



Geotechnical and Construction Materials Testing Services

January 27, 2010

Karen Callaway, P.E.
CITY OF ROCKY MOUNT
PO Box 1180
Rocky Mount, NC 27802

Re: Report of Subsurface Investigation
Leggett Park Sanitary Sewer Improvements
Rocky Mount, North Carolina
GeoTechnologies Project No. 1-10-0029-EA

Dear Ms. Callaway:

GeoTechnologies, Inc. has completed the authorized investigation to evaluate subsurface soil conditions for the Leggett Park Sanitary Sewer improvements planned for Rocky Mount, North Carolina. A total of 35 locations (Table 1) were investigated, with 27 of the locations being evaluated with soil test borings completed with a BK-51 drill rig. The remaining locations were evaluated with hand auger borings. During advancement of the borings, the consistency and density of the soils encountered were evaluated with standard penetration testing, dynamic hand cone penetrometer testing, or with estimated penetration resistances. The boring locations were established using either an in-field survey or a provided site plan, and the boring locations should be considered approximate. This report presents the findings of our investigation and our recommendations for installation of the proposed alignment.

PROJECT AND SITE DESCRIPTION

The project will involve the installation of about 10,000 linear feet of new sanitary sewer along several roadways and through wooded areas. Invert depths are typically expected to be in the range of 5 to no more than 15 feet below existing grade. A reconnaissance along the proposed alignment prior to completion of our drilling indicated the presence of a large rock outcropping about half way between MH-2 and MH-3, and therefore, a number of borings were concentrated in this area to help define the rock profile. Standing water was observed in many of the wooded areas of the alignment during our investigation.

SUBSURFACE CONDITIONS

Generalized subsurface profiles prepared from the investigation data are attached to this report as Figures 1A-1E to graphically illustrate subsurface conditions encountered at this site. More detailed descriptions of the conditions encountered at the individual locations investigated are then presented on the attached boring records.

Surface conditions were typically characterized by the presence of a surface layer of topsoil, fill soils, and/or asphalt/gravel that extended to depths in the range of 0.2 to 3.0 feet. Underlying these surface materials, the borings generally encountered either sandy or clayey (low to high plasticity) soils, with silts being present in a few borings. These materials exhibited significant variability, with

penetration resistances ranging from 2 to 20+ blows per foot or blows per increment (bpf/bpi). With depth, borings MH-1A, MH-2A, MH-2B, MH-2B2, MH-2C, MH-3, MH-31, and MH-46, encountered either partially weathered rock or boring refusal at depths as shallow as 6 inches. Partially weathered rock is defined as material exhibiting penetration resistances in excess of 100 bpf that can be penetrated by the soil drilling process. The elevation of PWR or auger refusal is summarized in Table 1. The borings were terminated upon encountering auger refusal or upon reaching the plan boring depth.

Groundwater was encountered in most of the borings at or above the planned invert elevation. It should be noted that groundwater elevations will fluctuate during different periods of the year, and will likely be higher or lower depending on the time of the year that the line is installed. Groundwater elevations at the boring locations are summarized in Table 1.

RECOMMENDATIONS

The following recommendations are made based upon a review of the attached data, our understanding of the proposed construction, and past experience with similar projects and subsurface conditions. Should alignment plans change significantly from those now under consideration, we would appreciate being provided with that information so that these recommendations may be confirmed, extended, or modified as necessary. Additionally, should subsurface conditions adverse to those indicated by this report be encountered during construction, those differences should be reported to us for review and comment.

General Excavation Considerations. Based on the results of our investigation, we anticipate that some portions of the alignment will encounter difficult excavation materials above the invert depth during installation. The most significant area of shallow difficult excavation appears to be concentrated in the proximity of the large rock outcropping between MH-2 and MH-3, however, isolated PWR or rock was also encountered at MH-31 and MH-46, and this suggests that more isolated PWR or rock could be encountered elsewhere, intermediate of the boring locations. Our experience has been that excavation of partially weathered rock or rock harder than 50 blows per 4 inches of penetration is typically impossible with most equipment available for trench excavation, such as track mounted backhoes equivalent to a CAT 320 or 330. Large track mounted backhoes with rock teeth can sometimes excavate partially weathered rock with penetration resistances ranging from 50 blows per 4 inches to 50 blows per 6 inches of penetration; however, the rate of excavation is slow and most contractors will request a trench rock price for any removal of partially weathered rock. Based on this criteria, our borings indicate that while it may be possible to remove some difficult excavation materials with a large excavator or ram-hoe, line blasting will be needed in most areas where difficult excavation materials are present.

Prior to performing any blasting, we recommend that a survey of all adjacent structures be performed by qualified personnel to document their condition. Vibration monitoring should be performed during all blasting operations.

Pipeline Bedding and Trench Backfilling. In areas where blasting is required, we recommend that the pipe be placed over at least 6 inches of open graded crushed stone such as #57 or #67 stone in order to provide a leveling cushion for the base of the pipe. All overshot rock must be removed from below the pipe. Our borings indicate that soft soils will be encountered at the invert elevation in some areas, and where soft soils are encountered in the base of the excavation, the trenches should be overexcavated approximately 12 to 24 inches (or as directed by the geotechnical engineer) and be backfilled with washed stone. Depending upon the success of the trench dewatering operation, some stone may be needed to maintain a clean excavation bottom.

A standard backfill compaction recommendation for soils placed over the pipe is to compact the material to at least 90% of the standard Proctor maximum dry density, except where post-construction settlement of backfill cannot be tolerated. In settlement sensitive areas, backfill should be compacted to 95% of the standard Proctor maximum dry density. However, a majority of the soils encountered during our investigation were somewhat to significantly wet of optimum moisture content, and some of the soils were high plasticity clays which can be difficult to recompact in a trench excavation. Therefore, we anticipate that the contractor will have difficulties achieving even 90% compaction in many areas. If this is the case, it may be necessary to accept a lower compaction percentage (resulting in higher post-construction settlements) in non-structural areas. In areas where post-construction movements need to be minimized, the contractor will have to be selective with regards to backfill material, and will likely need to import dry fill. The initial lift of soil over the pipe should consist of soil and not contain pieces of rock or weathered rock to serve as a cushion over the pipe for subsequent fill placement and compaction.

Stability & Groundwater Considerations. We anticipate that most of the inverts will extend near or below the groundwater level, and in some areas the inverts will be more than 5 feet below the groundwater level. In our opinion, the relatively high water table will be one of the most challenging aspects of construction. A common dewatering practice during trench installation is to use a sump and mud pump to remove any water that enters the excavation. However, based on the recorded water elevations relative to the invert elevations, and the fact that most of the deeper soils are moderately to highly permeable, we anticipate that this technique may be ineffective in many areas. Additionally, even if the contractor is able to maintain a relatively dry trench with this technique, hydrostatic forces could create a “quick” condition at the base of the excavation, seriously impacting the subgrade.

Based on the above, it is our opinion that proactive dewatering will be required in advance of the excavation to maintain a dry and stable excavation base in many areas along the alignment. Dewatering means and methods should be left to the discretion of the contractor; however, properly designed and installed wellpoints placed outside or inside the excavation limits should dewater the excavation area effectively.

Since the results of our investigation indicate that the side slopes for trench excavations will likely be quite variable, we recommend that the contractor be prepared to use temporary shoring such as a trench box during installation. With proper dewatering, the side slopes likely will not slough as readily as our borings; however, instability will likely still be observed in some areas and adequate protection must be provided for work safety. All OSHA regulations regarding excavation safety should be strictly adhered to during the construction operations.

GeoTechnologies, Inc. appreciates the opportunity to be of service on this phase of the project. Please contact us if you have any questions concerning this letter or if we may be of additional service on this or other projects.



Sincerely,

GeoTechnologies, Inc.

Ernest L. Stitzinger, P.E.
NC Registration No. 25534

Table 1
 Leggett Park Sanitary Sewer Improvements
 Rocky Mount, NC
 Project No. 1 10-0029-EA

Bore-Hole	STA±	Existing Site Grade Elevation (ft)	Invert Elevation(ft)	Partially Weathered Rock or Refusal Elevation (ft)	Water Table Elevation (ft)	Cave Elevation (ft)
MH-1	0+72	70.0'	60.5'	Not Encountered	66.0'	65.0
MH-1A	2+08	67.0'	61.0'	55.0'	62.5'	59.0
MH-2A	2+80	69.0'	61.0'	68.5'	Not Encountered	Not Encountered
MH-2B	3+25	72.0'	61.0'	71.5'	Not Encountered	Not Encountered
MH-2B(2)	3+35	72.0'	61.0'	70.5'	Not Encountered	Not Encountered
MH-2C	4+35	73.0'	61.0'	71.0'	69.5'	Not Encountered
MH-3	5+50	74.0'	61.7'	Not Encountered	Not Encountered	Not Encountered
MH-4	9+59	75.0'	62.8'	Not Encountered	68.5'	67.0
MH-5	12+63	74.0'	63.6'	Not Encountered	69.0'	68.0
MH-6	15+24	73.0'	64.2'	Not Encountered	70.0'	66.0
MH-7	18+05	74.0'	64.9'	Not Encountered	69.5'	66.5
MH-9	19+32	75.0'	65.4'	Not Encountered	67.5'	67.5
MH-10	20+82	73.0'	65.8'	Not Encountered	72.0'	Not Encountered
MH-12	23+10	76.0'	66.6'	Not Encountered	67.5'	68.0
MH-14	5+45	76.0'	69.3'	Not Encountered	70.0'	70.5
MH-16	4+15	94.0'	86.0'	Not Encountered	Not Encountered	Not Encountered
MH-17	6+50	94.0'	88.4'	Not Encountered	Not Encountered	Not Encountered
MH-18	1+56	74.0'	65.5'	Not Encountered	70.0'	69.5
MH-19	3+81	73.0'	66.1'	Not Encountered	69.0'	68.0
MH-21	8+39	74.0'	67.4'	Not Encountered	68.0'	67.0
MH-23	14+41	74.0'	68.9'	Not Encountered	68.0'	68.0
MH-24	1+60	74.0'	67.3'	Not Encountered	69.0'	68.0
MH-26	7+29	75.5'	69.8'	Not Encountered	Not Encountered	69.5
MH-28	4+00	72.0'	67.0'	Not Encountered	66.0'	Not Encountered
MH-29	7+45	74.0'	70.0'	Not Encountered	69.0'	Not Encountered
MH-31	2+41	71.4'	61.9'	66.1'	Not Encountered	71.4
MH-33	8+93	69.0'	64.7'	Not Encountered	64.0'	64.0
MH-35	3+65	74.5'	66.7'	Not Encountered	67.5'	Not Encountered
MH-37	8+59	74.0'	69.1'	Not Encountered	Not Encountered	Not Encountered
MH-40	4+41	76.5'	66.4'	Not Encountered	68.0'	67.5
MH-42	9+50	78.7'	68.7'	Not Encountered	67.2'	69.7
MH-43	11+67	79.0'	69.0'	Not Encountered	Not Encountered	Not Encountered
MH-45	2+05	78.6'	69.0'	Not Encountered	69.6'	71.6
MH-46	1+55	76.0'	69.1'	70.0'	71.5'	Not Encountered
MH-47	4+64	84.3'	74.2'	Not Encountered	74.8'	75.8

Elevation (Feet)

GENERALIZED SUBSURFACE PROFILE

LEGEND

- Topsoil
- Silty Sand
- Low Plasticity Clay
- Clayey Sand
- High Plasticity Clay
- Poorly-graded Sand
- Low Plasticity Silt
- Partially Weathered Rock
- 8 Standard Penetration Resistance
- N=8 Estimated Penetration Resistance
- Groundwater at Time of Boring
- Auger Refusal
- Cave Depth
- Proposed Elevation



PROJECT:

Leggett Park
Sanitary Sewer Improvements
Rocky Mount, North Carolina



SCALE: As Shown

JOB No:1-10-0029-EA

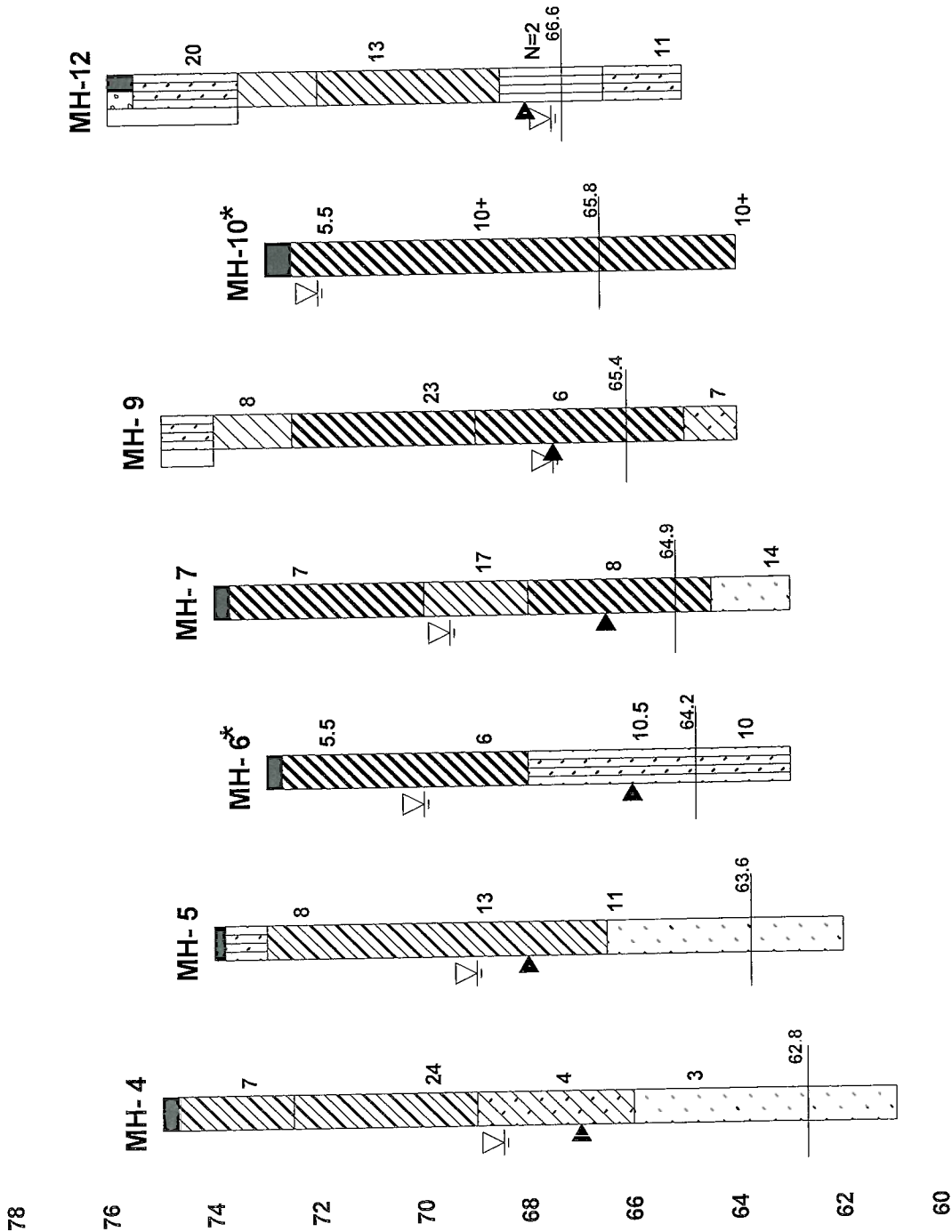
FIGURE No:1A

Elevation (Feet)

