670194

≥40W

002800000 1431 MINOR LTD PARTNERSP 01431 MINOR AV
BUILDING ID'S 1
AL INT. ALT'S TO ALL FLOORS OF EXISTING BOARDING HSE. PROJECT NR: 9206088
EC CHANGE USE OF A PORTION OF BASEMENT FROM MEETING MDM (PS)
O ROOM TO RETAIL SPACES PER PLANS CN: 930519 LU: 930519
OO (OCCUPANCY OF RETAIL SPACES UNDER SEPARATE PERMIT) REV
REV
REV CP

1431 Minor AV

Earth Consultants Inc.

Geotechnical Engineers, Geologists & Environmental Scientists

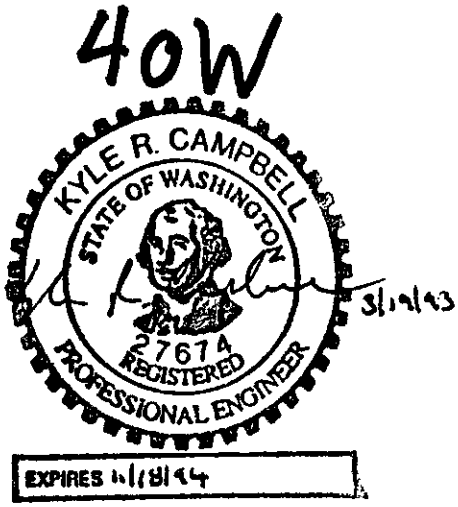
670194

40W

PREPARED FOR
1431 Minor Limited Partnership

Aaron McMichael
Project Engineer

Kyle R. Campbell, P.E.
Director of Geotechnical Services



1431 Minor Av

GEOTECHNICAL ENGINEERING STUDY
WINTONIA HOTEL
PIKE STREET AND MINOR AVENUE
SEATTLE, WASHINGTON

E-6074

March 18, 1993

Earth Consultants, Inc.
1805 - 136th Place Northeast, Suite 101
Bellevue, Washington 98005
(206) 643-3780

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Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

March 18, 1993 E-6074

1431 Limited Partnership
c/o Kovalenko Architects
208 South Main
Seattle, Washington 98103

Attention: Mr. Bob Hale

Dear Mr. Hale:

We are pleased to submit our report titled "Geotechnical Engineering Study, Wintonia Hotel, Seattle, Washington." This report presents the results of our field exploration, selective laboratory tests, and engineering analyses. The purpose and scope of our study was outlined in our February 4, 1993 proposal.

In general, our study indicates that the proposed mechanical, electrical and garbage dumpster areas are underlain with medium dense silty sand, which becomes dense at approximately three feet below the existing concrete slab surface. Based on our understanding of the proposed excavation and construction, it is our opinion that the proposed retaining wall and interior column footing extension could be supported on conventional spread footing foundations bearing on the dense soil encountered.

Due to the close proximity of existing heavily loaded perimeter and column footing, we have recommend surcharge loads be added to the retaining wall design. Additionally, construction of the retaining wall will require a sequenced excavation and construction schedule to reduce the risk of undermining these existing structures.

We appreciate this opportunity to have been of service to you during this phase of project development, and we look forward to working with you in the future. Should you have any questions about the content of this report, or if we can be of further assistance, please call.

Very truly yours,

EARTH CONSULTANTS, INC.

Kyle R. Campbell, P.E.
Manager of Geotechnical Services

AM/KRC/kml

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GEOTECHNICAL ENGINEERING STUDY
WINTONIA HOTEL
SEATTLE, WASHINGTON

E-6074

INTRODUCTION

General

This report presents the results of the geotechnical engineering study completed by ECI for the Wintonia Hotel, Seattle, Washington. The general location of the site is shown on the Vicinity Map, Plate 1. The purpose of this study was to explore the subsurface conditions within the proposed mechanical, electrical, and garbage dumpster areas, and, on this basis, to develop geotechnical recommendations for the proposed development.

Project Description

At the time our study was performed, the proposed construction layout, and our exploratory locations were approximately as shown on the Boring Location Plan, Plate 2.

We understand that the current basement kitchen area located in the southwest corner of the building will be replaced with mechanical, electrical, and garbage dumpster areas. The proposed floor slab elevation will be approximately four feet lower than the existing concrete floor slab elevation. A retaining wall approximately four feet high will be constructed along the south and east perimeters of the new construction. The south section of the proposed retaining wall will be located approximately four feet north of the existing buildings' south perimeter continuous footing. The east section of the proposed retaining wall will be located approximately one foot west of an existing column footing. Please refer to the cross sections shown on Plates 3 and 4.

Based on information provided by Mr. Bob Hale with Kolvalenko Architects, total dead plus live loads as follows.

- Existing South Perimeter Footing Load - 22 kips per lineal foot.
- Existing Column loads - 225 kips.
- Slab loads - 150 pounds per square foot.

If any of the above design criteria change, we should be consulted to review the recommendations contained in this report. In any case, we recommend that Earth Consultants, Inc. (ECI) be retained to perform a general review of the final design.

SITE CONDITIONS

Surface

The building is located at the southwest corner of the intersection of Pike Street and Minor Avenue, Seattle, Washington (see Plate 1, Vicinity Map). The approximately rectangular building is bordered on the north by Pike Street, and to the east by Minor Avenue. The south and west sides of the building are occupied by paved parking and an alley, respectively.

The ground surface around the building slopes downward to the northwest. Elevation change from the south to north sides of the building is approximately fifteen (15) feet.

Subsurface

The proposed utility area was explored by drilling two borings at the approximate locations shown on Plate 2. Please refer to the boring logs, Plates A2 and A3, for a more detailed description of the conditions encountered at each location explored. A description of the field exploration methods and laboratory testing program is included in the Appendix A of this report. The following is a generalized description of the subsurface conditions encountered.

