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

3383

- [ ] 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
  - [x] Other Plasticity Chart
- [ ] Soil Chemical Analytical Testing Summary Tables
- [ ] Water/Groundwater Chemical Analytical Summary Tables
- [ ] Comments

- [x] Date Copied 9/5/00 By Suzanne

2/9/99

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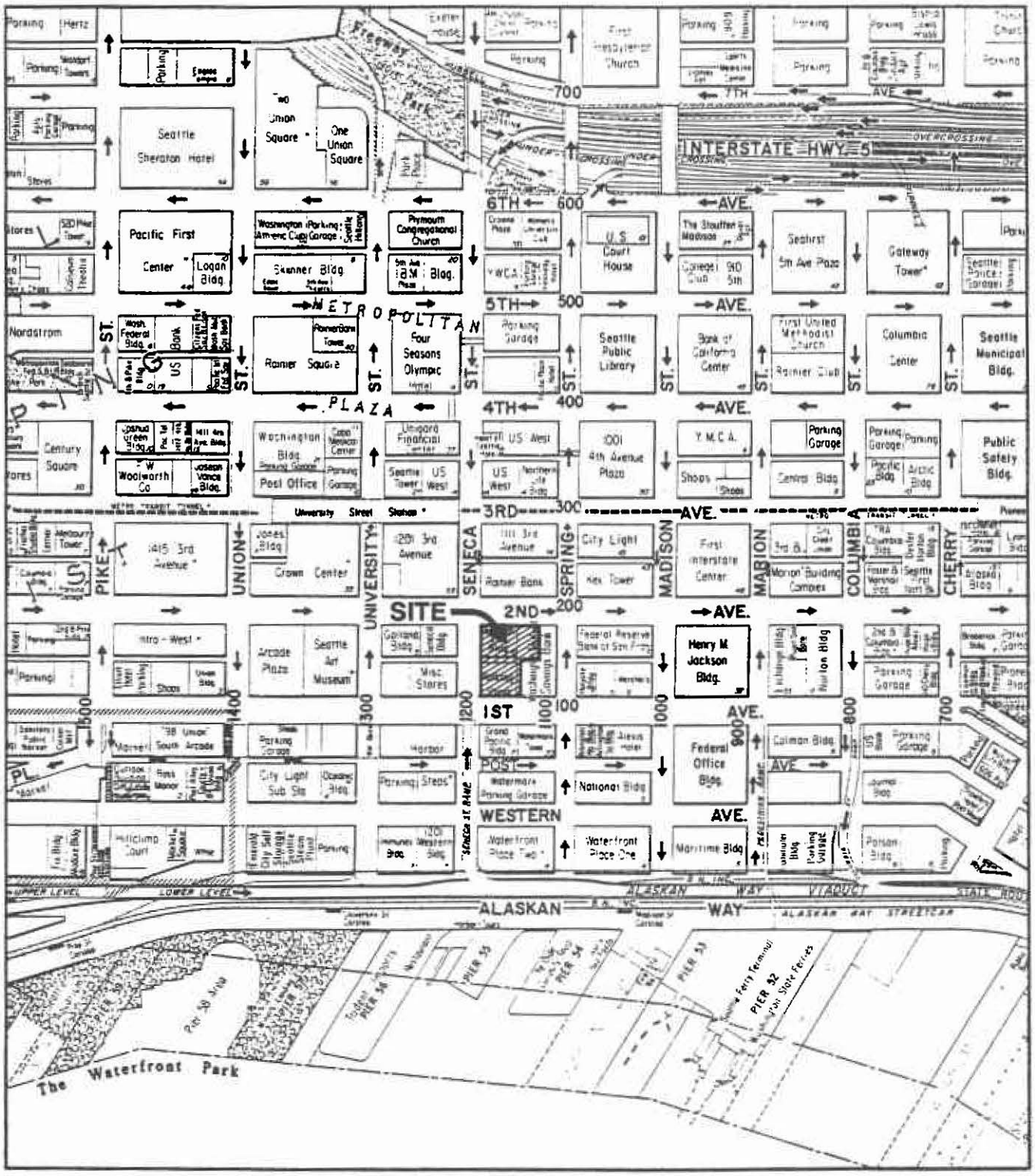
Vicinity Map



Base map prepared from Kroll 's map of Seattle Central Business District, Kroll Map Company, Inc. 1988.

0 500 1000

Scale in Feet

True

Project

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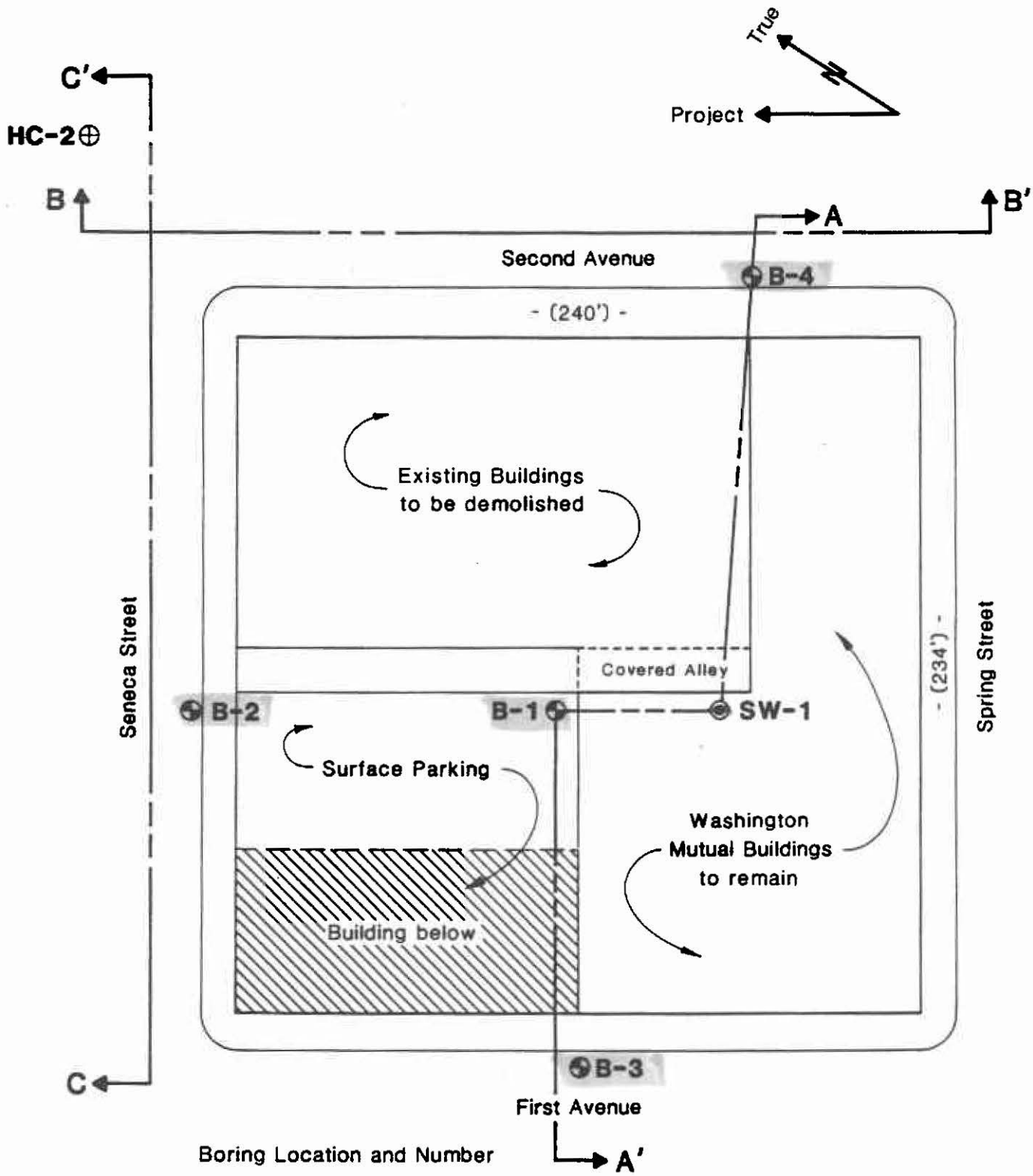
Figure 1

