FINAL GEOTECHNICAL ENGINEERING REPORT (REVISED)
MATTABASSETT REGIONALIZATION PROJECT
MIDDLETOWN SEWAGE PUMP STATION

MIDDLETOWN, CONNECTICUT
MGI NO. 14712.02

APRIL 2013

CDR MAGUIRE INC.
ENGINEERS
ROCKY HILL, CONNECTICUT

TABLE OF CONTENTS

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

APPENDIX

Figure 1 – Boring Location Plan

Figure 2 – Section Location Plan

Figures 3 through 9 – Generalized Soil Profiles

Boring Logs – B-1 through B-14 and DB-1

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I. PURPOSE AND SCOPE

This report presents the determination and analysis of the subsurface soil and rock conditions which would affect the design and construction of the Mattabassett Regionalization Project, Middletown Sewage Pump Station in the City of Middletown, Connecticut. Under this contract a new pump station will be constructed on City owned property located at 34 East Main Street. The new pump station will pump all City sanitary sewer flows to the Mattabassett District Wastewater Treatment Facility in Cromwell, CT for treatment. The City plans to decommission its wastewater treatment facility on River Road. In addition to field subsurface explorations, published geological data and field observations were used 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, section location plan, the generalized soil profiles, and the Engineer's boring logs for the project.

II. FIELD SUBSURFACE INVESTIGATIONS

The completed boring program for the Middletown Sewage Pump Station project was completed in two (2) phases. The first phase consisted of six (6) 3-1/4 inch inside diameter hollow stem auger borings (B-1 through B-6). All of the borings were drilled by General Borings, Inc., of Prospect, CT, under contract to Maguire Group Inc. General Borings, Inc. began the boring program on October 26, 2011 and completed operations on

October 31, 2011. The borings ranged in depth from 53.0 feet to 55.0 feet in soil and weathered rock. Five foot NQ rock cores were taken in borings B-1 and B-6 to determine the type and condition of the bedrock encountered. Borings B-2, B-3, B-4 and B-5 were drilled to auger refusal, presumably upon bedrock. To classify and determine the density or consistency of the various soil strata encountered, disturbed samples were taken in all borings by driving a split spoon sampler with a 140 pound weight falling 30 inches (standard penetration test). Maguire Group Inc. was responsible for the development, layout, inspection and analysis of the Phase I boring program.

The second phase consisted of nine (9) borings (B-7 through B-14 and DB-2). All of Phase 2 borings were drilled by Soiltesting, Inc. of Oxford, CT under contract to CDR Maguire Inc. Boring DB-1 was drilled on January 9 and 10, 2013 utilizing 4-1/4 inch inside diameter hollow stem augers and 3-7/8 inch inside diameter casing. The boring was drilled 15 feet into bedrock utilizing a 2-1/8 inch diameter NWD4 core barrel. A groundwater observation well was also installed in this boring.

Boring B-7 through B-14 were drilled between February 19, 2013 and February 27, 2013 utilizing 4-1/4 inch inside diameter hollow stem augers. Boring B-7 encountered auger refusal on concrete at a depth of 10 feet below the ground surface. Borings B-13 and B-14 were terminated in granular soil at a depth of 42 feel below the ground surface. Borings B-9, B-10 and B-11 were drilled to refusal, presumably on bedrock. Borings B-8 and B-12 were drilled 5 feet into bedrock utilizing NX core barrels. To classify and determine the density or consistency of the various soil strata encountered, disturbed samples were taken in all the Phase 2 borings by driving a split spoon sampler with a 140 pound weight

falling 30 inches (standard penetration test). CDR Maguire Inc. was responsible for the development, layout, inspection and analysis of the Phase 2 Boring Program.

III. SUBSURFACE SOIL AND ROCK CONDITIONS

The subsurface soil and rock conditions at the site of the Middletown Sewage Pump Station in Middletown, Connecticut will be discussed below. Reference should be made to the series of generalized soil profiles developed from the results of the subsurface explorations which show the basic pattern of soil deposits and rock found within the project limits. These profiles are shown on Figures 3 through 9 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%.

Four (4) major soil strata are present at the project site. The following is a generalized description of the soils encountered from the surface downward.

- An artificial fill composed of loose to medium dense brown, red-brown and gray-brown fine to coarse sand containing varying amounts of silt, gravel and cinders, traces of glass, ash, wood and concrete and a few cobbles and small boulders 6 to 30 feet thick.
- A stratum of loose, gray and brown silt containing traces of clay, fine sand and organic material 6 to 24 feet thick.
- A deposit of medium dense brown and gray-brown fine to coarse sand containing a little silt and gravel 6 feet to 21 feet thick.

- A thin stratum of very dense red-brown and gray-brown fine to coarse sand containing some silt and a little gravel overlying the bedrock floor. A portion of this stratum is made up of highly weathered bedrock.

Bedrock consisting of red-brown, gray and brown siltstone was encountered at depths of 38.5 feet to 56 feet below the existing ground surface. Groundwater was reported at depths of 13 feet to 15 feet below the existing ground surface at the time of completion of the borings.

IV. FOUNDATION ANALYSIS AND RECOMMENDATIONS

A foundation analysis and recommendations for design and construction of the Middletown Sewage Pump Station in Middletown, Connecticut 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. Reference 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 and rock 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, most of the pump station will bear within or above the stratum of loose silt. These soils are somewhat compressible under loading. Any structure founded within or above these soils would be subject to potentially excessive total or differential

settlement. Since the equipment within the proposed pump station will require rigid, horizontal foundations and any differential settlement would be potentially damaging, the silt is considered unsuitable for support of the structure. Therefore, to preclude any potential differential settlement due to differing foundation materials, it is recommended that the entire structure be founded on piles driven to end bearing on bedrock.

Since the pile lengths on this project will vary widely due to the varying foundation elevations required for the structure and somewhat irregular bedrock surface, and hard driving will be required to penetrate the very dense granular soils and highly weathered bedrock overlying the bedrock surface, steel H piles are recommended for use on this project. Steel H piles are easy to cut and splice and are not susceptible to damage during hard driving.

The following recommendations are provided for use in design of the steel H piles to be utilized on this project.

- Pile type – steel H pile
- Pile section – as needed based on final design loads
- Pile driving criteria – drive to practical refusal on bedrock (minimum 20 blows per inch for last 2 inches of penetration)
- Maximum allowable axial pile capacity – 100 tons per pile in compression
- Minimum pile spacing – 3 feet center to center
- Maximum pile spacing – 9 feet center-to-center
- Estimated pile length – varies 5 feet to 55 feet
- Minimum embedment in pile cap – 12 inches

- Lateral load capacity of vertical piles – 3 kips
- If possible, all lateral loads should be taken in axial load on battered piles
- Maximum pile batter – 1 horizontal to 3 vertical
- Uplift capacity – weight of pile
- Splices
  - fully welded if pile will ever be tension
  - mechanical if pile will always be in compression
  - maximum one splice per pile
  - no splices in the top 10 feet of any pile
- Minimum hammer energy – 19,500 foot pounds per blow
- Vibratory hammers will <u>not</u> be allowed
- Pile tip reinforcement is required
- Epoxy coating of piles to inhibit corrosion or a 1/16" reduction in pile cross section to allow for corrosion is recommended
- Two (2) test piles should be provided to confirm anticipated driving length
- Pile dynamic analyzer (PDA) tests are recommended on each test pile to confirm anticipated pile capacity
- For all pile groups, piles must be driven in such a sequence that the interior piles of the group are driven prior to the exterior piles
- Pile design must be consider imposed bending resulting from freestanding piles in fluid soil
- Piles in fluid soils must be designed as unsupported columns
- System must be tied together to resist lateral spreading of soils
- Bottom of liquefaction susceptible soils (fluid soils) E1.-20.0

No bedrock will be encountered in the excavation for the pump station. However, it is recommended that a small quantity of rock excavation be estimated to account for any boulders and abandoned concrete foundations which are apparently present within the artificial fill.

Due to the depth of the required excavation and the relatively high groundwater table, the use of an open excavation for construction of the pump station will be impractical. Therefore, temporary support of the excavation will be required. It is recommended that internally braced steel sheeting be utilized for this purpose. The sheeting may be left in place or removed after the completion of construction.

Extensive dewatering of the excavation will be required during construction. It is anticipated that a system of wellpoints or deep dewatering wells will be required to lower the water table in the project area and reduce the lateral loads on the sheeting. All structural concrete must be placed in the dry. Under no circumstances should any structural concrete be placed under wet conditions.

It is recommended that the Contractor be responsible for the design of both the excavation support and dewatering systems on this project since the methods and sequence of construction will have significant bearing on the design of these installations. A factor of safety of 1.25 must be provided in the design of the excavation support systems.

Groundwater levels observed in borings drilled at the site were generally about 13 feet to 15 feet below ground surface (elevation +5.0 to +7.0). Groundwater levels higher than those observed will likely be encountered after construction of the proposed facilities during periods of prolonged heavy precipitation. According to the Flood Insurance Rate Map (FIRM) for the project area, the potential flood elevation at the project site is elevation 25.0. It is possible that, during periods of sustained, heavy precipitation, the ground water level at the project site could rise to that level. It is recommended that the design water level for this project be established at elevation 25.0 feet.

All proposed structures, which will extend below elevation 25.0 feet, must be designed to resist both lateral and vertical water and soil pressures. It is recommended that an equivalent fluid pressure of 82.0 pounds per square foot per foot be utilized in the design of all below grade walls. In addition, the structures should be designed to resist all buoyancy forces by gravity. All backfill placed outside the structures must consist of clean, granular material containing less than 10 percent by weight passing the number 100 sieve. For design purposes, it may be assumed that all backfill material outside the structure walls will have a dry unit weight of 120.0 pounds per cubic foot and a saturated unit weight of 57.6 pounds per cubic foot. A minimum factor of safety of 1.15 is recommended for use in all floatation calculations. When calculating the floatation safety factor, the vertical resistance mobilized by friction along the exterior face of the structure shall be neglected. Also, the weight of any soil above the exterior footings shall be neglected.

The soil gradations and the results of the standard penetration tests performed in the borings were evaluated with regard to liquefaction potential. The liquefaction potential for the silt stratum is moderate to high. The liquefaction potential for all other soils present at the site is low. The recommended "S" factor for design is 1.2.

