2419 HARBOR AV SW

Earth Consultants Inc.

1674

SUPPLEMENTAL

GEOTECHNICAL ENGINEERING STUDY

HARBOR SQUARE

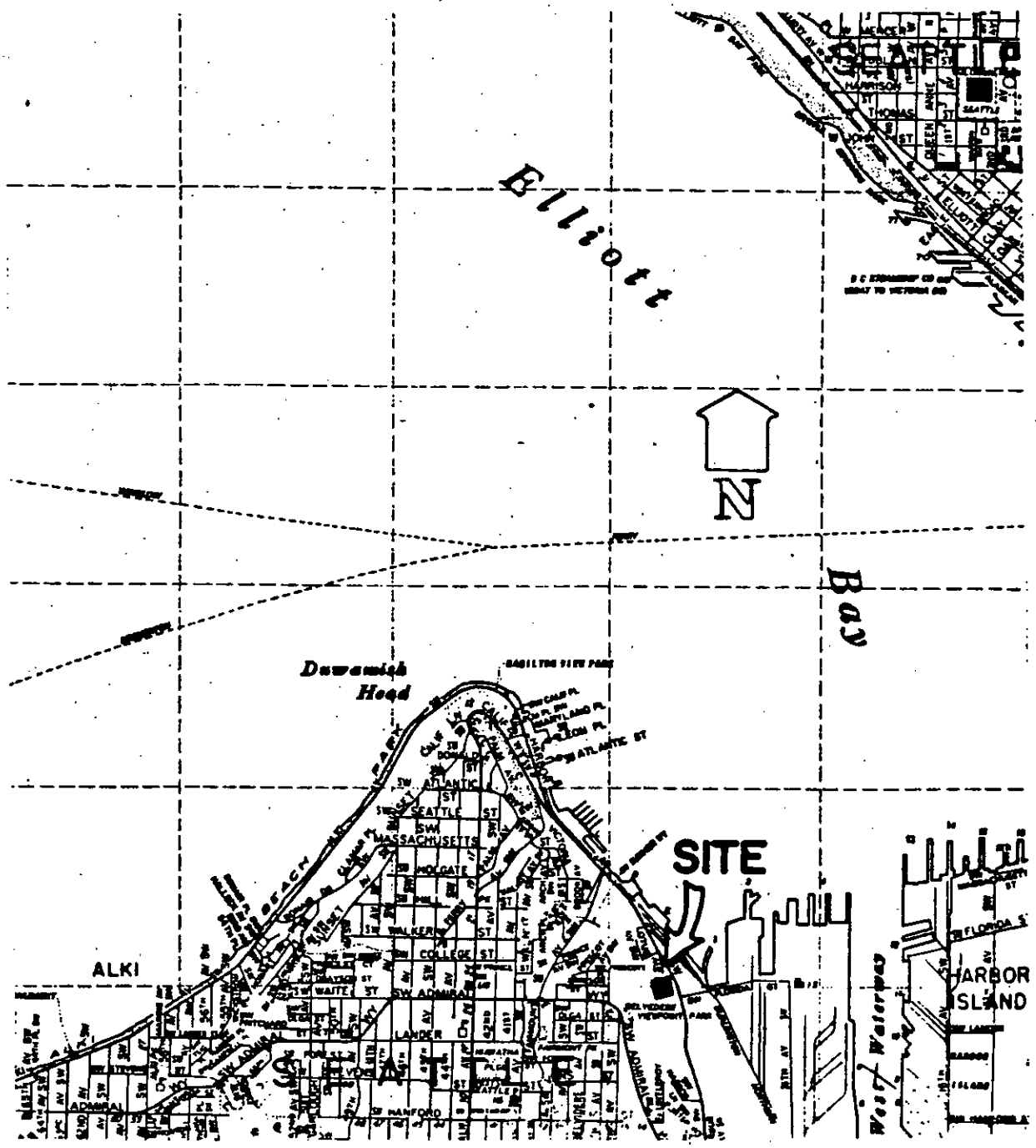
SEATTLE, WASHINGTON

E-1910-1 #870513

FOR

GABBERT BROWELEIT PETERSON ARCHITECTS

2419 Harbor Av SW 645161 49W



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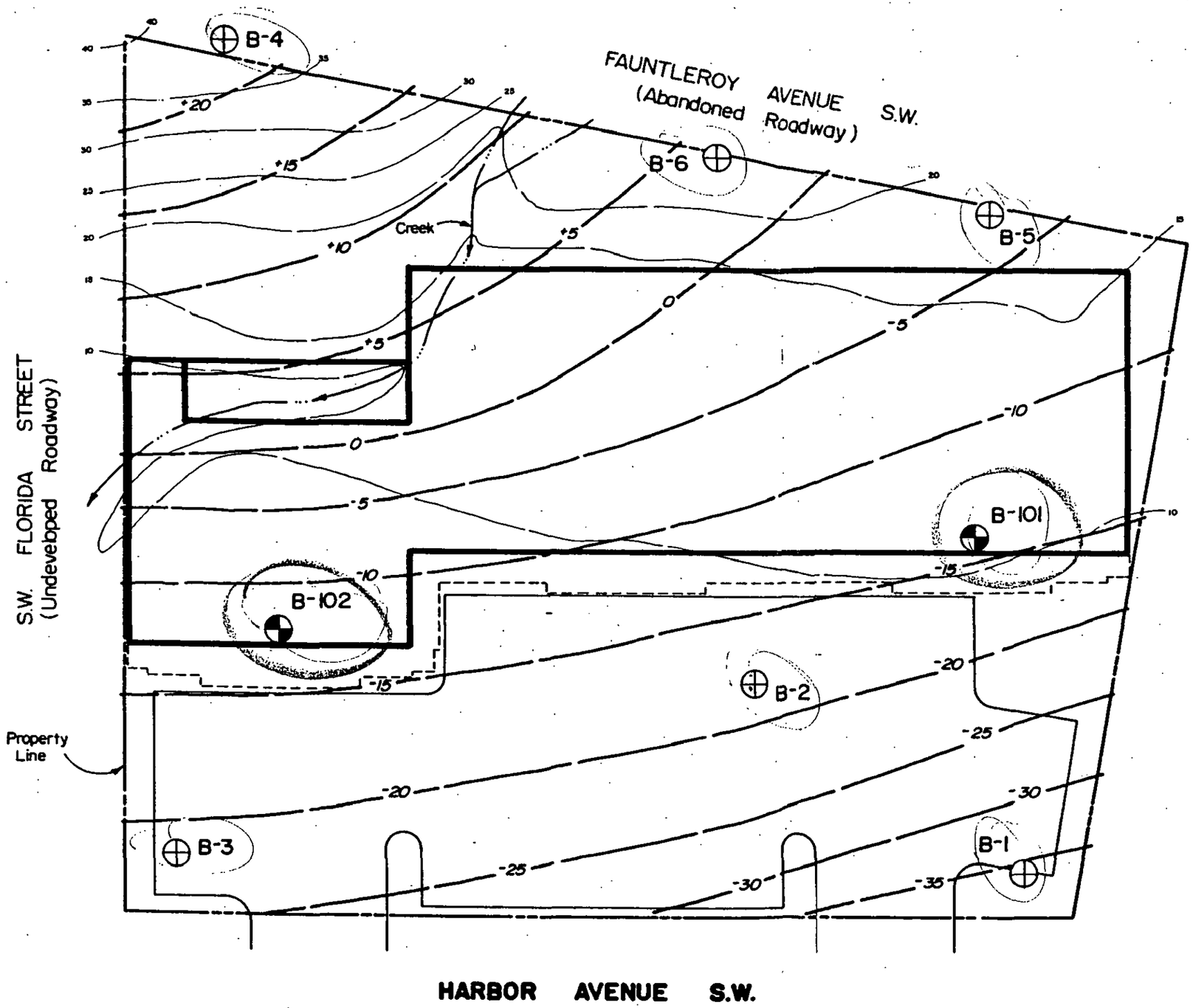
Vicinity Map
Harbor Square
Seattle, Washington

Proj. No. 1910-1	Date June '85	Plate 1



N

Approximate Scale

0 10 20 40 ft.

LEGEND

B-101 Approximate Boring Location

B-1 Approximate Location of Previous Boring from E.C.I. Report Dated 4/14/83

Proposed Building

-15 Approximate Contours of Contact with Very Dense Sands and Gravels (Elevation)

Reference :
Sheet 1
Preliminary Site Plan
By Gabbert Broweleit Peterson Architects P.S.
Dated 4/25/85

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Boring Location Plan
Harbor Square
Seattle, Washington

Proj. No. 1910-1	Date June '85	Plate 2

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils	Gravel And Gravelly Soils	Clean Gravels (little or no fines)		GW gw	Well-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
				GP gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
	More Than 50% Coarse Fraction Retained On No. 4 Sieve	Gravels With Fines (appreciable amount of fines)		GM gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
More Than 50% Material Larger Than No. 200 Sieve Size	Sand And Sandy Soils	Clean Sand (little or no fines)		SW sw	Well-Graded Sands, Gravelly Sands, Little Or No Fines
				SP sp	Poorly-Graded Sands, Gravelly Sands, Little Or No Fines
	More Than 50% Coarse Fraction Passing No. 4 Sieve	Sands With Fines (appreciable amount of fines)		SM sm	Silty Sands, Sand-Silt Mixtures
				SC sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils	Silts And Clays	Liquid Limit Less Than 50		ML ml	Inorganic Silts & Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ Slight Plasticity
				CL cl	Inorganic Clays Of Low To Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL ol	Organic Silts And Organic Silty Clays Of Low Plasticity
