REPORT
GEOTECHNICAL ENGINEERING SERVICES
PROPOSED WOODLAND TRAIL PROJECT
EASTSIDE STREET TO DAYTON STREET SE
OLYMPIA, WASHINGTON

FEBRUARY 6, 2006

FOR
BOB DROLL, ASLA

GEOENGINEERS

File No. 4837-001-01

Geotechnical Engineering Services
File No. 4837-001-01

February 6, 2006

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REPORT
GEOTECHNICAL ENGINEERING SERVICES
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FOR
BOB DROLL, ASLA

INTRODUCTION

This report represents the results of our geotechnical engineering services for the proposed Woodland Trail project in Olympia, Washington. Our services were performed in general accordance with our revised proposal dated November 30, 2005. Our services were authorized on November 30, 2005.

The site consists of a former railroad grade between Eastside Street and Dayton Street SE in Olympia, Washington. The location of the proposed trail is shown in the Vicinity Map, Figure 1. The site is about 8,500 feet in total length.

We completed a limited Phase I Environmental Site Assessment of the site in December 1995. The results of our earlier study are contained in the "Report, Limited Phase I Environmental Site Assessment, Proposed Woodland Trail, Olympia, Washington, December 28, 1995" for the City of Olympia Parks, Recreation and Cultural Services Department.

We understand that the proposed improvements associated with the trail include paving the approximate north half of the existing railroad grade, constructing an asphalt paved parking lot and one restroom structure at the west end of the project.

SCOPE OF SERVICES

The purpose of our services is to evaluate the former railroad grade for indicators of potential cut or fill slope instability, and to evaluate subsurface soil and groundwater conditions at various locations along the subject trail segment as a basis for developing geotechnical recommendations for design of pavements and structures. The specific scope of services completed for this project are described below.

1. Review available information regarding topography, hydrogeology, soil conditions and other relevant characteristics of the site and surrounding area.
2. Perform a geologic reconnaissance of the proposed trail site, including the two potential trail connection areas.
3. Map areas of apparent settlement, slope instability or potential slope instability on or adjacent to the trail based on our observations.
4. Evaluate subsurface conditions at specific locations on the site by completing 13 shallow explorations to depths of about 5 feet each using machine-operated push-probe equipment.
5. Collect soil samples from the explorations.
6. Evaluate pertinent physical and engineering characteristics of soils based on laboratory testing performed on samples obtained from the explorations. Laboratory testing consisted of moisture content and sieve analyses.

7. Develop recommendations for site preparation and earthwork for the proposed trail development.
8. Provide recommendations for foundation design for the proposed building near Eastside Street, including allowable soil bearing pressure, lateral resistance values and estimates of settlement.
9. Provide recommendations for an asphalt concrete pavement design section for the proposed trail and for the proposed parking area located near Eastside Drive.

SITE CONDITIONS

SURFACE CONDITIONS

The site consists of a former railroad grade that was known as the Tacoma, Olympia and Grays Harbor Railroad (TO & GHRR). The railroad right of way is about 50 to 60 feet wide. We understand that railroad tracks were located on the north side of the right of way and the south side of the right of way consisted of a service road.

The rail line was apparently used to haul logs to various mill sites and lumber to shipping points. Burlington Northern Railroad later acquired TO & GHRR. The rails and cross-ties were removed from this portion of the rail line sometime in the 1980s. The approximate existing layout of the railroad grade and nearby areas is shown in Figures 2 through 4.

As previously stated, the proposed trail is about 8,500 feet in length. Stationing established by others indicates that the east end of the project is Station 100, and the west end is at Station 186. The approximate location of specific features along the alignment is referenced to these stations throughout the remainder of this report.

Topographically, the former railroad grade has a gentle slope downward from east to west. The ground surface of the railroad grade at the east boundary of the site at Dayton Street SE is at about Elevation 180 feet. Ground surface at the west end of the site is at about Elevation 70 feet. The railroad right of way is relatively flat with grades established by a series of cuts through upland areas, and fills over low areas. The fills likely consist of locally derived material. Cut and fill slopes along the alignment appear to range from near vertical to about 50 percent. The majority of the cut and fill slopes appear to be inclined at about 50 to 60 percent.

Vegetation is mostly absent on the surface of the former railroad grade. Upland areas bordering the right of way, including fill slopes, are vegetated with a sparse to moderate covering of ferns, some blackberries, deciduous and conifer trees. A relatively large wetland area between about Station 120 to Station 129 was vegetated with alder trees and brush. We observed several leaning trees in this area, possibly indicating the presence of peat.

Indian Creek flows in an east to west direction near the right of way from about Station 122 to Station 181. The grade crosses Indian Creek at Station 129.5. There are several shallow to steep gullies that cross the railroad grade between about Station 152 and Station 182. Surface water was observed to flow in several of these gullies generally from south to north. We observed surface water flowing through culverts near the base of the railroad embankment fill prisms in these areas.

We observed one surficial seep near the base of a cut slope on the south side of the alignment near about Station 176. We did not observe evidence of surficial or deep-seated slope instability in most of the cut or

fill slope areas during our site visits. We observed evidence of minor slope instability in a fill slope on the north side of the alignment at about Station 168.

The railroad grade is mostly surfaced with sand. Railroad ballast, consisting of crushed rock/gravel, was observed in the north part of the grade from about Station 103 to about Station 111.

MAPPED GEOLOGIC CONDITIONS

Geologic materials at the site were evaluated by reviewing the "Geologic Map of the Lacey 7.5-Minute Quadrangle, Thurston County Washington, 2003" and the "Geologic Map of the Tumwater 7.5-minute Quadrangle, Thurston County, Washington, 2003" by R. L. Logan, T. J. Walsh, H. W. Schasse and Michael Polenz.

Geologic materials mapped at the site consist of "Latest Vashon recessional sand and minor silt," Map Unit Qgos. This material is described as sand with silt that was deposited in and around the margins of glacial lakes during the Vashon glaciation.

SUBSURFACE CONDITIONS

General

Subsurface conditions at the site were explored by drilling 13 shallow push-probes at the site on January 17, 2006 at the approximate locations shown in Figures 2 through 4. Details regarding the subsurface exploration program are included in Appendix A. Summary logs of the explorations are also included in Appendix A.