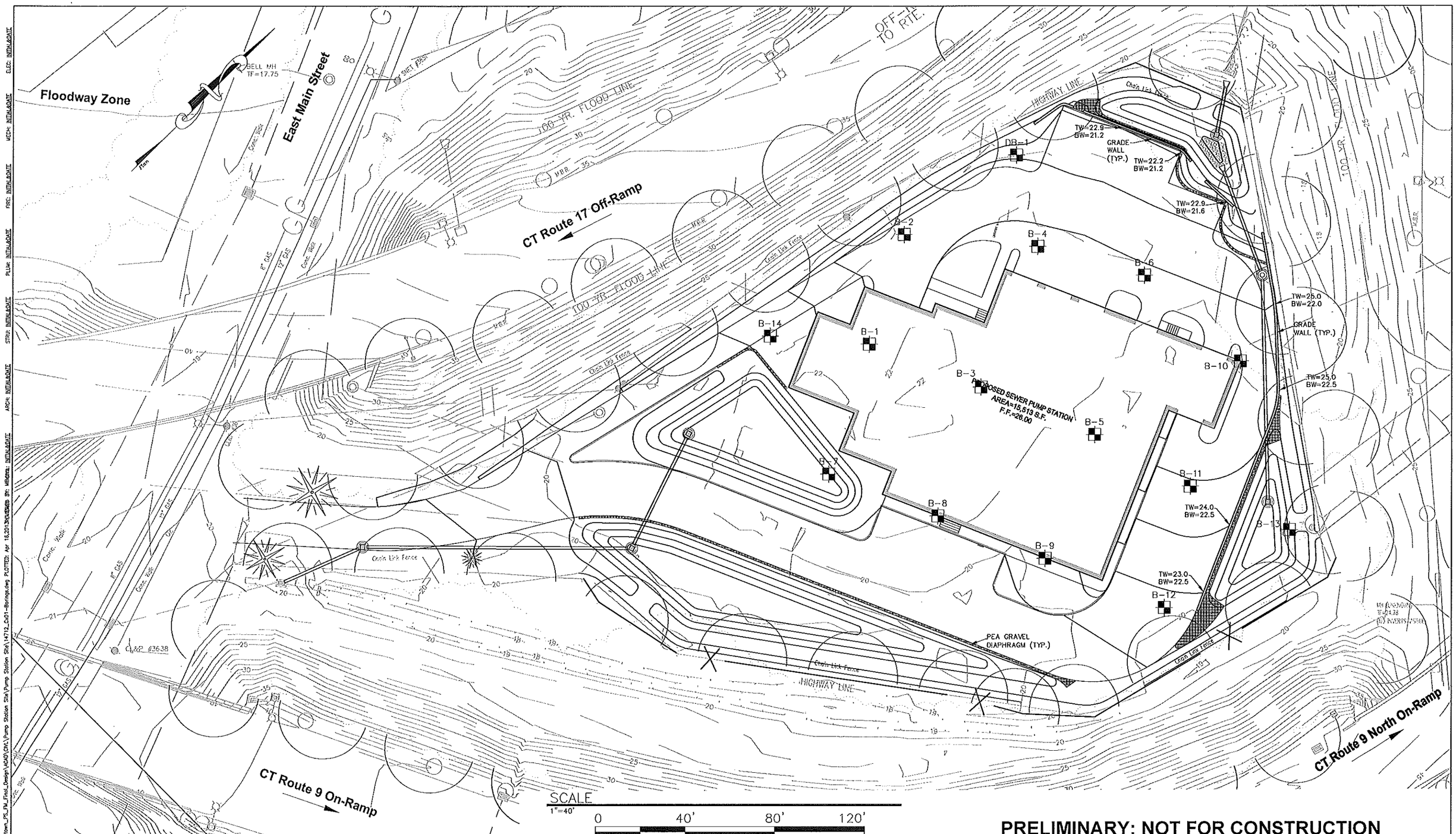
Foundation recommendations for all proposed gravity sewers, force mains and yard piping will be addressed in separate geotechnical engineering reports.

Some of the existing near surface soils at the site are suitable for reuse as fill under structures and pavements. Most of the near surface soils are suitable for use as fill under landscaped areas. The volume change of these materials is estimated to be negligible. All fills placed under proposed structures and pavements should be compacted to at least 95 percent of maximum dry density. All ash, cinders, wood, glass and concrete as well as ice, snow and frozen materials must be removed prior to placing any structure or pavement fills. Any topsoil removed during construction may be stockpiled for reuse on site.

The following pavement structure is recommended for all access drives and parking areas on the site: 3 inches of bituminous concrete placed in 2 courses on 6 inches of processed aggregate base and 10 inches of subbase.

If any existing structures on the site are designated to remain during construction operations, the Contractor will be required to protect and maintain the structural integrity of those structures.

APPENDIX



PRELIMINARY: NOT FOR CONSTRUCTION

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

CDR MAGUIRE
Architects/Engineers/Planners
2080 Silas Deane Highway
Rocky Hill, Connecticut 06067

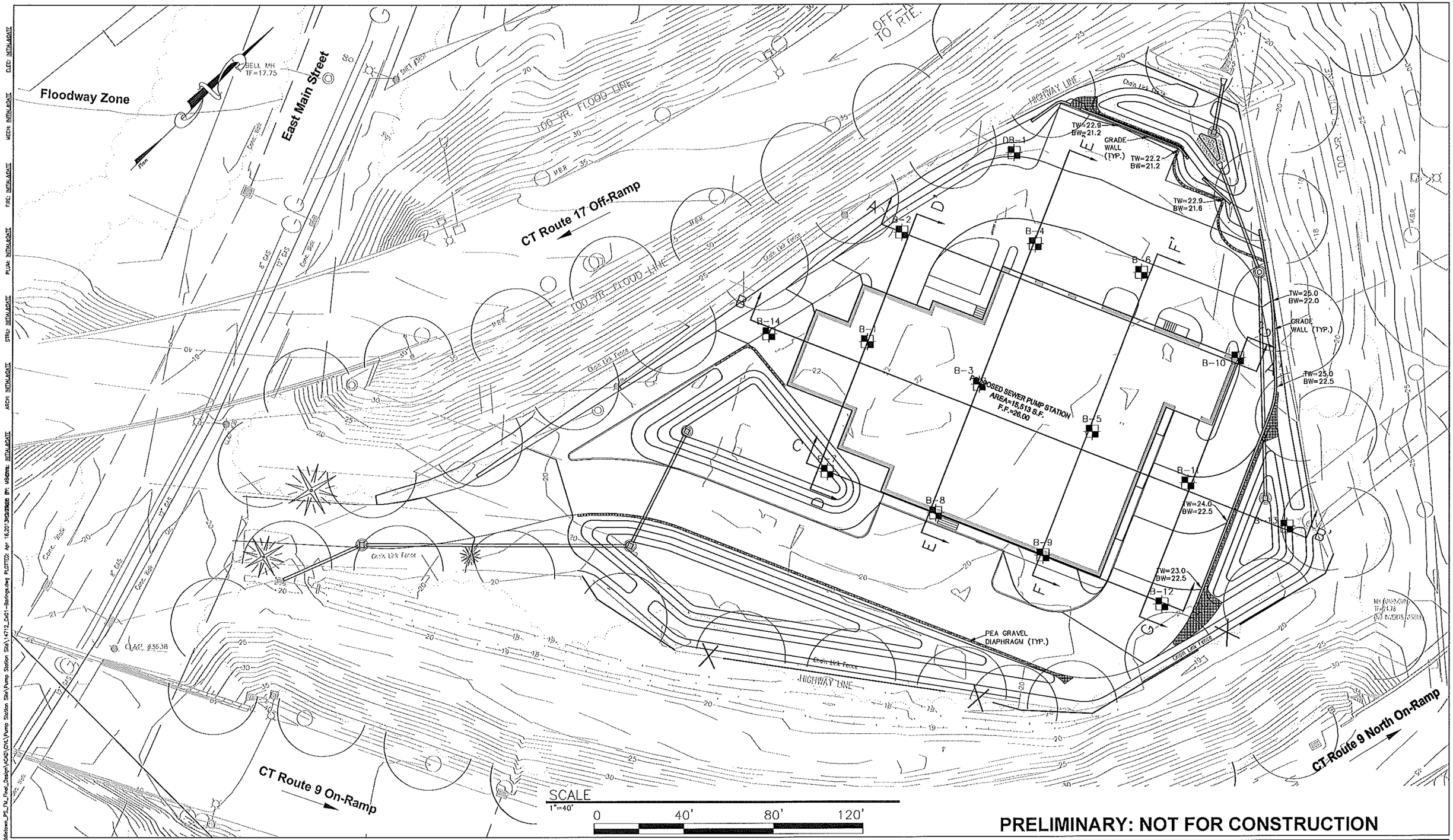
MARK	DATE	DESCRIPTION	BY	APP'D

PROJECT NO.:	14712.01
DESIGNED BY:	–
DRAWN BY:	–
CHK'D BY:	
DATE:	
SCALE:	AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

BORING LOCATION PLAN

SHEET NO.
FIG. 1
SHEET # OF #



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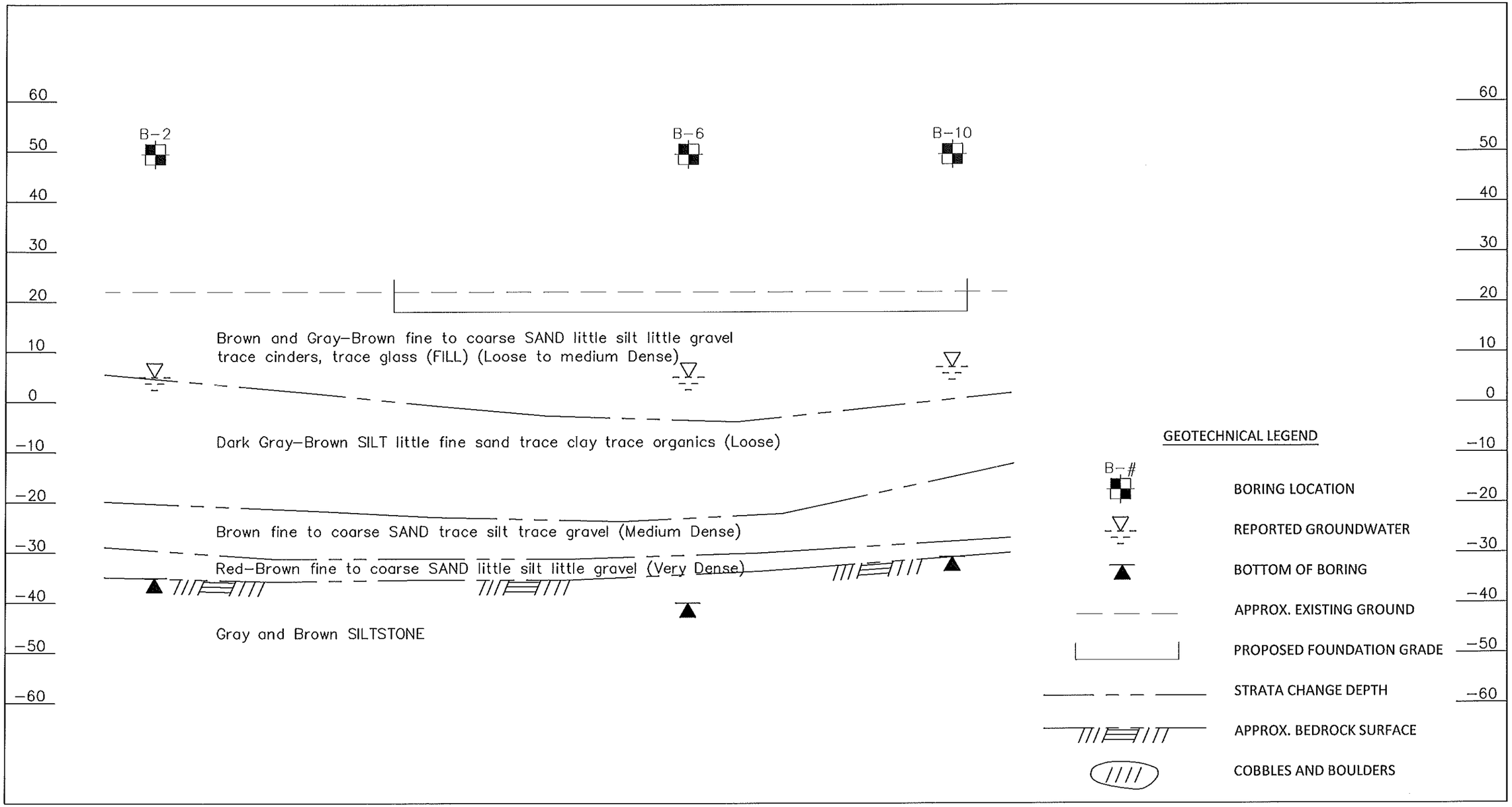
FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SECTION LOCATION PLAN