The borings found that the existing six inch thick kitchen area slab is generally underlain with three feet of medium dense silty sand (SM) grading to sand with silt (SP) (Unified Soil Classification). Below a depth of approximately three feet, dense to very dense soils of similar composition continued to the maximum depth explored, sixteen and one-half (16.5) feet. However, both borings encountered a layer of sandy medium gravel (GP) at depths of approximately three to five feet.

Groundwater

Both borings were completed by installing a 3/4 inch diameter PVC standpipe. The stabilized groundwater levels within the standpipes were measured relative to the existing floor slab elevation on March 2, 1993. These measurements indicate that groundwater levels are presently located at depths of 8.7 and 11.6 feet in Borings B-1 and B-2, respectively.

Based on these conditions, we do not anticipate that the proposed excavations will encounter the existing groundwater surface, or require special groundwater de-watering procedures before any cuts are made. However, due to the variable silt content of the silty sand strata, localized perched seepage may be encountered within excavations. The contractor should be prepared to drain the foundation areas if necessary.

Groundwater levels are not static, and may fluctuate depending upon the amount of rainfall and other factors. Typically, groundwater levels are at the highest during the wetter winter and spring months.

During our site work, a dry rot problem in the southeast corner of the building was shown to us by Mr. Bob Hale. It was our opinion that the dry rot has been caused by periodic wetting at the base of the south wall. Since the hillside continues upward to the south, it is possible that groundwater seepage may be seeping into the building. Thus there is the possibility that a footing drain may be needed along the south perimeter of this wall to prevent future building damage. Once the demolish debris are removed, we suggest that ECI make an additional site visit to assess the situation.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion it would be feasible to make the proposed excavation and support the proposed retaining wall and interior column footing extension using conventional foundations. These foundations should be supported on the existing dense soil which will be exposed at a depth of approximately three to four feet below the existing ground surface.

The proposed four foot high retaining wall which will be constructed along the south side of the utility rooms will be located four feet from the existing heavily loaded south perimeter continuous footing. The east section of this wall will be within one foot of a heavily loaded column footing. Please refer to Plates 3 and 4. Therefore, the lateral surcharge pressures induced in the retained soils must be taken into account during excavation and in design of the retaining wall.

A slot sequence of excavation and construction should be used to minimize the risk of undermining the existing south perimeter footing. Initially, we recommend that the slot cuts be limited to five foot widths. If the excavated soil face remains stable, the excavated slot width could be increased. However, this determination should be made by ECI and the structural engineer after observation of the excavated surface.

Near the center of the proposed east retaining wall, an existing building column footing will require temporary shoring of the adjacent excavation extending five feet north and south of the column to prevent undermining the footing. An alternative to shoring, the column could be underpinned or temporarily supported by a shoring system to allow construction of a permanent extension of the footing to the new floor subgrade elevation. This would eliminate the large lateral pressures that would be imposed on the new retaining wall if the existing footing was left in its present location.

This report has been prepared for specific application to this project only and in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area for the exclusive use of the 1431 Minor Limited Partnership 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 for the information of the contractor.

Site Preparation and General Earthwork

The proposed utility area should be stripped and cleared of all constructions debris. Stripped materials should not be mixed with any materials to be used as compacted backfill.

If utility pipes are encountered during excavation, they should be plugged or removed so that they do not provide a conduit for water and cause soil saturation and stability problems.

Following the stripping and excavating operation, the ground surface where foundations, or slabs are to be placed should be compacted to a competent non yielding condition. These areas should be observed by a representative of ECI to ensure adequate bearing conditions are available. Soil in any loose or soft areas, if re-compacted and still yielding, should be over-excavated and replaced with structural fill to a depth that will provide a stable base beneath the foundation.

Structural fill is defined as any compacted fill placed under buildings, roadways, slabs, pavements, or any other load-bearing areas. Structural fill under floor slabs and footings should be placed in horizontal lifts not exceeding 12 inches in loose thickness and compacted to a minimum 95 percent of its maximum dry density in accordance with ASTM Test Designation D-1557-78 (Modified Proctor). The fill materials should be placed at or near the optimum moisture content.

The on-site silty sand soils contain a significant amount of fines (10 to 32 percent) and are moisture sensitive. Therefore, they may be used as structural backfill if their moisture contents can be maintained near present levels.

Ideally, structural fill which is to be placed in wet conditions should consist of a granular material with a maximum size of three inches and no more than 5 percent fines passing the No. 200 sieve. During dry conditions, most compactible non-organic soil can be used as structural fill.

Foundations

The proposed retaining wall and column footing extensions can be supported on conventional continuous and spread footings bearing on the dense silty sand and sand soils which will be exposed after the proposed excavation, or on structural fill placed above these soils. The foundations may be dimensioned for a permanent allowable bearing capacity of four thousand (4,000) psf. We recommend that all footings be bottomed at a depth which will provide a minimum final cover of twelve (12) inches. We estimate that conventional footings utilizing the allowable bearing capacity given above may induce approximately one-half inch of total vertical settlement, and one-quarter inch of differential settlement.

Loading of this magnitude would have a theoretical factor of safety in excess of three against an actual shear (bearing capacity) failure. A one-third increase in the above allowable soil-bearing pressures can be used when considering short-term transitory wind or seismic loads.

Lateral loads can be resisted by friction between the foundation and the supporting native or compacted fill subgrade or by passive earth pressure acting on the buried portions of the foundations. The foundations must be poured "neat" against the existing soil or backfilled with a compacted fill meeting the requirements of structural fill:

- Passive pressure = 350 pcf equivalent fluid weight
- Coefficient of friction = 0.35

Note that the above values contain a factor of safety of 1.5.

All footing excavations should be examined by a representative of ECI, prior to placing forms or rebar, to verify that conditions are as anticipated in this report.

Seismic Design Considerations

Structures are subject to damage from earthquakes due to direct or indirect action. Direct action is represented by shaking. Indirect actions are represented by movement of soil supporting foundations and are typified by ground failure (rupture), or slope failure.

