Western Geotechnical Consultants, Inc.

4181 Saltsprings Drive • Ferndale, WA 98248
Phone (360) 380-2507 • Fax (360) 380-2507

May 23, 2000

Crown Distributing Inc.
3409 McDougall Avenue
Everett, WA 98210

Re: Report
Geotechnical Engineering Investigation
Commercial Distribution Building
Roetcisoender and Parkinson Properties
SE Corner of SR531 and 59th Ave. NE
Arlington, WA

Western Geotechnical Consultants Inc. is pleased to present the results of our geotechnical engineering investigation for the proposed commercial building in Arlington, WA. The investigation was performed in general accordance with our proposal dated March 31, 2000.

The site is located on the southwest corner of SR531 (172nd St. NE) and 59th Ave. NE. Figure 1 is a site plan showing the site layout and approximate building location relative to other site features. The project plan involves construction of a 750,000 square foot commercial distribution facility on the site. The site occupies 101.70 and the building will be located near the northwest corner of the property.

PURPOSE AND SCOPE

The purpose of our investigation for the site included the following services:

- Drilling 6 borings within the proposed building footprint to obtain design level geotechnical information for use in foundation design and general site development. The borings were advanced to depths ranging between 30 and 45 feet below present grade.
- Developing tabulated logs for each boring as to the thickness and depth of each soil unit and describing the soils encountered in accordance with the Unified Soils Classification System (USCS).
- Performing field and laboratory testing, as required, for use in our engineering evaluation of the site.
- Preparing this engineering report including a summary of work performed, and our recommendations for:
  - Foundation design for the proposed facility including allowable bearing pressures and settlement estimates.
  - General site development including rough stripping criteria.

- Cutting and structural fill criteria including the suitability of on site materials for use as structural fill.
- Floor slab support.
- Drainage considerations
- Construction monitoring

GEOLOGY

The following descriptions of the surficial and subsurface geology on the subject property and in the vicinity of the subject property were interpreted from the Surficial Geologic Map of the Port Townsend 30- by 60- Minute Quadrangle, Puget sound Region, Washington (Pessl and others, 1989, Soil Survey of Snohomish County Area Washington, (USDA, 1983), and Ground-Water Resources of Snohomish County Washington, (Newcomb, 1952).

The site and vicinity is underlain by recessional-marine deposits. These deposits consist of sand, gravel, and silt deposited primarily by melt-water from the receding Vashon ice sheet at a time when relative sea level was higher than present. Pessl and others (1989) indicate that the deposits in the vicinity of the subject property consist primarily of sand and gravel. The results of our boring investigation of the site are consistent with Pessl and others.

The geologic mapping in the area and area well logs indicates that the recessional-marine deposits are underlain by glacial till and ice contact deposits. The till consists of a poorly sorted mixture of rock fragments deposited directly by glacial ice. The finer components include silt, sand and clay in highly variable proportions, constituting a coherent to friable, moderately to highly compact matrix in which the coarser components (gravel and cobbles) are firmly embedded. Our boring investigation (45-feet maximum) did not encounter glacial till or any ice contact deposits.

SEISMIC ZONE

The project site is located in Seismic Zone 3 per the 1997 Uniform Building Code (UBC). Zone 3 seismic loading can cause relatively large differential settlements if liquefiable zones are present.

Field and Laboratory Testing

Field testing involved performing Standard Penetration Tests (SPT) on all samples obtained during drilling. The results of the SPT tests are included on the log of borings which are located in the Appendix to this report.

Laboratory testing included sample inspection under controlled laboratory conditions, determination of moisture content of samples, and grain size tests. Moisture content test results are included on the log of borings and the grain size test results are included in the appendix in the form of grain size distribution curves.

SITE CONDITIONS

Surface Conditions

A geotechnical engineer from our firm traveled to the site between April 26 and April 28, 2000 to oversee the drilling of six borings located within the footprint of the proposed commercial building. The site is nearly flat and is presently being used for raising cattle with an occupied home located near the northwest corner.

Subsurface Conditions

Subsurface conditions at the site were evaluated by drilling a total of 6 borings on within the building site between April 26 and April 28, 2000 using hollow stem auger drilling equipment. Soil samples were collected at approximately 5-foot intervals using a Standard Penetration Test (SPT) sampler driven with a 140-pound hammer using center rods. The hammer was dropped from a height of approximately 30-inches, and was lifted to the drop height by a cable controlled by the driller. The number of blows (drops) required to drive the sampler 18-inches into the undisturbed soil was recorded for use in analyzing the site. The bore holes were backfilled with drill cuttings and bentonite upon completion

The soils encountered in the borings were classified using the Unified Soils Classification System (USCS) and logs were maintained for each boring. Edited boring logs are included in the Appendix along with a USCS Chart explaining soil descriptions.

The borings revealed a relatively uniform subsurface profile consisting of about 18 inches of topsoil, which is underlain by gap graded sandy GRAVEL and gravelly SAND (SP and GP by USCS classification) to the depth of the borings. The sands and gravels are silty at the interface with the topsoil layer. The sands and gravels were saturated below about 3-1/2 feet, which was the location of the water table at the time of our investigation. The sands and gravels graded gray in color below 10-feet, which is indicative of permanent saturation.

Ground Water Conditions

Ground water was encountered at a depth of approximately 3-1/2 feet. This depth is consistent with water levels observed in piezometers on site. Based on soil coloration, it appears that the summer low water table is around 10-feet. Nearby piezometers revealed that the seasonal high water table is around 3.1 feet.

Liquefaction Potential

Liquefaction has been recognized and evaluated for many years by geotechnical engineers in other seismically prone areas. With the renewed awareness in recent years that the Puget Sound area is seismically active, there has also been an increased interest in liquefaction potential. Liquefaction is a phenomenon whereby certain soils loose their strength and bearing capacity during ground shaking, such as could occur during earthquakes. General criteria for liquefiable soils are that they be 1) relatively loose, 2) a material with a liquefiable soil gradation, 3) non-plastic, and 4) saturated. Associated with liquefaction is the potential for ground movements or lateral displacements that could cause differential settlements in the foundation soils.

For soils to be liquefiable they must meet all four of the conditions described above. The site soils meet criteria 2 through 4 (see Appended grain size curves) but the soils are generally in a medium dense to dense state (SPT blow counts greater than 25). Borings 4, 5, and 6 had thin strata with blow counts of 18, 19, and 17 respectively but each of these borings had high blow count soils (denser soils) above. These lower values indicate areas of marginal liquefaction potential. We have analyzed these strata for seismic induced settlement potential, and the results are detailed in the Conclusions and Recommendations under the Foundations section to this report.

CONCLUSIONS AND RECOMMENDATIONS

General

We conclude, based on our Geotechnical Investigation, that the site is suitable for construction of the proposed commercial distribution facility using conventional shallow spread foundations provided good construction practices are used and provided our recommendations are followed. The seasonal high ground water table could make winter construction more difficult. Therefore site earthwork and foundation construction would be more easily accomplished if performed during the summer or early fall months. The following sections provide specific recommendations for general site development and foundation design.

Site Preparation

All of the upper organic-rich topsoil should be stripped away from the area to be occupied by the proposed building foundations and other structural improvements. Based on our boring investigation, we estimate that the stripping depth will range from approximately 1-1/2 to 2 feet. Note that there could be localized areas of deeper soft organic soils that we did not encounter during our boring investigation.

Following stripping and site excavations, but prior to placement of any structural fill, qualified personnel should evaluate the exposed subgrade.

Fill and Compaction

We anticipate that some structural fill will be required beneath the building or other structural improvements. Structural fill used to obtain final grade elevations should be properly placed and compacted.

The on site sands and gravels would make satisfactory structural fill provided they can be separated from the topsoil and provided they can be drained so adequate compaction can be achieved. If import material is to be used we recommend that the structural fill consist of an imported, clean, well graded sandy gravel material containing less than 5% passing the U.S. Standard No. 200 sieve based on a wet sieve analysis of that portion passing the U.S. Standard No. 4 sieve (GW by USCS classification).