Site and Exploration Plan



Boring Location and Number

B-1 Hart Crowser, Current Study
HC-2 1201 Third Avenue (HCJ-1495)
SW-1 Shannon & Wilson - 1967 Study

0 50 100
Scale in Feet

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Figure 2

12-13-89

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Earth and Environmental Technologies

Geotechnical Engineering Design Report
Washington Mutual
Second and Spring Block
Seattle, Washington

Prepared for
Wright Runstad Company

November 9, 1988
J-2235

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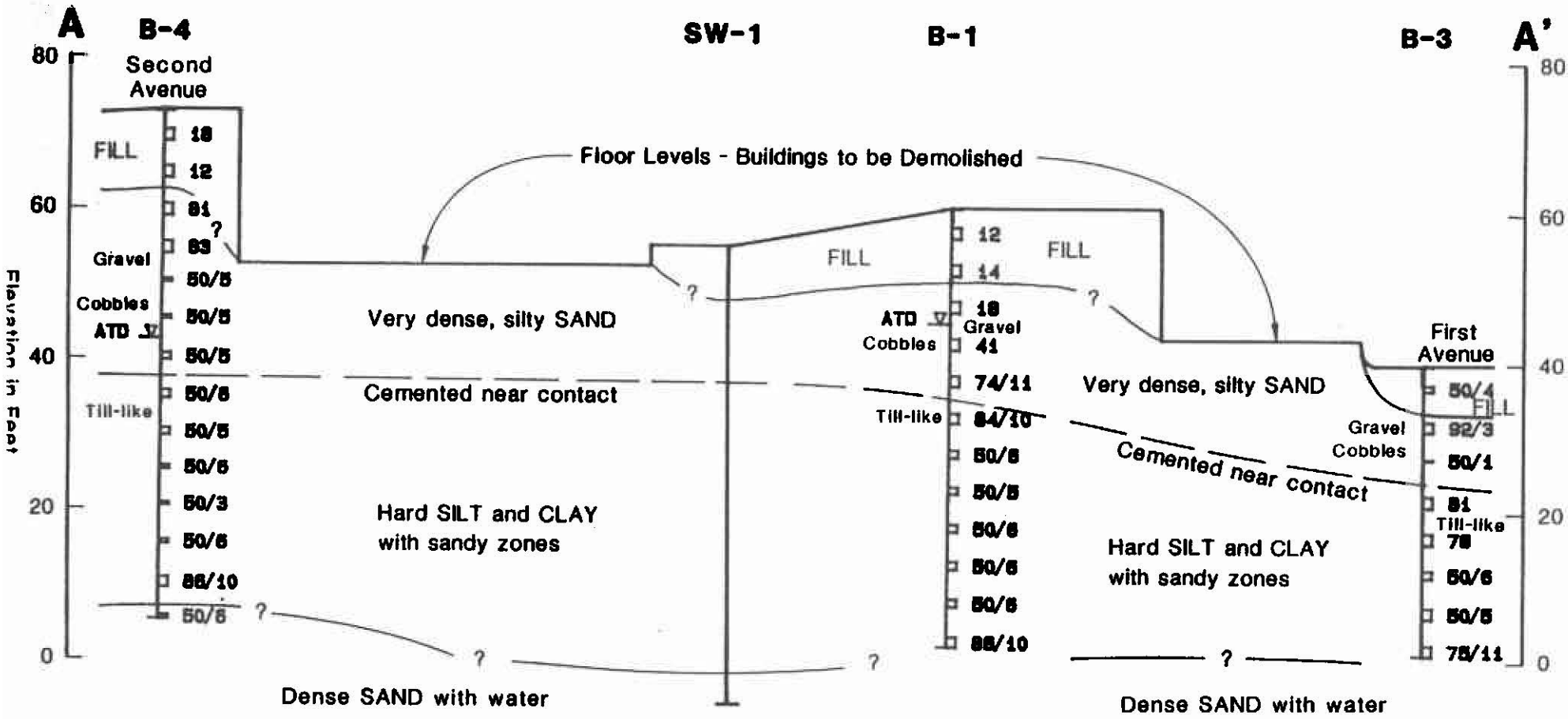
B-2 Plasticity Chart
B-3 Grain Size Classification

Section A-A'

Soil Conditions at Building Interface



B-4 Boring Number

Boring Location

18 Penetration Resistance in Blows per Foot

Groundwater Level in Observation Well

ATD Water Level at Time of Drilling

Horizontal Scale in Feet

0 40 80

0 20 40

Vertical Scale in Feet

Vertical Exaggeration x 2

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Figure 3

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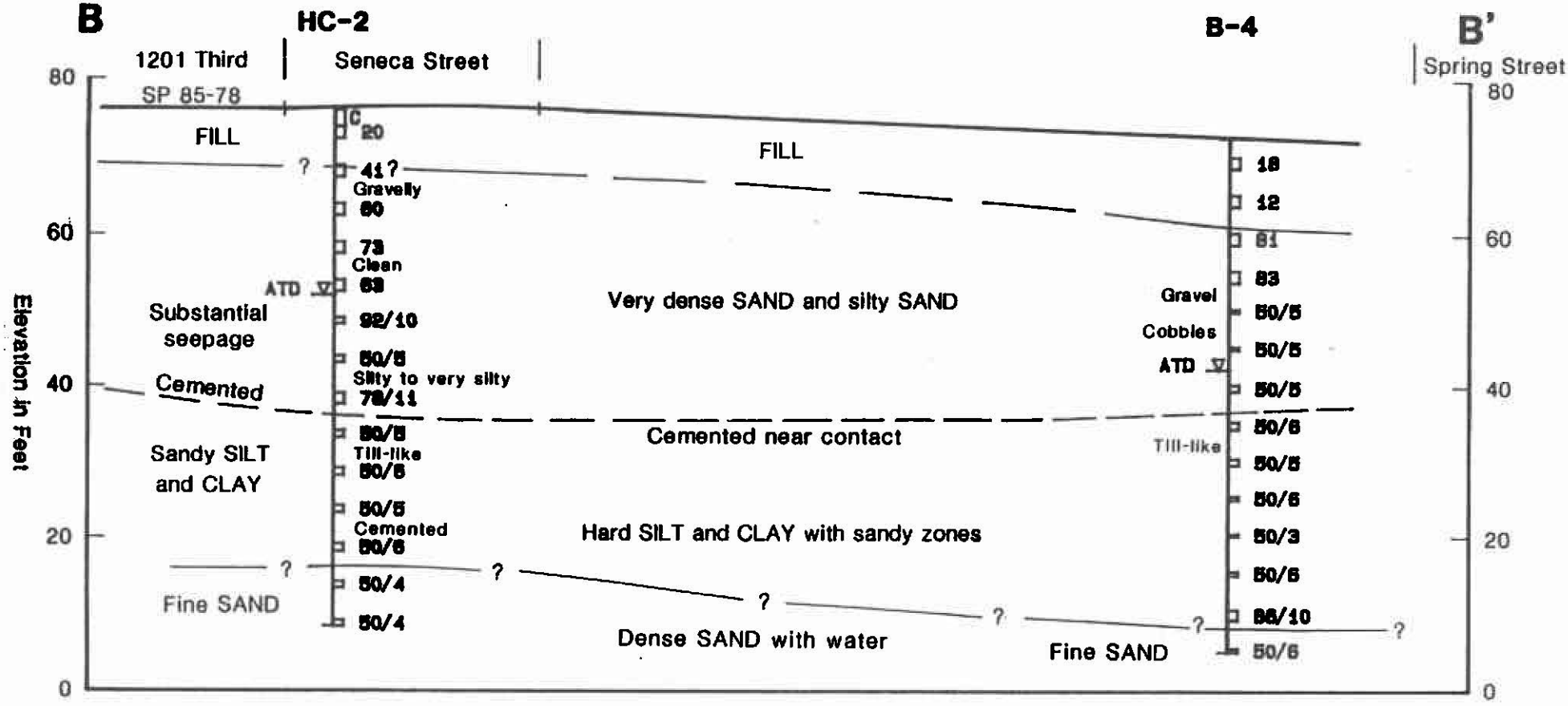
Section B-B'

