB	–
DESIGNED	DRAWN	CHECKED

SCALE: 1"=200'

DATE: JULY, 2015

PROJECT NO.: 1014-53

FIGURE NO.
1-2



MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

ASSUMED AREA OF EXCAVATION/FILLING

EAST MAIN STREET

WATERBURY, CONNECTICUT

–	TEB	–
DESIGNED	DRAWN	CHECKED

SCALE: 1"=200'

DATE: JULY, 2015

PROJECT NO.: 1014-53

FIGURE NO.: 1-3

APPENDIX B

BORING LOGS

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-1**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-2	2,3,3,5	8"	SS		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-7	50/4"	0"	SS		Dry	light brown f-m SAND, some Silt, trace gravel weathered rock fragments from 5-7 ftbg Refusal at 7 ftbg
						End of boring- 7 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-2**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
1-5'			AG		Dry	med-brown f-m SAND, some Silt, some gravel
						Refusal at 5 ftbg
						End of boring- 5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-3**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: Test Pit
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: Hand Auger Hammer Wt: Sampler: Casing: Hammer Fall: Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-0.5'			HA		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
						red-brown fine SAND, some silt, some gravel
0.5-2.5'			HA		Dry	Refusal at 2.5 ftbg
						End of boring- 2.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-4**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
						med-brown f-m SAND, some silt, trace gravel
						Bedrock beginning at 2.5 ftbg
1-3'			AG			Refusal at 3 ftbg
						End of boring- 2.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-5**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
1-3'			AG		Dry	med-brown f-m SAND, some Silt, trace gravel
						Bedrock/refusal- 3 ftbg
						End of boring- 3 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-6**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
1-5'			AG		Dry	med-brown f-m SAND, some Silt, some gravel
5'	50+	0	SS			Weathered bedrock- 5 ftbg Refusal (competant bedrock)- 5.5 ftbg
						End of boring- 5.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-7**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
1-5'			AG		Dry	light-brown f-m SAND, some Silt, some Gravel
5-6'	16, 50/5"		SS		Dry	light-brown f-m SAND, some Silt, some Gravel
						Refusal (competant bedrock)- 6 ftbg
						End of boring- 6 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-8**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/28/2015 Finish: 5/28/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-1'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
1-4.5'			AG		Dry	light-brown f-m SAND, some Silt, some Gravel
4.5'	50/1"		SS		Dry	med-brown f-m SAND, some Silt, some Gravel
						Refusal (competant bedrock)- 4.5 ftbg
						End of boring- 4.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-9**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/29/2015 Finish: 5/29/2015
MMI Inspector: Corey Pelletier	Boring Location: **East Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-0.5'			AG		Dry	med-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
0.5'					Dry	competent BEDROCK 0.5 ftbg
						Coring start 0.5 ftbg
0.5-5.5'	RQD = 68%		Core			Granofels- medium grained, non-uniform lamination, fractures with iron staining present
						End of boring- 5.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

APPENDIX C

SIEVE ANALYSIS RESULTS

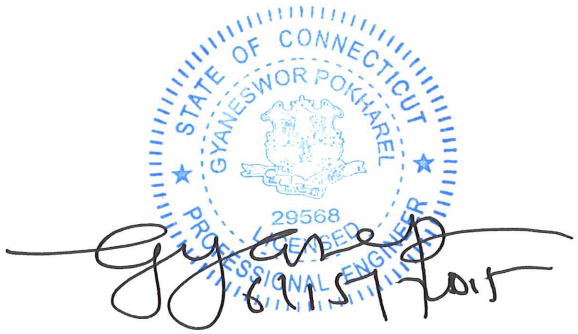
MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1121

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410



PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine Sand

Source: E-5 (0 - 3')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5031

Sieve Size	Percent Passing
½" (12.5mm)	100
⅜" (9.5mm)	99
#4 (4.75mm)	98
#8 (2.36mm)	93
#16 (1.18mm)	87
#30 (600µm)	77
#50 (300µm)	55
#100 (150µm)	24
#200 (75µm)	11.3

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1116

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine Sand

Source: E-6 (0 - 5')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5027

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	94
½" (12.5mm)	90
⅜" (9.5mm)	87
#4 (4.75mm)	81
#8 (2.36mm)	74
#16 (1.18mm)	68
#30 (600µm)	58
#50 (300µm)	39
#100 (150µm)	16
#200 (75µm)	7.8

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

Appendix A2

Assessment of City-Owned Properties
Huntingdon Avenue Parcel

Waterbury, Connecticut
July, 2015

MILONE & MACBROOM

Engineering | Planning | Landscape Architecture | Environmental Science

Assessment of City-Owned Properties
Huntingdon Avenue Parcel

Waterbury, Connecticut
July, 2015

Prepared for:
City of Waterbury
Waterbury Development Corporation
83 Bank Street, 3rd Floor
Waterbury, Connecticut 06702

MMI #1014-53-3

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203)-271-1773
www.miloneandmacbroom.com

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Overview

Milone & MacBroom, Inc. (MMI) was commissioned by the Waterbury Development Corporation to evaluate the development potential of an approximately 30-acre parcel owned by the City of Waterbury (City) and located on Huntingdon Avenue. The specific objective was to determine the potential volume and general nature of earth and rock that could be removed from the site in conjunction with such development. This evaluation will serve to assist the City in the preparation of a Plan of Conservation and Development, including determination as to the highest and best use for this parcel.