More Than 50% Material Smaller Than No. 200 Sieve Size	Silts And Clays	Liquid Limit Greater Than 50		MH mh	Inorganic Silts, Micaceous Or Diatomaceous Fine Sand Or Silty Soils
				CH ch	Inorganic Clays Of High Plasticity, Fat Clays
				OH oh	Organic Clays Of Medium To High Plasticity, Organic Silts
Highly Organic Soils				PT pt	Peat, Humus; Swamp Soils With High Organic Contents

Topsoil		Humus And Duff Layer
Fill		Highly Variable Constituents

The Discussion In The Text Of This Report Is Necessary For A Proper Understanding Of The Nature Of The Material Presented In The Attached Logs

Notes:

Dual symbols are used to indicate borderline soil classification. Upper case letter symbols designate sample classifications based upon laboratory testing; lower case letter symbols designate classifications not verified by laboratory testing.

I 2" O.D. SPLIT SPOON SAMPLER
II 2.4" I.D. RING SAMPLER OR SHELBY TUBE SAMPLER
P SAMPLER PUSHED
✱ SAMPLE NOT RECOVERED
▽ WATER LEVEL (DATE)
WATER OBSERVATION WELL

C TORVANE READING, tsf
qu PENETROMETER READING, tsf
W MOISTURE, percent of dry weight
pcf DRY DENSITY, pounds per cubic ft.
LL LIQUID LIMIT, percent
PI - PLASTIC INDEX

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LEGEND

Proj. No. 1910-1 | Date June '85 | Plate 3

BORING NO. 1

Logged By CRL

Date 1/19/83

ELEV. 8.5±

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
	SM SP	Gray-brown silty fine SAND with clay to fine to medium SAND with silt and zones of gravels, organics, and silty clay lenses, wet, very loose to meidum dense (upper 20' is possible fill material) (clayey lens at 23') (sandy silty CLAY lens at 43')	5	1/31	2	15	
				2/10	7	10	
					13	29	q_u=3.0 tsf
			10		14	21	
			15	1/20	7	25	
					11	23	
					3	23	
			20				
					3	40	q_u=1.0 tsf LL=60,PI=36
			25				
					17	15	
			30				
					11	17	
			35				
					34	9	
			40				
					7	26	q_u=0.75tsf
			45				
	GP GM	Brown sandy GRAVEL with silt, wet, dense grading very dense below 50'			43	11	
			50		50/4"	8	
			55		50/5"	7	

Boring terminated at 58.5' below existing grade.
Groundwater observation well installed to bottom of boring.

