FINAL GEOTECHNICAL ENGINEERING REPORT
MATTABASSETT REGIONALIZATION PROJECT
MIDDLETOWN GRAVITY SEWER AND FORCE MAIN (EXTENSION)
MIDDLETOWN, CONNECTICUT

AUGUST 2013

CDR MAGUIRE INC.
ENGINEERS
ROCKY HILL, CONNECTICUT

TABLE OF CONTENTS

SECTION	TITLE	PAGES
I.	PURPOSE AND SCOPE	1
II.	FIELD SUBSURFACE INVESTIGATIONS	1 - 2
III.	SUBSURFACE SOIL AND ROCK CONDITIONS	3
IV.	FOUNDATION ANALYSIS AND RECOMMENDATIONS	4 - 7

APPENDIX

Figure 1	-	Boring Location Plan
Figures 2 through 4	-	Generalized Soil Profiles
Boring Logs	-	B-14 B-16 through B-18 B-20 through B-22 B-25 B-27 DB-03 B-1 B-4 PSGP 59 through PSGP-61 PSGP-63

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I. PURPOSE AND SCOPE

This report presents the determination and analysis of the subsurface soil and rock conditions which will affect the design and construction of the Mattabessett Regionalization Project, Middletown Gravity Sewer and Force Main (Extension) in Middletown, Connecticut. Under this project, a 30 inch gravity sewer will be constructed from an existing manhole on River Road adjacent to the existing Middletown Waste Water Treatment Facility and running to the north along River Road to Union Street to an existing 42 inch gravity sewer. From that point, a 48 inch gravity sewer will be constructed along Union Street then south along East Main Street to the proposed new sanitary pump station. The route will cross Sumners Creek at two locations. Inverted siphons will be constructed to carry the gravity sewers under Sumners Creek at both locations. In addition, a 30 inch force main will be constructed running from the proposed new sanitary pump station northerly along East Main Street to a point to the North of Sumners Creek where it will connect to the new force main constructed under a separate contract. In addition to field subsurface explorations, published geological data and field observations were utilized in the analysis of the subsurface conditions and in determining the recommendations for this project. The appendix of this report contains the boring location plan, the generalized soil profiles, the Engineer's boring logs for the borings drilled for this project and file copies of the logs of two borings drilled during design of the bridge carrying East Main Street over Sumners Creek

II. FIELD SUBSURFACE INVESTIGATIONS

The completed boring program for this portion of the Mattabessett Regionalization Project consisted of fourteen (14) borings (B-14, B-16, B-17, B-18, B-20, B-21, B-22, B-25, B-27, DB-03, PSGP-59, PSGP-60, PSGP-61 and PSGP-63). Additional subsurface data was obtained from the logs of two (2) borings (B-1 and B-4) drilled during design of the bridge carrying East Main Street over Sumners Creek.

Borings B-14, B-16, B-17, B-18, B-20, B-21, B-22 and B-25 were drilled by Soiltesting, Inc. of Oxford, Connecticut between February 19, 2013 and March 4, 2013. The borings were

carried to depths ranging from 25.0 to 42.17 feet in soil and weathered bedrock. The borings were advanced utilizing 4-1/4 inch inside diameter hollow stem augers. Soil samples were obtained from these borings by driving a 1-3/8 inch inside diameter split spoon sampler with a 14.0 pound weight falling 30 inches. No rock cores were taken.

Boring B-27 was drilled by general Borings, Inc. of Prospect, Connecticut on June 28, 2013. The boring was drilled to a depth of 48.0 feet in soil and weathered rock using 4-1/4 inch inside diameter hollow stem augers. Soil samples were obtained by driving a 1-3/8 inch inside diameter split spoon sampler with a 140 pound weight falling 30 inches. This boring was advanced to refusal, presumably on bedrock. No rock core was taken.

Boring DB-03 was drilled on January 10, 2013 by Soiltesting, Inc. The boring was drilled to a depth of 40.5 feet in soil and weathered rock utilizing 4-1-2 inch inside diameter hollow stem augers and 3-7/8 inch inside diameter MR casing. The casing was advanced by driving with a 300 pound weight falling 24 inches. Soil samples were obtained by driving a 1-3/8 inch inside diameter split spoon sampler with a 140 pound eight falling 30 inches. A ten foot rock core was obtained from this boring utilizing a 2-1/8 inch inside diameter NWD4 core barrel fitted with a diamond bit. The boring was grouted with a bentonite-cement slurry upon completion.

Borings PSGP-59, PSGP-60, PSGP-61 and PSGP-63 were drilled by Logical Environmental Solutions, LLC of Tolland, Connecticut on July 15, 2013. The borings were advanced to depths ranging from 15.0 to 20.0 feet in soil utilizing a geoprobe direct push unit. Soil samples were collected continuously utilizing a five foot long two inch diameter Macro Core Sampler with dedicated acetate liners.

Borings B-1 and B-4 were drilled between September 18, 1981 and October 1, 1981 by an unknown driller during design the bridge carrying East Main Street over Sumners Creek. These borings were drilled to depths of 44.0 and 43.0 feet, respectfully, utilizing 2-3/8 inside diameter BW casing driven with a 300 pound weight falling 24 inches. Soil samples were obtained by driving a 1-3/8 inch inside diameter split spoon sampler with a 140 pound weight falling 30 inches. No rock cores were taken.

All borings except B-1 and B-4 were drilled by Contractors under contract to CDR Maguire Inc. CDR Maguire Inc. was responsible for the development, layout, inspection and analysis of the boring program. The Engineer's logs of all borings (except B-1 and B-4) are included

in the Appendix of this report. File logs of borings B-1 and B-4 are also included in the Appendix.

III. SUBSURFACE SOIL AND ROCK CONDITIONS

The subsurface soil and rock conditions for the Mattabessett Regionalization Project, Middletown Gravity Sewer and Force Main (Extension) will be discussed below. Reference should be made to the series of generalized soil profiles developed from the results of the subsurface explorations and laboratory soil testing which show the basic pattern of soil deposits and rock found along the proposed alignment. These profiles are shown in Figures 2 through 4 in the Appendix of this report. The following proportions are used in all soil descriptions: trace = 1% to 10%; little = 11% to 20%; some = 21% to 35%; and = 36% to 50%.

Three major soil strata are present along most of the proposed alignment of the proposed gravity sewer and force main. The following is a generalized description of the soils encountered from the surface downward.

- A stratum of red-brown and brown fine to medium sand containing some silt, a little gravel and traces of miscellaneous fill material. Up to 18 feet thick. Blow counts on the split spoon sampler indicate that the relative density of this soil varies from loose to very dense with most of the samples obtained being within the loose to medium dense range. Most of this stratum consists of artificially placed fill.

- A deposit of loose red-brown, brown and grey nonplastic silt containing trace amounts of fine sand, clay and organic material ranging in depth from about 5 feet to in excess of 40 feet. The silt stratum is absent between approximately stations 3+00 to 4+00 along the gravity sewer baseline.

- A stratum of a medium dense to dense brown and red-brown fine to coarse sand containing some silt and a little gravel up to 18 feet thick in the vicinity of station 3+50 but generally less than 10 feet thick.

Below the sand stratum is bedrock composed of red-brown siltstone. The top several feet of the rock is highly weathered with the weathering generally decreasing with depth.

levels will vary with the water levels in the Connecticut River which flows from north to south a short distance to the east of the proposed gravity sewer and force main alignment.

IV. FOUNDATION ANALYSIS AND RECOMMENDATIONS

A foundation analysis and recommendations for design and construction of the Mattabessett Regionalization Project, Middletown Gravity Sewer and Force Main (Extension) are presented below. Referring to the following analyses, conclusions and recommendations without referring to the several features previously discussed may result in interpreting certain statements out of context with the desired meaning. References to the preceding discussions, knowledge of the field geological conditions and an interpretative judgment based on the actual appearance and behavior of the subsurface soils comprising the foundation materials are all necessary prior to the most beneficial use of these conclusions and recommendations. With respect to the above presumption, the following analyses, conclusions and recommendations are presented for the work within the project limits.

As presently proposed, the gravity sewer and appurtenant structures will bear on the indicated soils within the following approximate station limits.

Stations 0+00 to 2+25 – artificial fill

Stations 2+25 to 2+75 – loose silt

Stations 2+75 to 4+50 – medium dense to dense silty, gravelly sand

Stations 4+50 to 5+00 – loose silt

Stations 5+00 to 6+75 – artificial fill

Stations 6+75 to 8+50 – loose silt

Stations 8+50 to 10+00 – artificial fill

Stations 10+00 to 10+60 – loose silt

Stations 10+60 to 11+20 – medium dense to dense silty, gravelly sand

Stations 11+20 to 14+75 – highly weathered siltstone bedrock

Stations 14+75 to 17+25 – medium dense to dense silty, gravelly sand

Stations 17+25 to 21+00 – loose silt

Stations 21+00 to 23+00 – artificial fill

Stations 23+00 to 25+57 – loose silt

As presently proposed, the southern end of the proposed force main will bear on artificial fill or silty, gravelly sand except in the area of the Sumners Creek crossing where it will bear on loose silt.