Soil

Soil encountered in the push-probe generally consists of loose to dense silty sand or sand with varying amounts of silt. We also encountered medium stiff to stiff silt at the locations of borings B-11 through B-13. About 8 inches of railroad ballast was encountered in boring B-2. Railroad ballast was not encountered in any of the other explorations. We interpret the materials encountered in the explorations to be either in-place recessional outwash or fill consisting of re-worked recessional outwash.

Groundwater

Groundwater was encountered at a depth of about 4.8 feet in exploration B-5. Groundwater was not encountered in the other explorations completed for this study. We expect that groundwater levels at the site will vary with season and precipitation.

Laboratory Testing

Grain-size analyses were performed on soil samples collected from explorations B-1, B-12 and B-13. The results of these analyses are presented in Figure A-15.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Based on the results of our subsurface exploration and analyses, it is our opinion that the site is generally suitable for the proposed improvements. The near-surface fill and native soils contain a relatively high percentage of fine sand and silt and can easily erode when disturbed or when concentrated surface water runoff is discharged onto slopes.

The proposed bathroom structure can be supported on shallow foundations bearing on the undisturbed native soils or compacted structural fill that extends to the native soil. Specific geotechnical recommendations for the proposed improvements are presented in the following sections of this report.

SITE PREPARATION

We recommend that the areas to be paved and/or otherwise improved be stripped of existing vegetation and organic-laden soils. Based on the explorations, we estimate stripping depths of less than about 4 inches over the majority of the alignment will be necessary to remove unsuitable subgrade soils. Deeper stripping depths will be needed in the proposed bathroom structure area based on the proposed location of the building. Stripping depths of 6 to 12 inches will likely be needed in this area.

Deeper stripping depths should be expected in areas where trees and brush currently exist. We recommend that trees be removed by overturning so that a majority of the tree roots are removed. The depressions resulting from tree removal should be backfilled with structural fill, prepared and compacted to the densities indicated in the "Structural Fill" section of this report. The unsuitable stripped material may be reused in landscaped areas or be disposed off site. Any stripped former railroad ballast can be stockpiled and later used for pavement subgrades.

After stripping has been completed, a representative of GeoEngineers should visually evaluate the exposed pavement and building subgrade for loose or disturbed areas. We recommend that all loose or disturbed areas be compacted to a firm, non-yielding condition or excavated and replaced with structural fill. Soil gradation and compaction specifications for structural fill are described in greater detail in the "Structural Fill" section of this report.

STRUCTURAL FILL

All fill beneath structures or pavements, and within utility trenches that pass beneath structures or pavements should be placed as structural fill. Structural fill should be free of debris, organic contaminants and rock fragments larger than 6 inches.

The suitability of material for use as structural fill depends on the gradation and moisture content of the material. As the amount of fines (materials passing the U.S. No. 200 sieve) increases, soil becomes increasingly more sensitive to small changes in moisture content and adequate compaction becomes more difficult, if not impossible, to achieve.

The outwash soil encountered in the borings may be considered for use as structural fill provided it is free of deleterious material and oversize particles, and can be properly moisture conditioned for compaction. This material contains a moderate to high percentage of fine sand and fines and will be difficult to adequately compact during wet weather conditions. The existing railroad ballast may be considered for use as crushed surfacing base course in pavement areas, provided it can be segregated from other on-site

materials and meets the gradation criteria specified in the "Pavement" section of this report. The native silt layers are highly moisture sensitive and in our opinion should not be considered for use as structural fill.

If imported structural fill is needed, we recommend that the fill consist of well graded sand or sand and gravel with less than 5 percent fines based on the fraction passing the 3/4-inch sieve. A fines content of up to about 10 percent is acceptable if earthwork is performed during dry weather.

We recommend structural fill placed within building foundation areas, floor slab areas and beneath pavements be compacted to at least 95 percent of the maximum dry density (MDD) as determined in accordance with American Society for Testing and Materials (ASTM) D 1557. We recommend that structural fill be placed in layers not exceeding 10 inches in loose thickness. Each layer should be uniformly compacted to the recommended density before placing additional lifts of fill.

We recommend that a representative from our firm be present during site preparation and structural fill placement. Our representative will observe subgrade performance under proof-rolling or probing, perform in-place density tests during filling to check if the required compaction is being achieved and provide recommendations for any modifications to procedures, which may be appropriate for the prevailing conditions.

FOUNDATION SUPPORT

We recommend that the bathroom structure be supported on shallow spread footings bearing on undisturbed native recessional outwash soils or on compacted structural fill that extends to native soils. Foundation excavations for building foundations should be completed with a smooth bladed bucket to limit disturbance.

For footings founded as described above, we recommend an allowable soil bearing pressure of 2,000 pounds per square foot (psf) be used for design. This value may be increased by one-third when total loads, including seismic or wind loads, are considered.

We recommend a minimum width of 18 inches for continuous wall footings and 2 feet for isolated footings. All footing elements should be embedded at least 18 inches below lowest adjacent grade. We recommend that all foundation bearing surfaces be observed by a representative of our firm to check for adequate bearing surface preparation prior to concrete placement.

Based on typical construction loads, we estimate that settlement of footings designed and constructed as recommended should be less than 1 inch with differential settlements between comparably loaded isolated footings of 1/2 inch or less. Most of the settlements should occur essentially as loads are being applied. However, loose or soft soil below footings or disturbance of foundation subgrade during construction could result in larger settlements than predicted.

Lateral Loads

Lateral loads may be resisted by friction on the base of foundation elements and passive soil pressure on the sides. We recommend a coefficient of 0.4 for base friction and an equivalent fluid weight of 300 pounds per cubic foot (pcf) for passive soil pressure. The above criteria include a safety factor of about 1.5.

FLOOR SLAB SUPPORT

For concrete floor slabs supported as recommended above, we recommend using a subgrade modulus of 300 pounds per cubic inch (pci). A minimum 4-inch-thick compacted crushed base course should be used to provide uniform support for the floor slab.

