

EX. 1100
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PRELIMINARY SOIL INVESTIGATION

LOTS 3, 4 AND 5

7600 BLOCK WEST MERCER WAY

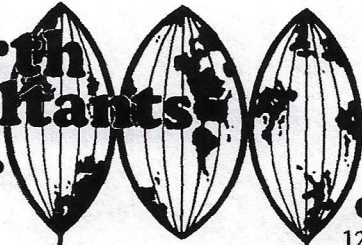
MERCER ISLAND, WASHINGTON

E-309



**Earth
Consultants Inc.**
Geotechnical Engineering and Geology

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Geotechnical Engineering and Geology

12893 N.E. 15th Place, Bellevue, Washington 98005 / Phone: (206) 455-2018

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August 26, 1977

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I. E., Inc.
10822 Rainier Avenue South
Seattle, Washington. 98178

Subject: Preliminary Soil Investigation
Lots 3, 4 and 5
7600 Block West Mercer Way
Mercer Island, Washington

Gentlemen:

In accordance with your request, we have completed our soil investigation for the purpose of evaluating stability of the hillside site and feasibility of house construction. Due to limitations set upon us by the City of Mercer Island, we could not satisfactorily complete our investigation of the entire site, especially some potential building sites. However, our investigation of the remaining areas indicates that the site may be suitable for development.

FIELD INVESTIGATION AND LABORATORY TESTING

The subsurface exploration consisted of excavating a series of seven test pits to a maximum depth of 11-1/2 feet below the existing grade. The test pits were excavated using a tractor-mounted backhoe. A Case 350 dozer was also used to assist the backhoe over the steep terrain. We wanted to excavate backhoe test pits in several other areas, especially at the middle portions of Lots 4 and 5; however, the City of Mercer Island denied us access roads to these sites.

The excavation of the test pits was continuously supervised by an engineering geologist from our office who classified the soils encountered and obtained representative samples of the soils. These samples were returned to our laboratory for further inspection and testing.

The locations of the test pits are shown on the Site Plan, Plate 1, with the test pit logs presented on Plates 2 through 5.

In addition, three test holes were hand augered at the lower lakeside portion of the site. The results of the test holes are presented on Table A. Moisture determinations, as well as grain size analyses, were run on samples for this project. The results of the grain size analyses are presented on Plates 6 and 7, Grain Size Analysis. Moisture determinations are presented on the individual test pit logs at the appropriate sample depth.

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SITE DESCRIPTION

Surface Conditions

The site is located at the 7600 block immediately west of West Mercer Way, on Mercer Island, Washington. The approximate 250 by 300 foot site occupies a southwest facing hill slope overlooking Lake Washington. The site is presently covered by brush, blackberry vines and madrona trees to 24 inches in diameter. A cat road has been cut to gain access to some portions of the site. Some springs were noted at the locations shown on the Site Plan, Plate 1. These were mainly at the toe of slope at the lower lakeside portion and some just above Test Pit No. 2. There is approximately 150 feet of relief across the site. Some debris was scattered across the site. A house is located near the top of Lot No. 3. A small slide had occurred just below the house.

Subsurface Conditions

The subsurface soil conditions under the parcel are quite uniform. Directly beneath the surface is from 3 to 10 feet of a medium dense, silty, gravelly sand. Below this unit we encountered a very dense, gravelly, silty sand (glacial Till). All of our test pits were terminated in this glacial Till unit which may extend to deeper depths. In test pits 6 and 7 we encountered a sandy, silt fill with some gravel to a gravelly, silty sand. This loose fill extends from 2 to 3 feet below the surface and may be part of the road fill.

Groundwater was encountered in Test Pit No. 1 at a depth of 6-1/2 feet below the surface flowing downhill toward the west. Some springs were noted emanating from the slope just above Test Pit. No. 2.

The lower lakeside portion of the site has numerous wet areas which may be due to seepage from the slopes. We could not observe any distinct springs along this area; the water just appears to permeate the area. This has been an extremely dry year and it would be natural not to observe marginal springs which may now be dry. We checked the site for signs of vegetation that would indicate wet conditions; however, none were found. It would be normal for the encountered geologic conditions to find that most ground water would be perched on the Till.