This parcel is a 30-acre site located in the northern portion of the City. The parcel has approximately 820 feet of frontage along the northern side of Huntingdon Avenue and approximately 550 feet along the eastern side Brookside Road. (See Figure 1-1 for Existing Conditions Map.) Area businesses include, but are not limited to, Tuttle's Auto on Huntingdon Avenue to the southeast and Gem Manufacturing Co., Inc. and Wheeler Clinic on Brookside Road. Transit bus stops are located in the vicinity along Huntingdon Avenue and Brookside Road.

It is understood or assumed that the site can be effectively served by public water supply and public sewers. Available utility capacity and any need for water and municipal sewer agreements must be verified before proceeding with the development of this site. Significant earthwork operations are expected for development of the site including, in some instances, large-scale rock quarry excavation efforts. Stormwater management requirements and utility and wetland setbacks may impact the design and density of development. Any potential development will be subject to review and approval by local land use commissions, the outcome of which cannot be predicted.

1.2 Topography and Geology

Currently a vacant lot, existing terrain is wooded and generally steep and hilly. Boulders and cobble stone walls are present indicating glacial till soils and evidence of historical agricultural land use. No surface water features were observed within the on-site areas investigated. Bedrock geology described herein is based upon the Bedrock Geological Map of Connecticut (Rodges, 1985) and surficial geology based on the Surficial Materials Map of Connecticut (Stone, J.R., Schafer, 2005). Soil designations are based on mapping using the National Resources Conservation Service (NRCS) Soil Survey Geographic database (SSURGO).

1.3 Subsurface Investigations

MMI completed subsurface investigations on the site from May 29 through June 2 of 2015. The investigation included multiple overburden soil borings completed to top of bedrock and a single 5-foot bedrock core sample. The results were used to classify the overburden geology, determine the general depth to bedrock, confirm mapped geologic information, and aid in general classification of materials for the City's or prospective buyers' use in estimating associated value in terms of reuse or sale. Test boring locations were selected based upon an assumed development footprint and building pad elevation. Subsurface explorations included borings advanced at specific locations within the site, which reflect

conditions strictly at those locations. No guarantee is being stated or implied regarding the consistency of subsurface conditions over the entirety of the site.

MMI retained the services of Soil Testing, Inc. of Oxford, Connecticut to complete the borings with oversight by MMI personnel. MMI personnel used a handheld GPS (geographic positioning system) unit to locate and record boring locations. MMI maintained geologic logs that included soil descriptions, standard penetration testing results, and bedrock lithology. The borings were performed using hollow-stem methodology; split spoon samples were collected where changes in lithology were observed or to collect samples for sieve analysis. A 5-foot bedrock core was completed using a 2-inch diamond bit at one location per parcel to confirm bedrock lithology. Appendix A includes Existing Conditions figures of the parcel depicting the boring locations and assumed area of excavation/filling. A copy of the geologic logs is found in Appendix B. At least one representative soil sample was submitted to Material Testing Laboratories, Inc. of New Haven, Connecticut for sieve analysis. The results of the sieve analysis are provided in Appendix C.

2.0 FINDINGS

2.1 Geologic and Subsurface Exploration

The majority of the soils for this parcel are mapped as Hollis-Chatfield-Rock outcrop complex, 15-45% slopes, and the Charlton-Chatfield complex, 15-35% slopes. Both soil series are described as very rocky melt-out (glacial) till shallow to bedrock.

Surficial geology at this site is mapped as thin glacial till. Thin glacial till is described as areas where till is generally less than 10 to 15 feet thick. Where bedrock outcrops were observed, glacial till deposits are absent. Glacial till is predominantly a heterogeneous mix of loose to moderately compact mix of sand, silt, and clay deposited directly by glacial ice.

Bedrock is mapped as two units at this parcel. The central and majority of the parcel is mapped as the Taine Mountain Formation. The Taine Mountain Formation is described as a gray, medium-grained, generally fairly well-layered to well-laminated ("pin-stripe") gneissic or schistose granofels, composed of quartz, oligoclase, biotite, muscovite, and garnet, and locally staurolite and kyanite or sillimanite. The southern portion of the parcel is mapped as the basal member of the Taine Mountain Formation. The bedrock lithology of the basal member formation is described as a gray, medium-grained, well-layered granofel and is generally less micaceous and schistose than the Taine Mountain Formation. In general, the formations are similar in properties and quality of bedrock.

A total of nine soil borings were completed (B-1 through B-9) including one bedrock core (B-9). Select samples were collected from borings B-2 and B-6 for sieve analysis. Borings were completed from grade to top of bedrock and/or refusal. (See Figure 2-1 for Boring Locations, Appendix B for Boring Logs, and Appendix C for Sieve Analysis.)

The depth to bedrock ranged from at-grade to 18 feet below grade (ftbg). Test boring B-2 was located in the western valley that extended to a maximum depth observed at the parcel of 18 ftbg. The average depth of the remaining test boring locations was 7 ftbg. In general, the majority of the parcel has a shallow depth to bedrock with outcrops observed at the highest peak in the central portion of the parcel.

The surficial material consists of a light-brown fine to medium sand, some silt, some gravel with trace angular rock fragments. Boulders, cobbles, and significant bedrock outcrops were observed throughout the parcel. The soil material encountered is not suitable for most civil applications but may be reused on site or off site for general fill. Due to the presence of sand and silt, the material sampled at the locations tested generally does not meet gradation requirements set forth by the Connecticut Department of Transportation Form 816 for roadway base materials, granular, or structural fills. It is expected that similar or equivalent standards would be required for these material classifications and applications where nonstate specifications are considered. Further evaluation would be required to determine if a portion of on-site soils could be used as general fill or bedding material for drainage applications.