The Puget Sound region is classified as Zone 3 by the Uniform Building Code (UBC). The largest earthquakes in the Puget Sound are widespread and have been subcrustal events, ranging in depth from 50 to 70 miles. Such deep events have not exhibited surface faulting.

The UBC Earthquake regulations contain a static force procedure and a dynamic force procedure for design base shear calculations. Based on the encountered soil conditions, it is our opinion that and S factor of $S_2 = 1.2$ should be used for the static force procedure as outlined in Section 2334 of the 1991 UBC. For the dynamic force procedure outlined in section 2335 of the 1991 UBC, the curve for deep cohesionless or stiff clay (soil type 2) should be used on Figure 3, Normalized Response Spectra Shapes.

Retaining and Foundation Walls

As discussed earlier, the close proximity of the heavily loaded existing foundations will apply a lateral surcharge load on the proposed retaining wall. Thus, the retaining wall should be designed to resist lateral earth pressures imposed by the soils retained and the additional surcharge pressures. Walls that are designed to yield 0.001H, where H equals the height of the wall, can be designed to resist the lateral earth pressures imposed by an equivalent fluid with a unit weight of thirty-five (35) pcf. If walls are to be restrained at the top from free movement, the equivalent fluid weight should be increased to fifty (50) pcf. To account for seismic loading, a uniform pressure of 6H should be added.

Along the south section of the retaining wall, a uniform surcharge pressure of 2 kips per square foot (kps) should be added to the wall design to account for the existing adjacent perimeter footing. Along the east section of the retaining wall adjacent to the existing column footing, a uniform surcharge pressure of 4.5 kps should be added to the design. This surcharge pressure would be applied over a distance of five feet north and south of the outside edges of the footing. As an alternative to including the additional surcharge pressure of the column footing, this footing could be extended to the new excavation subgrade elevation prior to construction of the new retaining wall, as mentioned previously.

These values are based on a horizontal backfill surface and that surcharges due to backfill slopes, hydrostatic pressures, equipment loads or other surcharge loads in addition to the loads given above will not act on the walls. If such surcharges are to apply, they should be added to the above design lateral pressure.

The walls should be backfilled with a suitable free-draining material, or Miradrain drainage panel. If free-draining material is used, it should extend at least six inches behind the wall and extend the full height of the wall. The remainder of the backfill should consist of structural fill. A typical wall backfill detail is provided as Plate 5.

Slab-on-Grade Floors

The slab-on-grade floor can be supported on the dense soil which will be exposed after the proposed four foot excavation, or on a minimum of one foot of compacted structural fill. Any disturbed soil must either be re-compacted or replaced with structural fill. The slab should be provided with a minimum of four inches of free-draining sand or gravel as a capillary break. In areas where slab moisture is undesirable, a vapor barrier such as a 6-mil plastic membrane may be placed beneath the slab. Two inches of damp sand may be placed over the membrane for protection during construction and to aid in curing of the concrete.

Excavations and Slopes

The foundation excavation should be made in accordance with local, state and federal safety regulations. The site soils can be classified as Type B as described in the current Occupational Safety and Health Administration (OSHA) regulations. Therefore, temporary cuts greater than four feet in height should be sloped at an inclination no steeper than 1H:1V. If slopes of this inclination, or flatter, cannot be constructed, temporary shoring may be necessary. This shoring will help protect against slope or excavation collapse, and will provide protection to workmen in the excavation. If temporary shoring is required, we will be available to provide shoring design criteria, if requested. We also recommend that all cut slopes be examined by Earth Consultants, Inc. during excavation to verify that conditions are as anticipated.

Site Drainage

As discussed earlier, groundwater seepage was not encountered in the exploratory borings within the proposed excavation level. Therefore, we do not we do not expect site groundwater seepage will present any major construction-related problems. However, if seepage is encountered in the excavations, the contractor should be prepared to pump out any seepage which collects in the footing areas, prior to placement of concrete.

We recommend the appropriate locations of subsurface drains, if needed, be established during excavation operations by ECI's representative at which time the seepage areas, if present, may be more clearly defined.

If seepage is encountered in the basement or foundation excavations during construction, we recommend your contractor slope the bottom of the excavation to one or more shallow sump pits. The collected water can then be pumped from these sumps to a positive and permanent discharge, such as a nearby storm drain.

