

- City box number C-1 (B)
- Title/cover page w/the following info:
  - Company (author) name 1346
  - Report Date
  - Project name
  - 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 1<sup>st</sup> or 2<sup>nd</sup> page of text)
- Executive Summary and associated figures
- Table of Contents
- Project Location Plan/Map or Vicinity Map
- Site Plans, Boring Location Plans, or Exploration Plans
- Survey
- Geologic Maps
- Cross Sections/Subsurface Profiles
- Fill or Peat Thickness Maps and Contour Maps
- Boring Logs
- Geology Text (if no logs)
- 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
  - Grain Size Analyses/Hydrometer Analyses
  - Atterberg Limits
  - Strength tests: Triaxial, Unconfined, Direct Shear
  - Organic Content
  - <sup>14</sup>C or Radiocarbon Testing
  - Other \_\_\_\_\_
- Soil Chemical Analytical Testing Summary Tables
- Water/Groundwater Chemical Analytical Summary Tables
- Comments \_\_\_\_\_
- Date Copied 2/17 By *[Signature]*

8602974

4/6



# HARTCROWSER

Earth and Environmental Technologies

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MAR 21 1991

Dept. of Construction & Land Use

**Subsurface Explorations and  
Geotechnical Engineering Study  
Duplex and Four-plex Residential Buildings  
Seattle, Washington**