If dry slabs are required (e.g., where adhesives are used to anchor carpet or tile to the slab), a waterproof liner, at least 6 mils thick, should be placed as a vapor barrier in the floor slab area prior to pouring concrete. A 2-inch thickness of clean sand may be placed over the vapor barrier to protect the liner and serve as a leveling course.

SLOPES

We recommend that permanent cut and fill slopes be inclined no steeper than 2H:1V (Horizontal to Vertical). Flatter cut slopes may be necessary in areas where persistent groundwater seepage or zones of soft or loose soil are encountered. Temporary cut slopes should be inclined no steeper than about 1-1/2H:1V. Surface loads should be kept at a minimum distance of at least one half the depth of the cut away from the top of temporary slopes.

Temporary cut slopes and shoring must comply with the provisions of Title 296 WAC, Part N, "Excavation, Trenching and Shoring." The contractor performing the work has the primary responsibility for protection of workmen and adjacent improvements, determining whether shoring is required, and for establishing the safe inclination for temporary slopes.

PAVEMENT

Pavement subgrades should be prepared as described previously in the "Site Preparation" section of this report. We recommend the pavement in areas to be used for light vehicle traffic (trail areas) consist of 2 inches of Class B asphalt concrete, as described in Washington State Department of Transportation (WSDOT) Section 9-03.8, underlain by 4 inches of crushed surfacing base course. For pavement in more heavily traveled areas or with significant truck traffic, we recommend providing 3 inches of asphalt concrete underlain by 6 inches of crushed surfacing base course. The base course should be compacted to at least 95 percent of the MDD (ASTM D 1577). Crushed rock base course should comply with WSDOT Standard Specifications for Road, Bridge and Municipal Construction Section 9-03.9(3).

STORMWATER INFILTRATION EVALUATION

General

We understand that you may infiltrate stormwater from paved surfaces in the west part of the site. We understand that the exact location of the facility or facilities is presently unknown. To evaluate infiltration potential, we performed grain-size evaluations of selected soil samples from borings B-12 and B-13. We then evaluated these data with respect to estimated infiltration rates provided in the 2005 Department of Ecology Stormwater Management Manual.

Results

The tested soil samples from borings B-12 and B-13 were collected at depths of 4 feet each. The soil samples consists of silt with about 5 percent fine sand. Soil of this type is generally not suitable for

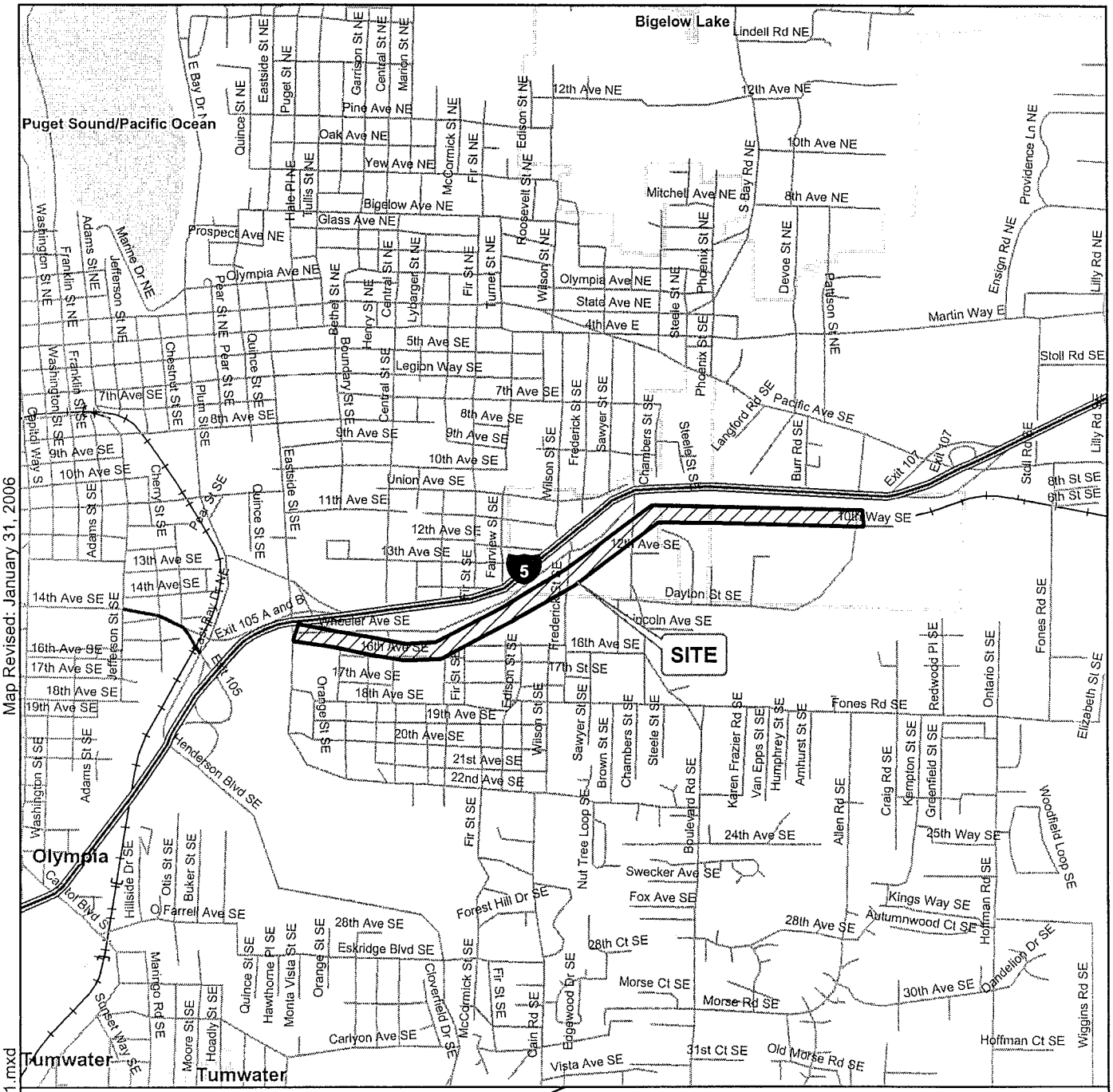
infiltration of stormwater. We estimate very slow infiltration rates for this soil type. It is possible that more permeable sands or gravels exist at depths greater than 5 feet at the locations of the test borings.