LIMITATIONS

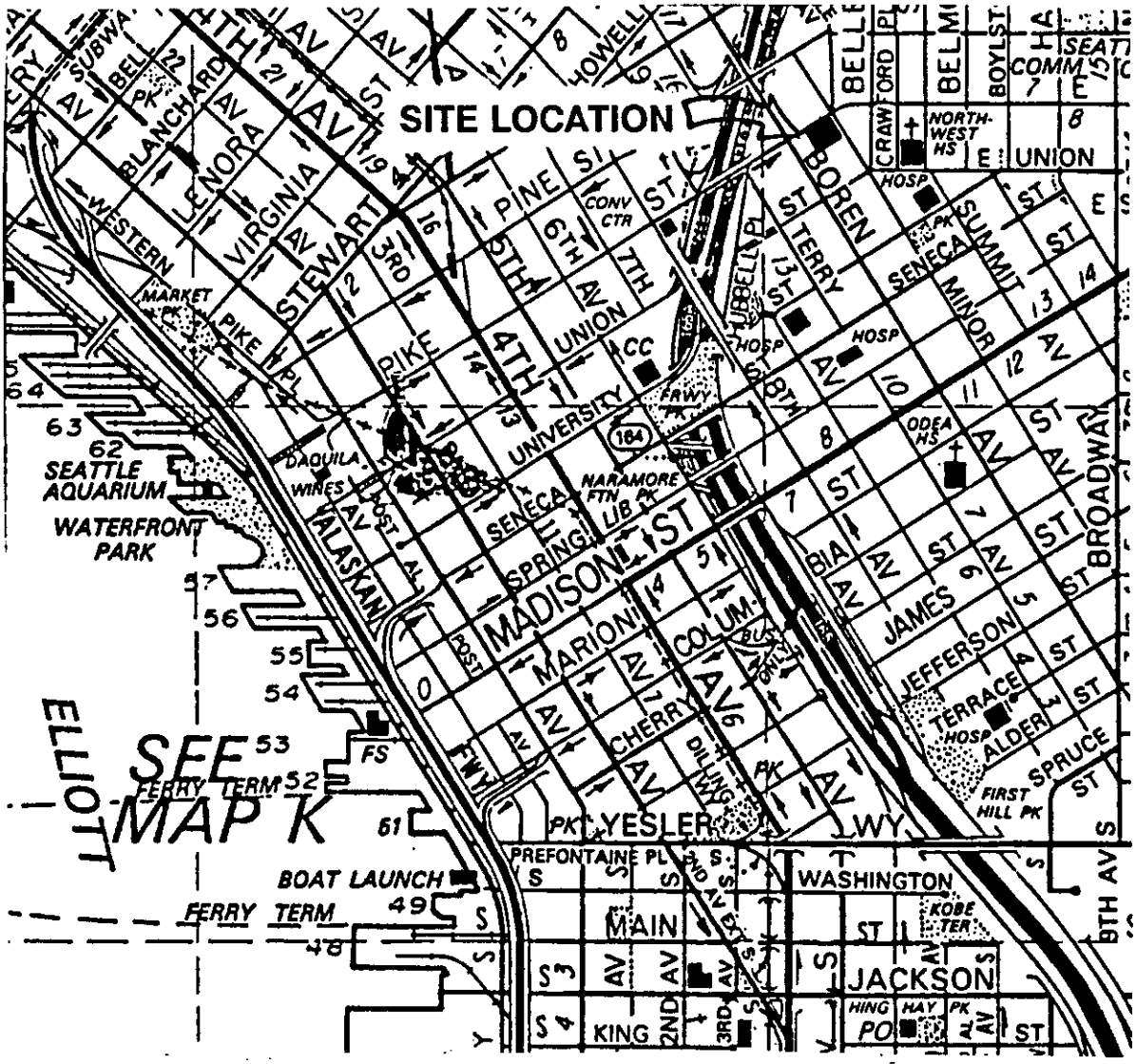
Our recommendations and conclusions are based on the site materials observed, selective laboratory testing and engineering analyses, the design information provided us by your architect, and our experience and engineering judgement. The conclusions and recommendations are professional opinions derived in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty is expressed or implied.

The recommendations submitted in this report are based upon the data obtained from the test pits. Soil and groundwater conditions between test pits may vary from those encountered. The nature and extent of variations between our exploratory locations may not become evident until construction. If variations do appear, ECI should be requested to reevaluate the recommendations of this report and to modify or verify them in writing prior to proceeding with the construction.

Additional Services

We recommend that ECI be retained to perform 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.

We also recommend that ECI be retained to provide geotechnical services during construction. 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. 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.

