- [x] City box number recent reports
- [x] Title/cover page w/the following info:
  - [x] Company (author) name
  - [x] Report Date
  - [x] Project name
  - [x] Company's job number
  - [x] City DCLU project number (7-digit number)
  - [x] City Permit number (6-digit number)
  - [x] Kroll map index number (3-digit number, w?/E,W,N,S)
  - [x] Green label (White)
  - [x] Site address (may be on 1st or 2nd page of text)

3433

- [ ] Executive Summary and associated figures
- [x] Table of Contents
- [x] Project Location Plan/Map or Vicinity Map
- [x] Site Plans, Boring Location Plans, or Exploration Plans
- [ ] Survey
- [ ] Geologic Maps
- [x] Cross Sections/Subsurface Profiles
- [ ] Fill or Peat Thickness Maps and Contour Maps
- [x] Boring Logs
- [ ] Geology Text (if no logs)
- [x] Soil Classification Key/Boring Log Key
- [ ] Probe Logs
- [ ] Test Pit Logs
- [ ] Monitoring Well Logs
- [ ] Cone Penetrometer Logs
- [ ] Shear Wave Velocity Measurements
- [ ] Groundwater Maps
- [ ] GW Elevation Tables/Data
- [ ] Soils Lab Testing (Geotechnical) Summary Tables
  - [x] Grain Size Analyses/Hydrometer Analyses
  - [ ] Atterberg Limits
  - [ ] Strength tests: Triaxial, Unconfined, Direct Shear
  - [ ] Organic Content
  - [ ] ^{14}C or Radiocarbon Testing
  - [ ] Other_____
- [ ] Soil Chemical Analytical Testing Summary Tables
- [ ] Water/Groundwater Chemical Analytical Summary Tables
- [ ] Comments_____

- [x] Date Copied 12/6/00 By Suzanne

2/9/99

002436997 PACIFIC INVESTMENTS 05030 1ST AV S
BUILDING ID S 1 PROJECT NR: 9904425
N CONSTRUCT 3-STORY ADMINISTRATIVE OFFICE/WAREHOUSE JRL (PS)
O AND OCCUPY, PER PLANS CN: 990715 LU:
REV
REV
REV NR

712531 98220 56 155

GEOTECHNICAL REPORT

3433

Office/Warehouse Facility
5030 – 1st Avenue South
Seattle, Washington

Project No. T-4343

5030 - 1st Ave South

Terra Associates, Inc.

Prepared for:

Pacific Investment Company
Seattle, Washington

April 12, 1999

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

April 12, 1999
Project No. T-4343

Mr. Robert Stack
Pacific Investment Company
2201 – 6th Avenue South
Seattle, Washington 98134

Subject: Geotechnical Report
Office/Warehouse Facility
5030 – 1st Avenue South
Seattle, Washington

Dear Mr. Stack:

As requested, we have conducted a geotechnical engineering study for the subject site. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

Soil conditions at the site generally consist of eight feet of sandy fill overlying loose becoming medium dense, native alluvial sands. A regional groundwater table was found at a depth of approximately eight feet in each boring.

In our opinion, the building may be supported on conventional spread footings with slab-on-grade floors placed on structural fill subgrades established within the existing site fills. Our analysis indicates that there is a potential for liquefaction-related settlements approaching one-inch during an earthquake of Richter magnitude 6.75.. If the risk of this settlement is not acceptable, the building should be supported on an augercast pile foundation.

We appreciate the opportunity to be of service to you on this project. We trust the information presented in this report is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

KEVIN P. ROBERTS
STATE OF WASHINGTON
32039
REGISTERED PROFESSIONAL ENGINEER

4-12-99

Kevin P. Roberts,
Project Engineer

EXPIRES 8/9/99

Theodore J. Schepper, P.E.
Principal Engineer

12525 Willows Road, Suite 101, Kirkland, Washington 98034
Phone (425) 821-7777 • Fax (425) 821-4334 • terra@terra-associates.com