GENERALIZED SUBSURFACE PROFILE

LEGEND

- Topsoil
- Moderate Plasticity Clay
- Clayey Sand
- Poorly-graded Sand
- Silty Sand
- High Plasticity Clay
- Low Plasticity Clay
- Asphalt Over CABC
- Low Plasticity Silt
- Fill
- 8 Standard Penetration Resistance
- 8 Dynamic Cone Penetration
- N=8 Estimated Penetration Resistance
- Groundwater at Time of Boring
- Auger Refusal
- Cave Depth
- Proposed Elevation



SCALE: As Shown

JOB No:1-10-0029-EA

FIGURE No:1B





















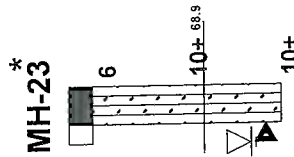
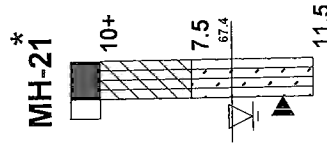
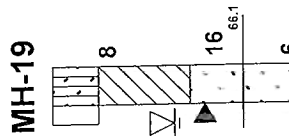
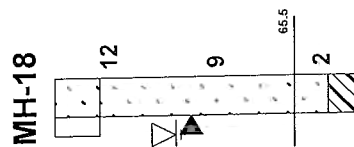
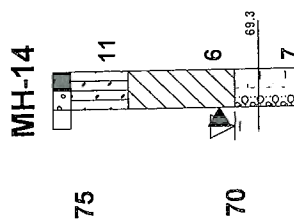
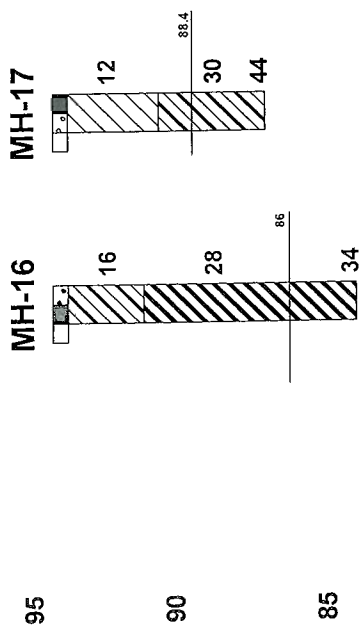
PROJECT:
 Leggett Park
 Sanitary Sewer Improvements
 Rocky Mount, North Carolina

Elevation (Feet)

GENERALIZED SUBSURFACE PROFILE

LEGEND

-  Asphalt Over CABC
-  Silty Sand
-  Low Plasticity Clay
-  Slightly Silty Sand
-  Asphalt over CABC
-  Moderate Plasticity Clay
-  High Plasticity Clay
-  Poorly-graded Sand
-  Topsoil
-  Low Plasticity Clay to Silt
-  Fill
-  8 Standard Penetration Resistance
-  8 Dynamic Cone Penetration Resistance
-  N=8 Estimated Penetration Resistance
-  Groundwater at Time of Boring
-  Auger Refusal
-  Cave Depth
-  Proposed Elevation



60

PROJECT:

Leggett Park
 Sanitary Sewer Improvements
 Rocky Mount, North Carolina

SCALE: As Shown

JOB No:1-10-0029-EA

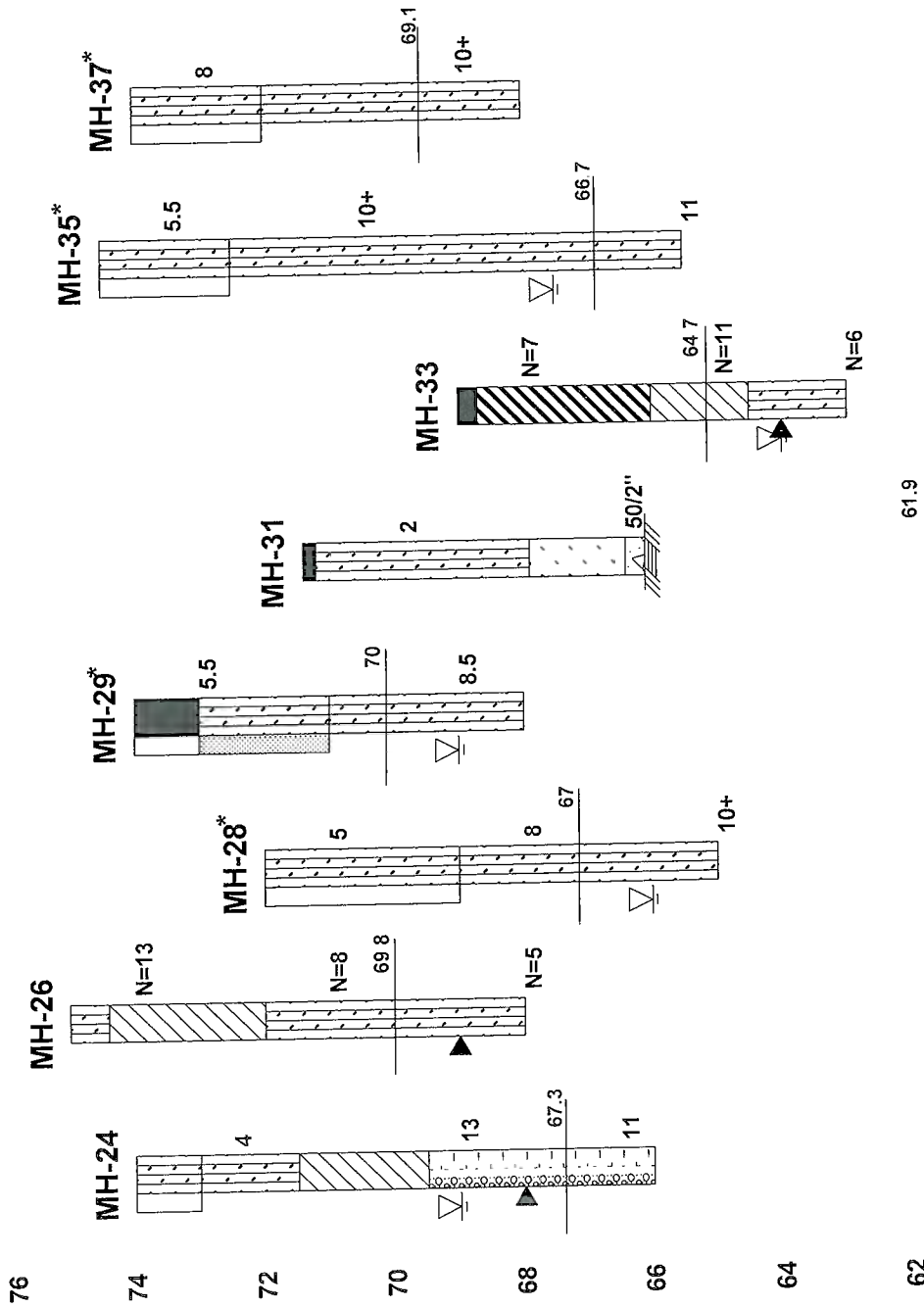
FIGURE No:1C



GENERALIZED SUBSURFACE PROFILE

LEGEND

- Silty Sand
- Low Plasticity Clay
- Slightly Silty Sand
- Topsoil
- Poorly-graded Sand
- Partially Weathered Rock
- High Plasticity Clay
- Fill
- Possible Fill
- 8 Standard Penetration Resistance
- 8 Dynamic Cone Penetration
- N=8 Estimated Penetration Resistance
- Groundwater at Time of Boring
- Auger Refusal
- Cave Depth
- Proposed Elevation



SCALE: As Shown

JOB No:1-10-0029-EA

FIGURE No:1D

PROJECT:

Leggett Park
Sanitary Sewer Improvements
Rocky Mount, North Carolina



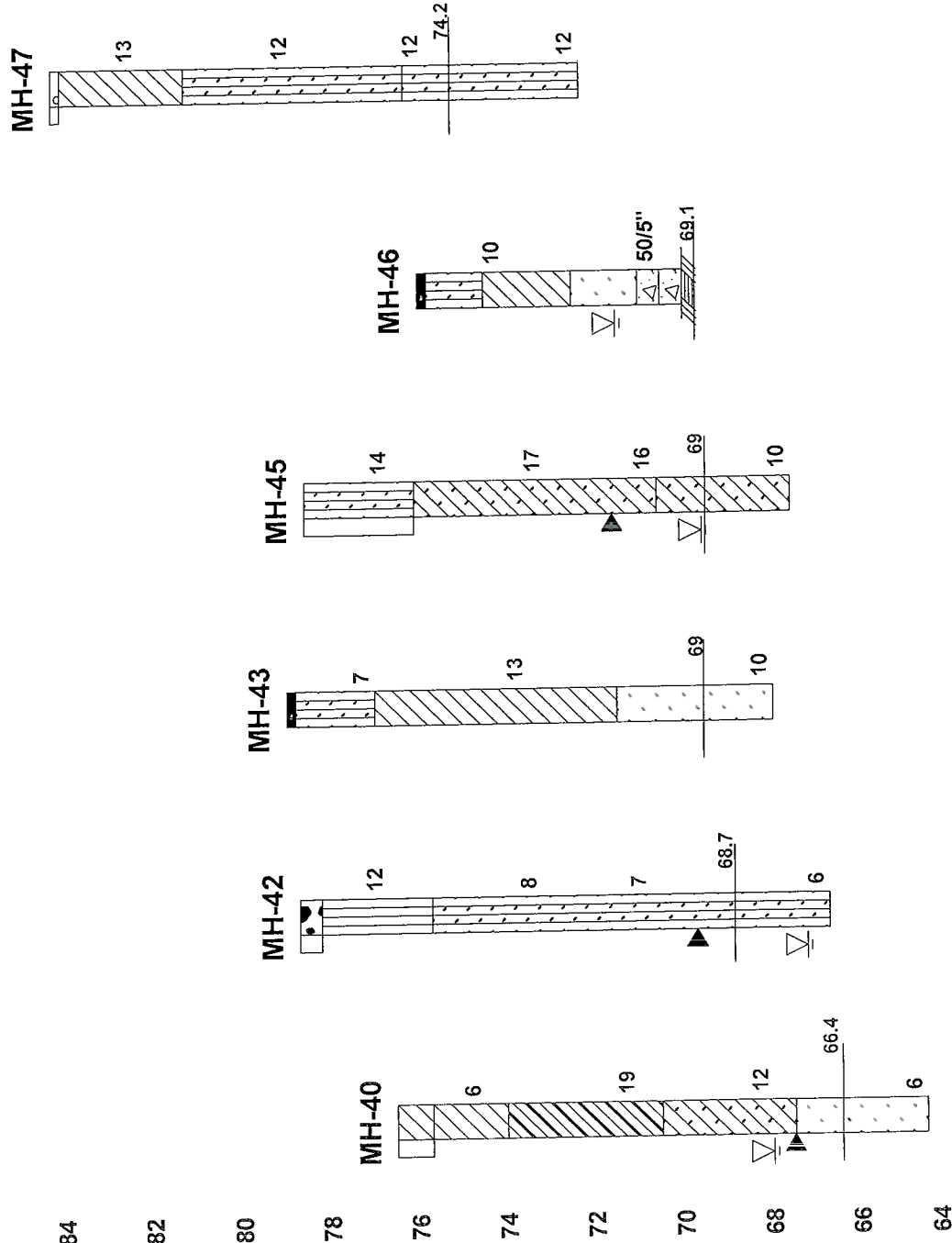
61.9

Elevation (Feet)

GENERALIZED SUBSURFACE PROFILE

LEGEND

- Low Plasticity Clay
- Moderate Plasticity Clay
- Clayey Sand
- Poorly-graded Sand
- Poorly-graded Gravel
- Low Plasticity Silt
- Silty Sand
- Topsoil
- Partially Weathered Rock
- Sandy Gravel
- Fill
- 8 Standard Penetration Resistance
- Groundwater at Time of Boring
- Auger Refusal
- Cave Depth
- Proposed Elevation



PROJECT:

Leggett Park
Sanitary Sewer Improvements
Rocky Mount, North Carolina

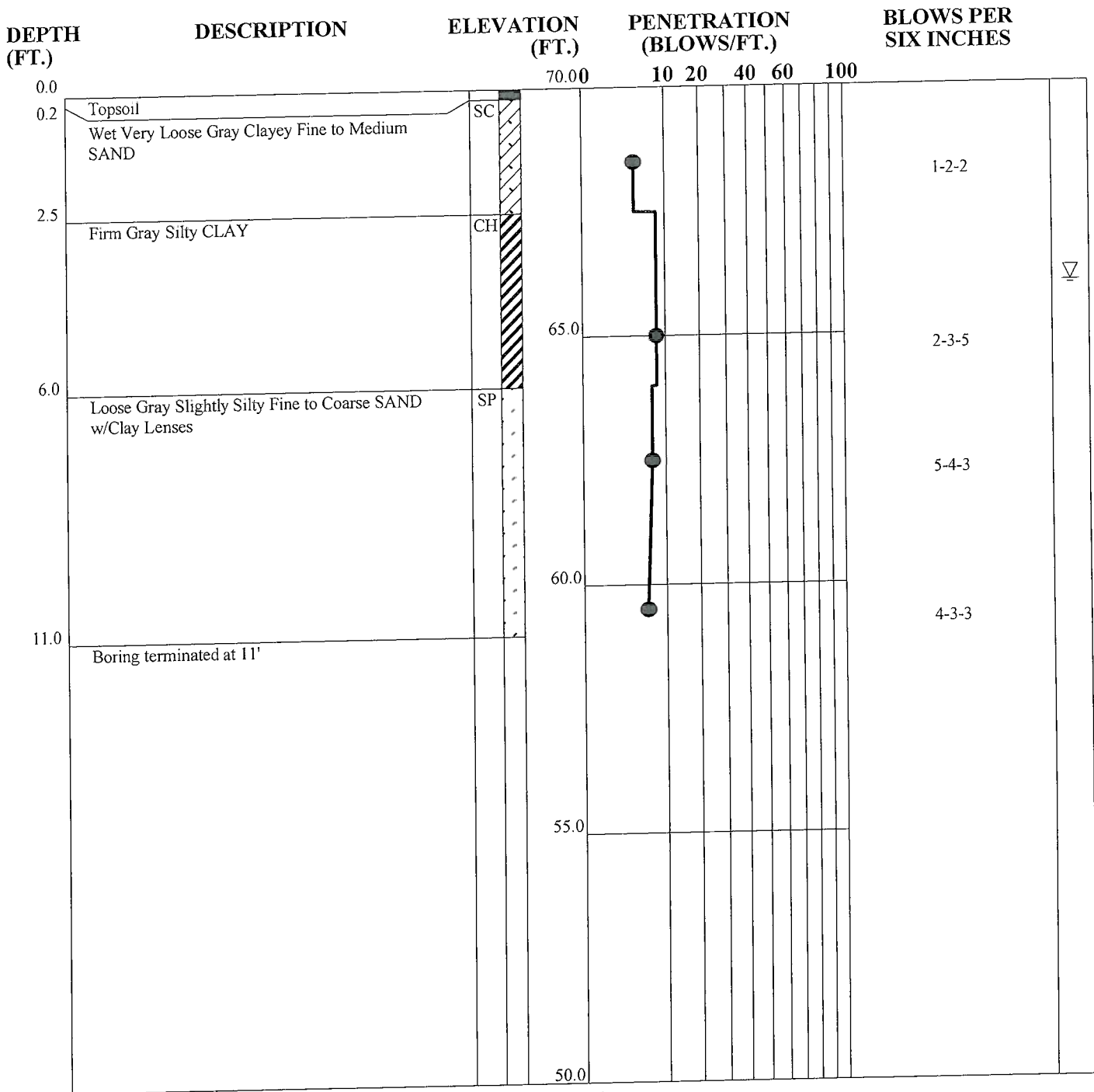


SCALE: As Shown

JOB No:1-10-0029-EA

FIGURE No:1E

TEST BORING RECORD



GTL_MAIN 100029 GPJ GTI.GDT 1/27/10

Groundwater encountered at 4' and caved at 5' at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH- 1
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		67.00						
0.3	Topsoil Wet Firm Gray Fine Sandy Silty CLAY	CL						N=7
5.0	Very Loose Gray Silty Fine to Medium SAND	SM						N=4
12.0	Auger Refusal at 12'							
		47.0						

GTI_MAIN 100029.GPJ GTI GDT 1/27/10

Groundwater encountered at 4 5' and caved at 8' at time of boring.