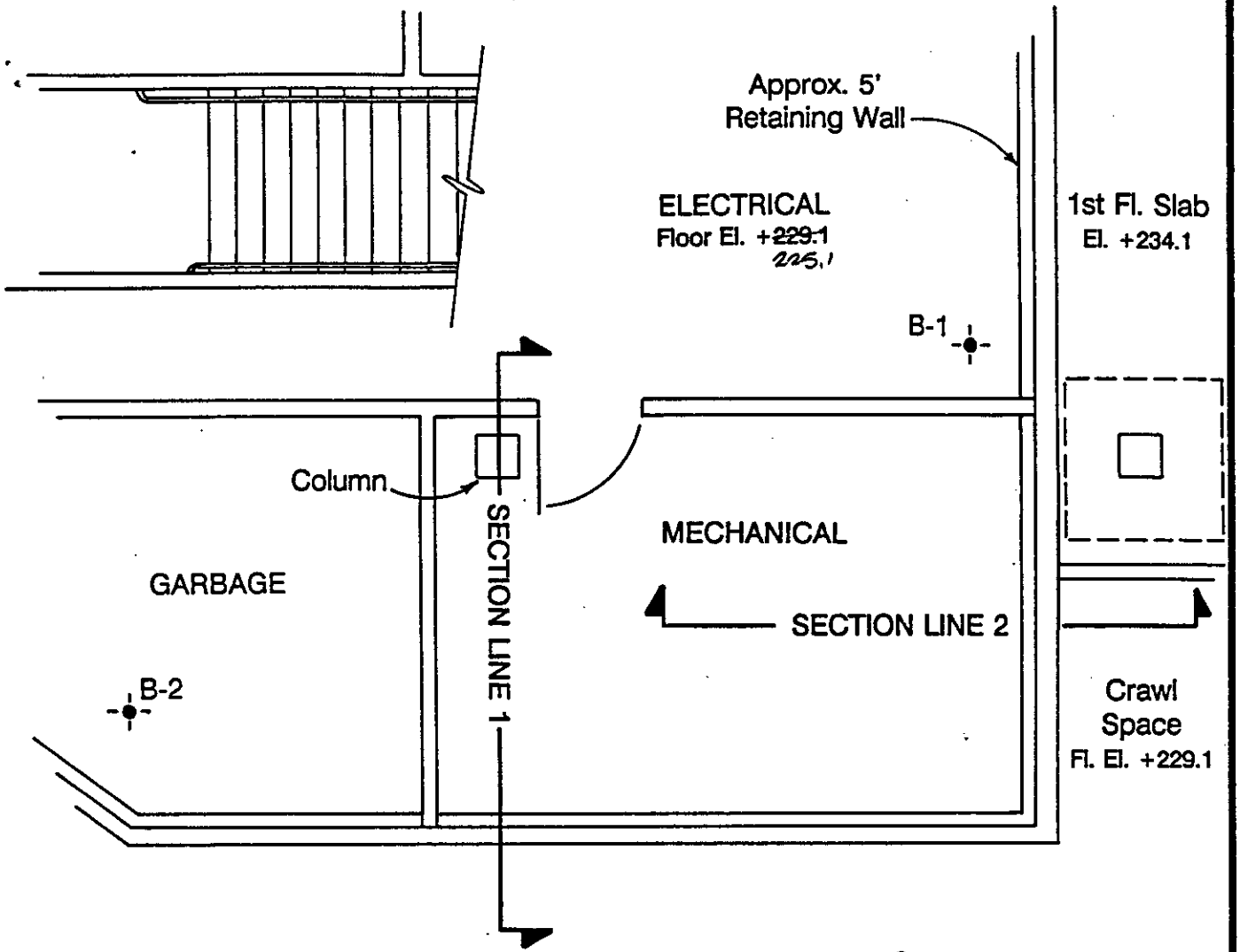


Reference:
King County / Map 20
By Thomas Brothers Maps
Dated 1990

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Vicinity Map
Wintonia Hotel
Seattle, Washington

Proj. No. 6074	Drwn. GLS	Date Mar. '93	Checked AM	Date 3/4/93	Plate 1



LEGEND

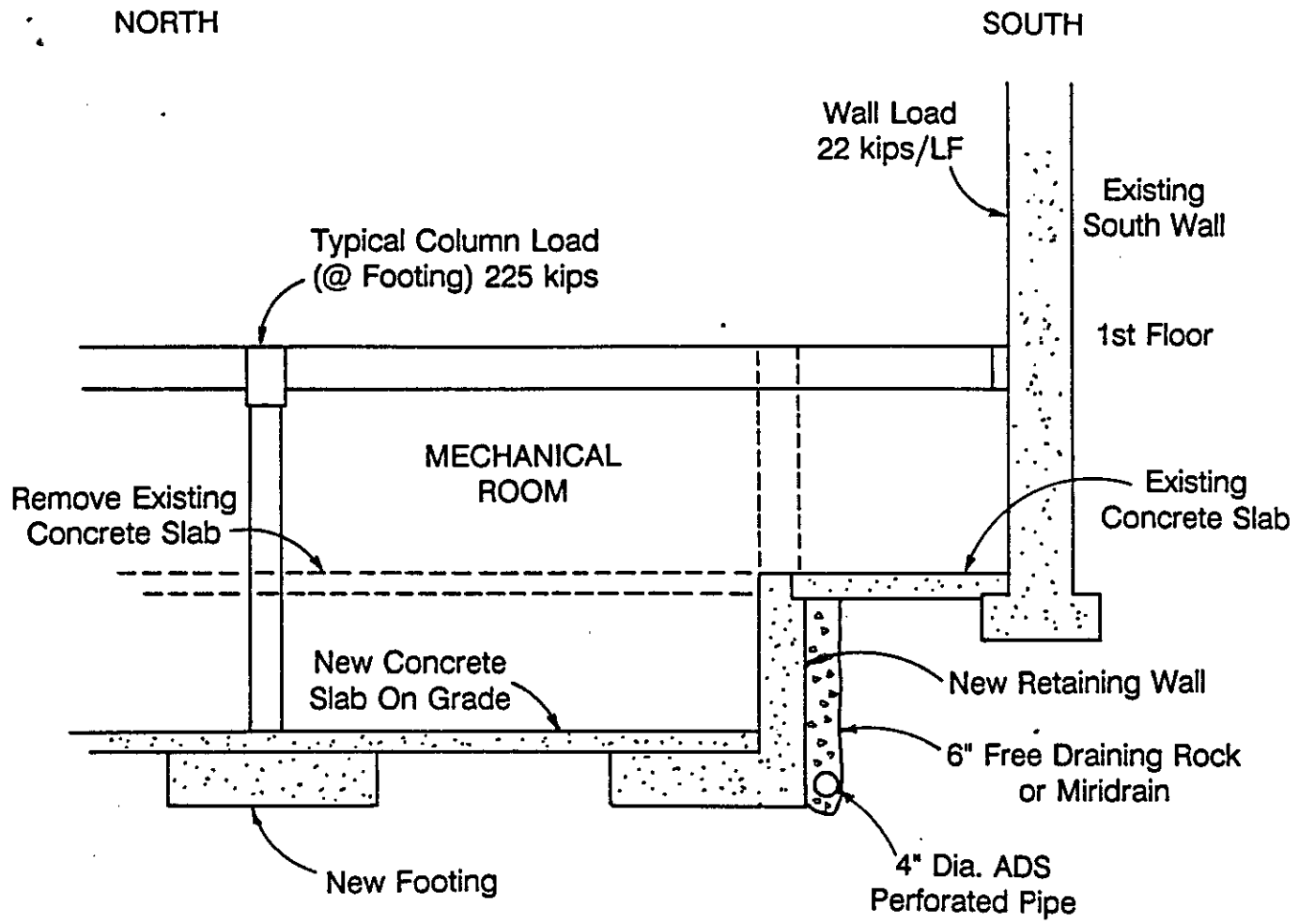
B-1 — Approximate Location of ECI Boring, Proj. No. E-6074, Feb. 1993

Section Line (See Plates 3 and 4)

Scale 3/16" = 1'-0"

