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Site Address E. Marginal Wy S / SR 599

Date Copied 8/21/02 By AM

☒ Title page with the following information:

- ☐ Company (Author) name
- ☐ Report date
- ☐ Project Name
- ☐ Company's job number
- ☐ Site address

- ☒ Executive Summary / Introduction of the report
- ☐ Table of contents
- ☐ Project Location Map / Vicinity Map
- ☒ Site / Exploration Plans, Boring Location Plans
- ☐ Cross-sections / Subsurface profiles
- ☒ Exploration Logs
- ☐ Monitoring Well Logs
- ☐ Cone Penetrometer Logs
- ☐ Groundwater Elevation Tables / Data

☐ Includes data from Previous Reports

☐ No new data / data review

☐ Missing Data / Illegible Data
Explanation _____

Comments: located SW of
SR 599 & E. Marginal Wy S
intersection.

Points

entered - Suzanne

vd by - Gabriel

Layers

entered - AF

vd -

#7993



Converse Consultants

Geotechnical Engineering
and Applied Sciences

April 27, 1984

83-5123-02

Arthur M. James - Engineers, Inc.
Oregon Bank Building
319 Southwest Washington Street
Portland, Oregon 97204

Attention: Mr. Charles J. Conlee, Project Coordinator

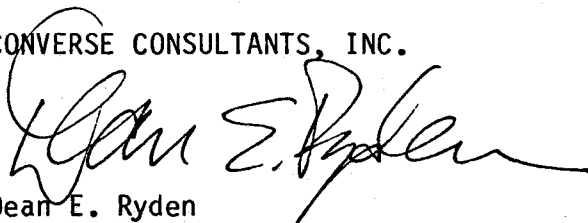
Subject: **REPORT ON GEOTECHNICAL INVESTIGATION**
Proposed Metro Transit South Operating Base Annex
King County, Washington

We herewith transmit ten copies of our summary report on geotechnical explorations for the proposed South Operating Base Annex. This report represents the completion of Task A of our subconsultant agreement, "Data Collection - Final Soils Investigation." Our participation was authorized by a subconsultant services agreement dated October 24, 1983.

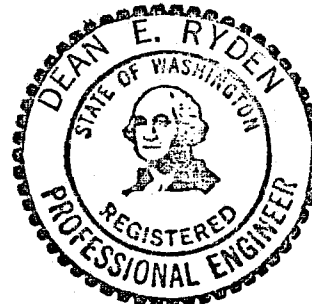
We appreciate the cooperation and communication afforded by your project team during our investigation. Our findings and recommendations were discussed with your staff during the investigation and a draft of this report was submitted for your comments.

If you have any further questions regarding the data and conclusions in this report, please do not hesitate to contact us.

CONVERSE CONSULTANTS, INC.


Dean E. Ryden
Principal Engineer

DER/kpp



Converse Consultants, Inc.
300 Elliott Avenue West
Suite 350
Seattle, Washington 98119
Telephone 206 285-5200

2. PROJECT DESCRIPTION

Mixed Use

The site layout plan chosen during design development is that designated as scheme 7B and includes a one-story transit training building, 1-1/2-story Operations and Maintenance Building, 1-1/2-story Facilities Maintenance Building, Fuel and Wash Buildings, Driver Training Course, southern access road from East Maginal Way South, and employee parking and coach storage areas as shown on Drawing 1. Site development will reportedly be accomplished in two phases: Phase 1 includes the Facilities Maintenance Building, Driver Training Course, Transit Training Building, and access road; Phase 2 development, scheduled for 1990, includes the central portion of the site, Fuel and Wash Buildings, and Operations and Maintenance Building. Phase 1 will be constructed in two contracts: initial site preparation and then building construction with final site preparation. The first of these contracts is scheduled for summer, 1984.