JOB NUMBER 1-10-0029-EA
 BORING NUMBER MH- 1A
 DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		69.00						
0.5	Topsoil							
	Auger Refusal at 0.5'							
		64.0						
		59.0						
		54.0						
		49.0						

GTL_MAIN 100028.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH- 2A
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		72.00						
0.5	Topsoil							
	Auger Refusal at 0.5'							
		67.0						
		62.0						
		57.0						
		52.0						

GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH- 2B
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		72.00						
0.5	Topsoil							
1.5	Wet Very Loose Tan Slightly Clayey Silty Fine to Medium SAND	SM						
	Auger Refusal at 1.5'							
		67.0						
		62.0						
		57.0						
		52.0						

GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH 2B(2)
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		73.00						
0.3	Topsoil							
1.0	Wet Very Loose Silty Fine to Medium SAND	SM						N=2
1.0	Stiff Yellow Fine Sandy Silty CLAY	CL						
2.0	Auger Refusal at 2'							N=13
		68.0						
		63.0						
		58.0						
		53.0						

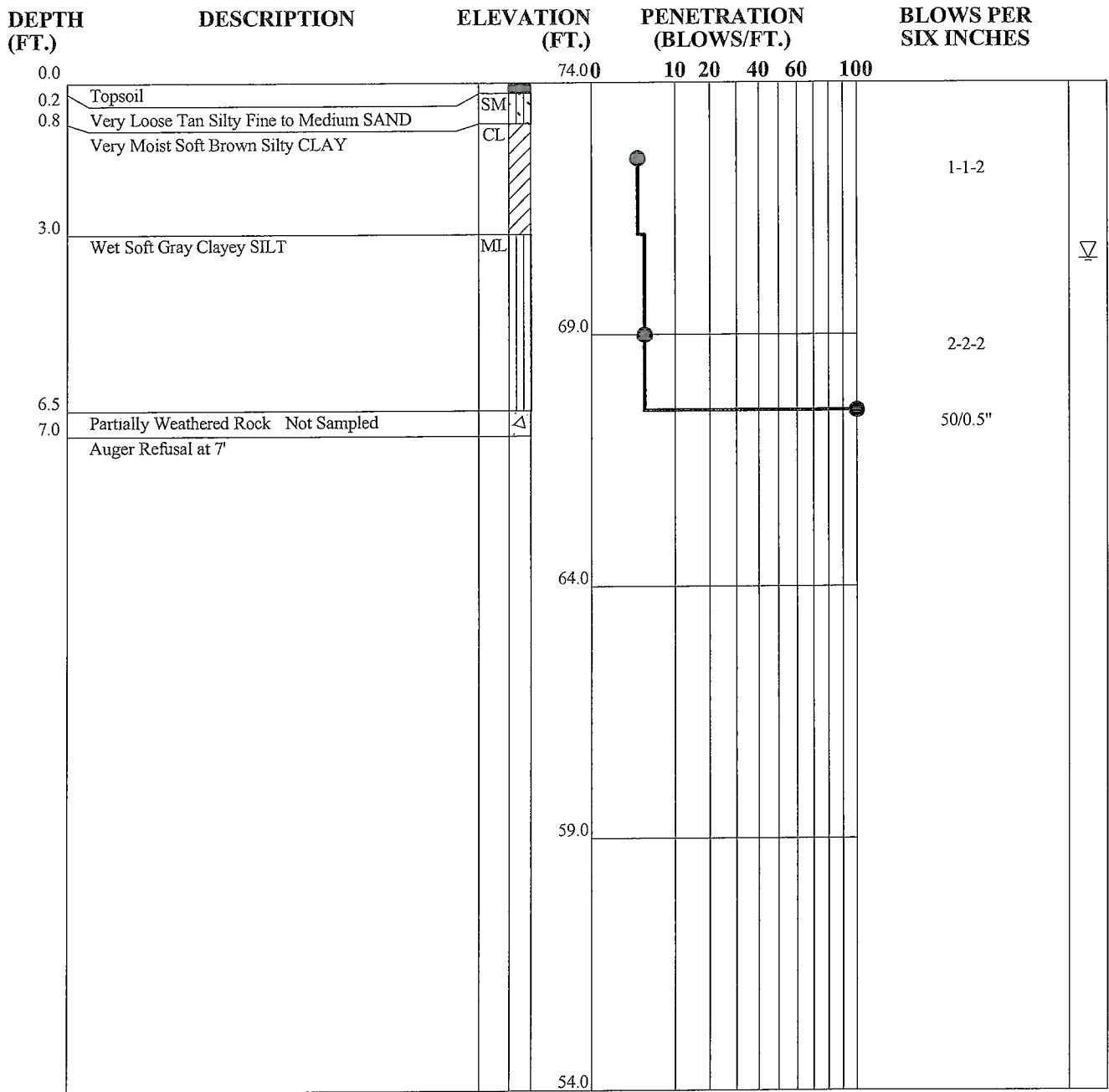
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH - 2C
DATE 1-25-10



TEST BORING RECORD



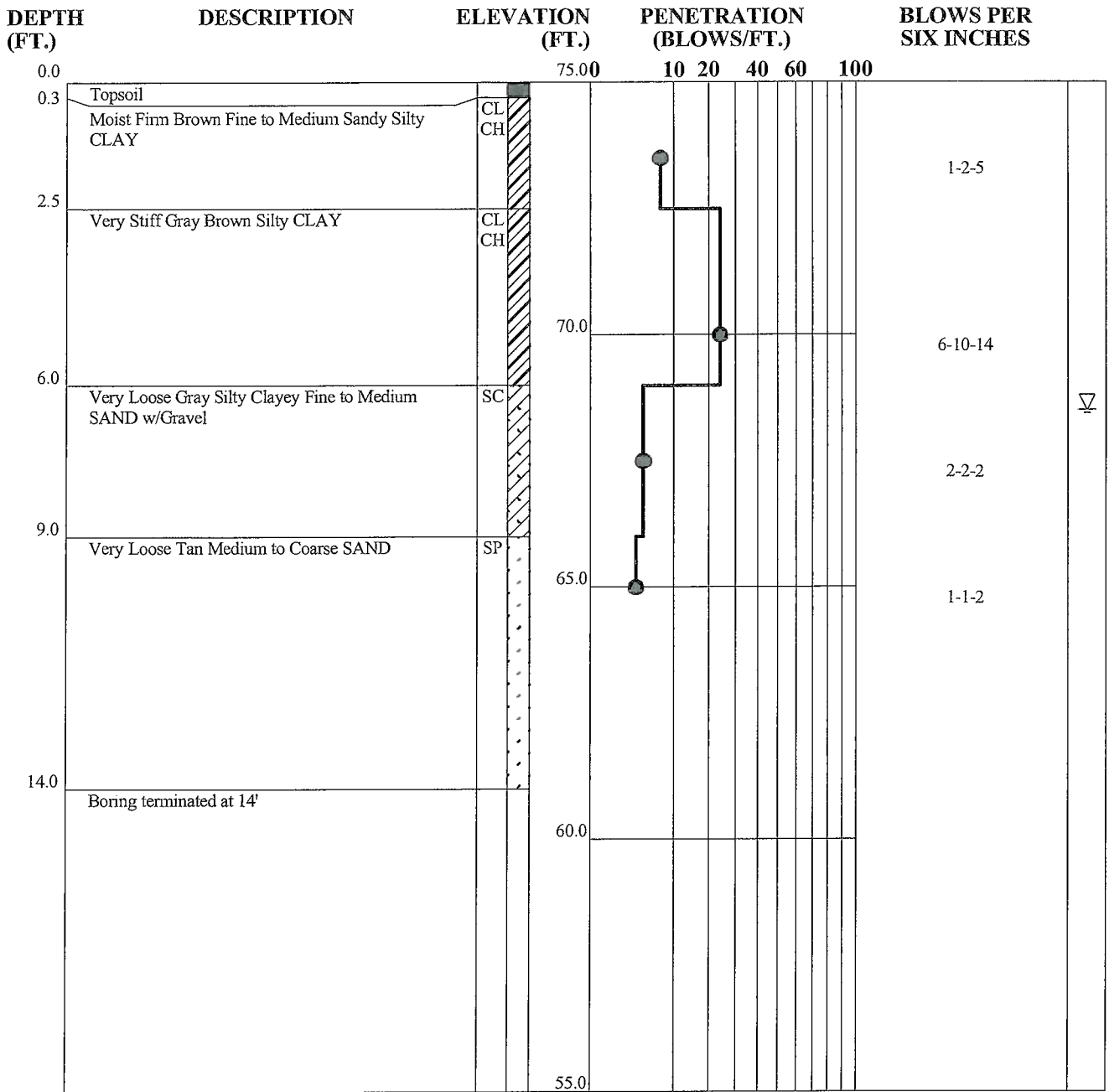
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 3.5' and caved at 6.5' at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH- 3
DATE 1-25-10



TEST BORING RECORD



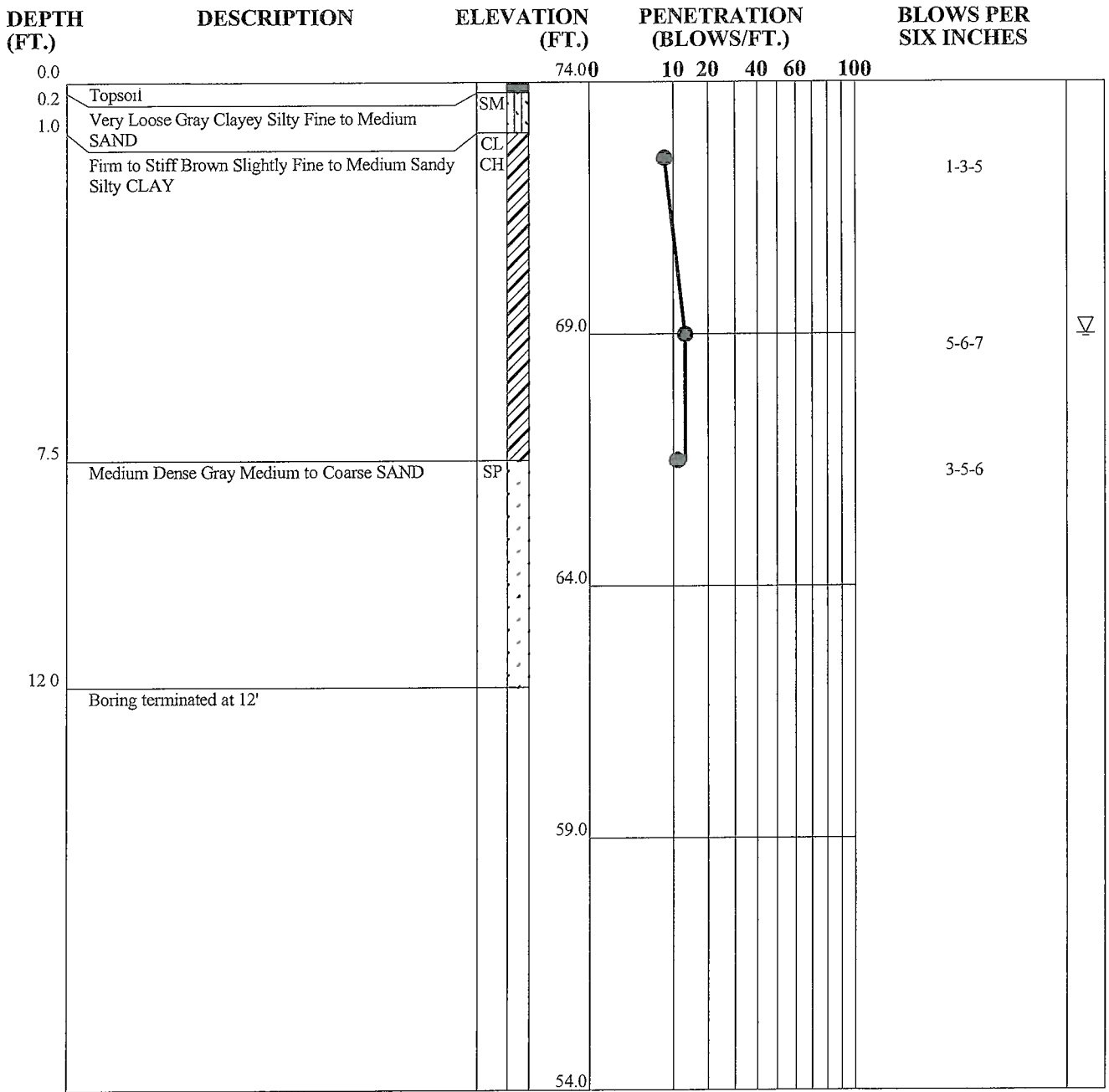
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 6.5' and caved at 8' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH- 4
DATE 1-25-10