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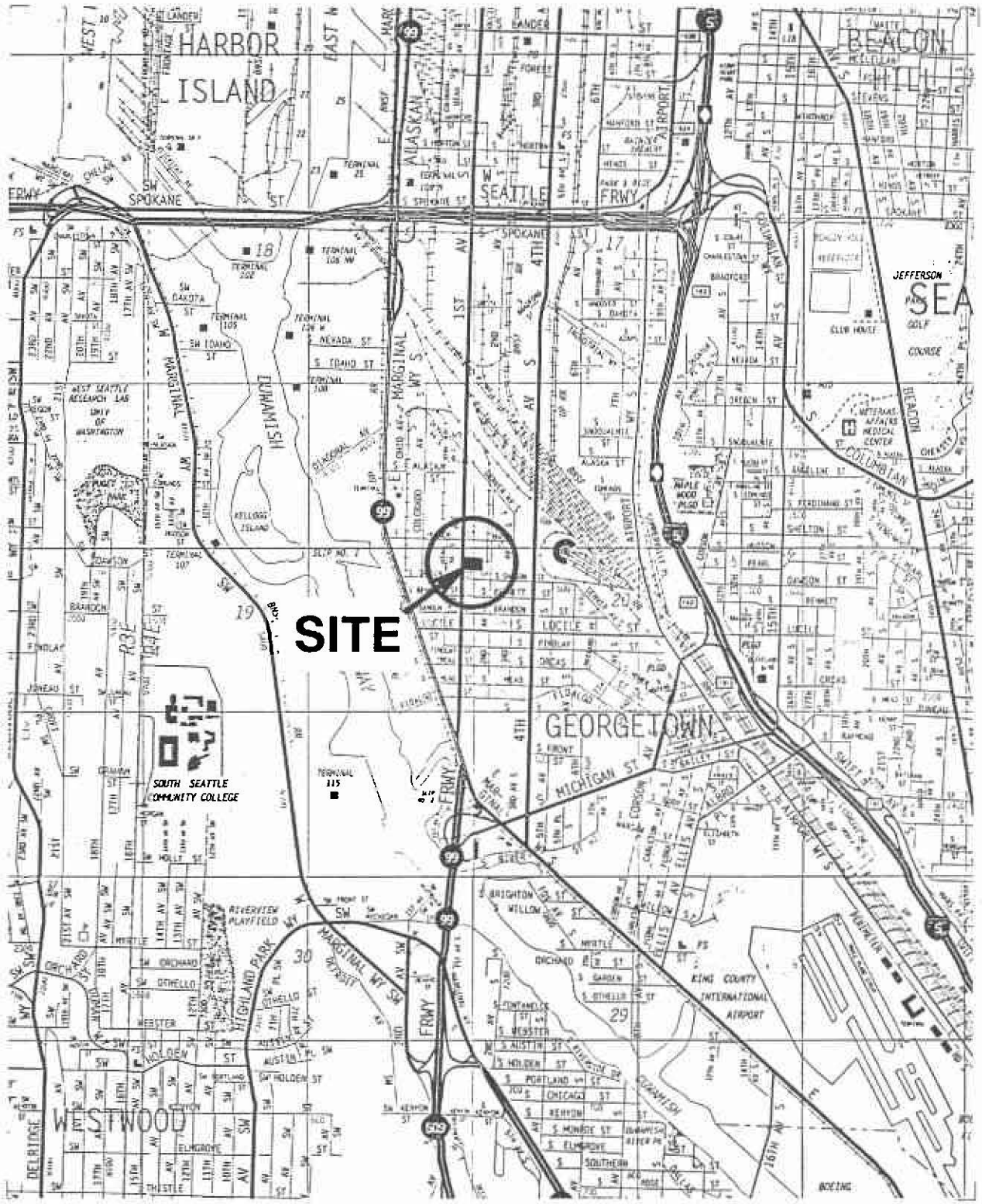
Appendix

Field Exploration and Laboratory Testing ..... Appendix A



REFERENCE: THE THOMAS GUIDE, KING COUNTY, WASHINGTON, PAGES 594, 595, 624 AND 625, 1999 EDITION.