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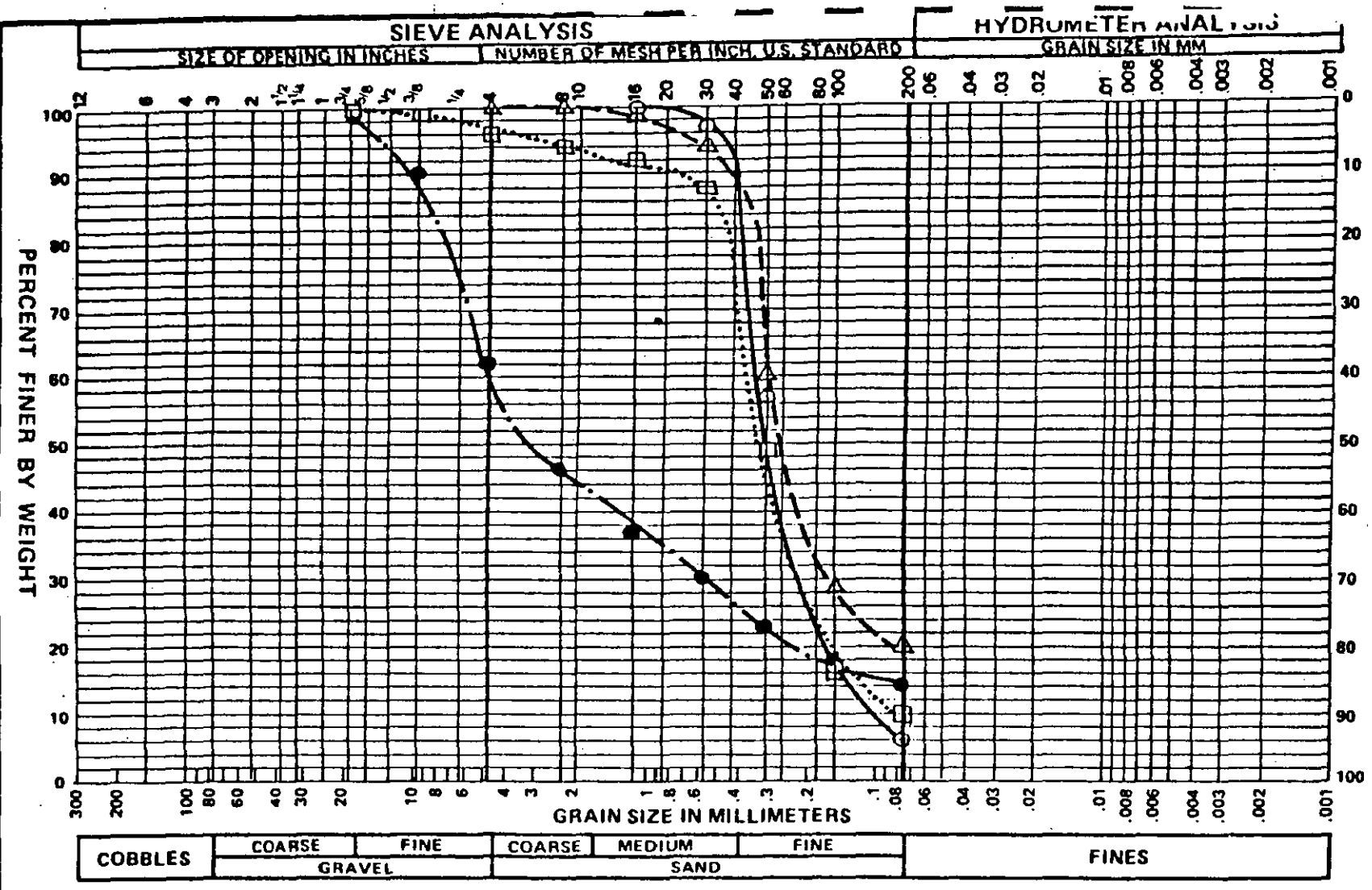
BORING LOG

HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910	Date Feb.'83	Plate 6



KEY	Boring or Test Pit No.	DEPTH (ft.)	USCS	DESCRIPTION	Moisture Content (%)	LL	PL
○ ———	B-1	4.5	SM/SP	fine SAND with silt	10		
△ — — —	B-3	10.0	SM	silty fine SAND	23		
□ ·····	B-4	45.0	SM/SP	fine SAND with silt and trace of gravel	20		
● —·—	B-5	25.0	SM	silty gravelly SAND	10		

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Proj. No. 1910

Date Feb. '83

Plate 12

GRAIN SIZE ANALYSIS

HARBOR SQUARE
SEATTLE, WASHINGTON

BORING NO. 2

Logged By CRL
Date 1/20/83

ELEV. 9^{5+}

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
	SM	Brown silty fine SAND with zones of organics and silty clay, wet, very loose to medium dense (lens of silty CLAY at 10') (log encountered at 10') (upper 20' is possible fill material) (lens of sandy silty CLAY at 23')	5 10 15 20 25	1/31 2/7 2/10	6 2 1 57/10" 13 6 3	23 28 28 32 22 31 38	q_u<0.5 tsf q_u=0.5 tsf
	GM GP	Brown sandy GRAVEL with silt, wet, dense grading very dense below 30'	30 35 40		40 50/4" 76 50/4"	8 10 8 --	

Boring terminated at 43.5' below existing grade.
Groundwater observation well installed to bottom of boring.

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BORING LOG
HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910	Date Feb.'83	Plate 7

BORING NO. 3

Logged By CRL

Date 1/20/83

ELEV. 9^{5+}

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
	SM	Brown to gray silty fine SAND with zones of gravel and silty clay, wet, loose to medium dense (upper 20' is possible fill material)			3	17	
			5	1/31	3	21	q_u=0.5 tsf
				2/7			
				2/10	11	31	
			10		17	23	
					15	21	
			15				
					14	22	
			20				
					10	27	
			25				
					20	13	
			30				
	GM GP	Gray sandy GRAVEL with silt, wet, very dense			50/5"	6	
			35				
					50/6"	9	
			40				
					81	9	
			45				
					90	7	

Boring terminated at 49' below existing grade.
Groundwater observation well installed to bottom of boring.

