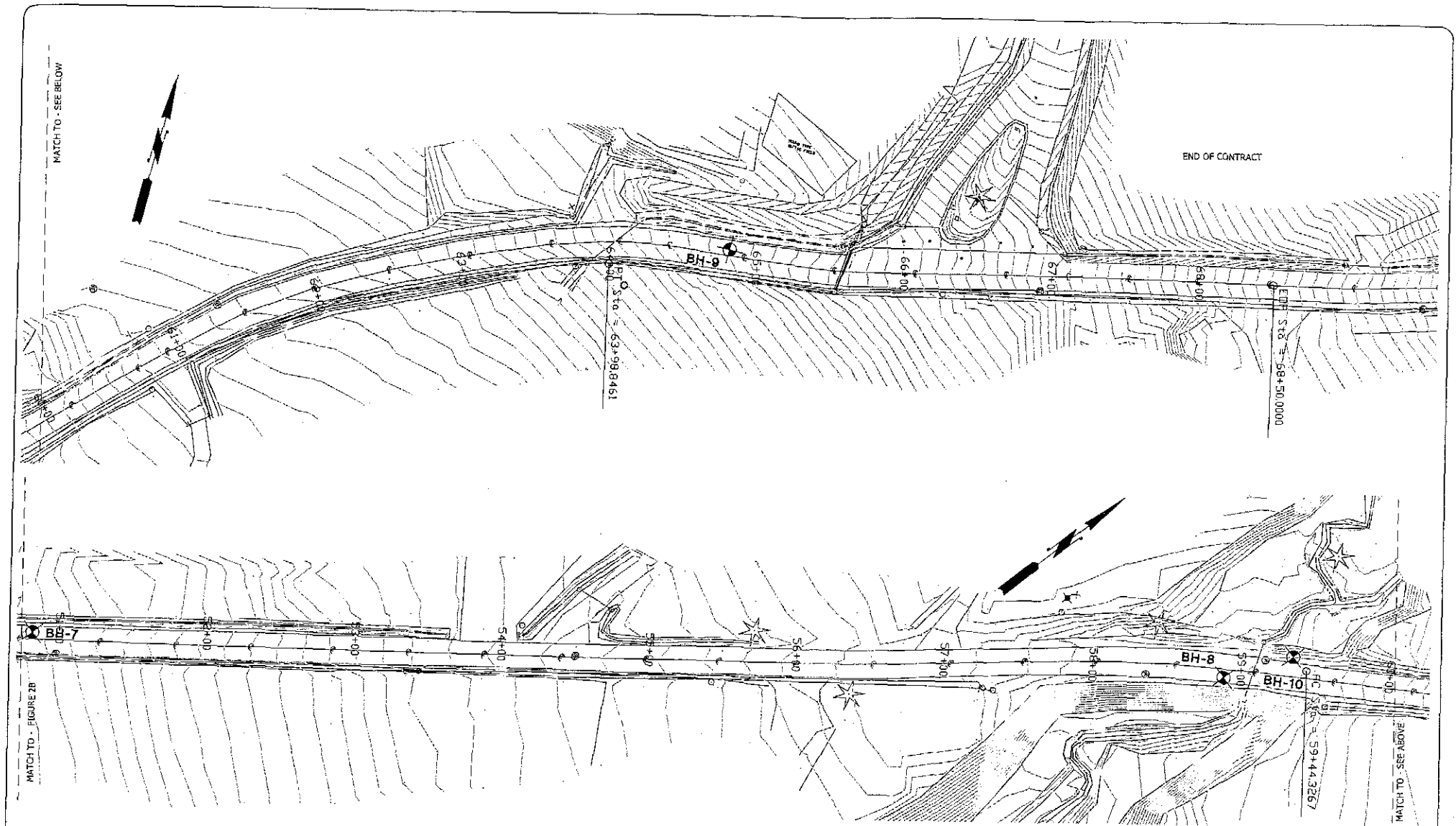
APPENDIX C

Geotechnical Reports



LEGEND

BH-1 BOREHOLE DESIGNATION AND APPROXIMATE LOCATION

0' 20' 40' 60' 120'

SCALE: 1"=60'

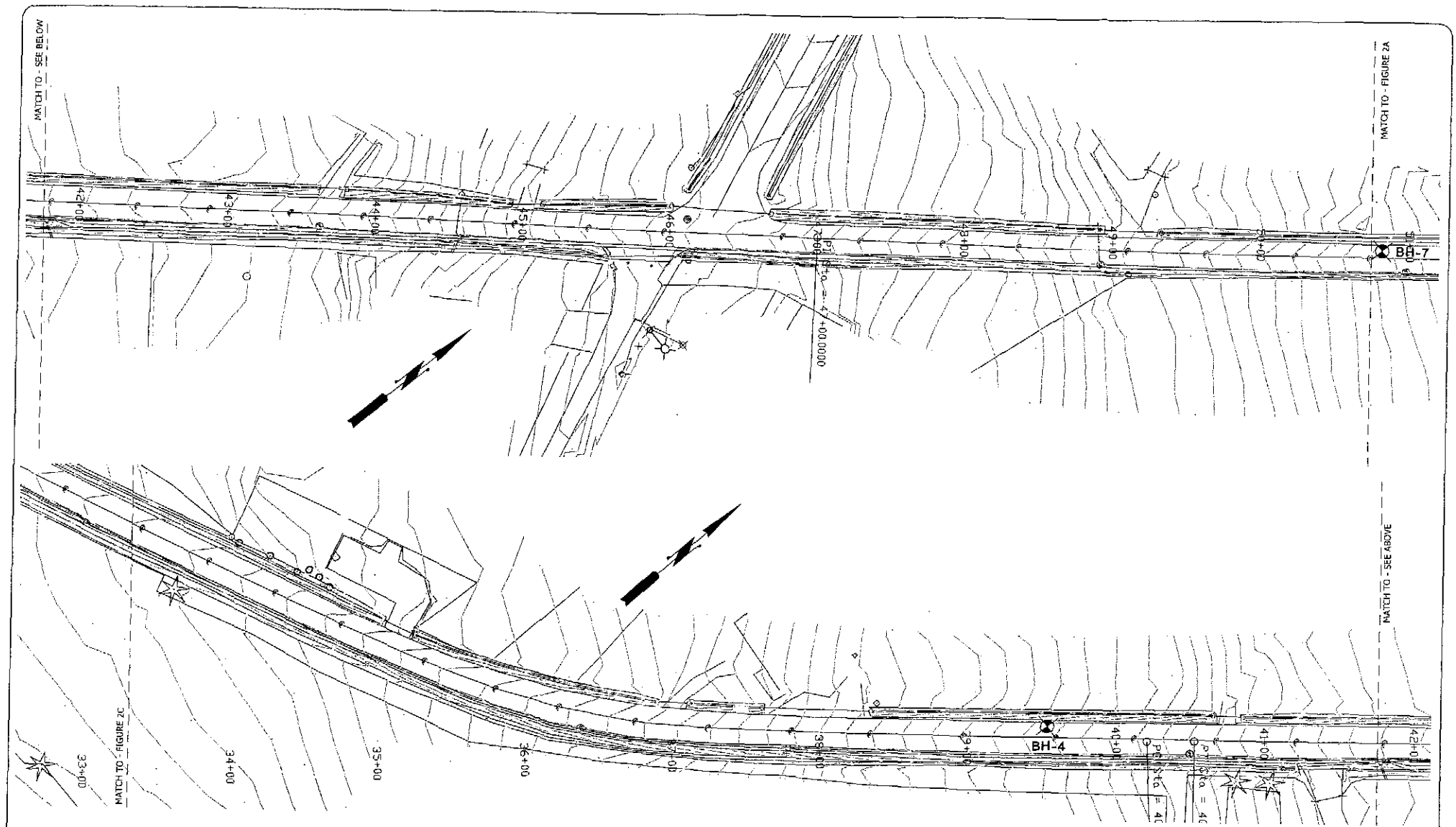
HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENT
SKAGIT COUNTY, WASHINGTON

SITE AND EXPLORTATION PLAN

DRAWN BY SM	FIGURE NO. 2-A
CHECKED BY SHH	
DATE 07.19.02	PROJECT NO. 2002079

H:\1Projects\2002 Projects\20020/9 Helmick Roadced\2002079D2.DWG



LEGEND

BH-1 BOREHOLE DESIGNATION AND APPROXIMATE LOCATION

0' 20' 40' 60' 120'

SCALE: 1"=60'

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENT
SKAGIT COUNTY, WASHINGTON