SHEET NO.
FIG. 2
SHEET # OF #



SCALE
1"=20'
0 20' 40' 60'

PRELIMINARY: NOT FOR CONSTRUCTION

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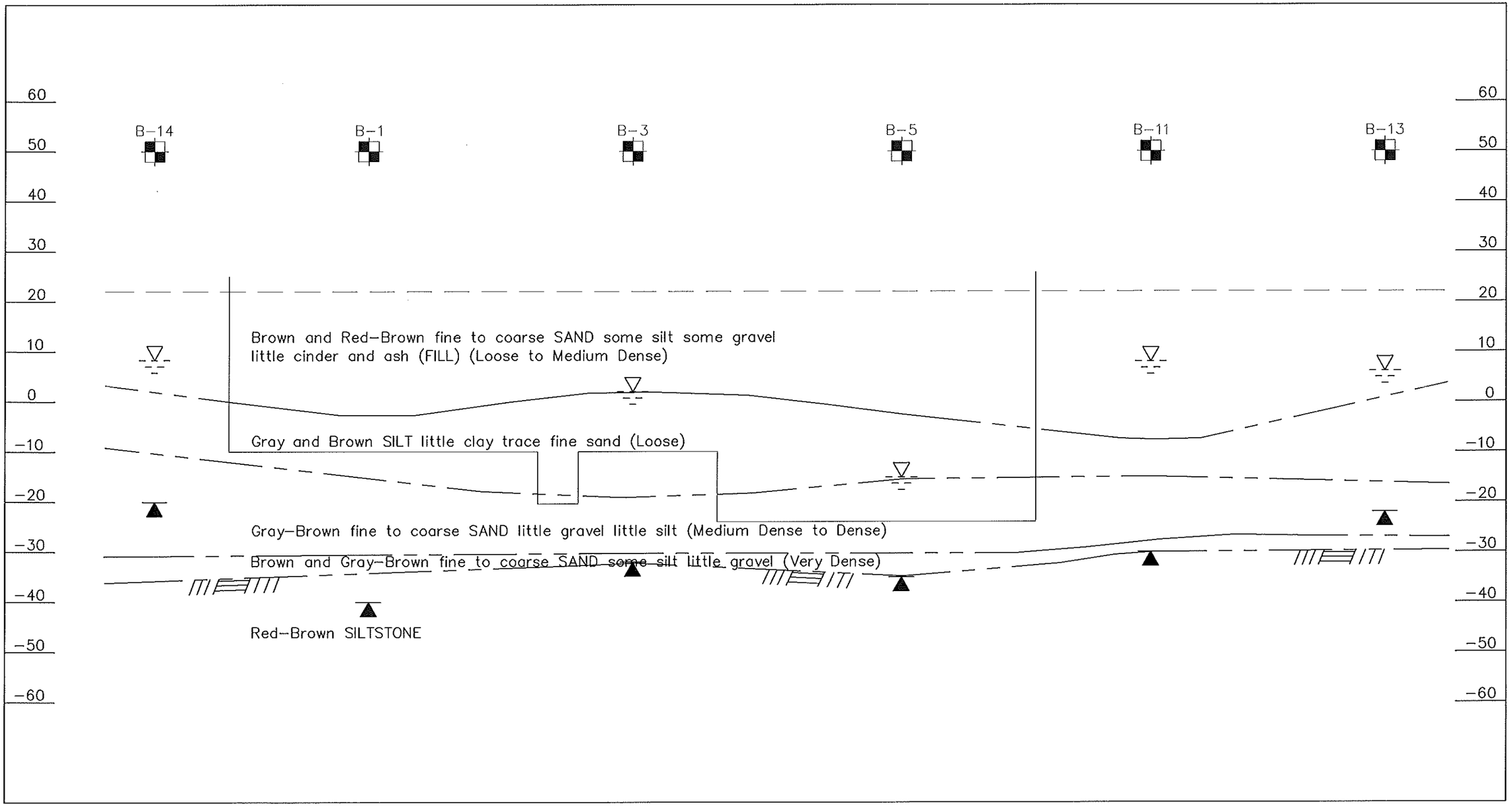
DRAWN BY:	--
CHK'D BY:	
DATE:	
SCALE:	AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE A−A'

SHEET NO.
FIG. 3
SHEET # OF #

DRAWING FILE: C:\JOBS\14712.02\-Middletown_PS_FM_Final_Design\CAD\CIVIL\Pump Station Site\Pump Station Site\14712_Civil-Borings.dwg PLOTTED: Apr 15,2013 BY:DAVIDSON@CDRMAIL.COM
ELEC: INITIALSDATE MECH: INITIALSDATE FIRE: INITIALSDATE PLUM: INITIALSDATE STRU: INITIALSDATE ARCH: INITIALSDATE



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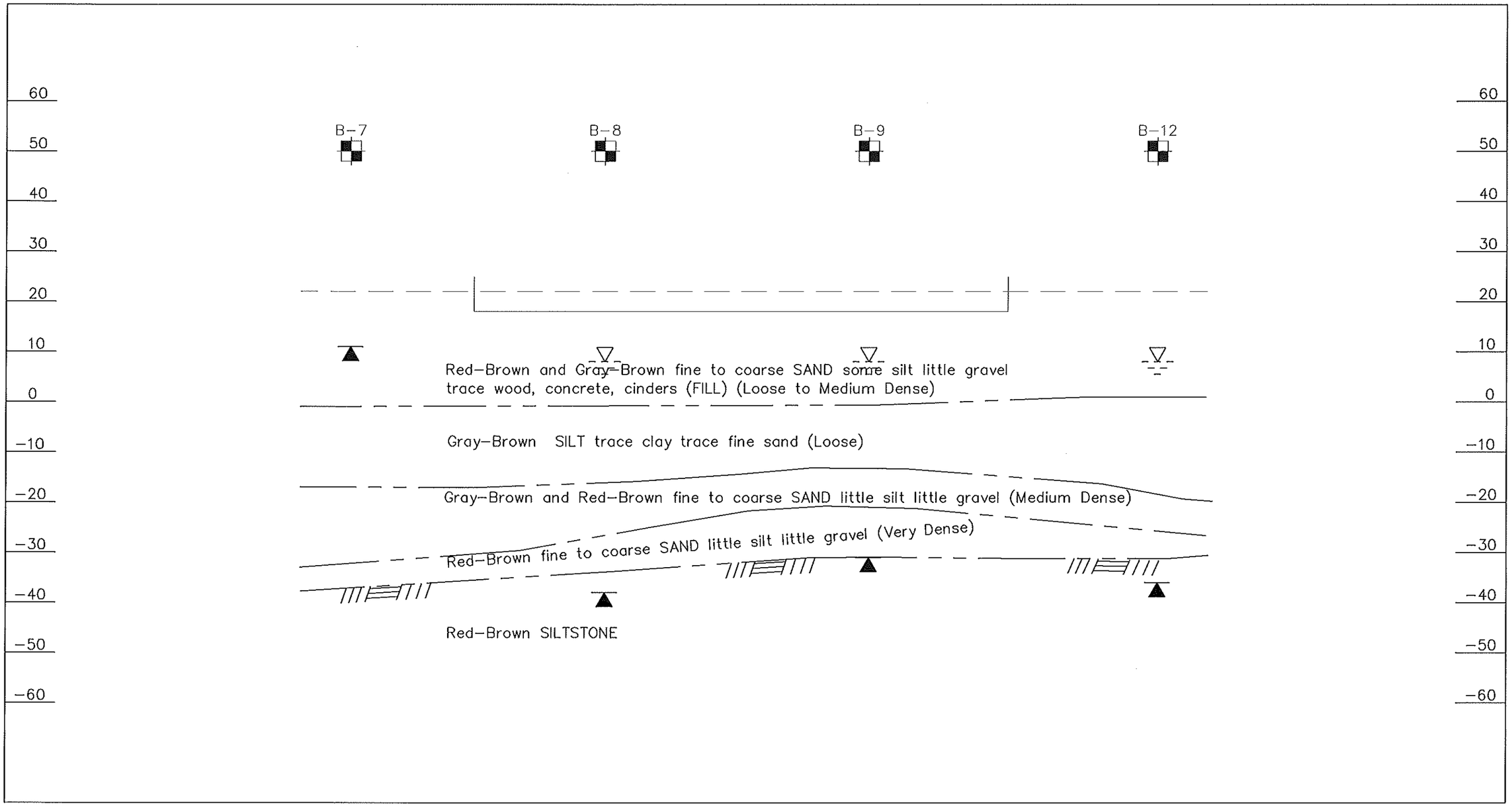
SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE B-B'

SHEET NO.
FIG. 4
SHEET # OF #



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Rocky Hill, Connecticut 06067

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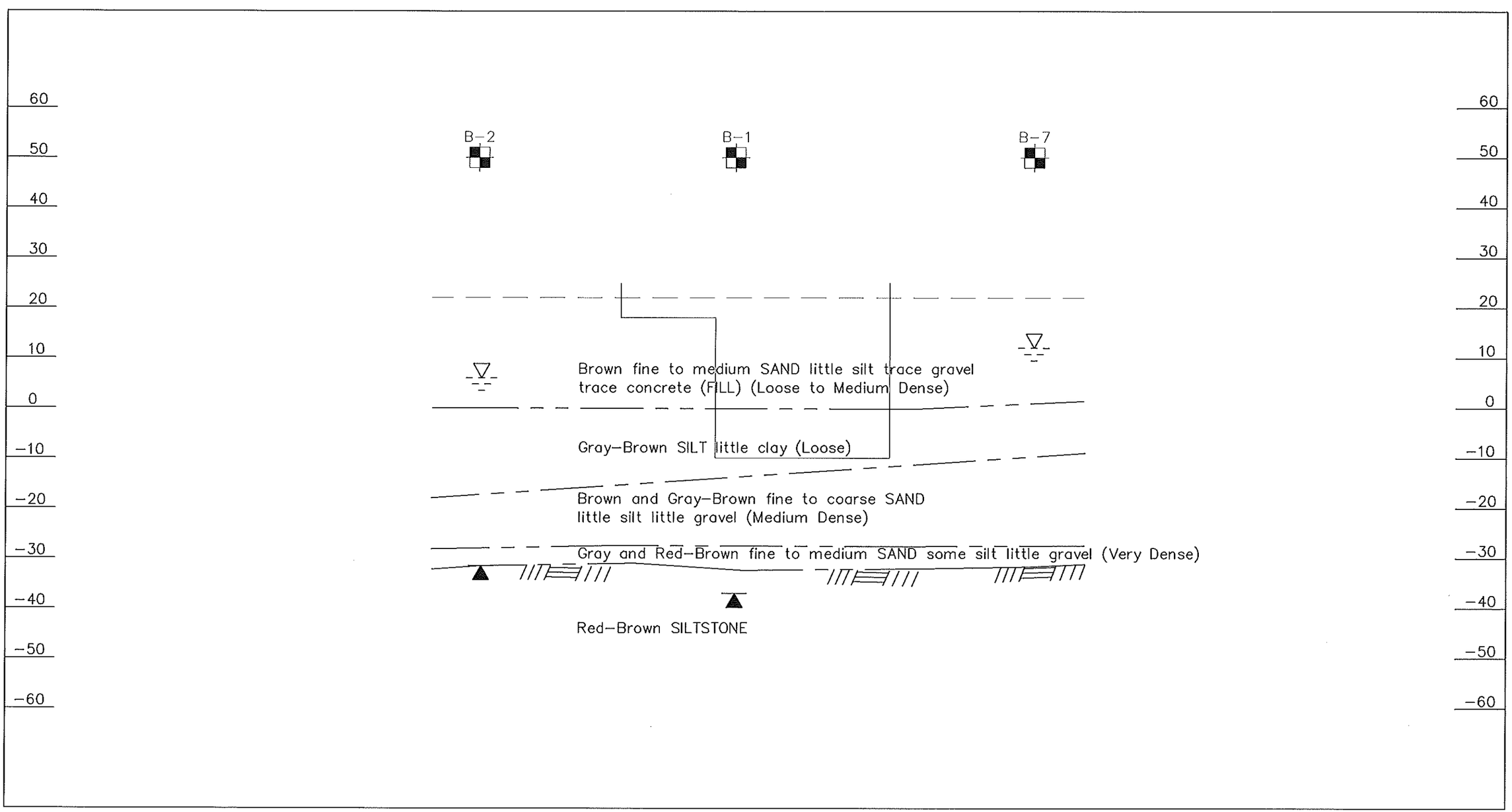
PROJECT NO.: 14712.01
DESIGNED BY: -
DRAWN BY: -
CHK'D BY:
DATE:
SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE C-C'