The results of the laboratory testing performed on similar soils at the proposed new sewage pump station site and more northerly portions of the proposed force main indicate that all of the natural soils present along the proposed gravity sewer and force main alignments are incompressible, non plastic soils containing only trace amounts of organic material and clay-size particles. Therefore, with the exception of the artificial fill, all of these soils will provide suitable foundation support for the proposed pipes and appurtenant structures. The artificial fill is of highly variable makeup and density and contains significant amounts of ash, cinder, broken brick and concrete in some locations and is, therefore, considered unsuitable for support of the pipes and appurtenant structures. In all areas where artificial fill is present at the proposed foundation grade, it is recommended that the fill be excavated to its full depth and be replaced with compacted granular fill prior to placement of the bedding material.

While the silts will provide adequate support for the pipes and appurtenant structures, when saturated, these soils will be very sensitive to liquefaction if subjected to vibrations during construction, Therefore, it is extremely important that proper techniques for dewatering of the excavations and compaction of the bedding material and trench backfill be utilized during construction. The groundwater levels observed at the time of completion of the borings indicate that the natural groundwater levels will be near or above the bottom of excavation during all pipe installation. Therefore, dewatering of the excavations will be required during construction. To avoid possible instability of the foundation soils during construction, it is recommended that wellpoints or dewatering wells be installed and pumped to lower the water table in the vicinity of construction operations. Pumping from within the excavation without the use of wellpoints or dewatering wells will likely be ineffective in obtaining a stable bottom of excavation during placement and compaction of the bedding material and pipe installation. The contractor will be responsible for the design, construction and operation of

all dewatering systems utilized. In addition, it is strongly recommended that static compaction methods be utilized when compacting all bedding and trench backfill.

Much of the gravity sewer and force main will be constructed within River Road, Union Street and East Main Street close to numerous existing utilities. The contractor will be responsible for the design and installation of trench support systems in these areas adequate to protect and maintain all existing roadways and utilities in their current location and condition during all construction operations. Design of all proposed trench support systems shall be subject to review and approval of the engineer and the Connecticut Department of Transportation. The minimum factor of safety to be utilized in the design is 1.25. It is anticipated that, due to the trench width and close proximity to existing utilities and roadways, braced timber or steel sheeting will be required in most areas.

It is anticipated that some provision must be made for thrust restraint along the force main proposed for this project. Normally, either a concrete thrust block utilizing the passive resistance of the soils in front of the block or the skin friction between the pipe and the surrounding soil are utilized for this purpose. If concrete thrust blocks are utilized on this project, it is recommended that they be designed to resist a total of 540 pounds of thrust per square foot of face. All backfill around the thrust blocks must consist of well graded granular soil compacted to 95 percent of maximum dry density. If skin friction between the pipe and surrounding soils is utilized, it is recommended that a value of thrust restraint equal to 50 pounds per square foot of pipe surface be utilized. If skin friction is used for thrust restraint it is extremely important that the bedding and trench backfill material be properly placed and compacted around the pipe. The use of restrained joint pipe is also necessary.

The design water table for this project is the 100 year flood elevation on the adjacent Connecticut River. To prevent floatation of the force main when empty, the minimum recommended cover is 6.0 feet.

Based upon the results the subsurface investigations performed, the gravity sewer will bear up to 4.0 feet below the bedrock surface between approximately stations 11+20 to 14+75. The top 6 to 9 feet of bedrock in this area is highly weathered and can likely be excavated utilizing standard excavating equipment. If, however, some of the rock cannot be excavated utilizing standard excavation methods, additional mechanical methods shall be employed to remove the rock to the required grade. Blasting of the rock will **NOT** be allowed on this project.

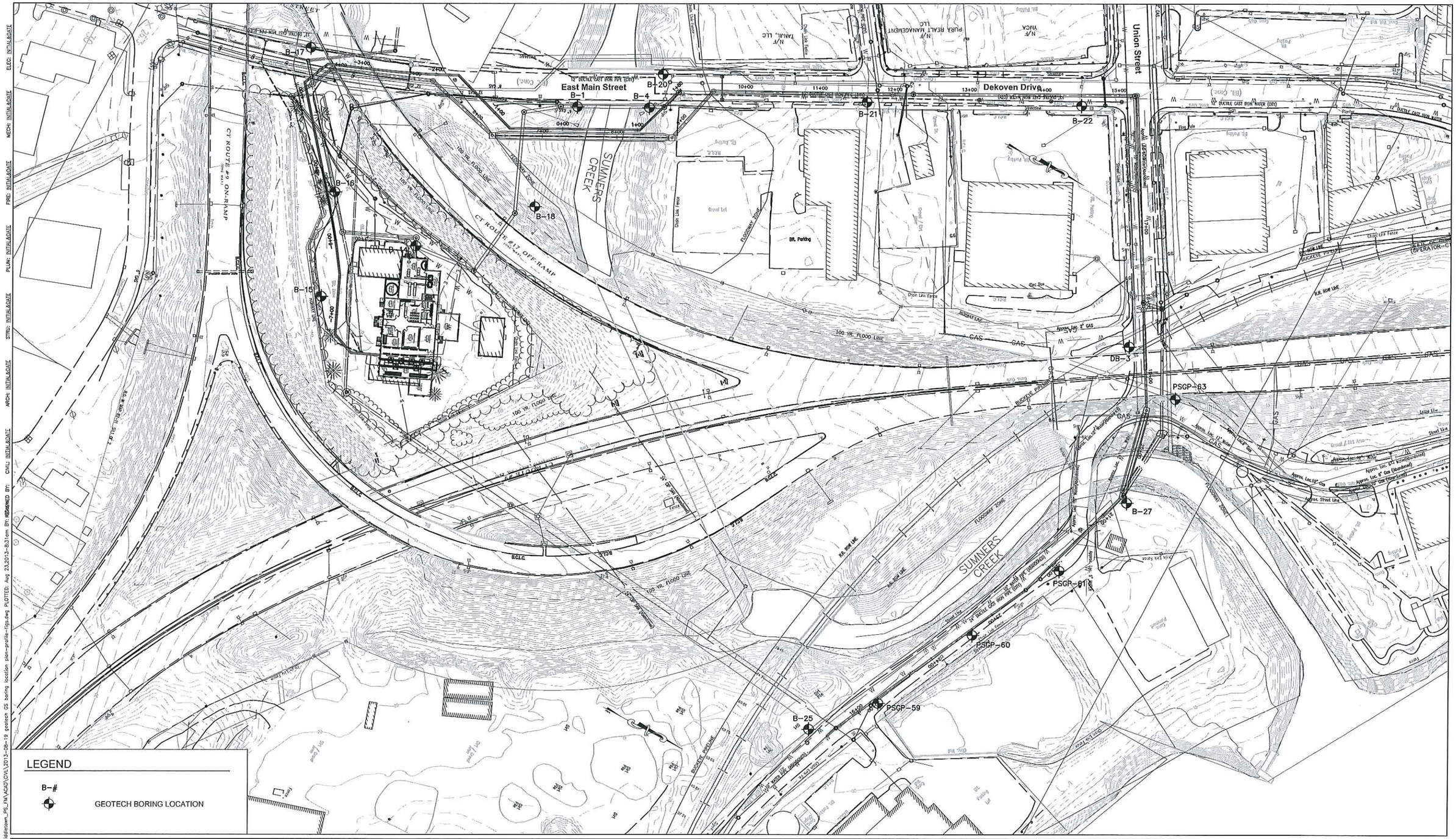
It is recommended that a minimum of 6 inches of bedding material consisting of well graded coarse grained soil be provided beneath the proposed pipes. A well graded coarse grained soil should also be placed outside the pipes for the full trench width and extending to a minimum of one (1) foot above the pipe in unpaved areas. All of the above referenced bedding and backfill material should be compacted to 95 percent of maximum dry density using static compaction methods for reasons previously indicated. Vibratory compaction methods are not recommended for use on this project. In unpaved areas, the remainder of the trench may be backfilled with excavated material compacted to 90 percent of maximum dry density. In all paved areas, the entire trench should be backfilled with well graded granular soil compacted to 95 percent of maximum dry density. Crushed stone is not recommended for use as pipe bedding or trench backfill on this project.

No compressible material or material containing significant amounts of ash, cinder, broken brick, concrete or other objectionable materials should be used as backfill and all waste material must be discarded outside the project limits. In addition, all waste material characterized as controlled material as a result of the environmental investigations completed for this project must be disposed of at an approved disposal/recycling facility. If construction is to take place during the winter months, all ice, snow and frozen material will be considered unsuitable for use as trench backfill.