Soil Conditions along Second Avenue



B-4 Boring Number

Boring Location

20 Penetration Resistance in Blows per Foot

Groundwater Level in Observation Well

ATD Water Level at Time of Drilling

Horizontal Scale in Feet

0 40 80

0 20 40

Vertical Scale in Feet

Vertical Exaggeration x 2

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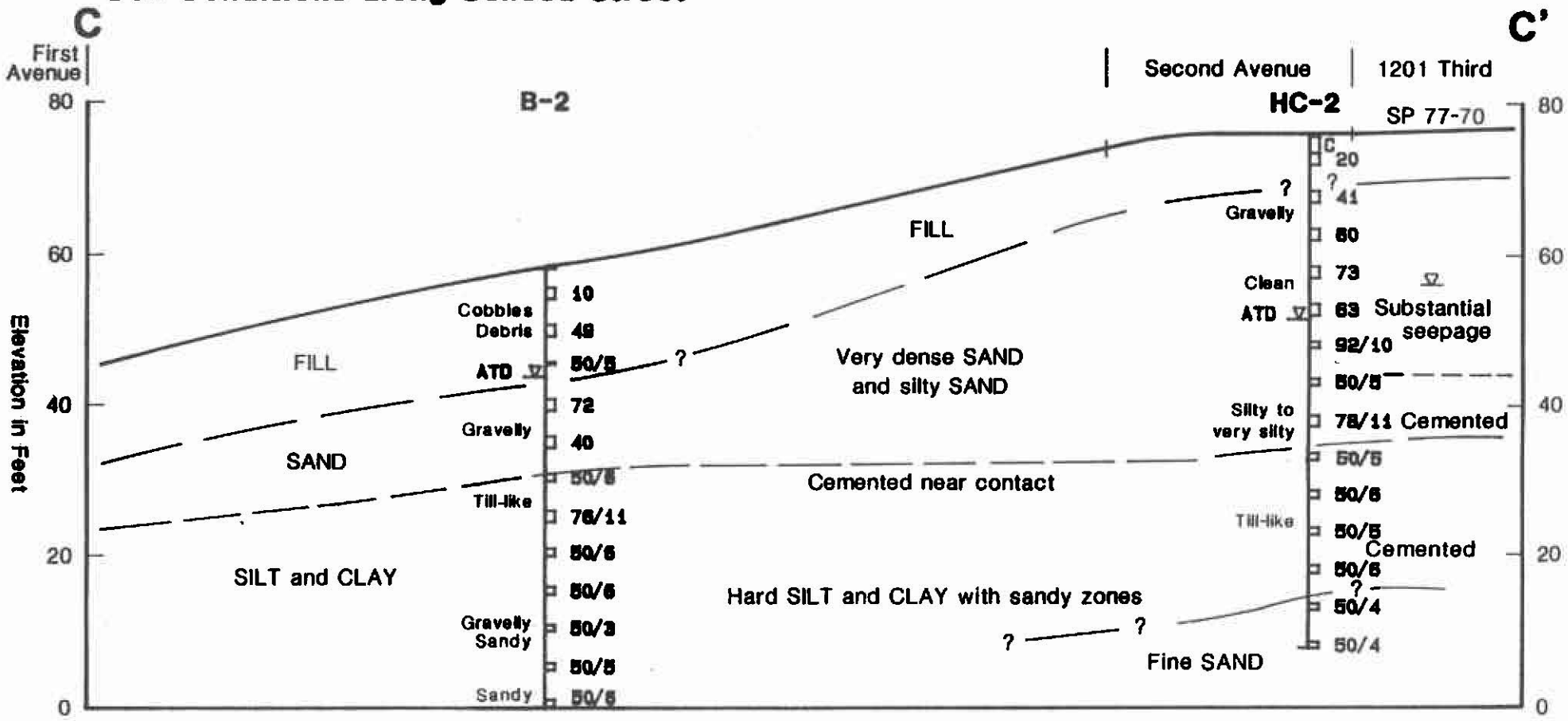
Figure 4

Section C-C'

Soil Conditions along Seneca Street



B-4 Boring Number

Boring Location

10 Penetration Resistance in Blows per Foot

Groundwater Level in Observation Well

ATD Water Level at Time of Drilling

Horizontal Scale in Feet

0 40 80

0 20 40

Vertical Scale in Feet

Vertical Exaggeration x 2

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Figure 5

8/88

Key to Exploration Logs

Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Legends

Sampling

BORING SAMPLES

- Split Spoon
- Shelby Tube
- Cuttings
- Core Run
- * No Sample Recovery
- P Tube Pushed, Not Driven

TEST PIT SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

Ground Water Observations

- Surface Seal
- Ground Water Level on Date (ATD) At Time of Drilling
- Observation Well Tip or Slotted Section
- Ground Water Seepage (Test Pits)

Test Symbols

GS	Grain Size Classification
CN	Consolidation
TUU	Triaxial Unconsolidated Undrained
TCU	Triaxial Consolidated Undrained
TCD	Triaxial Consolidated Drained
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits

Water Content in Percent
Liquid Limit
Natural
Plastic Limit

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Figure A-1

Boring Log B-1

SOIL DESCRIPTIONS

Ground Surface Elevation in Feet 61

3 inches ASPHALT over medium dense, damp, brown, slightly gravelly, silty SAND with occasional fragments of brick. (FILL)

Stiff, damp, light gray, clayey SILT with iron staining interbed.

Medium dense, moist, brown to gray-brown, silty, fine SAND.