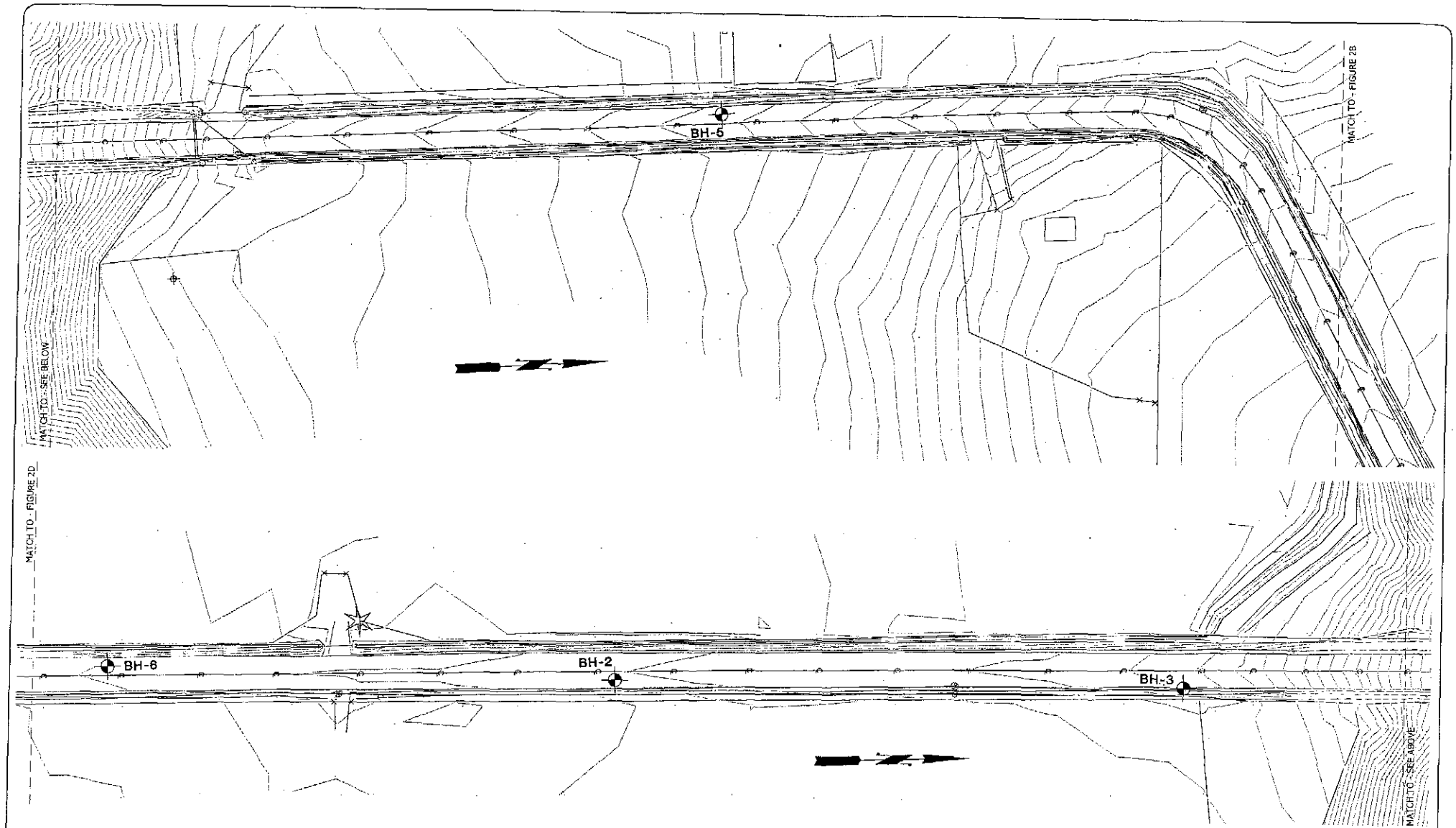
SITE AND EXPLORTATION PLAN

DRAWN BY SM.
CHECKED BY SHH
DATE 07.19.02

FIGURE NO. 2-B

PROJECT NO. 2002079

I:\Projects\2002 Projects\2002079 Helmick Road\cad\2002079D2.DWG



LEGEND

BH-1 BOREHOLE DESIGNATION AND APPROXIMATE LOCATION

0' 20' 40' 60' 120'

SCALE: 1"=60'

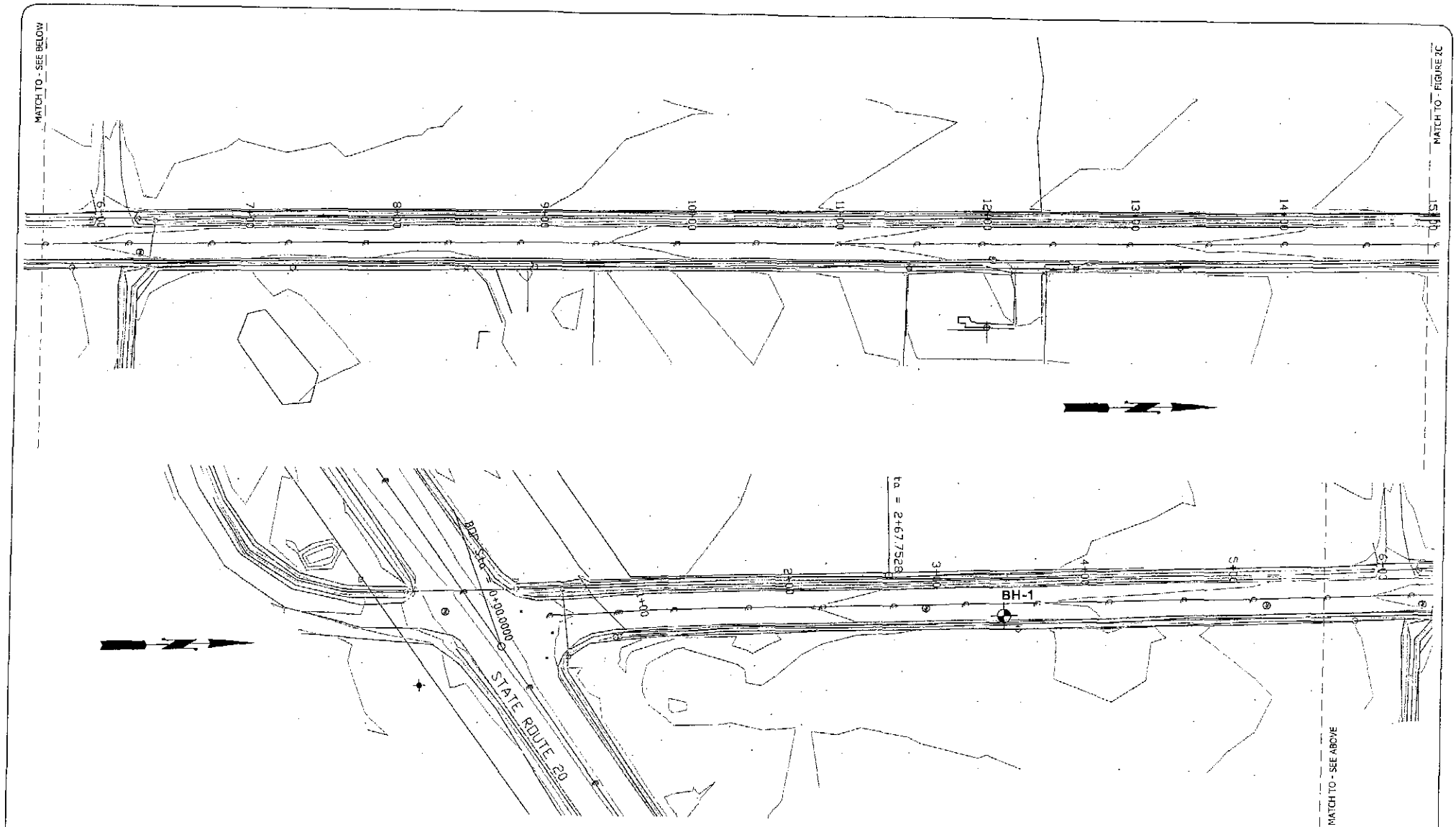
HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENT
SKAGIT COUNTY, WASHINGTON

SITE AND EXPLORTATION PLAN

DRAWN BY SM	FIGURE NO. 2-C
CHECKED BY SHH	
DATE 07.19.02	PROJECT NO. 2002079

H:\1Projects\2002 Projects\2002079 Helmick Rnad\cad\20020790 2.DWG



LEGEND

BH-1 BOREHOLE DESIGNATION AND APPROXIMATE LOCATION

0' 20' 40' 60' 120'

SCALE: 1"=60'

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENT
SKAGIT COUNTY, WASHINGTON

SITE AND EXPLORTATION PLAN

DRAWN BY SM	FIGURE NO. 2-D
CHECKED BY SBH	
DATE 07.19.02	PROJECT NO. 2002079

H:\Projects\2002 Projects\2002079 Helmick Road\cad\20020702.DWG

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Aproximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
	More than 50% of Coarse *Fraction Retained* on No. 4 Sieve		GP	Poorly-graded GRAVEL
		Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
More than 50% *Retained* on No. 200 Sieve Size			SP	Poorly-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	*PEAT*

TEST SYMBOLS

%F	Percent Fines	
AL	Atterberg Limits:	PL = Plastic Limit LL = Liquid Limit
CBR	California Bearing Ratio	
CN	Consolidation	
DD	Dry Density (pcf)	
DS	Direct Shear	
GS	Grain Size Distribution	
K	Permeability	
MD	Moisture/Density Relationship (Proctor)	
MR	Resilient Modulus	
PID	Photoionization Device Reading	
PP	Pocket Penetrometer Approx. Compressive Strength (tsf)	
SG	Specific Gravity	
TC	Triaxial Compression	
TV	Torvane Approx. Shear Strength (tsf)	
UC	Unconfined Compression	

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- 3-1/4" OD Split Spoon with Brass Rings
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- Non-standard Penetration Test (3.0" OD split spoon)

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	*No. 4 (4.5 mm) to No. 10 (2.0 mm)*
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)

Components are arranged *in order of increasing quantities.*

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation. Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

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SKAGIT COUNTY, WASHINGTON

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

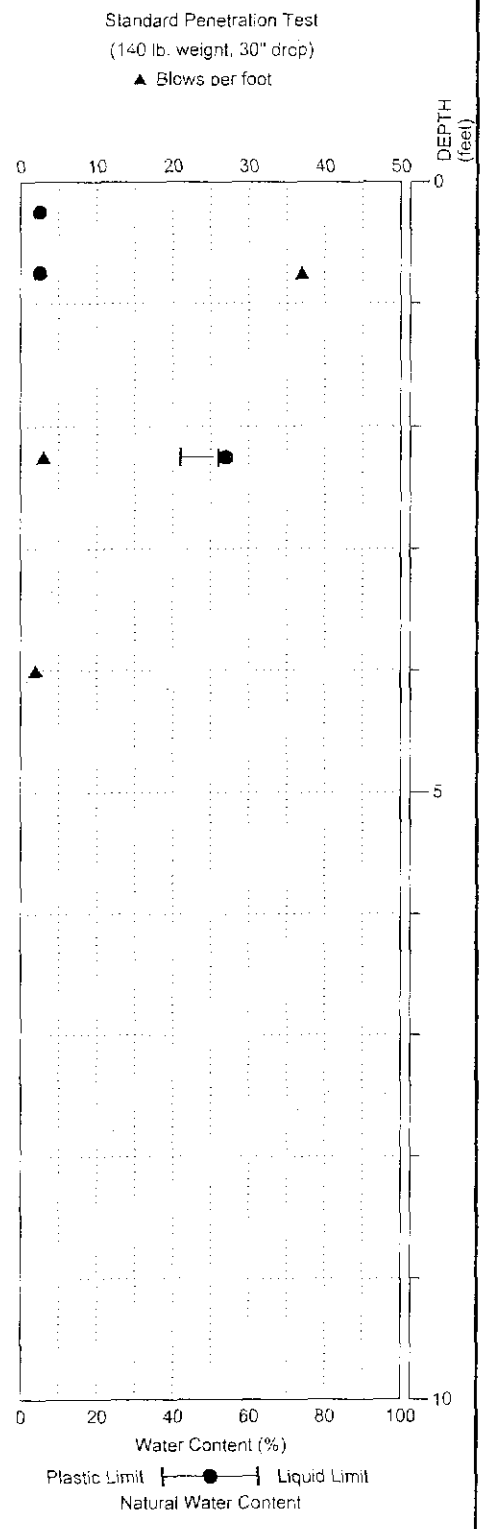
PROJECT NO.: 2002079 FIGURE: A-1

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 3+40
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			3" ACP					
		GP	5" Medium dense, brown, slightly silty, sandy, fine GRAVEL, moist.		S-1		GS	
			[CRUSHED BASE FILL]					
		GM	16" Medium dense, gray, silty, sandy, fine to coarse GRAVEL, moist. Cobbles noted. [FILL]		S-2	21-22-15	GS	
		CL	Soft, brown and gray, slightly sandy, silty CLAY, moist. Organics/charcoal noted.		S-3	2-2-1	AL	
		ML	Very soft, brown gray, sandy SILT, moist. Organics noted.		S-4	4-1-1		
5								
10								

