

- City box number C-2
- Title/cover page w/the following info:
 - Company (author) name
 - Report Date
 - Project name
 - Company's job number
 - City DCLU project number (7-digit number)
 - City Permit number (6-digit number)
 - Kröll map index number (3-digit number, w?/E,W,N,S)
 - Green label
 - Site address (may be on 1st or 2nd page of text)
- Executive Summary and associated figures
- Table of Contents (*date attachment*)
- 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
 - ¹⁴C or Radiocarbon Testing
 - Other _____
- Soil Chemical Analytical Testing Summary Tables
- Water/Groundwater Chemical Analytical Summary Tables
- Comments Consolidation Test
- Date Copied 7-23-94 By AM

Geotechnical Report to
John Peterson

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8706167

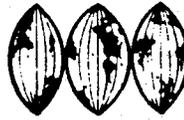
36 Cremona St.

21E
639650

1173

SEP 27 1989

DEPARTMENT OF CONSTRUCTION
AND LAND USE



**Earth
Consultants Inc.**
Geotechnical Engineers, Geologists
& Environmental Scientists

November 4, 1987

E-3565

Hammond-Reiss Development, Inc.
4019 - 21st Avenue West
Seattle, Washington 98199

SEP 27 1989

Attention: Doug Reiss

DEPARTMENT OF CONSTRUCTION
AND LAND USE

Gentlemen:

We are pleased to submit our report titled "Geotechnical Engineering Study, Ann Building, Cremona Street, Seattle, Washington". This report presents the results of our field exploration, laboratory tests, and engineering analyses. The purpose and scope of our study was outlined in our proposal dated September 15, 1987.

Soils below the site surface consist of loose or soft compressible material between depths of about fourteen (14) to thirty-three (33) feet. We recommend that the proposed structure be supported on timber piles or augercast piers to reduce the magnitude of potential settlement. Pre-drilling of the surficial fills may be necessary for driving timber piles.

This report has been prepared for specific application to this project in accordance with generally accepted geotechnical engineering practices for the exclusive use of Hammond-Reiss Development, Inc. and their representatives. No other warranty, expressed or implied, is made. We recommend that this report, in its entirety, be included in the project contract documents. The following sections of this report describe our study and contain recommendations regarding foundation design criteria, earthwork considerations, and site drainage.

PROJECT DESCRIPTION

The site configuration and proposed building location are shown on the Boring Location Plan, Plate 2.

We understand that it is planned to construct a four-story concrete and glass building with one level of below grade parking space. Cuts up to five feet in depth are anticipated. Maximum column loads are expected not to exceed five hundred and twenty-five (525) kips.

If any of the above design criteria change, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Consultants, Inc. (ECI) provide a general geotechnical review of the final design and construction documents.

SITE CONDITIONS

Surface

The site is located at the east end of Cremona Street in Seattle, Washington. The triangular-shaped property is approximately one-third of an acre in size and is bordered on the south by Cremona, on the west by a two-story concrete and glass office building and on the northeast by railroad tracks. South of Cremona Street a two-story brick building exists. The site is presently being used as a parking lot. The crushed rock surface slopes gently to the east and has wooden runners marking the parking area.

Subsurface

The site subsurface below the surficial fill can be generally described as four different strata. The upper stratum is silty fine sand and sand extending from two and one-half (2-1/2) to nineteen (19) feet. The silty fine sand is medium dense to dense. A hydrocarbon-like odor was detected from two and one-half to about ten feet. Below this stratum, a nine foot thick layer of peat exists to a depth of twenty-eight (28) feet. The peat exhibits moisture contents from 114 to 276 percent. The third stratum consists of interlayered silt and sand mixtures extending to fifty-four (54) feet or more below the surface. This stratum varies from a relatively loose to very dense condition with increasing depth. A very soft, silty clay layer was encountered between forty-two and one-half (42-1/2) and forty-four (44) feet below the surface.

Groundwater

The groundwater level observed while drilling was six feet below the ground surface and is shown on the Boring Log, Plate 4. A slotted pipe was installed in the boring to allow subsequent measurement of the groundwater level. A reading taken three days after completion of the boring indicated the water depth to be about seven feet. The groundwater level is not static, and fluctuations in the level will occur depending on the amount of rainfall, surface water runoff, and other factors. Generally, the water level is higher in the wetter winter months.

DISCUSSION AND RECOMMENDATIONS

General

We recommend supporting the planned structure on drilled, cast-in-place, concrete piers or on driven timber piles. Pre-drilling of

Additional Services

It is recommended that ECI provide a general review of the final design and specifications to verify that the earthwork and foundation recommendations have been properly interpreted and implemented in the design and in the construction specifications.