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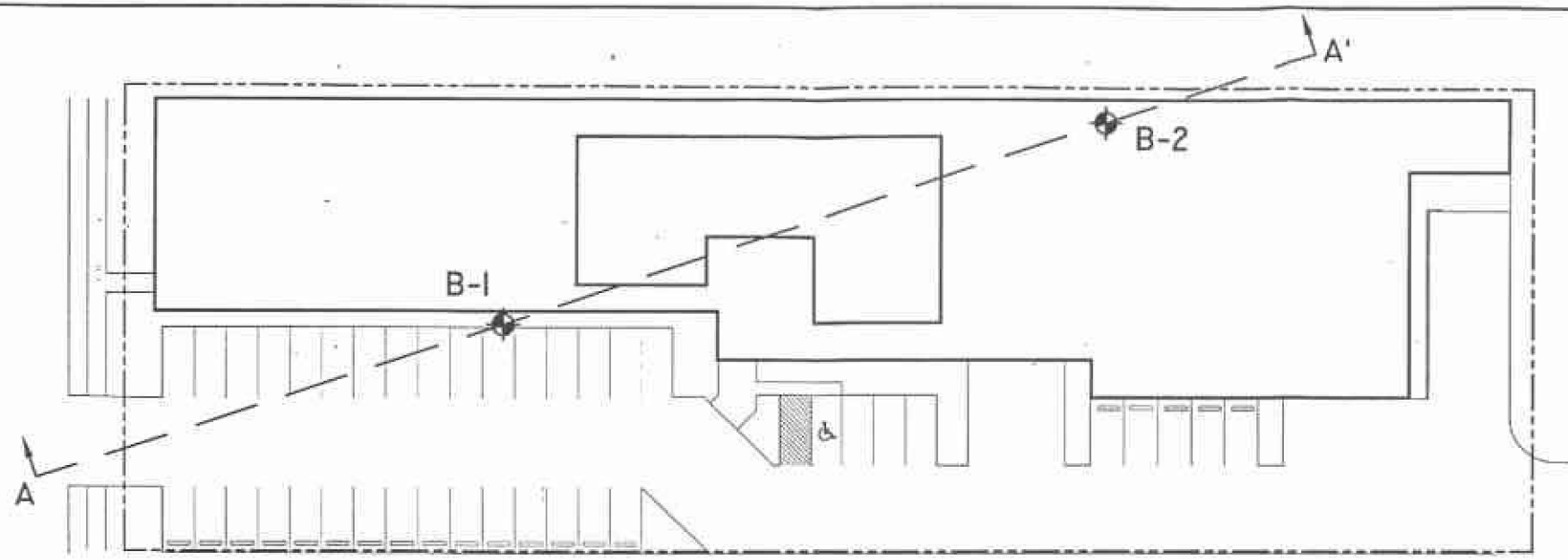
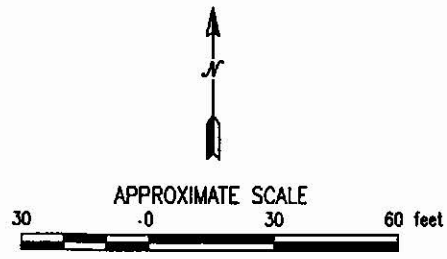
VICINITY MAP
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj.No. 4343	Date APR. 1999	Figure 1





LEGEND:

APPROXIMATE BORING LOCATION

REFERENCE:

SITE PLAN PREPARED AND PROVIDED BY LDG ARCHITECTS, SHEET No. A-1, DATED 11/16/98, LAST REVISION DATED 2/15/99.