TEST BORING RECORD



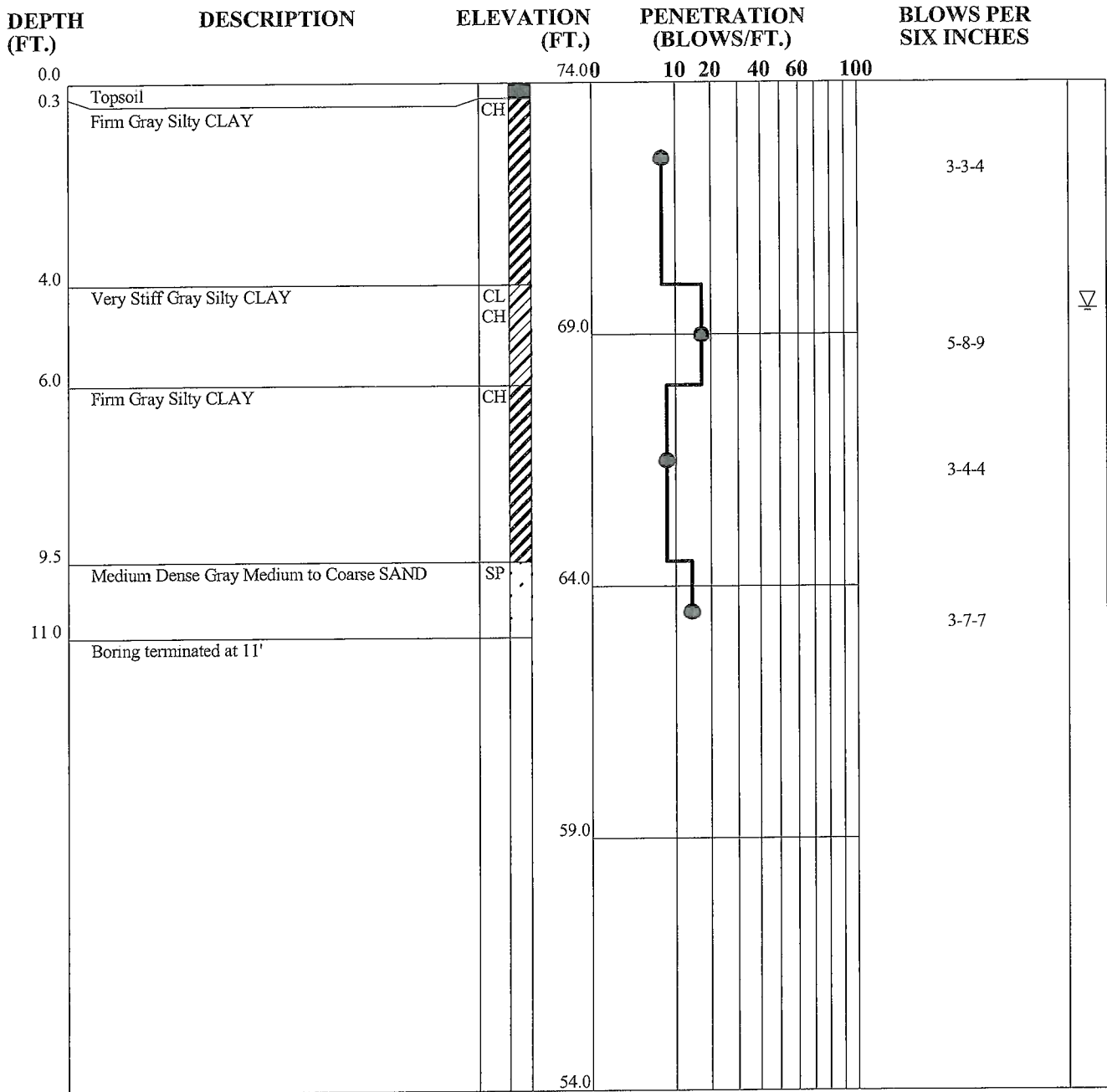
GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

Groundwater encountered at 5' and caved at 6.0' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH- 5
DATE 1-25-10



TEST BORING RECORD



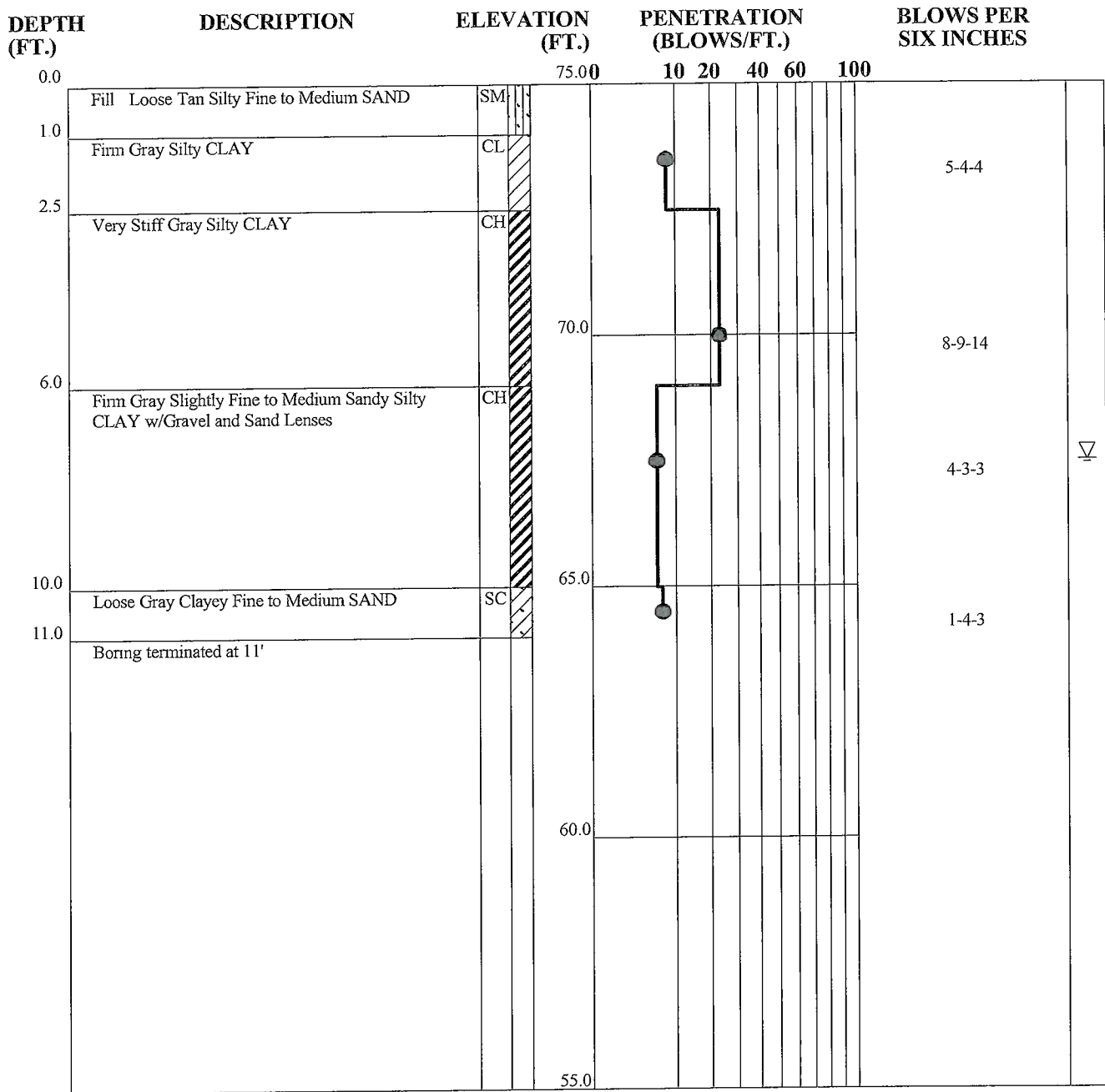
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 4.5' and caved at 7.5' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-7
DATE 1-25-10



TEST BORING RECORD



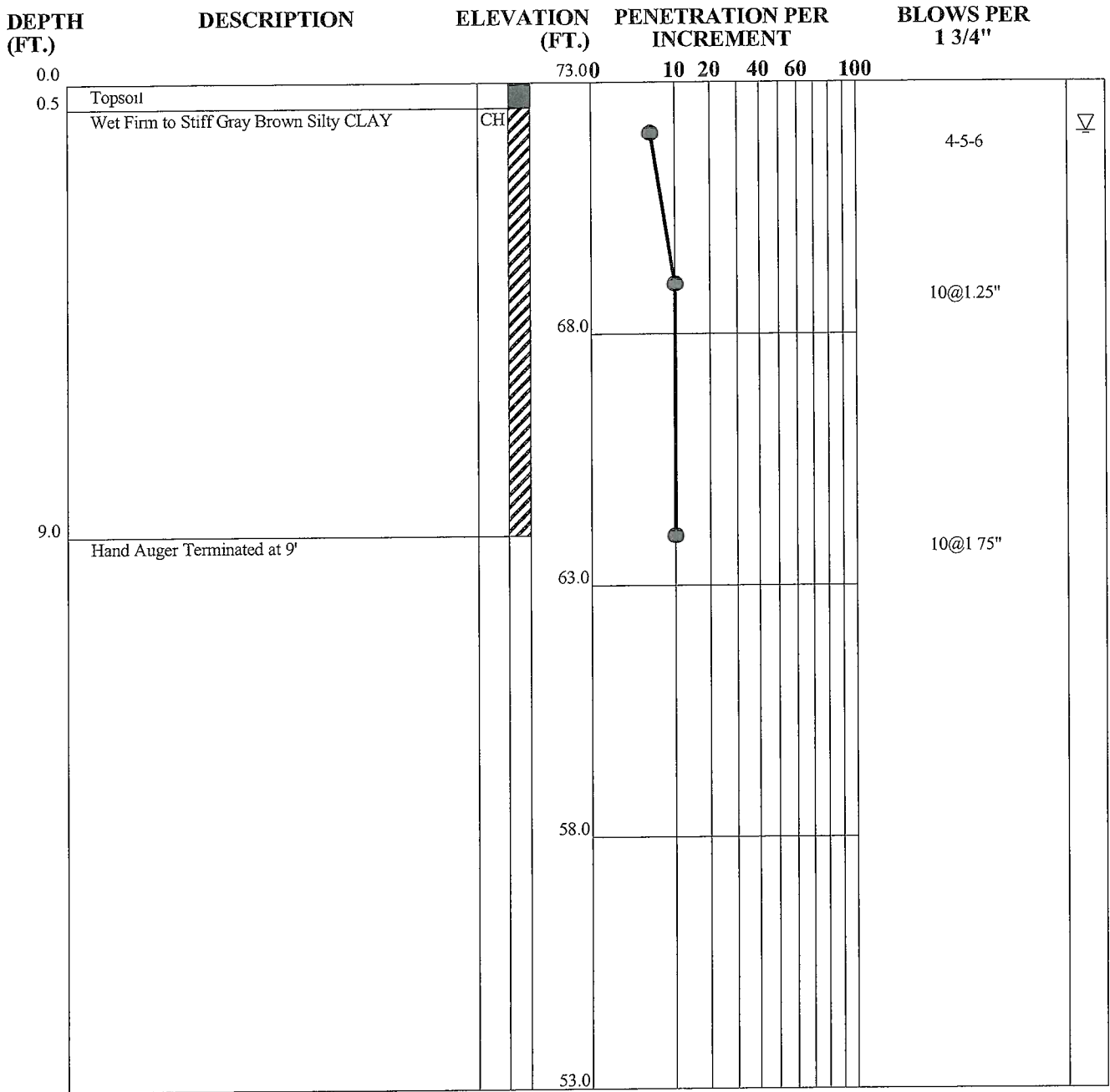
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 7.5' and caved at 7.5' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH- 9
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**



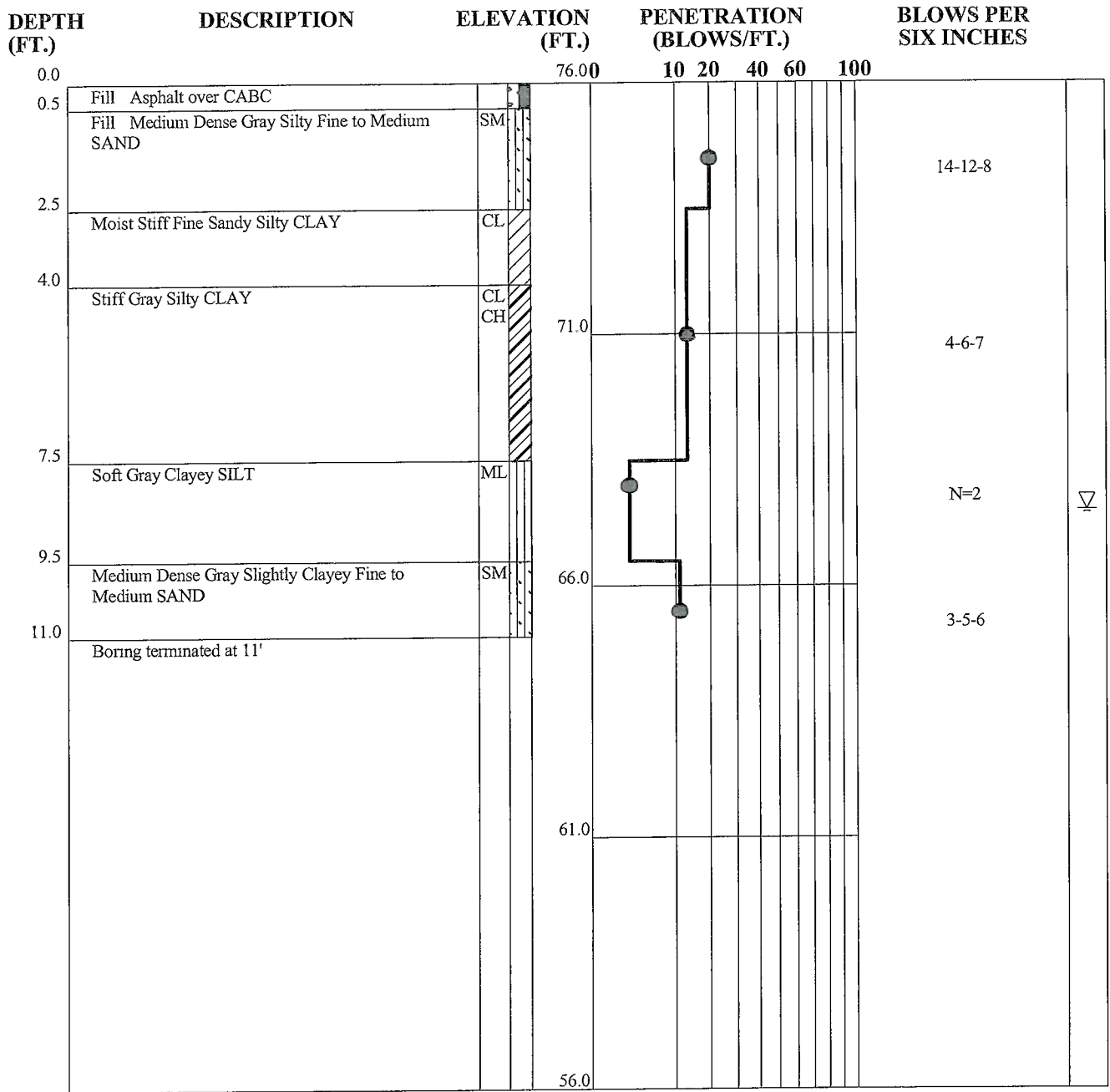
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 1' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-10
DATE 1-25-10