The Contractor will be required to maintain all existing utilities in their present location and condition during all construction operation. Care should also be taken to prevent pollution and silting of all streams and wetlands adjacent to the project site to the greatest possible extent.

It is recommended that all gravel, crushed stone and pavement materials utilized on this project conform to the City of Middletown specifications referencing State of Connecticut, Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 816, including all addenda thereto.

APPENDIX



LEGEND

B-#

GEOTECH BORING LOCATION

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

CDR MAGUIRE
2080 Silas Deane Highway
Rocky Hill, CT 06067

MARK	DATE	DESCRIPTION	BY	APP'D

PROJECT NO.:	14712.02
DESIGNED BY:	DRS
DRAWN BY:	CAD
CHK'D BY:	
DATE:	08/19/13
SCALE:	1" = 60'

GRAVITY SEWERS AND FORCE MAIN
MIDDLETOWN, CONNECTICUT

INTERCEPTOR GRAVITY SEWER
ALT. 1 – RIVER RD, UNION ST, E. MAIN ST.
GEOTECH BORING LOCATION PLAN

SHEET NO.

FIG – 1

SHEET 1 OF 4

DRAWING FILE: G:\JOBS\14712.01-Middletown_PS_FM\ACAD\CIVIL\2013-08-19 geotech GS boring location plan-profile-figs.dwg PLOTTED: Aug 23,2013-8:31am BY: REDRAWED BY:
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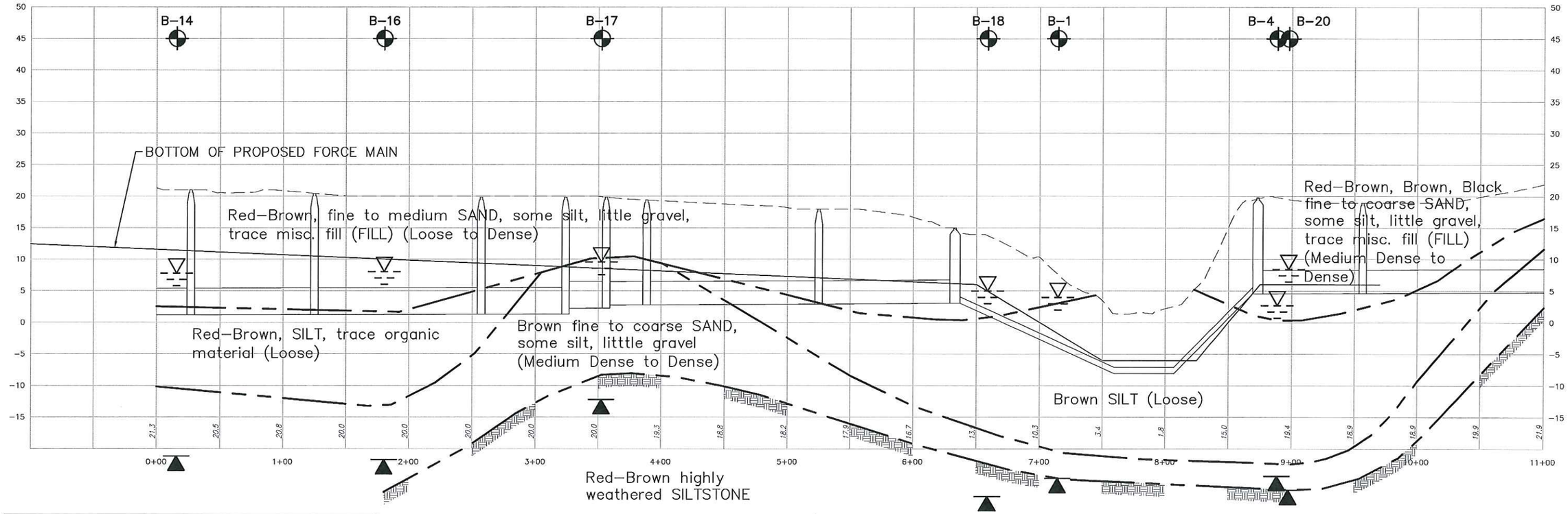

GEOTECHNICAL LEGEND

- BORING LOCATION
- REPORTED GROUNDWATER
- BOTTOM OF BORING
- APPROX. STRATA CHANGE
- APPROX. TOP OF BEDROCK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

HOR. SCALE IN FEET 0 40

VER. SCALE IN FEET 0 8

CDR MAGUIRE
2080 Silas Deane Highway
Rocky Hill, CT 06067

MARK	DATE	DESCRIPTION	BY	APP'D

PROJECT NO.:	14712.02
DESIGNED BY:	DRS
DRAWN BY:	CAD
CHK'D BY:	
DATE:	08/19/13
SCALE:	AS NOTED

GRAVITY SEWERS AND FORCE MAIN
MIDDLETOWN, CONNECTICUT

INTERCEPTOR GRAVITY SEWER
ALT. 1 – RIVER RD, UNION ST, E. MAIN ST.
GEOTECH GENERALIZED SOIL PROFILE

SHEET NO.
FIG–2
SHEET 1 OF 4

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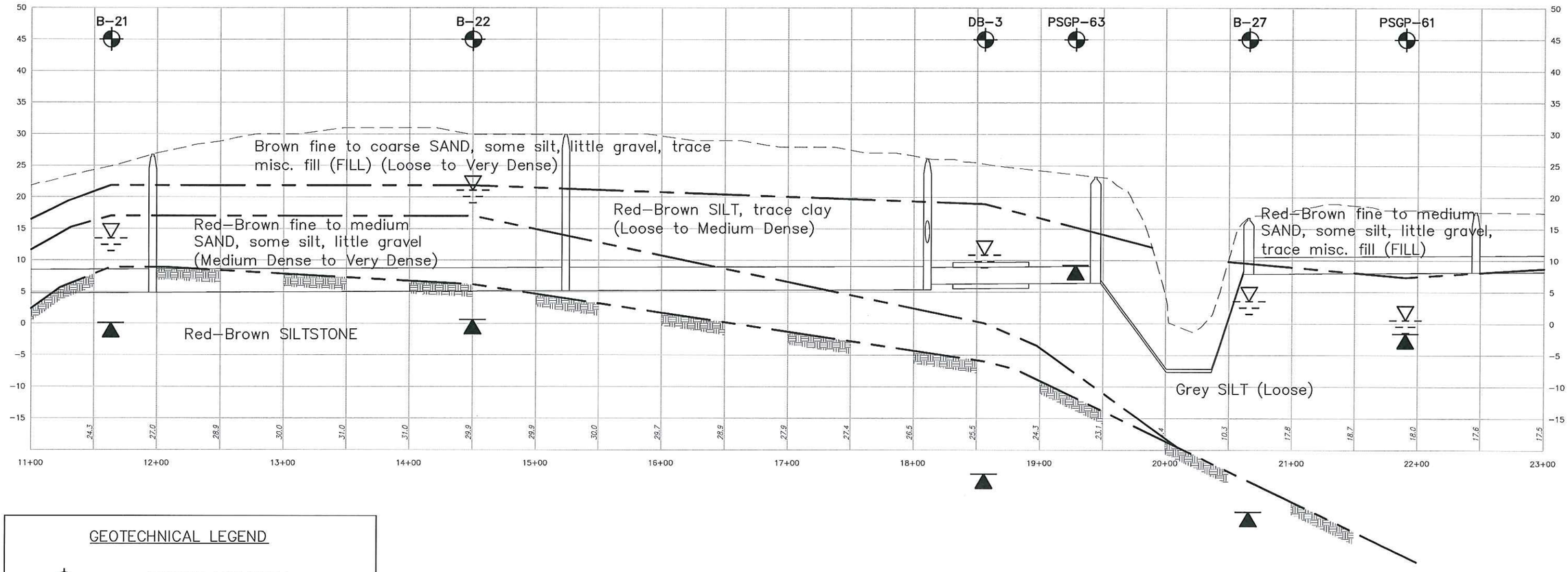

GEOTECHNICAL LEGEND

- BORING LOCATION
- REPORTED GROUNDWATER
- BOTTOM OF BORING
- APPROX. STRATA CHANGE
- APPROX. TOP OF BEDROCK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