The bedrock core is entirely one unit described as a gray banded "salt and pepper" fine- to coarse-grained gneiss with a coarse-grained band of schist from 2 to 3 feet. The core has medium bedding from 0 to 3 feet and moderately fractured with laminated bedding from 3 to 5 feet. Overall, the core is fresh with slight weathering from 3 to 5 feet. Based on field assessment, the core sample has a hardness category of hard to very hard. Based on field assessment, the core sample has a hardness category of

hard to very hard. However, the rock quality designation (RQD) for the drill core was logged as 13%, which is considered very poor rock mass quality. The RQD indicates the percentage of intact, sound rock along the core length and is computed as the sum of the core pieces greater than or equal to 4 inches in length divided by the total length of the core, in this case 5-feet total. This is a general indication of rock mass quality. It is important to note that RQD is not a stand-alone parameter but one characteristic in rock mass classification. While typically provided in core logs, how this parameter is applied is beyond the scope of this report.

In general, the bedrock consisted of a slightly weathered to fresh unit of gneiss or schist. Due to the coarse grained, fractured, weathered, and laminated nature of the bedrock encountered, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Generally, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. However, such material may be crushed and used for general fill, slope stabilization, or drainage on site or off site depending on characteristics after the material has been processed.

2.2 Volumes

For purposes of performing a broad cut-and-fill analysis, approximate areas of excavation/filling were assumed with anticipated finish grade elevations of 440 in the northwestern portion of the site and elevation 410 to 420 in the central portion of the site. Based on this scenario, we would approximate earthwork to include in the range of 300,000 cubic yards (CY) of cut, 280,000 CY of which is estimated to be rock, and 20,000 CY of fill for a net total of 280,000 CY of excess material. It is anticipated that the majority of this excess material would be rock. This estimation is based on subsurface exploration by borings at specific locations within the site. (See Figure 2-3 in Appendix A for the assumed areas of excavation/filling.)

2.3 Value

Excess rock from the site is expected to consist of a slightly weathered to fresh unit of gneiss or schist. The coarse grained, fractured, weathered, and laminated nature of the bedrock encountered, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Under state Department of Transportation (DOT) and ASTM standards, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. While pockets of material potentially suitable to be processed as DOT roadway base material may be encountered, it is anticipated that the predominant use would be for general fill, slope stabilization, or drainage on site or off site.

Given the above, the value or cost associated with this excess material would be dependent upon the market need for general fill when the excavation would take place. If there is a need for such large quantities of fill nearby, there might be a small value associated with this excess material. However, if no such need is present, there would be a cost associated with removing this excess material from the site.

APPENDIX A

EXISTING CONDITIONS AND BORING LOCATIONS

LEGEND

B-1 BORING-NO.
7 FT DEPTH TO BEDROCK

HUNTINGDON AVENUE
PARCEL
±30 ACRES

B-1
7 FT

B-2
18 FT

B-3
7.5 FT

B-4
7.5 FT

B-5
2 FT

BEDROCK
0 FT

ROCK OUTCROP

B-6
6 FT

B-7
6 FT

B-8
10 FT

B-9 (CORE)
10 FT

EAST AURORA ST.

HUNTINGDON AVE.

GEAR ST.

BROOKSIDE RD.

0' 100' 200'
0 1/2" 1"

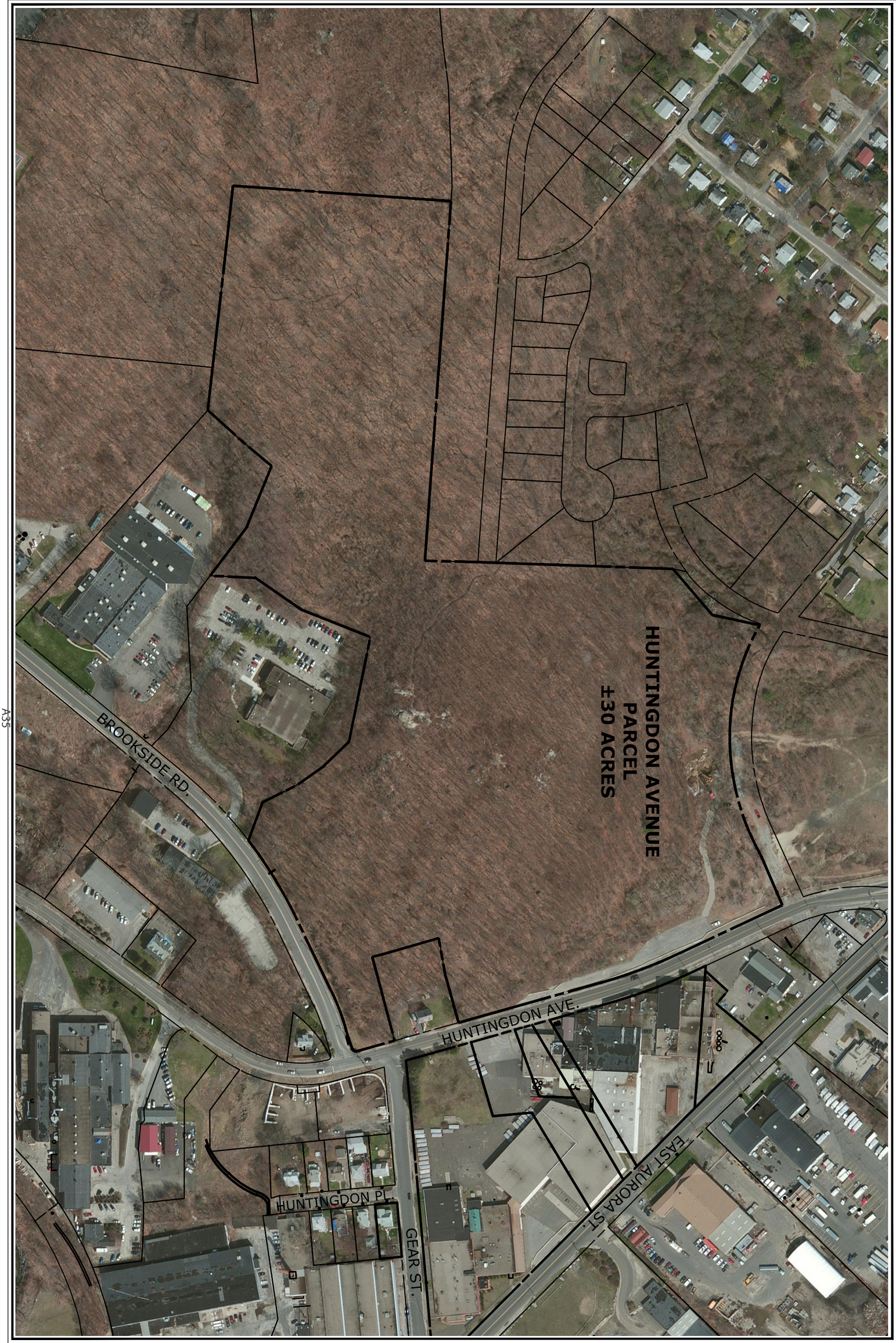
MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