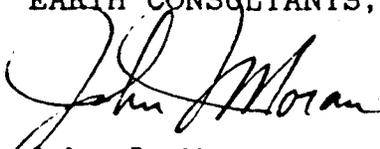
It is also recommended that ECI be retained to provide geotechnical services during construction. Because of the nature of this project, we do not accept responsibility for the performance of the foundation or earthwork unless we are retained to review the construction drawings and specifications, and to provide construction observation and testing services. This is to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event subsurface conditions differ from those anticipated prior to the start of construction.

The following plates are attached and complete this report:

Plate 1	Vicinity Map
Plate 2	Boring Location Plan
Plate 3	Legend
Plate 4	Boring Log
Plate 5	Consolidation Test Data
Plate 6	Retaining Wall Drainage and Backfill

Respectfully submitted,

EARTH CONSULTANTS, INC.



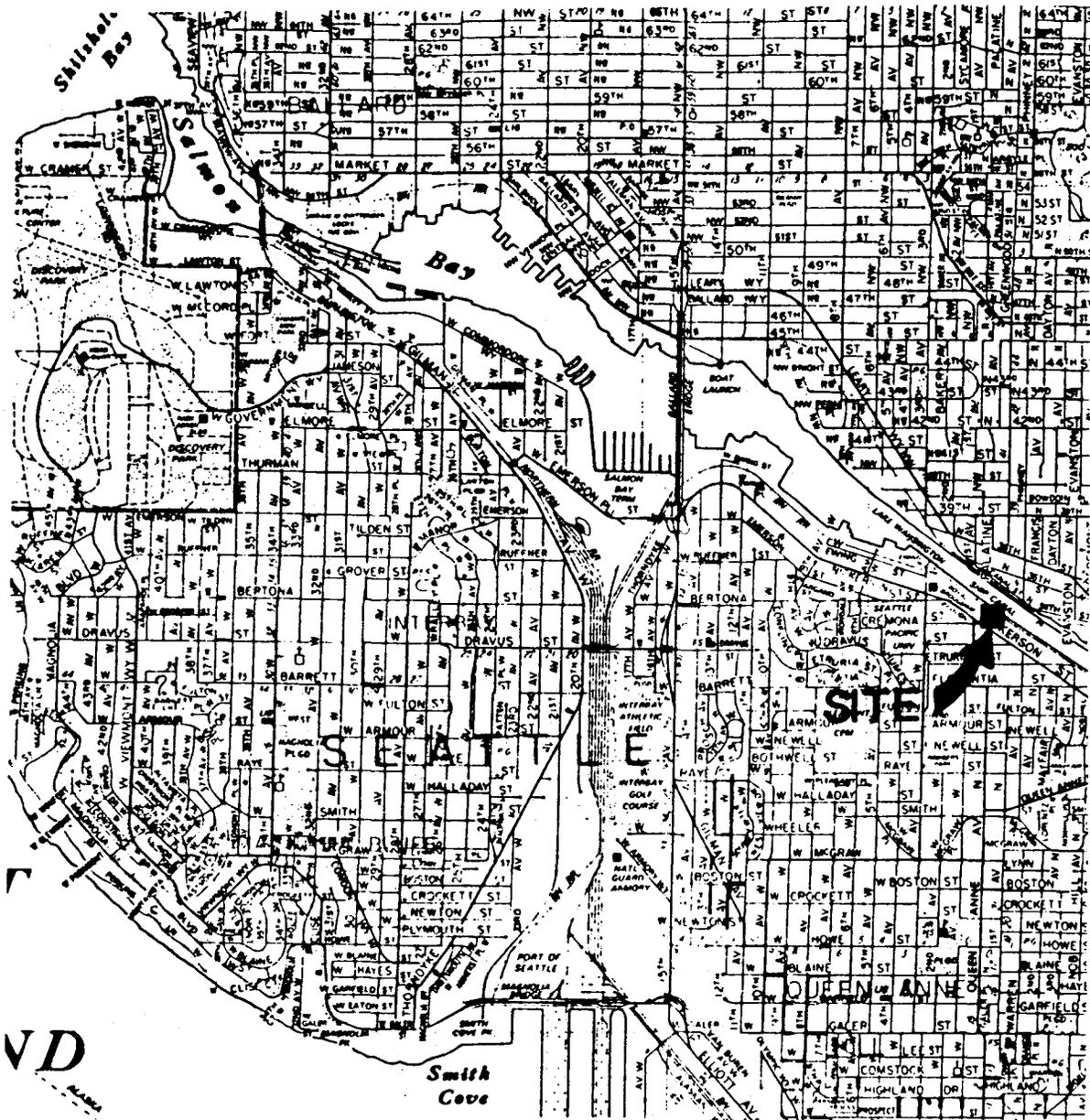
John J. Moran
Project Manager



Robert S. Levinson, P. E.
President

STL/JJM/cac/kml





Reference :