Structural fill should be placed in maximum 8- to 10-inch loose horizontal lifts and it should be compacted to 95% of maximum dry density as determined by the ASTM D-1557 test procedure. The structural fill should extend beyond the edges of the foundations by a distance equal to the thickness of the fill beneath the base of the foundations.

Foundations

We recommend that the planned building is supported on isolated spread and continuous footings founded on undisturbed sand and gravel soils or compacted structural fill. Bearing soil that is disturbed during foundation excavation should be recompacted or removed. All soil directly below and around footings should be compacted to at least 95% of maximum dry density (ASTM D-1557 test procedure) prior to placement of forms or reinforcing steel. All continuous and isolated spread footings should have minimum widths of 18 and 24 inches, respectively, and should be founded a minimum of 18 inches below the lowest adjacent final grade for frost protection. All footings supported on properly prepared native sandy gravelly soils or structural fill may be proportioned using a net allowable bearing pressure of 2,500 psf.

The term net allowable bearing pressure refers to the pressure which can be imposed on the soil at foundation level due to the total of all dead plus live loads, exclusive of the weight of the footing or any backfill placed above the footing. These values may be increased by one-third for transient wind or seismic loading.

Settlement of spread foundations depends on the foundation size and bearing pressure as well as the strength and compressibility characteristics of the underlying bearing soils. Two types of settlement are possible for the subject soils, namely 1) short and long-term static settlement and 2) earthquake induced dynamic settlement. The results of our settlement analyses are summarized below.

Settlement from static loading:
We performed static settlement analysis using the following foundation load information.

- Allowable foundation pressure = 2,500 psf.
- Perimeter footings = 6.5 klf maximum at mesanine. This results in a nominal 2.6-foot wide footing.
- Column footings = 200 kips maximum at mesanine. This results in a nominal 9x9-foot column footing.

Based on the size of the proposed foundations, we calculated that the settlement from static loading would be on the order of ½ to 2/3 of an inch. Our estimate was computed, based on soil gradation, density, SPT N-values and experience with similar soil and loading conditions. Because of the generally granular nature of the foundation soils, a large portion of this settlement should occur relatively quickly as the loads are applied during construction. Along with this initial settlement, however, there is the potential for an additional component of settlement from static loading due to the rearrangement of soil grains over time. Our calculations indicate that long term static settlement will be less than 1/4-inch over the next 30-years.

Settlement from Liquefaction
There is a potential for limited liquefaction of a portion of the foundation soils during a strong earthquake. Liquefaction is a phenomenon whereby certain soils loose their strength and bearing capacity during ground shaking, such as could occur during earthquakes. General criteria for liquefiable soils are that they be relatively loose, a material with a liquefiable soil gradation, non-plastic, and saturated. Associated with liquefaction is the potential for ground movement or lateral displacement that could cause differential settlement for the foundation soils.

We encountered medium dense, non-plastic soils in our exploration that have a soil gradation similar to those soils that have been found to liquefy during earthquakes. Lateral displacement can occur when soils lose strength during liquefaction. A relatively flat site such as this will experience minimal lateral movement as compared to sites closer to sloping ground. Consequently, liquefaction at this site would likely result in differential settlements, but lateral displacements are not likely. Furthermore, we would anticipate that the slab foundation proposed for the building would be capable of accommodating a certain amount of differential settlement.

We used empirical procedures proposed by Seed and Tokimatsu to estimate the total amount of settlement that could be expected from seismically induced liquefaction during a strong earthquake. We estimate that this settlement will be around 1 to 1-1/2 inches. Seed and Tokimatsu recommend broadening the range of predicted settlement due to uncertainties in the analytical procedure. We therefore recommend designing the building to accommodate 1 to 2 inches of settlement for a large earthquake on the order of Magnitude 7.5 with a ground acceleration of 0.3 g (UBC, 1997). This is a maximum credible earthquake for the area of which some damage to structures would be expected. We also evaluated liquefaction induced settlement under a magnitude 6.0 earthquake with a ground acceleration of 0.2g. Our calculations indicate that settlement on the order of 1-inch would occur under such seismic loading.

Slab Sub-grade Modulus

We understand that the proposed commercial distribution building will have a slab-on-grade. We have performed a literature review and correlated standard penetration test blow counts to obtain a reasonable stress-strain relationship for the supporting soils. Based on our evaluation of subsurface conditions we recommend a sub-grade modulus of 200 tcf (230 pci) for design of the earth supported floor slab. This value assumes the slab will be constructed over undisturbed native sands and gravels or structural fill and it assumes that the floor slab sub-grade will be prepared as recommended below.

Floor Slab Support

Preparation of the building areas in a manner described in the previous sections of this report should provide an adequate base for floor slab support. We recommend that all earth-supported floor slabs be underlain by 6-inches of compacted, clean, free-draining sandy gravel or gravel with less than 5% passing the No. 200 mesh sieve, based on a wet sieve analysis of that portion passing the No. 4 sieve. The purpose of this layer is to provide uniform support and a capillary break. If desired, a vapor barrier may be placed below the floor slab. The vapor barrier, if used, should be covered with a thin layer of sand or crushed gravel to protect it during concrete placement and to aid in concrete curing. After a sand or crushed gravel layer is placed, it should remain relatively dry. It is important that the 6-inch free draining layer located below the vapor barrier is connected to the footing drain system to promote drain from beneath the floor slab.

Lateral Load Resistance

Lateral loads may be resisted by passive earth pressures and friction between the foundations and the underlying soil. For design purposes, a passive resistance for structural fill placed against the sides of the foundations may be considered equivalent to the pressure developed by a fluid (equivalent fluid pressure) with a density of 250 pcf. This value assumes a non-buoyant conditions that will prevent the buildup of hydrostatic pressure in the structural fill. A coefficient of base friction of 0.40 may be used between the base of the foundation and the underlying soils. If passive resistance is used in conjunction with frictional resistance, we recommend using only ½ of the passive resistance recommended above because it takes much larger strains to mobilize full passive resistance as compared to frictional resistance.

Drainage

Due to the seasonal high water table at the site we recommend placement of a footing drain around the perimeter of the building. Footing drains typically consist of a minimum 4-inch diameter perforated or slotted pipe which is bedded in and surrounded by drain rock. Given the granular nature of the site soils the drain rock should be surrounded by a drainage geotextile (TC Mirafi 4NP or equivalent). The drainpipe should be placed at or below the base of the footing and ½-foot outside the footing. The footing drain should exit in a tightline, which transmits water to the site stormwater system.

Roof drains must not introduce water to the footing drain system, but should transmit collected water to the stormwater system by separate tightline. Final grading should promote surface water runoff away from the building.

Erosion Control

Erosion control during construction of the proposed facilities can be accomplished through placement of proper sedimentation control facilities. We recommend siltation control facilities, consisting of either hay bales or silt fences that are fabricated around the construction areas. Typical details for siltation control facilities using either hay bales or silt fences are attached to this report.

Siltation devices should be placed down gradient of all construction areas and cleared areas to provide siltation control during construction. All siltation control devices should be maintained in operable condition during construction, and left in operable condition until the site has been revegetated and siltation is no longer a threat. At that time the siltation facilities should be removed.

Construction Monitoring
Western Geotechnical Consultants, Inc. should review the final foundation design and grading plans prior to construction to insure conformance with our recommendations. We recommend that a geotechnical engineer or engineering geologist be present to inspect the exposed subgrade before any placement of structural fill. All fill placement and compaction activities should be monitored and documented.

We appreciate the opportunity to be of service to you. Should you have any questions concerning this report or require further information, please contact the undersigned in our office at (360)-380-2507.

Sincerely yours,

Western Geotechnical Consultants, Inc.