DISCUSSION AND RECOMMENDATIONS

Based on the results of our limited preliminary investigation, it appears that the site will be suitable for development of single-family residences. The suitability of particular potential building sites could not be fully investigated due to the restrictions imposed upon by us the City of Mercer Island. The sites on Lot 5 were not explored, but based on the other areas explored, we believe the subsurface conditions on this lot will be the same as the site conditions encountered in the explored areas.

There is always an inherent risk in developing relatively steep hillside property. However, our investigation did not reveal the presence of any major slope instabilities or prior movements, and in our opinion, a relatively stable condition presently exists. There are some indications of minor shallow movements, but we feel they can be arrested with rockeries or proper control of

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ground water. The underlying glacial Till is very stable and foundations supported on this material will function satisfactorily. Final grades will determine whether this is accomplished with shallow or deep foundations. The overlying silty sands could be retained with low rockeries a maximum of 8 feet in height; with retaining walls; or on slopes cut to 1-1/2 to 1 (H:V). Subsurface drains should be planned for along the toe of all cut slopes.

Slope regrading for construction of driveways or building pads should be kept to a minimum. All surface water should be controlled and removed from slopes with an adequate storm drainage system. The slopes should be left in their natural state wherever possible, or if regraded, be planted with a fast growing ground cover to reduce erosion.

We recommend that we review plans for site development and be allowed to investigate the building site that was not explored at this time. At that time we can then provide recommendations for foundation design for each proposed building site and site development.

LIMITATIONS

The materials encountered on the project site and utilized in our investigation are believed representative of the total area; however, soil conditions may vary in characteristics between test pit and hand auger hole locations.

Since our investigation is based on the site materials observed, selective laboratory testing and engineering analyses, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Should encountered conditions or design parameters change, this firm should be contacted for instructions prior to proceeding.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, please feel free to call.

The following Plates are included and complete this report:

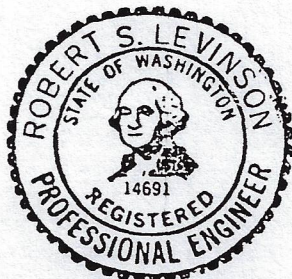
Plate 1	Site Plan
Plates 2 through 5	Test Pit Logs
Plates 6 and 7	Grain Size Analysis
Table A	Test Hole Logs

Respectfully submitted,
EARTH CONSULTANTS, INC.

David Wintermute

David Wintermute
Engineering Geologist

Robert S. Levinson
Robert S. Levinson, P. E.
Chief Engineer



RSL/dw

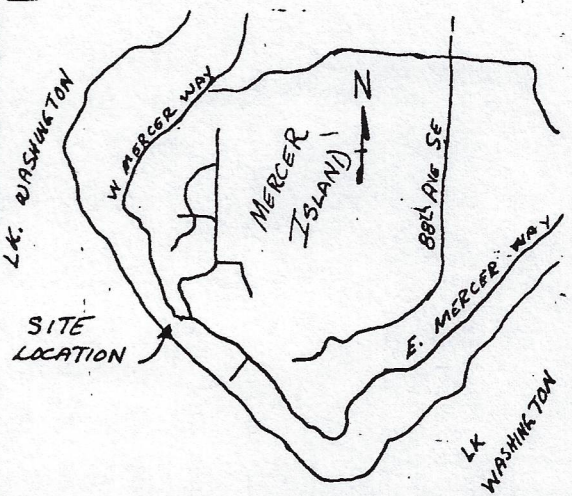
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LAKE WASHINGTON

SCALE
1" = 100'

- TP2 ■ TEST PIT LOCATION (7.19.77)
- TH30 ○ TEST HOLE LOCATION (7.21.77)
- EXISTING BUILDINGS
- SPRING LOCATIONS (6.29.77)
- APPROXIMATE LOCATION OF CAT ACCESS TRAIL



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TEST PIT LOGS
Log of Test Pit 1

Depth (ft.)	USCS	Soil Description	Elev. _____	w	Lab Data
0	SM	Brown, silty SAND with occasional gravel, loose, moist.	18		
5	SM	Gray, silty SAND with some gravel, loose, wet.	22 24		
10	ML	Tan, fine sandy SILT, very dense, moist.	17		
15		Test Pit terminated at 9 feet on 7/19/77. Minor seepage from 6.5 feet.			