SHEET NO.
FIG. 5
SHEET # OF #



SCALE
1"=20'
0 20' 40' 60'

PRELIMINARY: NOT FOR CONSTRUCTION

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Architects/Engineers/Planners
2080 Silas Deane Highway
Rocky Hill, Connecticut 06067

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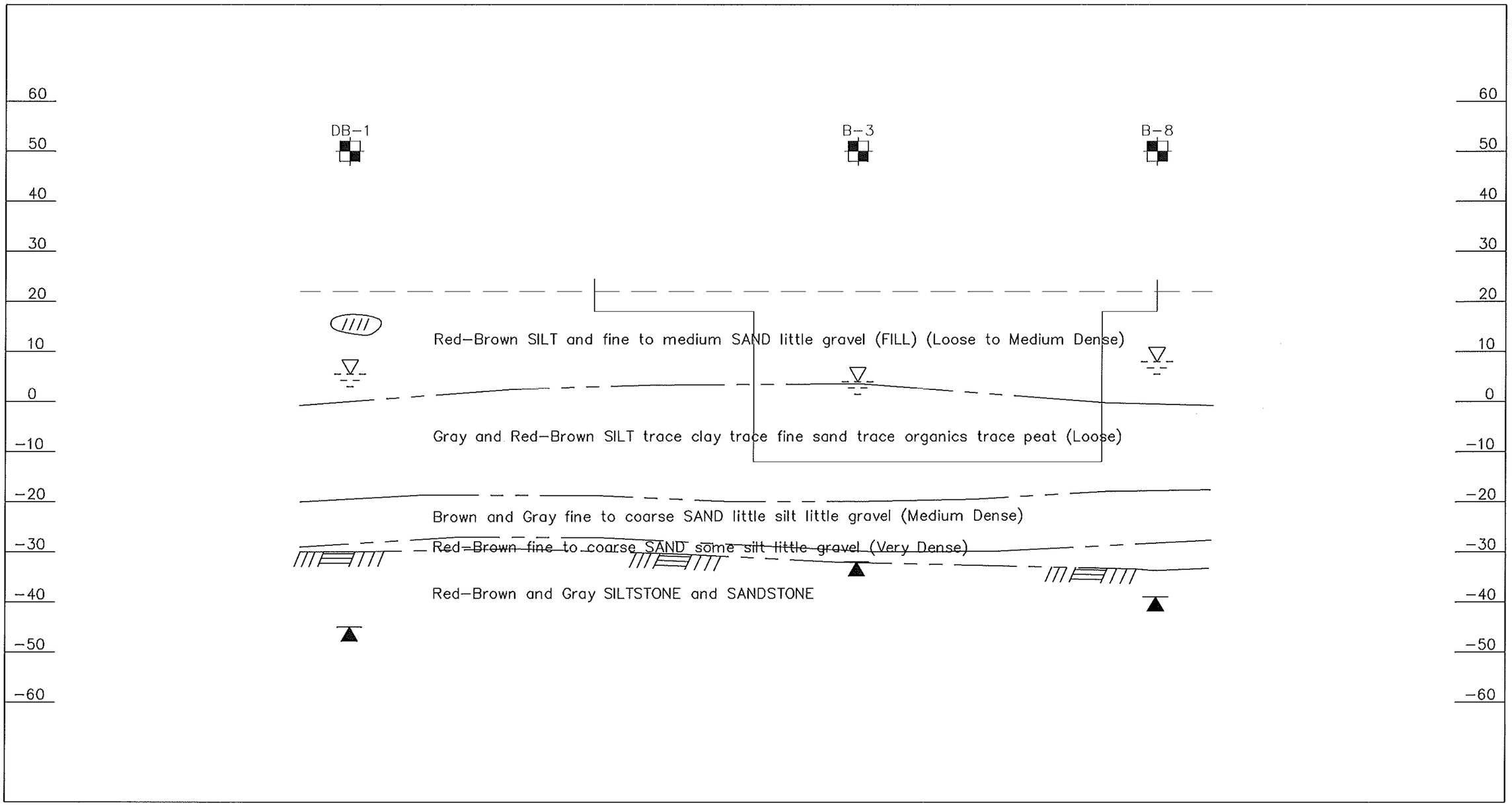
DESIGNED BY: -
DRAWN BY: -
CHK'D BY:
DATE:
SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE D-D'

SHEET NO.
FIG. 6
SHEET # OF #



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Rocky Hill, Connecticut 06067

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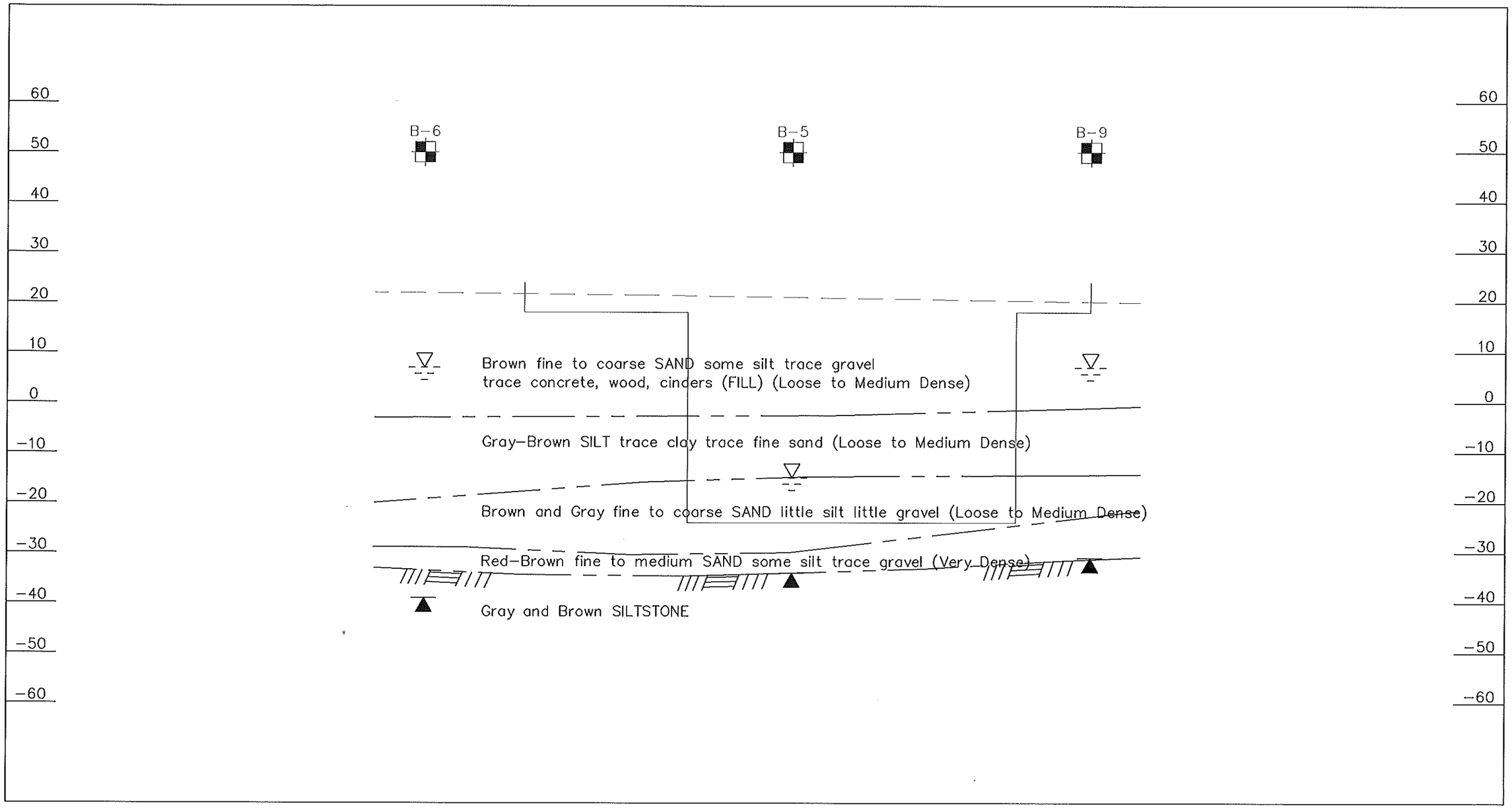
DRAWN BY: –
CHK'D BY:
DATE:
SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE E-E'

SHEET NO.
FIG. 7
SHEET # OF #



SCALE
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0 20' 40' 60'

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Rocky Hill, Connecticut 06067

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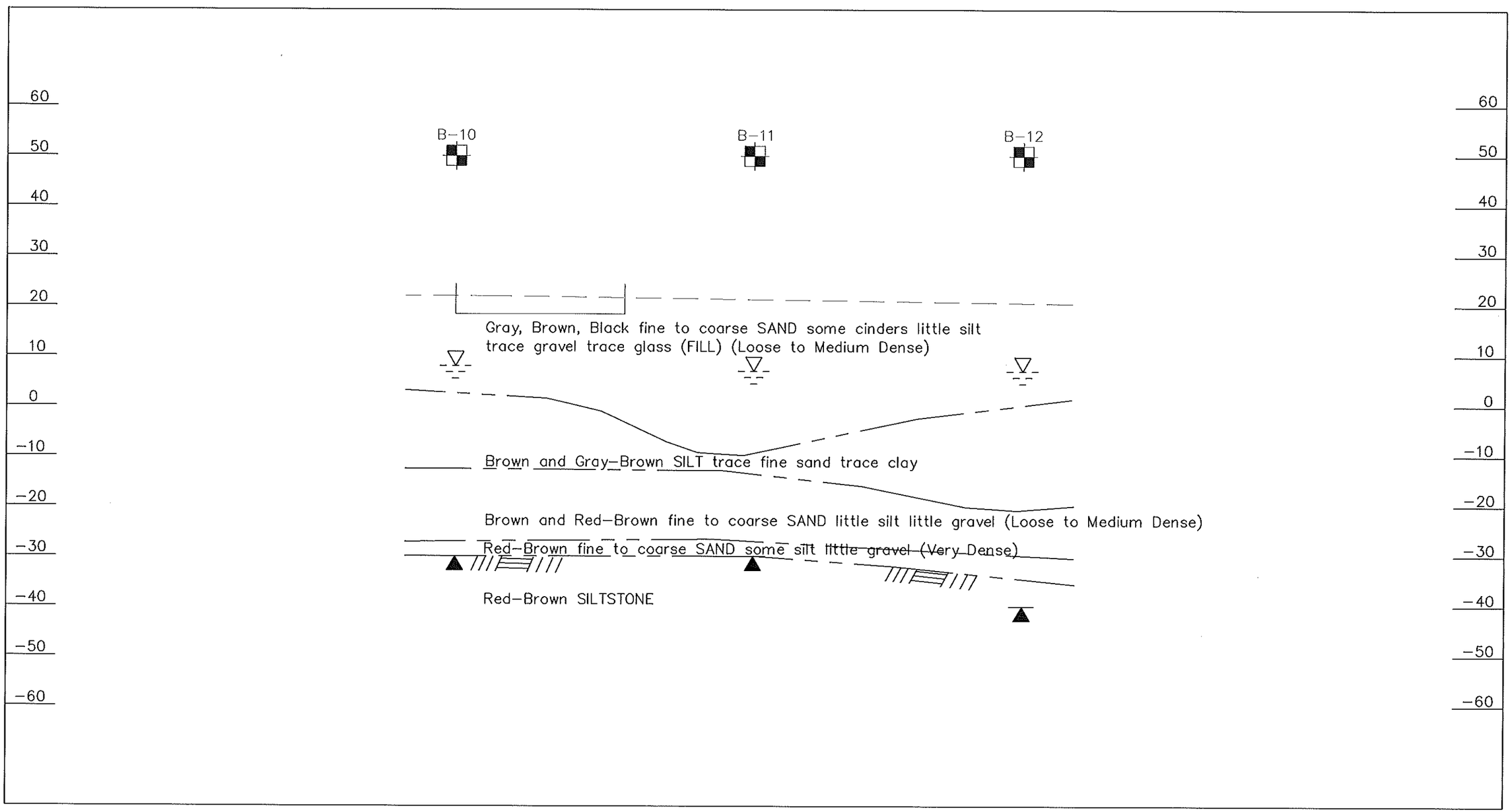
CHK'D BY:
DATE:
SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE F-F'