LIMITATIONS

We have prepared this report for use by Bob Droll and members of the design team. Our interpretations regarding subsurface conditions are based on widely spaced borings and a review of published geologic information. The interpretations made in this report should not be construed as a warranty of subsurface conditions. Actual subsurface conditions may vary with location and time. If development plans change, we should be allowed to review and revise our opinions and recommendations with respect to the changes.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: Interstates, state routes, and roads from TIGER 2000. County boundaries, cities, and waterbodies from Department of Ecology.

Lambert Conformal Conic, Washington State Plane North, North American Datum 1983

Vicinity Map

Proposed Woodland Trail Project
Olympia, Washington

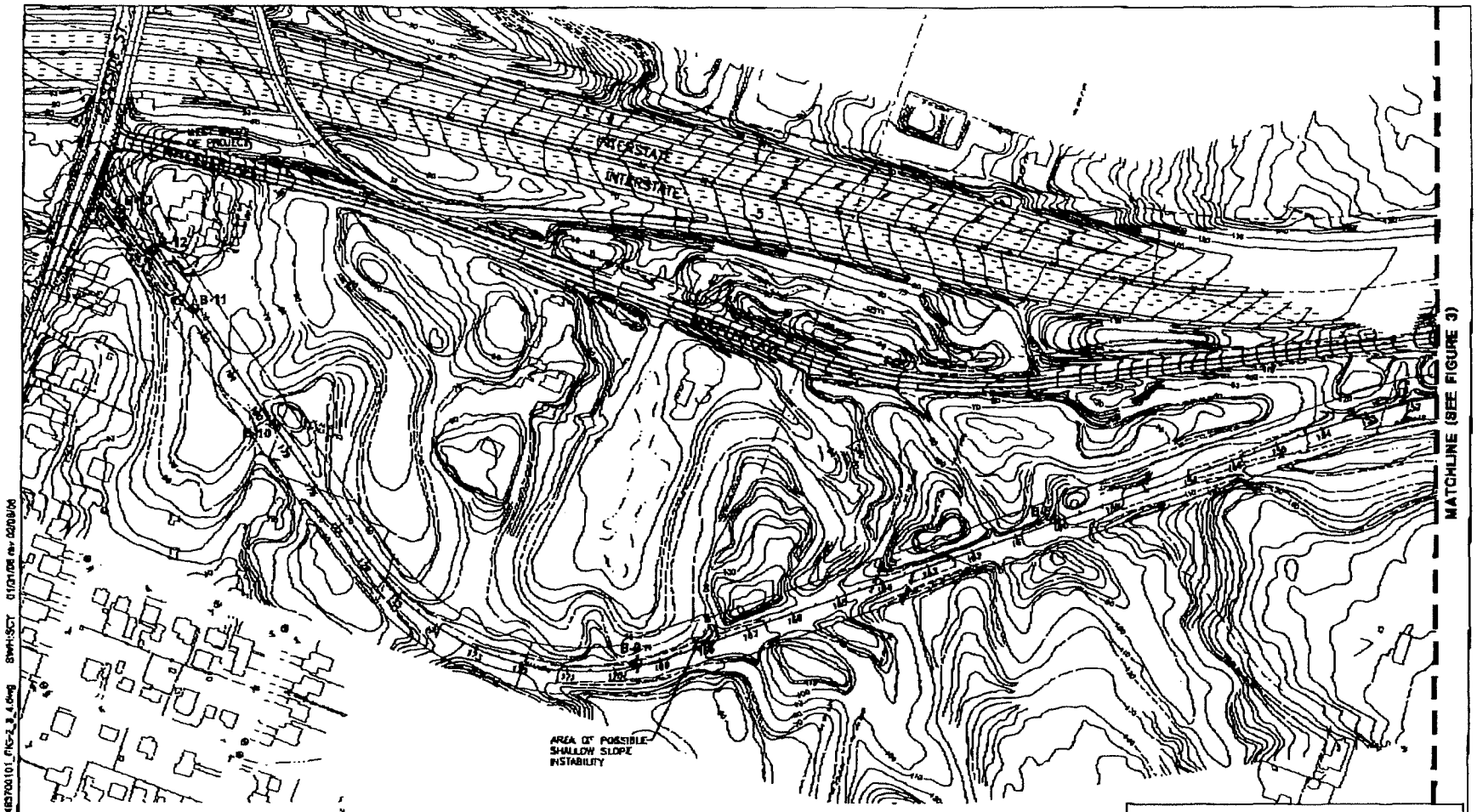
GEOENGINEERS

Figure 1

Map Revised: January 31, 2006

Path: 4\4837001\01\GIS\4837001 01_FIG-1.mxd

Office: TAC



Notes:
1. The locations of all features shown are approximate.
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Reference: Drawing provided by Robert W. Drell Landscape Architect, P.S.