Log of Test Pit 2

Depth (ft.)	USCS	Soil Description	Elev. _____	w	Lab Data
0	SM	Reddish brown, gravelly silty SAND with cobbles, medium dense, moist.	11		
5	SM	Gray, silty gravelly SAND, very dense, moist. (Till)	8		
10		Test Pit terminated at 7.5 feet on 7/19/77. No groundwater seepage.			
15					

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TEST PIT LOGS

Log of Test Pit 3

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Depth (ft.) USCS Soil Description Elev. _____ w Lab Data

0					
11	SM	Brown, silty gravelly SAND, medium dense, moist.	11		
14	SM	Gray, silty gravelly SAND, very dense, moist.	14		
15		Test Pit terminated at 7.5 feet on 7/19/77. No groundwater seepage.			

Log of Test Pit 4

Elev. _____

0					
9	SM	Tan, gravelly silty SAND with some cobbles, loose to medium, moist.	9		
7	SM	Tan, silty gravelly SAND, very dense, moist.	7		
15		Test Pit terminated at 7.5 feet on 7/19/77. No groundwater seepage.			

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TEST PIT LOGS
Log of Test Pit 5

Depth (ft.)	USCS	Soil Description	Elev. _____	w	Lab Data
0					
5	SM	Tan, silty gravelly SAND, medium dense, moist. Roots to 2 feet. Lens of silty sand and silt.	11		
10	SM	Gray, silty gravelly SAND, dense, moist. (Till)	12		
15		Test Pit terminated at 11.5 feet on 7/19/77. No groundwater encountered.			

Log of Test Pit 6

Depth (ft.)	USCS	Soil Description	Elev. _____	w	Lab Data
0	ML	Brown, sandy SILT with some gravel, loose, moist. (Fill)	12		
		Black TOPSOIL, loose, moist.			
5	SM	Reddish brown, gravelly silty SAND with cobbles, medium dense, moist.	8		
	SM	Gray, silty gravelly SAND, very dense, moist.	14		
10		Test Pit terminated at 8.5 feet on 7/19/77. No groundwater encountered.			
15					