HOR. SCALE IN FEET 0 40
VER. SCALE IN FEET 0 8

CDR MAGUIRE
2080 Silas Deane Highway
Rocky Hill, CT 06067

MARK	DATE	DESCRIPTION	BY	APP'D

PROJECT NO.:	14712.02
DESIGNED BY:	DRS
DRAWN BY:	CAD
CHK'D BY:	
DATE:	08/19/13
SCALE:	AS NOTED

GRAVITY SEWERS AND FORCE MAIN
MIDDLETOWN, CONNECTICUT

INTERCEPTOR GRAVITY SEWER
ALT. 1 - RIVER RD, UNION ST, E. MAIN ST.
GEOTECH GENERALIZED SOIL PROFILE

SHEET NO.
FIG-3
SHEET 1 OF 4

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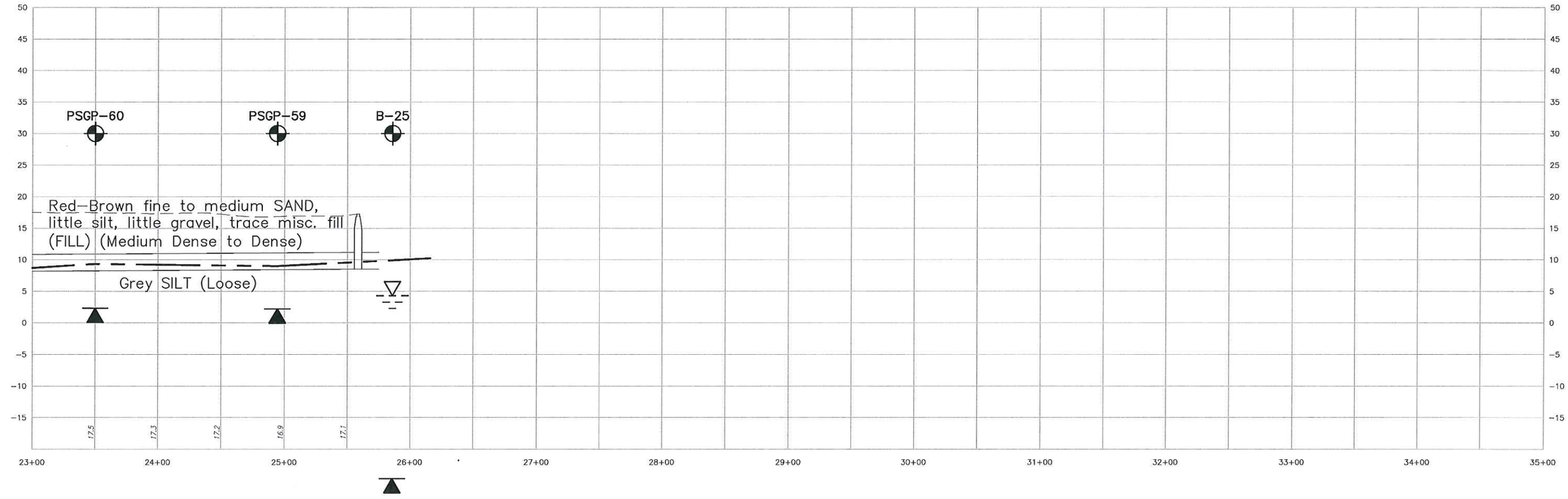

GEOTECHNICAL LEGEND

- BORING LOCATION
- REPORTED GROUNDWATER
- BOTTOM OF BORING
- APPROX. STRATA CHANGE
- APPROX. TOP OF BEDROCK

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

HOR. SCALE IN FEET 0 40
VER. SCALE IN FEET 0 8

CDR MAGUIRE
2080 Silas Deane Highway
Rocky Hill, CT 06067

MARK	DATE	DESCRIPTION	BY	APP'D

PROJECT NO.:	14712.02
DESIGNED BY:	DRS
DRAWN BY:	CAD
CHK'D BY:	
DATE:	08/19/13
SCALE:	AS NOTED

GRAVITY SEWERS AND FORCE MAIN
MIDDLETOWN, CONNECTICUT

INTERCEPTOR GRAVITY SEWER
ALT. 1 – RIVER RD, UNION ST, E. MAIN ST.
GEOTECH GENERALIZED SOIL PROFILE

SHEET NO.
FIG-4
SHEET 1 OF 4

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BORING CONTRACTOR: Soiltesting Inc.
90 DONAVAN RD OXFORD CT.

LOG PREPARED BY: CONTR. _____ CDR RL

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Municipal Force Main Pump Station
CDR NO. 14712.02 OFFICE: Rocky Hill Ct.

SHEET 1 OF 1
LOCATION: See Plan
HOLE NO: B-14
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS
AT 13 FT. After 0 HOURS
AT N/A FT. After N/A HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.	H.S.A.			
TYPE			SS	
SIZE I.D.	4.25"		1 3/8	
HAMMER WT.			140	
HAMMER FALL			30"	

SURFACE ELEV. 20.7
DATE STARTED-FINISHED: 2/19/2013
BORING FOREMAN: Matt DeAngelis
INSPECTOR: R. Lindenberger
SOILS ENGR: D. Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - TO 0-6	6-12	12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
		0'-2'	SS	34	26	14	Dry	Red Br. f-c SAND, little Gravel, tr. Silt. (FILL)	1	24"	18"
				12			Dense				
5		5'-7'	SS	8	5	4	Moist		2	24"	6"
				5			Loose	Red Br. f-c SAND, some Gravel, little Silt. (FILL)			
10		10'-12'	SS	8	10	3	Moist		3	24"	12"
				3			Loose	Red Br. f-m SAND and SILT, tr. Gravel. (FILL)			
15		15'-17'	SS	2	1	2	Wet	Red Br. SILT, some f-c Sand, tr. Gravel. (FILL)	4	24"	17"
				10			Loose				
							18'				
20		20'-22'	SS	2	4	5	Wet	Red Br. SILT	5	24"	21"
				6			Loose				
25		25'-27'	SS	3	3	5	Wet	Dark brown ORGANIC SILT.	6	24"	24"
				5			Loose				
							Wet				
30		30'-32'	SS	3	7	8	Med. Dense	Drk. Br. ORGANIC SILT.	7	24"	20"
				8			31'				
								Br. f-c SAND, little Silt, tr. Organics.			
35		35'-37'	SS	4	6	10			8	24"	22"
				10			Wet	Gry. Br. f-c SAND, tr. Silt, tr. Gravel.			
							Med. Dense				
							Wet				
40		40'-42'	SS	5	10	7	Med. Dense	Br. f-c SAND and SILT, little Gravel.	9	24"	12"
				8			42'				
								Bottom of boring.			
34	26	14									

GROUND SURFACE TO 40 FT. Used H.S.A. : CASING TO _____ FT.
D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST
UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		42
FOOTAGE IN ROCK		0
NO. OF SAMPLES		9
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc.

LOG PREPARED BY: CONTR. _____ CDR RL

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Municipal Force Main Pump Station
CDR NO. 14712.02 OFFICE: Rocky Hill Ct.

SHEET 1 OF 1
LOCATION: See Plan
HOLE NO: B-16
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS

AT 12 FT. After 0 HOURS
AT _____ FT. After _____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.	H.S.A.			
TYPE			SS	
SIZE I.D.	4.25"		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30"	

SURFACE ELEV. 19.8
DATE STARTED-FINISHED: 2/19/2013
BORING FOREMAN: Matt DeAngelis
INSPECTOR: R. Lindenberger
SOILS ENGR: D. Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - TO 0-6	6-12	12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
		0'-2'	SS	19	17	16	Dry	ASPHALT, GRAVEL.	1	24"	17"
				17			Med. Dense	Red Br. f-c SAND, some Silt, little Gravel. (FILL)			
								BOULDER			
5		5'-7'	SS	15	8	3	Dry Loose	Red Br. f-m SAND and SILT, little Gravel. (FILL)	2	24"	14"
				4							
							Moist				
10		10'-12'	SS	2	3	2	Loose	Red Br. f-m SAND, some Silt, little Gravel. (FILL)	3	24"	9"
				2							
							Wet				
15		15'-17'	SS	1	2	3	Loose		4	24"	17"
				3				Red Br. f-c SAND, little Silt, tr. Gravel. (FILL)			
							18'				
20		20'-22'	SS	3	4	5	Wet loose		5	24"	22"
				7				Red br. SILT			
25		25'-27'	SS	2	3	4	Wet Loose	Red Br. SILT, little Wood.	6	24"	18"
				5							
30		30'-32'	SS	2	3	3	Wet Loose	Gry. Br. SILT	7	24"	7"
				4			33'				
35		35'-37'	SS	7	11	28	Wet Dense	Red Br. f-m SAND, some Silt, tr. Gravel, tr. Cobbles.	8	24"	10"
					59						
40		40'-42'	SS	25	31	36	Wet Very Dense	Red Br. f-c SAND and GRAVEL, little Silt.	9	24"	14"
				41			42'				
							42'	Bottom of boring.			