Becomes gravelly with cobbles indicated by drill action. Some cementing. Hard drilling.

Very dense, wet, gray-brown. Silty SAND with some fine gravel.

Hard, damp, gray, sandy, clayey SILT

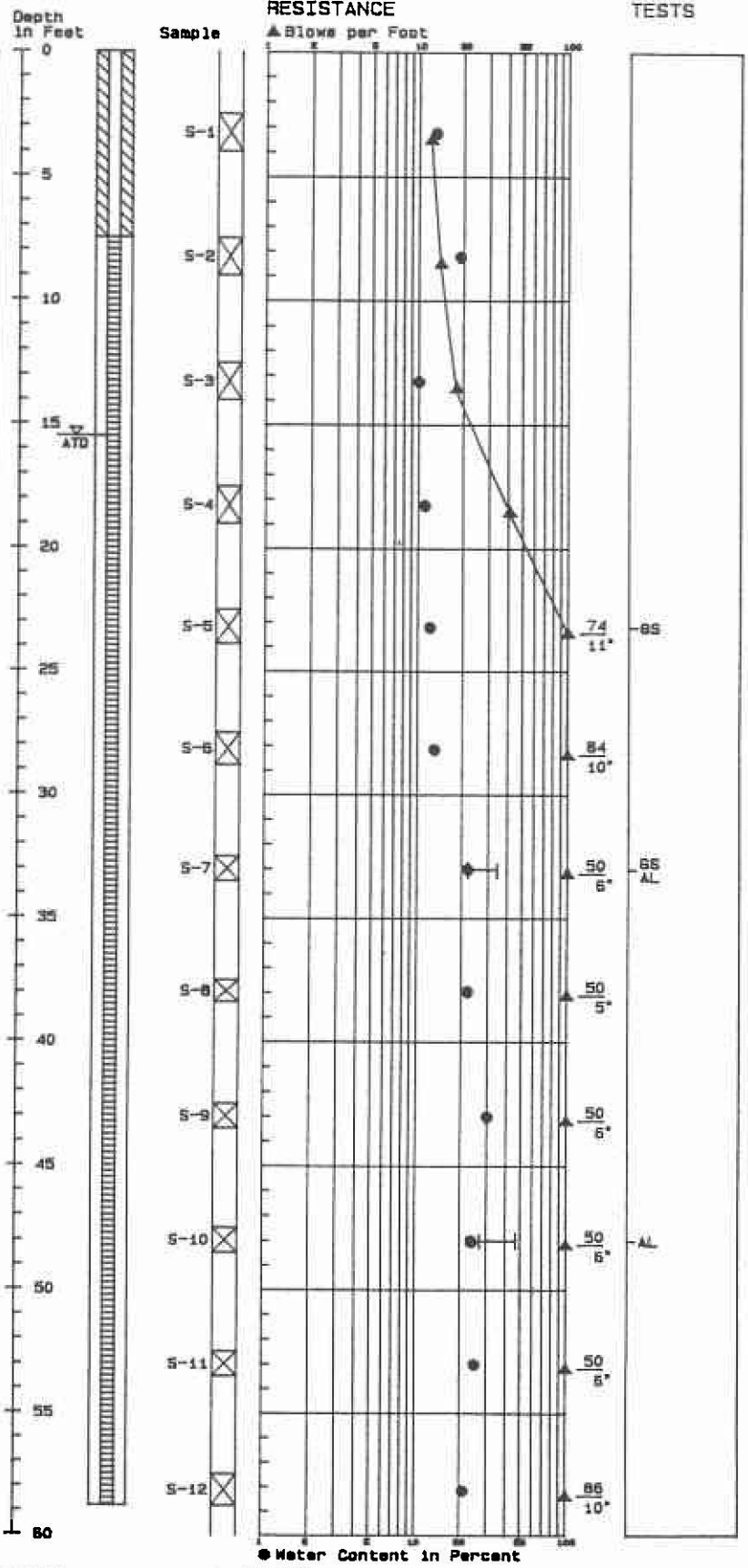
Trace gravel.

Trace slickensides.

Grades to hard, damp, gray, silty CLAY.

Sandy zone (4 inches).

Bottom of Boring at 58.8 Feet.
Completed 9/20/88.



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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Figure A-2

Boring Log [redacted]

SOIL DESCRIPTIONS

Ground Surface Elevation in Feet 58

2 inches ASPHALT, 6 inches BRICK, 10 inches CONCRETE.

Loose, damp, light brown-gray, clayey SILT with iron staining. (FILL)

- Grades to dense, damp, light gray brown, silty SAND. (FILL)
- Drill action indicates cobbles, boulders and/or debris in upper 15 feet. Hard drilling.
- Becomes very dense and gravelly.

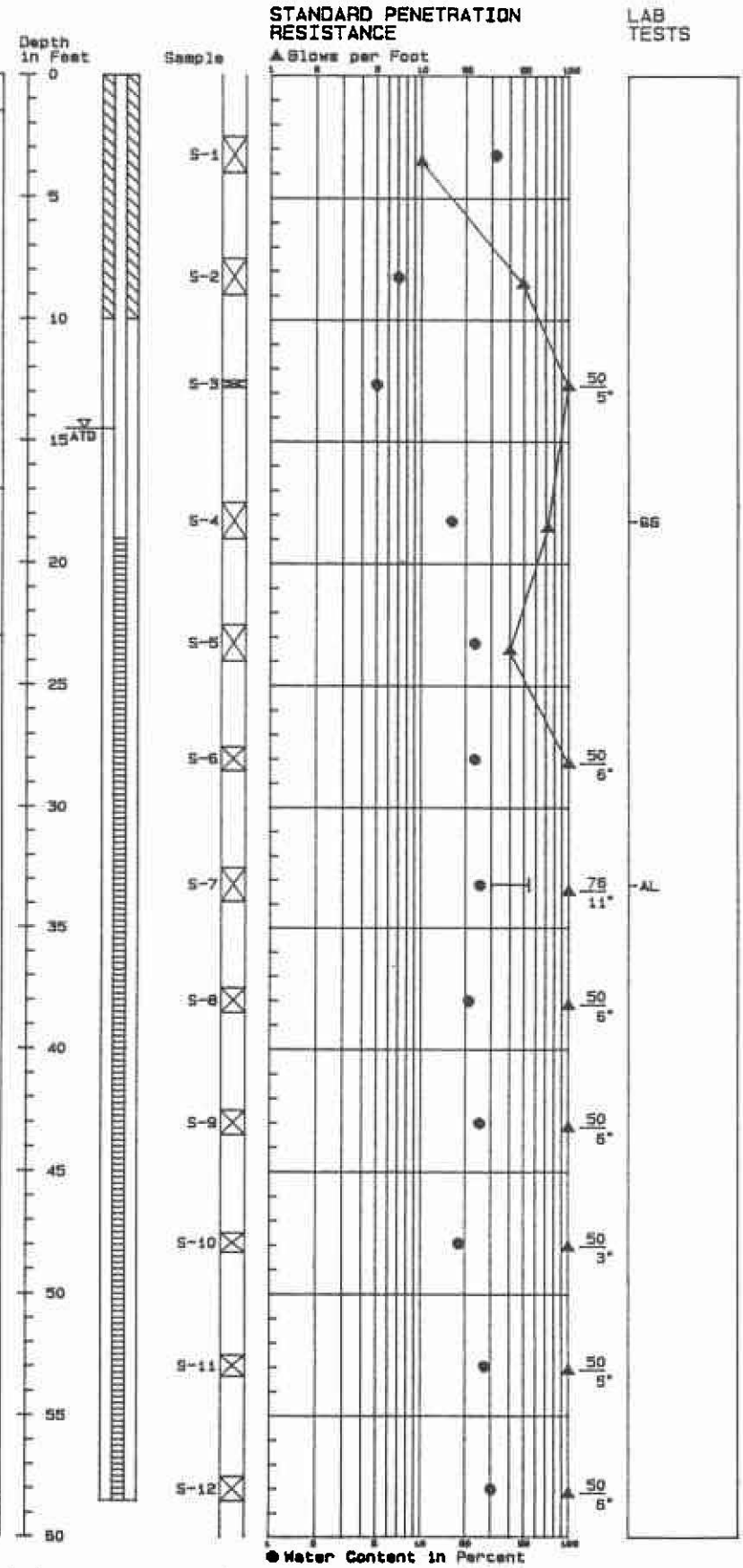
Very dense, moist to wet, gray-brown gravelly, sandy SILT to silty SAND.