It is understood that the structures will be steel-framed with metal siding and concrete walls about five feet high. Maximum interior and exterior column loads are indicated to be approximately 257 and 63 kips, respectively. Floors will be concrete slabs with 5.3-foot deep inspection pits in the Operations and Maintenance Building and a six-foot deep dip tank in the Facilities Maintenance Building. Eight-foot diameter fiberglass fuel tanks will be buried to the north of the Fuel Building.

General finished site grade is planned at elevation +11 feet (1929 U.S. Coast & Geodetic Survey datum) and finished floor elevations in the buildings are planned at +12. Since the ground surface is generally about elevation +7, the proposed grade will be achieved by placing several feet of fill. Coach storage areas will ultimately be paved with concrete but may remain as gravel-surfaced areas for several years. Employee parking areas and the area around the Facilities Maintenance Building will reportedly be paved with asphaltic concrete.

3. SITE CONDITIONS

3.1 Surface Conditions

At the time of our field explorations, November 21 through December 14, 1983, the site was a low-lying area with thick grasses at the surface and standing water on approximately the western third of the property. Some small deciduous trees occupied the northern and western perimeters of the site. An abandoned road berm entered the site near the center of the south property line.

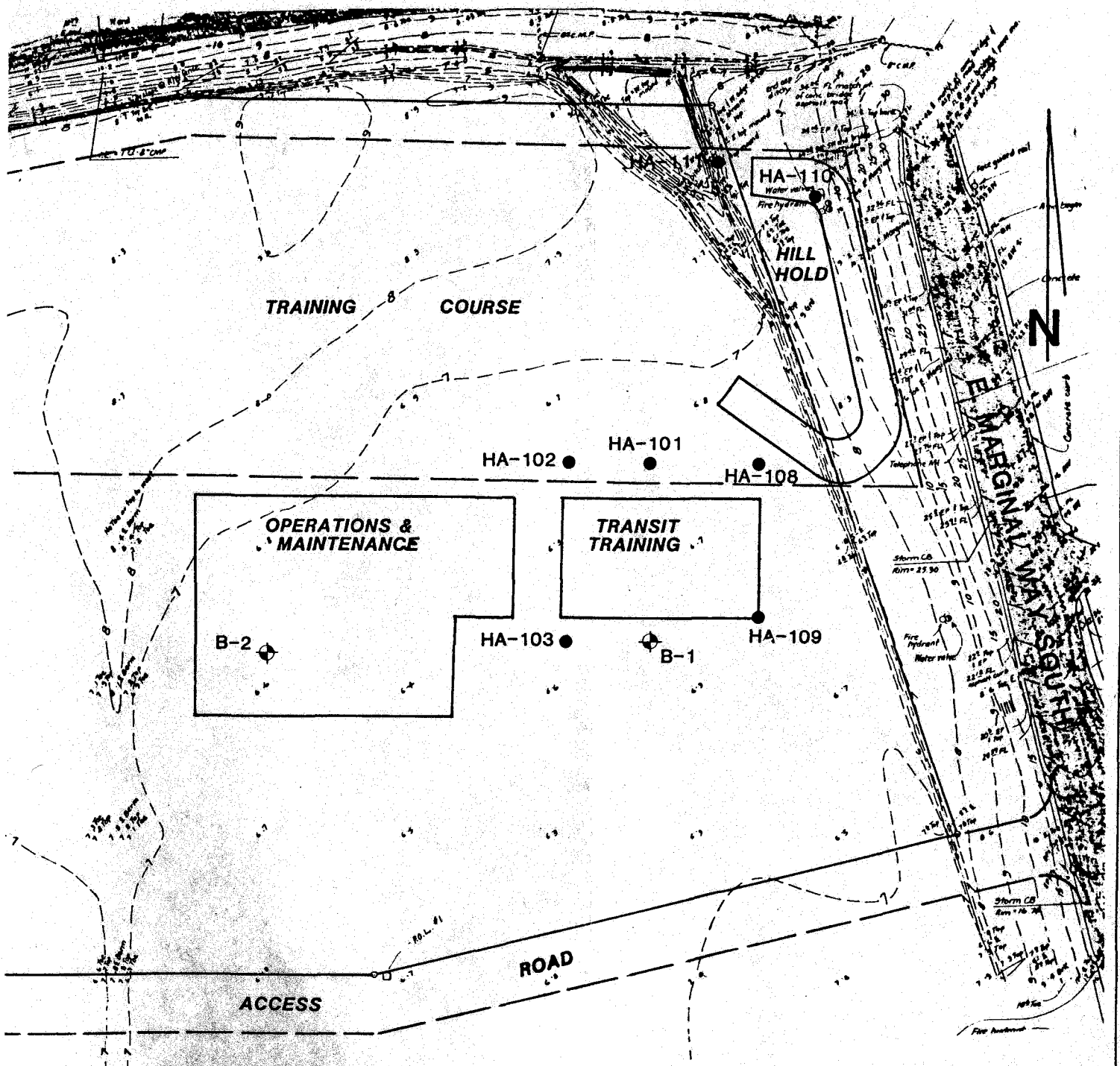
The site is bordered by the East Marginal Way South embankment along the east, State Route 509 to the north, a gently sloping wooded area up to State Route 99 on the west, and similar open field conditions on the south eventually rising to a filled area for Sam's Tire Service.