SHEET NO.
FIG. 8
SHEET # OF #



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Rocky Hill, Connecticut 06067

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SCALE: AS NOTED

FORCE MAIN AND PUMP STATION
MIDDLETOWN, CONNECTICUT

SOIL PROFILE G-G'

SHEET NO.
FIG. 9
SHEET # OF #

BORING CONTRACTOR:
Soil Testing Inc.
90 DONNAVAN RD Oxford CT.

LOG PREPARED BY:
CONTR. JC CDR RL

CDR MAGUIRE INC.
ENGINEERS
BORING LOG
TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Pump Station
CDR NO. 14712.01 OFFICE: Rocky Hill

SHEET 1 OF 2
LOCATION: see plan
HOLE NO: B-1
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS
AT ____ FT. AFTER 0 HOURS
AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	H.S.A		SS	NQ
SIZE I.D.	4.25"		1 3/8	1 7/8
HAMMER WT.			140	BIT.
HAMMER FALL			30"	Dia.

SURFACE ELEV. 20
DATE STARTED-FINISHED: Oct. 26 2011
BORING FOREMAN: J.Casson
INSPECTOR: M.J. Bazzano
SOILS ENGR: D.R.Stock

LOCATION OF BORING:

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	13	16	14			1	24	4
				8				Br. f-c SAND, little Silt, little Gravel. (FILL)			
5		5'-7'	D	6	9	10		Br. f-m SAND, little Silt, tr. Gravel. (FILL)	2	24	3
				7							
10		10'-12'	D	4	2	3		Br. f-m SAND, little Silt, tr. Gravel. (FILL)	3	24	6
				3							
15		15'-17'	D	1	2	1		Br. f-m SAND, little Silt, tr. Gravel. (FILL)	4	24	8
				2				strong gasoline odor.			
20		20'-22'	D	WOH	WOH	3		Br. f-m SAND and SILT, tr. Gravel (FILL)	5	24	16
				3			Wet Loose				
							23'				
							-3				
25		25'-27'	D	1	2	4	Wet Medium Stiff	Gry. Br. SILT, some clay, tr. f Sand.	6	24	24
				5							
30		30'-32'	D	1	2	2	Wet Soft	Gry. Br. SILT, some clay, tr.f Sand.	7	24	24
				5							
							Wet Medium Dense				
35		35'-37'	D	6	8	12	35'		8	24	24
				15			-15	Gry. Br. f-c Sand, little Silt, little Gravel..			
							Wet Medium				
40		40'-42'	D	9	7	8	Dense	Br. f-c SAND, little gravel, tr. Silt.	9	24	24
					11						
45		45'-47'	D	17	20	31		Br. f-c SAND, some Gravel, little Silt.	10	24	8
				46							
50		50'-52	D	100/2"			50'		11	2	2
							Wet Very Dense	Gry. Br. highly weathered SILTSTONE.			
55							55'				

GROUND SURFACE TO 55 FT., USED H.S.A " CASING: THEN NQ-35 : CASING TO 60 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		55
FOOTAGE IN ROCK		5
NO. OF SAMPLES		11
HOLE NO. B-1	TYPE	B

BORING CONTRACTOR:
Soil Testing Inc.
90 DONNAVAN RD Oxford CT.

LOG PREPARED BY:
CONTR. JC CDR RL

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Pump Station
CDR NO. 14712.01 OFFICE: Rocky Hill

SHEET 2 OF 2
LOCATION: see plan
HOLE NO: B-1
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS

AT _____ FT. AFTER 0 HOURS

AT _____ FT. AFTER _____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	H.S.A		SS	NQ
SIZE I.D.	4.25"		1 3/8	1 7/8
HAMMER WT.			140	BIT.
HAMMER FALL			30"	Dia.

SURFACE ELEV. 20
DATE STARTED-FINISHED: Oct. 26 2011
BORING FOREMAN: J.Casson
INSPECTOR: M.J. Bazzano
SOILS ENGR: D.R.Stock

LOCATION OF BORING:

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.
								1 MPF			
								2 MPF			
								3 MPF Red Br. SILTSTONE			
								4 MPF			
							60	5 MPF			
							-40	Bottom of Boring 60'			

GROUND SURFACE TO 55 FT., USED H.S.A " CASING: THEN NQ-35 : CASING TO 60 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		55
FOOTAGE IN ROCK		5
NO. OF SAMPLES		11
HOLE NO. B-1	TYPE	B

BORING CONTRACTOR: Soil Testing Inc. 90 DONNAVAN RD Oxford CT.	**CDR MAGUIRE INC.** ENGINEERS BORING LOG	**SHEET** 1 OF 1
LOG PREPARED BY: CONTR. JC CDR CAD	**TOWN, STATE:** Middletown Ct.	**LOCATION:** see plan
	PROJECT NAME: Middletown Pump Station	**HOLE NO:** B-2
	CDR NO. 14712.01 **OFFICE:** Rocky Hill	**BORING TYPE:** B
		LINE & STA: N/A
		OFFSET: N/A

GROUND WATER OBSERVATIONS

AT 15 FT. AFTER 0 HOURS

AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE			SS	
SIZE I.D.	3.25		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30"	

SURFACE ELEV.	20.1
DATE STARTED-FINISHED:	Oct. 26 2011
BORING FOREMAN:	J.Casson
INSPECTOR:	C.A. Davis
SOILS ENGR:	D.R.Stock

LOCATION OF BORING:

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'	D	30 / 21 / 18	Moist Dense	Br. f-m SAND, little Silt, little Gravel. (FILL)	1	24	16
				14					
5		5'-7'	D	10 / 11 / 9	Moist Medium Dense	Gravel inspoon tip. (FILL)	2	24	1
				9					
10		10'-12'	D	12 / 11 / 10	Moist Medium Dense	Gravel in spoon tip. (FILL)	3	24	1
				6					
15		15'-17'	D	4 / 1 / 2	Wet Loose		4	24	12
				1		Br. CLAYEY SILT and f-m SAND. (FILL)			
20		20'-22'	D	2 / 2 / 2	Wet Loose	Br. CLAYEY SILT and f-m SAND. (FILL)	5	24	18
				2	21.5'				
					Soft	Blk. Peat			
25		25'-27'	D	2 / 5 / 7	Wet Stiff	Drk. Gry. Br. ORGANIC SILT and f SAND, tr. Roots.	6	24	24
				8					
30		30'-32'	D	2 / 3 / 4	Wet Stiff	Gry. Br. clayey SILT, little f Sand.	7	24	22
				6					
35		35'-37'	D	2 / 2 / 3	Wet Medium Stiff	Gry. Br. clayey SILT, little f Sand.	8	24	24
				2					
40		40'-42'	D	WOH / WOH / 3	40'		9	24	10
				6	Wet Loose	Gry. Br. f-c SAND, tr. Silt.			
45		45'-47'	D	5 / 3 / 10	Wet Medium Dense	Br. f-c SAND, tr. Silt, tr. Gravel.	10	24	12
				14					
50		50'-52	D	32 / 39 / 33	Wet Very Dense	Br. f-c SAND, some Silt, little Gravel.	11	2	12
				37					
					54'	Refusal on Auger @ 54'			
55						Bottom of Boring @ 54'			

GROUND SURFACE TO 54 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		54
FOOTAGE IN ROCK		0
NO. OF SAMPLES		11
HOLE NO. B-2	TYPE	B

BORING CONTRACTOR: Soil Testing Inc.	CDR MAGUIRE INC. ENGINEERS BORING LOG	SHEET 1 OF 1	
90 DONNAVAN RD Oxford CT.	TOWN, STATE: Middletown Ct.	LOCATION: see plan	
LOG PREPARED BY:	PROJECT NAME: Middletown Pump Station	HOLE NO: B-3	
CONTR. JC CDR C.A.D.	CDR NO. 14712.01 OFFICE: Rocky Hill	BORING TYPE: B	
		LINE & STA: N/A	
		OFFSET: N/A	

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
	BAR.					SURFACE ELEV.	20
AT 15 FT. AFTER 0 HOURS	TYPE	HS		SS		DATE STARTED-FINISHED:	10/27/13 - 10/28/2013
	SIZE I.D.	3.25		1 3/8		BORING FOREMAN:	J.Casson
AT FT. AFTER HOURS	HAMMER WT.			140	BIT.	INSPECTOR:	C.A. Davis
	HAMMER FALL			30"		SOILS ENGR:	D.R.Stock

LOCATION OF BORING:

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'	D	3 / 9 / 14	Moist	3" Topsoil	1	24	18
				30	Medium Dense	Br. f-m SAND, some Silt, tr. Gravel. (FILL)			
5		5'-7'	D	2 / 3 / 2	Moist	Red Br. SILT, Some f-c Sand, little Gravel. (FILL)	2	24	4
				5	Loose				
10		10'-12'	D	2 / 3 / 3	Moist Loose	Red Br. SILT, some f-m Sand, some Gravel. (FILL)	3	24	12
				4					
15		15'-17'	D	1 / 3 / 4	Wet Loose	Red Br. SILT, some f-m Sand, some Gravel. (FILL)	4	24	10
				1	15.5				
					4.5	Blk. FABRIC strong petroleum odor.			
20		20'-22'	D	1 / 1/12" / 1	Wet Soft	Gry. Br. ORGANIC SILT, little f-m Sand, tr. Roots.	5	24	15
25		25'-27'	D	WOH	Wet Soft	Gry. Grn. SILT, some Clay, tr. f Sand, tr. Roots.	6	24	22
30		30'-32'	D	WOH / WOH / 1	Wet Soft	Gry. Br. SILT, little f Sand.	7	24	24
				1					
35		35'-37'	D	1 / 1 / 1	Wet Soft	Gry. Br. SILT, some f Sand.	8	24	24
				1	39				
40		40'-42'	D	18 / 7 / 6	Wet Medium Dense	Br. f-c SAND, little Silt, little Gravel.	9	24	20
				6					
45		45'-47'	D	1 / 5 / 6	Wet Medium Dense	Br. f-c SAND, little Silt.	10	24	24
				18					
50		50'-51.75'	D	30 / 30 / 35	Wet Very Dense	Br. f-m SAND, some Silt, little Gravel, decomposed rock in spoon tip.	11	21	16
				100/3"					
					53	Refusal on Auger @ 53'			
55					-33	Bottom of Boring 53'			