**Prepared for  
Coughlin/Lucas**

**J-1782**

**DRAFT  
SUBJECT TO REVISION  
DATE 8-28-86**

Address: 01803 Broadway E  
Well #: 70 E

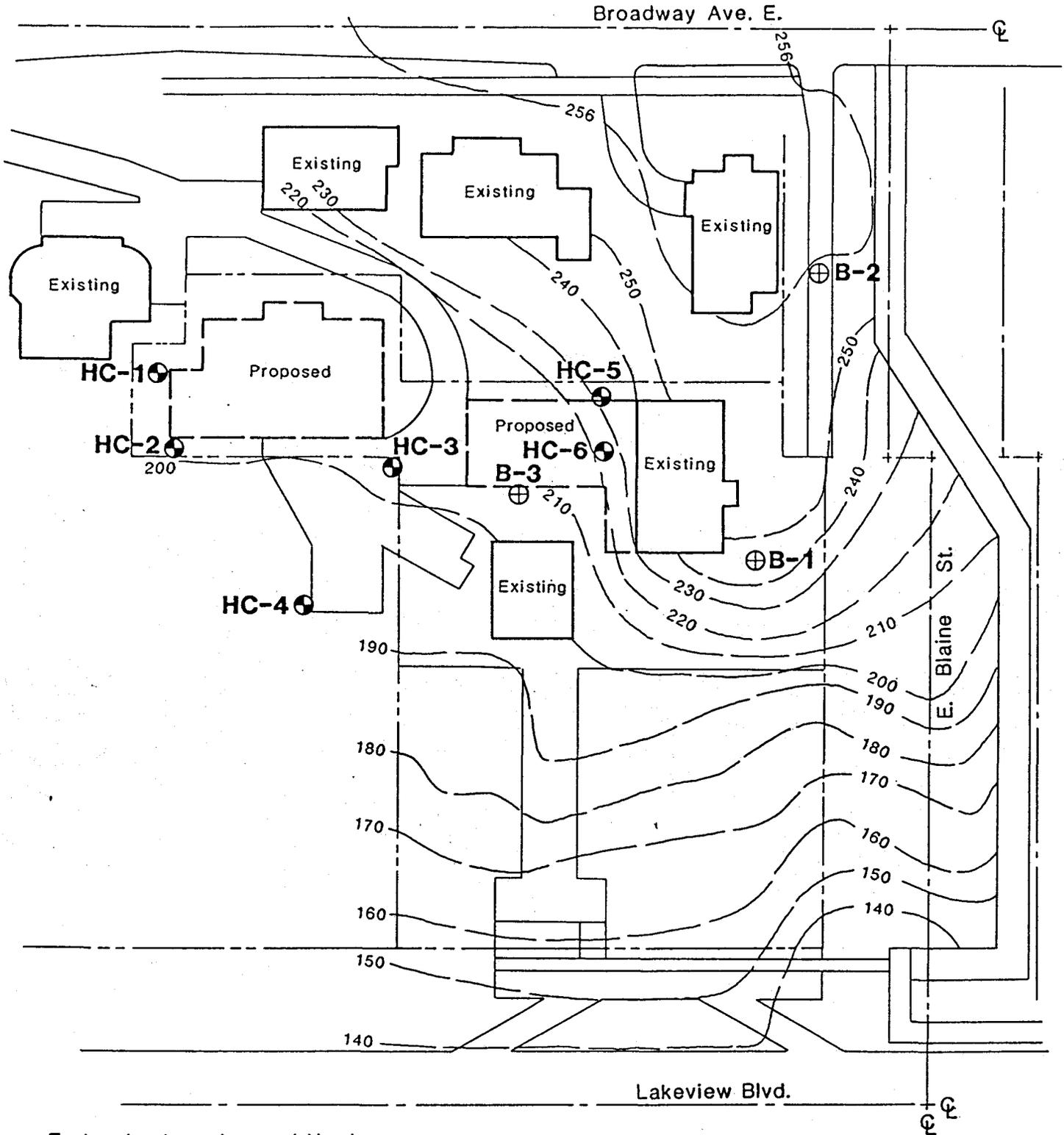
Project #: 8602974  
Permit #: 645147

J-1782

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# Site and Exploration Plan

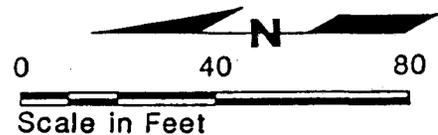


## Exploration Location and Number

**HC-1** ⊕ Hand Auger Hole, Current Study

**B-1** ⊕ Boring, Previous Study

Note: Base map prepared from drawing (undated)  
provided by Mr. Tom Lucas on August 21, 1986.



Scale in Feet

J-1782 August 1986  
HART-CROWSER & associates inc.

Figure 1

# 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	Standard Penetration Resistance in Blows/Foot	SILT or CLAY	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
Density		Consistency		
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

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

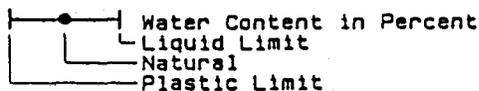
- Split Spoon
- Shelby Tube
- Cuttings
- Core Run
- \* No Sample Recovery
- P Tube Pushed, Not Driven

#### TEST PIT SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

### 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
- TV Torvane
- CBA California Bearing Ratio
- MD Moisture Density Curve
- AL Atterberg Limits



### 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)

# Hand Auger Boring HC-1

Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~ 208
S-1			0	(Loose to medium dense), damp, light brown to red-brown, very silty SAND with occasional GRAVEL and trace organics. (COLLUVIUM)
S-2	25		4	Stiff, moist, gray-brown, fine sandy SILT.
			4	Bottom of Hand Auger Boring at 4.0 Feet. Completed 7/23/86.
			5	
			6	
			7	
			8	
			9	

# Hand Auger Boring HC-2

Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~ 200
S-1			0	(Loose), dry, brown, silty SAND. (COLLUVIUM)
			1	(Hard), damp, gray-brown, slightly sandy SILT.
			2	Bottom of Hand Auger Boring at 1.5 Feet. Completed 7/23/86.
			3	
			4	
			5	
			6	
			7	
			8	
			9	

# Hand Auger Boring HC-3

Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~ 204
S-1	18		0	(Loose), damp, dark brown, silty SAND with trace organics. (COLLUVIUM)
S-2	20		1	(Stiff to hard), damp to moist, light brown, (weathered), sandy SILT.
			2	Bottom of Hand Auger Boring at 2.0 Feet. Completed 7/29/86.
			3	
			4	
			5	
			6	
			7	
			8	
			9	

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 conditions, if indicated, are at time of excavation. Conditions may vary with time.