TEST BORING RECORD



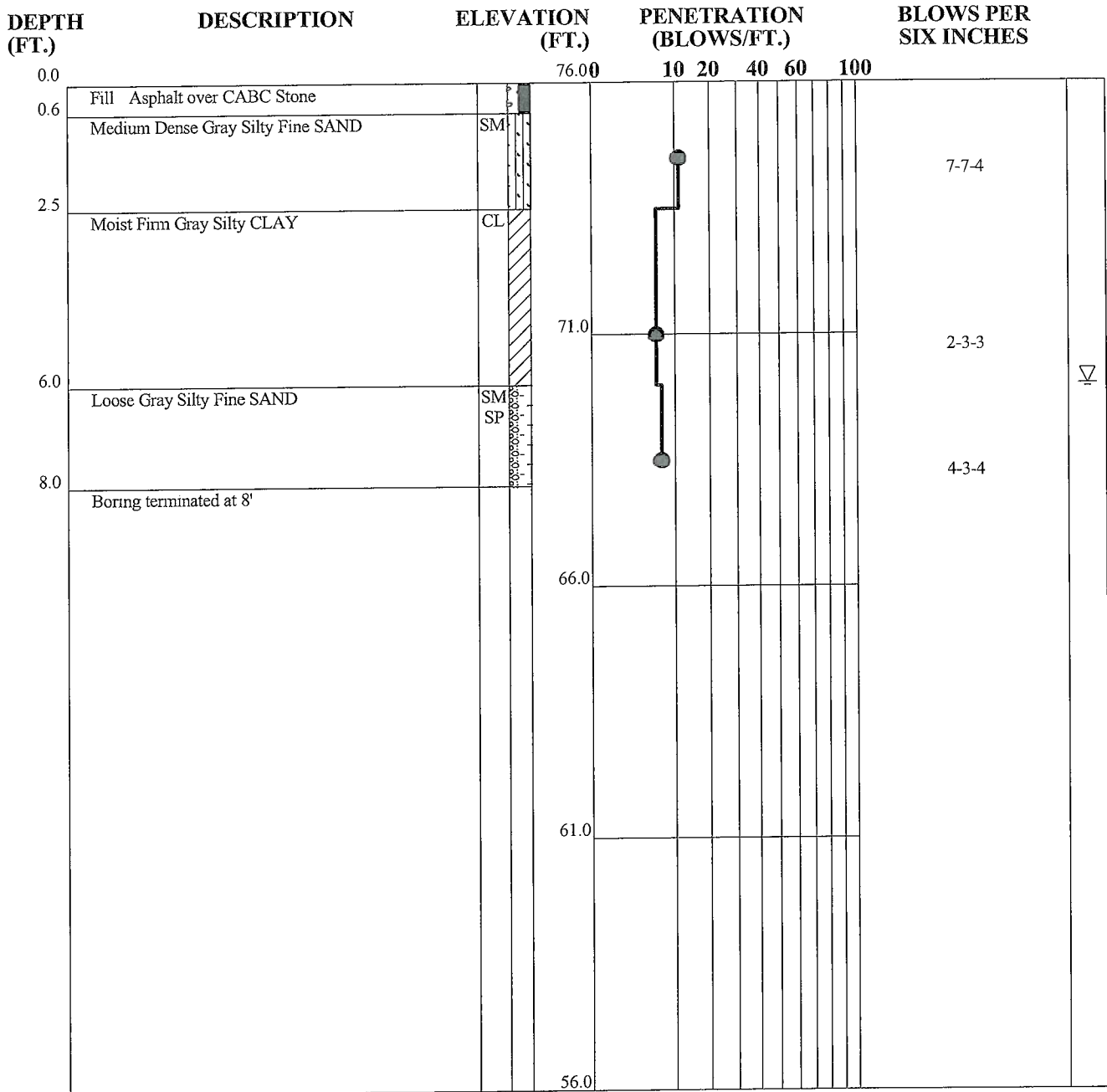
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 8.5' and caved at 8' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-12
DATE 1-25-10



TEST BORING RECORD



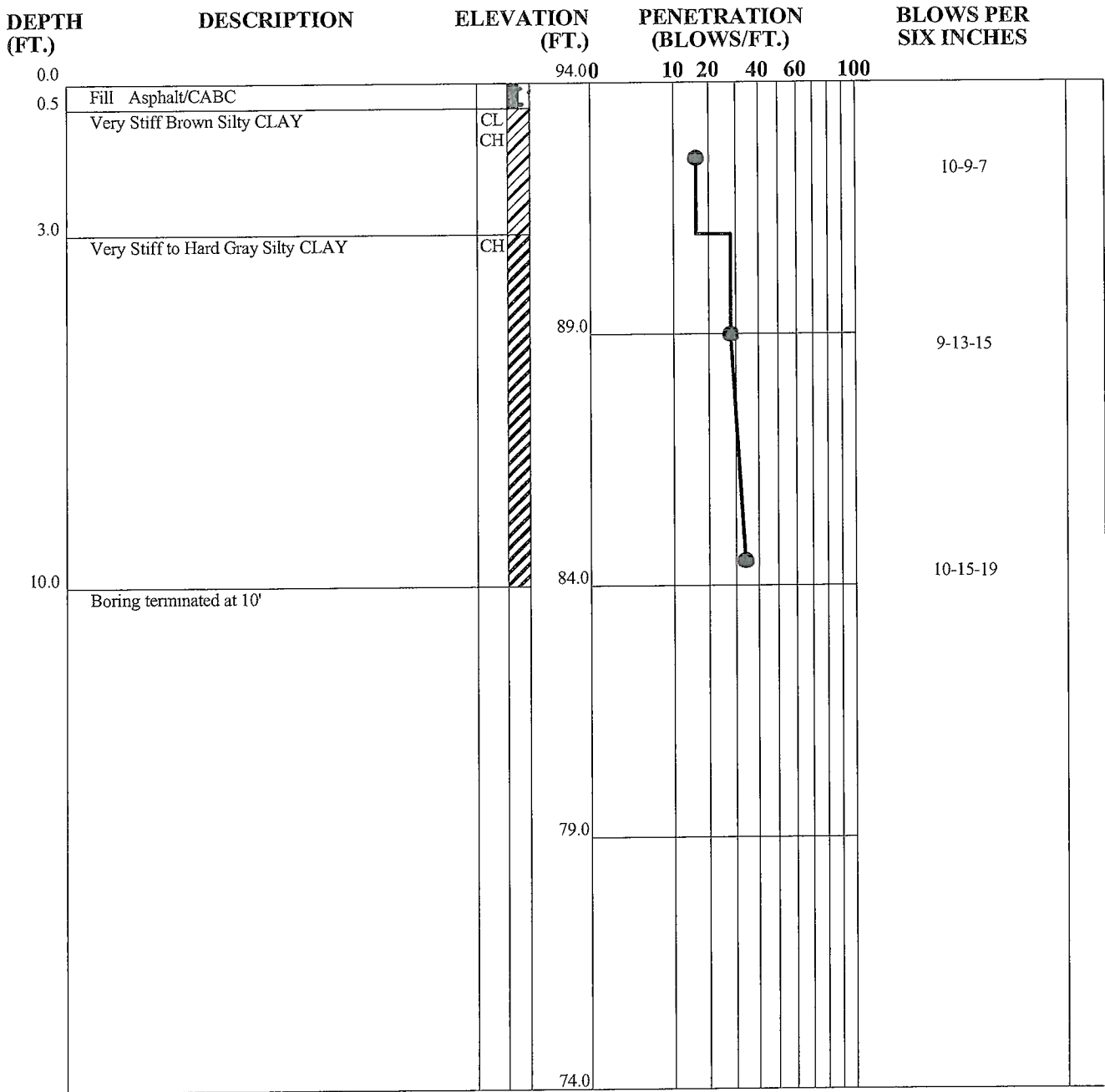
GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

Groundwater encountered at 6' and caved at 5.5' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-14
DATE 1-25-10



TEST BORING RECORD



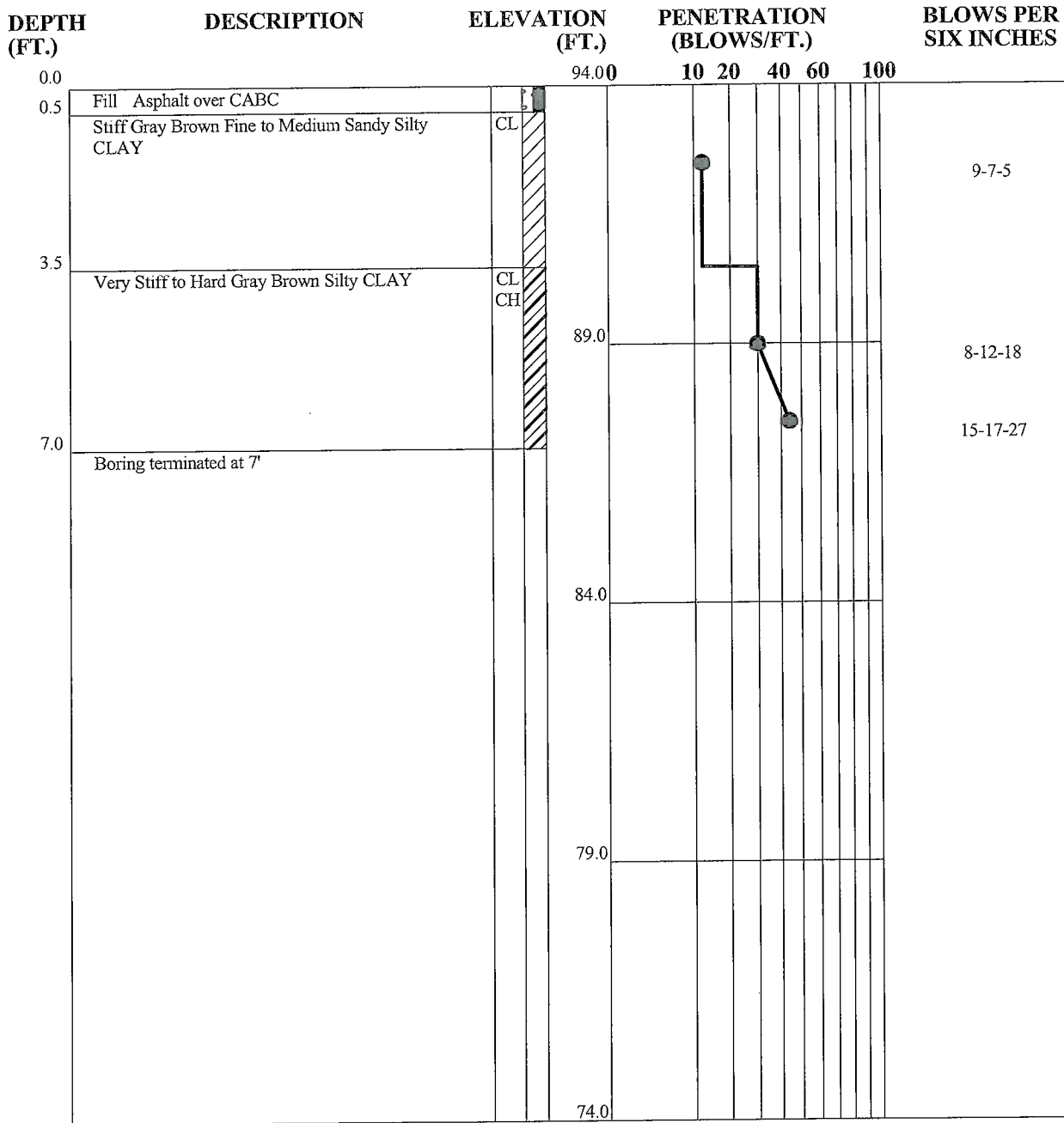
Dry at time of boring.

GTI_MAIN 100029.GPJ CTT.GDT 1/26/10

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-16
DATE 1-25-10



TEST BORING RECORD



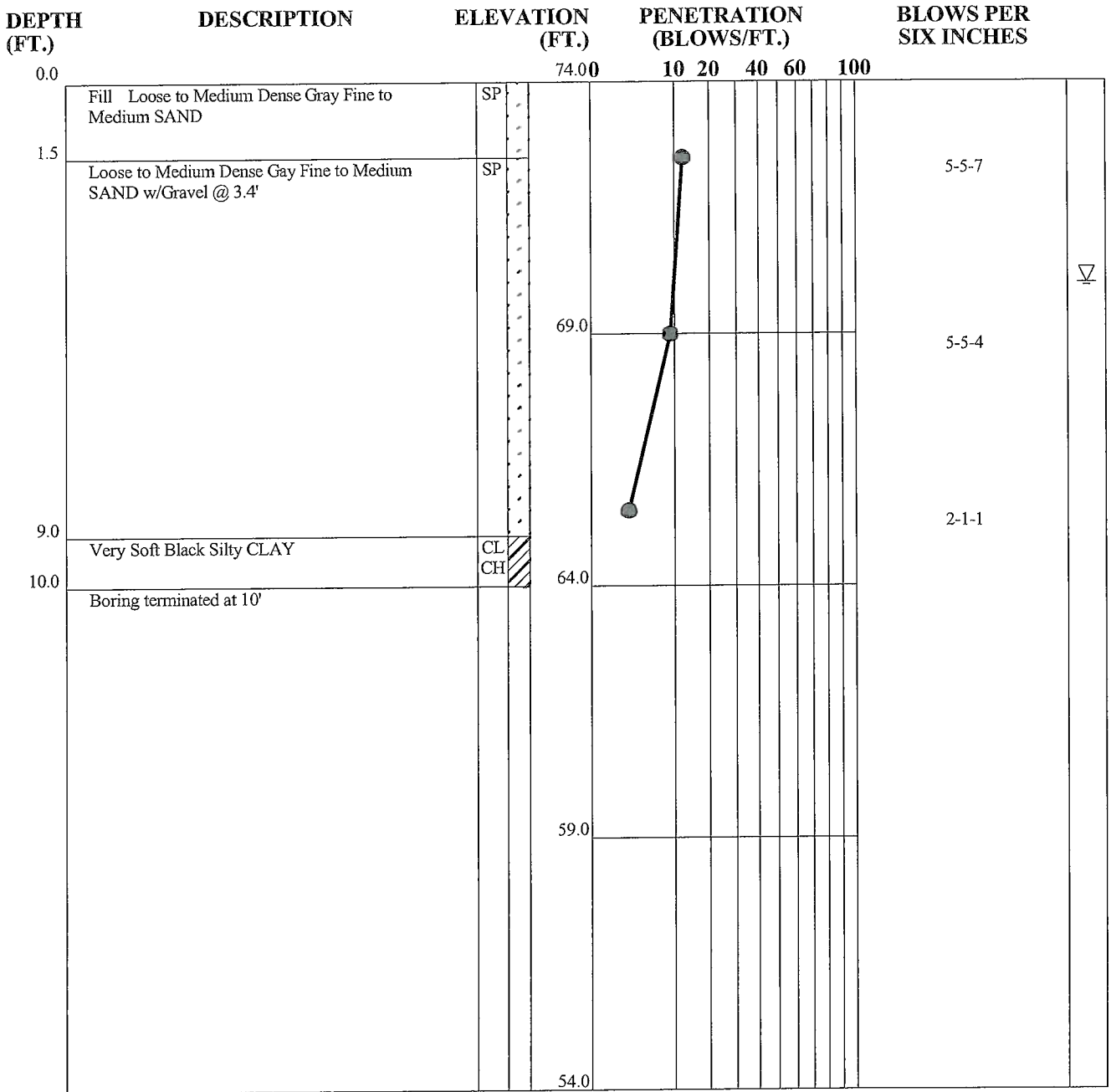
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-17
DATE 1-25-10