Site Plan

Proposed Woodland Trail Project
Olympia, Washington

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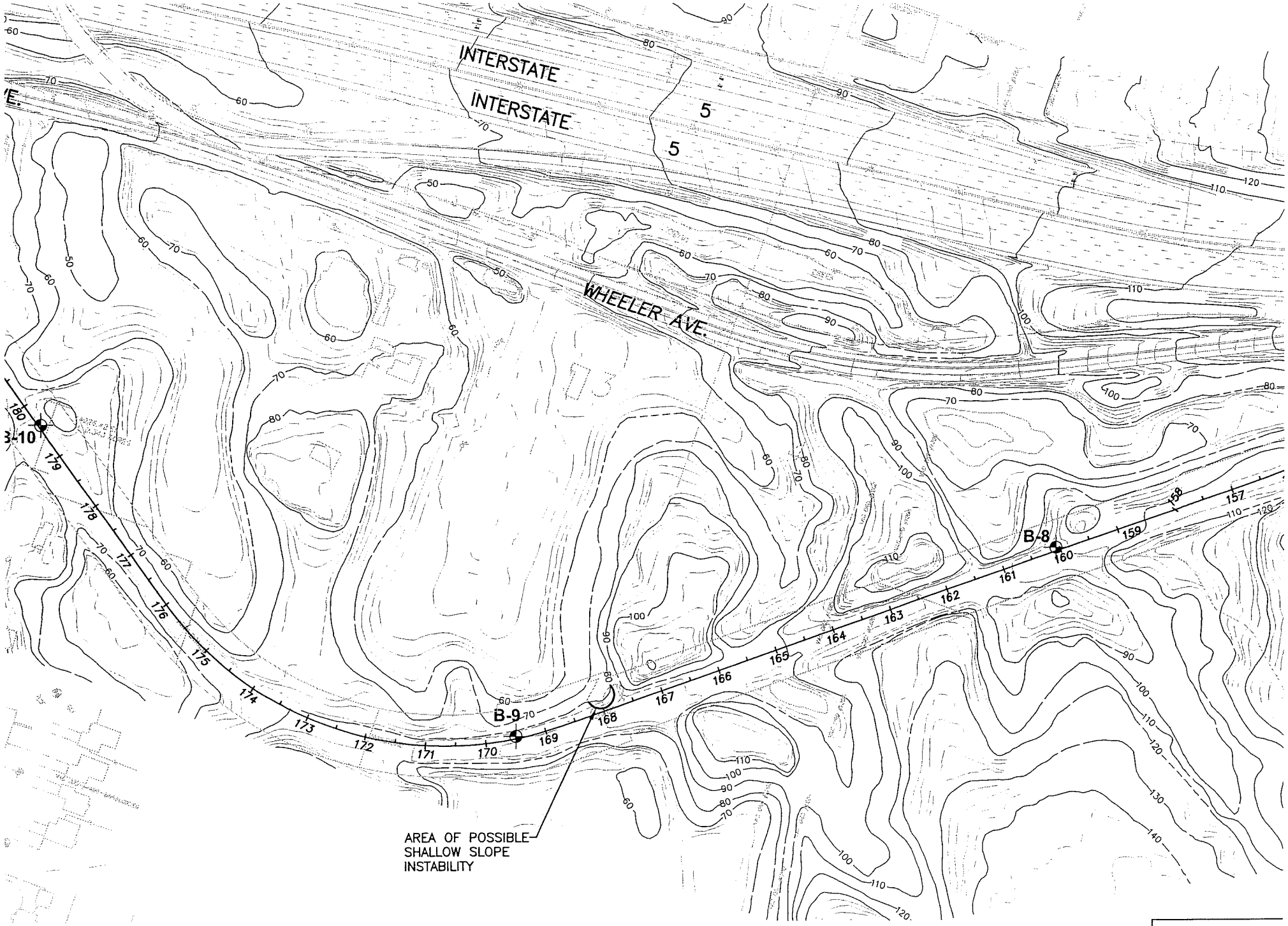
Figure 2