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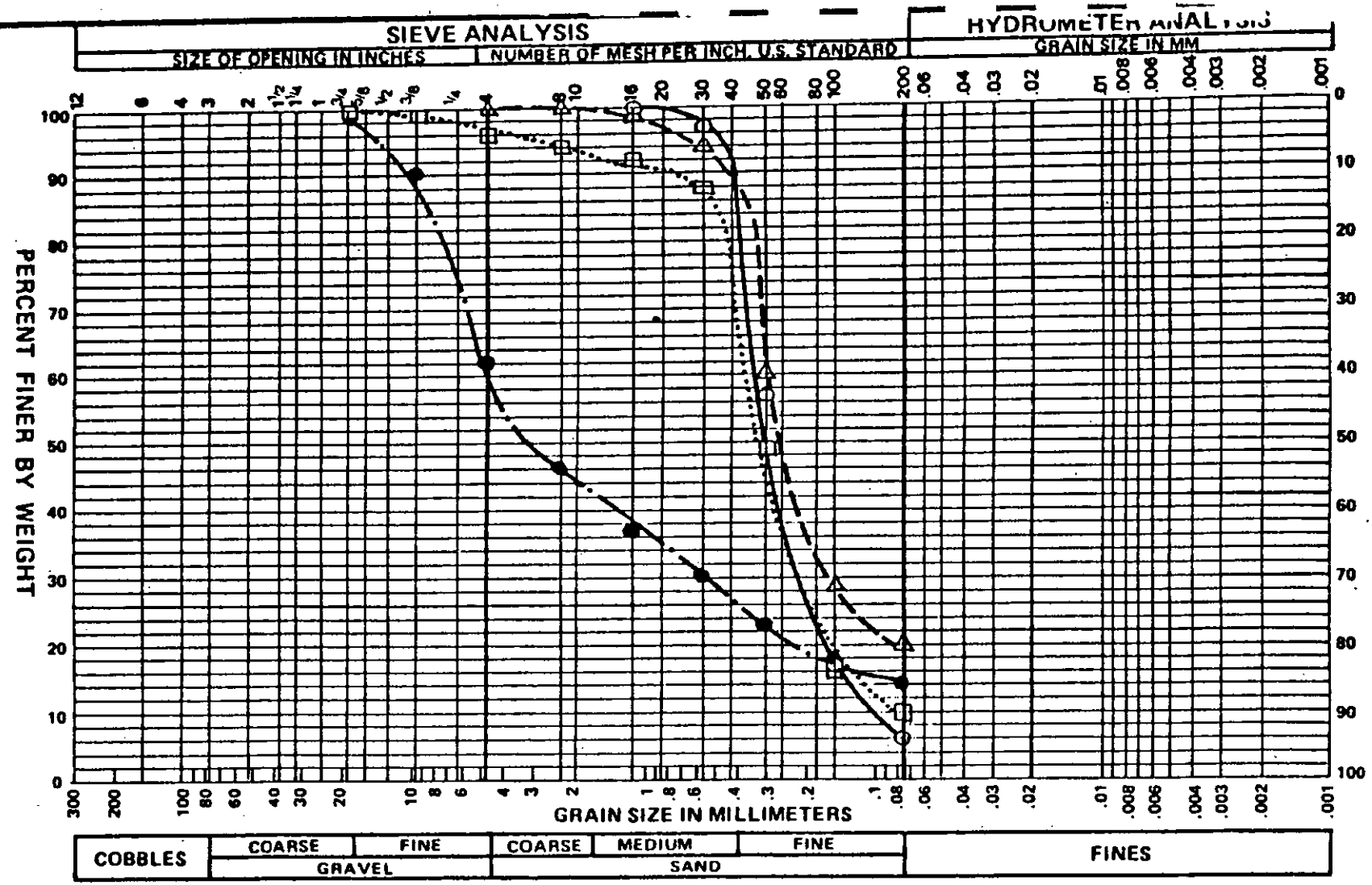
BORING LOG

HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910 | Date Feb.'83 | Plate 8



KEY	Boring or Test Pit No.	DEPTH (ft.)	USCS	DESCRIPTION	Moisture Content (%)	LL	PL
○ ——	B-1	4.5	SM/SP	fine SAND with silt	10		
△ — — —	B-3	10.0	SM	silty fine SAND	23		
□ ·····	B-4	45.0	SM/SP	fine SAND with silt and trace of gravel	20		
● —·—	B-5	25.0	SM	silty gravelly SAND	10		

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Proj. No. 1910

Date Feb. '83

Plate 12

GRAIN SIZE ANALYSIS
HARBOR SQUARE
SEATTLE, WASHINGTON

BORING NO. 4

Logged By CRL

Date 1/25/83

ELEV. 42±

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
		(18" brown sandy TOPSOIL, wet, loose					
	ML	Gray-brown clayey SILT, wet, stiff to very stiff	5		8	34	q_u=2.0 tsf 94 pcf
					23	30	q_u>4.5 tsf
					28	33	q_u>4.5 tsf 91 pcf
	CL ML	Brown to gray silty CLAY to clayey SILT with silt zones, moist, hard, with contorted bedding and occasional fractures	10		26	32	LL=43, PI=14 q_u>4.5 tsf
			15		38	31	q_u>4.5 tsf 93 pcf
			20		46	20	
			25		50/5"	11	
	SM SP	Brown-gray gravelly SAND with silt to silty gravelly SAND with zones of sandy GRAVEL, wet, dense grading very dense below 25'	30		50/5"	11	
				▽ 1/31/83			
			35		50/5"	11	
				▽ 2/7/83			
		(grades below 40' to fine SAND with silt and gravel)	40		50/6"	11	
			45		88/11"	20	
			50		83	22	

Boring terminated at 51.5' below existing grade.
Water observation well installed to bottom of boring.