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EXPLORATION LOCATION PLAN
OFFICE/WAREHOUSE FACILITY
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Proj.No. 4343	Date APR. 1999	Figure 2

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	GRAVELS More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands or gravelly sands, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, (lean clay).
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

SAND or GRAVEL

Density	Standard Penetration Resistance in Blows/Foot
Very loose	0-4
Loose	4-10
Medium dense	10-30
Dense	30-50
Very dense	>50

SILT or CLAY

Consistency	Standard Penetration Resistance in Blows/Foot
Very soft	0-2
Soft	2-4
Medium stiff	4-8
Stiff	8-16
Very stiff	16-32
Hard	>32

I	2" OUTSIDE DIAMETER SPLIT SPOON SAMPLER
I	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (DATE)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj. No. T-4343	Date APR 1999	Figure A-1

Boring No. B-1

Logged by: KPR

Date: 3/22/99

Approximate Elev.

Soil Description	Consistency/ Relative Density.	Depth (ft.)	Sample	(N) Blows/ ft.	Moisture Content (%)	Notes
FILL; Brown silty, fine to medium sand, moist. (Cuttings: SM)						
FILL; Brown fine to medium sand, moist. (SP)	Loose to Medium Dense			10	6.1	Boulder at 4.5 feet.
FILL; Dark brown mottled, silty, fine to medium sand, moist. (SM)	Loose	5		6	14.4	
Dark gray medium SAND with silt, water-bearing. (SP-SM)	Loose	10		8	22.9	
Dark gray medium SAND, water-bearing. (SP)	Medium Dense	15		13	26.9	Augers sinking into ground under own weight.
No recovery.	Medium Dense	20		12		Drilled to 20 feet. 4.5 feet of sand heave into auguer. Heave flushed out of hole. Drilling with column of water.
Dark gray to black, fine to medium SAND, water-bearing. (SP)	Dense	25		30	24.2	
Black fine to medium SAND with silt, 3-inch layer of sandy silt at 31 feet, water-bearing. (SP-SM)	Medium Dense	30		17	31.4	
Black fine to medium SAND with silt, water-bearing. (SP-SM)	Loose to Medium Dense	35		10	27.4	
	Medium Dense	40		26	28.4	

Boring terminated at 41.5 feet.
Groundwater encountered at 8.5 feet.

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BORING LOG
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj. No. T-4343 | Date APR 1999 | Figure A-2

Boring No. B-2

Logged by: KPR

Date: 3/23/99

Approximate Elev.

Soil Description	Consistency/ Relative Density	Depth (ft.)	Sample	(N) Blows/ ft.	Moisture Content (%)	Notes
FILL; Brown sandy silt with some gravel, moist. (Cuttings; ML)						
FILL; Dark brown-gray, fine to medium SAND with silt, moist. (SP-SM)	Medium Dense			11	15.0	
No recovery. Rock in sampler shoe.	Loose	5		7		
Dark gray-brown, medium SAND, water-bearing. (SP)	Loose	10 ▼		9	26.2	Two feet of water shown on sampler and rods. Water added to hole to control heave.
Black medium SAND, water-bearing. (SP)	Medium Dense	15		18	26.4	
Black, fine to medium SAND, water-bearing. (SP)	Medium Dense	20		16	29.1	
As above. (SP)		25		18	28.0	
Black, sandy SILT, very fine to fine sand, saturated, non-plastic. (ML)	Loose	30		7	36.7	
Black, fine to medium SAND with silt, water-bearing. (SP-SM)	Medium Dense	35		21	29.5	
Black, fine to medium SAND, water-bearing. (SP)	Medium Dense	40		26	29.5	

Boring terminated at 41.5 feet.
Groundwater encountered at 9.5 feet.