# Hand Auger Boring HC-4

Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~192
S-1			0	(Loose to medium dense), damp to moist, dark brown, gravelly, silty SAND. (COLLUVIUM)
			1	
			2	
			3	
			4	
S-2	5		5	(Dense), moist, brown SAND. (NATURAL MATERIAL)
			5	Bottom of Hand Auger Boring at 5.0 Feet.
			6	Completed 7/29/86.
			7	
			8	
			9	

# Hand Auger Boring HC-5

Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~232
S-1			0	(Very loose), damp, brown, gravelly SAND. (FILL)
			1	
			2	
			3	Bottom of Hand Auger Boring at 3.0 Feet.
			4	Completed 7/29/86.
			5	
			6	
			7	
			8	
			9	

# Hand Auger Boring HC-6

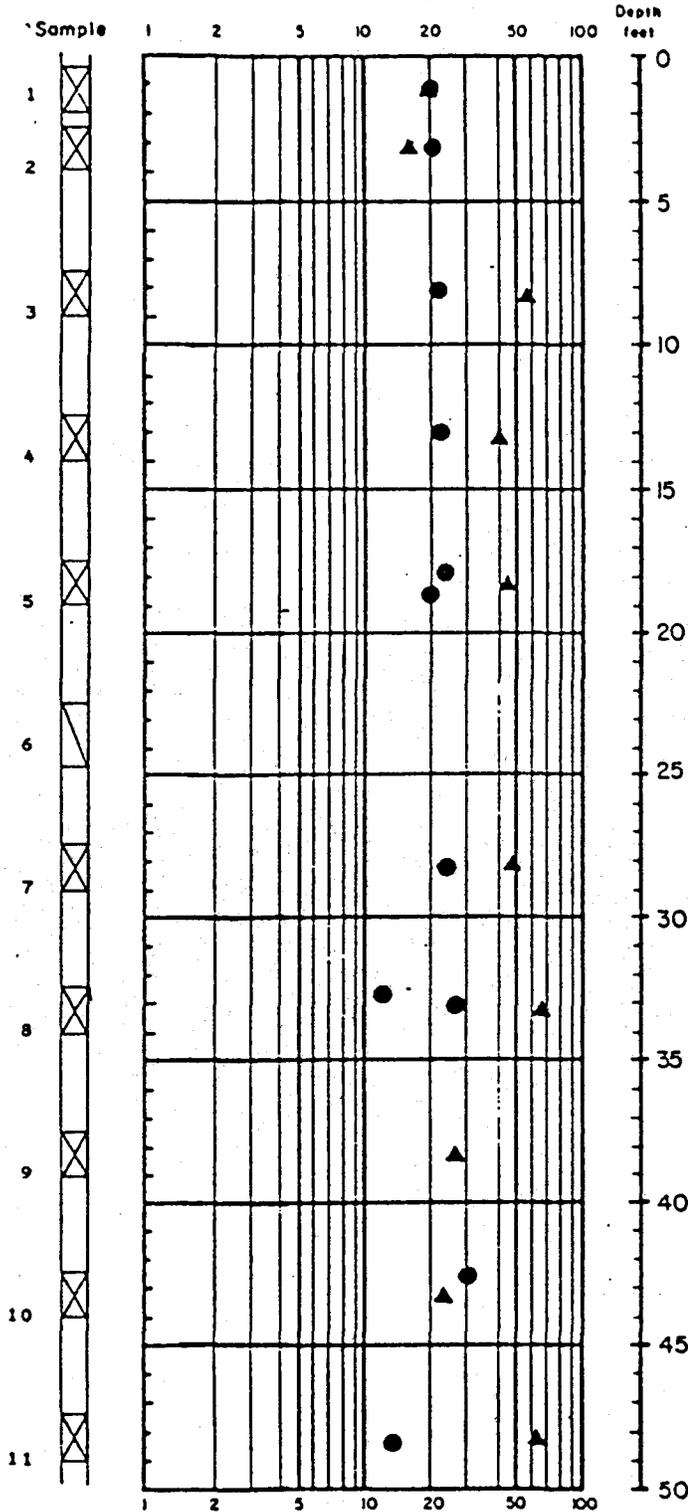
Sample	Water Content Percent	Lab Tests	Depth in Feet	SOIL DESCRIPTIONS
				Ground Surface Elevation in Feet ~222
S-1			0	(Hard), damp to moist, gray-brown, slightly fine sandy SILT.
			1	
			2	Bottom of Hand Auger Boring at 1.5 Feet.
			2	Completed 7/29/86.
			3	
			4	
			5	
			6	
			7	
			8	
			9	

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 conditions, if indicated, are at time of excavation. Conditions may vary with time.