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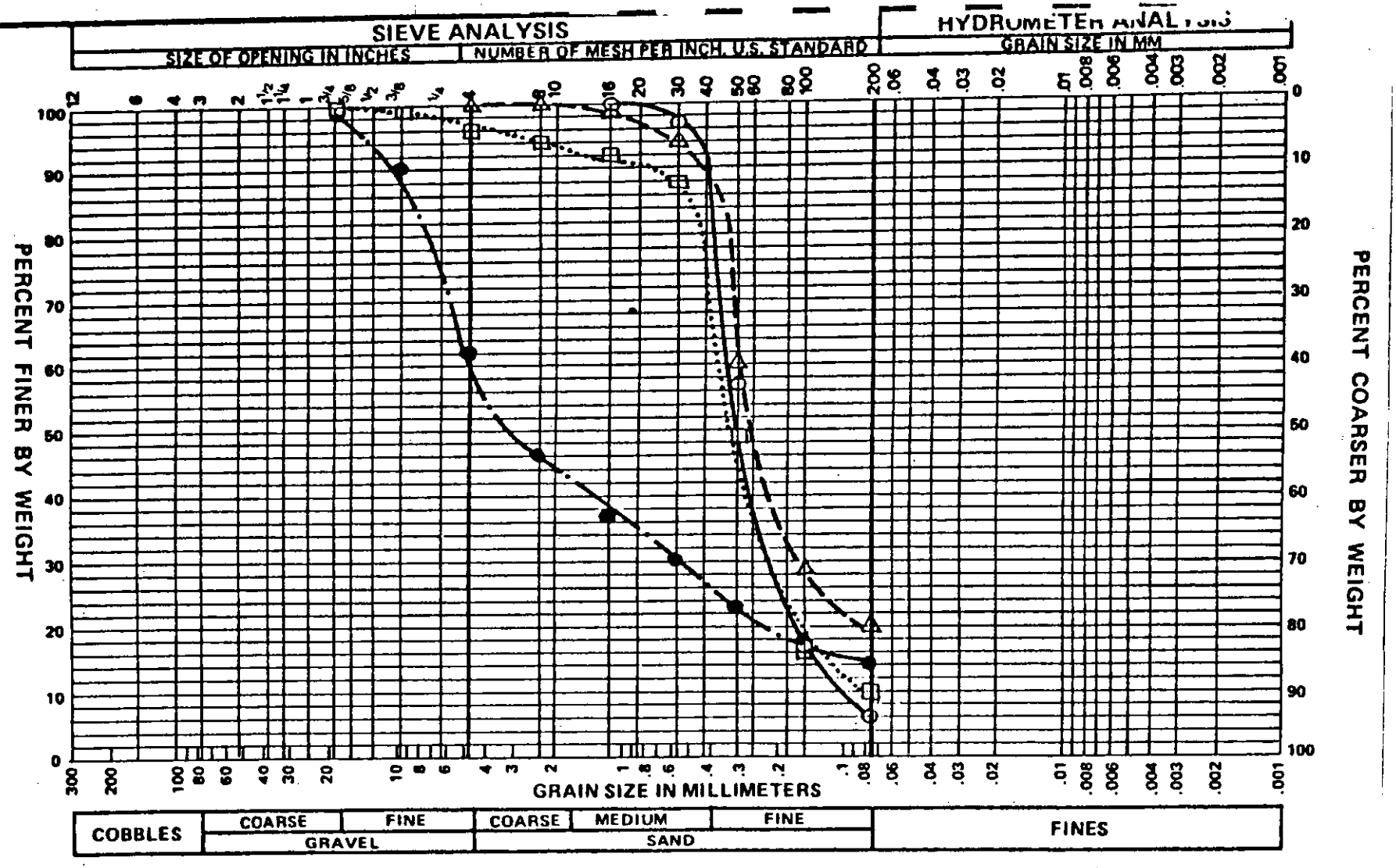
BORING LOG

HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910	Date Feb.'83	Plate 9



KEY	Boring or Test Pit No.	DEPTH (ft.)	USCS	DESCRIPTION	Moisture Content (%)	LL	PL
○ ———	B-1	4.5	SM/SP	fine SAND with silt	10		
△ – – –	B-3	10.0	SM	silty fine SAND	23		
□ ·····	B-4	45.0	SM/SP	fine SAND with silt and trace of gravel	20		
● —·—	B-5	25.0	SM	silty gravelly SAND	10		