Theodore A. Hammer P.E.
Geotechnical Engineer

EXPIRES 12/27/01

Attachments: Figure 1 - Site Plan

Appendix – USCS Classification Chart
Log of Boring
Gain Size Distribution Curves

File:991454.doc

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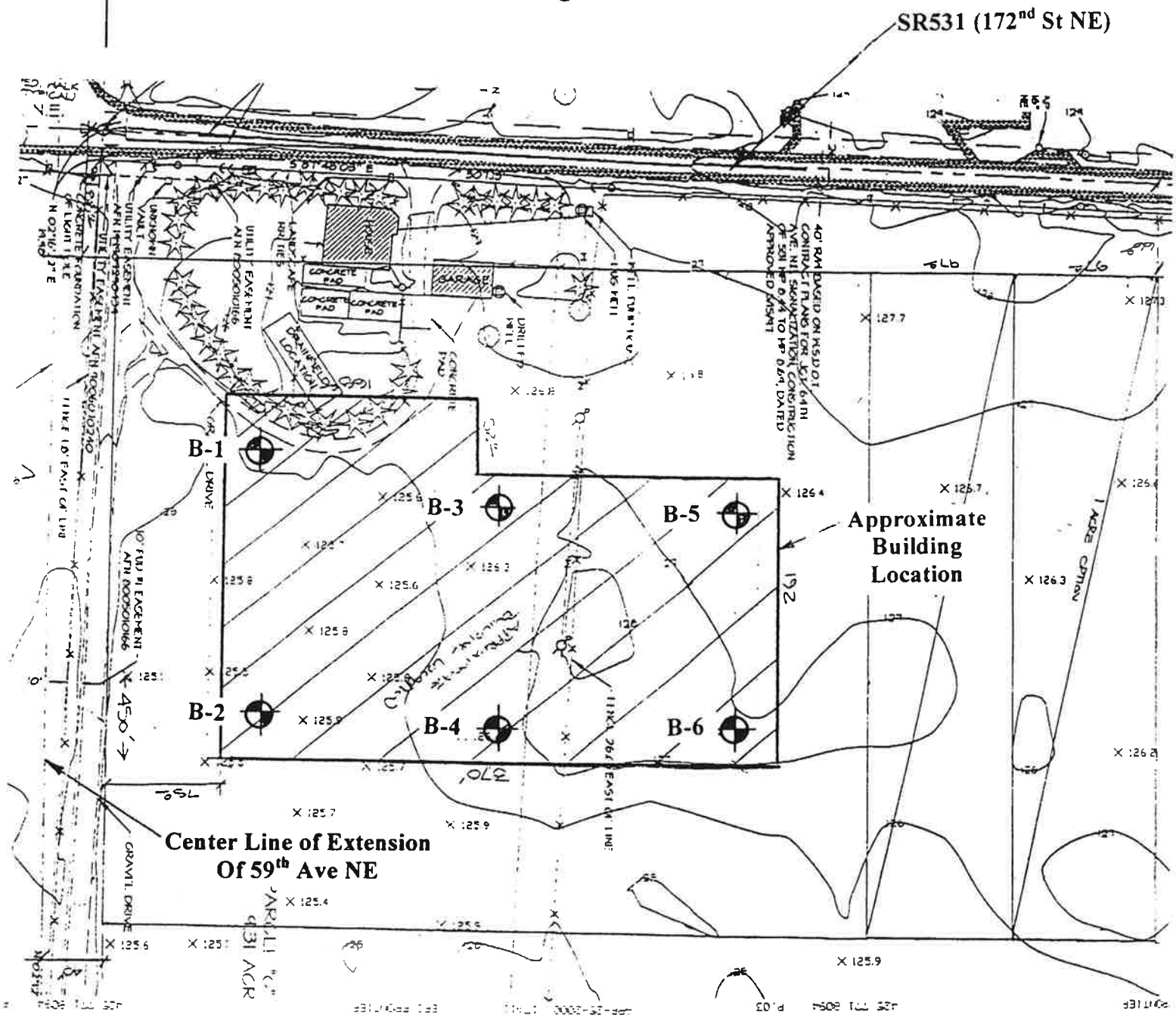
Figure 1
Site Plan & Boring Locations
Commercial Distribution Building
SE Corner of SR531 & 59TH Ave NE
Arlington, WA

North



Source:

BCF Frontier, Inc.
Lynnwood, WA

Key:

B-1 ⊕ **Boring Location**

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APPENDIX

UNIFIED SOIL CLASSIFICATION CHART (USCS)

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES) <5%		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES) <5%		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%		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 AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS RO CLAYEY SILTS WITH SLIGHY 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% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

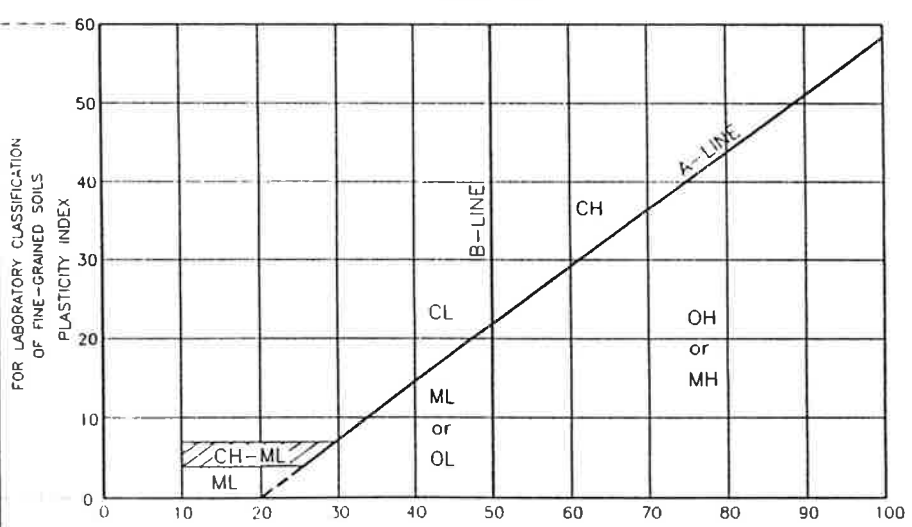
GRADATION CHART

MATERIAL SIZE		PARTICLE SIZE			
		LOWER LIMIT		UPPER LIMIT	
		MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND					
	FINE	.074	#200 •	0.42	#40 •
	MEDIUM	0.42	#40 •	2.00	#10 •
	COARSE	2.00	#10 •	4.76	#4 •
GRAVEL					
	FINE	4.76	#4 •	191	3/4" •
	COARSE	191	3/4" •	762	3" •
COBBLES		76.2	3" •	304.8	12" •
BOULDERS		304.8	12" •	914.4	