Interbeded of wet, coarse SAND noted.

Hard, damp, gray, slightly gravelly, silty CLAY to gray, sandy SILT. (TILL-like)

- Grades to hard, damp, gray, silty CLAY and clayey SILT.
- Trace slickensides.
- Some cementing.
- Slightly sandy, gravelly.
- Some cementing.
- Very dense, wet, gray, very gravelly SAND (3 inches).
- Slightly sandy at tip.

Bottom of Boring at 58.5 Feet.
Completed 9/20/88.



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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Figure A-3

Boring Log

SOIL DESCRIPTIONS

Ground Surface Elevation in Feet 40

ASPHALT, CONCRETE, and BRICK to 18 inches.

(Very dense), moist, brown, slightly silty SAND grading to sandy GRAVEL. (FILL)

Hard drilling-possible debris.

(Very dense), moist, brown, slightly gravelly, interbedded medium and fine SAND.

- Become gravelly and silty. Drill action indicates cobbles, boulders and/or debris in upper 12 feet.

Hard, damp, gray, slightly sandy, slightly gravelly, clayey SILT. (TILL-like)

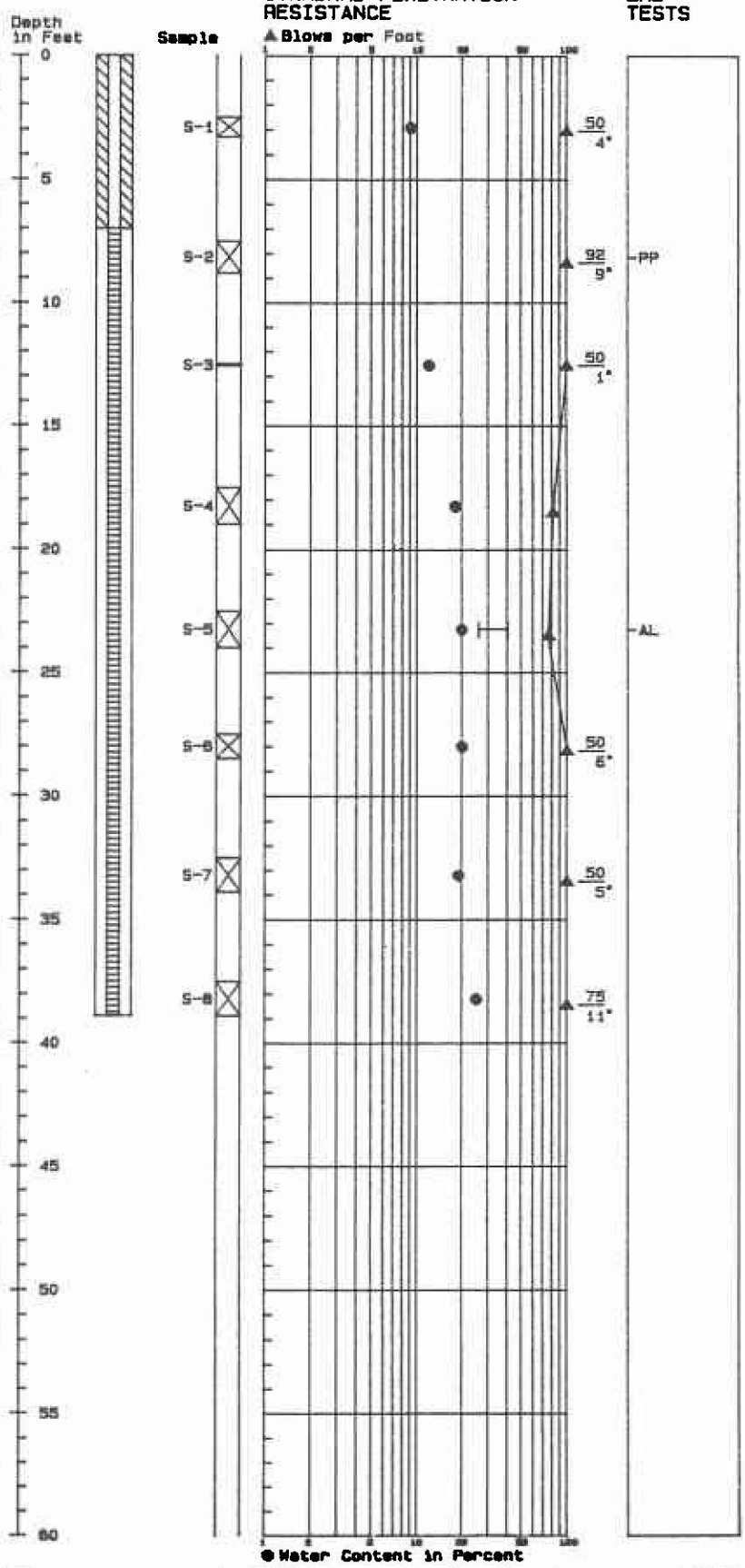
- Grades to hard, damp, gray, silty CLAY.

- Wet, gray, medium SAND interbeds.

- Slow drill process.

- Wet, sandy zone.

Bottom of Boring at 38.9 Feet. Completed 9/21/88.



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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Figure A-4

Boring Log B-4

Done

SOIL DESCRIPTIONS

Ground Surface Elevation in Feet 73

ASPHALT and CONCRETE to 18 inches.

Medium dense, damp, brown, slightly gravelly, silty SAND. (FILL)

Very dense, damp, tan, slightly silty SAND.

Grades more silty.

Very dense, moist, light gray-brown, silty, clayey, sandy GRAVEL to sandy gravelly, clayey SILT with some iron staining.

Difficult drilling - cobble or boulder at 27 feet.

Very dense, wet, light gray brown, silty, fine SAND to fine sandy SILT.