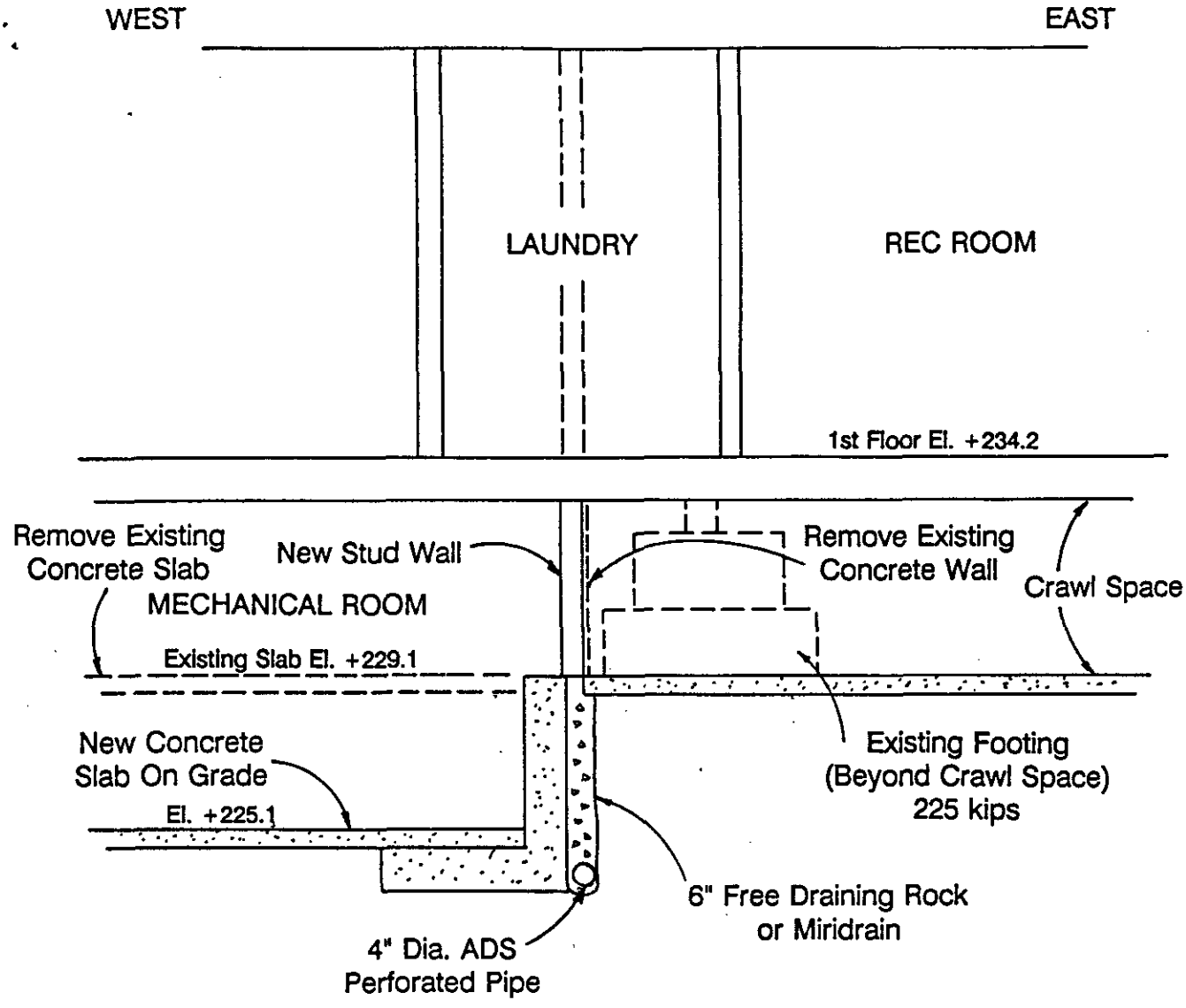
Reference:
Basement Plan
Received From Client
Undated

Earth Consultants Inc. Geotechnical Engineers, Geologists & Environmental Scientists			Boring Location Plan Wintonia Hotel Seattle, Washington		
Proj. No. 6074	**Drwn.** GLS	**Date** Mar. '93	**Checked** AM	**Date** 3/4/93	**Plate** 2



Scale 1/4" = 1'-0"

Earth Consultants Inc. Geotechnical Engineers, Geologists & Environmental Scientists			Section 1 Wintonia Hotel Seattle, Washington		
Proj. No. 6074	**Drwn.** GLS	**Date** Mar. '93	**Checked** AM	**Date** 3/4/93	**Plate** 3