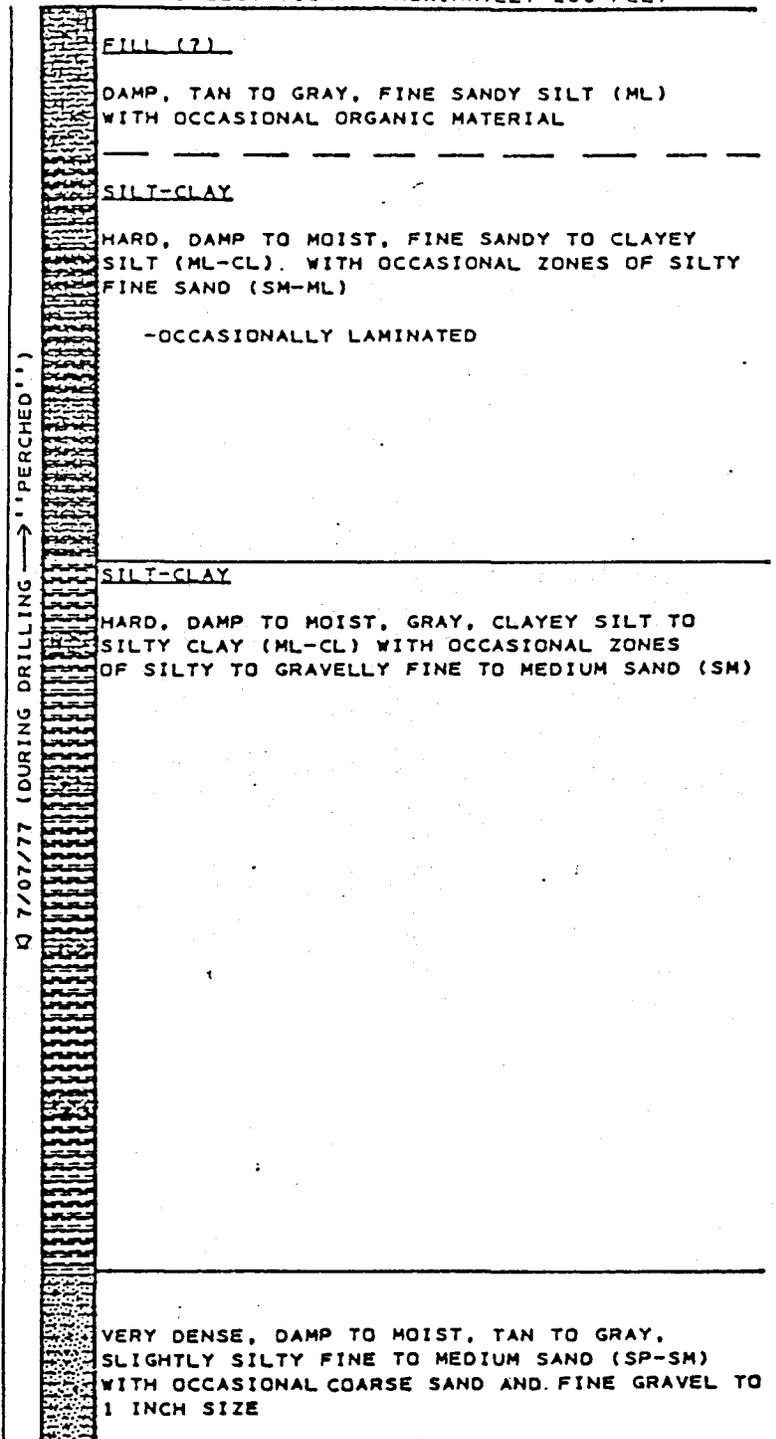
# Boring Log B-1

STANDARD PENETRATION RESISTANCE  
(140 pound weight, 30 inch drop)  
BLOWS PER FOOT ▲

## SOIL INTERPRETATION



GROUND ELEVATION APPROXIMATELY 250 FEET



WATER CONTENT  
PERCENT ●

### LEGEND

- ☒ 2" O.D. Split Spoon Sample
- ☒ 3" O.D. Shelby Sample
- \* No Sample Recovery
- ☒ Water Level
- ☒ Observation Well