Several open ditches transmit water across the site to a highway drainage ditch and culvert to the north. Along the eastern property line, a drainage ditch was observed to carry water to depths of about two feet. A steep-sided ditch, about four to seven feet deep, was observed to transmit water two to four feet deep through the western third of the site.

A mound of soil extending about four to five feet above surrounding areas (to elevation +12) was observed at the northeast corner of the site. Shallow holes dug in this material with a shovel and hand augers exposed sand, silty sand, and gravel with some cobbles which is interpreted to be a remnant of man-made fill.

3.2 Subsurface Conditions

The site is interpreted to be within an alluvial channel associated with the Duwamish River which has been channelized to the north. Upper soils observed in our explorations consisted of interlayered organic silt, peat, sandy silt, silty clay, and sand which appear to be backwater and



REFERENCE: Untitled site survey, undated by Pool Engineering.

SITE AND EXPLORATION PLAN

PROPOSED SOUTH BASE ANNEX
King County, Washington
for Arthur M. James - Engineers, Inc.

Scale 1"=100'

Project No.

Date JAN 1984

83-5123-02

Prepared by JM

Drawing No.

Checked by DER

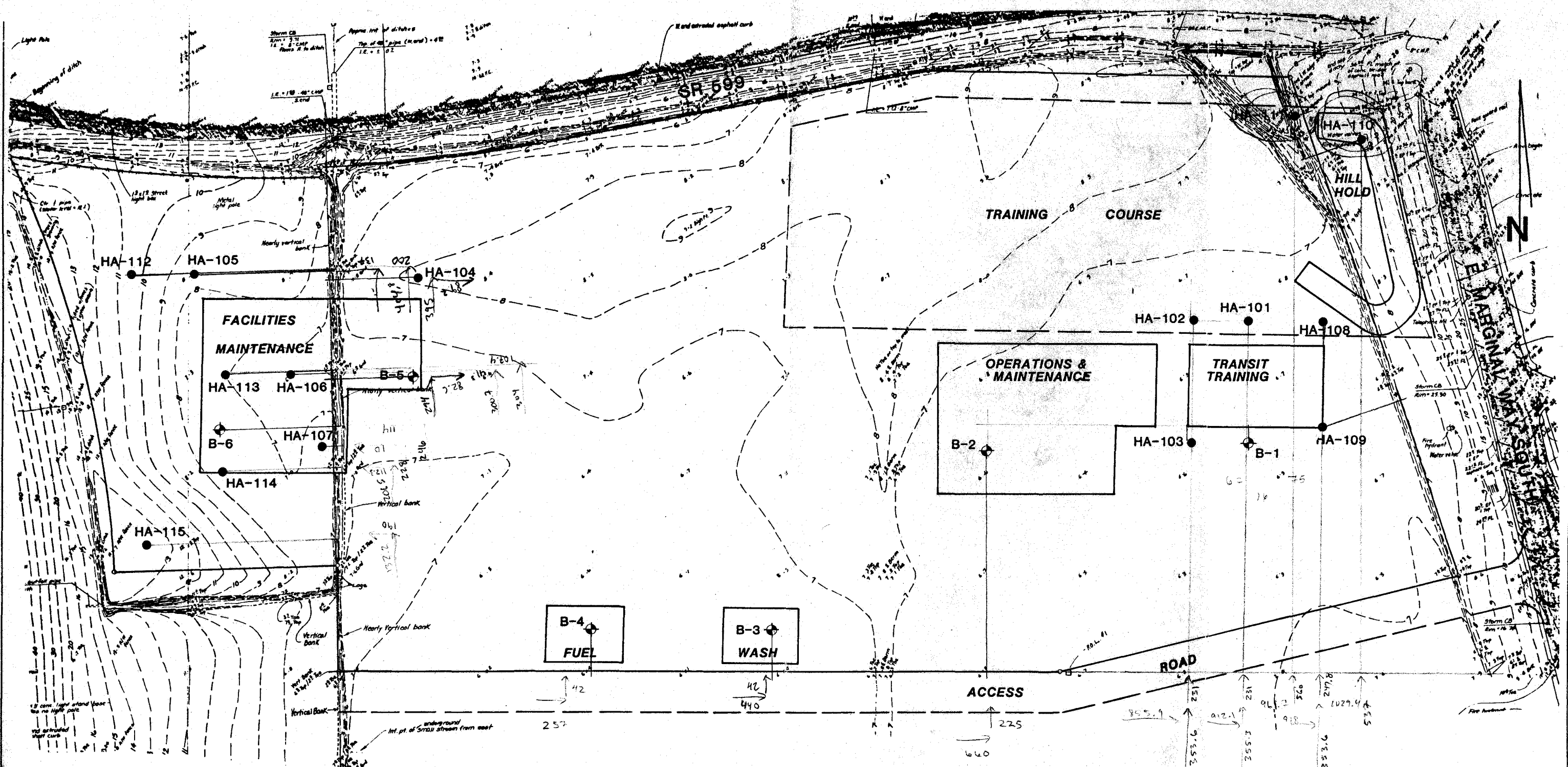
Approved By DER

1





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LEGEND:

- B-1  Boring location
 HA-102  Hand auger location

REFERENCE: Untitled site survey, undated by Pool Engineering.

SITE AND EXPLORATION PLAN

PROPOSED SOUTH BASE ANNEX
 King County, Washington
 for Arthur M. James - Engineers, Inc.

| | |
|-----------------|-------------|
| Scale 1"=100' | Project No. |