Total depth = 5.5 feet.
No ground water seepage observed.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 1

PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-2

BORING 2002079.GPJ 8/12/02

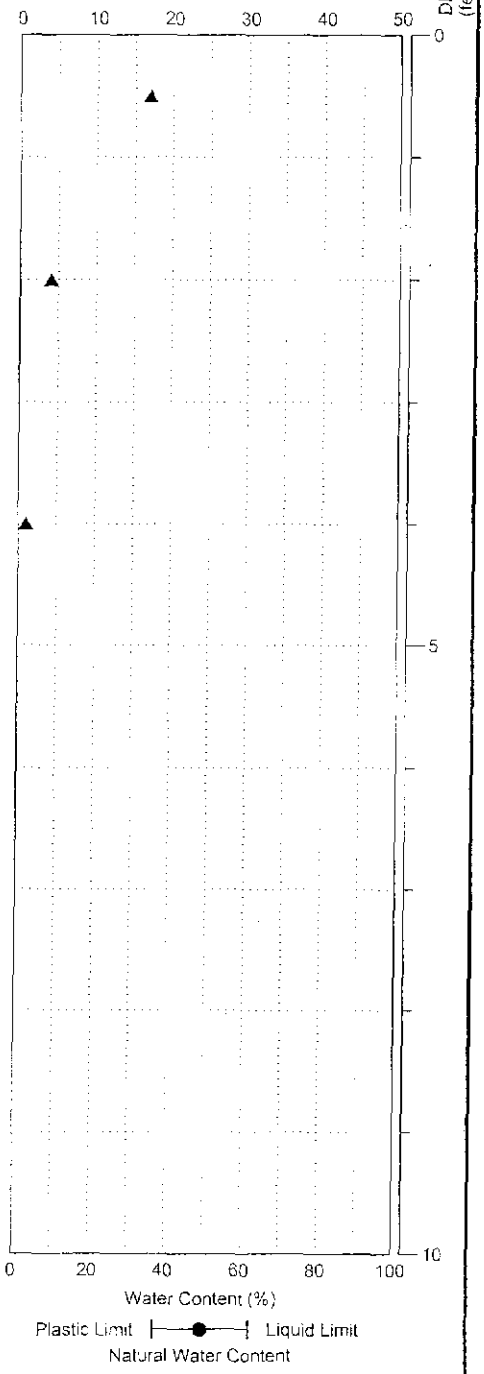
DRILLING COMPANY: *Holocene Drilling*
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 18+90
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			2.5" ACP					
		GP	3.5" Medium dense, brown, slightly silty, sandy, fine GRAVEL, moist.					
		GM	[CRUSHED BASE FILL]		S-1	23-12-5		
			12" Medium dense, gray, silty, sandy, fine to coarse GRAVEL, moist. [FILL]					
		SM	Very loose, dark brown and gray, very silty, fine SAND, moist to wet.		S-2	1-2-2		
5		ML	No Recovery of Sample S-3. Soil cuttings appeared to be *very soft, gray, sandy* SILT, moist to wet.		S-3	3-1/12"		
10								

Total depth = 5.5 feet.
No ground water seepage observed.

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

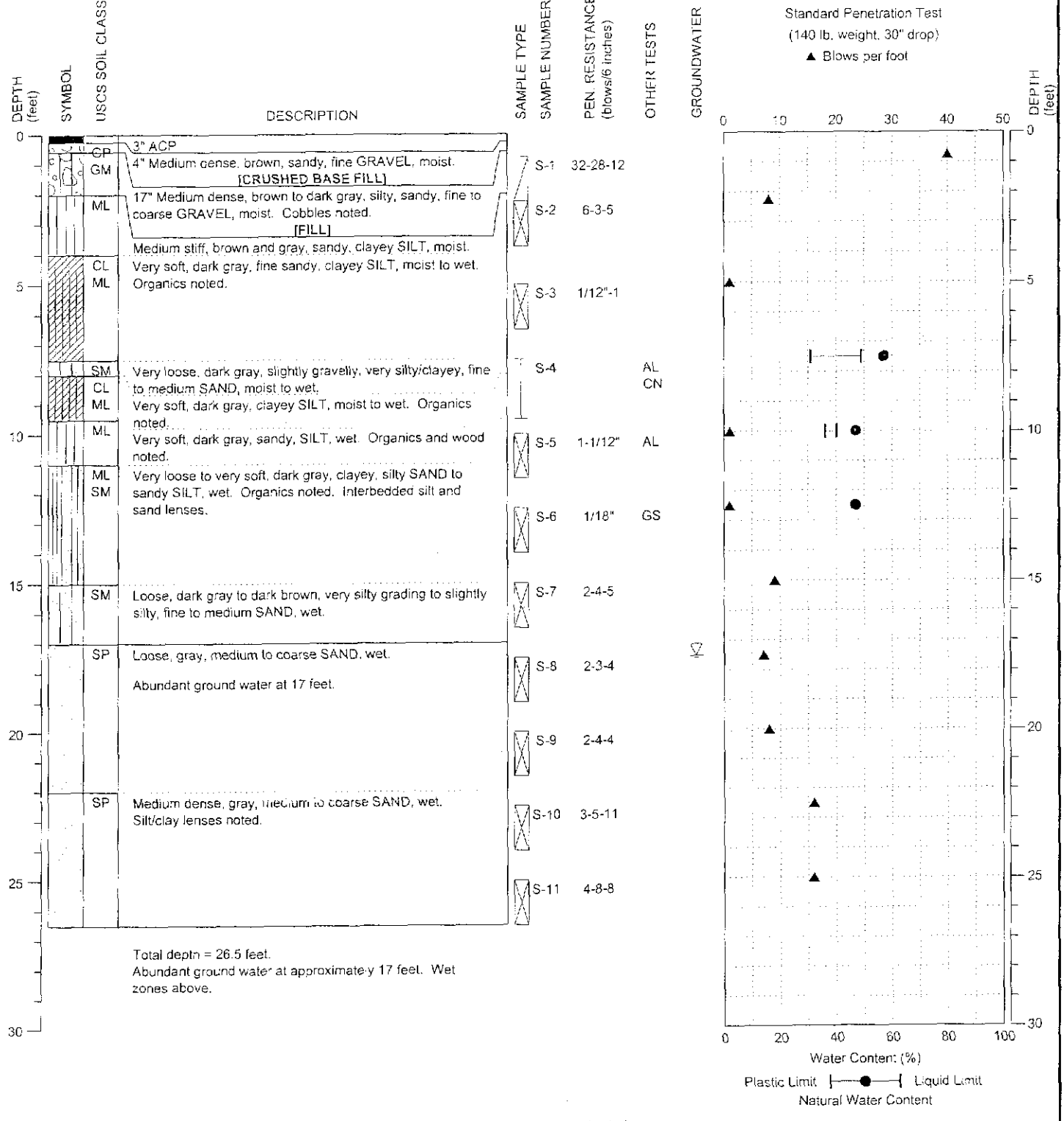
HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 2

PROJECT NO.: 2002079 FIGURE: A-3

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 22+80
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 3

PAGE: 1 of 1

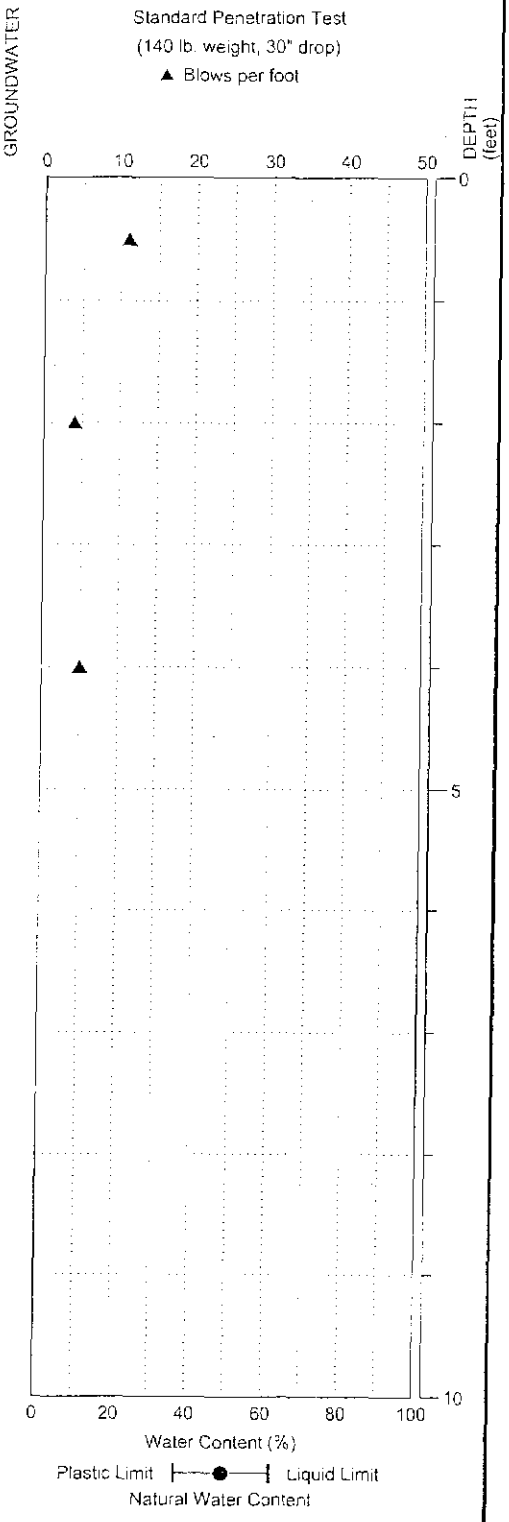
PROJECT NO.: 2002079 FIGURE: A-4

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 39+50
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			3" ACP					
		GP	3" Medium dense, brown, sandy, fine GRAVEL, moist.					
		GM	[BASE FILL]		S-1	20-7-4		
			6" Medium dense, dark brown, silty, sandy, fine to coarse GRAVEL, moist.					
		SM	[FILL]					
			Loose, dark brown, slightly gravelly, silty SAND, moist. Organics noted.					
		ML	*Soft, dark brown to light brown, SILT, moist.*		S-2	1/12"-4		
5		ML	*Medium stiff, brown and gray, slightly sandy SILT, moist.* Organics noted.		S-3	0-2-3		
10								