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Proj. No. 1910

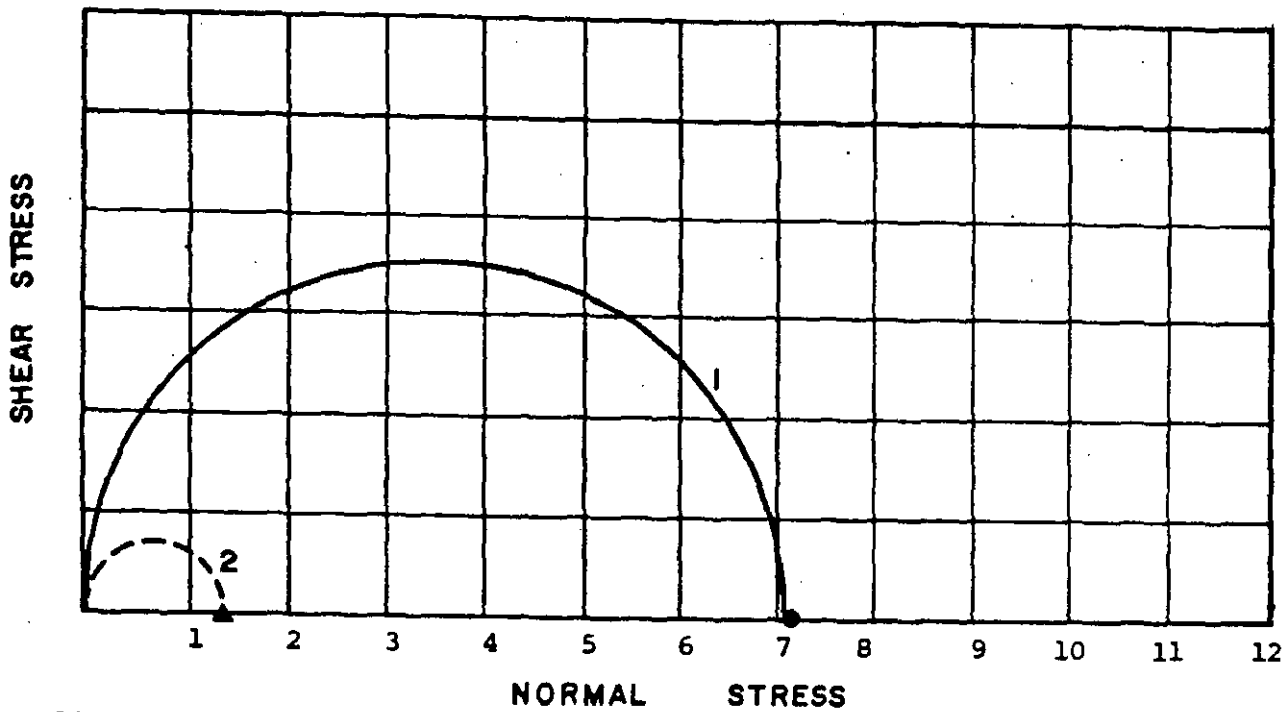
Date Feb. '83

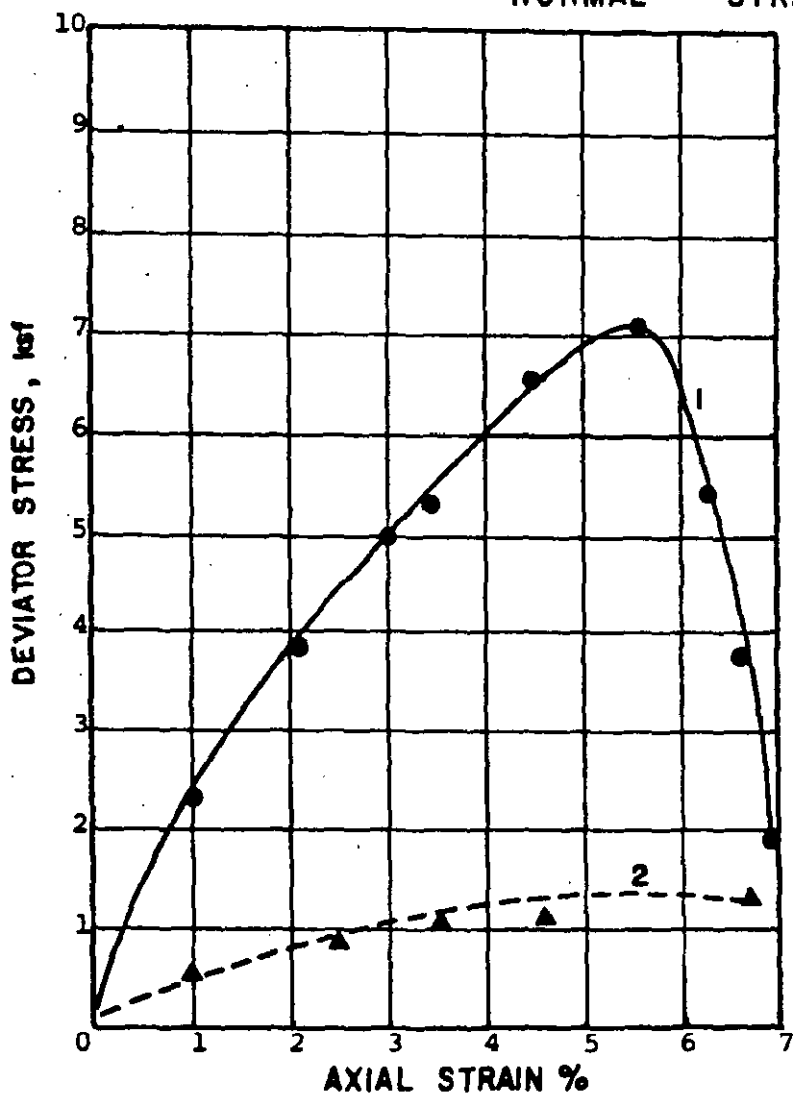
Plate 12

GRAIN SIZE ANALYSIS

HARBOR SQUARE
SEATTLE, WASHINGTON

TRIAXIAL COMPRESSION TEST REPORT





TEST NO.	1	2	
INITIAL MOISTURE	33	48	
DRY DENSITY pcf	91	74	
FINAL MOISTURE	33	48	
CONSOLIDATION PRESSURE psi	--	--	
TIME TO FAILURE	6.6	6.7	
INITIAL DIAM. in	2.41	2.41	
INITIAL HEIGHT in	5.72	4.81	

SHEAR VALUES ϕ = _____
c = _____

TYPE OF TEST _____

METHOD OF SATURATION _____

RATE OF STRAIN 1%/min.

SAMPLE TYPE _____

1 BORING B-4 DEPTH 7.5

2 BORING B-5 DEPTH 10.0

SAMPLE _____ DATE _____

PLATE 13

BORING NO. 5

Logged By CRL

Date 1/27/83

ELEV. 19±

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
		(30" brown sandy TOPSOIL, wet, loose)					
	ML CH CL	Gray fractured silty CLAY to clayey SILT with occasional layers of organic debris and silty sand zones, wet, medium stiff to stiff			9	49	73 pcf q_u=2.0 tsf
			5		7	--	
					8	54	66 pcf q_u=1.0 tsf LL=45,PI=14
			10		7	48	74 pcf q_u=1.0 tsf
					6	53	LL=61,PI=36
			15 ▽ 2/7/83 1/31/83		6	42	71 pcf q_u=1.0 tsf
			20		4	20	79 pcf q_u=2.0 tsf LL=60,PI=33 q_u=0.5 tsf
	SM GM	Gray-brown silty gravelly SAND to silty sandy GRAVEL, wet, very dense	25		50/6"	10	
		grades below 32' to:	30		135/6"	9	
		Gray silty fine to medium SAND, very dense	35		50/6"	20	

Boring terminated at 36' below existing grade.
Groundwater observation well installed to bottom of boring.