| Date JAN 1984 | 83-5123-02 |
| Prepared by JM | Drawing No. |
| Checked by DER | |
| Approved By DER | |



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APPENDIX A

FIELD EXPLORATIONS

Field explorations during this design phase included a series of six subsurface borings and 15 shallow hand auger holes completed during late November and early December, 1983. Locations of the explorations are indicated on the Site Plan, Drawing 1.

Borings were drilled to depths of 78.5 to 92 feet with a Mobile B-61 hollow steam auger drill rig mounted on a tracked Nodwell all-terrain vehicle. Continuous supervision of the drilling and sampling, and logging of the soils encountered, were carried out by our project geologist or technician. The soils encountered are shown graphically on the boring logs, Drawings A-1 through A-6.

Representative soil samples from the borings were secured for visual examination and laboratory testing. Undisturbed samples were obtained using a 3.25-inch O.D. split-barrel drive sampler. When undisturbed samples were not retained in our 3.25-inch diameter sampling barrel, disturbed samples were collected at the same elevation for visual and laboratory classification. The disturbed samples were taken with the "Standard Penetration Test" which utilizes a 2-inch O.D. split-spoon drive sampler. Both samplers were driven by means of a 140-pound hammer dropping a distance of 30 inches. Normally, each sample was obtained by an 18-inch penetration of the sampler and the number of hammer blows for each six-inch increment was recorded. The blow counts shown on the boring logs are for such six-inch increments except as noted where lesser penetration was achieved.