Total deptn = 5.5 feet.
No ground water seepage observed.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 4

PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-5

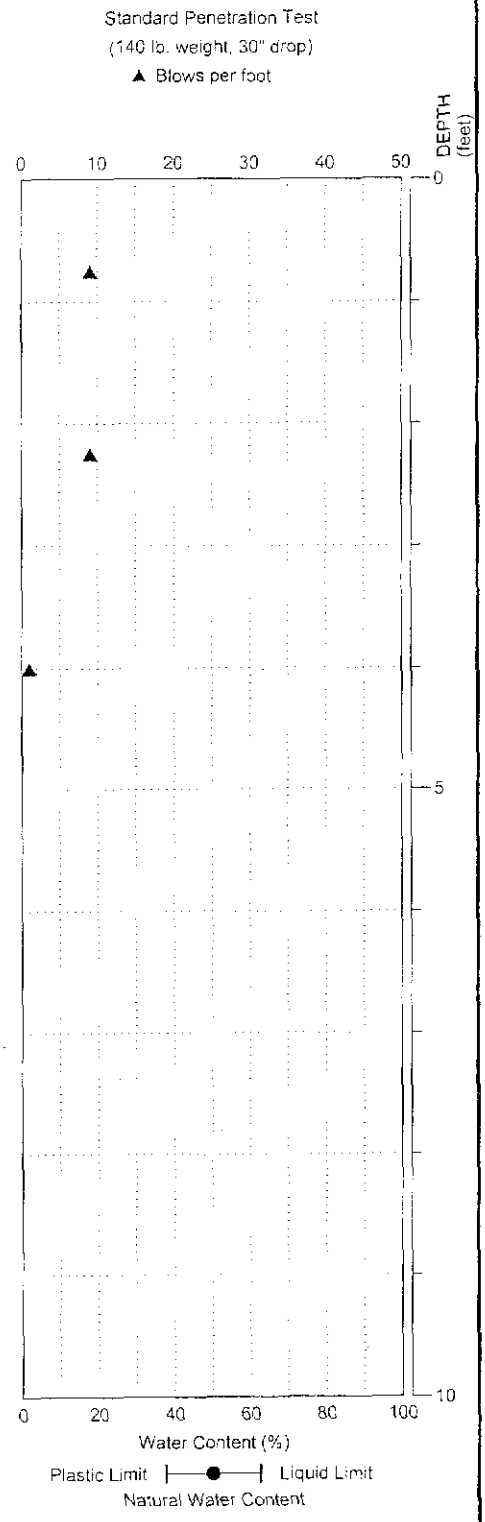
BORING 2002079.GPJ 8/12/02

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta Sta 28+50
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			2.5" ACP					
		GP GM	6.5" Medium dense, dark brown, slightly silty, sandy, fine GRAVEL, moist. [BASE FILL]					
		GM	6" Medium dense, brown and gray, silty, sandy, fine to coarse GRAVEL, moist.		S-1	14-4-5		
		CL ML	Medium stiff to very soft, mottled brown and gray, clayey SILT to silty CLAY, moist. Organics/wood noted.		S-2	2-3-6		
					S-3	1/12"-1		
5								
10								

Total depth = 5.5 feet.
No ground water seepage observed.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

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HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 5

PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-6

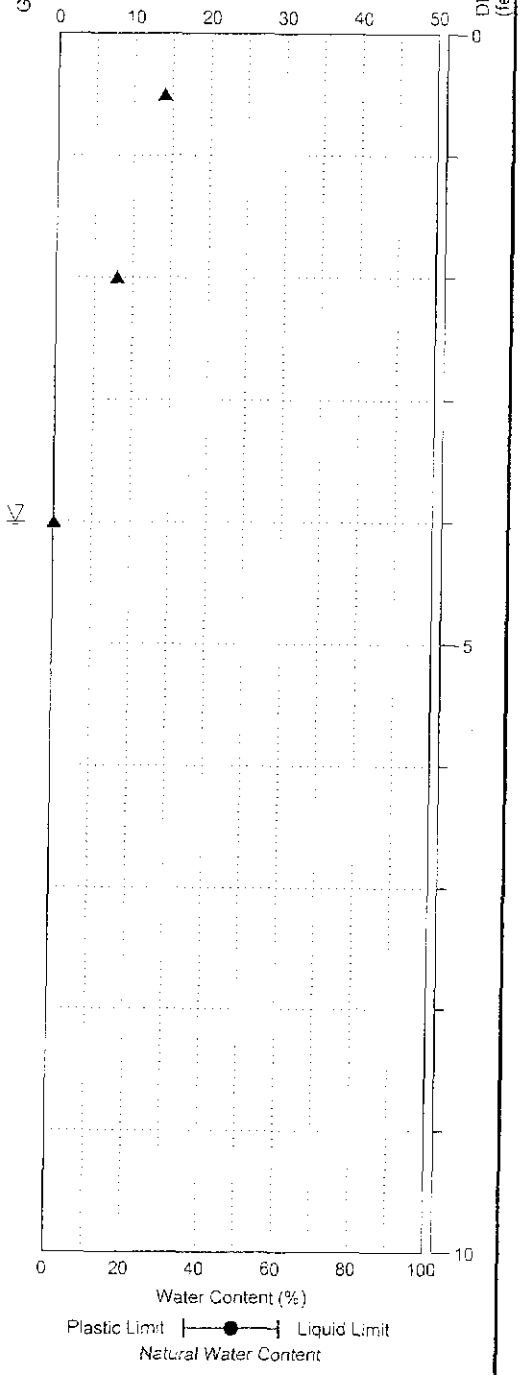
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 15+50
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			2" ACP					
		GP	4" *Medium dense, brown, sandy, fine GRAVEL, moist.* [BASE FILL]					
		GM	12" Medium dense, dark brown to gray, silty, sandy, fine to coarse GRAVEL and COBBLES, moist. *[FILL]*		S-1	17-10-4		
		SM	Medium dense, dark brown to gray brown, very silty, fine SAND, *moist. Organics noted.*					
		SM	Loose, dark grayish brown, slightly fine to coarse gravelly, silty, fine to medium SAND, moist.		S-2	2-4-4		
		ML	Very soft, dark gray, sandy, clayey SILT, wet.		S-3	0/18"		▽
5		SM	Very loose, dark gray, very silty, fine SAND, wet.					
10								

Total depth = 5.5 feet.
Ground water seepage at approximately 4 feet.

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

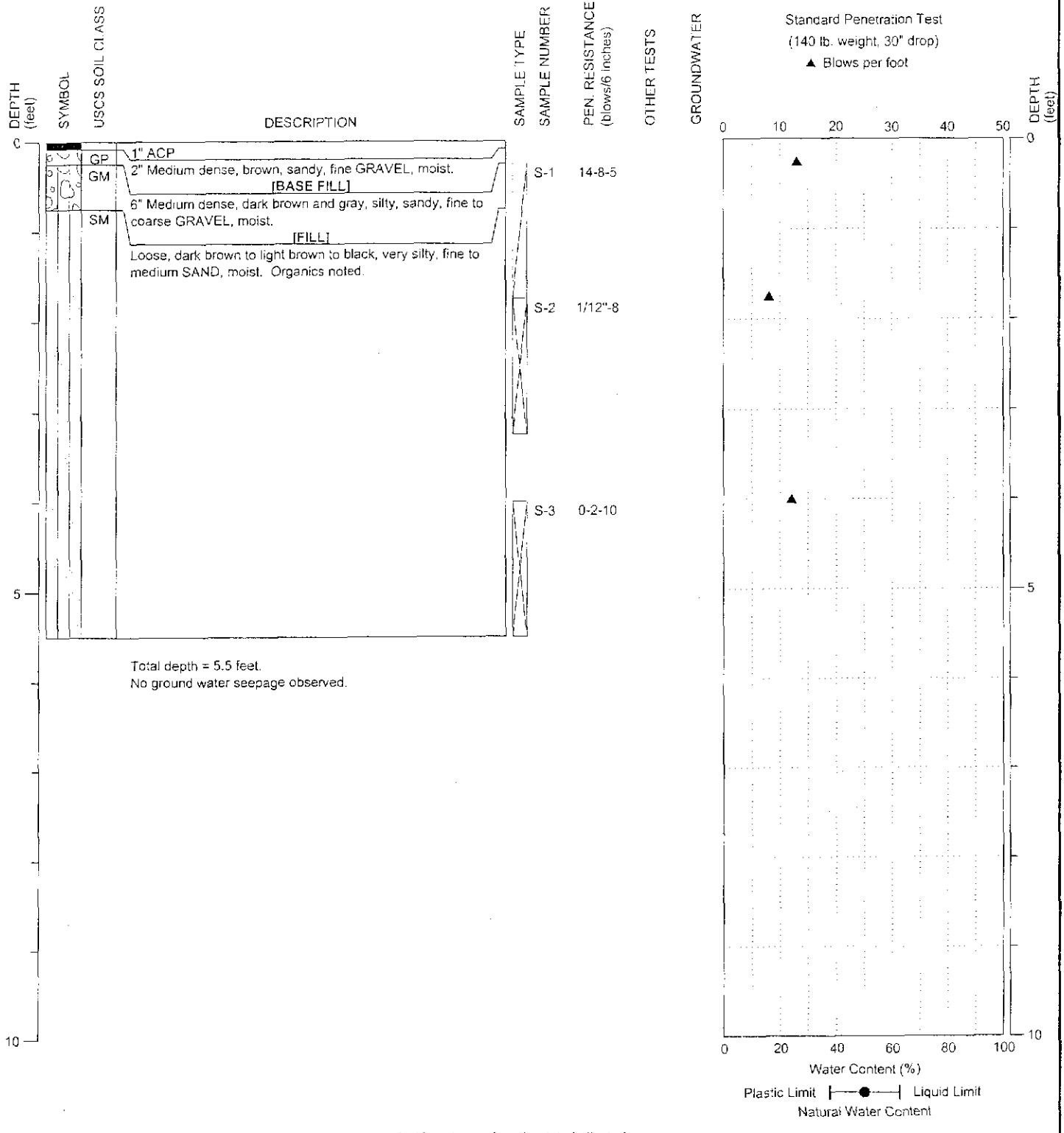
BORING:
BH- 6

PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-7

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 50+80
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins



Total depth = 5.5 feet.
No ground water seepage observed.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 7

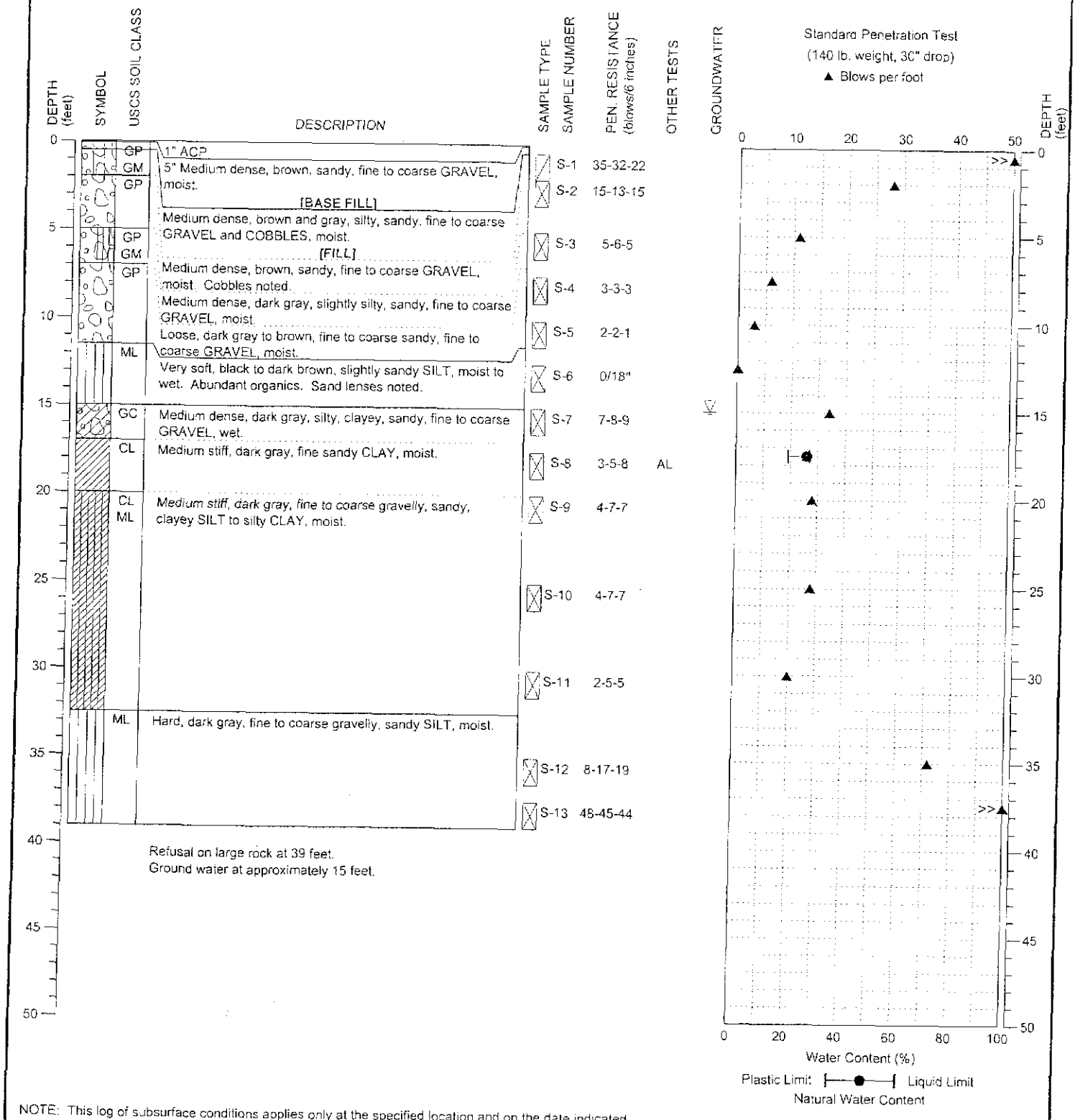
PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-8

BORING 2002079.GPJ 8/12/02

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 58+90
DATE STARTED: 5/13/2002
DATE COMPLETED: 5/13/2002
LOGGED BY: B. Hawkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

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HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 8

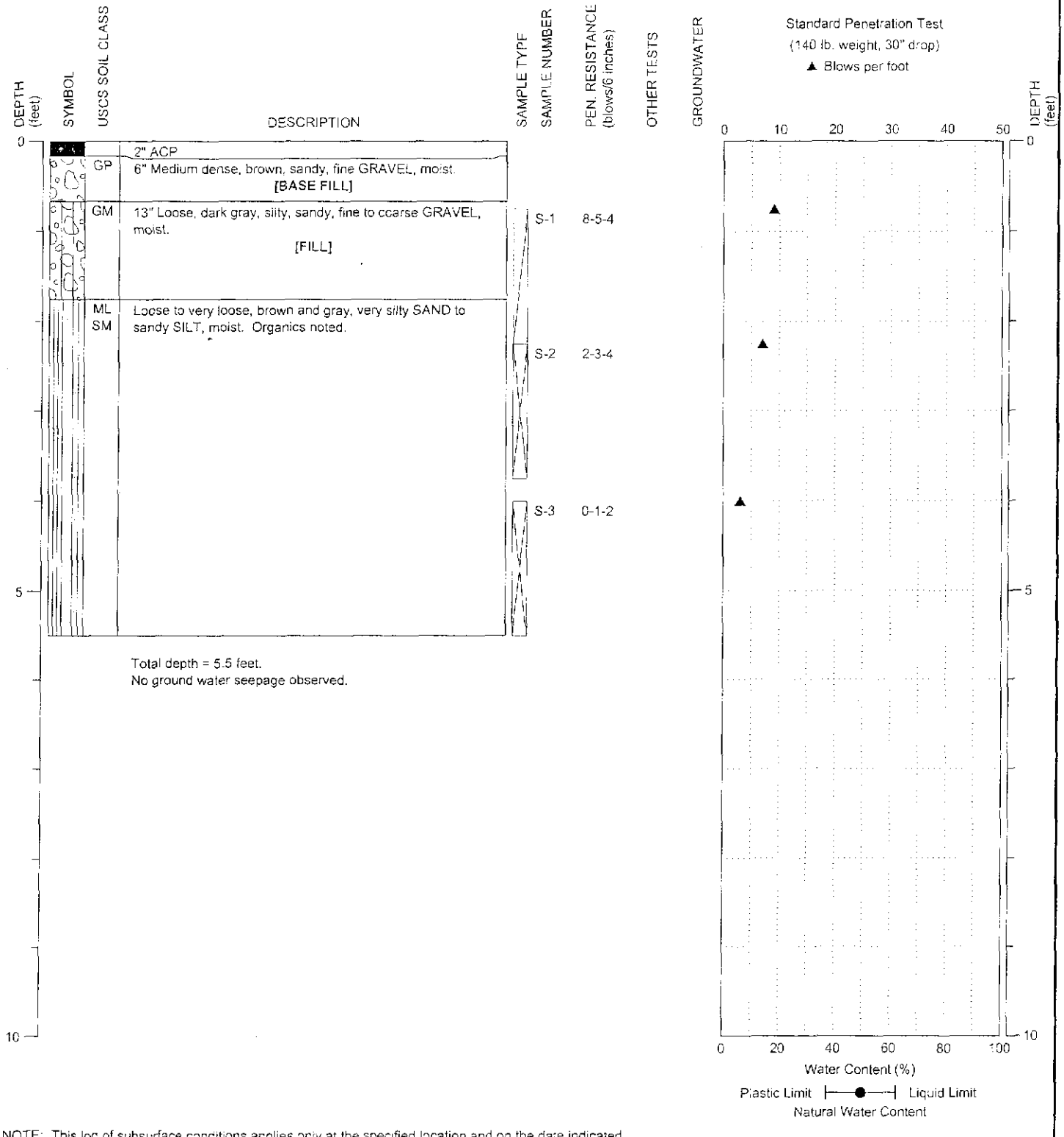
PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-9

BORING 2002079.GPJ 8/12/02

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: S:a 64+00
DATE STARTED: 5/14/2002
DATE COMPLETED: 5/14/2002
LOGGED BY: B. Hawkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GeoSciences Inc.

HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH- 9

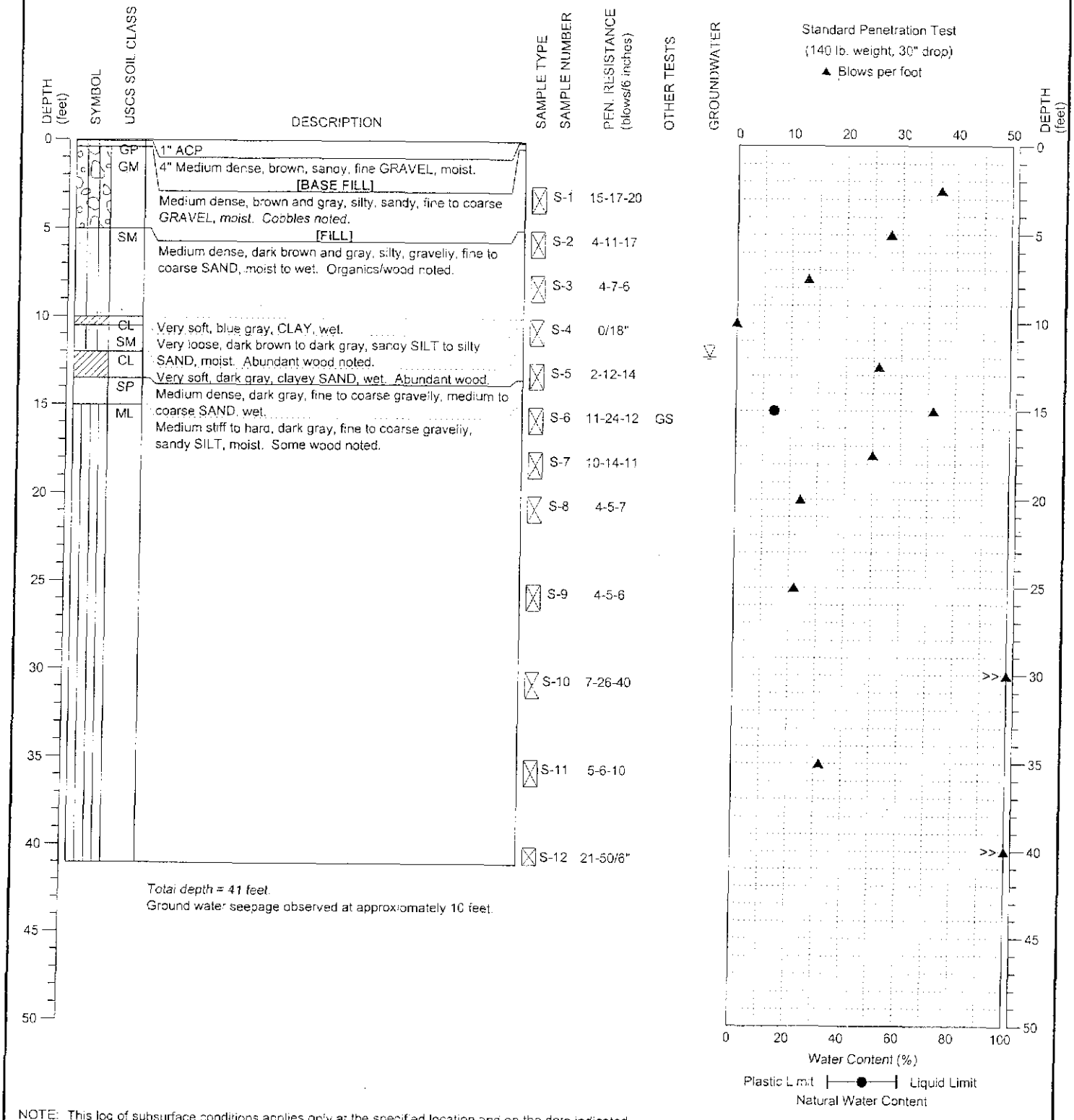
PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-10

BORING 2002079.GPJ 5/12/02

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: NSPT/SPT
SURFACE ELEVATION: ± feet

LOCATION: Sta 59+25
DATE STARTED: 5/14/2002
DATE COMPLETED: 5/14/2002
LOGGED BY: B. Hawkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

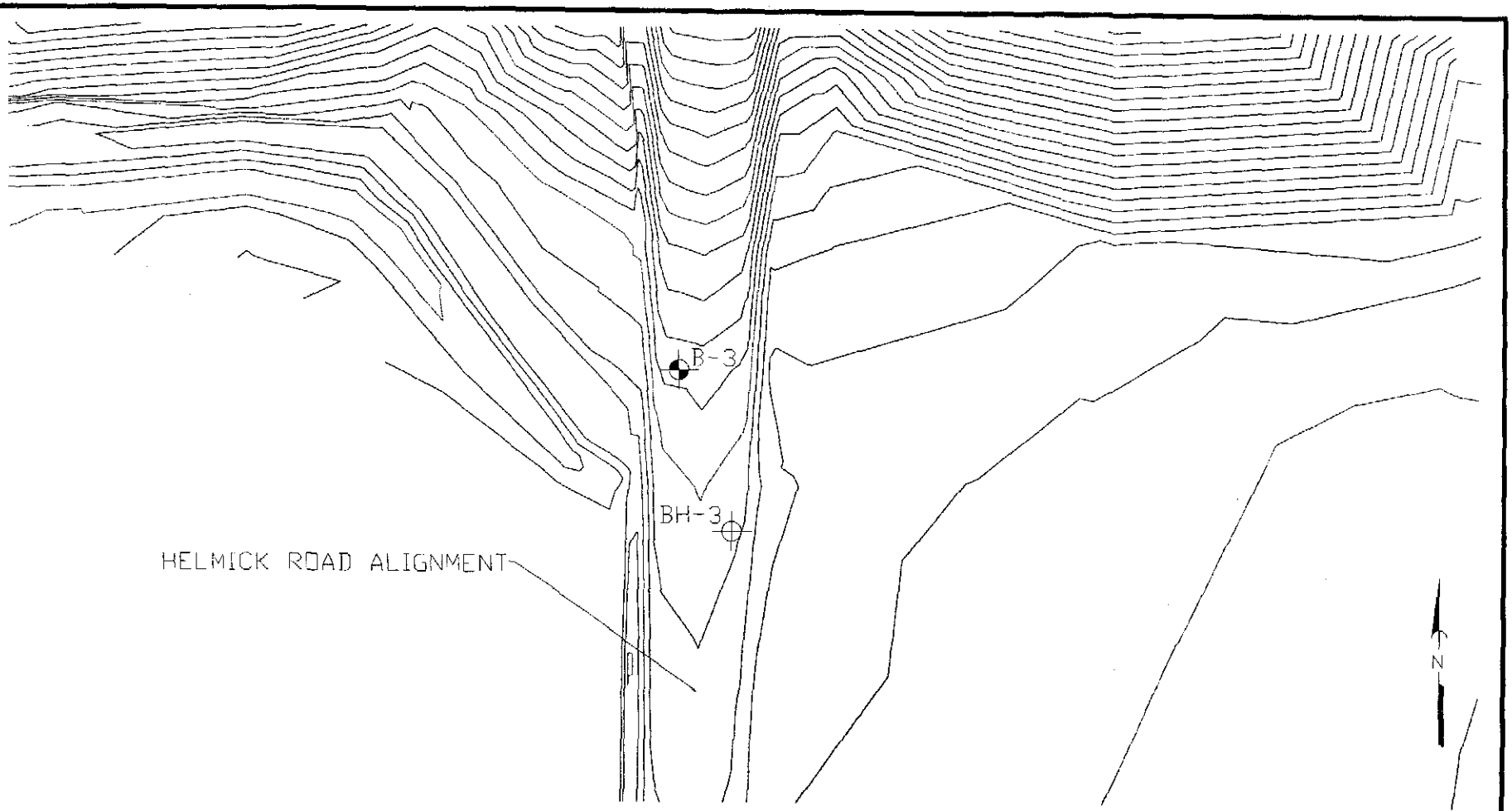
HELMICK ROAD IMPROVEMENTS
SKAGIT COUNTY, WASHINGTON

BORING:
BH-10

PAGE: 1 of 1

PROJECT NO.: 2002079 FIGURE: A-11

BORING 2002079.GPJ 8/12/02



Notes: 1. The locations of all features shown are approximate.

2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. *The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.*

Reference: Base drawing provided by Skagit County Public Works, Mount Vernon, Washington

EXPLANATION:

B-3 ⊕ BORING NUMBER AND APPROXIMATE LOCATION

BH-3 ⊕ BORING BY OTHERS

0 30 60

SCALE IN FEET

GeoEngineers

Site Plan

Figure 2

Bellingham:\P:\01\022007S\C1\022007S01F2.DWG AKM:MS 05/09/05

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	CC	Cement Concrete
	AC	Asphalt Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

- **Measured groundwater level in exploration, well, or piezometer**
- **Groundwater observed at time of exploration**
- **Perched water observed at time of exploration**
- ***Measured free product in well or piezometer***

Stratigraphic Contact

- **Distinct contact between soil strata or *geologic units***
- **Gradual change between soil strata or geologic units**
- **Approximate location of soil strata change within a geologic soil unit**

Sampler Symbol Descriptions

- **2.4-inch I.D. split barrel**
- **Standard Penetration Test (SPT)**
- **Shelby tube**
- ***Piston***
- **Direct-Push**
- **Bulk or grab**

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

GeoEngineers

Figure 3

Date(s) Drilled	4/1/2005	Logged By	S. Ramsey	Checked By	A. McCain
Drilling Contractor	Holt Drilling (Div. of Boart Longyear)	Drilling Method	Mud Rotary	Sampling Methods	Large diameter split spoon sampler
Auger Data	None	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted B-29 Drill Rig
Total Depth (ft)	26.5	Surface Elevation (ft)	Not determined	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample	Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft³	OTHER TESTS AND NOTES
	0		9	16		1			GP-GM	Brown fine to coarse gravel with silt (medium dense, moist)	46		
									ML	Gray sandy silt (soft, moist to wet)			
	5		0	11		2							No recovery
			0	4		2A			SM	Gray silty fine sand with occasional gravel (loose, moist to wet)			No recovery
			6	2		3					39		%F=21%
	10		6	3		4					31		%F=70%
			12	8		5			ML	Gray fine sandy silt (medium stiff, wet)	33	90	CS
	15		12	9		6							
									ML	Gray silt with gravel (medium stiff, wet)			
	20		10	10		7							
	25		12	4		8							

Note: See Figure 3 for explanation of symbols.