TACOMA\837001\01\CAD\837001_FIG-2_3_4.dwg SWH:SCT 01/31/08 rev 02/08/08

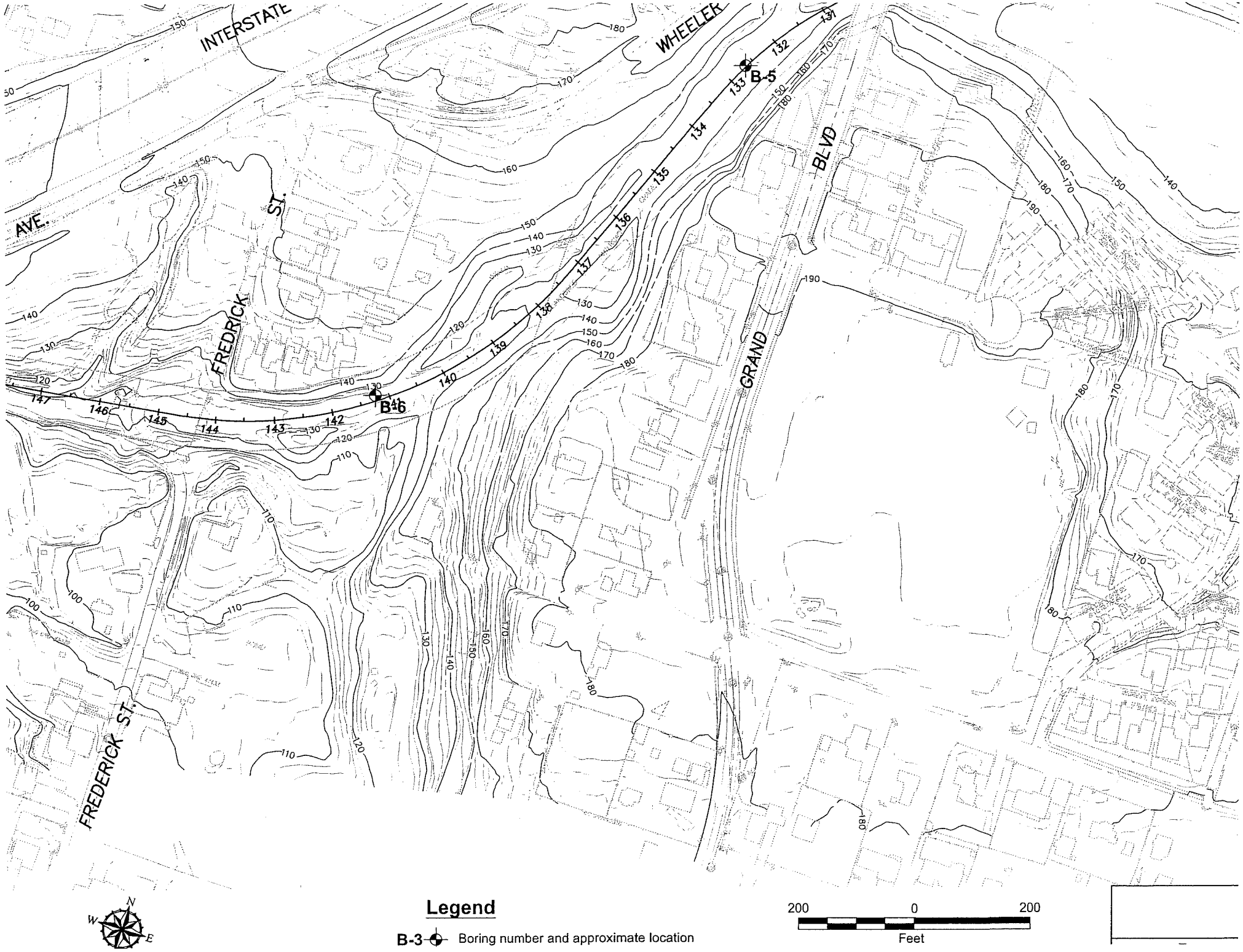


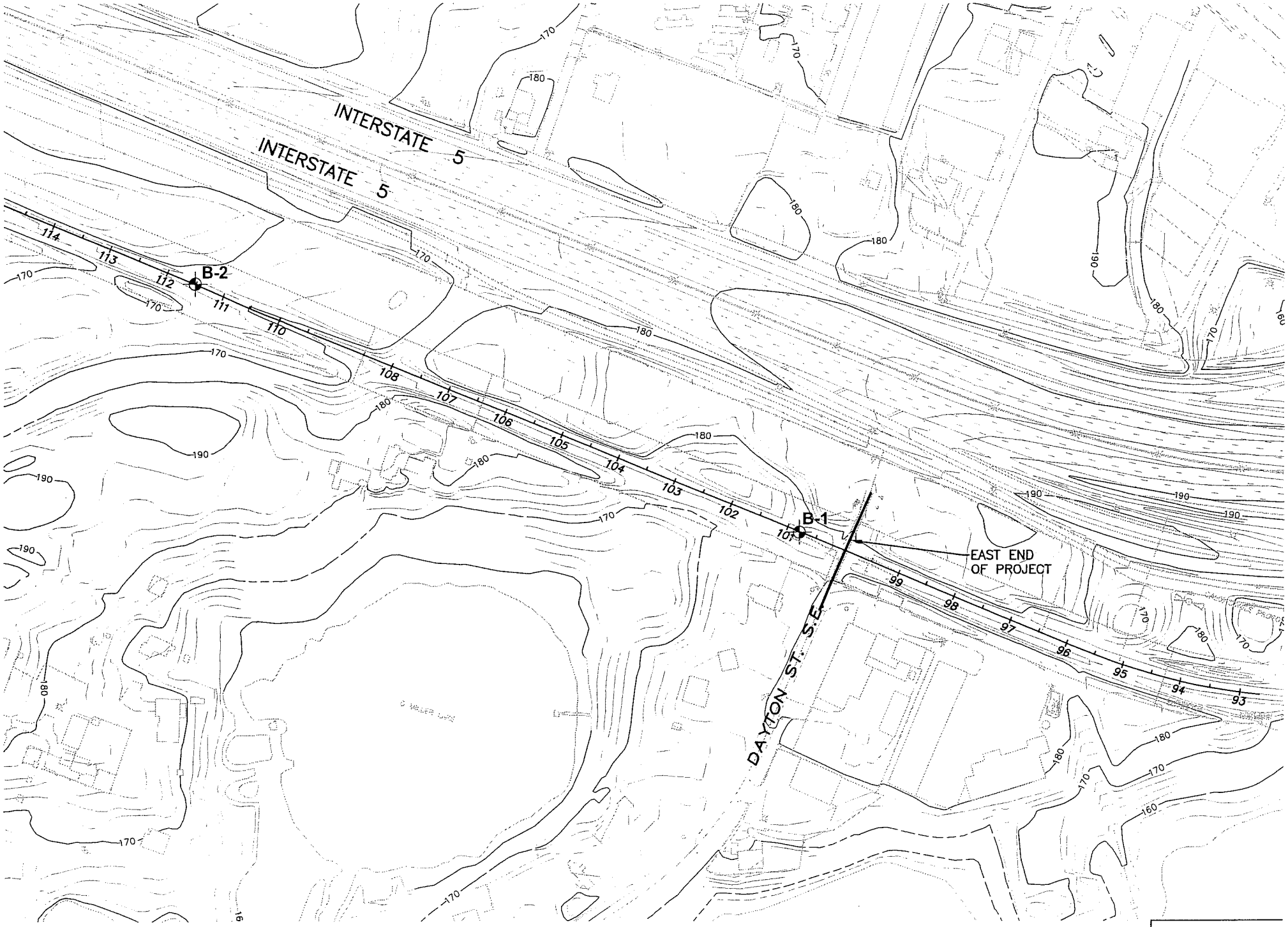
Legend

B-8 Boring number and approximate location

200 0 200
Feet

N
W
E


INTERSTATE
WHEELER
AVE.
FREDRICK ST.
FREDERICK ST.
GRAND BLVD
B-5
B-6
Legend
B-3 Boring number and approximate location
200
0
200
Feet
N
W
E


INTERSTATE 5
INTERSTATE 5
B-2
B-1
EAST END
OF PROJECT
DAYTON ST. S.E.
114
113
112
111
110
108
107
106
105
104
103
102
101
99
98
97
96
95
94
93
170
180
190
160
N
W
E
Legend
B-1 Boring number and approximate location
200
0
200
Feet

GeoEngineers

Appendix A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATIONS

Soil and groundwater conditions at the site were evaluated by advancing 13 push-probe borings on January 17, 2006. The borings were advanced to depths of 5 feet each using equipment owned and operated by ESN Northwest of Olympia, Washington.

The approximate locations of the explorations are shown in Figures 2 through 4. Explorations were located in the field by taping or pacing from existing site features and should be considered approximate. We estimated boring elevations by interpolating between topographic contour data provided by Bob Droll, ASLA.

The push-probes were continuously monitored by a representative from our firm who examined and classified the soils encountered, obtained soil samples, observed and recorded groundwater conditions and prepared a detailed log of each exploration. Bulk soil samples were collected from the push-probes and transferred into plastic bags.

Soil encountered in the explorations was visually classified in general accordance with the classification system described in Figure A-1. A key to the exploration log symbols is also presented in Figure A-1. Logs of the push-probes are presented in Figures A-2 through A-14. These logs are based on our interpretation of the field and laboratory data and indicate the various types of soil and groundwater conditions encountered. They also indicate the depths at which the soil characteristics change, although the change may actually be gradual.