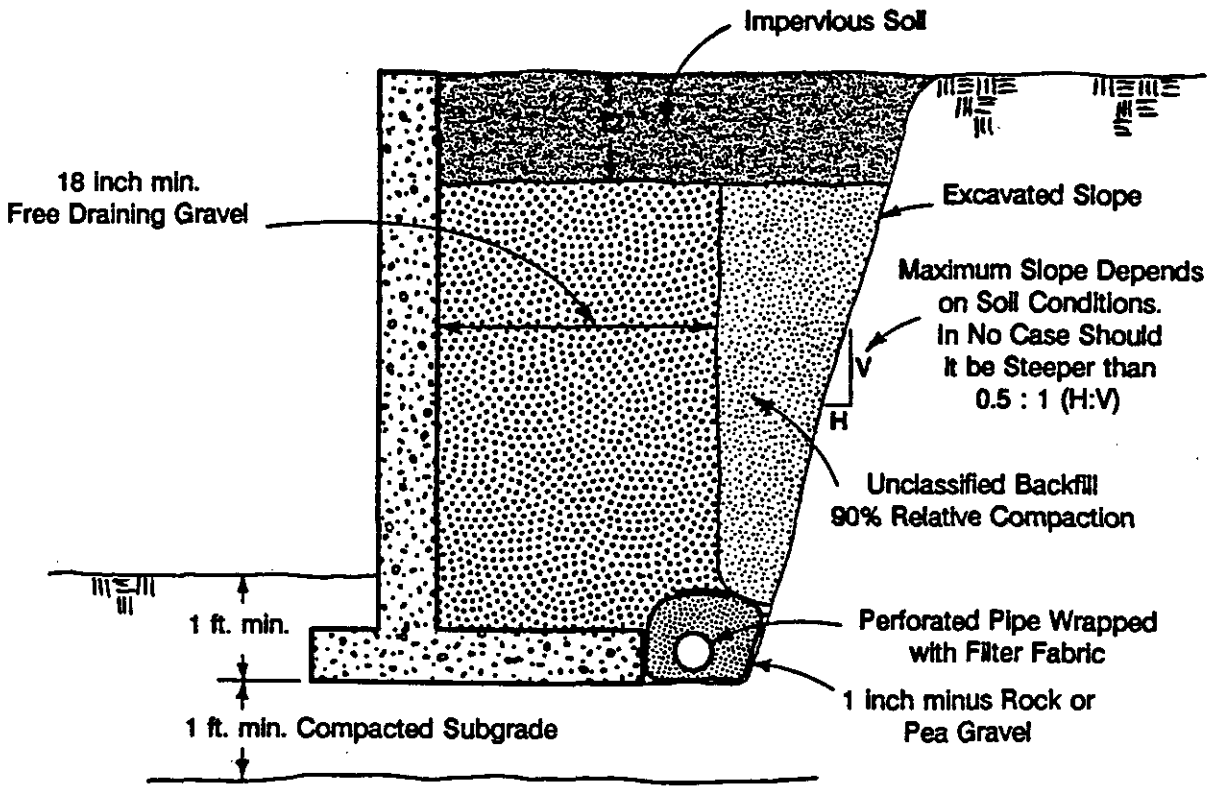


Scale 1/4" = 1'-0"

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Section 2
Wintonia Hotel
Seattle, Washington

Proj. No. 6074	Drwn. GLS	Date Mar. '93	Checked AM	Date 3/4/93	Plate 4



SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

NOTES

1) Classified backfill should consist of granular soil having no more than 5 percent passing the #200 sieve and no particles greater than 4" in diameter. The percentage of particles passing the #4 sieve should be between 25 and 75 percent.

2) Unclassified backfill should be free of organics, clayey soils, debris and other deleterious materials. It should be placed at or below the optimum moisture content.

3) For free-standing walls, weep holes may be used. Surround each weep hole with 3 cubic feet of 1" minus rock.

Earth Consultants Inc. Geotechnical Engineers, Geologists & Environmental Scientists			RETAINING WALL DRAINAGE AND BACKFILL WINTONIA HOTEL SEATTLE, WASHINGTON		
Proj. No. 6074	**Drwn.** GLS	**Date** Mar'93	**Checked** AM	**Date** 03-19-93	**Plate** 5

APPENDIX A

Boring Log

Project Name: Wintonia Hotel				Sheet 1 of 1
Job No.: 6074	Logged by: Aaron McMicheal	Start Date: 02-18-93	Completion Date: 02-18-93	Boring No: **B-2**
Drilling Contractor: Boretech		Drilling Method: HSA		Sampling Method: SPT
Ground Surface Elevation:		Hole Completion: ☐ Monitoring Well ☐ Piezometer ☐ Abandoned, sealed with bentonite		

W (%)	No. Blows Ft.	Graphic Symbol	Depth Ft.	Sample	USCS Symbol	Surface Conditions:
						6 inch concrete slab
			1			
			2			
8.4	36		3		SM	Gray silty SAND, dense, damp
			4			
			5			Trace of fine - medium gravel
10.5	49		6			Brownish mottling at 6 feet
			7			
15.6	52		8		SM-SP	Gray silty SAND w/gravel to poorly graded fine SAND w/silt, very dense, moist
			9			
6.4	55		10			Same w/medium gravel
			11			
			12			11.6 feet below existing slab surface 3-2-93
			13			
			14			
			15			
23.5	48		16		SM-SP	Same, wet at 15.5 feet
			17			Boring terminated at 16.5 feet below existing grade. Groundwater encountered at 15.5 feet during drilling. 3/4 inch PVC standpipe installed to 15 feet. Lower 3 feet slotted. Boring backfilled with cutting & bentonite.
			18			
			19			

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Boring Log
WINTONIA HOTEL
SEATTLE, WASHINGTON

Proj. No. 6074	Dwn. GLS	Date Mar'93	Checked AM	Date 03-04-93	Plate A3

Boring Log

Project Name: Wintonia Hotel				Sheet 1 of 1
Job No.: 6074	Logged by: Aaron McMicheal	Start Date: 02-18-93	Completion Date: 02-18-93	Boring No: **B-1**
Drilling Contractor:		Drilling Method: HSA		Sampling Method: SPT
Ground Surface Elevation:		Hole Completion: ☐ Monitoring Well ☐ Piezometer ☐ Abandoned, sealed with bentonite		

W (%)	No. Blows Ft.	Graphic Symbol	Depth Ft.	Sample	USCS Symbol	Surface Conditions:
						Concrete slab 6 inches
10.7			1		sm-sp	Black - gray silty SAND, trace gravel & poorly graded fine SAND, medium dense, damp
	14		2		SM	Gray silty SAND, some gravel, very dense, damp
9.4	50/6		3			
			4		gp-sp	Medium GRAVEL at 3.5 feet Loose poorly graded fine SAND 3.5 feet - 5 feet
			5		SM	Gray silty SAND, trace of gravel, dense, damp
7.6	38		6			Mottled at 6 feet
			7			
8.9			8			8.7 feet below existing slab surface 3-2-93
	32		9		SP-SM	Gray poorly graded SAND w/silt, very dense, wet
			10			
22.2	38		11			
			12			
			13			
			14			
			15			Drilled to 15 feet encountered 3 feet heave No sample recovery, Sand cuttings
			16			Boring terminated at 15 feet below existing grade. Groundwater encountered at 9 feet during drilling. 3/4 inch PVC standpipe installed to 12 feet. Lower 3 feet slotted. Boring backfilled with cuttings & bentonite.
			17			
			18			
			19			

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Boring Log
WINTONIA HOTEL
SEATTLE, WASHINGTON

Proj. No. 6074	Dwn. GLS	Date Mar'93	Checked AM	Date 03-04-93	Plate A2

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

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

LEGEND

Proj. No. 6074	Date Mar'93	Plate A1

APPENDIX A

FIELD EXPLORATION

E-6074

Our field exploration was performed on February 18, 1993. Subsurface conditions at the site were explored by drilling two borings to a maximum depth of sixteen and one-half (16.5) feet below the kitchen area concrete floor slab. The borings were drilled using Acker portable drilling equipment.