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BORING LOG
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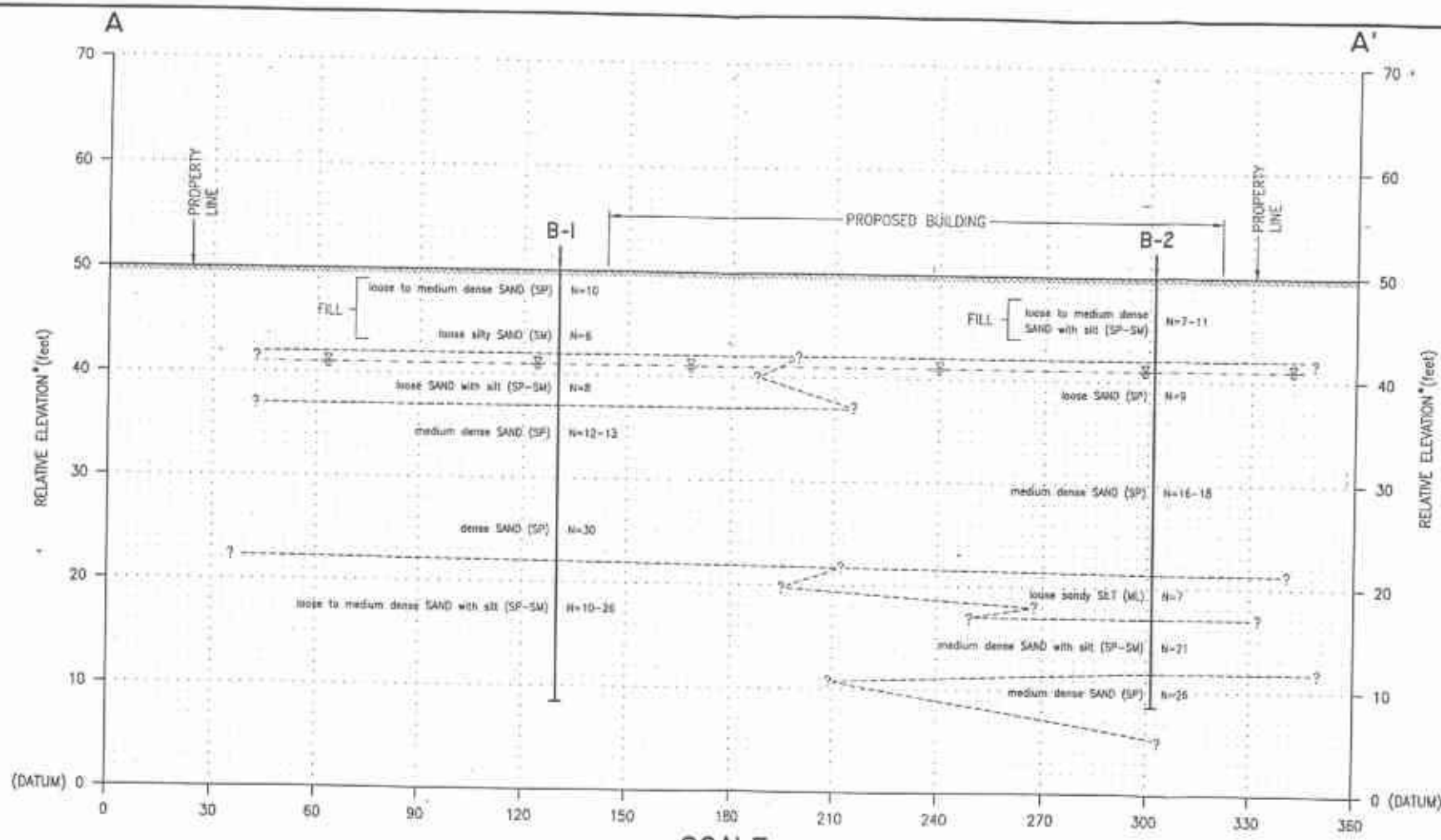
Proj. No. T-4343	Date APR 1999	Figure A-3



SCALE
VERTICAL: 1" = 30'
HORIZONTAL: 1" = 10'

*NOTE:
ELEVATIONS ARE RELATIVE TO THE DATUM SHOWN AND ARE NOT REPRESENTATIVE OF ACTUAL SITE ELEVATIONS.