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TEST PIT LOGS

Log of Test Pit 7

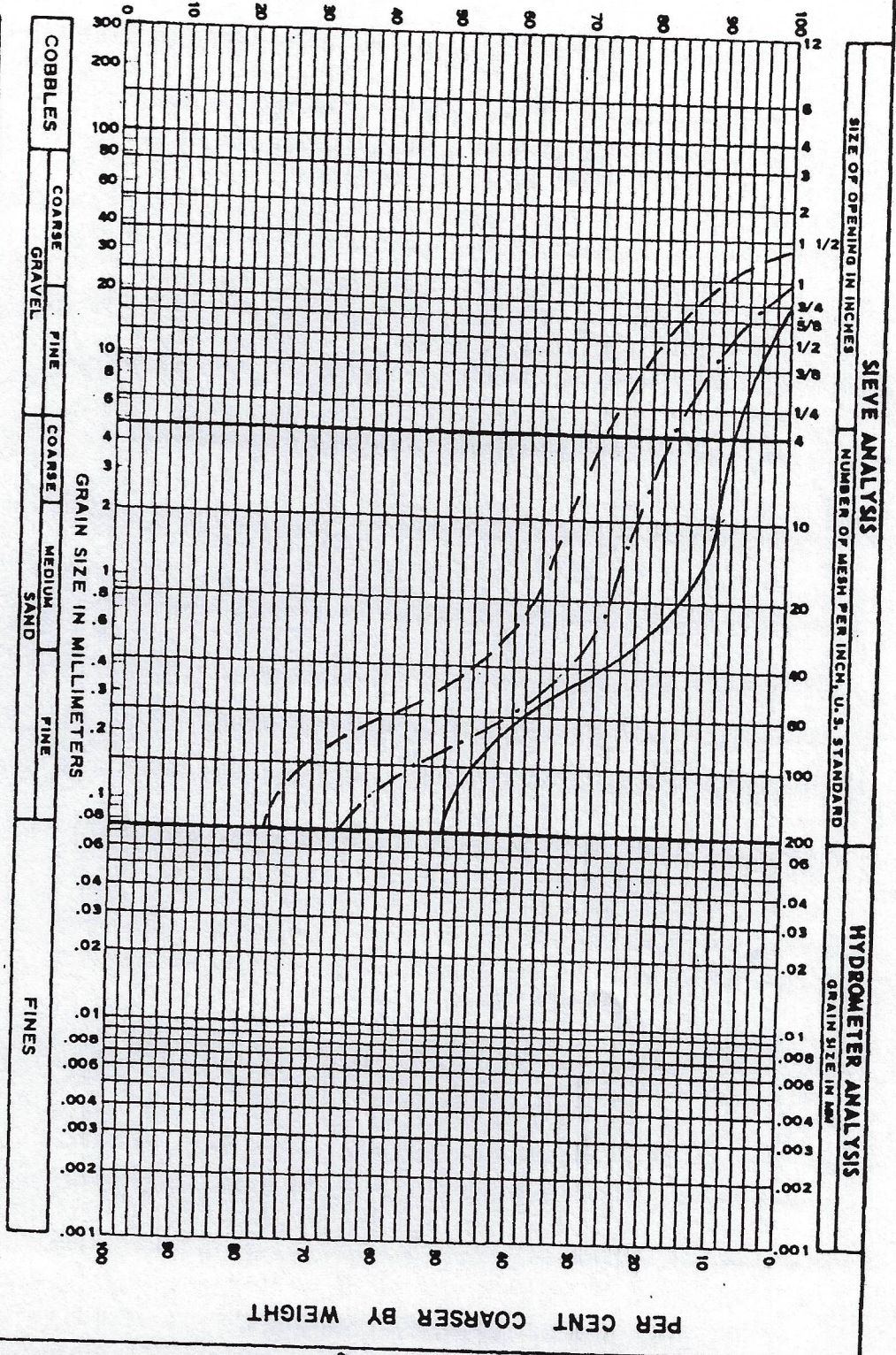
Elev. _____

Depth (ft.)	USCS	Soil Description	w	Lab Data
0	SM	Gray, silty gravelly SAND, loose, moist. (Fill)	10	
5	SM	Reddish brown, silty gravelly SAND with cobbles to 5 inches in diameter, medium dense, moist.		
	SM	Gray, silty gravelly SAND, very dense, moist. (Till)	8	
10		Test Pit terminated at 8.5 feet on 7/19/77. No groundwater encountered.		
15				

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GRAIN SIZE ANALYSIS

PER CENT FINER BY WEIGHT



Test Pit No.	DEPTH -FT.	U.S.C.	DESCRIPTION	NAT. W.C. %	LL	PL	PI
5	4.5	SM	silty gravelly SAND	11.1		NP	
6	1.0	ML	sandy SILT with some gravel	11.6			
7	8.0	SM	gravelly silty SAND	8.0		NP	