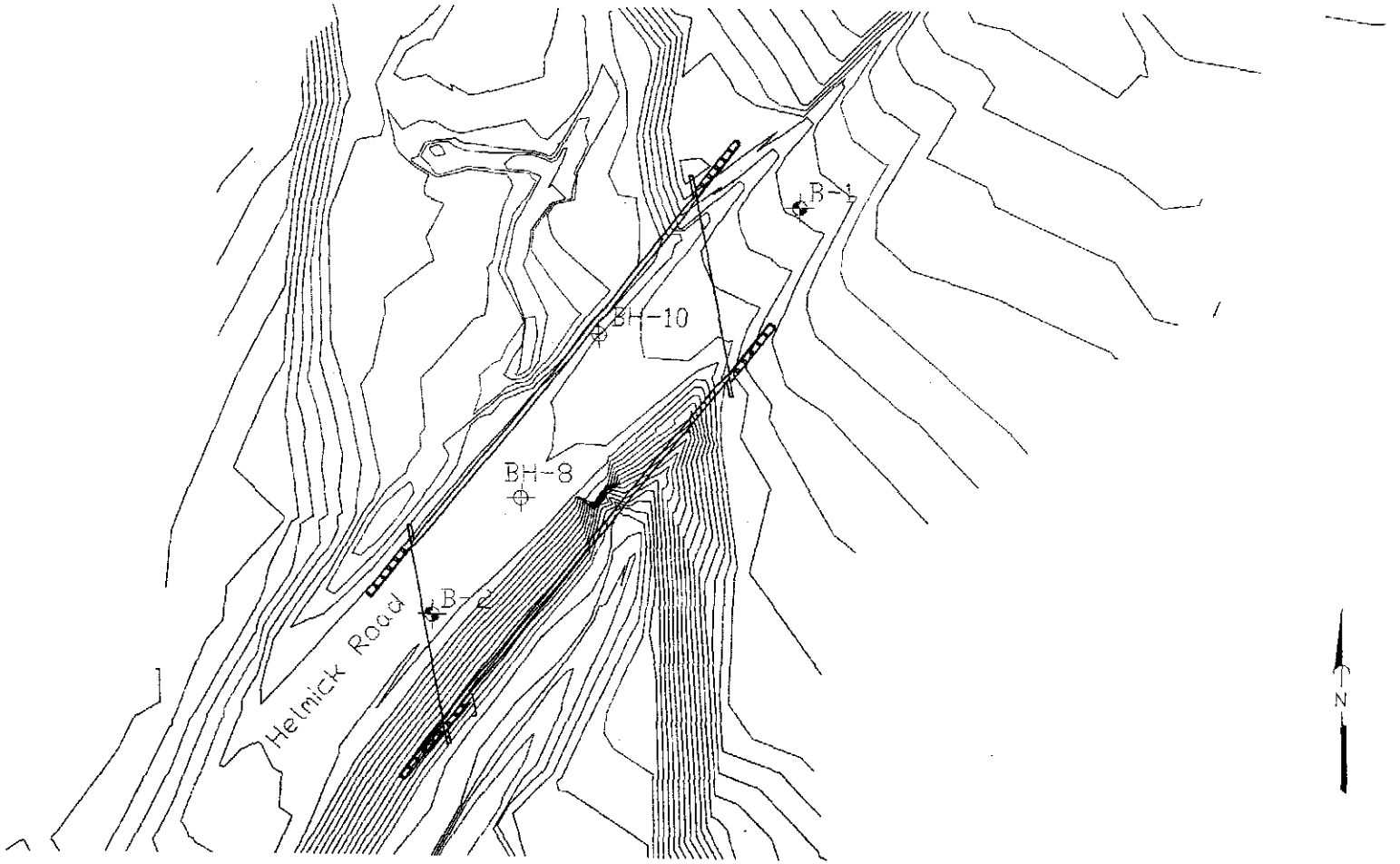
LOG OF BORING B-3

GeoEngineers

Project: Helmick Road Improvement Project
Project Location: Skagit County, Washington
Project Number: 00220-075-01

Figure: 4
Sheet 1 of 1

V6_GTBORING P:\0\00220075\01\22007507 B.GPJ GEIV6_1.GDT 5/13/05



Notes: 1. The locations of all features shown are approximate.

2. This figure is for informational purposes only. It is intended to assist in the identification of features *discussed in a related document. Data were compiled from sources as listed in this figure.* The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Reference: Base drawing provided by Skagit County Public Works, Mount Vernon, Washington.

EXPLANATION:

B-1 BORING NUMBER AND APPROXIMATE LOCATION

BH-8 BORING COMPLETED BY OTHERS

0 30 60

SCALE IN FEET

GEOENGINEERS

SITE PLAN

FIGURE 2

Bellingham: \P:\0\00220075\01\00220075F2.DWG AKM:MS 05/09/2005

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
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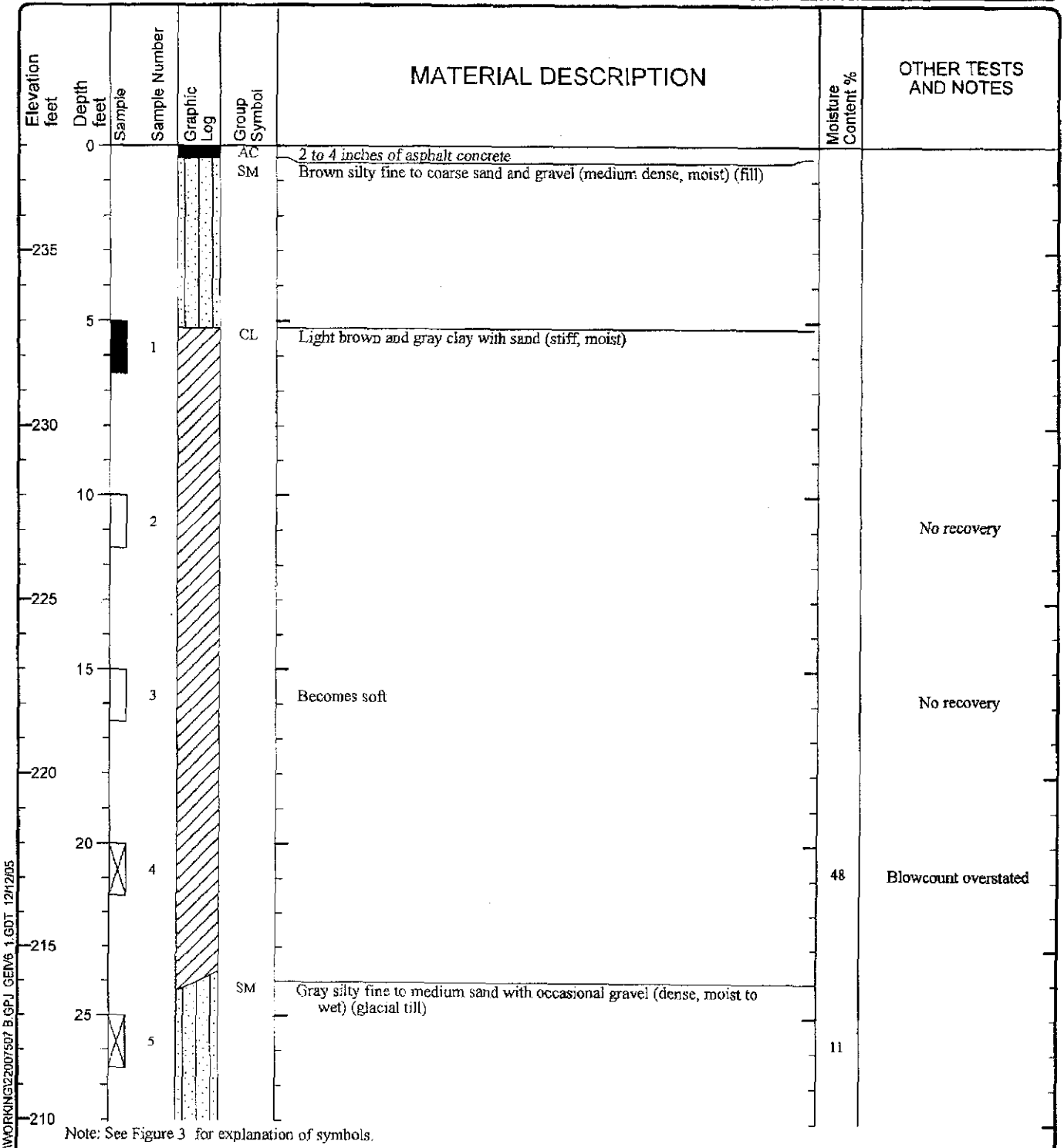
KEY TO EXPLORATION LOGS

GeoEngineers

Figure 3

Date Excavated: 3/31/2005 Logged by: S. Ramsey

Equipment: Truck-mounted B-29 Drill Rig Surface Elevation (ft): 238



Note: See Figure 3 for explanation of symbols.

V6_GTTPIT P:\0022007501\WORKING\22007507 B.GPJ GEIV6 1.GDT 12/12/05

LOG OF BORING B-1

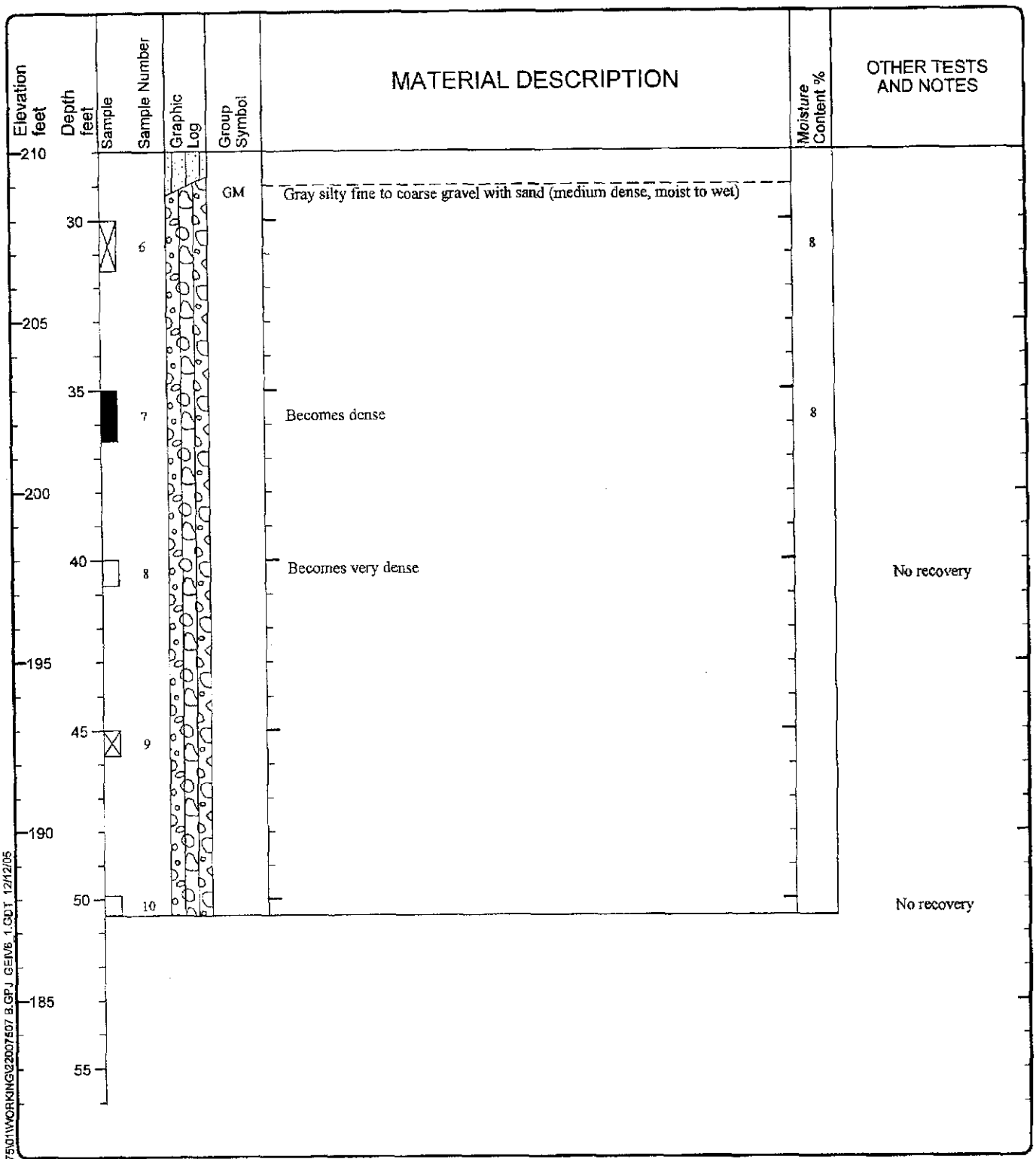
GeoEngineers

Project: Helmick Road Improvement Project
Project Location: Skagit County, Washington
Project Number: 0220-075-01