Shallow soils were observed in a series of hand auger holes which were advanced to depths on the order of ten feet with a three-inch or one-inch diameter hand auger. Logs of these holes are enclosed as Drawings A-7 through A-14.

The locations of our explorations were determined by taping to survey grid stakes. Ground elevations at the exploration locations were interpolated from the project topography map. A series of 15 hand auger probes was completed in May 1983 during the predesign investigation. However, the locations of the probes are questionable because a site survey was not available at that time. The logs for these holes are not included in this report but are available in our files.

Soils were classified in general accordance with the Unified Soil Classification System as described on the enclosed key to soil symbols and terms. Those soil samples not completely used for testing have been stored in our laboratory and are available for examination should it be desired. Due to the elapsed time since they were secured, changes in moisture content and appearance of the samples have occurred.

DATE DRILLED: 11/21/83

SUMMARY: BORING NO. 1

ELEVATION: Approx. 6.7

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|----------|---------------|-----------------------------------|--------------------|---|----------|----------|--------------|-------|
| 1C | 1/18" | C | 60 | 63 | | CLAYEY SILT; brown, with organics | MH OL | wet | soft | 6 |
| 2C | 1/12" 3/6" | | 39 | 80 | | with thin layers of fine to medium sand | | | medium stiff | 0 |
| 3C | 2 2 3 | DS | 27 | 97 | | SAND; black, fine to medium grades finer | SP | wet | loose | -5 |
| 4X | 1 1 5 | | | | | | | | | -10 |
| 5X | 2 5 16 | | | | | | | | medium dense | -15 |
| 6A | 9 13 21 | | | | | grades finer with depth to very fine sand | | | dense | -20 |
| 7A | 14 22 28 | | | | | | | wet | | -25 |
| 8A | 4 14 23 | | | | | trace silt | | | | -30 |
| 9A | 10 18 19 | | | | | increasing silt to some silt (Continued) | | | | -35 |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED SOUTH BASE ANNEX
King County, Washington
for Arthur M. James - Engineers, Inc.

Project No.
83-5123-02

Drawing No.



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A-1

DATE DRILLED:

SUMMARY: BORING NO.1 (Cont.)

ELEVATION:

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|----------|---------------|-----------------------------------|--------------------|--|--------|----------|-----------------|-------|
| 45 | | | | | | SAND; black, fine to medium, some silt | SP | | medium dense | -40 |
| 10A | 0 1 1 | | 38 | | | CLAYEY SILT; gray | | wet | very soft | |
| 50 | | | | | | | MH | | | -45 |
| 11C | 1 3 5 | | 35 | | | to dark gray in color | | | medium stiff | |
| 55 | | | | | | | | | | -50 |
| 12C | 1 2 3 | | | | | trace sand | | | | |
| 60 | | | | | | | | | | -55 |
| 13 | push C | | 44 | 73 | | | | | | -60 |
| 65 | | | | | | | | | | -65 |
| 14 | push | | 41 | 80 | | | | | | -70 |
| 70 | | | | | | | | | | -75 |
| 15 | push | | 51 | 73 | | | | | | -80 |
| 75 | | | | | | | | | | -85 |
| 16X | push | | | | | increasing sand content, with shell fragments | | | | -90 |
| 80 | | | | | | | | | | -95 |
| 17A | 26 24 35 | | | | | SAND; gray, medium, with trace gravel and shell fragments | SP | wet | very dense | |
| 85 | | | | | | | | | | -90 |
| 18A | 9 4 8 | | | | | increasing silt content | | | | |
| 90 | 19A | 50/3" | | | | SANDY SILT; gray, with gravel | ML | wet | hard | |
| | | | | | | Auger refusal at depth 92.0' | | | | |
| | | | | | | Groundwater encountered at surface | | | | |

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Drawing No.