TEST BORING RECORD



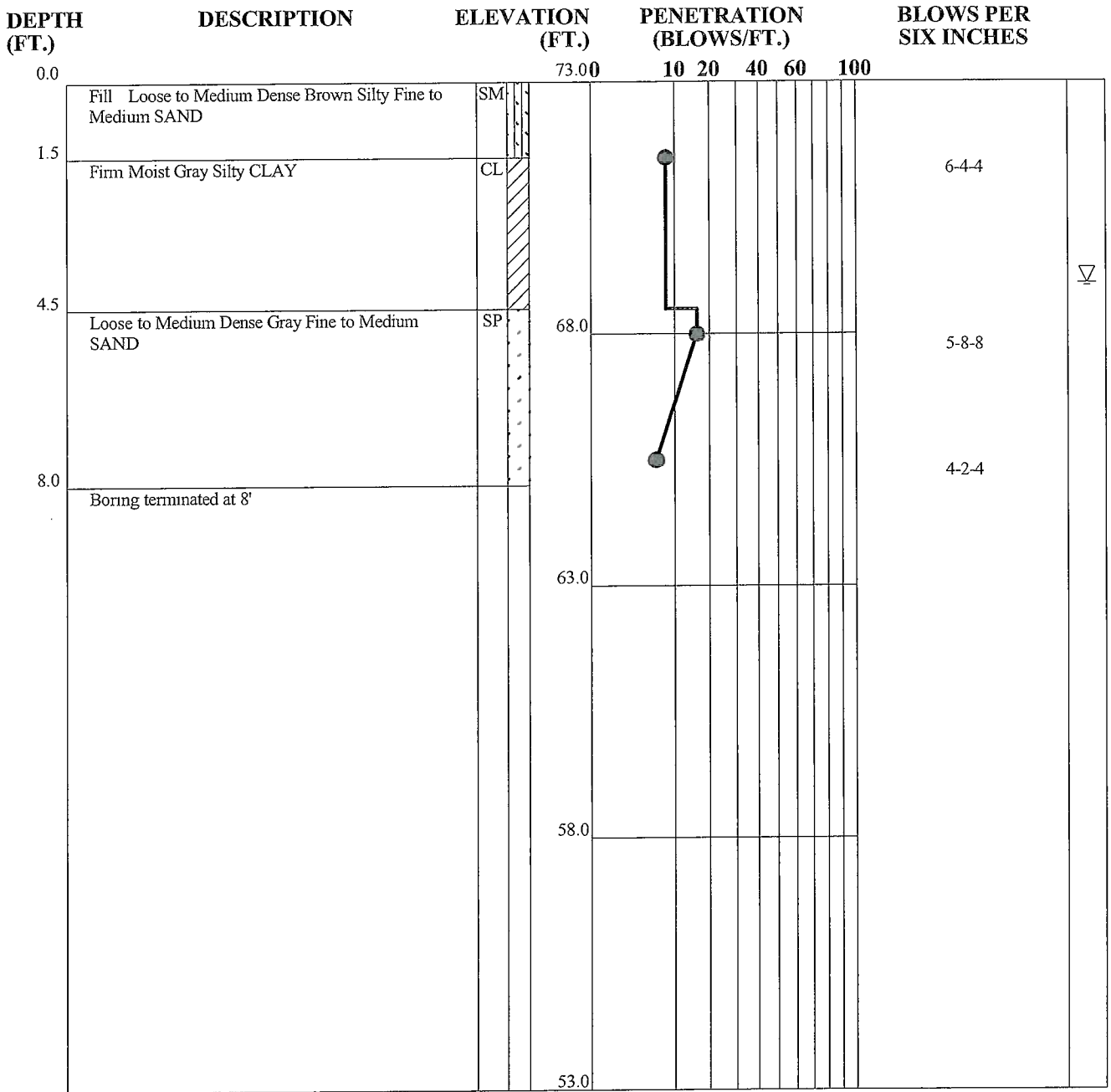
GTL_MAIN 100028.GPJ GTL.GDT 1/26/10

Groundwater encountered at 4' and caved at 4.5' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-18
DATE 1-25-10



TEST BORING RECORD



GTL_MAIN 100028.GPJ GTI.GDT 1/26/10

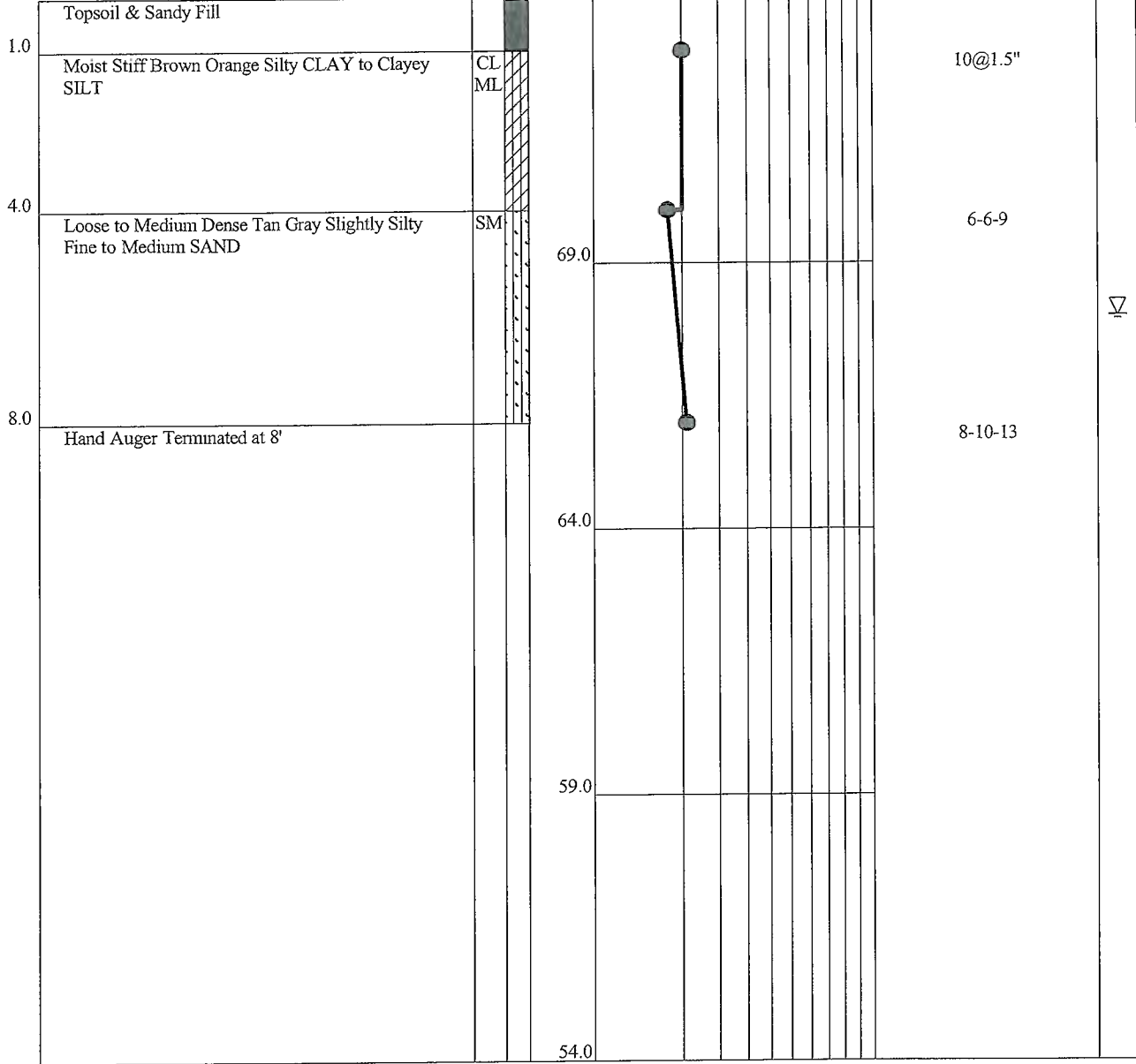
Groundwater encountered at 4' and caved at 5' at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH-19
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION PER INCREMENT					BLOWS PER 1 3/4"
			10	20	40	60	100	



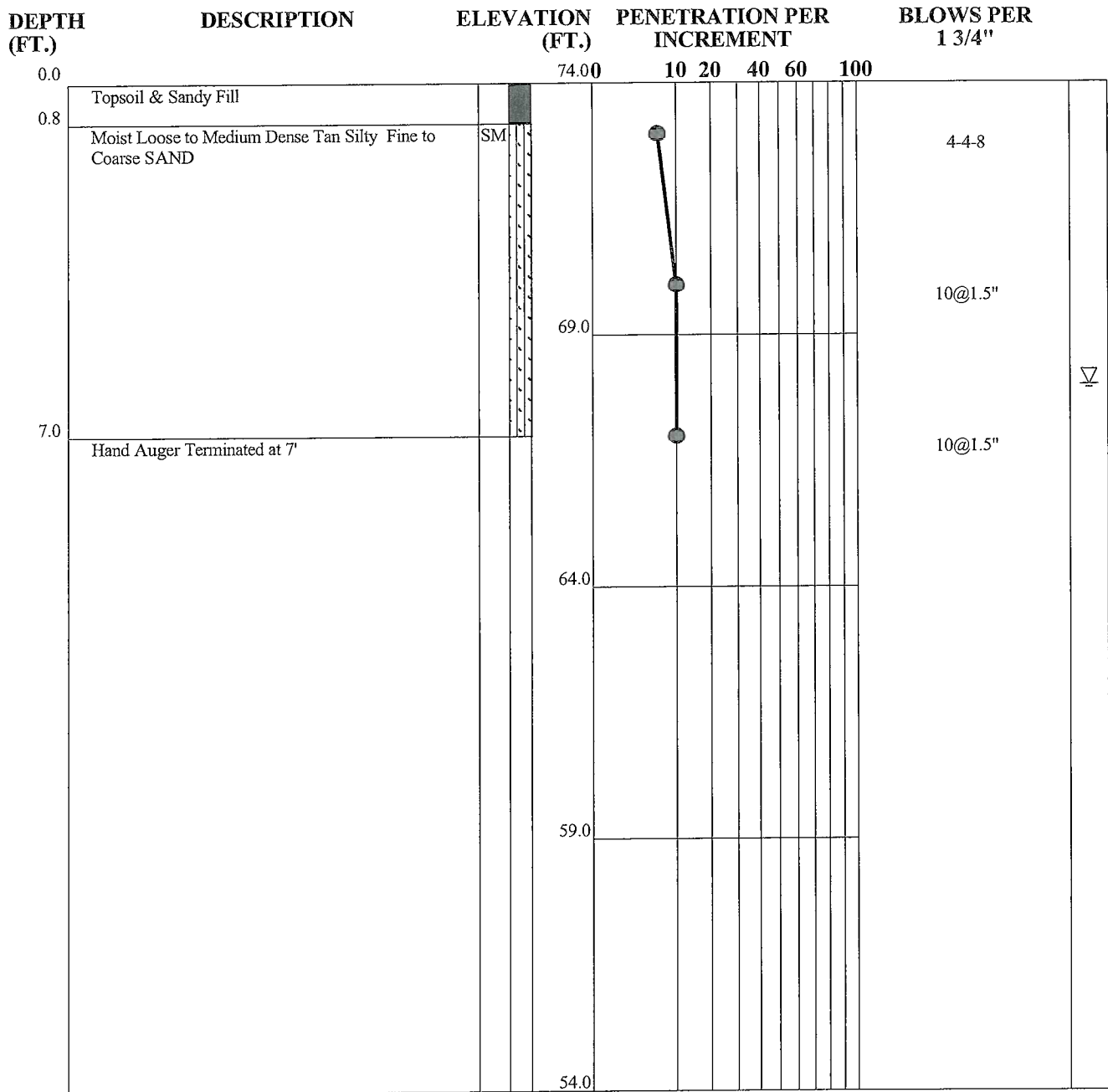
GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 6' and caved at 7' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-21
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**

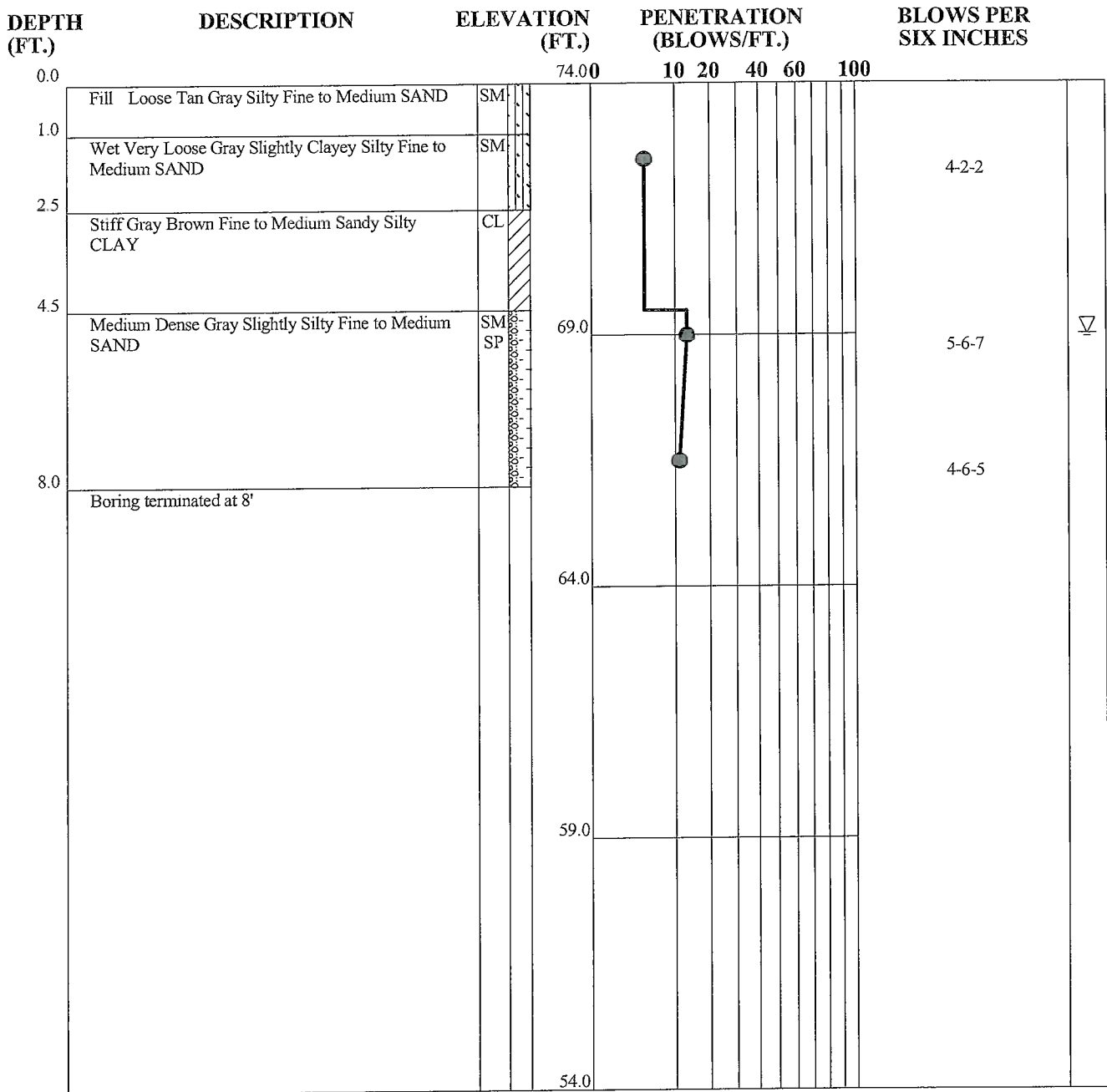


Groundwater encountered at 6' and caved at 6.5' at time of boring.