EXISTING CONDITIONS
HUNTINGDON AVENUE AND BROOKSIDE ROAD
WATERBURY, CONNECTICUT

– DESIGNED	TEB DRAWN	– CHECKED

SCALE: 1"=200'
DATE: JULY, 2015
PROJECT NO.: 1014-53
FIGURE NO.: 2-1



A35

AERIAL MAPPING

HUNTINGDON AVENUE AND BROOKSIDE ROAD

WATERBURY, CONNECTICUT

FIGURE NO. 2-2

PROJECT NO. 1014-53

DATE JULY, 2015

SCALE 1"=200'

DESIGNED -

DRAWN TEB

CHECKED -

REVISIONS

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

ASSUMED AREAS OF EXCAVATION/FILLING

LIMIT OF DISTURBANCE

APPROXIMATE FINISHED GRADE EL. 410-420

APPROXIMATE FINISHED GRADE EL. ±440

EAST AURORA ST.

HUNTINGDON AVE.

GEAR ST.

BROOKSIDE RD.

0' 100' 200'
0 1/2" 1"

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

ASSUMED AREAS OF EXCAVATION / FILLING

HUNTINGDON AVENUE AND BROOKSIDE ROAD

WATERBURY, CONNECTICUT

RJM DESIGNED	TEB DRAWN	JMM CHECKED

SCALE: 1"=200'

DATE: JULY, 2015

PROJECT NO.: 1014-53

FIGURE NO.
2-3

APPENDIX B

BORING LOGS

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-1**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 5/29/2015 Finish: 5/29/2015
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5	6,5,7,10	10"	SS		Dry	0-6" m-f SAND, some Organic, TOP-SOIL
						6-10" med brown f-m SAND, some Silt, trace Gravel
5-7	28,39,33,31	18"	SS		Dry	med brown f-m SAND, some silt, some gravel, some cobble fragments
7-8	50+	0"	SS		Dry	bedrock FRAGMENT, competent @ 7 ftbg
						Refusal at 8 ftbg
						End of Boring - 8.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-2**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 5/29/2015 Finish: 5/29/2015
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5	6,5,7,10	10"	SS		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-7	13,23,21,22	17"	SS		Dry	med brown f-m SAND, some Silt, some Gravel, some Cobble fragments
10-12	22,34,29,36	14"	SS		Wet	med brown f-c SAND, some Silt, some Gravel, trace Cobble fragments
12'			AG		Wet	Weathered bedrock (fragments of gneiss)
15-17	53, 37, 50+	16"	SS		Wet	Weathered Bedrock (gneiss) Refusal @ 18 ftbg
						End of Boring 18 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-3**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 5/29/2015 Finish: 5/29/2015
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-7			AG		Dry	med brown f-m SAND, some Silt, some Gravel, some Cobble fragments
7.5-8.0			AG		Dry	Weathered bedrock @ 7.5 ftbg Competent bedrock @ 8.5 ftbg Refusal @ 8 ftbg
						End of Boring 8 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-4**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/1/15 Finish: 6/1/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-7	51,50+	12"	SS		Dry	light brown f-m SAND, some Silt, some Gravel, some Cobble (fragments)
7.5-8.5			AG		Dry	Weathered bedrock @ 7.5 ftbg Competent bedrock @ 8.5 ftbg Refusal @ 8.5 ftbg
						End of Boring 8.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-5**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/1/15 Finish: 6/1/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-2			AG		Dry	0-2' light brown f SAND, TOP-SOIL, trace Organic Competent BEDROCK @ 2.0 ftbg Refusal @ 2.0 ftbg End of Boring 2.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-6**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/1/15 Finish: 6/1/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-6	18,50+	16"	SS		Dry	light brown f SAND, some Silt, trace Gravel competent BEDROCK @ 6.0 ftbg Refusal @ 6.0 ftbg End of Boring 6.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable

H.S.A = Hollow Stem Auger

AG = Auger Cuttings

SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science

MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-7**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/1/15 Finish: 6/1/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-6			AG		Dry	light brown f SAND, some Silt, trace Gravel competent BEDROCK @ 6.0 ftbg Refusal @ 6.5 ftbg End of Boring 6.5 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable

H.S.A = Hollow Stem Auger

AG = Auger Cuttings

SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science

MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-8**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/1/15 Finish: 6/1/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-6			AG		Dry	light brown f SAND, some Silt, trace Gravel
10						competent BEDROCK @ 10 ftbg Refusal @ 10.0 ftbg End of Boring 10.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-9**
Operator: Brock and Matt	Town: Waterbury, Connecticut	Date Start: 6/2/15 Finish: 6/2/15
MMI Inspector: Corey Pelletier	Boring Location: **Huntingdon Avenue / Brookside Road**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	brown m-f SAND, some Organic, TOP-SOIL
5-7	50+		SS		Dry	med brown f-m Sand and Gravel, some rock fragments, some Silt
10			AG			competent BEDROCK @ 10 ftbg
10-15	RQD = 13%	5'	Core			Granofels, banded gneiss, fine-grained layered gniess, fractured rock and evidence of iron staining
						End of Boring @ 15 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

APPENDIX C

SIEVE ANALYSIS RESULTS

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1123

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine to Medium Sand

Source: B-2 (5 - 7')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5033

Sieve Size	Percent Passing
1 ½" (37.5mm)	100
1" (25mm)	83
¾" (19mm)	83
½" (12.5mm)	76
⅜" (9.5mm)	75
#4 (4.75mm)	68
#8 (2.36mm)	62
#16 (1.18mm)	56
#30 (600µm)	47
#50 (300µm)	31
#100 (150µm)	14
#200 (75µm)	7.8

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

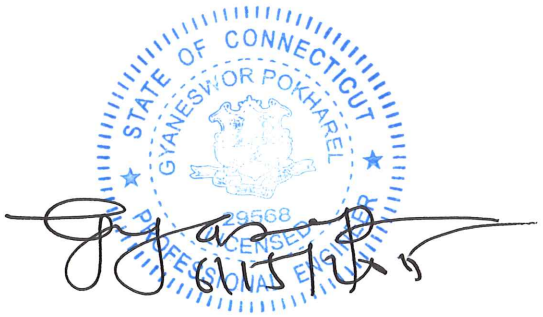
MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1120

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410



PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine to Coarse Sand

Source: B-2 (10 - 12')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5030

Sieve Size	Percent Passing
¾" (19mm)	100
½" (12.5mm)	95
⅜" (9.5mm)	88
#4 (4.75mm)	79
#8 (2.36mm)	72
#16 (1.18mm)	64
#30 (600µm)	54
#50 (300µm)	37
#100 (150µm)	15
#200 (75µm)	7.9

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1118

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

STATE OF CONNECTICUT
GYANESWOR POKHAREL
LICENSED PROFESSIONAL ENGINEER

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine Sand

Source: B-6 (5 - 7')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5028

Sieve Size	Percent Passing
⅜" (9.5mm)	100
#4 (4.75mm)	99
#8 (2.36mm)	96
#16 (1.18mm)	91
#30 (600µm)	82
#50 (300µm)	72
#100 (150µm)	51
#200 (75µm)	31.0

Materials Testing, Inc.

William J. Soucy

1cc: Client
SW

Appendix A3

Assessment of City-Owned Properties
South Main Street Parcel

Waterbury, Connecticut
July, 2015

MILONE & MACBROOM

Engineering | Planning | Landscape Architecture | Environmental Science

Assessment of City-Owned Properties
South Main Street Parcel

Waterbury, Connecticut
July, 2015

Prepared for:
City of Waterbury
Waterbury Development Corporation
83 Bank Street, 3rd Floor
Waterbury, Connecticut 06702

MMI #1014-53-3

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203)-271-1773
www.miloneandmacbroom.com

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Overview

Milone & MacBroom, Inc. (MMI) was commissioned by the Waterbury Development Corporation to evaluate the development potential of an approximately 107-acre parcel owned by the City of Waterbury (City) and located on South Main Street. The specific objective was to determine the potential volume and general nature of earth and rock that could be removed from the site in conjunction with such development. This evaluation will serve to assist the City in the preparation of a Plan of Conservation and Development, including determination as to the highest and best use for this parcel.

This total area of this parcel is 107 acres and is located in the southwestern portion of the City at the Naugatuck town line. Fifty-five acres of the site are located in the Borough of Naugatuck (Borough), and 52 acres are located in Waterbury. Parcel frontage includes South Main Street in Waterbury and Sheridan Drive in Naugatuck. (See Figure 3-1 for Existing Conditions Map.) Area businesses include, but are not limited to, Brass House Restaurant, Dunkin' Donuts, and Pitney Bowes.

It is understood or assumed that the site can be effectively served by public water supply and public sewers. Available utility capacity and any need for water and municipal sewer agreements must be verified before proceeding with the development of this site. Significant earthwork operations are expected for development of the site including, in some instances, large-scale rock quarry excavation efforts. Stormwater management requirements and utility and wetland setbacks may impact the design and density of development. Any potential development will be subject to review and approval by local land use commissions, the outcome of which cannot be predicted.

1.2 Topography and Geology

Currently a vacant parcel, existing terrain is wooded and generally steep and hilly. A very steep slope up to 250 feet in height exists along the east side of South Main Street making this portion of the parcel generally unbuildable. In the balance or eastern portion of the site, boulders and cobble stone walls are present indicating glacial till soils and evidence of historical agricultural land use. No surface water features were observed within the on-site areas investigated. Bedrock geology described herein is based upon the Bedrock Geological Map of Connecticut (Rodges, 1985) and surficial geology based on the Surficial Materials Map of Connecticut (Stone, J.R., Schafer, 2005). Soil designations are based on mapping using the National Resources Conservation Service (NRCS) Soil Survey Geographic database (SSURGO).