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GENERALIZED GEOLOGIC SECTION A-A'
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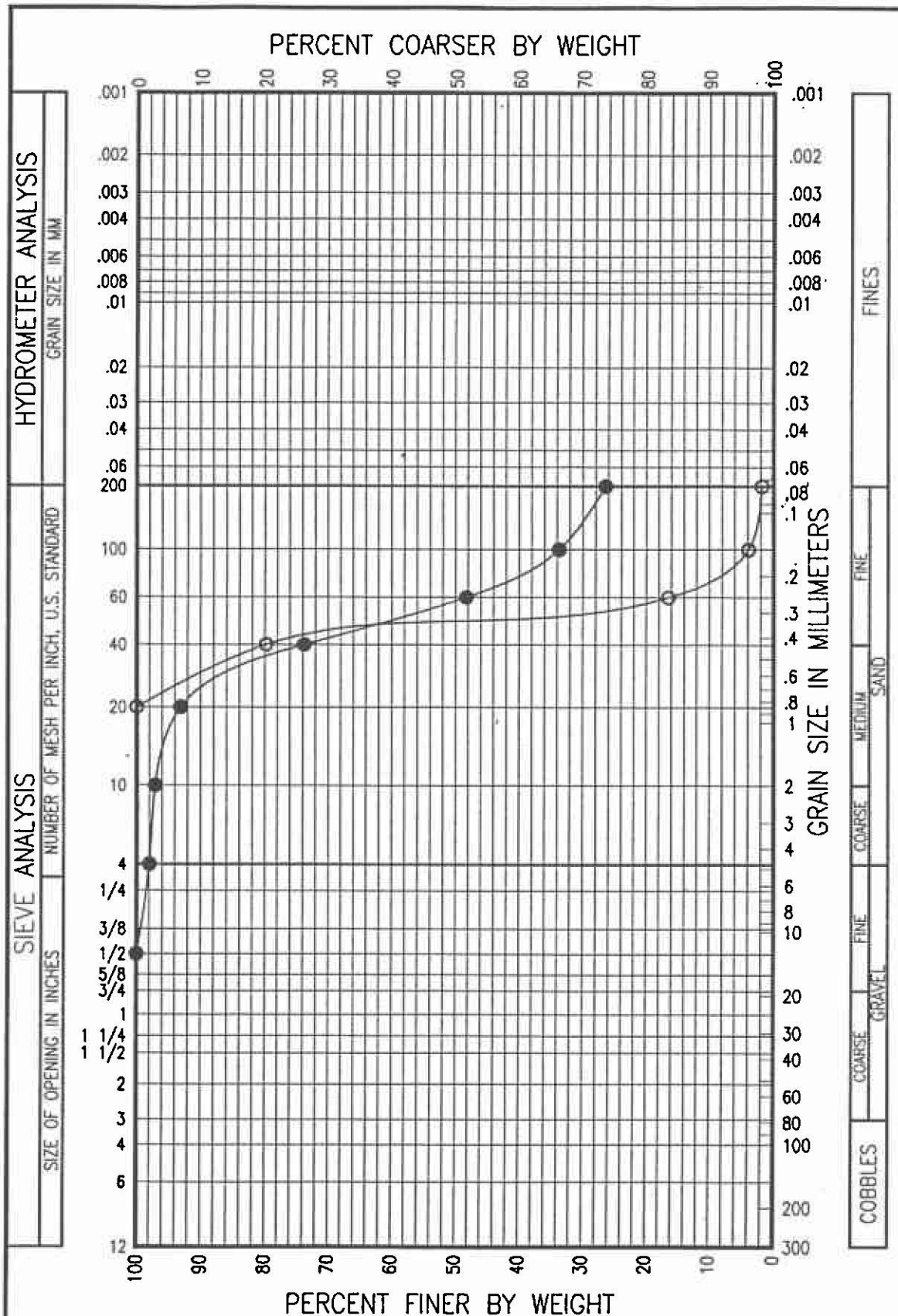
Proj.No. 4343	Date APR. 1999	Figure A-4



Key	Boring Number	Depth (ft.)	USCS	Description	LL	PL	Moisture Content (%)
●	B-1	5.0	SM	silty SAND			
○	B-1	15.0	SP	SAND			