JOB NUMBER 1-10-0029-EA
 BORING NUMBER MH-23
 DATE 1-25-10



TEST BORING RECORD



GTT_MAIN 100029.GPJ GTTGDT 1/26/10

Groundwater encountered at 5' and caved at 6' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-24
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		75.00						
0.6	Tan Gray Silty Fine to Medium SAND							
	Stiff Yellow Orange Fine Sandy Silty CLAY							N=13
3.0								
	Very Loose to Loose Gray Tan Silty Fine to Medium SAND							N=8
7.0		70.0						
	Boring terminated at 7'							N=5
		65.0						
		60.0						
		55.0						

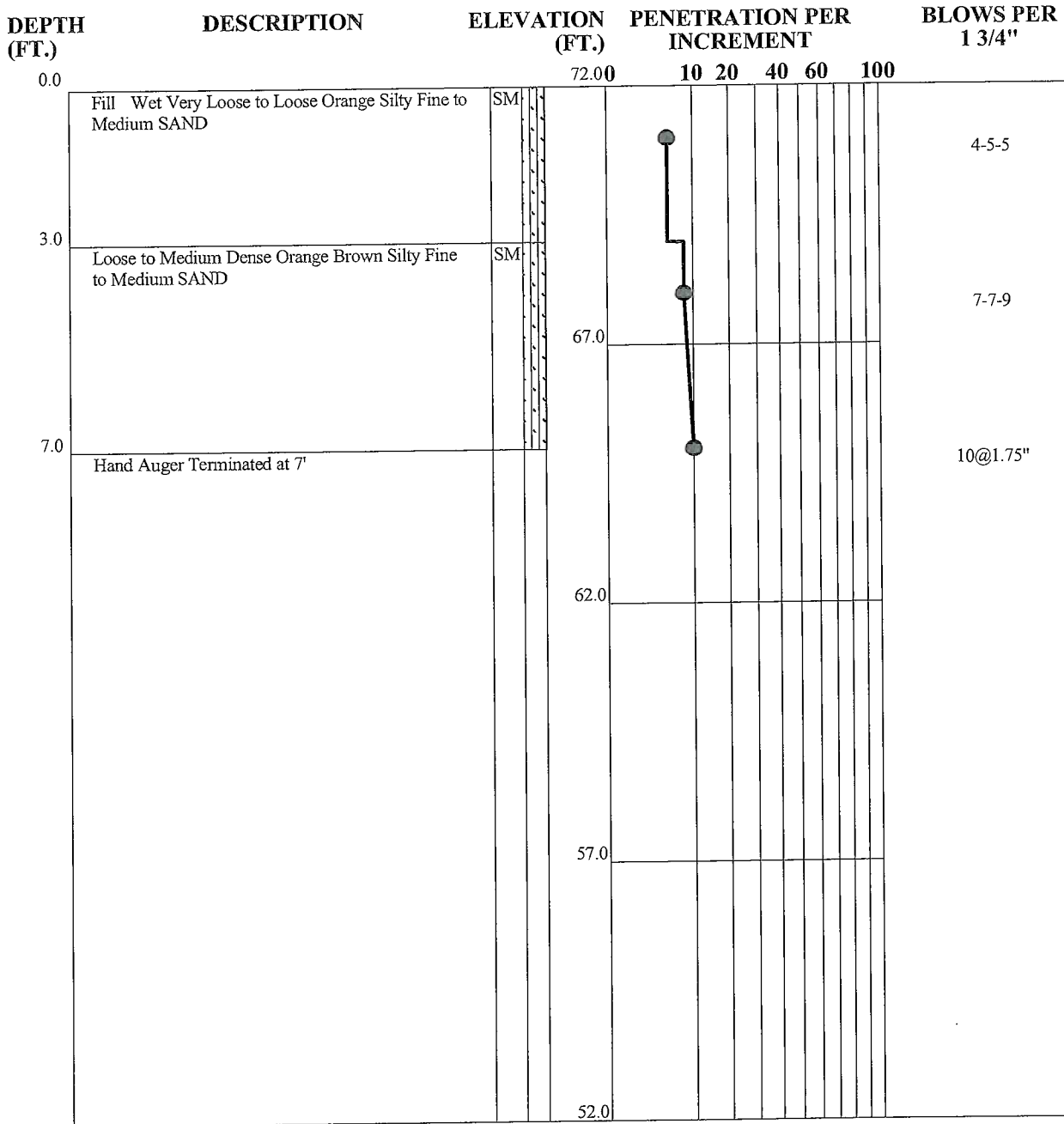
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Caved at 6'

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-26
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**



GTL_MAIN 100028.GPJ GTI.GDT 1/26/10

Groundwater encountered at 6' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-28
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION PER INCREMENT					BLOWS PER 1 3/4"
			10	20	40	60	100	
0.0	Topsoil & Organic Fill	74.00						
1.0	Possible Fill Moist Loose Orange Silty Fine to Medium SAND	SM						3-5-6
3.0	Loose Tan Gray Silty Fine to Medium SAND	SM						
6.0	Hand Auger Terminated at 6'	69.0						8-8-9
		64.0						
		59.0						
		54.0						

Groundwater encountered at 5' at time of boring.

GTL_MAIN 100029.GPJ GTI.GDT 1/26/10

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH-29
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		71.4						
0.2	Topsoil Moist Very Loose Silty Fine to Medium SAND							2-1-1
3.5	Medium Dense Tan Fine to Medium SAND							
5.0	Partially Weathered Rock No Recovery	66.4						6-9-50/2"
5.3	Auger Refusal at 5 3'							
		61.4						
		56.4						
		51.4						

GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-31
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		69.00						
0.3	Topsoil							
	Fin Orange Gray Silty CLAY							N=7
3.0								
	Stiff Tan Brown Fine to Medium Sandy Silty CLAY							N=11
4.5		64.0						
	Loose Tan Silty Fine to Medium SAND							
6.0	Boring terminated at 6'							N=6
		59.0						
		54.0						
		49.0						

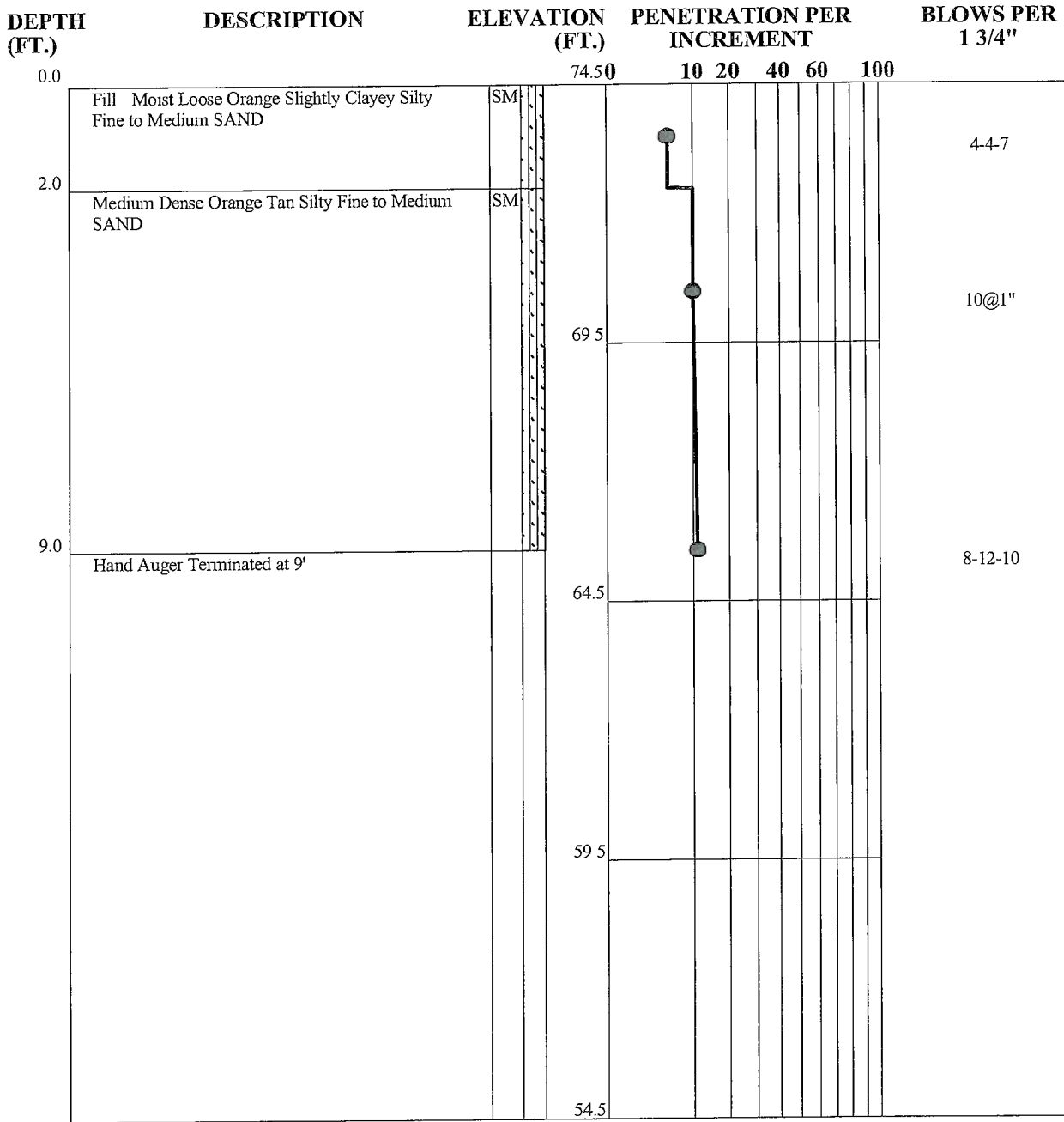
Groundwater encountered at 5' and caved at 5' at time of boring.

GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-33
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**



GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 7' at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH-35
DATE 1-25-10



**DYNAMIC HAND CONE
PENETROMETER RECORD**

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION PER INCREMENT					BLOWS PER 1 3/4"
			10	20	40	60	100	
0.0		74.00						
0.0 - 2.0	Fill Moist Loose Orange Slightly Clayey Silty Fine to Medium SAND							8-7-10
2.0 - 6.0	Medium Dense Tan Gray Silty Fine to Medium SAND							10@1.25"
6.0	Hand Auger Terminated at 6'							
		69.0						
		64.0						
		59.0						
		54.0						

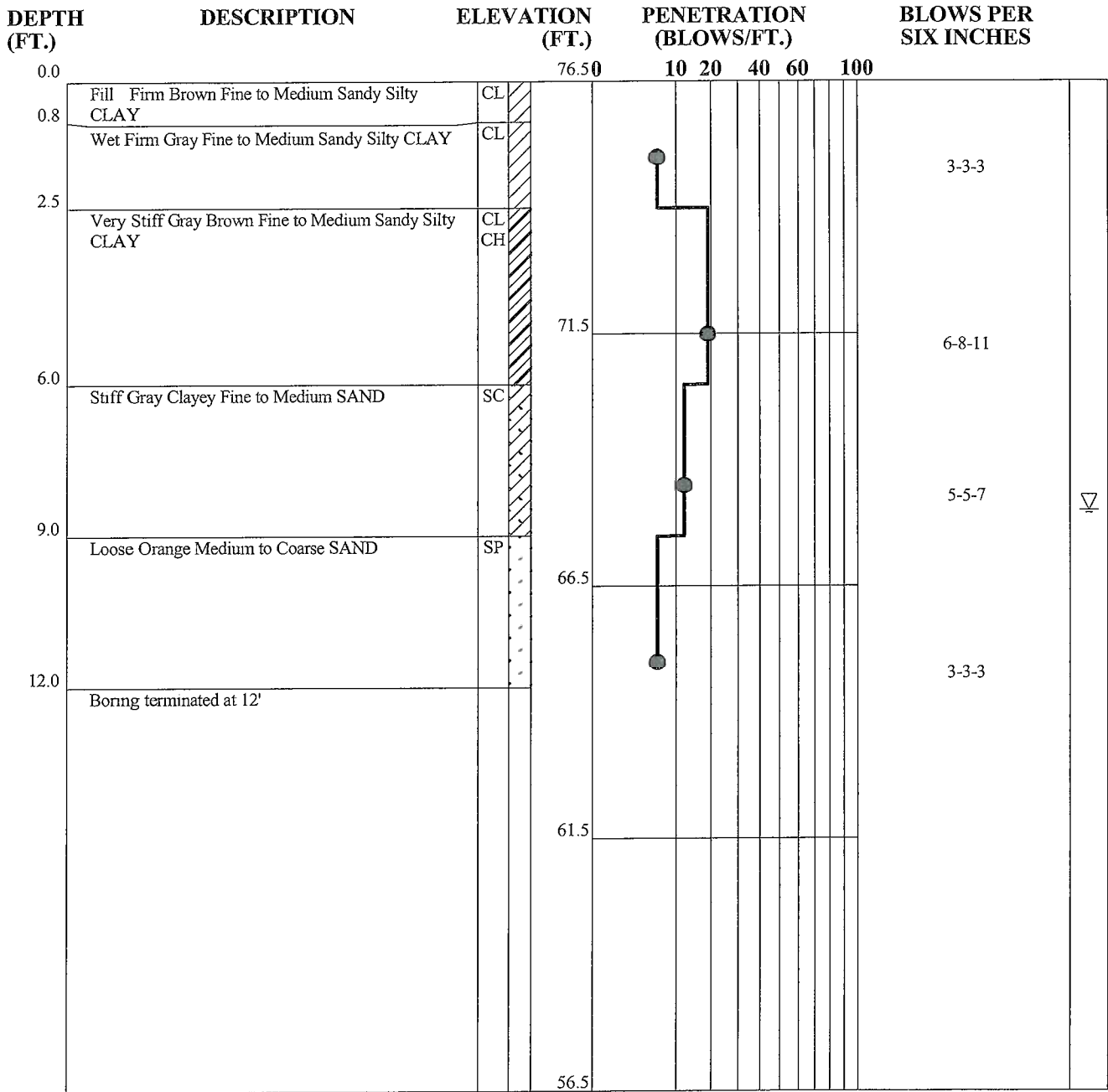
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
 BORING NUMBER MH-37
 DATE 1-25-10