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A-1 (CONT.)

DATE DRILLED: 11/23/83

SUMMARY BORING NO. 2

ELEVATION: Approx. 6.6

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** FIELD MOISTURE % OF DRY WEIGHT DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|----------------|--|--|----------|----------|--------------------------|---------|
| 5 | 1C | 1 2 3 | C 63 61 | CLAYEY SILT; brown, with organics thin sand layer at depth 4.5' | MH OL | wet | soft | 6 |
| 10 | 2C | 10 22 34 | DS 25 97 | SAND; black, fine to medium fine, with little silt | SP | wet | dense medium dense | 0 -5 |
| 15 | 3A | 5 7 7 | | | | | | -10 |
| 20 | 4A | 6 15 40 | | grades to very fine, trace silt | | | dense | -15 |
| 25 | 5A | 18 12 29 | | | | | | -20 |
| 30 | 6A | 11 25 23 | | | | | | -25 |
| 35 | 7A | 1 15 36 | | increasing silt content | | | very dense | -30 |
| 40 | 8A | 1 10 15 | | | | | medium dense | -35 |
| | 9A | 5 13 10 | | CLAYEY SILT; light gray (Continued) | MH | wet | soft | |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability



water level
impervious seal
piezometer tip

PROPOSED SOUTH BASE ANNEX
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Project No.
83-5123-02

Drawing No.

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A-2

DATE DRILLED:

SUMMARY: BORING NO. 2 (Cont.) ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** FIELD MOISTURE % OF DRY WEIGHT DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|--------------------|--|---|----------|----------|-------------|-------|
| 45 | | | | CLAYEY SILT; light gray | MH | wet | very soft | 40 |
| 50 | 10A | 0/18" | | | | | | 45 |
| 55 | 11 | pushC | 31 94 | | | | | 50 |
| 60 | 12X | push | | | | | | 55 |
| 65 | 13 | push | | | | | | 60 |
| 70 | 14 | push | | | | | | 65 |
| 75 | 15 | push | | | | | | 70 |
| 80 | 16C | 22 38 47 | | SILTY SAND AND GRAVEL; gray, medium to coarse sand, with shell fragments | SM GM | wet | very dense | 75 |
| 85 | 17C | 150/ 6" | | to greenish-gray in color | | | | 80 |
| 90 | 18C | 116 74 60/3" | | decreasing silt content to SANDY GRAVEL with some silt | GW | | | |
| | | | | Bottom of boring at depth 89.7' | | | | |
| | | | | Groundwater encountered at surface | | | | |

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A-2 (CONT.)

DATE DRILLED: 11/28/83

SUMMARY: BORING NO. 3

ELEVATION: Approx. 6.5

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|-------------------|---------------|-----------------------------------|--------------------|-------------------------------------|--------|----------|-----------------|-------|
| 5 | 1C | 3 3 5 | C | 62 | 61 | SANDY SILT; brown, with organics | ML | wet | medium stiff | 6 |
| 10 | 2C | 6 6 7 | | 26 | 99 | SAND; black, fine | SP | wet | loose | 0 |
| 15 | 3A | 5 13 37 | | | | 2" layer of sandy silt at depth 15' | | | dense | -5 |
| 20 | 4A | 10 6 13 | | | | 6" layer of sandy silt at 18.5' | | | medium dense | -10 |
| 25 | 5A | 13 21 40 | | | | | | | very dense | -15 |
| 30 | 6A | 21 50/6" | | | | | | | | -20 |
| 35 | 7A | 24 17 50/6" | | | | | | | | -25 |
| 40 | 8A | 18 30 50/6" | | | | (Continued) | | | | -30 |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability



water level

impervious seal

piezometer tip

PROPOSED SOUTH BASE ANNEX
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Project No.
83-5123-02

Drawing No.