• U.S. STANDARD • CLEAR SQUARE OPENINGS

5-12% FINES (SILT & CLAY) DUAL CLASS

PLASTICITY CHART



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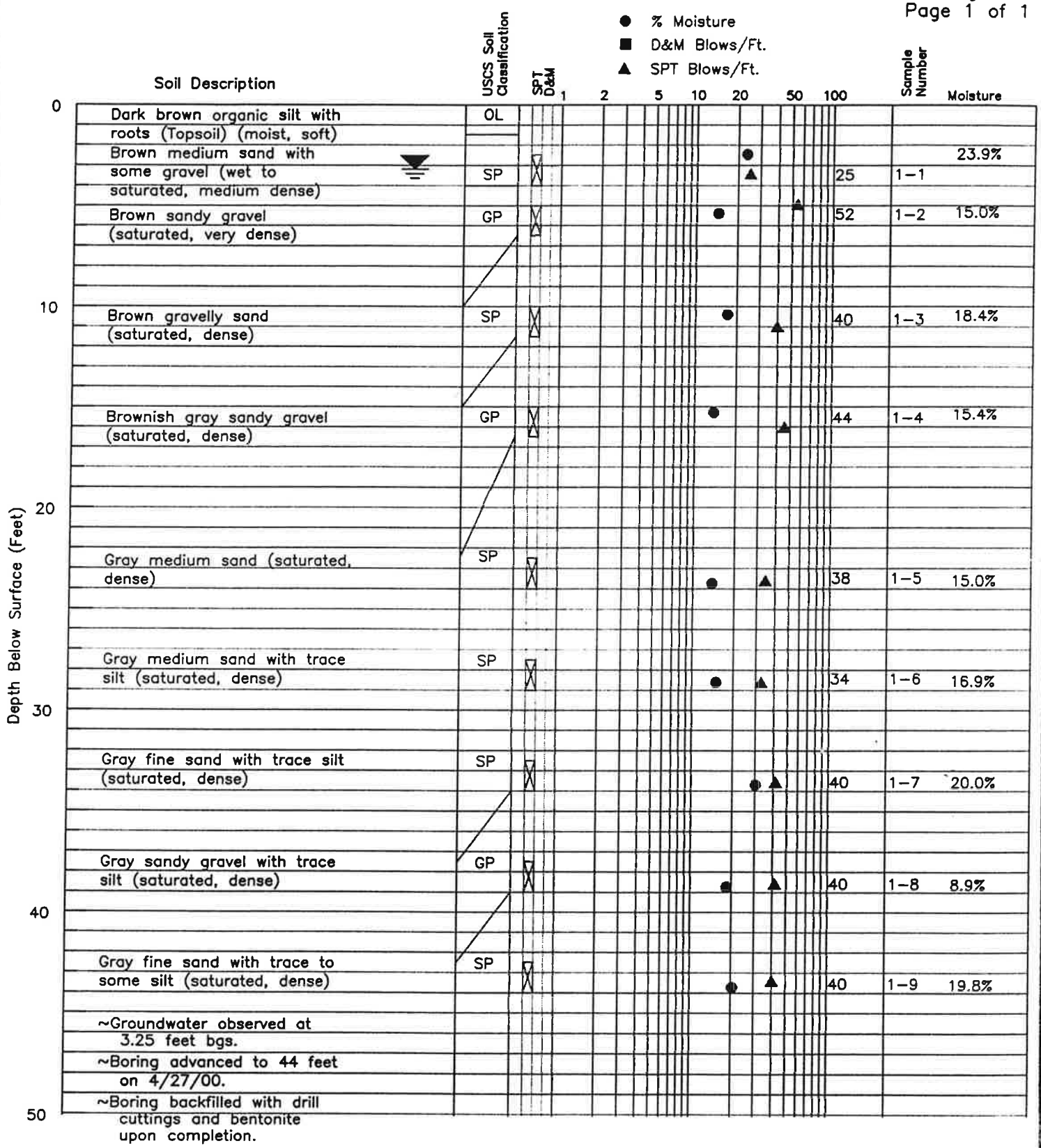
Key to Test Pit Logs Using the Unified Soil Classification System

DATE: 5/11/95 SCALE: H: N/A V: N/A

A:TEST PITS



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DRILLER: SUBTERRANEAN
DRILLING METHOD: M-R & HSA
DATE DRILLED: 4-27-00
HOLE DIAMETER: VARIED
HOLE DEPTH: SEE LOG

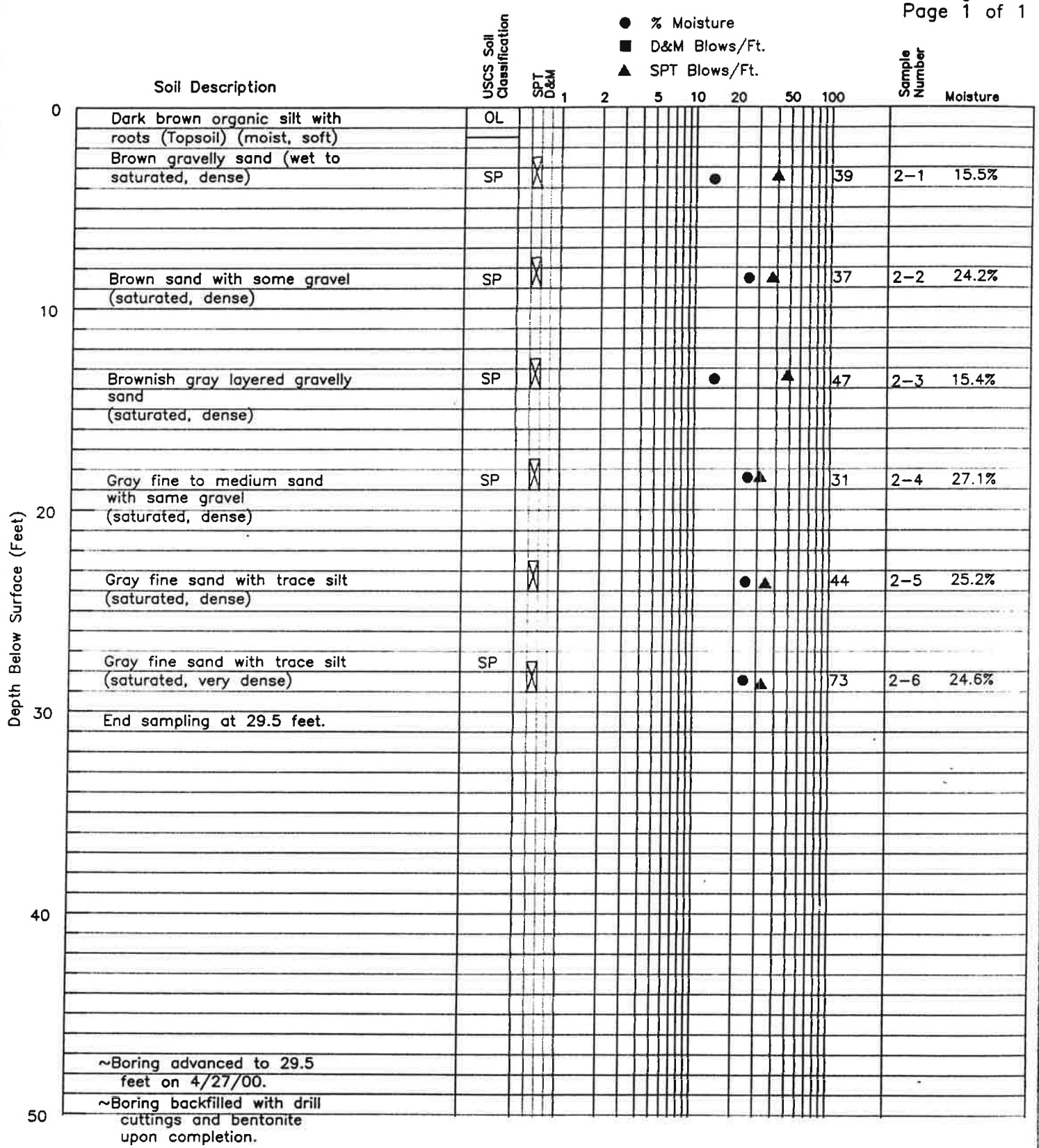
Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
DESIGNED BY:	RPB
DRAWN BY:	RPB
CHECKED BY:	TAH

WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-1
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A



LOGGED BY: RPB
DRILLER: SUBTERRANEAN
DRILLING METHOD: HSA
DATE DRILLED: 4-27-00
HOLE DIAMETER: 8-INCH
HOLE DEPTH: SEE LOG

Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
DESIGNED BY:	RPB
DRAWN BY:	RPB
CHECKED BY:	TAH

WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-2
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A

● % Moisture
■ D&M Blows/Ft.
▲ SPT Blows/Ft.