GROUND SURFACE TO 53 FT., USED HAS " CASING: THEN : CASING TO FT.		FOOTAGE IN EARTH	53
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	11
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%		HOLE NO. B-3	TYPE B

BORING CONTRACTOR: Soiltesting Inc. 90 Donovan Road Oxford, CT 06478 **LOG PREPARED BY:** CONTR. JC CDR CAD	**CDR MAGUIRE INC.** **2080 SILAS DEANE HIGHWAY** **ROCKY HILL, CT. 06067** **TOWN, STATE:** Middletown, CT **PROJECT NAME:** Middletown Municipal Force Main **CDR NO.** 14712.01 **OFFICE:** Rocky Hill, CT	**SHEET** 1 **OF** 1 **LOCATION:** See Plan **HOLE NO:** B-04 **BORING TYPE:** B **STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS

AT 15 FT. AFTER 0 HOURS

AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	HS		SS	
SIZE I.D.	3.25		1⅜"	
HAMMER WT.			140#	BIT.
HAMMER FALL			30"	

SURFACE ELEV. 20
STARTED-FINISHED: 10/28/13 - 10/21/13
BORING FOREMAN: J.Casson
INSPECTOR: C.A.Davis
SOILS ENGR: D. Stock

AS-DRILLED BORING LOCATION: Northing: 767662.0067 Easting: 1027027.8772 Portland St. and Bridge St.

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'	D	15	20	31	Moist	GRAVEL (FILL)			
				30			Very Dense		1	24"	4
5		5'-7"	D	8	4	4	Moist	Br. f-m SAND, some Silt, tr. Gravel. (FILL)	2	24"	16
				4			Loose				
10		10'-12'	D	4	4	6	Moist	Br. f-m SAND, some Silt, tr. Gravel. (FILL)	3	24"	20
				7			Loose				
15		15'-17'	D	5	16	4	Wet	Br. f-c SAND, some Silt, tr. Gravel. (FILL)	4	24"	8
				3			Med. Dense				
20		20-22'	D	3	4	4	Wet	Br. f-c SAND, little Silt. (FILL)	5	24"	4
				5			Loose				
							23'				
25		25'-27'	D	9	11	11	Wet	Gry. Br. clayey ORGANIC SILT, tr. f Sand, tr.	6	24"	18
				14			Very Stiff	Roots.			
30		30'-32'	D	2	3	3	Wet	Gry. Br. clayey SILT, tr. f Sand.	7	24"	24
				6			Med. Stiff				
35		35'-37'	D	3	9	4	Wet	Gry. Br. clayey SILT, tr. f Sand.	8	24"	24
				4			Stiff				
							39'				
40		40'-42'	D	7	7	14	Wet	Br. f-c SAND, tr. Silt.	9	24"	16
				12			Med. Dense				
45		45'-47'	D	12	20	22	Wet	Red Br. f-c SAND, little Silt, tr. Gravel.	10	24"	6
				27			Dense				
50		50'-51.75	D	38	54	100/3"	50'	Red Br. fractured SILTSTONE.	11	15"	13
							Wet	Refusal on Auger @ 55'			
							Very Dense				
55								Bottom of Boring @ 55'			

GROUND SURFACE TO 55 FT., USED HAS " 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		55
FOOTAGE IN ROCK		0
NO. OF SAMPLES		11
HOLE NO. B-4	TYPE	B

BORING CONTRACTOR: General Borings Inc.	CDR MAGUIRE INC. ENGINEERS BORING LOG	SHEET 1 OF 1	
	TOWN, STATE: Middletown Ct.	LOCATION: see plan	
LOG PREPARED BY:	PROJECT NAME: Middletown Pump Station	HOLE NO: B-5	
CONTR. JC CDR C.A.D.	CDR NO. 14712.01 OFFICE: Rocky Hill	BORING TYPE: B	
		LINE & STA: N/A	
		OFFSET: N/A	

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
	BAR.					SURFACE ELEV.	20.1
AT 15 FT. AFTER 0 HOURS	TYPE	HS		SS		DATE STARTED-FINISHED:	10/31/2011
	SIZE I.D.	3.25		1 3/8		BORING FOREMAN:	J.Casson
AT FT. AFTER HOURS	HAMMER WT.			140	BIT.	INSPECTOR:	C.A. Davis
	HAMMER FALL			30		SOILS ENGR:	D.R.Stock

LOCATION OF BORING:

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							Moist Dense	Br. f-c SAND, some Gravel, tr. Silt. (FILL)			
		1'-3'	D	27	13	21			1	24	16
				26							
5		5'-7'	D	11	16	8	Moist	Br. f-c SAND, some silt, tr. Gravel. (FILL)	2	24	14
				6			Med. Dense				
10		10'-12'	D	5	7	10	Moist	Lt. Br. f-m SAND, tr. Silt, tr. Gravel. (FILL)	3	24	12
				12			Med. Dense				
15		15'-17'	D	11	10	13	Med. Dense	No recovery	0	24	0
				12							
20		20'-22-	D	8	10	10	Moist	Br. f-m SAND, some Silt, tr. Gravel tr. Wood. (FILL)	4	24	18
				6			Med. Dense				
							23'				
25		25'-27'	D	5	11	7	Moist Stiff	Gr. clayey SILT, tr. f-m Sand, tr. Roots. 4" Wood.	5	24	8
				8							
30		30'-32'	D	3	4	4	Moist	Gr. clayey SILT, tr. f Sand,tr. Roots tr. Wood.	6	24	24
				5			Med. Stiff				
35		35'-37'	D	1	3	4	35'		7	24	24
				5			Wet Loose	Gr. Br. f-c SAND, tr. Silt.			
40		40'-42'	D	7	10	15	Wet	Gr. Br. f-c SAND, tr. Silt.	8	24	24
				20			Med. Dense				
45		45'-47'	D	11	12	21		Br. f-c SAND, little Gravel, tr. Silt.	9	24	10
				44			Wet Dense				
50		50'-51.75	D	38	100/5"		50'		10	11	6
								Gray-Br. highly weathered SILTSTONE			
							Wet				
							Very Dense	Refusal on auger @ 55'			
55								Bottom of boring 55'			

GROUND SURFACE TO 55 FT., USED HAS " CASING: THEN : CASING TO FT.		FOOTAGE IN EARTH	55
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	10
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%		HOLE NO. B-5	TYPE B

BORING CONTRACTOR: General Borings Inc.

LOG PREPARED BY: CONTR. JC CDR C.A.D.

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Pump Station
CDR NO. 14712.01 OFFICE: Rocky Hill

SHEET 1 OF 2
LOCATION: see plan
HOLE NO: B-6
BORING TYPE: B
LINE & STA:
OFFSET:

GROUND WATER OBSERVATIONS

AT 15 FT. AFTER 0 HOURS

AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	HS		SS	NQ
SIZE I.D.	3.25		1 3/8	1 7/8
HAMMER WT.			140	BIT.
HAMMER FALL			30	Dia.

SURFACE ELEV. 20.2
DATE STARTED-FINISHED: 10/26-10/27/ 2011
BORING FOREMAN: J.Casson
INSPECTOR: M.J. Bazzono
SOILS ENGR: D.R.Stock

LOCATION OF BORING:

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'		13	20	15	Moist Dense	Br. f-m SAND, little Silt, little Gravel. (FILL)	1	24	18
				19							
5		5'-7'	D	3	4		Moist	Br. f-m SAND, little Silt, little Gravel. (FILL)	2	24	15
				11			Loose				
10		10'-12'	D	3	3	4	Moist	Br. f-c SAND, some Gravel, little Silt. (FILL)	3	24	12
				9			Loose				
15		15'-17'	D	2	2	3	Moist	Br. f-m SAND, little Silt, little Gravel. (FILL)	4	24	16
				3			Loose				
20		20'-22-	D	14	3	5	Wet	Gr. Br. f-m SAND, some Silt, tr. Gravel. (FILL)	5	24	8
				7			Loose				
25		25'-27'	D	3	5	7	Wet Stiff	Dark Br. SILT, little f Sand, tr. Roots.	6	24	18
				8							
30		30'-32'	D	1	3	6	Wet Stiff	Gray-Br. SILT, little f Sand.	7	24	18
				11							
35		35'-37'	D	wor	1	1	Wet Soft	Gray Br. SILT, some f Sand.	8	24	22
				2							
40		40'-42'	D	2	4	9		WOOD	9	24	16
				11			41'				
							-20.8 Wet Med. Dense	Br. f-c SAND, little Silt.			
45		45'-47'	D	6	10	11			10	24	24
				15			Wet Med. Dense	Br. f-c SAND, tr Silt, tr Gravel.			
50		50'-52'	D	29	40	55			11	24	16
				100				Red Br. f-c SAND, little Silt little Gravel			
							Wet Very Dense				
55							55'	Top of Rock 55'			

GROUND SURFACE TO 55 FT., USED H.S.A. " CASING: THEN NQ : CASING TO 60 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	55
FOOTAGE IN ROCK	5
NO. OF SAMPLES	11
HOLE NO. B-6	TYPE B

BORING CONTRACTOR: General Borings Inc.

LOG PREPARED BY: CONTR. JC CDR C.A.D.

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Pump Station
CDR NO. 14712.01 OFFICE: Rocky Hill

SHEET 2 OF 2
LOCATION: see plan
HOLE NO: B-6
BORING TYPE: B
LINE & STA:
OFFSET:

GROUND WATER OBSERVATIONS

AT 15 FT. AFTER 0 HOURS

AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	HS		SS	
SIZE I.D.	3.25		1 3/8	
HAMMER WT.			140	BIT.
HAMMER FALL			30	

SURFACE ELEV. 20.2
DATE STARTED-FINISHED: 10/26-10/27/2013
BORING FOREMAN: J.Casson
INSPECTOR: C.A. Davis-M. Bazzano
SOILS ENGR: D.R.Stock

LOCATION OF BORING:

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.
								3 minutes per foot			
								3			
								4 Gray brown SILTSTONE			
								4			
							60'	4	C-1	60	60
							-39.8	Bottom of Boring			

GROUND SURFACE TO 55 FT., USED H.S.A. " CASING: THEN NQ : CASING TO 60 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	55
FOOTAGE IN ROCK	5
NO. OF SAMPLES	11
HOLE NO. B-5 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 OFFICE: Rocky Hill Ct.