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A-3

DATE DRILLED:

SUMMARY: BORING NO. 3 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|----------------|---------------|-----------------------------------|--------------------|--|--------|----------|-------------|-------|
| 40 | | | | | | SAND; black, fine | SP | wet | very dense | -35 |
| 45 | 9A | 2/18" | | | | CLAYEY SILT; light gray | MH | wet | very soft | -40 |
| 50 | 10 | push C | 42 | 79 | | | | | | -45 |
| 55 | 11 | push | | | | to dark gray in color | | | stiff | -50 |
| 60 | 12 | push C | 42 | 77 | | light gray | | | | -55 |
| 65 | 13 | push | | | | | | | | -60 |
| 70 | 14X | 90/6" | | | | SILTY SAND; gray, fine to coarse, | SM | wet | very dense | -65 |
| 75 | 15A | 50/6" 50/6" | | | | greenish-gray, fine to medium, little gravel, thinly laminated with green, medium sand grades coarser with increasing gravel | | | | -70 |
| 80 | 16A | 67/6" | | | | | | | | |

Bottom of boring at depth 78.5'
Groundwater encountered at surface

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED SOUTH BASE ANNEX
King County, Washington
for Arthur M. James - Engineers, Inc.

Project No.
83-5123-02

Drawing No.



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A-3 (CONT.)

DATE DRILLED: 11/29/83

SUMMARY: BORING NO. 4

ELEVATION: Approx. 6.5

DEPTH
IN FEET

SAMPLE NO.
SAMPLE

BLOWS/6"

OTHER TESTS**

FIELD MOISTURE
% OF DRY WEIGHT

DRY DENSITY
PCF

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

DESCRIPTION

SYMBOL MOISTURE

CONSISTENCY

ELEV.

| | | | | | | | | |
|----|----|----------------|----|---|----|-----|------------|-----|
| 5 | 1A | 1/18" | 23 | SILTY PEAT; dark brown | Pt | wet | very soft | 6 |
| 10 | 2A | 7 13 19 | | SAND; dark gray, fine to medium, trace silt, occasional lens of peat | SP | wet | dense | 0 |
| 15 | 3A | 7 14 18 | | trace wood fibers | | | | -5 |
| 20 | 4A | 13 25 27 | | | | | very dense | -10 |
| 25 | 5A | 1/12" 15 | | 18" peat layer at depth 22' | | | soft | -15 |
| 30 | 6A | 28 55/6" | | | | | very dense | -20 |
| 35 | 7A | 18 50/6" | | CLAYEY SILT; gray | MH | wet | soft | -25 |
| 40 | 8A | 18 58/6" | | SAND; dark gray, fine to medium, interbedded with clayey silt | SP | wet | very dense | -30 |
| | 9A | 17/ 18" | 40 | SANDY SILT; dark gray (Continued) | ML | wet | stiff | -35 |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability



water level

impervious seal

piezometer tip

PROPOSED SOUTH BASE ANNEX
King County, Washington
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Project No.

83-5123-02

Drawing No.



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A-4

DATE DRILLED:

SUMMARY: BORING NO. 4 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** FIELD MOISTURE % OF DRY WEIGHT DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|-------------------|--|--|--------|------------|--------------|-------|
| 45 | | | | grades finer to: | | | | 40 |
| 50 | 10A | 5/18" 14/6" | 53 | CLAYEY SILT; dark gray | MH | wet | stiff | 45 |
| 55 | 11A | 1 12 9 | 42 | with organics | | | | 50 |
| 60 | 12A | 1 3 8 | 52 | | | | | 55 |
| 65 | 13A | 1/12" 14/6" | | SILTY SAND; dark gray, fine to medium, with trace gravel and shell fragments | SM | wet | medium dense | 60 |
| 70 | 14X | 50/6" 43/6" | | | | | very dense | 65 |
| 75 | 15A | 24 28 42 | 18 | CLAYEY SILT; mottled gray-brown, with some gravel | MH | | hard | 70 |
| 80 | 16A | 18 46 50/3" | 21 | SILTY SAND; gray, fine to medium | SM | wet | very dense | 75 |
| 85 | 17A | 66/6" | 18 | to very fine | | very moist | | |

Bottom of boring at depth 83.5'
Groundwater encountered at surface

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability



water level

impervious seal

piezometer tip

PROPOSED SOUTH BASE ANNEX
King County, Washington
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Project No.