GROUND SURFACE TO 40 FT. Used H.S.A. " CASING: THEN _____ : CASING TO _____ FT.
D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST
UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		42
FOOTAGE IN ROCK		0
NO. OF SAMPLES		9
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc. 90 DONAVAN RD Oxford ct. **LOG PREPARED BY:** CONTR. _____ CDR RL	**CDR MAGUIRE INC.** **ENGINEERS** **BORING LOG** **TOWN, STATE:** Middletown Ct. **PROJECT NAME:** Middletown Municipal Force Main Pump Station **CDR NO.** 14712.02 **OFFICE:** Rocky Hill Ct.	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-17 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS		**AUGER**	**CASING**	**SAMPLER**	**CORE**	
AT 11 FT. After 0 HOURS	**BAR.**	H.S.A.				**SURFACE ELEV.** 20.75
	TYPE			SS		**DATE STARTED-FINISHED:** Feb 28 2013
	SIZE I.D.	4.25"		1 3/8		**BORING FOREMAN:** Matt DeAngelis
AT _____ FT. After _____ HOURS	**HAMMER WT.**			140	**BIT.**	**INSPECTOR:** R. Lindenberger
	HAMMER FALL			30"		**SOILS ENGR:** D. Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM 0-6	- 6-12	TO 12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	3	10	10		6" TOPSOIL	1	24"	6"
				7			Dry	Red Br. f-m SAND, some Silt, tr. Gravel. (FILL)			
							Med. dense				
5		5'-7'	SS	3	4	7	Dry	Red Br. f-m SAND, some Silt, little Cinders	2	24"	7"
				6			Med. Dense	little Brick frag. (FILL)			
10		10'-12'	SS	7	1	1	Moist Loose	SMALL BOULDER	3	24"	12"
				2			10.5				
								Red Br. f-c SAND, some Silt.			
							Wet				
15		15'-17'	SS	5	11	12	Med. Dense	Br. f-m SAND, some Silt.	4	24"	15"
				13							
							19'				
20		20'-22'	SS	5	10	12	Wet	Br. f-m SAND, some silt, tr. Gravel.	5	24"	18"
				13			Med. Dense				
							Wet Very				
25		25'-27'	SS	33	41	34	Dense	Br. f-m SAND, some Silt, tr. Gravel.	6	24"	13"
				51							
							29'				
30		30'-32'	SS	13	33	30	29'-33'	Red Br. Weathered Bedrock.	7	24"	14"
				50/4"			Wet Very	SILTSTONE.			
							Dense				
							33'	Auger refusal			

GROUND SURFACE TO 33 FT. Used H.S.A. " CASING: THEN _____ : CASING TO _____ FT.

D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST

UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD

PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		33
FOOTAGE IN ROCK		0
NO. OF SAMPLES		7
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc. 90 DONAVAN RD Oxford ct. **LOG PREPARED BY:** CONTR. _____ CDR RL	**CDR MAGUIRE INC.** **ENGINEERS** **BORING LOG** **TOWN, STATE:** Middletown Ct. **PROJECT NAME:** Middletown Municipal Force Main Pump Station **CDR NO.** 14712.02 **OFFICE:** Rocky Hill Ct.	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-18 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS

AT 8.5 FT. After 0 HOURS

AT _____ FT. After _____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.	H.S.A.			
TYPE			SS	
SIZE I.D.	4.25"		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30"	

SURFACE ELEV. 14
DATE STARTED-FINISHED: FEB 25 2013
BORING FOREMAN: Matt DeAngelis
INSPECTOR: R. Lindenberger
SOILS ENGR: D. Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - TO 0-6	6-12	12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	24	18	19	Dry	Br. f-m SAND, some Silt. few Cobbles, tr.	1	24"	6"
				14			Dense	Concrete, Wood, Glass, (FILL)			
5		5'-7'	SS	21	19	10	Moist	Red Br. Blk. f-c SAND, little Gravel, some Silt.	2	24"	14"
				14			Med. dense	(FILL)			
							Wet				
10		10'-12'	SS	5	5	5	Med. dense	Red Br. f-m SAND, little Silt, little Gravel.	3	24"	10"
				2				(FILL)			
							13'				
							Wet				
15		15'-17'	SS	3	3	5	Loose	Br. SILT.	4	24"	24"
				5							
							Wet				
20		20'-22'	SS	3	3	4	Loose	Br. SILT.	5	24"	24"
				4							
							Wet				
25		25'-27'	SS	2	5	5	Loose	Br. SILT.	6	24"	24"
				5							
							Wet				
30		30'-32'	SS	3	4	5	Loose	Br. SILT.	7	24"	24"
				9			31'				
								Br. f-m SAND, little Silt.			
							Wet				
35		35'-37'	SS	2	6	9		Br. f-c SAND, little Gravel, tr. Silt.	8	24"	12"
				9			Med. Dense				
							Wet				
40		40'-42'	SS	12	19	14	Dense	Br. f-c SAND, some Silt, tr. Gravel.	9	24"	10"
				18			42'				
								Bottom of boring			

GROUND SURFACE TO 40 FT. Used H.S.A. " CASING: THEN _____ : CASING TO _____ FT.

D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST

UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD

PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		42
FOOTAGE IN ROCK		0
NO. OF SAMPLES		9
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc.	**CDR MAGUIRE INC.**	**SHEET** 1 OF 1	
90 DONAVAN RD Oxford ct.	**ENGINEERS**	**LOCATION:** See Plan	
	BORING LOG	**HOLE NO:** B-20	
LOG PREPARED BY:	**TOWN, STATE:** Middletown Ct.	**BORING TYPE:** A	
CONTR. ____ **CDR** RL	**PROJECT NAME:** Middletown Municipal Force Main Pump Station	**LINE & STA:** N/A	
	CDR NO. 14712.02 **OFFICE:** Rocky Hill Ct.	**OFFSET:** N/A	

GROUND WATER OBSERVATIONS

AT 10 FT. After 0 HOURS

AT ____ FT. After ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.	H.S.A.			NX
TYPE				
SIZE I.D.	4.25"		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30"	

SURFACE ELEV. 18.45
DATE STARTED-FINISHED: 2/25/2013
BORING FOREMAN: Matt DeAngelis
INSPECTOR: R. Lindenberger
SOILS ENGR: D. Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - TO 0-6	6-12	12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	27	24	7		4" ASPHALT	1	24"	13"
				14				8" GRAY BROWN PROCESSED GRAVEL			
							Med. Dense	Red Br. f-c SAND, little Silt, little f Gravel. (FILL)			
5		5'-7'	SS	10	14	10	Med. dense	Brown f-c SAND, some Gravel, little Silt,	2	24"	2"
				10				few Cobbles. (FILL)			
							Wet				
10		10'-12'	SS	7	11	6	Med. Dense	Br. Blk. f-m SAND, some Silt, little Cinders,	3	24"	6"
				2				Wood, tr. Glass. (FILL)			
15		15'-17'	SS	10	17	19		Red Br. f-c SAND, some Silt.	4	24"	16"
				19			Wet				
							Dense				
							18'				
20		20'-22'	SS	4	5	6	Med. Dense	Drk. Br. SILT.	5	24"	24"
				6			Wet				
							Wet				
25		25'-27'	SS	WOH	3	4	Loose	Drk. Br. SILT.	6	24"	24"
				4							
							Wet				
30		30'-32'	SS	2	2	4	Loose	Gry. Br. SILT.	7	24"	24"
				4							
							Wet				
35		35'-37'	SS	1	2	5	Loose	Gry. Br. SILT.	8	24"	24"
				6							
							Wet				
40		40'-42'	SS	2	7	56	Loose	Red Br. f-c SAND, some Silt, little Gravel.	9	24"	22"
				32			41'				
							Wet				
45		42'-45'2"	SS	50/2"			Very Dense	Highly weathered SILTSTONE	10	2"	2"
							45'2"	BOTTOM OF BORING			

GROUND SURFACE TO 45 FT. Used H.S.A. " CASING: THEN ____ : CASING TO ____ FT.
D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST
UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		45
FOOTAGE IN ROCK		0
NO. OF SAMPLES		10
HOLE NO.	TYPE	A

BORING CONTRACTOR: Soiltesting Inc. 90 DONAVAN RD Oxford ct. **LOG PREPARED BY:** CONTR. _____ CDR RL	**CDR MAGUIRE INC.** **ENGINEERS** **BORING LOG** **TOWN, STATE:** Middletown Ct. **PROJECT NAME:** Middletown Municipal Force Main Pump Station **CDR NO.** 14712.02 **OFFICE:** Rocky Hill Ct.	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-21 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS

AT 11.5 FT. After 0 HOURS

AT _____ FT. After _____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.	H.S.A.			
TYPE				
SIZE I.D.	4.25"		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30"	

SURFACE ELEV. 25
DATE STARTED-FINISHED: FEB 22 2013
BORING FOREMAN: Matt DeAngells
INSPECTOR: R. Lindenberger
SOILS ENGR: D.Stock