SHEET 1 OF 1
LOCATION: See Plan
HOLE NO: B-7
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS

AT N/A 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. 21.5
DATE STARTED-FINISHED: FEB 27 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		0-1.5	SS	4	14	20			1	18	4
				50/0"				Red Br. m-f SAND, some Silt, tr. Gravel. (FILL)			
								CONCRETE			
5								Possible existing underground storage tank.			
								Augered into concrete presuming it was fill.			
								Boring terminated after several attempts.			
10							10'				
							10'	BOTTOM OF BORING			
15											
20											
25											
30											
35											
40											

GROUND SURFACE TO 10 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	10
FOOTAGE IN ROCK	1
NO. OF SAMPLES	0
HOLE NO. B-7 TYPE	B

BORING CONTRACTOR: Soiltesting Inc.	**CDR MAGUIRE INC.**	**SHEET** 1 **OF** 2	
90 DONAVAN RD Oxford ct.	**ENGINEERS**	**LOCATION:** See Plan	
	BORING LOG	**HOLE NO:** B-8	
LOG PREPARED BY:	**TOWN, STATE:** Middletown Ct.	**BORING TYPE:** B	
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 13 FT. After 0 HOURS

AT ____ FT. After ____ HOURS

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

SURFACE ELEV. 21.1
DATE STARTED-FINISHED: 2/19-2/20/13
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 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	6	5		TOPSOIL	1	24"	12"
				6			Dry	Drk. Br. f-m SAND, some Silt, tr. Gravel. (FILL)			
							Med. dense				
								BOULDER (FILL)			
5		5'-7'	SS	10	1	1	Dry		2	24"	3"
				2			Loose	Br. Sand, Gravel, Silt, Wood. (FILL)			
							Moist				
10		10'-12'	SS	16	12	10	Med. Dense	Br. Sand, Gravel, Silt, Wood. (FILL)	3	24"	1"
				4							
							Wet				
15		15'-17'	SS	2	1	2	Loose	Red Br.-Blk. SILT, little f-m Sand, tr. f Gravel.	4	24"	9"
				3				(FILL) petroleum odors in soils.			
							Wet				
							Very				
20		20'-22'	SS	3	100/2"		Dense		5	8"	2"
								Same with trace metals.			
								CONCRETE possible floor slab.			
							22'				
								Drk. Br.-Gry. clayey ORGANIC SILT, tr. Wood.			
25		25'-27'	SS	1	1	1	Wet Soft		6	24"	24"
				1							
30		30'-32'	SS	W.O.R.	W.O.H.	W.O.H.	Wet Soft	Drk. Br.-Gry. clayey ORGANIC SILT tr. Wood.	7	24"	14"
				3							
							Wet				
35		35'-37'	SS	3	5	4	Soft	Drk. Gry. WOOD	8	24"	24"
				5							
							38'				
							Wet				
40		40'-42'	SS	4	5	7	Medium	Br. Gry. f-c SAND, little Silt, Gravel	9	24"	20"
				5			Dense				
							Wet				
45		45'-47'	SS	4	5	4	Loose	Br. Gry. f-c SAND, little Silt, little Gravel	10	24"	20"
				10							
							48.5'				
								Red Br. f-c SAND, some Silt, little Gravel,			
50		50'-50'5"	SS	100/5"				cobbles (TILL)	11	5"	5"
							Wet				
							Very	RED BROWN WEATHERED			
							Dense	BEDROCK-SILTSTONE			
55							55'				

GROUND SURFACE TO 55 FT. Used H.S.A. " CASING: THEN NQ : CASING TO 60 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		55
FOOTAGE IN ROCK		5
NO. OF SAMPLES		11
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc.	CDR MAGUIRE INC. ENGINEERS BORING LOG	SHEET 2 OF 2
90 DONAVAN RD Oxford ct.	TOWN, STATE: Middletown Ct.	LOCATION: See Plan
LOG PREPARED BY:	PROJECT NAME: Middletown Municipal Force Main Pump Station	HOLE NO: B-8
CONTR. ____ CDR RL	CDR NO. 14712.02 OFFICE: Rocky Hill Ct.	BORING TYPE: B
		LINE & STA: N/A
		OFFSET: N/A

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE	
AT 13 FT. After 0 HOURS	BAR.	H.S.A.			NQ	SURFACE ELEV. 21.1
	TYPE			SS		DATE STARTED-FINISHED: 2/19-2/20/2013
AT ____ FT. After ____ HOURS	SIZE I.D.	4.25"		1 3/8		BORING FOREMAN: Matt DeAngelis
	HAMMER WT.			140	BIT.	INSPECTOR: R. Lindenberger
	HAMMER FALL			30"	Dia.	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.
55		55'-60'	C					1.5 min/ft.			
			C					2 Red Brown SILTSTONE			
			C					2			
			C					1.5			
60			C					1.5			
							60'	Bottom of boring			
								RUN 1 55'-60' 45" RECOVERY RQD=0%			

GROUND SURFACE TO 55 FT. Used H.S.A. " CASING: THEN NQ : CASING TO 60 FT.		FOOTAGE IN EARTH	55
D = DRY W = WASHED C = CORED P = PIT A = AUGER V = VANE TEST		FOOTAGE IN ROCK	5
UP = UNDISTURBED, PISTON UB = UNDISTURBED, BALL CHECK OER = OPEN END ROD		NO. OF SAMPLES	11
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%		HOLE NO. B-8	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-9
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS

AT 13 FT. After 0 HOURS
AT ____ FT. After ____ HOURS

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

SURFACE ELEV. 20.05
DATE STARTED-FINISHED 2/19-2/20/2013
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	22	15	15	Dry	Gry. Br. f-c SAND, some Gravel, little Silt, (FILL)	1	24"	8"
				16			Med. Dense				
							2.5'	Concrete, possible foundation.			
5		5'-7'	SS	4	4	12	5'	Red Br. f-c SAND, some Gravel, tr. Silt, Wood,	2	24"	8"
				4			Moist	(FILL)			
							Med. dense				
							9'				
10		10'-12'	SS	WOR	WOR	WOR	Moist	Gry. and Br. SILT, some f-c Sand, Gravel,	3	24"	2"
				W.O.H			Loose	tr. Cinders and wood. (FILL)			
							Wet				
15		15'-17'	SS	WOR	W.O.H	11	Med	Gry. and Br. SILT, some f-c Sand, tr. Gravel,	4	24"	10"
				33			Dense	tr. Cinders. (FILL)			
							19'				
20		20'-20'2"	SS	100/2"				CONCRETE	-	2	0
							21'				
							Wet				
25		25'-27'	SS	WOR	W.O.H.	W.O.H.	Loose	Gry. Br. SILT.	5	24"	24"
				W.O.H.							
							Wet				
30		30'-32'	SS	W.O.H.	W.O.H.	2	Loose	Gry. Br. SILT.	6	24"	24"
				2							
							33'				
							Loose				
35		35'-37'	SS	3	4	6	Wet	Gry. f-c SAND, tr. Silt.	7	24"	14"
				4			36'	Gry. f-c SAND, tr. Silt, tr. Gravel.			
							Wet				
40		40'-42'	SS	3	4	4	Loose	Gry. f-c SAND, tr. Silt, tr. Gravel.	8	24"	10"
				3							
							42'				
45		45'-47'	SS	12	15	41	Wet		9	24"	8"
				56			Med. Dense	Red Br. f-c SAND, little Silt, little Gravel.			
								(TILL)			
50		50'-50'7"	SS	40	100/1"				10	7"	3"
							51'				
							51'	Auger Refusal			
								Bottom of boring			
55											

GROUND SURFACE TO 51 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		51
FOOTAGE IN ROCK		0
NO. OF SAMPLES		10
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-10 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
AT 13 FT. After 0 HOURS	BAR.	H.S.A.				**SURFACE ELEV.**	21.1
	TYPE			SS		**DATE STARTED-FINISHED:**	FEB 26 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	7	11	14	Dry	Br. f-c SAND, little Silt, little Gravel. (FILL)	1	24"	16"
				19			Med. Dense				
5		5'-7'	SS	14	19	39	Dry Very	Blk. f-c SAND, little Silt, little Gravel, tr. Glass,	2	24"	6"
				13			Dense	tr. Cinders. (FILL)			
10		10'-12'	SS	3	1	3	Moist	Gry. Br. f-c SAND, some Silt, little Gravel. (FILL)	3	24"	14"
				2			Loose				
15		15'-17'	SS	1	1	14	Wet	Br. f-m SAND, Silt, Cobbles, little Glass. (FILL)	4	24"	3"
				31			Med. Dense				
							19'				
20		20'-22'	SS	3	4	5	Wet	Drk. Br. SILT, tr. f Sand.	5	24"	21"
				8			Loose				
25		25'-27'	SS	2	1	2	Wet	Drk. Br. SILT, tr. f Sand.	6	24"	24"
				1			Loose				
30		30'-32'	SS	2	1	2	Wet	Drk. Br. SILT, tr. f Sand.	7	24"	24"
				2			Loose				
							34'				
35		35'-37'	SS	1	2	1	wet	Br. f-c SAND, tr. Silt.	8	24"	12"
				4			Loose				
40		40'-42'	SS	4	10	8	wet	Red Br. f-c SAND, tr. Gravel, tr. Silt.	9	24"	23"
				9			Med. Dense				
45		45'-47'	SS	4	5	6	Wet	Red Br. f-c SAND, little Gravel, tr. Silt.	10	24"	20"
				10			Med. Dense				
							49'				
50		50'-50'8"	SS	41	50/2"		Wet	Red Br. f-c SAND, little Gravel, little Silt, Cobbles			
							Very Dense	(TILL)			
							51.5'				
							51.5	Auger Refusal			
								Bottom of boring			

GROUND SURFACE TO 51.5 **FT. Used** H.S.A. **" CASING: THEN** _____ **: CASING TO** _____ **FT.**	**FOOTAGE IN EARTH**		51.5
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**		10
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%	**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-11
BORING TYPE: B
LINE & STA: N/A
OFFSET: N/A

GROUND WATER OBSERVATIONS

AT 13 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. 20.45
DATE STARTED-FINISHED: FEB 26 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 - 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	14	9	Dry Medium Dense	Br. f-c SAND, little Silt, little f Gravel. (FILL)	1	24"	6"
				11							
5		5'-7'	SS	3	7	9	Dry Medium Dense	Blk. f-c SAND, Cinders, tr. Brick, tr. f Gravel. (FILL)	2	24"	14"
				10							
10		10'-12'	SS	2	2	2	Moist Loose	Br. Gry. CINDERS. (FILL)	3	24"	10"
				2							
15		15'-17'	SS	1	1	1	Wet Loose	Br. Gry. CINDERS. (FILL)	4	24"	24"
				1							
							18'-29'	Br. CINDERS, f-c SAND, Gravel. (FILL)			
20		20'-22'	SS	3	5	2	Wet Loose		5	24"	24"
				2							
25		25'-27'	SS	2	2	5	Wet Loose	Br. CINDERS, f-c SAND, Gravel. (FILL)	6	24"	24"
				2							
30		30'-32'	SS	1	2	3	29'-36'	Br. SILT.	7	24"	24"
				4			Wet Loose				
35		35'-37'	SS	2	3	3	35'		8	24"	12"
				4			Wet Loose	Br. f-c SAND, some Gravel, little Silt, tr. Wood.			
40		40'-42'	SS	2	3	2	Wet Loose	Drk. Br. SILT, and f-c Sand, little Gravel.	9	24"	10"
				2							
45		45'-47'	SS	10	9	14	Wet Medium Dense	Drk. Br. f-c SAND, and SILT, little Gravel.	10	24"	
				12			47'				
50		50'-50'4"	SS	50/4"			Wet Very Dense 51'	Red Br. f-m SAND, some Silt, little Gravel. (TILL)	11	4"	
								Auger Refusal Bottom of boring			

GROUND SURFACE TO 56 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		56
FOOTAGE IN ROCK		5
NO. OF SAMPLES		12
HOLE NO.	TYPE	B