Depth Below Surface (Feet)	Soil Description	USCS Soil Classification	SPT D&M	1 2 5 10 20 50 100	Sample Number	Moisture
0	Dark brown organic silt with roots (Topsoil) (moist, soft)	OL				
	Brown fine to medium sand with trace gravel (wet, dense)	SP		● ▲ 32	3-1	20.4%
	Grayish brown sandy gravel (saturated, dense)	GP		● ▲ 33	3-2	19.9%
10	Gray gravelly sand (saturated, dense)	SP		● ▲ 30	3-3	15.7%
	Gray fine to medium sand (saturated, medium dense)	SP		● ▲ 28	3-4	20.9%
20	Gray sand with some fine gravel and trace silt over gray sandy silt (saturated, dense to hard)	ML		● ▲ 38	3-5	15.9%
	Gray sandy silt over fine to medium sand (saturated, dense to hard)	SP		● ▲ 47	3-6	16.0%
30	End Sampling at 29.5 feet					
40						
	~Boring advanced to 29.5 feet on 4/28/00.					
50	~Boring backfilled with drill cuttings and bentonite upon completion.					

LOGGED BY: RPB
DRILLER: SUBTERRANEAN
DRILLING METHOD: HSA
DATE DRILLED: 4-28-00
HOLE DIAMETER: 8-INCH
HOLE DEPTH: SEE LOG

Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
DESIGNED BY:	RPB
DRAWN BY:	RPB
CHECKED BY:	TAH

WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-3
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A

● % Moisture
■ D&M Blows/Ft.
▲ SPT Blows/Ft.

Depth Below Surface (Feet)	Soil Description	USCS Soil Classification	SPT D&M 1 2 5 10 20 50 100	Sample Number	Moisture
0	Dark brown organic silt with roots (Topsoil) (moist, soft)	OL			
	Brown medium sand (wet to saturated, dense) ▽	SP	● ▲ 29	4-1	20.7%
10	Brownish gray sand with some fine gravel (saturated, medium dense)	SP	●▲ 18	4-2	16.6%
	Gray gravelly sand with slight layering of sand and gravel (saturated, dense)	GP	● ▲ 47	4-3	13.4%
20	Gray fine and medium sand, layered (saturated, medium dense)	SP	▲● 19	4-4	20.6%
	Gray fine sand with trace silt and gravel (saturated, medium dense)	SP	▲ ● 15	4-5	22.5%
30	Gray medium sand with occasional gravel (saturated, dense)	SP	● ▲ 31	4-6	22.2%
	End Sampling at 29.5 feet				
40	~Groundwater observed at 3.5 feet bgs.				
	~Boring advanced to 29.5 feet on 4/28/00.				
50	~Boring backfilled with drill cuttings and bentonite upon completion.				

LOGGED BY: RPB
DRILLER: SUBTERRANEAN
DRILLING METHOD: HSA

DATE DRILLED: 4-28-00
HOLE DIAMETER: 8-INCH
HOLE DEPTH: SEE LOG

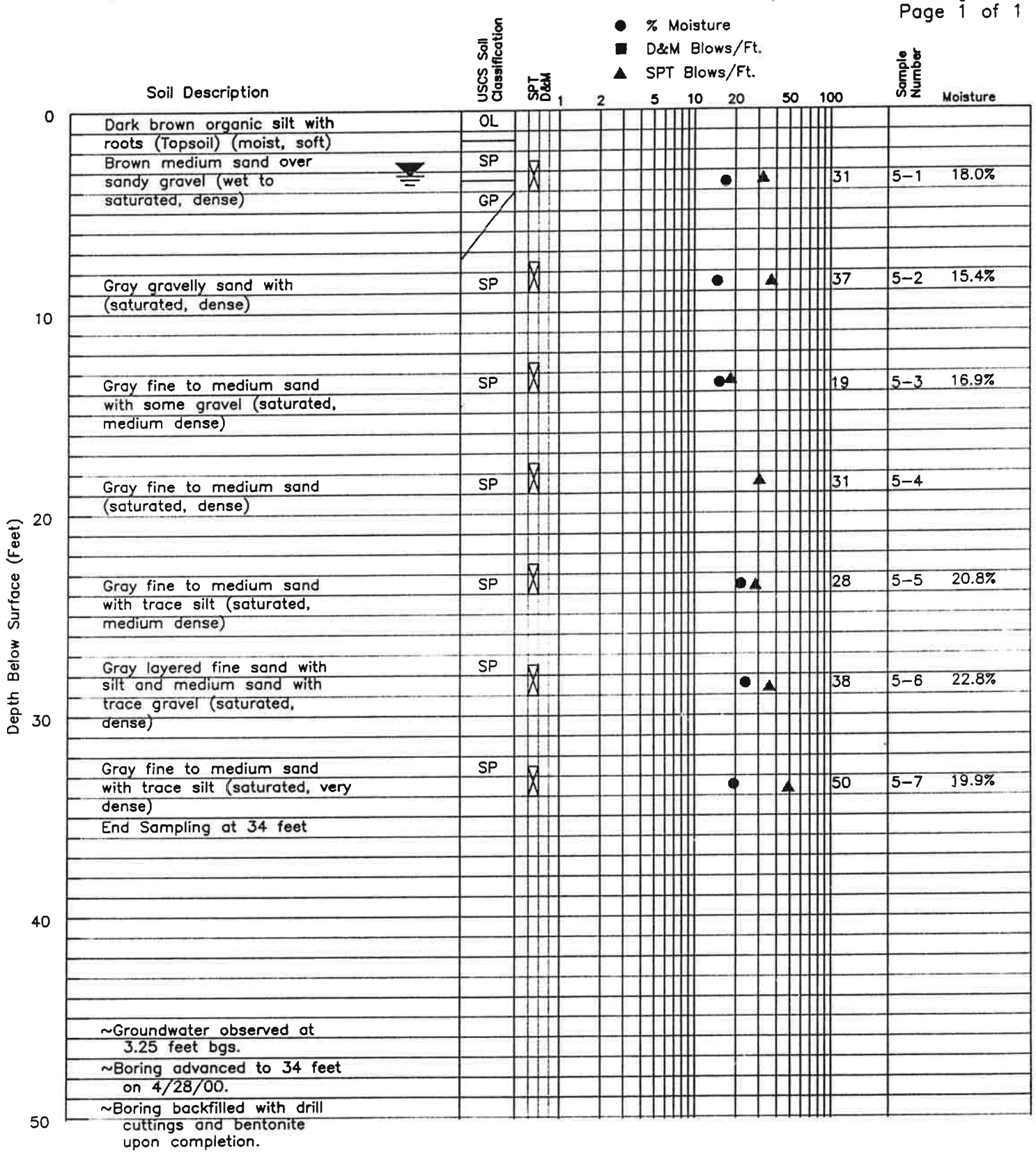
Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
DESIGNED BY:	RPB
DRAWN BY:	RPB
CHECKED BY:	TAH

WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-4
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A