King County / Map 13

By Thomas Brothers Maps

Dated 1988



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Consultants Inc.**
Geotechnical Engineering and Geology

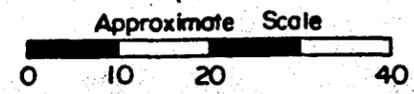
Vicinity Map
Proposed Office Building
Seattle, Washington

Proj. No. 3565

Date Sept ' 87

Plate 1

LAKE WASHINGTON SHIP CANAL



LEGEND

⊕ B-1 Approximate Location of
ECI Boring, Proj. No.
E-3565, Sept. 1987

□ Proposed Building

Reference
Site Plan
By Wyatt Stapper Architects
Dated 9/9/87

Property Line

Proposed Parking Garage

⊕
B-1

CREMONA STREET



Boring Location Plan
Proposed Office Building
Seattle, Washington

Proj. No. 3565 Date Sept '87 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	
	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	Silt 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	Silt 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 1 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



LEGEND

BORING NO. 1

Logged By STL

Date 9-18-87

ELEV. 100'±*

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows Ft.	W (%)	
		Fill" Crushed rock and gravel with sand and concrete blocks					
	sm	Gray silty fine SAND, moist, medium dense - strong petroleum odor 2' to 10'	5	I	27	14	
	sp	Gray medium to coarse SAND, wet, dense		I	35	10	
	sm	Tan/gray silty fine to coarse SAND, wet, medium dense	10	I	14	22	
	sp	- with gravel at 10'		I	14	14	
		- clayey sand, 10.5' to 10.75'		I	19	55	
		- with gravel at 12.5'	15				
	ml	Gray clayey SILT, wet, stiff	20	I	9	67	
	pt	Brown fibrous PEAT		I	Push	276	qu=1.75tsf
			25	I	7	232	
	sm	Interlayered sandy SILT, and silty SAND, wet, loose	30	I	4	114	
	ml			I	55	27	
	sm	Interlayered SILT and SAND, wet, stiff, dense	35	I	61	20	qu=3.0tsf
	ml			I	61	20	
	sm	Gray silty fine SAND/sandy SILT, wet, very dense	40	I	10	44	qu=0.0tsf
	ml			I	10	44	
	cl	Gray silty CLAY, wet, very soft	45	I	52	10	
	sm	Gray silty fine SAND with gravel, wet, very dense		I	52	10	
			50	I	65		

Boring terminated at 54 feet below existing grade. Groundwater encountered at 6 feet during drilling. 3/4" PVC standpipe installed to bottom of boring. Lower 10 feet slotted. Boring backfilled with cuttings.

* Elevation datum is the base of street lamp at northeast property corner. Elevation assumed = 100.0.

Water Level

Date

7.2 feet

9/21/87

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by engineering tests, analysis, and judgement. They are not necessarily representative of other times and locations. We cannot accept responsibility for the use or interpretation by others of information presented on this log.