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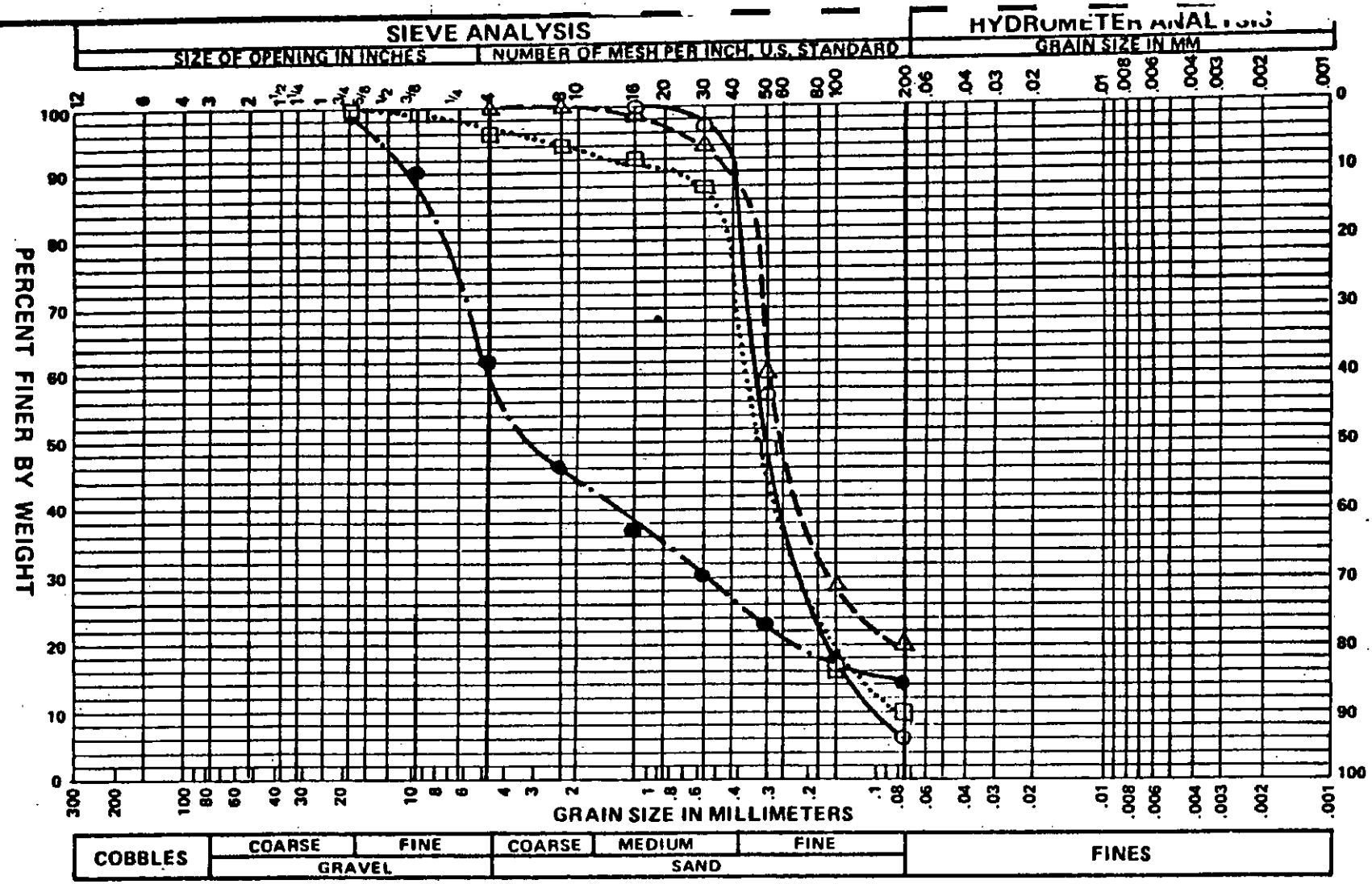
BORING LOG

HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910 | Date Feb.'83 | Plate 10



KEY	Boring or Test Pit No.	DEPTH (ft.)	USCS	DESCRIPTION	Moisture Content (%)	LL	PL
○ ——	B-1	4.5	SM/SP	fine SAND with silt	10		
△ — — —	B-3	10.0	SM	silty fine SAND	23		
□ ·····	B-4	45.0	SM/SP	fine SAND with silt and trace of gravel	20		
● —·—	B-5	25.0	SM	silty gravelly SAND	10		

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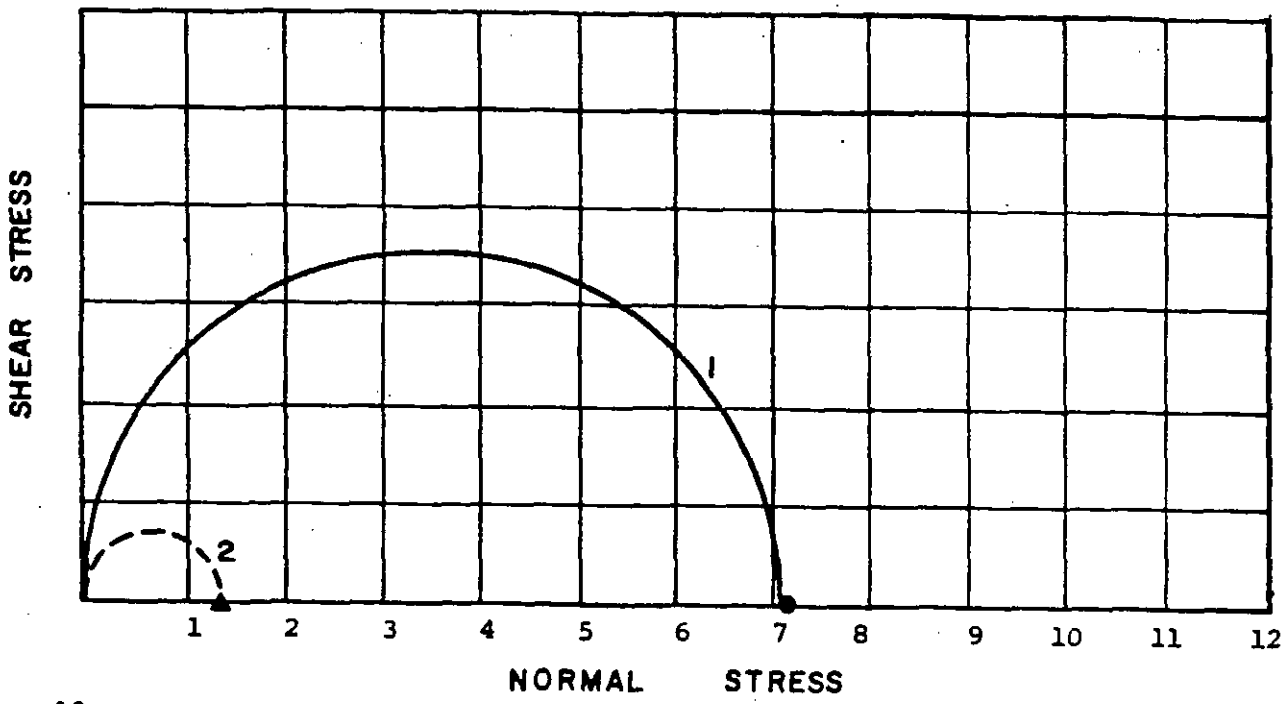
Proj. No. 1910