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM 0-6	- 6-12	TO 12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	3	2	8	Dry	6" TOPSOIL	1	24"	13"
				10			Med. Dense	Br. f-m SAND, some Silt, tr. Gravel.			
							3'				
							Dry				
5		5'-7'	SS	7	8	12	Med. dense	Red Br. SILT, little Clay.	2	24"	23"
				12							
							8'				
							Wet Very				
10		10'-12'	SS	40	30	28	Dense	Red Br. f-c SAND, some Silt, little Gravel.	3	24"	14"
				36							
							Wet Very				
15		15'-16'3"	SS	14	15	50/3"	Dense	Red Br f-c SAND, some Silt, little Gravel.	4	15"	6"
							16'				
							Wet Very	Red Br. Weathered SILTSTONE			
20		20'-20'2"	SS	100/2"			Dense		5	2"	2"
25							25'				
								Auger refusal Bottom of boring			

GROUND SURFACE TO 25 FT. Used H.S.A. " CASING: THEN _____ : CASING TO _____ FT.
D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST
UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		25
FOOTAGE IN ROCK		0
NO. OF SAMPLES		5
HOLE NO.	TYPE	A

BORING CONTRACTOR: Soiltesting Inc. 90 DONAVAN RD Oxford ct. **LOG PREPARED BY:** CONTR. _____ CDR RL	**CDR MAGUIRE INC.** **ENGINEERS** **BORING LOG** **TOWN, STATE:** Middletown Ct. **PROJECT NAME:** Middletown Municipal Force Main Pump Station **CDR NO.** 14712.02 **OFFICE:** Rocky Hill Ct.	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-22 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE	**SURFACE ELEV.** 30
AT 9 FT. After 0 HOURS	BAR.	H.S.A.				**DATE STARTED-FINISHED:** FEB 22 2013
	TYPE			SS		**BORING FOREMAN:** Matt DeAngelis
AT _____ FT. After _____ HOURS	SIZE I.D.	4.25"		1 3/8		**INSPECTOR:** R. Lindenberger
	HAMMER WT.			140	BIT.	**SOILS ENGR:** D.Stock
	HAMMER FALL			30"		

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM 0-6	- 6-12	TO 12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	2	4	5	Dry	TOPSOIL	1	24"	4"
				4			Loose	Red Br. f-c SAND, some Silt, little Gravel.			
							Moist				
5		5'-7'	SS	26	21	36	Very dense	Br. f-c SAND, little Silt, little Gravel.	2	24"	6"
				13							
							8'				
							Wet	Red Br. SILT, some Clay.			
10		10'-12'	SS	3	3	3	Loose		3	24"	12"
				3							
							13'				
							Wet	Red Br. f-m SAND, some Silt, little Gravel.			
15		15'-17'	SS	10	7	15	Med. Dense		4	24"	17"
				22							
							Wet				
20		20'-22'	SS	14	24	35	Very Dense	Red Br. f-m SAND some Silt, tr. Gravel.	5	24"	22"
				37							
							24'				
25		25'-27'	SS	50/4"			Wet Very Dense	Red Br. Weathered SILTSTONE.	6	4"	4"
							Wet Very Dense				
30		30'-32'	SS	50/1"			30'1"	Red Br. Weathered SILTSTONE.	7	1"	1"
							30'1"	Auger refusal Bottom of boring			

GROUND SURFACE TO 30 FT. Used H.S.A. " CASING: THEN _____ : CASING TO _____ FT.

D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST

UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD

PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH	30
FOOTAGE IN ROCK	0
NO. OF SAMPLES	7
HOLE NO. / TYPE	

BORING CONTRACTOR: Soiltesting Inc. 90 DONAVAN RD Oxford ct. **LOG PREPARED BY:** **CONTR.** ____ **CDR** RL	**CDR MAGUIRE INC.** **ENGINEERS** **BORING LOG** **TOWN, STATE:** Middletown Ct. **PROJECT NAME:** Middletown Municipal F Main Pump Station **CDR NO.** 14712.02 **OFFICE:** Rocky Hill Ct.	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-25 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS							
AT 13 **FT. After** 0 **HOURS**		**AUGER**	**CASING**	**SAMPLER**	**CORE**	**SURFACE ELEV.**	16.15
AT ____ **FT. After** ____ **HOURS**	**BAR.**	H.S.A.				**DATE STARTED-FINISHED:**	FEB 24/25 2013
	TYPE			SS		**BORING FOREMAN:**	Matt DeAngelis
	SIZE I.D.	4.25"		1 3/8		**INSPECTOR:**	R. Lindenberger
	HAMMER WT.			140	**BIT.**	**SOILS ENGR:**	D.Stock
	HAMMER FALL			30"			

LOCATION OF BORING: See Plan

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM 0-6	- 6-12	TO 12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	SS	11	13	11	Med. Dense	Red Br. f-c SAND, little Gravel, little Silt.	1	24"	6"
				14							
5		5'-7'	SS	7	8	6	Med. Dense	Red Br. f-c SAND, little Gravel, little Silt.	2	24"	14"
				8			7'				
10		10'-12'	SS	WOH	WOH	WOH	Loose	Br. SILT.	3	24"	10"
				1							
15		15'-17'	SS	1	1	1	Loose	Br. SILT.	4	24"	24"
				1							
20		20'-22'	SS	1	2	1	Loose	Gry. Br. SILT	5	24"	24"
				1							
25		25'-27'	SS	WOH	1	2	Loose	Gry. Br. SILT	6	24"	24"
				3			29'				
30		30'-32'	SS	2	1	2	Loose	Gry. SILT.	NR	24"	0"
				1							
35		35'-37'	SS	4	6	6	Med. Dense	Gry. SILT.	7	24"	12"
				9							
40		40'-42'	SS	2	4	5	Med. Dense	Gry. SILT.	8	24"	10"
				6			42'				
								BOTTOM OF BORING			

GROUND SURFACE TO 42 **FT. Used** H.S.A. **" CASING: THEN** ____ **: CASING TO** ____ **FT.**		**FOOTAGE IN EARTH**	42
D = DRY W = WASHED **C = CORED** **P = PIT** **A = AUGER** **V = VANE TEST**		**FOOTAGE IN ROCK**	0
UP = UNDISTURBED, PISTON **UB = UNDISTURBED, BALL CHECK** **OER = OPEN END ROD**		**NO. OF SAMPLES**	8
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%		**HOLE NO.**	**TYPE** B

BORING CONTRACTOR:	CDR MAGUIRE INC.	SHEET 1 OF 1	
General Borings Inc.	2080 SILAS DEANE HIGHWAY	LOCATION: River Road	
PO Box 7135	ROCKY HILL, CT 06067	HOLE NO: B-27	
Prospect, CT 06712	TOWN, STATE: Middletown, CT	BORING TYPE: B	
LOG PREPARED BY:	PROJECT NAME: Mattabassett Regionalization Project	STA: 20+66	
CONTR. ___ CDR X	CDR NO. 14712.02 OFFICE: Rocky Hill, CT	OFFSET: 10' LT	

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
	BAR.					SURFACE ELEV.	+17.25
AT 14.0 FT. After 0 HOURS	TYPE	HSA		SS		DATE STARTED-FINISHED	6/28/13
	SIZE I.D.	4¼"		1⅜"		BORING FOREMAN:	John Wyant
AT ___ FT. After ___ DAYS	HAMMER WT.			140 lbs	BIT.	INSPECTOR:	Michael Bazzano
	HAMMER FALL			30"		SOILS ENGR:	David Stock
						Note: MR = Mud Rotary	

LOCATION OF BORING: Northing: 764141 Easting: 1027173

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - 0-6	6-12	TO 12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		0'-2'	D	8	12	25		2" TOPSOIL	1	24"	16"
				25			Moist	Red-br. f-m SAND, some gravel, little			
							Dense	silt (FILL)			
5		5'-7'	D	22	20	10	Moist	Red-br. f-m SAND, some silt, tr. gravel,	2	24"	22"
				11			Dense	ash and cinders.			
							8.0				
							+9.25				
10		10'-12'	D	3	3	1	Moist	Red-br. SILT, some f-sand	3	24"	12"
				1			Loose				
15		15'-17'	D	1	1	3	Wet	Gray SILT, some f-sand	4	24"	24"
				3			Loose				
20		20'-22'	D	1	3	5	Wet	Gray SILT, little f-sand	5	24"	24"
				7			Loose				
25		25'-27'	D	2	2	3	Wet	Gray SILT, little f-sand, tr. clay	6	24"	24"
				3			Loose				
30		30'-32'	D	1	2	5	Wet	Gray SILT, little f-sand, tr. clay	7	24"	24"
				6			Loose				
35		35'-37'	D	1	2	4	Wet	Gray-br. SILT and f-SAND, tr. organic	8	24"	24"
				5			Loose	material			
40		40'-42'	D	2	2	2	Wet	Gray SILT, little f-sand, tr. Organic material	9	24"	15"
				10			Loose				
							43.0				
							-25.75	Red-br. Highly weathered SILTSTONE			
45		45'-47'	D	25	13	5	Wet Medium Dense	Red-br. Highly weathered SILTSTONE	10	24"	6"
				10			Very Dense				
		47'-47.5'	D	100/6			48.0	Auger refused at 48.0	11	6"	3"
							-30.75	Bottom of Boring 48.0'			
50											

GROUND SURFACE TO 48 FT. Used H.S.A. " CASING: THEN --- : CASING TO --- FT.