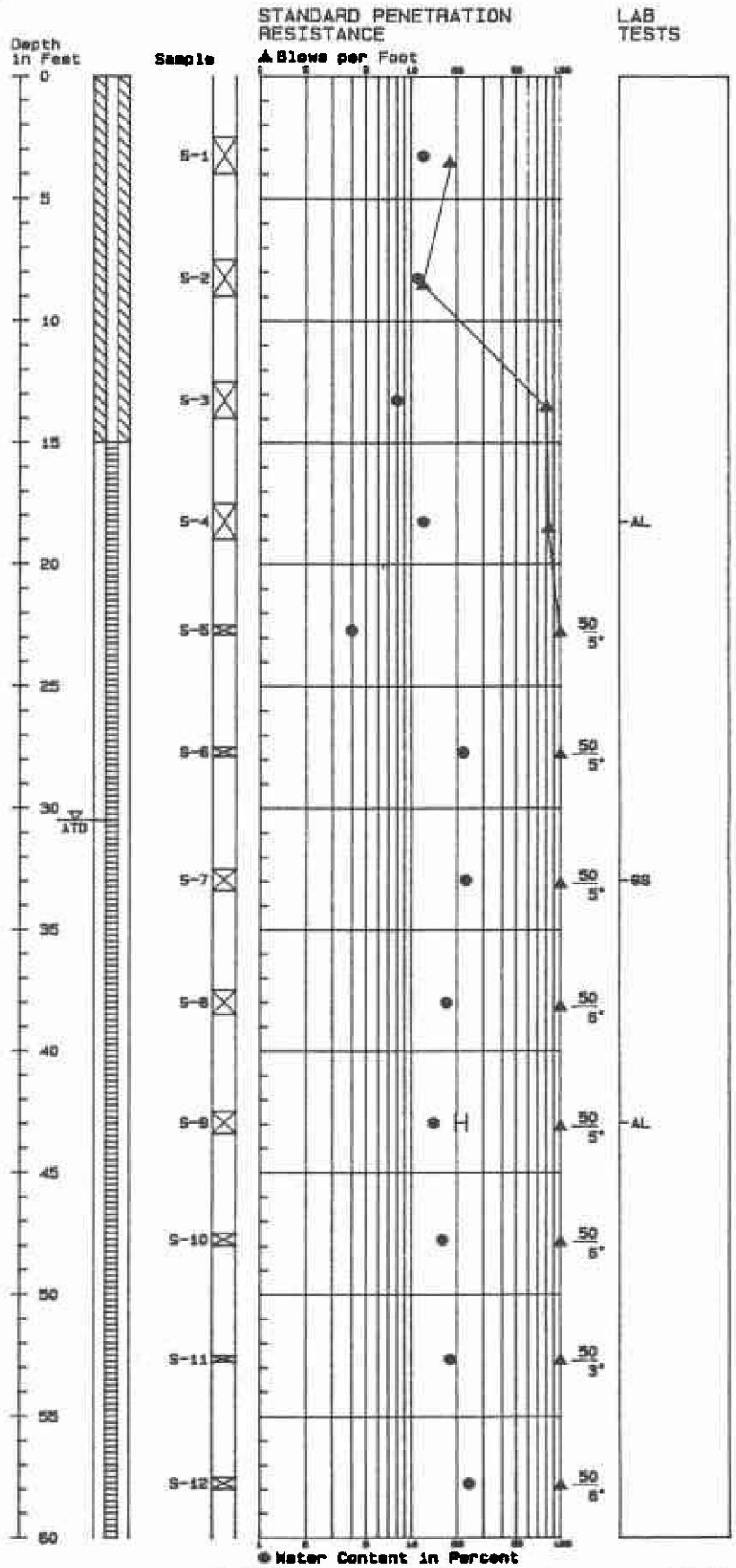
Hard, moist, gray, slightly gravelly sandy SILT. (TILL-like)

Clayey.

Becomes damp, some cementing.

Becomes slighlty clayey and slightly sandy.

Grades to hard, damp, gray, silty CLAY.



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Sheet 1 of 2 Figure A-5

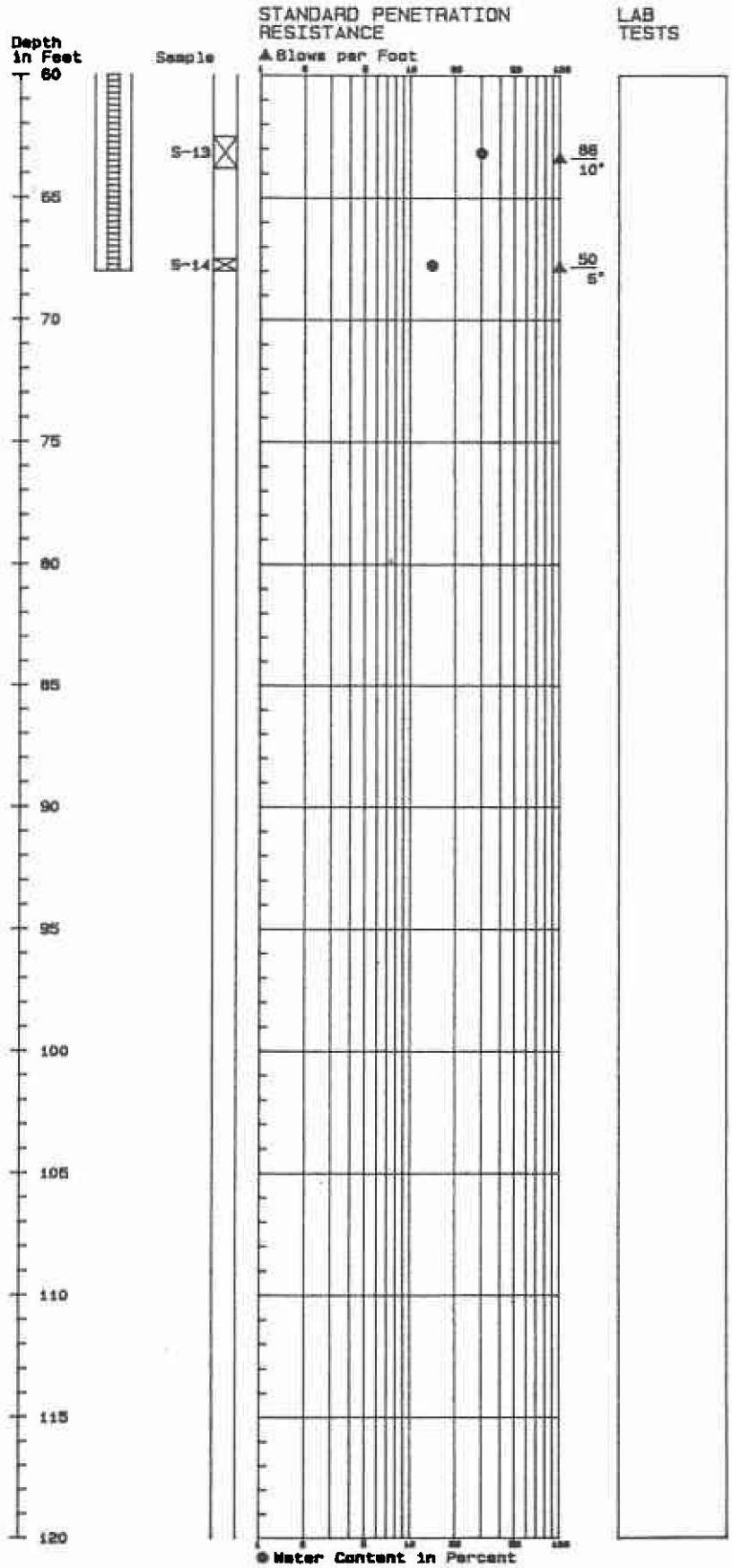
Boring Log B-4 Done

SOIL DESCRIPTIONS

Ground Surface Elevation in Feet 73

- Hard, damp, gray, silty CLAY.
- Slightly sandy, trace slickensides.
- Grades to sandy SILT or silty SAND.