LOGGED BY: RPB
DRILLER: SUBTERRANEAN
DRILLING METHOD: HSA

DATE DRILLED: 4-28-00
HOLE DIAMETER: 8-INCH
HOLE DEPTH: SEE LOG

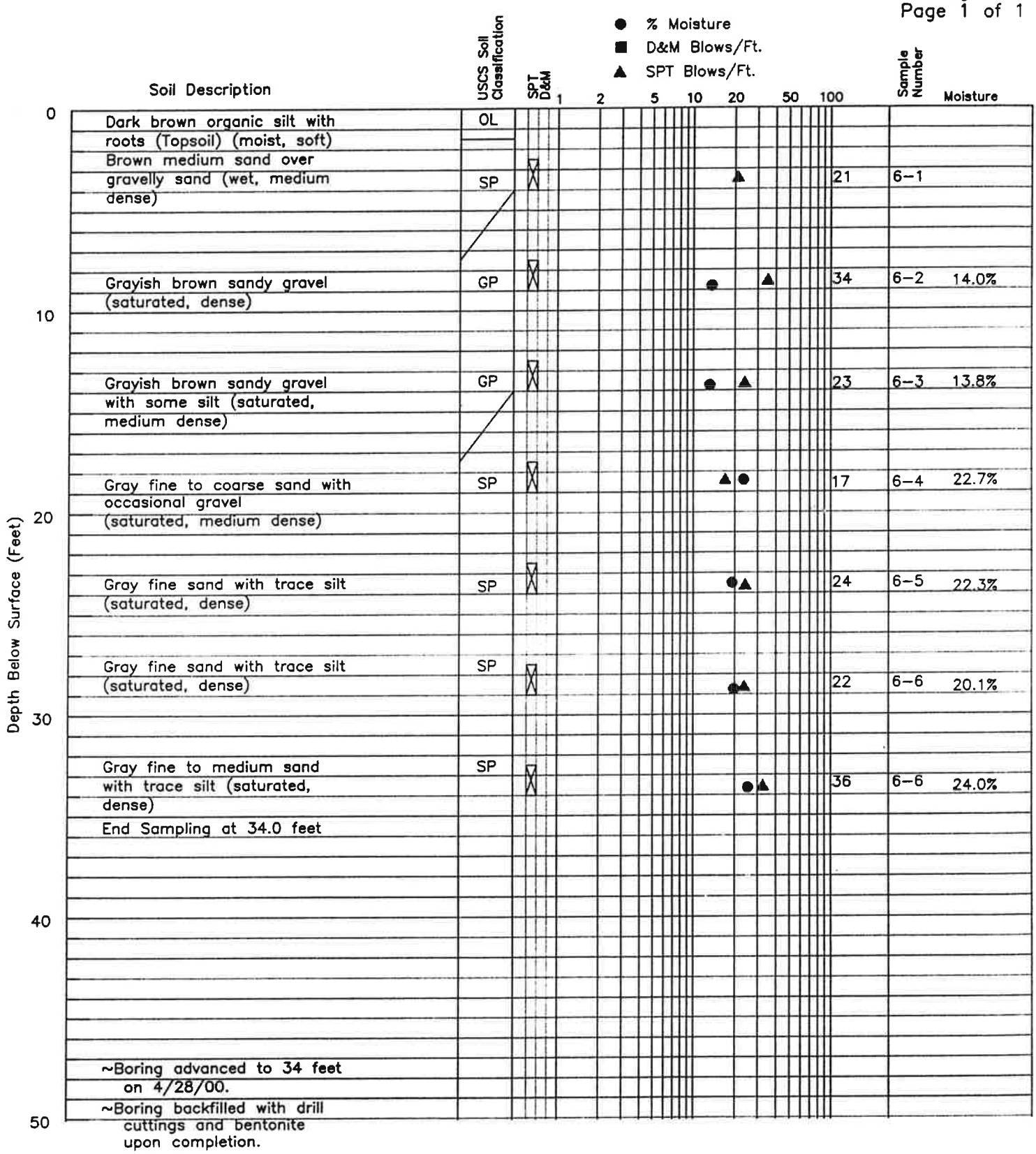
Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
DESIGNED BY:	RPB
DRAWN BY:	RPB
CHECKED BY:	TAH

WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-5
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A



LOGGED BY: RPB
DRILLER: SUBTERRANEAN
DRILLING METHOD: HSA

DATE DRILLED: 4-28-00
HOLE DIAMETER: 8-INCH
HOLE DEPTH: SEE LOG

Soils classified visually using the Unified Soils Classification System. Please see USCS Key to Boring Logs for descriptions.

JOB NO.:	N/A
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CHECKED BY:	TAH

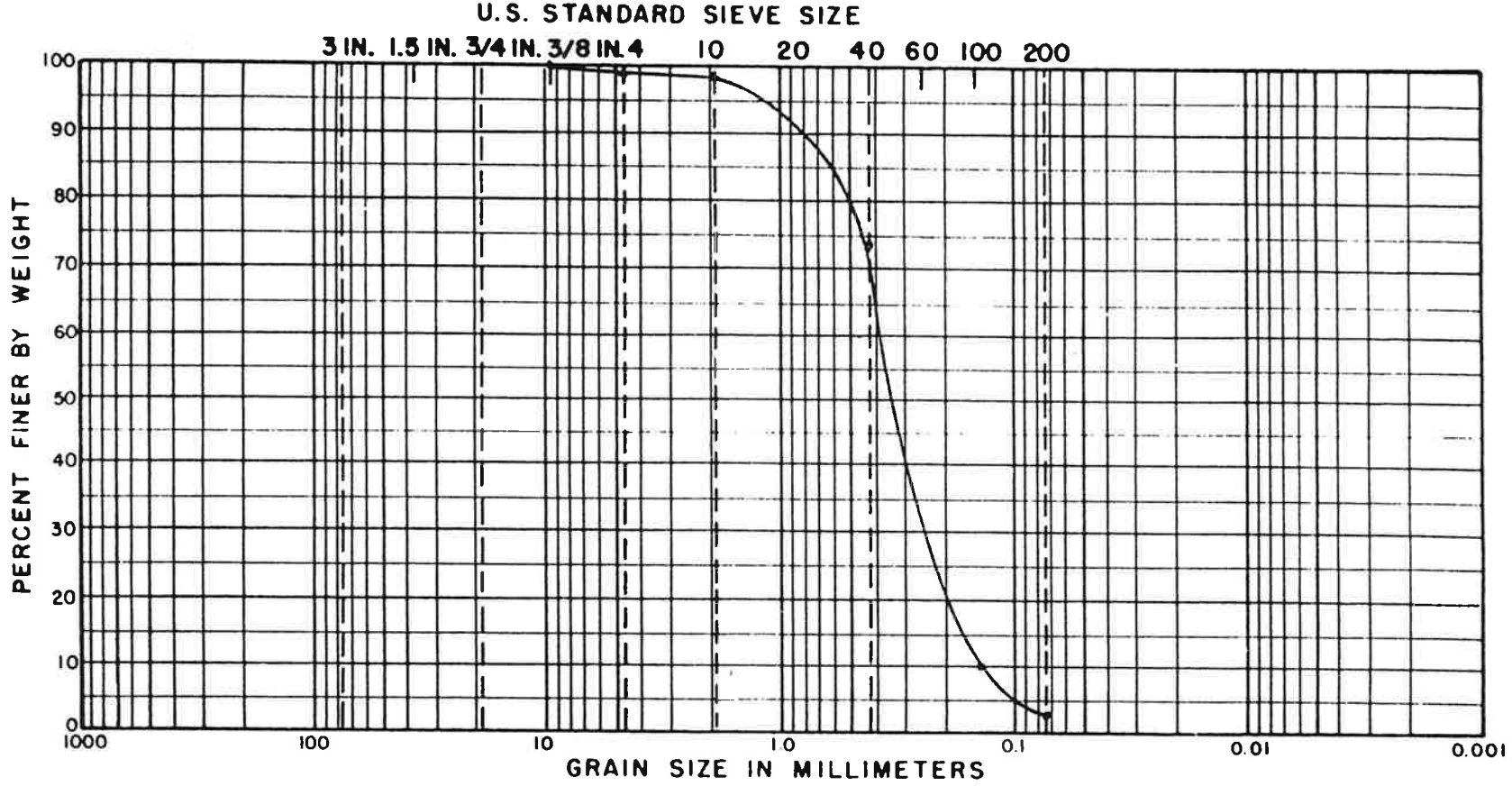
WESTERN GEOTECHNICAL CONSULTANTS, INC

BORING LOG B-6
CROWN DEVELOPMENT PROPERTY
ARLINGTON, WASHINGTON

DATE: 5/4/00
SCALE: H: N/A V: N/A

FILE 991454
BY TAH DATE 5/23/00
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Boring	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
B-2	22.5'	SP	Fine to Medium SAND					