1.3 Subsurface Investigations

MMI completed subsurface investigations on the site on May 26 and 27 of 2015. The investigation included multiple overburden soil borings completed to top of bedrock and a single 5-foot bedrock core sample. The results were used to classify the overburden geology, determine the general depth to bedrock, confirm mapped geologic information, and aid in general classification of materials for the City's or prospective buyers' use in estimating associated value in terms of reuse or sale. Test boring locations were selected based upon an assumed development footprint and building pad elevation.

Subsurface explorations included borings advanced at specific locations within the site, which reflect conditions strictly at those locations. No guarantee is being stated or implied regarding the consistency of subsurface conditions over the entirety of the site.

MMI retained the services of Soil Testing, Inc. of Oxford, Connecticut to complete the borings with oversight by MMI personnel. MMI personnel used a handheld GPS (geographic positioning system) unit to locate and record boring locations. MMI maintained geologic logs that included soil descriptions, standard penetration testing results, and bedrock lithology. The borings were performed using hollow-stem methodology; split spoon samples were collected where changes in lithology were observed or to collect samples for sieve analysis. A 5-foot bedrock core was completed using a 2-inch diamond bit at one location per parcel to confirm bedrock lithology. Appendix A includes Existing Conditions figures of the parcel depicting the boring locations and the assumed area of excavation/filling. A copy of the geologic logs is found in Appendix B. At least one representative soil sample was submitted to Material Testing Laboratories, Inc. of New Haven, Connecticut for sieve analysis. The results of the sieve analysis are provided in Appendix C.

2.0 FINDINGS

2.1 Geologic and Subsurface Exploration

The majority of the soils are mapped as the Charlton-Chatfield complex, 3-15% and 15-45% slopes. The soil series are described as rocky melt-out till with moderate to bedrock thickness. The eastern boundary of the parcel is mapped as Ridgebury, Leicester, and Whitman soils that are described as extremely stony, poorly drained, and hydric.

Surficial geology at this site is mapped as thin glacial till. Where bedrock outcrops were observed, glacial till deposits are absent. Glacial till is predominantly a heterogeneous mix of loose to moderately compact mix of sand, silt, and clay deposited directly by glacial ice.

Bedrock is mapped beneath the parcel as Waterbury Gneiss. Waterbury Gneiss is described as a medium to dark-gray, fine to medium-grained, generally irregularly foliated and lenticular rather than regularly layered schist and schistose gneiss, composed of biotite, quartz, oligoclase, kyanite (or sillimanite), and garnet.

A total of seven soil borings were completed (B-1 through B-7) including one bedrock core (B-7). Select soil samples from borings B-2 and B-5 were collected for sieve analysis. Borings were completed from grade to top of bedrock and/or refusal. (See Figure 1-1 for Boring Locations, Appendix B for Boring Logs, and Appendix C for Sieve Analysis.)

The depth to bedrock ranged from half a foot to 34.5 feet below grade (ftbg) with outcrops observed throughout the central portion of the parcel. In general, the depth to bedrock was shallow with surficial material consisting of a light brown fine to medium sand, some silt, and some gravel and rock fragments. Cobbles and boulders were observed throughout the parcel. The soil material encountered is not suitable for most civil applications but may be reused on site or off site for general fill. Due to the presence of sand and silt, the material sampled at the locations tested generally does not meet gradation requirements set forth by the Connecticut Department of Transportation Form 816 for roadway base materials, granular, or structural fills. It is expected that similar or equivalent standards would be required for these material classifications and applications where nonstate specifications are considered. Samples tested show the presence of fines that would require further screening of material to conform to state Department of Transportation Form 816 requirements for bedding material for drainage applications. Further evaluation would be required to determine if a portion of on-site soils could be used as general fill.

The bedrock core is entirely one unit described as a gray fine-grained banded gneiss with medium bedding and moderately fractured. The core is fresh with no discoloration, loss of strength, or other effect of weathering alteration observed. Based on field assessment, the hardness category of the gneiss is very hard rock. However, the rock quality designation (RQD) for the drill core was logged as 40%, which is considered poor rock mass quality. The RQD indicates the percentage of intact, sound rock along the core length and is computed as the sum of the core pieces greater than or equal to 4 inches in length divided by the total length of the core, in this case 5-feet total. This is a general indication of rock mass quality. It is important to note that RQD is not a stand-alone parameter but one characteristic in rock mass classification. While typically provided in core logs, how this parameter is applied is beyond the scope of this report.

Due to the fractured and laminated nature of the bedrock encountered, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Generally, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. However, such material may be crushed and used for general fill, slope stabilization, or drainage on site or off site depending on characteristics after the material has been processed.

2.2 Volumes

For purposes of performing a broad cut-and-fill analysis, an approximate area of anticipated excavation/ filling was assumed with an anticipated finished grade ranging from elevation 480 to 520. It was assumed that excavation relating to future development would occur in both the City and the Borough. Based on these assumptions, we would approximate earthwork volumes to be in the range of 500,000 cubic yards (CY) of cut, 200,000 CY of which is estimated to be rock, and 300,000 CY of fill for a net total of 200,000 CY of excess material. This estimation is based on subsurface exploration by borings at specific locations within the site. (See Figure 3-3 in Appendix A for the assumed area of excavation/filling.)

2.3 Value

Excess rock from the site is expected to consist of a slightly weathered to fresh unit of gneiss or schist. The banded, fractured, and laminated nature of the bedrock encountered, it is likely not suitable for use as roadway materials, aggregates, or structural fills. Mechanically processed rock materials used for these construction applications must meet minimum standard requirements. Under state Department of Transportation (DOT) and ASTM standards, these requirements include, but may not be limited to, specified tests for the determination of durability, soundness, and resistance to abrasion. While pockets of material potentially suitable to be processed as DOT roadway base material may be encountered, it is anticipated that the predominant use would be for general fill, slope stabilization, or drainage on site or off site.