Bottom of Boring at 68.0 Feet.
Completed 9/21/88.



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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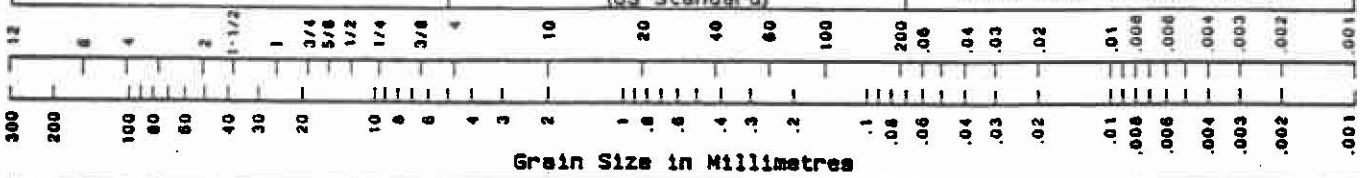
Sheet 2 of 2 Figure A-5

Unified Soil Classification (USC) System

Soil Grain Size

Size of Opening in Inches	Number of Mesh per Inch (US Standard)	Grain Size in Millimetres



COBBLES	GRAVEL	SAND	SILT and CLAY
Coarse-Grained Soils			Fine-Grained Soils

Coarse-Grained Soils

G W	G P	G M	G C	S W	S P	S M	S C
Clean GRAVEL <5% fines	*	GRAVEL with >12% fines		Clean SAND <5% fines	*	SAND with >12% fines	
GRAVEL >50% coarse fraction larger than No. 4				SAND >50% coarse fraction smaller than No. 4			
Coarse-Grained Soils >50% larger than No. 200 sieve							

G W and S W $\left(\frac{D_{60}}{D_{10}}\right) > 4$ for G W, > 6 for S W & $1 \leq \left(\frac{(D_{30})^2}{D_{10} \times D_{60}}\right) \leq 3$

G P and S P Clean GRAVEL or SAND not meeting requirements for G W and S W

G M and S M Atterberg limits below A Line with PI <4

G C and S C Atterberg limits above A Line with PI >7

* Coarse-grained soils with percentage of fines between 5 and 12 are considered borderline cases requiring use of dual symbols.

D_{10}, D_{30}, and D_{60} are the particle diameter of which 10, 30, and 60 percent, respectively, of the soil weight are finer.

Fine-Grained Soils

M L	C L	O L	M H	C H	O H	Pt
SILT	CLAY	Organic	SILT	CLAY	Organic	Highly Organic Soils
Soils with Liquid Limit <50%			Soils with Liquid Limit >50%			
Fine-Grained Soils >50% smaller than No. 200 sieve						