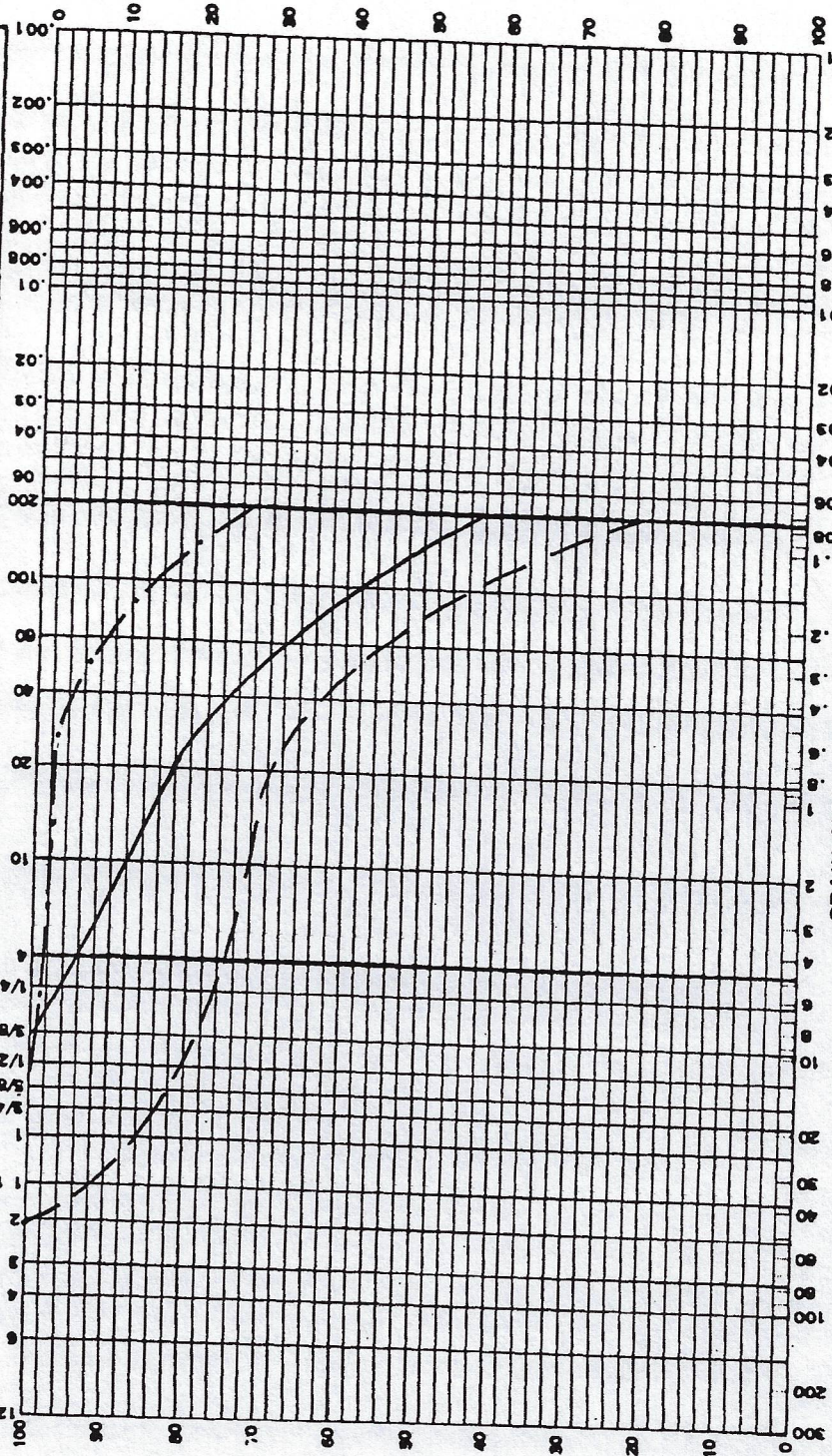
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PER CENT COARSER BY WEIGHT

HYDROMETER ANALYSIS
GRAIN SIZE IN MM

SIEVE ANALYSIS
NUMBER OF MESH PER INCH, U. S. STANDARD

SIZE OF OPENING IN INCHES



PER CENT FINER BY WEIGHT

COBBLES COARSE GRAVEL FINE GRAVEL SAND MEDIUM SAND FINE SAND FINES

Test Pit NO.	DEPTH -FT.	U.S.C.	DESCRIPTION	NAT. W.C. %	LL	PL	PI
1	1.5	SM	silty SAND with some gravel	17.6			
1	7.5	ML	fine sandy SILT	16.7			
2	5.0	SM	silty gravelly SAND	7.5			

GRAIN SIZE ANALYSIS

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PLATE 7

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TABLE A

TEST HOLE LOGS

Depth - ft. Soil Classification

Test Hole No. 1

0.0 - 1.8 Gray, clean gravelly SAND, loose, moist.
1.8 - 3.4 Gray, clean, fine to medium SAND, dense, moist.
 Roots to 2 feet.
 Groundwater seepage at 3 feet.

Test Hole No. 2

0.0 - 0.6 Black, sandy TOPSOIL, loose, moist.
0.6 - 3.7 Brown, clean gravelly SAND, loose, moist to wet.
3.7 - 3.9 Gray, gravelly silty SAND, dense, wet.
 Roots to 3 feet.

Test Hole No. 3

0.0 - 1.0 Brown, silty, gravelly SAND with cobbles to 8 inches
 in diameter, loose, dry
1.0 - 3.2 Tan, gravelly silty SAND, medium dense to dense,
 moist.