D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST

UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD

PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		48
FOOTAGE IN ROCK		0
NO. OF SAMPLES		11
HOLE NO. B-27	TYPE	B

BORING CONTRACTOR: Soiltesting Inc. 90 Donavan Road Oxford, CT 06478	CDR MAGUIRE INC. 2080 SILAS DEANE HIGHWAY ROCKY HILL, CT 06067	SHEET 1 OF 1	
LOG PREPARED BY: CONTR. ____ CDR X	TOWN, STATE: Middletown, CT	LOCATION: See Plan C01	
	PROJECT NAME: Middletown Municipal Force Main	HOLE NO: DB-03	
	CDR NO. 14712.02 OFFICE: Rocky Hill, CT	BORING TYPE: A	
		STA: 9+05	
		OFFSET: 12' LT	

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
	BAR.					SURFACE ELEV.	+25.90
AT 15.5 FT. After 0 HOURS	TYPE	HSA	MR	SS	NWD4	DATE STARTED-FINISHED	1/10/13
	SIZE I.D.	4¼"	3⅞"	1⅜"	2 ⅛"	BORING FOREMAN:	Matt DeAngelis
AT ____ FT. After ____ DAYS	HAMMER WT.		300#	140#	BIT.	INSPECTOR:	R. Lindenberger
	HAMMER FALL		24"	30"	Dia.	SOILS ENGR:	Dave Nacci

Note: MR = Mud Rotary

LOCATION OF BORING: Northing: 764034.028 Easting: 1028962.7615 Union Street

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTH FROM - TO	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER FROM - TO 0-6	6-12	12-18	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL & ROCK INCL. COLOR, LOSS OF WASH WATER, JOINTS IN ROCK, ETC.	SAMPLE NO.	PEN.	REC.
0		1'-3'	D	14	10	9	0"-0'5"	TOPSOIL	1	24"	13"
				9			0'5"-5'	Red-brown, medium dense, FINE TO MEDIUM gr			
								GRAVEL AND SILT, some coarse sand and			
								fne gravel			
5											
		5'-7'	D	15	19	9	5'-6'	Red-brown, medium dense, FINE TO COARSE	2	24"	12"
				9			6'-10'	SAND AND FINE GRAVEL, trace silt			
								Red-brown clay with little silt			
10											
		10'-12'	D	3	5	7	10'-15'	Red-brown, stiff, CLAY, some silt	3	24"	24"
				6							
15											
		15'-17'	D	9	11	15	15'-20'	Red-brown, dense, SILT, some very fine sand	4	24"	17"
				15							
20											
		20'-22'	D	5	7	8	20'-26'	Red-brown, medium dense, FINE SAND, little	5	24"	21"
				10				silt			
25											
		25'-27'	D	8	10	25	26'-30'	Red-brown, dense, FINE TO MEDIUM SAND,	6	24"	24"
				32				some coarse sand, little silt			
30											
		30'-32'	D	17	19	14	30'-34'	Red-brown, dense, FINE TO MEDIUM SAND,	7	14"	6"
				16				some silt, little fine to coarse, gravel, trace			
								coarse sand			
35							34'-39.5'	Red-brown, very dense, FINE TO MEDIUM			
		35'-35'8"	D	39	60/2"			SAND AND SILT, little coarse sand and fine	8	24"	12"
								to medium gravel, trace clay			
								Red-brown to gray, very dense, weathered			
40		40'-40'4"	D	60/4"			39.5'	bedrock	9	2"	1"
		40.5'-45.5'	C1		C	1	40.5'-45.5'	Red-brown, moderately weathered, close	C-1	60"	60"
					C	1		to medium spaced fractures, very	REC: 95% RQD: 68%		
					C	1		intensely and horizontally laminated, very			
					C	1.5		fine grained, soft, SILTSTONE			
45					C	1					
		45.5'-50.5'	C2		C	1.5	45.5'-50.5'	Red-brown, moderate to slightly weathered,	C-2	60"	60"
					C	1		close to medium spaced fractures, very	REC: 100% RQD: 62%		
					C	1		intensely and horizontally laminated, very			
					C	1.5		fine grained, soft, SILTSTONE			
50					C	1					
							50.5'	Bottom of Boring 50.5'			
								Bore hole grouted with bentonite-cement			
								slurry at completion			
55											

GROUND SURFACE TO 40.5 FT. Used H.S.A. " CASING: THEN rotary mud : CASING TO 40.5' FT.

D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST

UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD

PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%

FOOTAGE IN EARTH		40.5
FOOTAGE IN ROCK		10
NO. OF SAMPLES		9
HOLE NO.	TYPE	A

B-1 ℄ STA. 13+72, 24' RT.

GROUND WATER OBSERVATIONS
At 15.0' after 0 Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR
Type	BW	S-S	
Size I.D.	2 3/8"	1 3/8"	
Hammer Wt.		140lb.	BIT
Hammer Fall		30"	

SURFACE ELEV. 19.0
DATE STARTED 9/29/81
DATE COMPL. 9/30/81
BORING FOREMAN D. Quagliaroli
INSPECTOR R. Beccia
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen.	Rec.
	25	0.0'-1.5'	D	7	21	43	Dry Very Dense	.3'	Topsoil.	1	1.5'	.8'
	16								Brown fine-coarse Sand, Fill Material.			
	13											
	8											
	8						Dry Medium Dense		" "	2	1.5'	1'
	5	5.0'-6.5'	D	6	6	4						
	6											
	6											
	11											
	3						Dry Loose		" "	3	1.5'	.4'
	4	10.0'-11.5'	D	6	2	2						
	2											
	2											
	4											
	51								Red Brown fine-coarse Sand, trace fine-coarse Gravel,			
	12	15.0'-16.5'	D	63	11	8	Dry Medium Dense	16.0'	Root Matter.	4	1.5'	.8'
	6								Gray Brown Silt, trace fine Sand, slight trace Root Matter.			
	7											
	8											
	17											
	11	20.0'-21.5'	D	2	1	1	Wet Soft		" "	5	1.5'	1.5'
	11											
	11											
	11											
	11											
	8	25.0'-26.5'	D	1	2	2	Wet Soft		Gray Brown Silt, Peat Layers trace fine Sand Material from Log.	6	1.5'	1.5'
	10											
	10											
	9											
	10											
	13	30.0'-31.5'	D	3	2	2	Wet Soft		" "	7	1.5'	1.5'
	13											
	15											
	13											
	14											
	15	35.0'-36.5'	D	2	1	2	Wet Soft		" "	8	1.5'	1.5'
	14											
	15											
	16											
	25											
	37	40.0'-41.5	D	22	23	35	Wet Very Dense		Red Brown fine-coarse Sand, little Silt, Little fine-medium Gravel, Cobbles.	9	1.5'	1.5'
	69											
	75											
	120	44.0'	D	50	No Pent.			44.0'				
									Refusal at 44.0'			

N 263,268
E 628,836

B-4 ℄ STA. 14+76, 28' RT.

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	
At 16.0' after 0 Hours	Type	BW	S-S		SURFACE ELEV. 18.6
At ____ after ____ Hours	Size I.D.	2 3/8"	1 3/8"		DATE STARTED 10/1/81
	Hammer Wt.		140lb.	BIT	DATE COMPL. 10/1/81
	Hammer Fall		30"		BORING FOREMAN D. Quagliarolli
					INSPECTOR R. Beccia
					SOILS ENGR.