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GRAIN SIZE ANALYSIS
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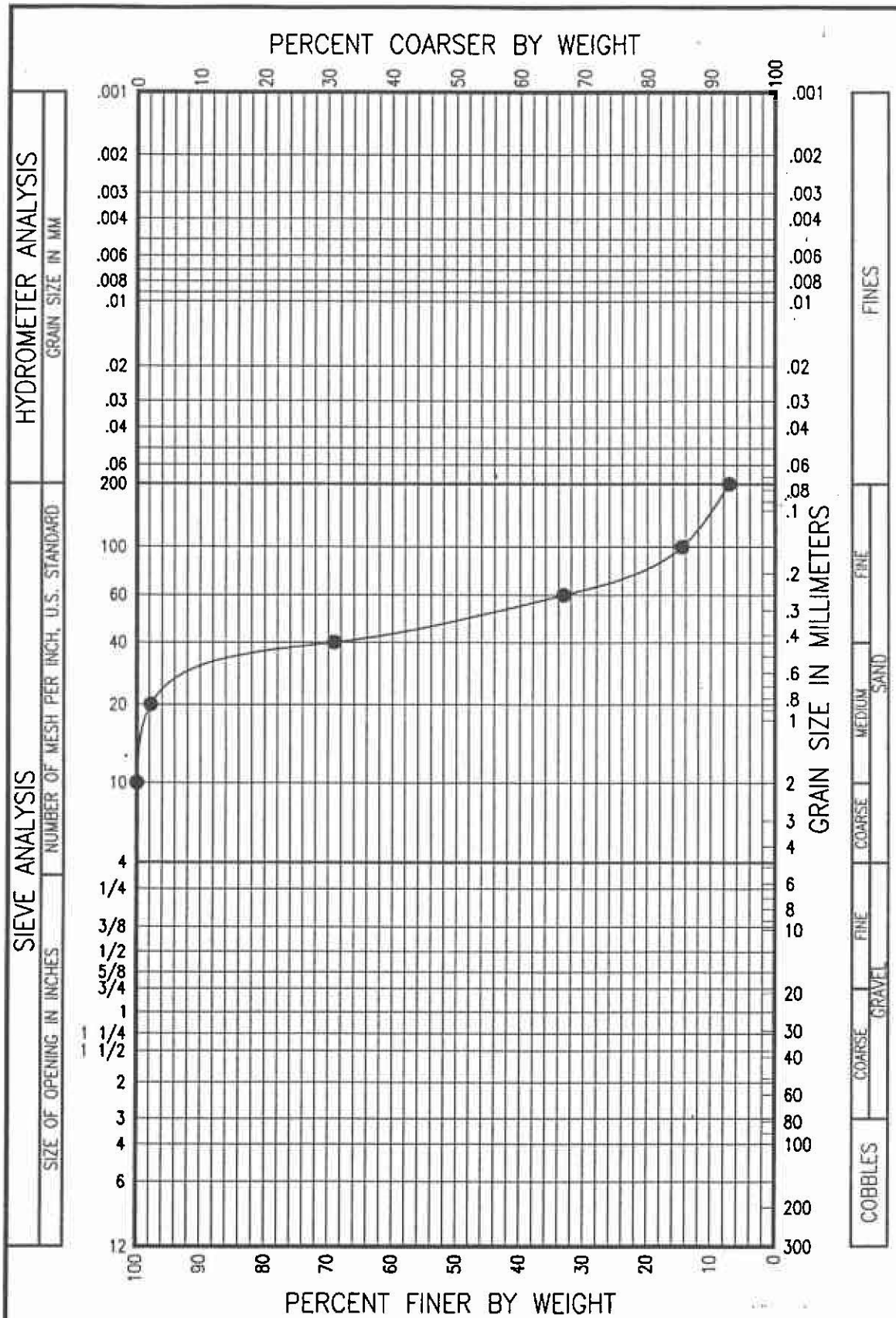
SEATTLE, WASHINGTON

Proj.No. 4343	Date APR. 1999	Figure A-5



Key	Boring Number	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	B-2	35.0	SP-SM	SAND with silt			

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GRAIN SIZE ANALYSIS
OFFICE/WAREHOUSE FACILITY
SEATTLE, WASHINGTON

Proj.No. 4343 | Date APR. 1999 | Figure A-6