LABORATORY TESTING

Soil samples obtained from the explorations were brought to our laboratory and reviewed to confirm field classifications. Selected samples were tested to determine their moisture content and grain-size distribution in general accordance with applicable American Society for Testing and Materials (ASTM) methods. We used the test results to aid soil classification and for correlation with other engineering soil properties.

Moisture Content

Moisture content of soil samples from borings B-1, B-12 and B-13 were determined in general accordance with ASTM Test Method D 2216. The test results are presented on the respective logs.

Grain Size Analysis

Grain-size distribution (sieve) analyses were conducted on three soil samples, one from exploration B-1, one from B-12 and one from B-13. The results of the analyses are presented in the exploration logs and in Figure A-15.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	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
	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

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FIGURE A-1

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	6	Surface Elevation (ft)	178	Groundwater Elevation (ft)	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		42			1			SM	Dark brown silty fine sand, with organics (loose, moist)			
									SP-SM	Light brown fine sand with silt (medium dense, moist)			
175													
			24			2					14		GS
	5												
170													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-1

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-2
Sheet 1 of 1

V6 GTBORING P:\4\4837001\01\FINALS\4837001\01.GPJ GEIV6 1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	168	Groundwater Elevation (ft)	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		24			1			SP-SM	Dark brown fine to medium sand, with silt and occasional gravel (ballast) (loose, moist)			
									SM	Light brown silty fine sand (loose, moist)			
									SM	Dark brown silty fine sand (loose, moist)			
165													
			10			2							
	5												
160													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-2

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-3
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001 01.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	148	Groundwater Elevation (ft)	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		36			1			GP	Dark brown fine to coarse gravel, trace silt (dense, moist) (fill)			
									SP	Light brown fine to medium sand (loose, moist) (fill)			
									SM	Light brown silty fine sand (loose, moist) (fill)			
145									SP	Light brown fine to medium sand, trace silt (loose, moist) (fill)			
			8			2							
	5												
140													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-3

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-4
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001\01.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	149	Groundwater Elevation (ft)	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					1			OL/ML	Organics, topsoil			
									SP-SM	Medium brown fine to coarse sand with silt (loose, moist)			
									SM	Tan grading to black with orange silty fine sand (loose, moist)			
									SM	Brown silty fine to medium sand (loose, moist)			
145			12			2							
	5												
140													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-4

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-5
Sheet 1 of 1

V5_GTBORING P:\4837001\01\FINALS\4837001-01.GPJ GEIV5_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	145	Groundwater Elevation (ft)	140.2
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
145	0					1			SM	Dark brown silty fine sand, medium gravel (dense, moist)			
									SP	Light brown fine to medium sand, trace silt (loose, moist)			
									SP-SM	Black fine to medium sand with silt (loose, moist)			
			12			2	▼						
140	5								SP	Tan fine sand, trace silt (very loose, wet)			
135	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-5

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-6
Sheet 1 of 1

V5_GTBORING P:\4\4837001\01\FINALS\4837001\01.GPJ GEM6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	132	Groundwater Elevation (ft)	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					1			SP-SM	Dark brown fine to medium sand with silt, occasional gravel (loose, moist)			
									SP-SM	Light brown fine sand with silt (loose, moist)			
130													
									SM	Tan silty fine sand (loose, moist)			
						2							
	5												
125													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-6

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-7
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001\01.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	107	Groundwater Elevation (ft)	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		36			1			GP	Gray gravel, trace sand and silt (crushed rock)			
									SP	Dark brown medium to coarse sand, trace silt (medium dense, moist)			
105									SM	Dark brown grading to light brown silty fine to medium sand, occasional gravel (medium dense, moist)			
									SP-SM	Tan fine to medium sand with silt and gravel (dense, moist)			
			12			2							
	5												
100													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-7

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-8
Sheet 1 of 1

V6_GTBORING P:\4837001\01\FINALS\4837001\01.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	89	Groundwater Elevation (ft)	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					1			SP-SM	Black fine sand with silt and gravel (medium dense, moist)			
									SP	Light brown fine to medium sand, trace silt (loose, moist)			
									SM	Tan silty fine sand with gravel (dense, moist)			
									SP	Light brown fine to medium sand, trace silt, occasional gravel (dense, moist)			
									SP	Light brown fine to medium sand, trace silt (medium dense, moist)			
85			12			2							
	5												
80													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-8

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-9
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001.GPJ GEIV5_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	81	Groundwater Elevation (ft)	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		30			1			SP	Brown medium to coarse sand, trace silt (medium dense, moist)			
80													
									SP	Tan fine sand, trace silt (medium dense, moist)			
			12			2							
	5												
75													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-9

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-10
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\483700101.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	73	Groundwater Elevation (ft)	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		42			1			SP	Black fine to medium sand, trace silt (medium dense, moist)			
									SM	Tan mottled with black silty fine sand (medium dense, moist)			
70													
									SM	Tan silty fine sand (dense, moist)			
			12			2							
	5												
65													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-10

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-11
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001 GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	71	Groundwater Elevation (ft)	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		42			1			SP	Tan fine to medium sand, trace silt (medium dense, moist)			
70									SP-SM	Black fine to coarse sand, occasional gravel (medium dense, moist)			
									ML	Tan silt (stiff, moist)			
			12			2							
	5												
65													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-11

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-12
Sheet 1 of 1

V6 GTBORING P:\4837001\01\FINALS\4837001.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	71	Groundwater Elevation (ft)	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		24		1			SP	Dark brown fine to coarse sand, occasional gravel (medium dense, dry)			
70												
								ML	Tan silt with sand (medium stiff, moist)			
			12		2					42		GS
	5											
65												
	10											

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-12

GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-13
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001.GPJ GEIV6_1.GDT 2/6/06

Date(s) Drilled	1/17/06	Logged By	JWS	Checked By	SWH
Drilling Contractor	ESN	Drilling Method	Push Probe	Sampling Methods	4 inch core with macro liners
Auger Data	None	Hammer Data	Pneumatic	Drilling Equipment	ESN Kabota LAR
Total Depth (ft)	5	Surface Elevation (ft)	71	Groundwater Elevation (ft)	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		42			1			SP	Light brown fine to coarse sand, trace silt and occasional gravel (medium dense, moist)			
70									SP	Dark brown fine sand, trace silt and occasional gravel (medium dense, moist)			
									ML	Tan silt (stiff, moist)			
			12			2					38		GS
	5												
65													
	10												

Note: See Figure A-1 for explanation of symbols.