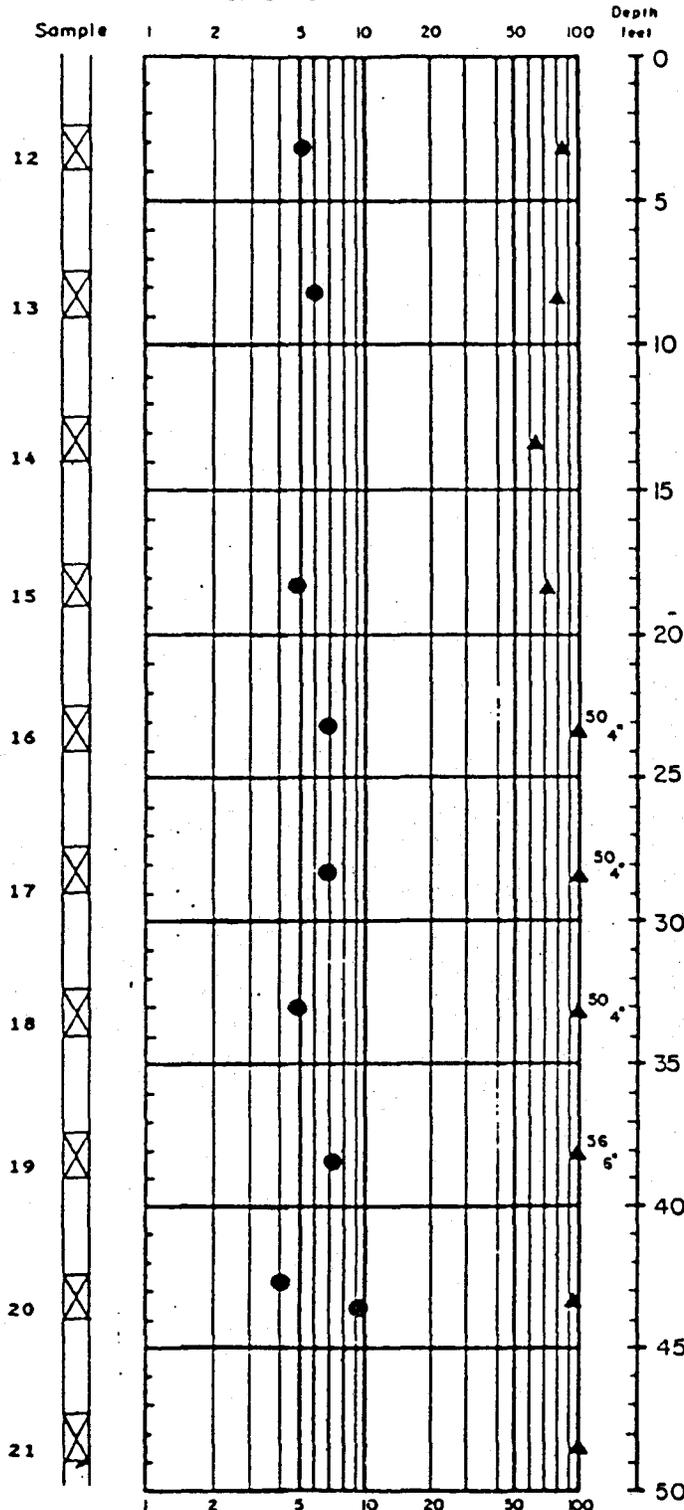
NOTE: Soil descriptions are interpretive and actual changes may be gradual.