Given the above, the value or cost associated with this excess material would be dependent upon the market need for general fill when the excavation would take place. If there is a need for such large quantities of fill nearby, there might be a small value associated with this excess material. However, if no such need is present, there would be a cost associated with removing this excess material from the site.

1014-53-3-jl2015-2-rpt

APPENDIX A

EXISTING CONDITIONS AND BORING LOCATIONS

LEGEND

B-1 BORING-NO.
16 FT DEPTH TO BEDROCK

SOUTH MAIN STREET PARCEL ±107 ACRES

CITY OF WATERBURY / BOROUGH OF NAUGATUCK

B-1 16 FT
B-2 10 FT
B-3 10 FT
B-4 14.5 FT
B-5 34.5 FT
B-6 5 FT
B-7 (CORE) 10 FT

SHADELAWN RD
LONGMEADOW DR
EUGENE RD
ARLENE AVE
HORSESHOE DR
GORMAN CIR
BALDWIN ST.
SOUTH MAIN ST.
PLATTS MILL RD
SHERIDAN DRIVE

0' 200' 400'
0 1/2" 1"

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

EXISTING CONDITIONS
SOUTH MAIN STREET
WATERBURY, CONNECTICUT

DESIGNED	DRAWN	CHECKED
-	TEB	-

SCALE: 1"=400'
DATE: JULY, 2015
PROJECT NO.: 1014-53
FIGURE NO.: **3-1**

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

AERIAL MAPPING
SOUTH MAIN STREET
WATERBURY, CONNECTICUT

--	TEB	--
DESIGNED	DRAWN	CHECKED

SCALE: 1"=400'
DATE: JULY, 2015
PROJECT NO.: 1014-53
FIGURE NO. 3-2

SOUTH MAIN STREET PARCEL ±107 ACRES

ASSUMED AREA OF EXCAVATION/FILLING (APPROXIMATE FINISHED GRADE EL. 480-520)

CITY OF WATERBURY
BOROUGH OF NAUGATUCK

SHADEE LA.
EUGENE DR.
LONGMEADOW DR.
ALPINE AVE.
HORSESHOE DR.
HORSESHOE DR.
ALPINE AVE.
GORMAN CIR.
BALDWIN ST.
SOUTH MAIN ST.
PLATTS MILL RD.
SOUTH MAIN ST.
SHERIDAN DRIVE

0' 200' 400'
0 1/2" 1"

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

REVISIONS

ASSUMED AREA OF EXCAVATION / FILLING
SOUTH MAIN STREET
WATERBURY, CONNECTICUT

RJM DESIGNED	RJM DRAWN	JMM CHECKED
SCALE: 1"=400'		
DATE: JULY, 2015		
PROJECT NO.: 1014-53		
FIGURE NO.: 3-3		

APPENDIX B

BORING LOGS

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-1**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/26/2015 Finish: 5/26/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 10~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-7	7,13,14,19	18"	SS		Dry	light brown f-m SAND, some Gravel, some Silt
10-12	17,23,50,50+	12"	SS		Wet	brown m-c SAND, some Gravel, some Silt. boulders/cobbles @ 11ft
15-17	35,50+	7"	SS		Dry	weathered bedrock FRAGMENT (Gneiss) Refusal at 16 ft
						End of Boring - 16.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-2**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/26/2015 Finish: 5/26/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: Time: DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-10			AG		Dry	brown f-m SAND, some Gravel, some Silt
10-13			AG			weathered rock fragments, refusal at 13 ftbg
						End of Boring - 13 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-3**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/26/2015 Finish: 5/26/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 10~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-7	19,23,41,50	18"	SS		Dry	light brown f-m SAND, some Gravel, some Silt
10-12	50+	1"	SS		Dry	bedrock FRAGMENT (Gneiss) Refusal at 12 ftbg (weathered rock)
						End of Boring - 12.0 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-4**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/26/2015 Finish: 5/26/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 14~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-7			AG		Dry	brown f-m SAND, some Gravel, some Silt
10-12			AG		Dry	brown f-m SAND, some Gravel, some Silt, trace Cobbles
14.5-15			AG			BEDROCK (inferred based upon site observations) Refusal at 15 ftbg
						End of Boring - 15 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-5**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/26/2015 Finish: 5/27/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 13~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt
5-7	55,50,50+	3"	SS		Dry	rock fragments (no soil recovery)
10-12	15,50,50+	6"	SS		Moist	brown m-c SAND, some Gravel, little f Sand, trace Silt
15-17	60,50,50+	12"	SS		Wet	brown m-c SAND, some f Sand, little Gravel, trace Silt
20-22	30,41,56,73	18"	SS		Wet	brown m-c SAND, some f Sand, little Gravel, trace Silt
25-27	48,50,50+	12"	SS		Wet	brown m-c SAND, some Gravel, little Silt
30-32	34,51,50,50+	16"	SS		Wet	brown m-c SAND, some Gravel, some Silt
34.5	100+	0"	SS		Wet	rock FRAGMENTS, bedrock (Gneiss)
						End of Boring - 34.5 ftbg

Depth = feet below grade (ftbg)
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample
NA = Not Applicable
BOB = Bottom of Boring

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-6**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/27/2015 Finish: 5/27/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 14~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-7			AG		Dry	BEDROCK (inferred based upon site observations) Refusal at 7 ftbg
						End of Boring - 7 ftbg

Depth = feet below grade (ftbg) NA = Not Applicable
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