LOCATION OF BORING:

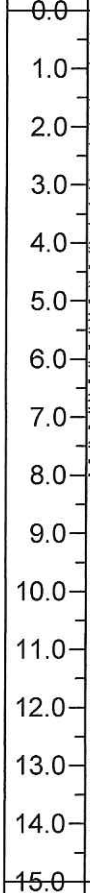
DEPTH	Casing Blows per foot	Sample Depths From-To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec.
	26	0.0'-1.5'	D	2	3	6	Dry Loose	.2'	Topsoil.	1	1.5'	1.0'
	15								Brown fine-coarse Sand,			
	12								Root Matter.			
	10											
	10						Dry					
	20	5.0'-6.5'	D	15	11	15	Medium		Brown fine-coarse Sand,	2	1.5'	1.1'
	28						Dense		trace Silt, Misc. Fill			
	25								Material.			
	25											
	25						Dry					
	11	10.0'-11.5'	D	45	14	14	Medium		" "	3	1.5'	1.1'
	20						Dense					
	24											
	29											
	61						Dry					
	16	15.0'-16.5'	D	17	6	26	Dense		" "	4	1.5'	.9'
	15											
	13							18.0'				
	13											
	21						Wet		Gray Brown Silt, Peat			
	14	20.0'-21.5'	D	5	1	2	Soft		Layers.	5	1.5'	1.5'
	14											
	11											
	15											
	14						Wet					
	12	25.0'-26.5'	D	3	2	2	Soft		Gray Brown Silt.	6	1.5'	1.5'
	10											
	10											
	10											
	9						Wet		Gray Brown fine-coarse Sand			
	13	30.0'-31.5'	D	3	6	9	Stiff		Layers, Peat, Log Matter.	7	1.5'	1.5'
	13											
	15											
	14											
	14						Wet					
	16	35.0'-36.5'	D	6	5	7	Stiff		" "	8	1.5'	1.5'
	15											
	15											
	16											
	15											
	48	40.0'-41.5'	D	20	28	37	Wet Very		Brown Gray fine-coarse Sand,	9	1.5'	1.4'
	77								trace Silt, little fine-			
	85	43.0'	D	50 No Pent.			Dense	43.0'	medium Gravel (Till).			
									Refusal at 43.0'			

N 263,174
E 628,882

SOIL BORING LOG

Project: Pump Station & Gravity Sewers
Boring: PSGP-59
Location: Middletown, CT
Inspector: M. Bazzano
Client: CDR Maguire
Date: 7-15-13

Logical Environmental Solutions
354 South River Road
Tolland, CT 06084
Truck, Portable & ATV/Backhoe-Mounted Geoprobes



Depth (feet)	Description	Depth (feet)	PID (ppm)	Sample Interval
0.0	Ground Surface	0.0		
0.0 – 4.0	Dark-Brown fine to medium SAND, little Silt Red-Brown SILT, little fine to medium Sand, trace Coal & fine to coarse Gravel	4.0	1.3	Macro Core 0'-5'
4.0 – 8.0	Dark-Gray to Black ASH & CINDERS, trace Glass, Ceramics, & fine to coarse Gravel	8.0	0.4	Macro Core 5'-10'
8.0 – 15.0	Gray SILT, little fine Sand grading to Gray SILT, trace Clay & fine Sand (very soft & moist)	15.0	0.3	Macro Core 10'-15'
15.0	End of Boring at 15'			

Soil Description: and = 35-50% some = 20-35% little = 10-20% trace = 1-10%

Driller: W. Lineberry
Depth to Water: Dry
Boring Dia.: 2"
Rig: Geoprobe 540U
Boring Depth: 15'
Page: 1 of 1

SOIL BORING LOG

Project: Pump Station & Gravity Sewers
Boring: PSGP-60
Location: Middletown, CT
Inspector: M. Bazzano
Client: CDR Maguire
Date: 7-15-13

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Tolland, CT 06084
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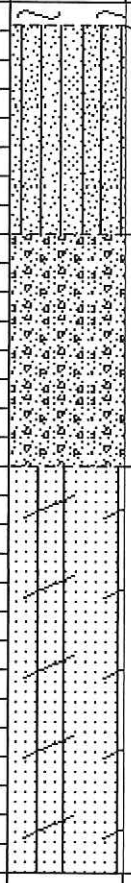

Depth (feet)	Description	Depth (feet)	PID (ppm)	Sample Interval
0.0	Ground Surface	0.0		
0.0 – 4.0	Dark-Brown fine to medium SAND, little Silt Red-Brown SILT, little fine to medium Sand, trace Coal & fine to coarse Gravel	4.0	0.5	Macro Core 0'-5'
4.0 – 8.0	Dark-Gray to Black ASH & CINDERS, trace Glass, Ceramics, & fine to coarse Gravel	8.0	1.7	Macro Core 5'-10'
8.0 – 15.0	Gray SILT, little fine Sand grading to Gray SILT, trace Clay & fine Sand (very soft & moist)	15.0	0.1	Macro Core 10'-15'
15.0	End of Boring at 15'			

Soil Description: and = 35-50% some = 20-35% little = 10-20% trace = 1-10%

Driller: W. Lineberry
Depth to Water: Dry
Boring Dia.: 2"
Rig: Geoprobe 540U
Boring Depth: 15'
Page: 1 of 1

SOIL BORING LOG

Project: Pump Station & Gravity Sewers
Boring: PSGP-61
Location: Middletown, CT
Inspector: M. Bazzano
Client: CDR Maguire
Date: 7-15-13

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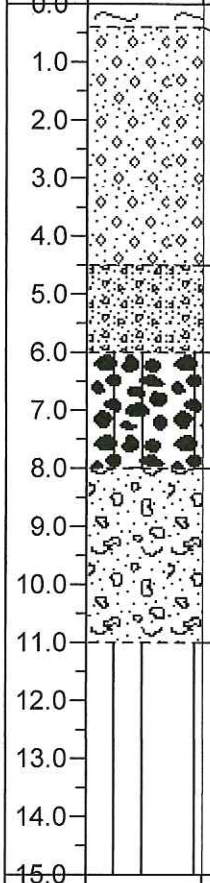


Depth (feet)	Description	Depth (feet)	PID (ppm)	Sample Interval
0.0	Ground Surface	0.0		
	Dark-Brown fine to medium SAND, little Silt			
1.0 – 4.0	Light-Brown fine to coarse SAND, trace Silt, fine Gravel & Silt	4.5	1.8	Macro Core 0'-5'
5.0	Dark-Gray to Black ASH & CINDERS, little fine to medium Sand, trace Silt & fine Gravel	6.0		
6.0 – 8.0	Red-Brown SILT & COBBLE, trace fine to medium Sand & Gravel	8.0	0.6	Macro Core 5'-10'
9.0 – 10.0	Dark-Gray to Black fine to medium SAND, little Silt, trace Ash & Cinders	11.0		
11.0 – 14.0	Red-Brown SILT, trace fine Sand & Clay	15.0	0.3	Macro Core 10'-15'
15.0 – 20.0	End of Soil Sampling at 15' Pre-probed to 20' & Collected GW Grab			

Soil Description: and = 35-50% some = 20-35% little = 10-20% trace = 1-10%

Driller: W. Lineberry
Depth to Water: 18'
Boring Dia.: 2"
Rig: Geoprobe 540U
Boring Depth: 20'
Page: 1 of 1

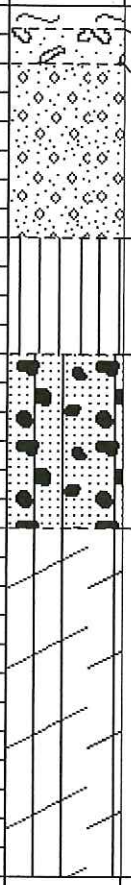
SOIL BORING LOG

Project: Pump Station & Gravity Sewers | **Boring:** PSGP-63

Location: Middletown, CT | **Inspector:** M. Bazzano

Client: CDR Maguire | **Date:** 7-15-13

Logical Environmental Solutions
354 South River Road
Tolland, CT 06084
Truck, Portable & ATV/Backhoe-Mounted Geoprobes



Depth (feet)	Description	Depth (feet)	PID (ppm)	Sample Interval
0.0	Ground Surface	0.0		
1.0	Dark-Brown fine to medium SAND, trace Silt	1.0		
2.0	Gray medium to coarse GRAVEL, mixed with Gray-Brown fine to medium Sand			
3.0	Red-Brown fine to coarse SAND, trace Silt & fine to coarse Gravel		2.1	Macro Core 0'-5'
4.0		4.0		
5.0	Red-Brown SILT, trace fine Sand & fine to coarse Gravel (moist)			
6.0		6.0		
7.0	Brown to Orange-Brown fine to medium SAND, little Silt & Cobble with seams of Gray Ash & Cinders, little fine to medium Sand, trace Silt & Brick		0.5	Macro Core 5'-10'
8.0				
9.0		9.0		
10.0	Red-Brown to Brown SILT, trace Clay (moist)			
11.0				
12.0			0.2	Macro Core 10'-15'
13.0				
14.0				
15.0		15.0		
16.0	End of Boring at 15'			
17.0				
18.0				
19.0				
20.0				

Soil Description: and = 35-50% some = 20-35% little = 10-20% trace = 1-10%

Driller: W. Lineberry | **Depth to Water:** Dry | **Boring Dia.:** 2"

Rig: Geoprobe 540U | **Boring Depth:** 15' | **Page:** 1 of 1