J-1782 August 1986  
J-481 August 1977  
HART-CROWSER & associates inc.  
Sheet 1 of 2 Figure A-4

# Boring Log B-1

STANDARD PENETRATION RESISTANCE  
(140 pound weight, 30 inch drop)  
BLOWS PER FOOT ▲

SOIL INTERPRETATION



BOTTOM OF BORING 99.0 FEET  
COMPLETED 7/7/77

LEGEND

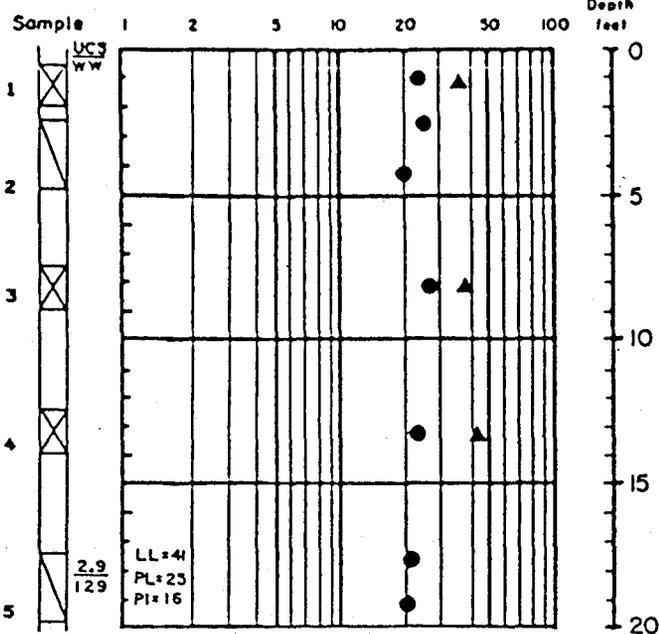
- ☒ 2" O.D. Split Spoon Sample
- ☒ 3" O.D. Shelby Sample
- \* No Sample Recovery
- ▽ Water Level
- Observation Well

NOTE: Soil descriptions are interpretive and actual changes may be gradual.

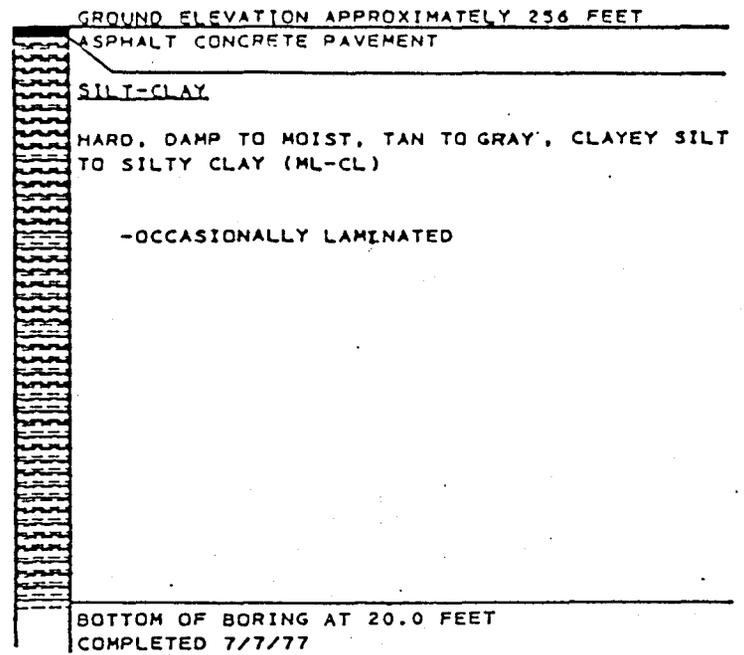
J-1782 August 1986  
J-481 August 1977  
HART-CROWSER & associates inc.  
Sheet 2 of 2 Figure A-4

# Boring Log B-2

STANDARD PENETRATION RESISTANCE  
(140 pound weight, 30 inch drop)  
BLOWS PER FOOT ▲