MMI Job No.: 1014-53	**Milone & MacBroom, Inc.** 99 Realty Drive Cheshire, CT 06410	Sheet: 1 of 1
Drilling Co.: Soil Testing, LLC	Project Name: WDC	Hole ID: **B-7**
Operator: Matt	Town: Waterbury, Connecticut	Date Start: 5/27/2015 Finish: 5/27/2015
MMI Inspector: Corey Pelletier	Boring Location: **South Main Street**	Boring Type: General Test Boring
Ground Water Obs: DTW: 7~ Time: 16:00 DTW: Time:	Drilling Details: Method: H.S.A. Hammer Wt: 140 lb. Sampler: 24" split spoon Casing: 4" Hammer Fall: 30" Misc.:	

Depth:	Blows: 0-6", 6-12", 12-18", 18-24"	Recovery:	Sample:	PID (NA)	Moisture:	Field Description:
0-5			AG		Dry	light-brown TOP-SOIL, m-f SAND, some Silt, trace Organic
5-10			AG		Wet	BEDROCK (inferred based upon site observations)
						Refusal at 10 ftbg
10-15	RQD = 40%		CO			Coring Start - 10 Ftbg
						Gniess, f-m grained well banded, fractures
						with iron staining present
						End of boring- 15 ftbg

Depth = feet below grade (ftbg)
H.S.A = Hollow Stem Auger
AG = Auger Cuttings
SS = Split-Spoon Sample
NA = Not Applicable
CO = Bedrock Core

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®

APPENDIX C

SIEVE ANALYSIS RESULTS

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1117

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Silt, Sand and some Gravel

Source: S-3 (5 - 7')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5026

Sieve Size	Percent Passing
1 ½" (37.5 mm)	100
1" (25mm)	89
¾" (19mm)	58
½" (12.5mm)	54
⅜" (9.5mm)	53
#4 (4.75mm)	50
#8 (2.36mm)	43
#16 (1.18mm)	38
#30 (600µm)	35
#50 (300µm)	30
#100 (150µm)	24
#200 (75µm)	10.3

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1124

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Silt, Sand, Rock

Source: S-3 (10 - 10.5')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5034

Sieve Size	Percent Passing
1 ½" (37.5mm)	100
1" (25mm)	75
¾" (19mm)	75
½" (12.5mm)	75
⅜" (9.5mm)	71
#4 (4.75mm)	64
#8 (2.36mm)	61
#16 (1.18mm)	57
#30 (600µm)	50
#50 (300µm)	37
#100 (150µm)	17
#200 (75µm)	8.0

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1130

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine to Medium Sand some Silt

Source: S-5 (10 - 12')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5040

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	97
½" (12.5mm)	95
⅜" (9.5mm)	89
#4 (4.75mm)	84
#8 (2.36mm)	79
#16 (1.18mm)	74
#30 (600µm)	66
#50 (300µm)	52
#100 (150µm)	27
#200 (75µm)	13.6

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

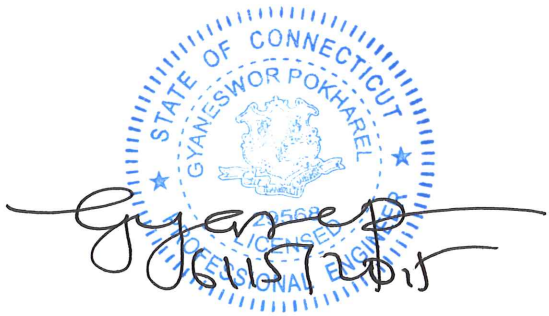
DATE: 06-09-15

REPORT: S-1125

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**



Material: Fine to Coarse Sand

Source: S-5 (15 - 17')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5035

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	88
½" (12.5mm)	88
⅜" (9.5mm)	88
#4 (4.75mm)	82
#8 (2.36mm)	77
#16 (1.18mm)	70
#30 (600µm)	60
#50 (300µm)	46
#100 (150µm)	24
#200 (75µm)	13.1

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1126

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Fine to Medium Sand

Source: S-5 (20 - 22')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5036

Sieve Size	Percent Passing
½" (12.5mm)	100
⅜" (9.5mm)	94
#4 (4.75mm)	89
#8 (2.36mm)	83
#16 (1.18mm)	76
#30 (600µm)	65
#50 (300µm)	49
#100 (150µm)	25
#200 (75µm)	12.7

STATE OF CONNECTICUT
GYANESWOR POKHAREL
LICENSED PROFESSIONAL ENGINEER

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1122

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Material: Medium to Coarse Sand

Source: S-5 (25 - 27')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5032

Sieve Size	Percent Passing
¾" (19mm)	100
½" (12.5mm)	96
⅜" (9.5mm)	95
#4 (4.75mm)	89
#8 (2.36mm)	83
#16 (1.18mm)	76
#30 (600µm)	64
#50 (300µm)	49
#100 (150µm)	25
#200 (75µm)	13.8

STATE OF CONNECTICUT
GYANESWOR POKHAREL
29568
PROFESSIONAL ENGINEER
6/15/2015

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

DATE: 06-09-15

REPORT: S-1119

CLIENT: Milone & MacBroom, Inc.
99 Realty Drive
Cheshire, CT 06410

PROJECT: Clients Information

SUBJECT: **SIEVE ANALYSIS (ASTM C-136)**

Source: S-5 (30 - 32')

Sampled by: Client

Received: 06-02-15

Lab Sample: L-5029

Sieve Size	Percent Passing
¾" (19mm)	100
½" (12.5mm)	97
⅜" (9.5mm)	95
#4 (4.75mm)	92
#8 (2.36mm)	87
#16 (1.18mm)	79
#30 (600µm)	72
#50 (300µm)	55
#100 (150µm)	31
#200 (75µm)	19.6

Materials Testing, Inc.

William J. Soucy

1cc: Client
sw