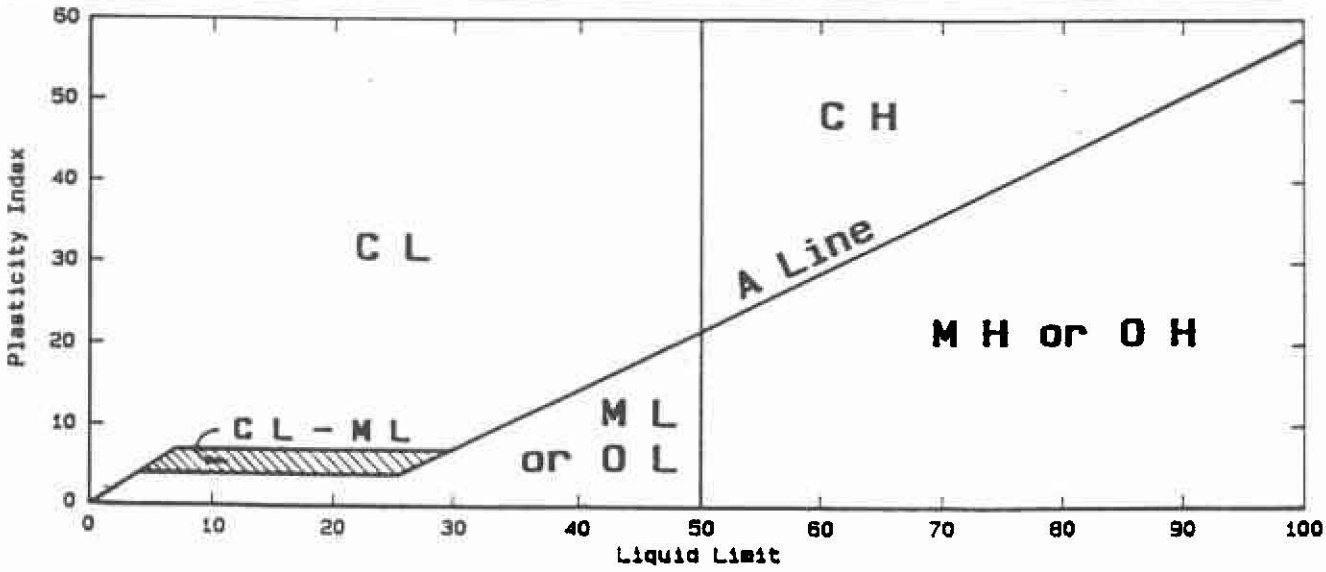


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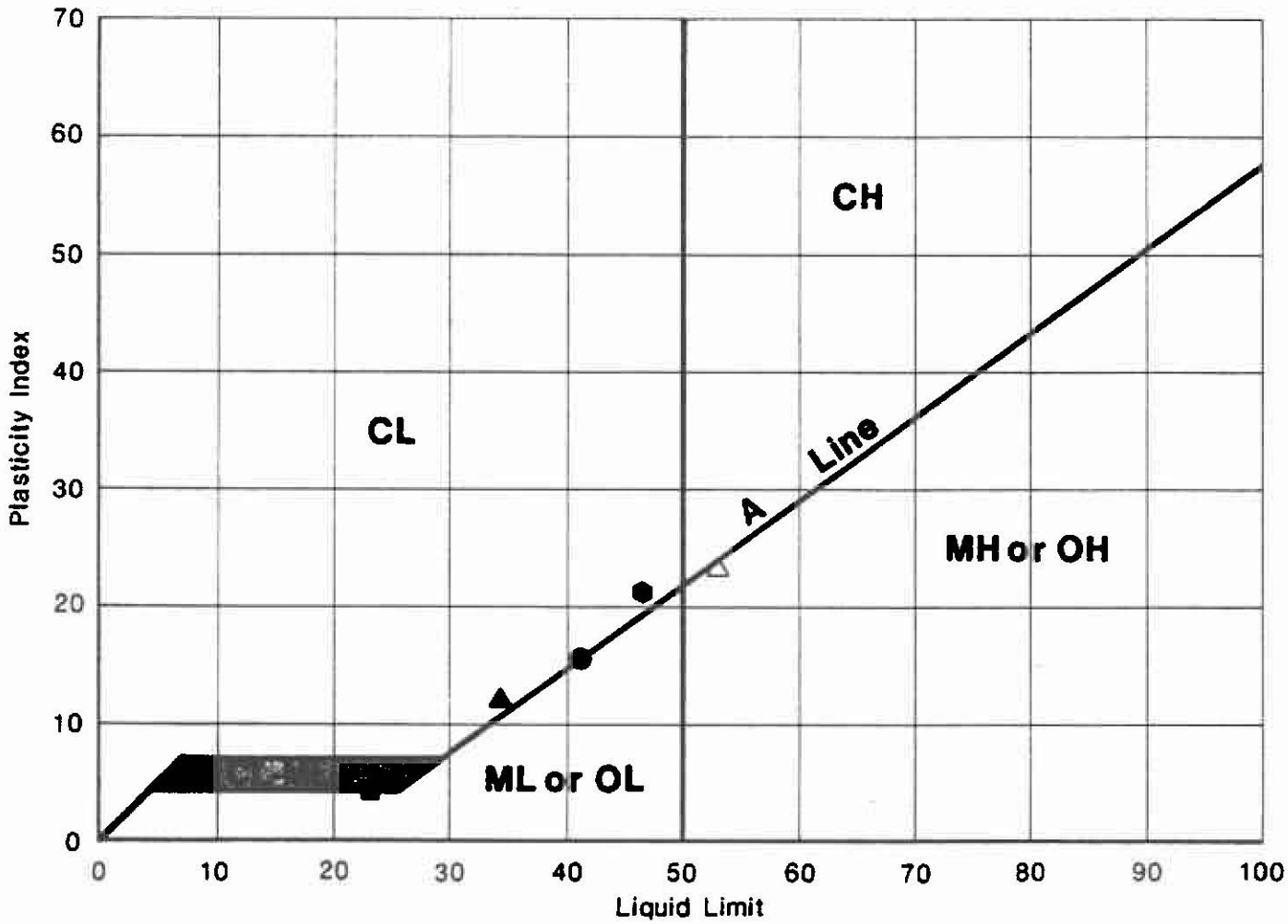
Figure B-1

Plasticity Chart



SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH IN FEET	WATER CONTENT IN PERCENT NAT.	L.L.	P.L.	P.I.	CLASSIFICATION	USC
▲	B-1	S-7	32.5 - 35.0	22	34	22	12	Silty CLAY.	CL
⬢	B-1	S-10	47.5 - 49.0	23	47	26	21	Silty CLAY.	CL
△	B-2	S-7	32.5 - 34.0	27	53	30	23	Clayey SILT.	MH
●	B-3	S-5	22.5 - 24.0	18	41	26	15	Silty CLAY.	CL
■	B-4	S-9	42.5 - 44.0	14	23	19	4	CLAY to SILT.	CL-ML

L.L. LIQUID LIMIT
P.L. PLASTIC LIMIT
P.I. PLASTICITY INDEX
USC UNIFIED SOIL CLASSIFICATION

J-2235 September 1988
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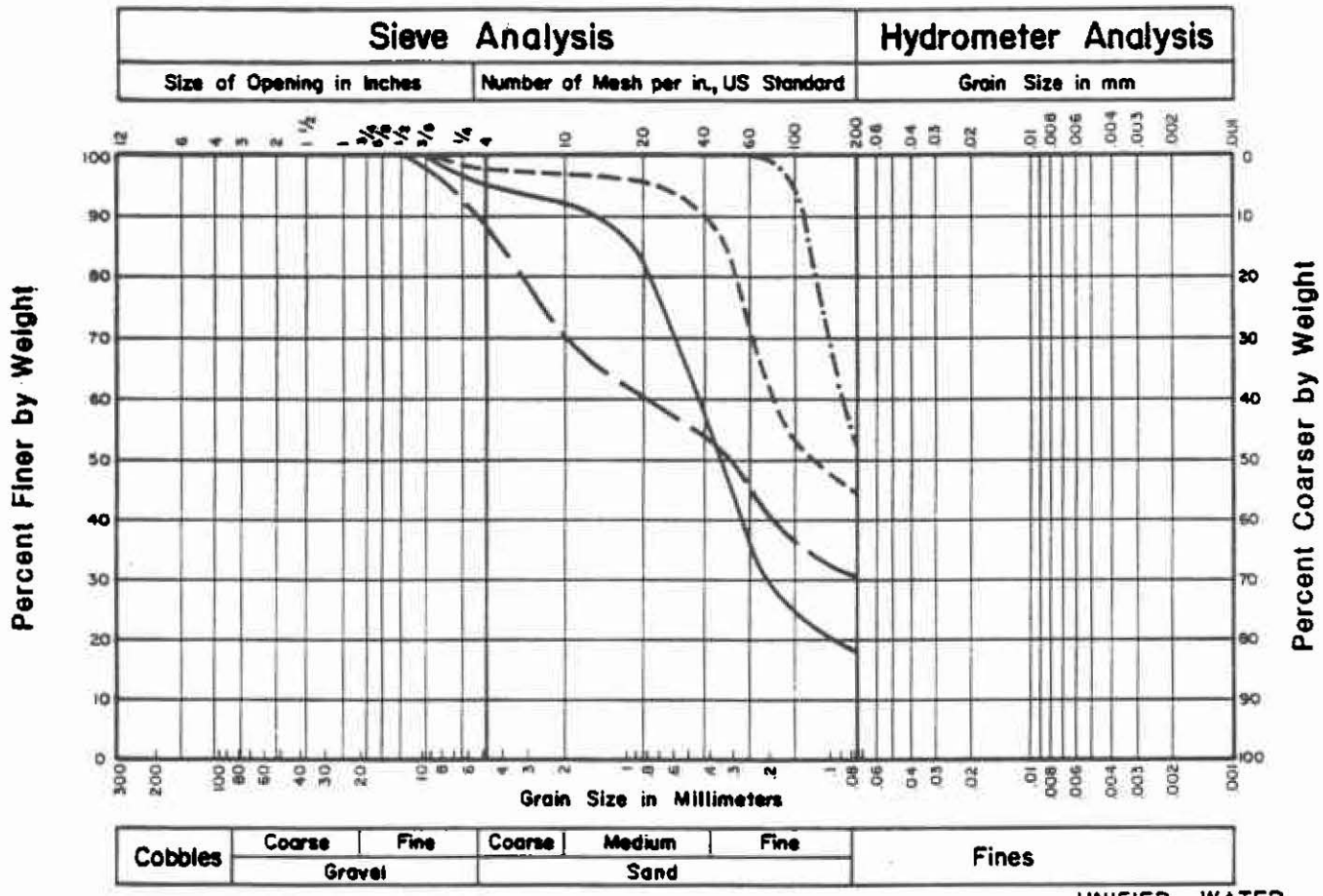
Figure B-2

Grain Size Classification



LINE SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH IN FEET	CLASSIFICATION	UNIFIED SOIL CLASS.	WATER CONTENT PERCENT
———	B-1	S-5	22.5 - 24.0	Slightly gravelly, silty, medium to fine SAND.	SM	12
— —	B-2	S-4	17.5 - 19.0	Slightly gravelly, very silty SAND.	SM	14
— — —	B-4	S-4	17.5 - 19.0	Very silty, medium to fine SAND.	SM	14
—·—·—	B-4	S-7	32.5 - 34.0	Very sandy SILT.	ML	23

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Figure B-3