TEST BORING RECORD



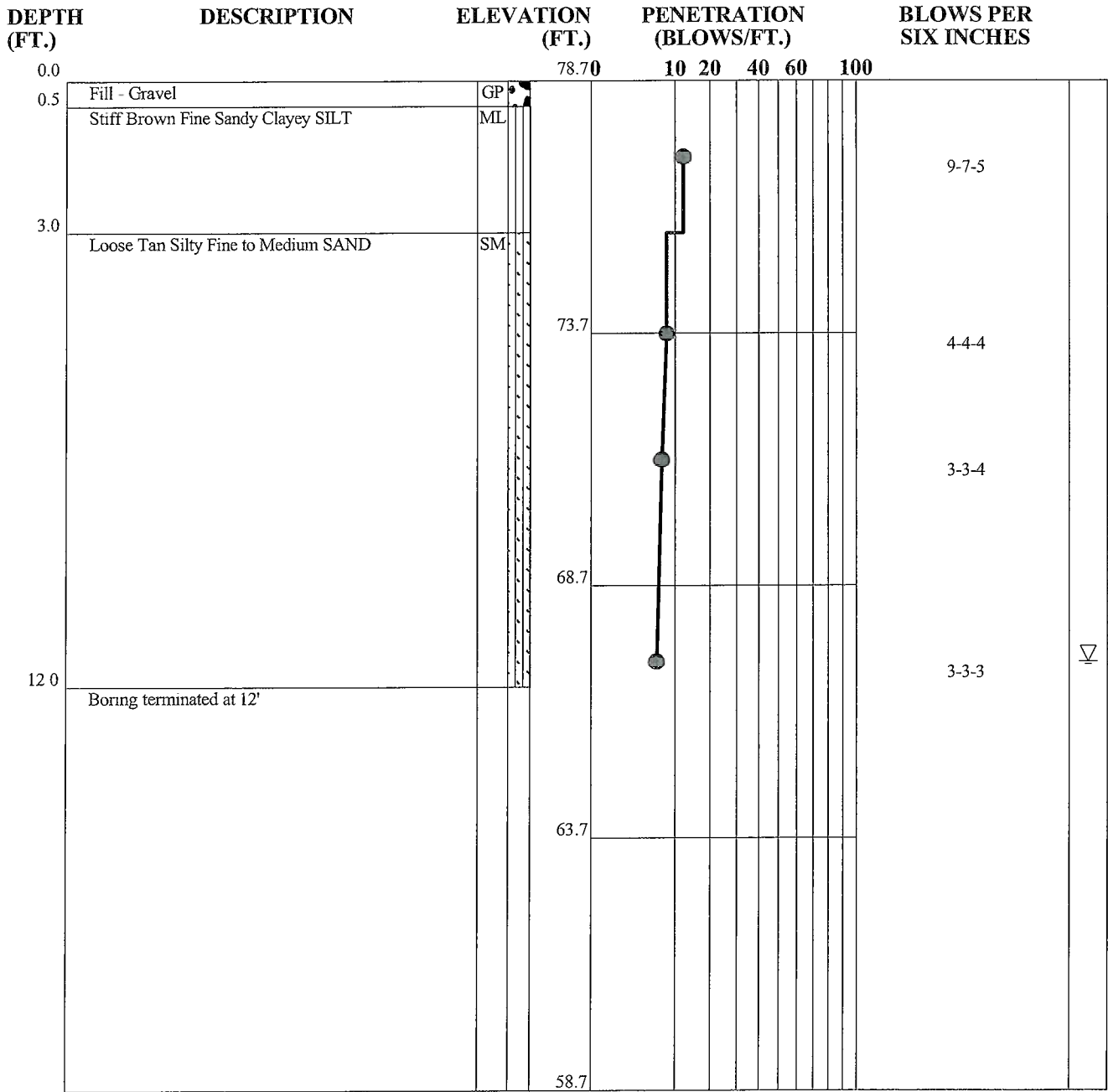
GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

Groundwater encountered at 8.5' and caved at 9' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-40
DATE 1-25-10



TEST BORING RECORD



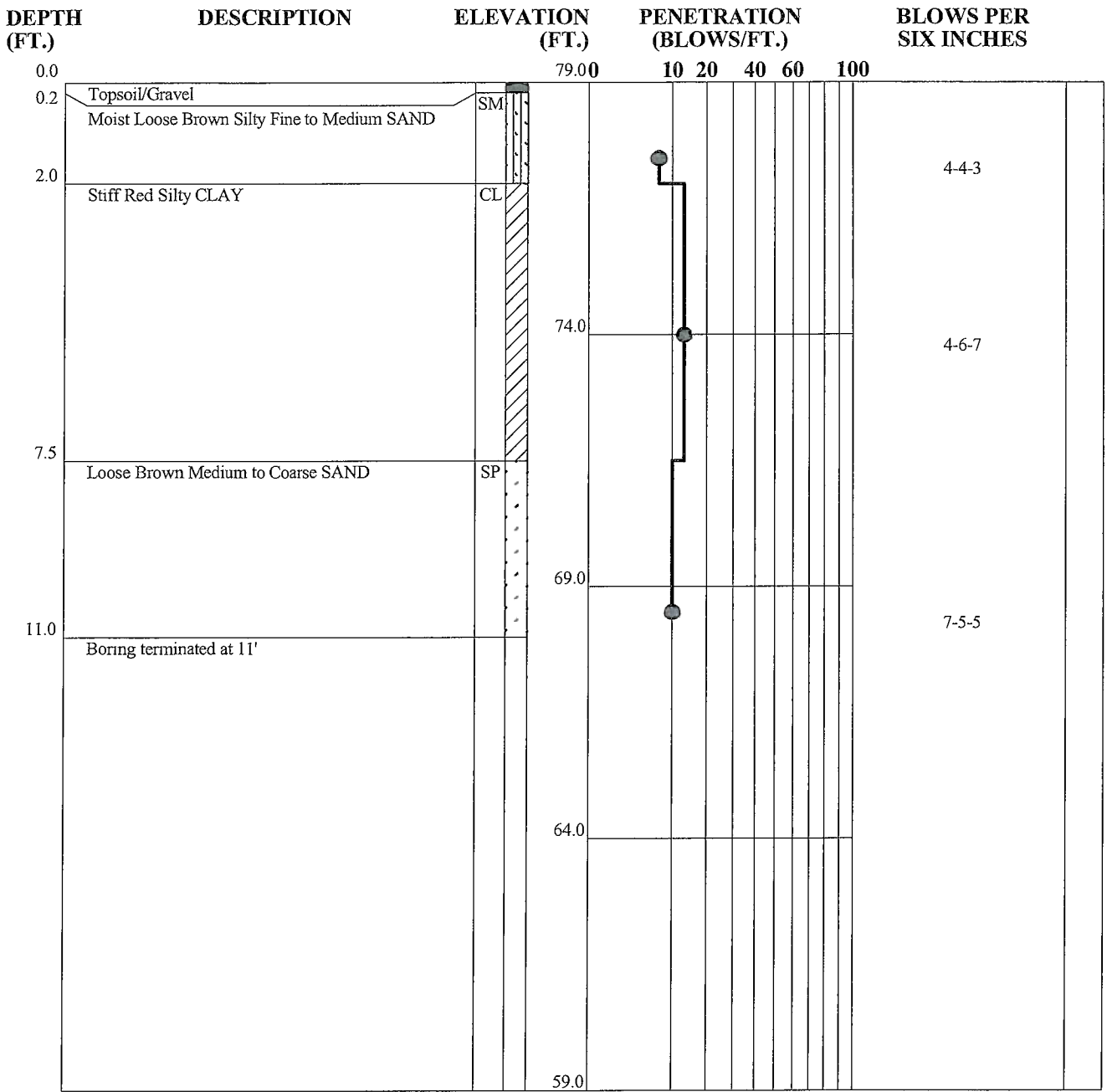
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Groundwater encountered at 11 5' and caved at 9' at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-42
DATE 1-25-10



TEST BORING RECORD



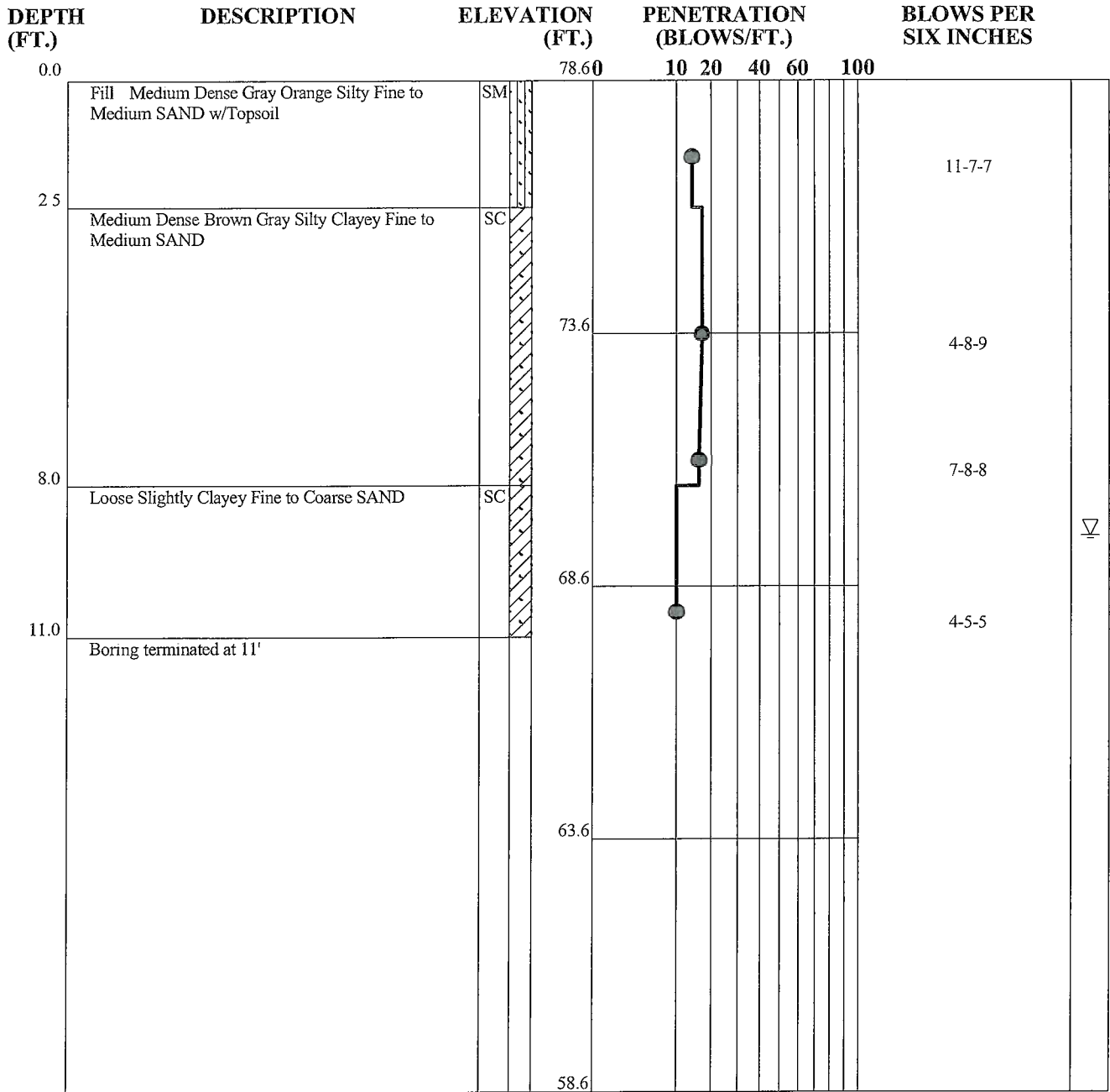
GTI_MAIN 100029.GPJ GTI.GDT 1/26/10

Dry at time of boring.

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-43
DATE 1-25-10



TEST BORING RECORD



Groundwater encountered at 9' and caved at 7' at time of boring.

GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH-45
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		76.00						
0.2	Topsoil Medium Dense Tan Silty Fine to Medium SAND							
1.5	Wet Firm Orange Fine to Medium Sandy Silty CLAY w/PWR Lenses @ 2.2-2.3'						6-6-4	
3.5	Medium Dense Tan Fine to Medium SAND							
5.0	Partially Weathered Rock Not Sampled	71.0					6-6-50/5"	
5.5	Partially Weathered Rock							
6.0	Auger Refusal at 6'							
		66.0						
		61.0						
		56.0						

Groundwater encountered at 4.5' at time of boring.

GTL_MAIN 100029.GPJ GTL.GDT 1/26/10

JOB NUMBER 1-10-0029-EA
BORING NUMBER MH-46
DATE 1-25-10



TEST BORING RECORD

DEPTH (FT.)	DESCRIPTION	ELEVATION (FT.)	PENETRATION (BLOWS/FT.)					BLOWS PER SIX INCHES
			10	20	40	60	100	
0.0		84.30						
0.2	Fill - Sand/Gravel Stiff Orange Silty CLAY	84.30						4-6-7
3.0	Medium Dense Orange Silty Fine to Medium SAND	79.3						7-6-6
8.0	Medium Dense Tan Slightly Clayey Silty Fine to Medium SAND	74.3						4-5-7
12.0	Boring terminated at 12'	69.3						5-6-6
		64.3						

GTI_MAIN 100029.GPJ GTI GDT 1/27/10

Groundwater encountered at 9.5' and caved at 8.5' at time of boring.

JOB NUMBER 1 10-0029-EA
BORING NUMBER MH-47
DATE 1-25-10