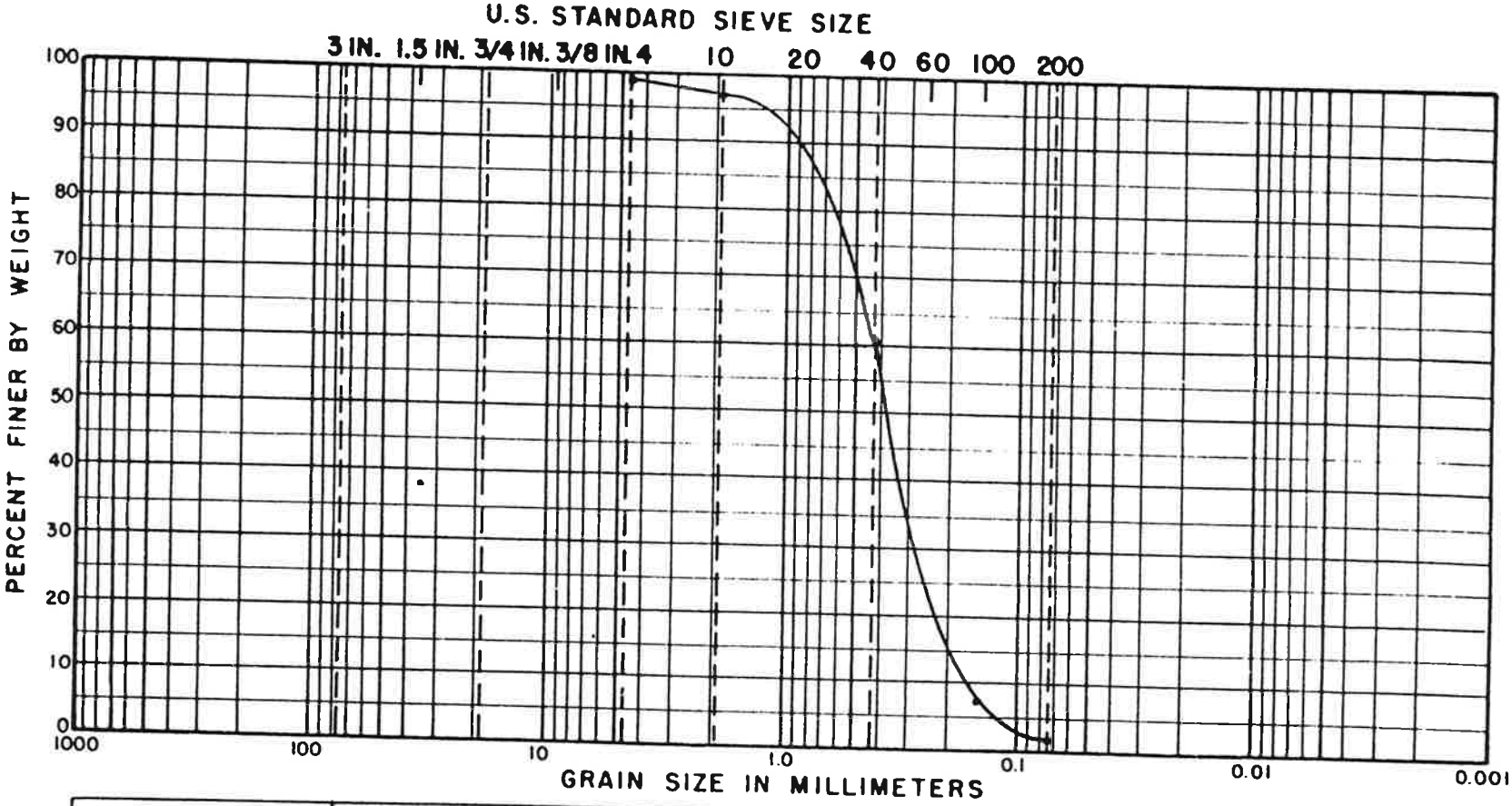
Western Geotechnical Consultants, Inc.

4181 Saltsprings Drive • Ferndale, WA 98248
Phone (360) 380-2507 • Fax (360) 380-2507

GRADATION CURVE

FILE 99145-4
BY TAH DATE 5/23/00
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Boring	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI
B-3	17.5'	SP	Fine to Medium SAND				

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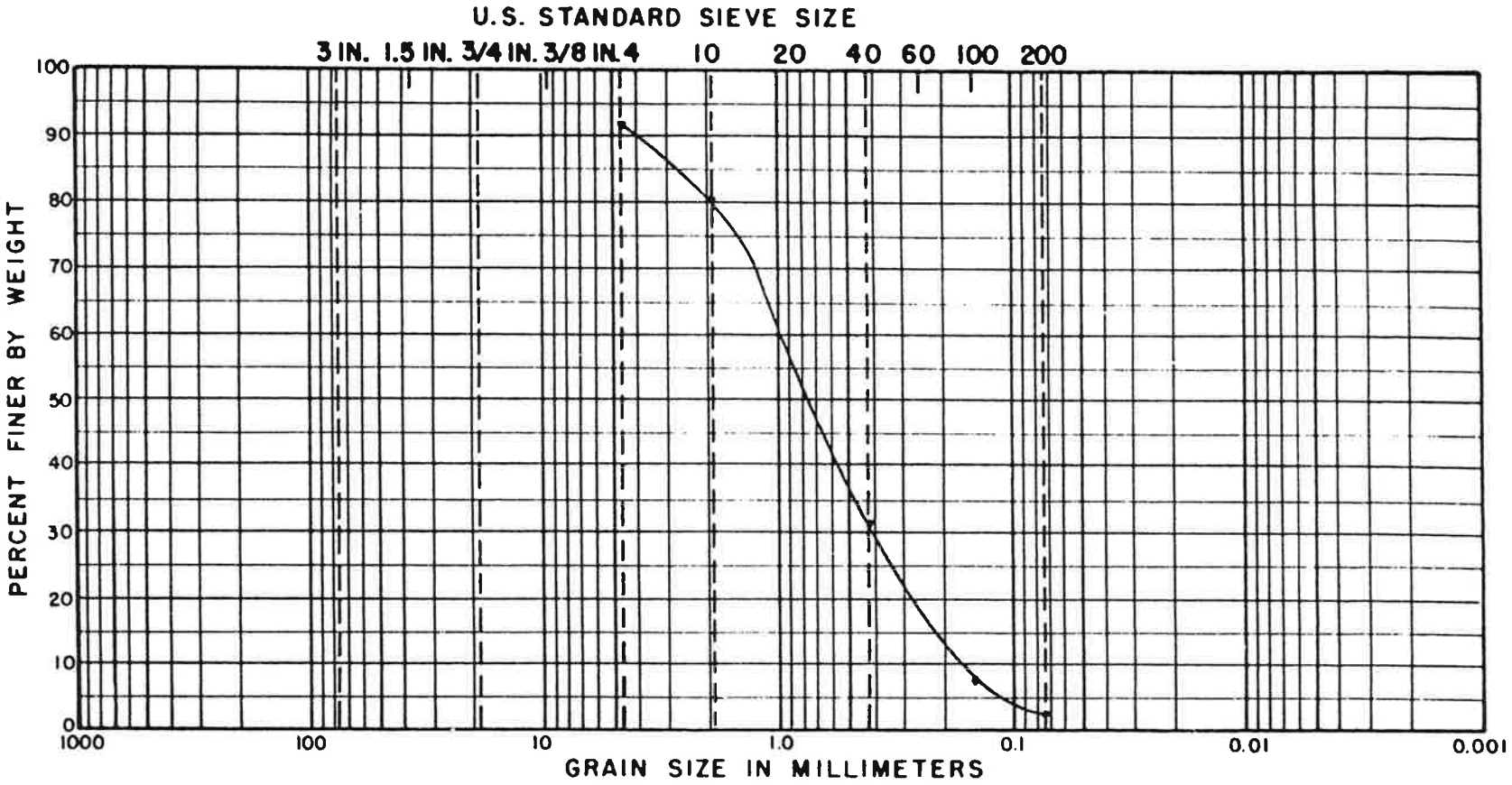
FILE 99454
BY THA DATE 5/23/00
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Boring	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
B-4	17.5'	SP	SAND, Trace gravel					