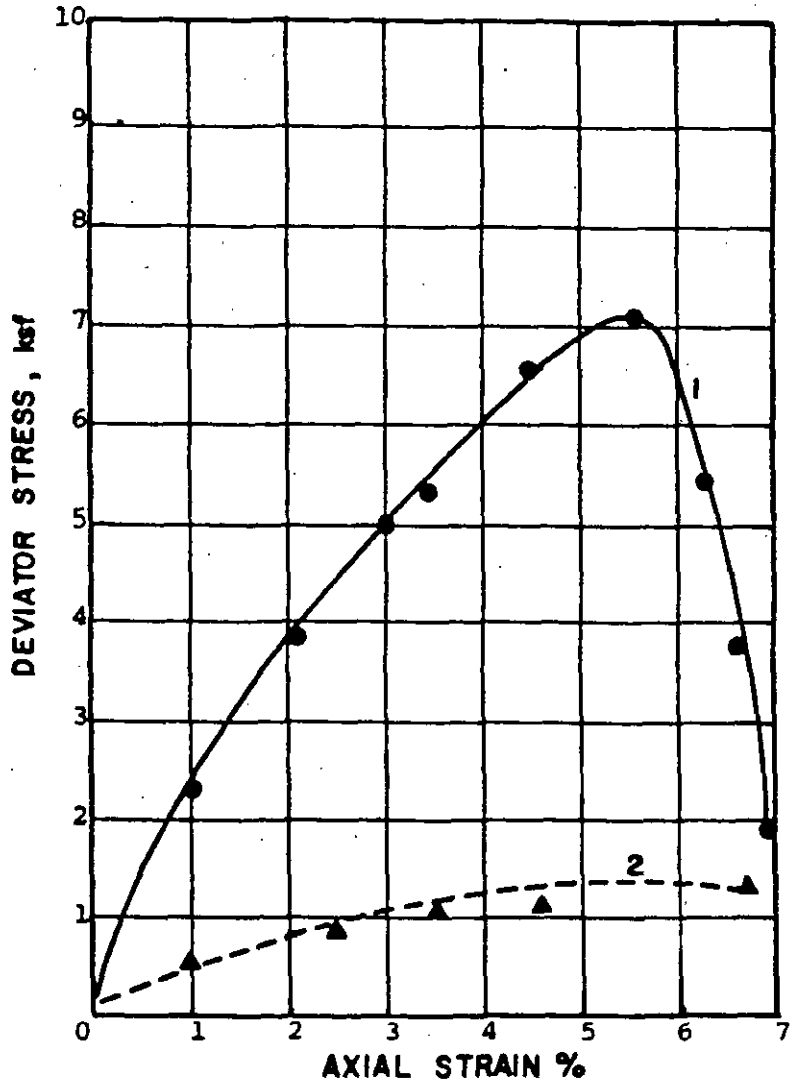
Date Feb. '83

Plate 12

GRAIN SIZE ANALYSIS
HARBOR SQUARE
SEATTLE, WASHINGTON

TRIAXIAL COMPRESSION TEST REPORT





TEST NO.	1	2	
INITIAL MOISTURE	33	48	
DRY DENSITY pcf	91	74	
FINAL MOISTURE	33	48	
CONSOLIDATION PRESSURE psi	--	--	
TIME TO FAILURE	6.6	6.7	
INITIAL DIAM. in	2.41	2.41	
INITIAL HEIGHT in	5.72	4.81	

SHEAR VALUES ϕ = _____

c = _____

TYPE OF TEST _____

METHOD OF SATURATION _____

RATE OF STRAIN 1%/min.

SAMPLE TYPE _____

1 BORING B-4 DEPTH 7.5

2 BORING B-5 DEPTH 10.0

SAMPLE _____ DATE _____

PLATE 13

BORING NO. 6

Logged By CRL

Date 1/31/83

ELEV. 23±

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
		24" brown silty TOPSOIL, wet, soft					
	CL ML	Gray fractured silty CLAY to clayey SILT with zones of silty SAND, wet, stiff	5		9	22	104 pcf
					5	--	
			10		9	46	q_u=2.0 tsf 77 pcf
					16	32	q_u=2.0 tsf 90 pcf
			15 ▽ 2/7/83		9	68	LL=44, PI=14
					23	--	
			20		13	34	q_u=1.5 tsf
					44	12	
	GM SM	Gray-brown silty sandy GRAVEL, wet, dense grading very dense below 24'	25		50/4"	--	
	SM	grades below 28' to: Gray silty fine to medium SAND	30		50/5"	11	

Boring terminated at 31' below existing grade.
Groundwater observation well installed to bottom of boring.

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BORING LOG

HARBOR SQUARE
SEATTLE, WASHINGTON

Proj. No. 1910	Date Feb.'83	Plate 11