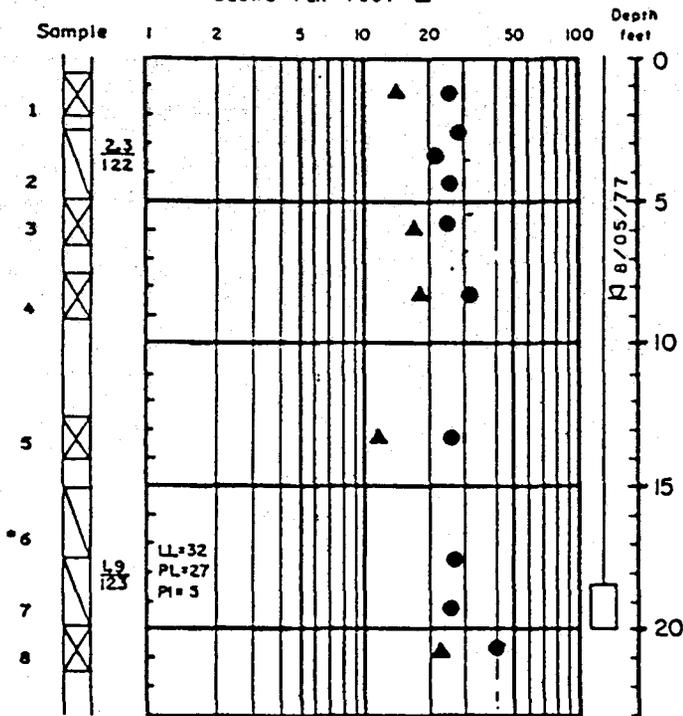


## SOIL INTERPRETATION

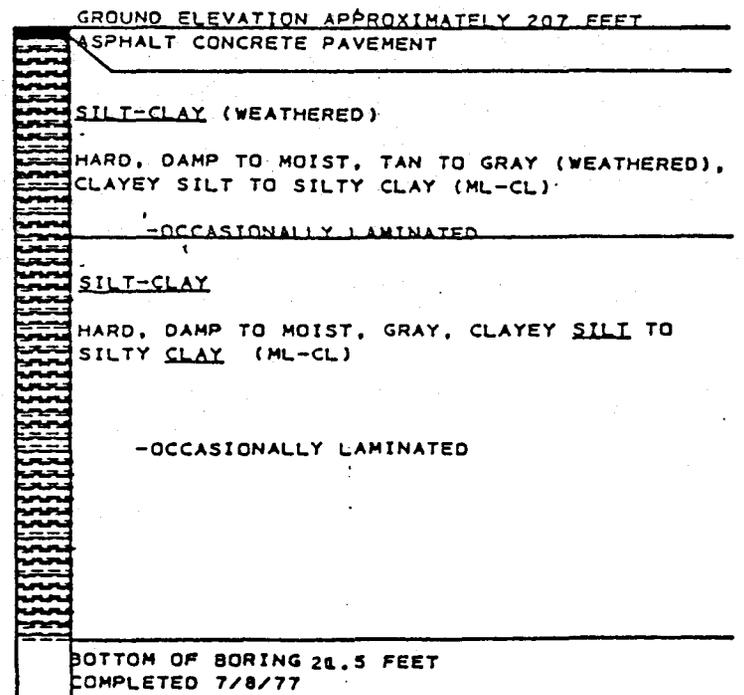


# Boring Log B-3

STANDARD PENETRATION RESISTANCE  
(140 pound weight, 30 inch drop)  
BLOWS PER FOOT ▲



## SOIL INTERPRETATION



WATER CONTENT PERCENT ●

### LEGEND

☒ 2" O.D. Split Spoon Sample

☒ 3" O.D. Shelby Sample

\* No Sample Recovery

Water Level

Observation Well

UCS Unconfined Compressive Strength (ksi)

WW Wet Unit Weight (pcf)

LL = Liquid Limit

PL = Plastic Limit

PI = Plasticity Index

J-1782

J-481

HART-CROWSER & associates inc.

August 1986

August 1977

NOTE: Soil descriptions are interpretive and actual changes may be gradual.

APPENDIX B  
LABORATORY TESTING PROGRAM

A laboratory testing program consisting of visual soil classifications and water content determinations was performed for this study. Moisture content tests were performed on disturbed samples recovered from the hand auger borings. The laboratory procedures followed are outlined below.

Soil Classification

Soil samples recovered in the explorations were visually classified in the field and then taken to our laboratory where the classifications were verified in a relatively controlled environment. Visual-manual field and laboratory observations include density/consistency, moisture condition, grain size and plasticity estimates.

Water Content Determinations

Water contents were determined for most samples recovered in the explorations in general accordance with ASTM D 2216 as soon as possible following their arrival in our laboratory. Water contents were not determined for very small samples nor samples where large gravel contents would result in values considered unrepresentative. The results of these tests are presented at the respective sample depth on the exploration logs.