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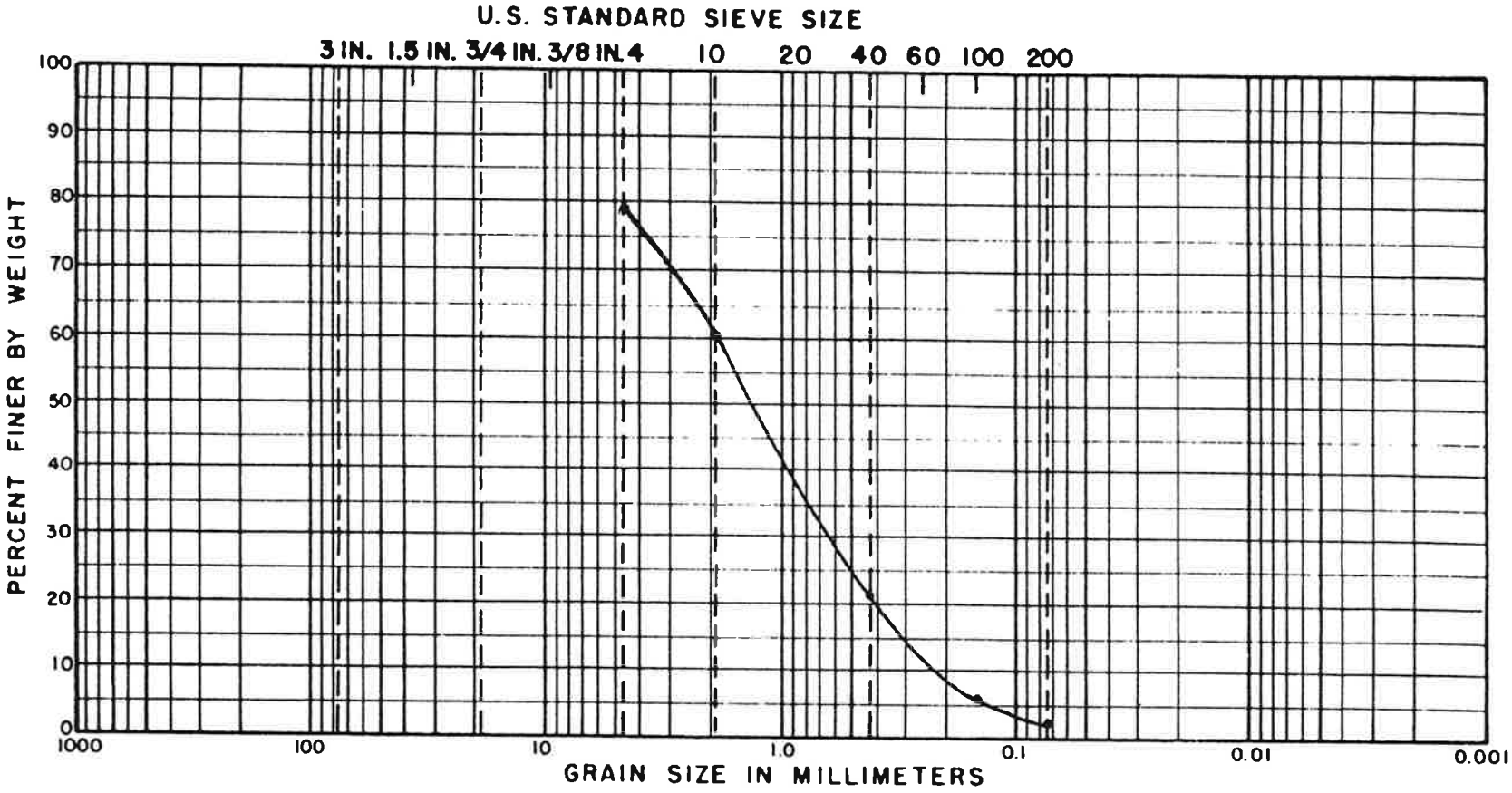
GRADATION CURVE

FILE 99147
BY THH DATE 5/23/01
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Boring	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
B-5	12.5'	SP	Gravelly SAND					

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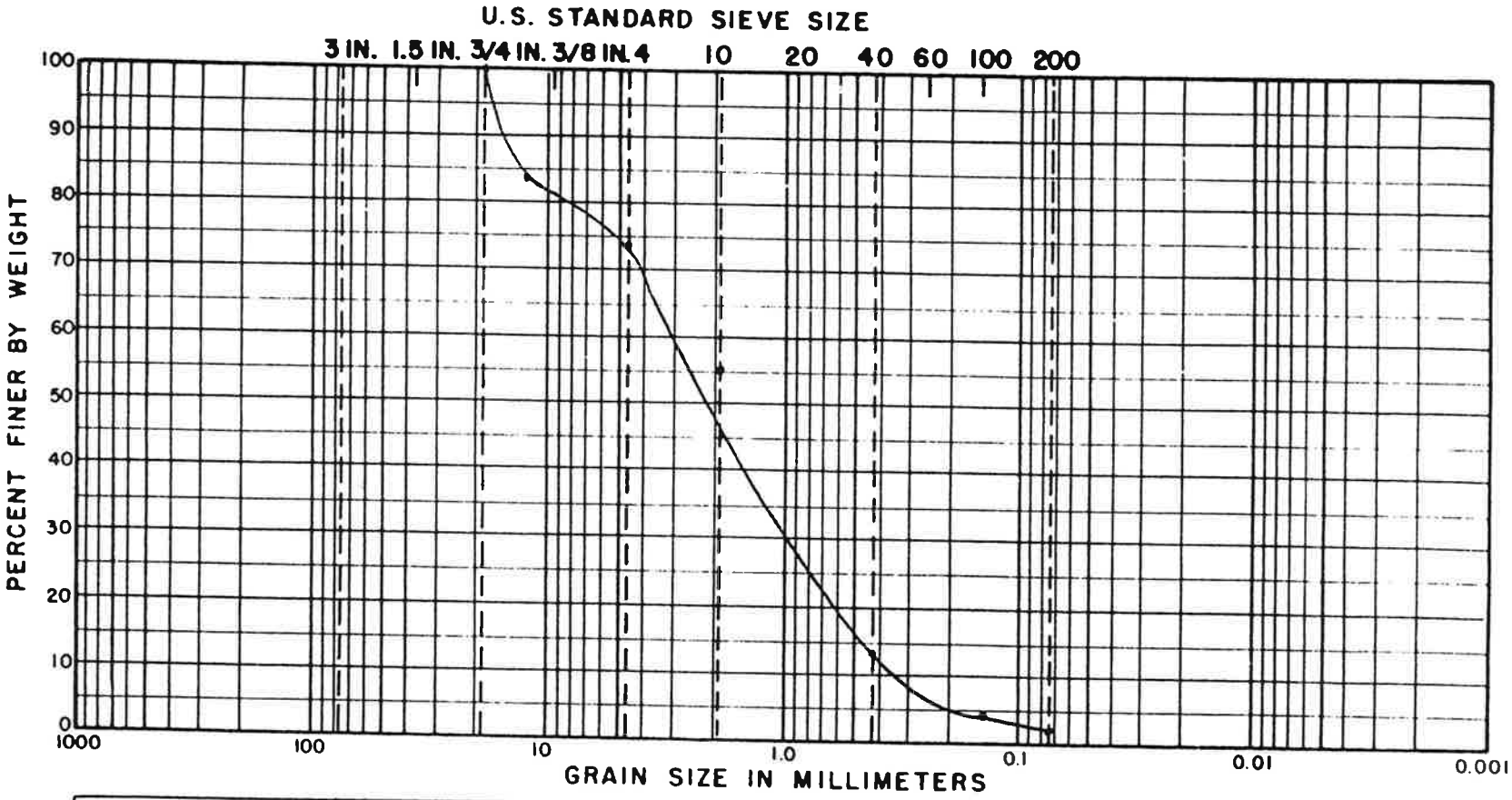
GRADATION CURVE

FILE

BY JTH DATE 9/2 3/20

CHECKED BY. DATE

REVISIONS
BY DATE
BY DATE
PLATE OF



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Boring	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
B-6	7.5'	SP	Gravelly SAND					

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GRADATION CURVE