Approximate boring locations were determined by taping from the room corners. The locations of the borings should be considered accurate only to the degree implied by the method used. These approximate locations are shown on the Boring Location Plan, Plate 2.

The field exploration was continuously monitored by a engineer from our firm who classified the soils encountered and maintained a log of each boring obtained representative samples, measured groundwater levels, and observed pertinent site features.

All samples were visually classified in accordance with the Unified Soil Classification System which is presented on Plate A1, Legend. The boring logs are presented in Appendix A on Plates A2 and A3.

The final logs represent our interpretations of the field logs and the results of the laboratory examination and tests of field samples. The stratification lines on the logs represent the approximate boundaries between soil types. In actuality, the transitions may be more gradual.

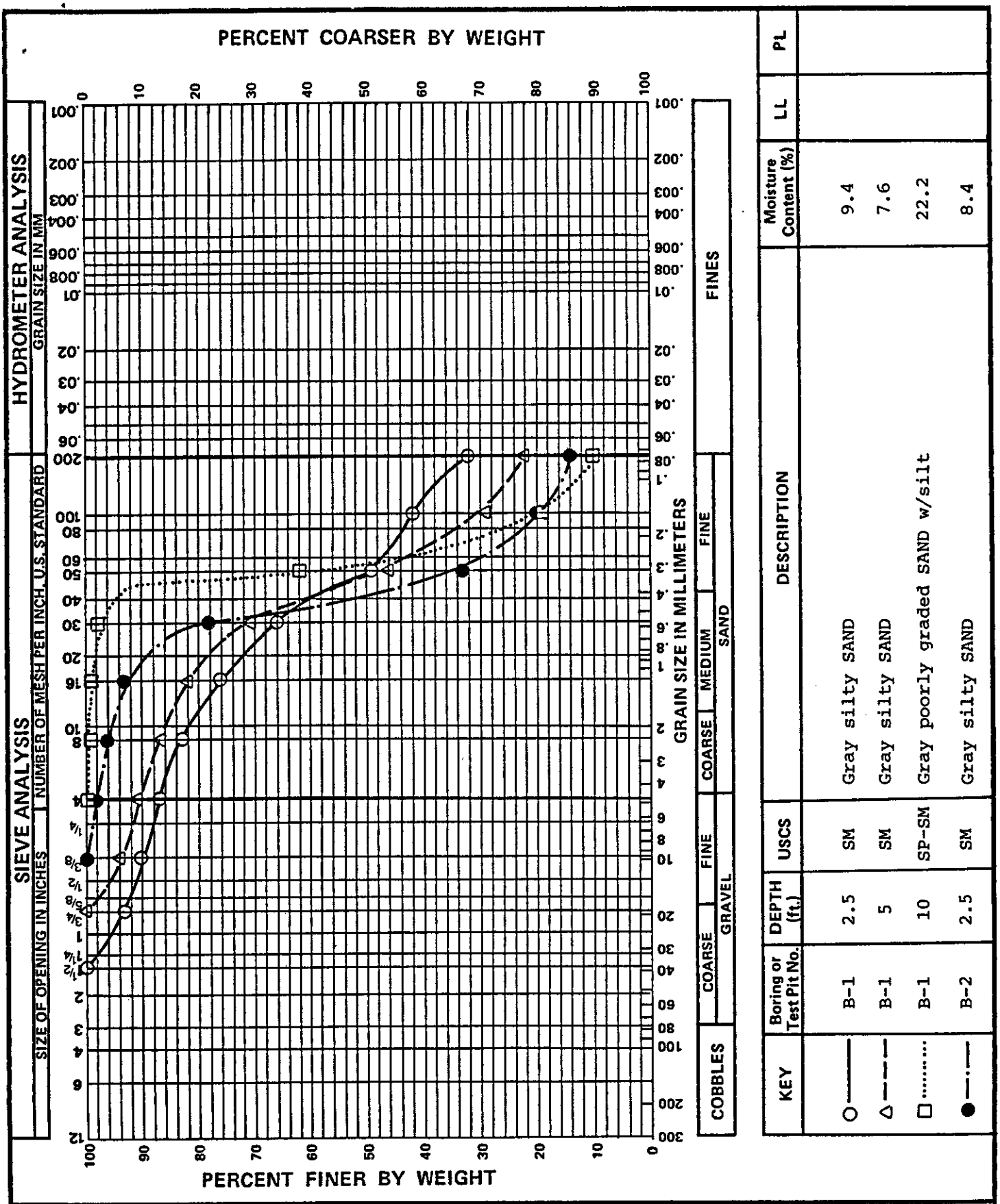
In each boring, Standard Penetration Tests (SPT) were performed at selected intervals in general accordance with ASTM Test Designaiton D-1586. The split spoon samples were driven with a one hundred forty (140) pound hammer freely falling thirty (30) inches. Representative soil samples were placed in closed containers and returned to our laboratory for further examination and testing.

APPENDIX B

APPENDIX B

LABORATORY TEST RESULTS

E-6074



KEY	Boring or Test Pit No.	DEPTH (ft.)	USCS	DESCRIPTION	Moisture Content (%)	LL	PL
○	B-1	2.5	SM	Gray silty SAND	9.4		
△	B-1	5	SM	Gray silty SAND	7.6		
□	B-1	10	SP-SM	Gray poorly graded SAND w/silt	22.2		
●	B-2	2.5	SM	Gray silty SAND	8.4		

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