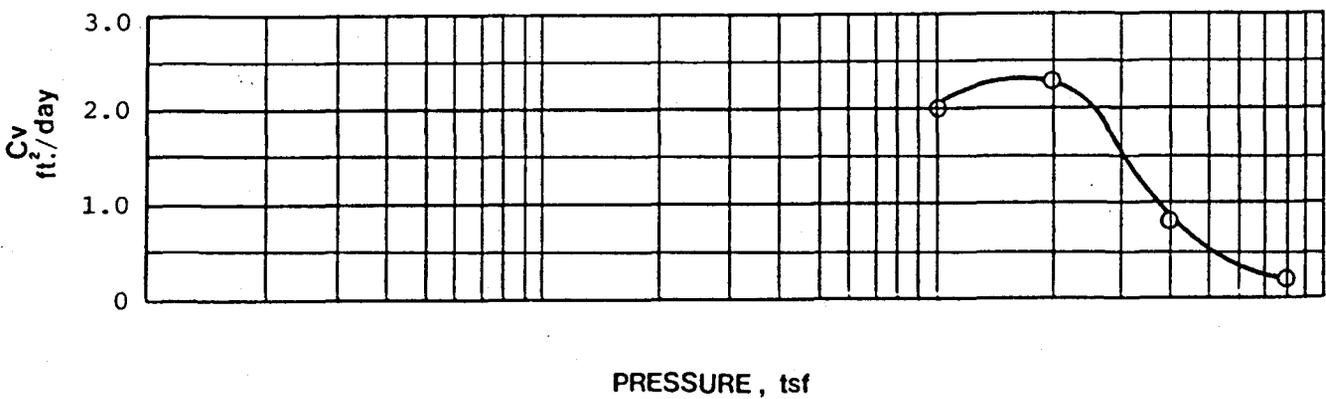
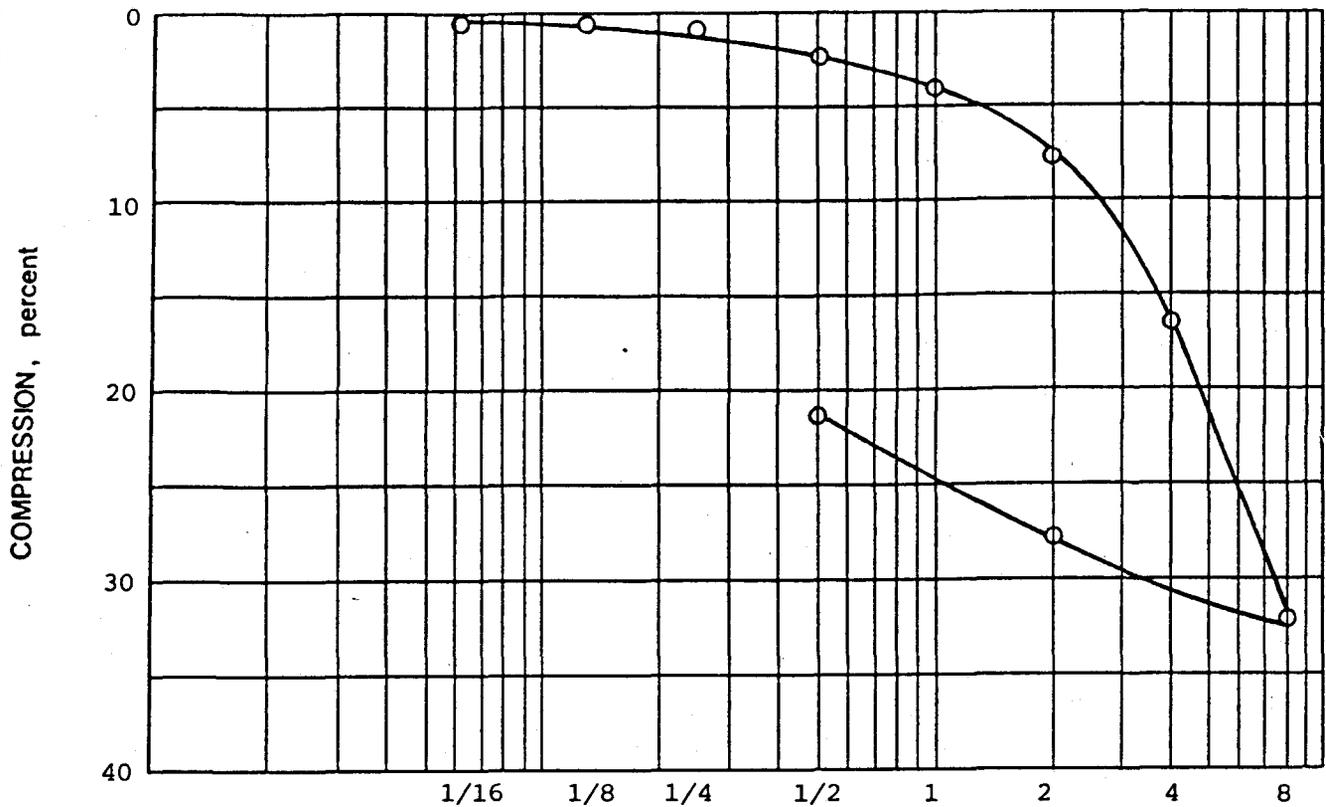
Earth Consultants Inc.
Geotechnical Engineering and Geology

BORING LOG
PROPOSED OFFICE BUILDING
SEATTLE, WASHINGTON

Proj. No. 3565

Date Sept '87

Plate 4



Key	Boring No.	Depth (ft.)	USCS	Soil Description	Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content, W %		Dry Density (pcf)
								Before	After	
O	B-1	19	pt	Peat	-	-	-	276.0	213.9	18.3

Earth Consultants Inc.
 GEOTECHNICAL ENGINEERING & GEOLOGY



CONSOLIDATION TEST DATA
 PROPOSED OFFICE BUILDING
 SEATTLE, WASHINGTON

Proj. No. 3565

Date Sept '87

Plate 5