BORING CONTRACTOR: Soiltesting Inc.	CDR MAGUIRE INC. ENGINEERS BORING LOG	SHEET 1 OF 2	
90 DONAVAN RD Oxford ct.	TOWN, STATE: Middletown Ct.	LOCATION: See Plan	
	PROJECT NAME: Middletown Municipal Force Main Pump Station	HOLE NO: B-12	
LOG PREPARED BY:	CDR NO. 14712.02 OFFICE: Rocky Hill Ct.	BORING TYPE: A	
CONTR. CDR RL		LINE & STA: N/A	
		OFFSET: N/A	

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE		
AT 13 FT. After 0 HOURS	BAR.	H.S.A.			NQ	SURFACE ELEV.	20.15
	TYPE			SS		DATE STARTED-FINISHED:	FEB 24/25 2013
AT FT. After HOURS	SIZE I.D.	4.25"		1 3/8		BORING FOREMAN:	Matt DeAngelis
	HAMMER WT.			140	BIT.	INSPECTOR:	R. Lindenberger
	HAMMER FALL			30"	Dia.	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	13	16	17	Dry	Brown f-c SAND, little gravel, little silt. (FILL)	1	24"	6"
				22			Dense				
							Dry	Red Br. f SAND, tr. Silt, Gravel, Cinders, (FILL)			
5		5'-7'	SS	6	5	5	Loose		2	24"	14"
				6							
10		10'-12'	SS	7	6	4	Moist	Br. Blk. CINDERS, little f-m Sand. (FILL)	3	24"	13"
				3			Loose				
								Br. f-c SAND, some Gravel, little Silt, (FILL)			
15		15'-17'	SS	3	1	1	Wet		4	24"	4"
				2			Loose				
							18'				
								Drk. Br. SILT			
20		20'-22'	SS	2	1	5	Wet		5	24"	18"
				6			Loose				
25		25'-27'	SS	2	3	3	Wet	Gry. Br. SILT	6	24"	21"
				3			Loose				
30		30'-32'	SS	WOR	WOR	W.O.H.	Wet	Gry. Br. SILT	7	24"	24"
				3			Loose				
35		35'-37'	SS	WOR	WOR	2	Wet	Gry. Br. Clayey SILT	8	24"	24"
				3			Loose				
							Wet				
40		40'-42'	SS	WOR	7	12	Med. Dense		9	24"	16"
				15			40.5'				
								Red Br. f-c SAND, some Gravel, little Silt.			
							Wet				
45		45'-47'	SS	5	12	18	Med. Dense		10	24"	16"
				43							
								Red Br. f-c SAND and GRAVEL, little Silt.			
							Wet				
50		50'-50/4"	SS	59	50/4"		Very dense	Red Br. f-c SAND, some Gravel, some Silt.	11	10"	6"
							51'				
55		50/4"	SS	50/4"			56'	RED BROWN weathered SILTSTONE	12	4"	4"

GROUND SURFACE TO 56 FT. Used H.S.A. " CASING: THEN NQ : CASING TO 61 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		56
FOOTAGE IN ROCK		5
NO. OF SAMPLES		12
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 2 OF 2 LOCATION: See Plan HOLE NO: B-12 BORING TYPE: A LINE & STA: N/A OFFSET: N/A

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE	
AT 13 FT. After 0 HOURS	BAR.	H.S.A.			NQ	SURFACE ELEV. 20.15
	TYPE					DATE STARTED-FINISHED: FEB 24/25 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"	DIA.	SOILS ENGR:

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.
55'							56'	CORED BEDROCK			
			C					1.5 min/ft.			
			C					1.5			
			C					1.5 Red Br. SILTSTONE			
			C					2			
			C				61'	2			
								BOTTOM OF BORING			
								RECOVERY=32" RQD = 0%			

GROUND SURFACE TO 56 FT. Used H.S.A. " CASING: THEN NQ : CASING TO 61 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		56
FOOTAGE IN ROCK		5
NO. OF SAMPLES		12
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-13 **BORING TYPE:** B **LINE & STA:** N/A **OFFSET:** N/A

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE	
AT 14 FT. After 0 HOURS	BAR.	H.S.A.				**SURFACE ELEV.** 20.65
	TYPE			SS		**DATE STARTED-FINISHED:** FEB 21 2013
AT ____ FT. After ____ HOURS	SIZE I.D.	4.25"		1 3/8		**BORING FOREMAN:** Matt DeAngelis
	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 - 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	8	7	7	Dry	Br. f-c SAND, some Silt, tr. Glass, tr. Brick	1	24"	6"
				7			Med dense	tr. Gravel. (FILL)			
5		5'-7'	SS	5	4	2	Dry	Br. CINDERS and ASH. (FILL)	2	24"	1"
				1			Loose				
							Wet				
10		10'-12'	SS	16	11	5	Med. Dense	Br. CINDER and ASH. (FILL)	3	24"	1"
				4							
15		15'-17'	SS	WOH	WOH	WOH	Wet Loose	No Recovery.			
				WOH							
							: 18'				
20		20'-22'	SS	4	3	2	Wet	Drk. Br. ORGANIC SILT.	4	24"	8"
				3			Loose				
25		25'-27'	SS	6	4	4	Wet	Gry. Br. SILT.	5	24"	7"
				3			Loose				
30		30'-32'	SS	WOH	WOH	3	Wet	Gry. Br. SILT.	6	24"	24"
				4			Loose				
							Wet				
35		35'-37'	SS	WOH	WOH	3	Loose	Gry. Br. SILT.	7	24"	24"
				6			36'				
								Gry. Br. f-m SAND, little Silt, tr. Wood, tr. Organics			
40		40'-42'	SS	2	3	6	Wet Loose	Gry. Br. SILT, little f Sand.	8	24"	22"
				8			41.5'				
							41.5'	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:
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				
30		30'-32'	SS	3	7	8	Wet Med. Dense	Drk. Br. ORGANIC SILT.	7	24"	20"
				8			31'				
35		35'-37'	SS	4	6	10		Br. f-c SAND, little Silt, tr. Organics.	8	24"	22"
				10			Wet Med. Dense	Gry. Br. f-c SAND, tr. Silt, tr. Gravel.			
40		40'-42'	SS	5	10	7	Wet 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: Soil Testing Inc. 90 DONNAVAN RD Oxford CT.	CDR MAGUIRE INC. ENGINEERS BORING LOG		SHEET 1 OF 2
LOG PREPARED BY: CONTR. MD CDR RL	TOWN, STATE: Middletown Ct.		LOCATION: see plan
	PROJECT NAME: Middletown Pump Station		HOLE NO: DB-1
	CDR NO. 14712 OFFICE: Rocky Hill		BORING TYPE: A
			LINE & STA:
			OFFSET: 10' West

GROUND WATER OBSERVATIONS		AUGER	CASING	SAMPLER	CORE	
AT 16.5 FT. AFTER 0 HOURS	BAR.					SURFACE ELEV. 21.4
	TYPE			SS	NW	DATE STARTED-FINISHED: 01/09/13-01/10/13
AT FT. AFTER HOURS	SIZE I.D.		3"	1 3/8		BORING FOREMAN: Matt Deangelis
	HAMMER WT.		140	140	BIT.	INSPECTOR: R. Lindenberger
	HAMMER FALL		30"	30"	Dia.	SOILS ENGR: D. Nacci

LOCATION OF BORING:

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	5	3	3	Dry		1	24	15
				2			Loose	Br. f-c SAND, little Gravel, little Silt, tr. Ash, tr. Cinders. (FILL)			
5							Dry	few Cobbles			
		5'-7'	D	7	2	2	Loose	Gry. Br. f-m SAND, little Gravel, little	2	24	3
				3			Moist	Silt, tr. Ash, Cinders. (FILL)			
		7'-8'	D	3	4	5	Loose	Br. f-c SAND, little Silt, little Gravel. (FILL)	3		
				6							
10							Moist				
		10'-12'	D	7	7	8	Medium	Br. f-m SAND, little Silt, little Gravel. (FILL)	4	24	5
				5			Dense				
15							Wet				
		15'-17'	D	10	6	6	Medium	Br. f-c SAND, some Silt, little Gravel. (FILL)	5	24	12
				5			Dense				
20							Wet Medium Dense				
		20'-22'	D	6	5	5	21'	Br. f-m SAND, some Silt, little Gravel (FILL)	6	24	17
				5			Loose	Br. SILT, tr. f Sand.			
25							Wet				
		25'-27'	D	2	6	7	Medium	Gry. Br. SILT and Blk. PEAT, tr. f Sand.	7	24	22
				9			Dense				
		27'-29'	ST								
30		29'-31'	D	3	4	5	Wet Loose	Red Br. SILT, tr. f Sand.			
				5					8	24	23
35							Wet	Gry. Br. SILT, tr. f Sand, tr. Clay.			
		35'-37'	D	2	4	5	Loose		9	24	24
				5							
40							Wet	Gry. SILT, little f Sand.			
		40'-42'	D	2	4	9	Loose		10	24	9
				9			42'				
45							Wet				
		45'-47'	D	17	16	16	Dense	Br. f-c SAND, some Silt, some Gravel.	11	24	13
				12							
50							Wet Dense				
		50'-52	D	30	22	23	51'	Red Br. f-c SAND, some Silt, little Gravel.	12	24	8
				32				1.5 mm/ft			
								1			
55								1 Gry. SANDSTONE			

GROUND SURFACE TO 52 FT., USED A " CASING: THEN 3" : CASING TO 52 FT.								FOOTAGE IN EARTH		52
D = DRY	W = WASHED	C = CORED	P = PIT	A = AUGER	V = VANE TEST			FOOTAGE IN ROCK		15
UP = UNDISTURBED, PISTON		UB = UNDISTURBED, BALL CHECK		OER = OPEN END ROD				NO. OF SAMPLES		13
PROPORTIONS USED: TRACE=0-10%, LITTLE=10-20%, SOME=20-35%, AND 35-50%								HOLE NO. DB-1	TYPE	A

BORING CONTRACTOR: Soil Testing Inc.

LOG PREPARED BY: CONTR. MD CDR RL

CDR MAGUIRE INC.
ENGINEERS
BORING LOG

TOWN, STATE: Middletown Ct.
PROJECT NAME: Middletown Water Mun. Force Main
CDR NO. 14712 OFFICE: Rocky Hill

SHEET 2 OF 2
LOCATION: see plan
HOLE NO: DB-1
BORING TYPE: B to A
LINE & STA:
OFFSET: 10' West

GROUND WATER OBSERVATIONS
AT 16.5 FT. AFTER 0 HOURS
AT ____ FT. AFTER ____ HOURS

	AUGER	CASING	SAMPLER	CORE
BAR.				
TYPE	HS		SS	NW
SIZE I.D.	3.25	3"	1 3/8	
HAMMER WT.		140	140	BIT.
HAMMER FALL		30"	30"	Dia.

SURFACE ELEV. 41.4
DATE STARTED-FINISHED: 01/09/13-01/10/13
BORING FOREMAN: Matt Deangelis
INSPECTOR: R. Lindenberger
SOILS ENGR: D. Nacci

LOCATION OF BORING:

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.
								1.5 Min			
57								1.5 Min	C1	60	36
								1.5 Min Red Br. and Gry. SANDSTONE.			
								1 Min			
60								1 Min			
								1.5 Min			
62								1 Min	C2	60	60
								1 Min Red Br. and Gry. SANDSTONE.			
								1 Min			
65								1 Min			
								1.5 Min			
67								1 Min	C3	60	60
								67' Bottom of Boring			

GROUND SURFACE TO 52 FT., USED A " CASING: THEN 3" : CASING TO 52 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		52
FOOTAGE IN ROCK		15
NO. OF SAMPLES		13
HOLE NO. DB-1	TYPE	B to A