LOG OF DIRECT-PUSH BORING B-13

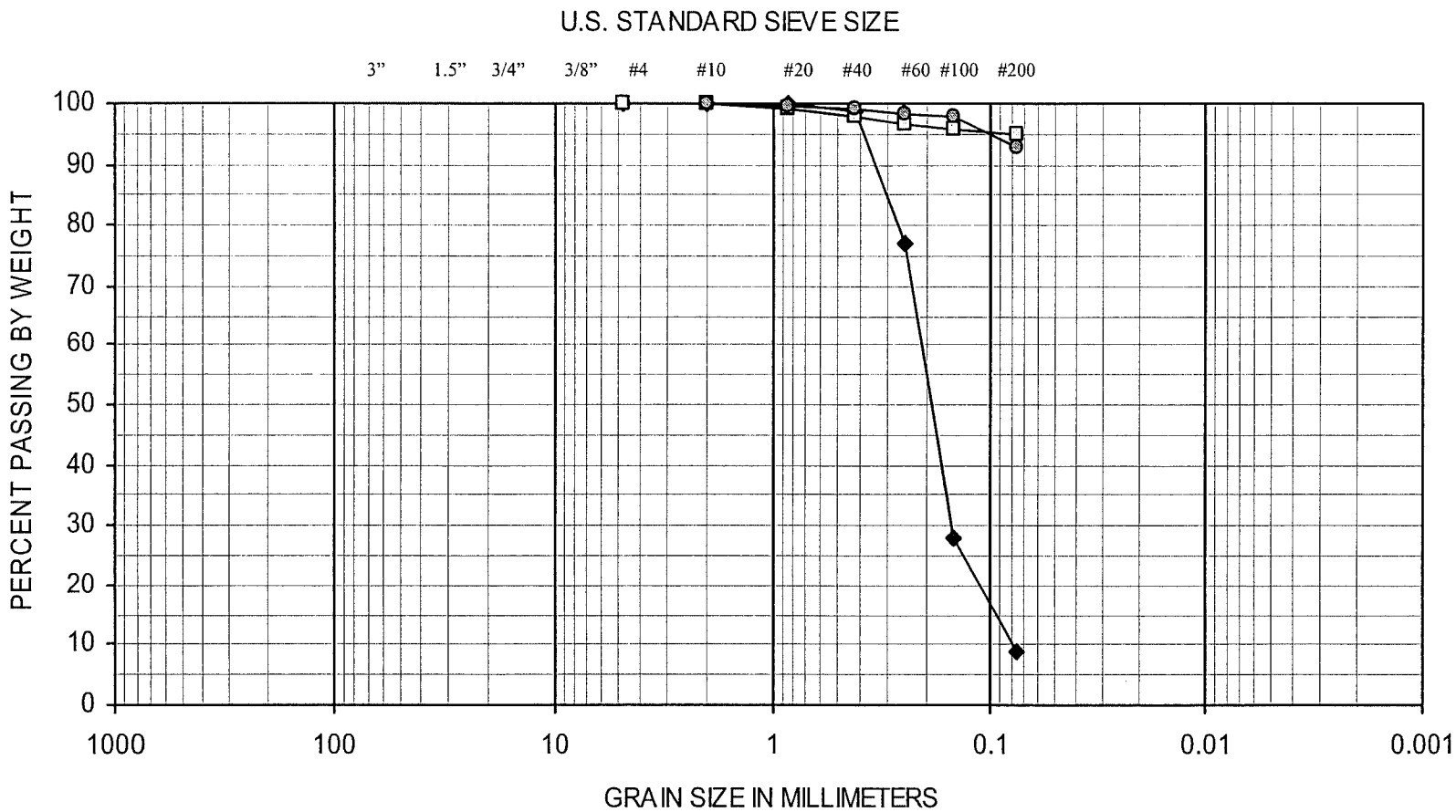
GEOENGINEERS

Project: Proposed Woodland Trail Project
Project Location: Olympia, Washington
Project Number: 4837-001-01

Figure A-14
Sheet 1 of 1

V6_GTBORING P:\4\4837001\01\FINALS\4837001\01.GPJ GEIV6_1.GDT 2/6/06

GEOENGINEERS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	B-1	4	Sand with silt (SP-SM)
□	B-12	4	Silt (ML)
◎	B-13	4	Silt (ML)

SIEVE ANALYSIS RESULTS

FIGURE A-15

GeoEngineers

Appendix B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Bob Droll, ASLA and other members of the design team for the Woodland Trail project in Olympia, Washington. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for the proposed Woodland Trail between Dayton Street SE and Eastside Street in Olympia, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

TOPSOIL

For the purposes of this report, we consider topsoil to consist of generally fine-grained soil with an appreciable amount of organic matter based on visual examination, and to be unsuitable for direct support of the proposed improvements. However, the organic content and other mineralogical and gradational characteristics used to evaluate the suitability of soil for use in landscaping and agricultural purposes was not determined, nor considered in our analyses. Therefore, the information and recommendations in this report, and our logs and descriptions should not be used as a basis for estimating the volume of topsoil available for such purposes.

SUBSURFACE CONDITIONS CAN CHANGE

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

MOST GEOTECHNICAL AND GEOLOGIC FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

GEOTECHNICAL ENGINEERING REPORT RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering or Geologic Report Could be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors A Complete Report and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

GEOTECHNICAL, GEOLOGIC AND ENVIRONMENTAL REPORTS SHOULD NOT BE INTERCHANGED

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

BIOLOGICAL POLLUTANTS

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention, or assessment of the presence of Biological Pollutants in or around any structure. Accordingly, this report includes no interpretations, recommendations, findings, or conclusions for the purpose of detecting, preventing, assessing, or abating Biological Pollutants. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.