Figure: 4
Sheet 1 of 2

Date Excavated: 3/31/2005 Logged by: S. Ramsey

Equipment: Truck-mounted B-29 Drill Rig Surface Elevation (ft): 238



LOG OF BORING B-1 (continued)

GeoEngineers

Project: Helmick Road Improvement Project

Project Location: Skagit County, Washington

Project Number: 0220-075-01

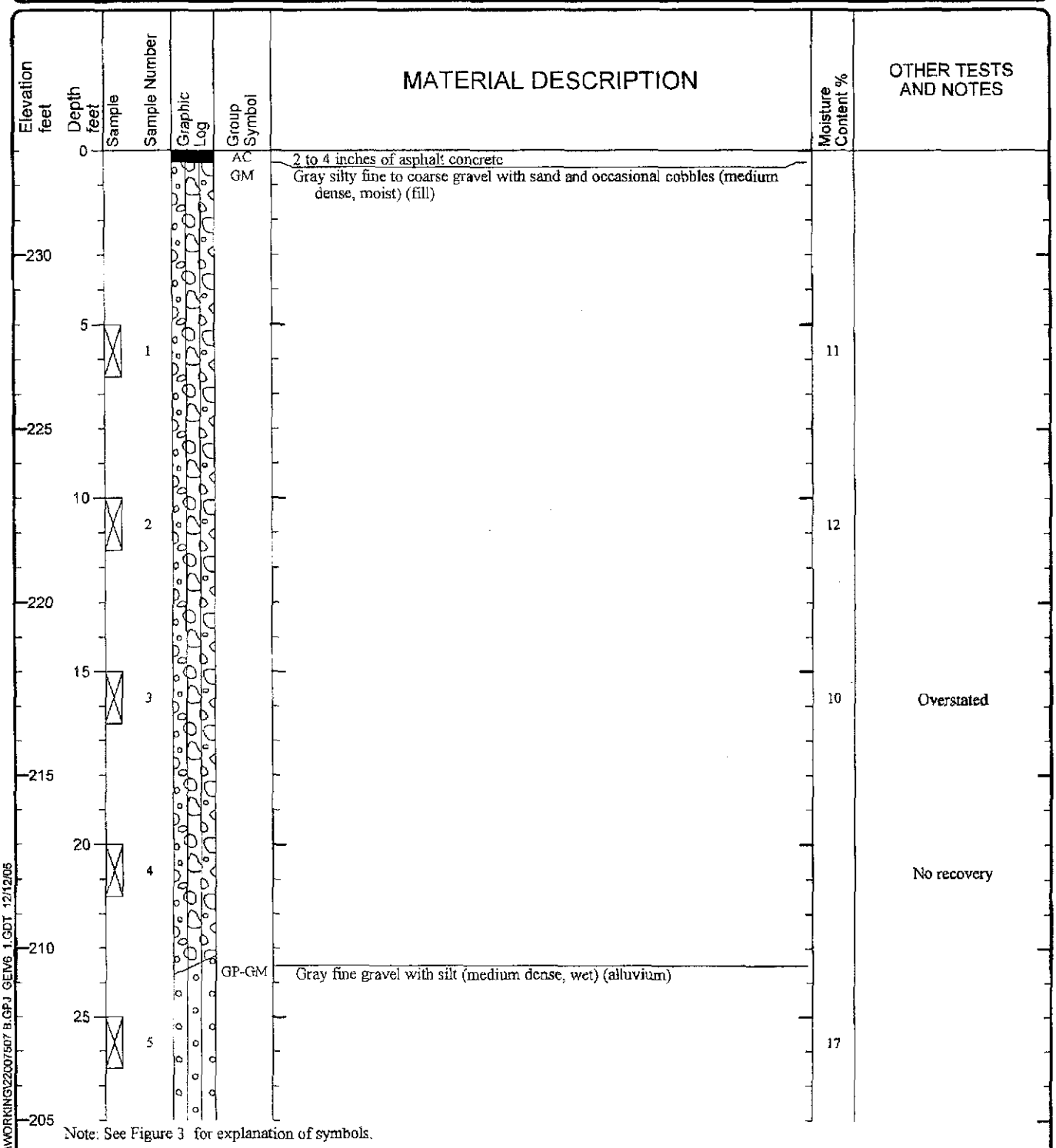
Figure: 4

Sheet 2 of 2

V6_GTTPLT_P:\0\0220075\01\WORKING\220075O7 B.GPJ_GEIV6_1.GDT_12/12/05

Date Excavated: 3/31/2005 Logged by: S. Ramsey

Equipment: Truck-mounted B-29 Drill Rig Surface Elevation (ft): 233



Note: See Figure 3 for explanation of symbols.

LOG OF BORING B-2

GeoEngineers

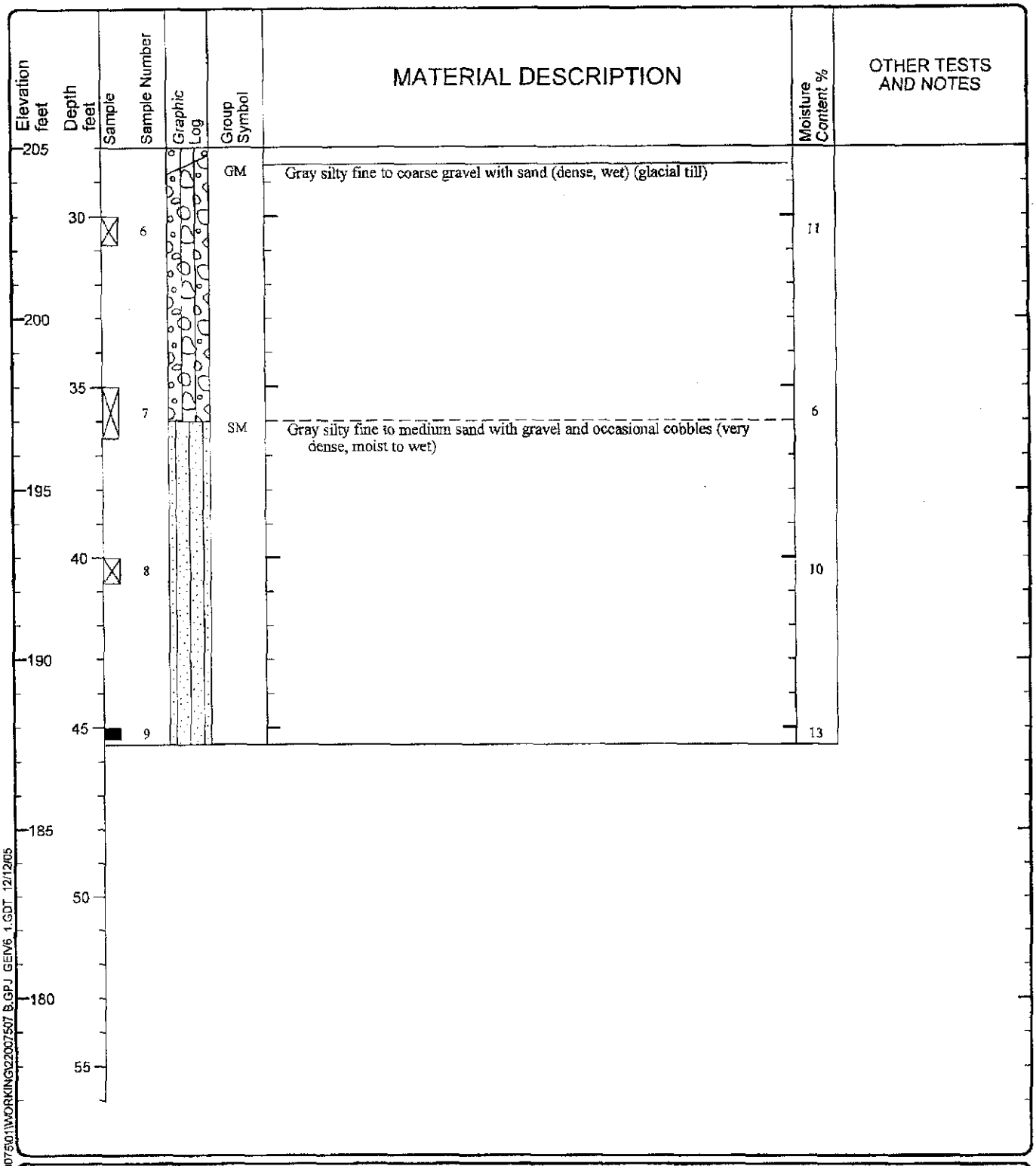
Project: Helmick Road Improvement Project
Project Location: Skagit County, Washington
Project Number: 0220-075-01

Figure: 5
Sheet 1 of 2

V6_GTTPIT P:\0N\0220075\01\WORKING\220075B.GPJ GEV6_1.GDT 12/12/05

Date Excavated: 3/31/2005 Logged by: S. Ramsey

Equipment: Truck-mounted B-29 Drill Rig Surface Elevation (ft): 233



V6_GTTPIT P:\0022007501\WORKING\022007507 B.GPJ GEIV6_1.GDT 12/12/05

LOG OF BORING B-2 (continued)

GeoEngineers

Project: Helmick Road Improvement Project
Project Location: Skagit County, Washington
Project Number: 0220-075-01

Figure: 5
Sheet 2 of 2