83-5123-02

Drawing No.

**Converse Consultants**Geotechnical Engineering
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DATE DRILLED: 11/30/83

SUMMARY: BORING NO. 5

ELEVATION: Approx. 6.6

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|-------------------|---------------|-----------------------------------|--------------------|-------------|--------|----------|---------------|-------|
| 5 | 1A | 9/18" | C | 23 | 89 | 43 | ML | wet | soft | 6 |
| | | | | | | | | | | |
| | | | | | | | | | | 0 |
| 10 | 2A | 25 34 50/6" | | 23 | 94 | | SP | wet | very dense | 5 |
| | | | | | | | | | | |
| 15 | 3A | 6/18" | | | | | | | loose | 10 |
| | | | | | | | | | | |
| 20 | 4A | 8 24 19 | | | | | | | dense | 15 |
| | | | | | | | | | | |
| 25 | 5A | 3 18 55/6" | | | | | | | very dense | 20 |
| | | | | | | | | | | |
| 30 | 6A | 21 35 42 | | | | | | | | 25 |
| | | | | | | | | | | |
| 35 | 7A | 13 21 50/3" | | | | | | | | 30 |
| | | | | | | | | | | |
| 40 | 8A | 7 11 24 | | | | | | | dense | 35 |
| | | | | | | | | | | |
| | 9A | 5 7 14 | | 41 | | | MH | wet | stiff | |
| | | | | | | | | | | |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED SOUTH BASE ANNEX
King County, Washington
for Arthur M. James - Engineers, Inc.

Project No.
83-5123-02

Drawing No.



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and Applied Sciences

A-5

DATE DRILLED:

SUMMARY: BORING NO.5 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO.* | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------|---------------|---------------|-----------------------------------|--------------------|--|--------|----------|-------------|-------|
| 45 | | | | | | CLAYEY SILT; gray | MH | wet | stiff | -40 |
| 50 | 10A | 1/18" | 38 | | | SANDY SILT; dark gray | ML | wet | very soft | -45 |
| 55 | 11A | 1/18" | 57 | | | CLAYEY SILT; dark gray, trace sand | MH | wet | very soft | -50 |
| 60 | 12A | 8 9 10 | 42 | | | SANDY SILT; dark gray | ML | wet | very stiff | -55 |
| 65 | 13A | 1/18" | 48 | | | CLAYEY SILT; dark gray, with trace sand | MH | wet | soft | -60 |
| 70 | 14A | 1/18" | 53 | | | | | | | -65 |
| 75 | 15A | 0/18" | 28 | | | grades to: SANDY SILT; with shell fragments, and trace gravel | ML | | | -70 |
| 80 | 16A | 8 17 41 | 16 | | | SILTY SAND; gray, fine to medium, with some gravel and shell fragments | SM | wet | very dense | -75 |
| 85 | 17A | 50/4" | 11 | | | SAND; gray, medium to coarse, with trace gravel and shell fragments fine to medium | SP | wet | very dense | -80 |
| 90 | 18A | 129/ 6" | 16 | | | | | | | |

Bottom of boring at depth 88.5'
Groundwater encountered at depth 1.3'

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Project No.
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A-5 (CONT.)

DATE DRILLED: 12/2/83

SUMMARY: BORING NO. 6

ELEVATION: Approx. 7.5

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS
ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/8" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|-------------------|---------------|-----------------------------------|--------------------|--|--------|----------|--------------|-------|
| 5 | 1C | 2/12" 4/6" | 54 | | | SANDY SILT; brown, with organics | ML | wet | medium stiff | 7 |
| | | | | | | layer of sand with some silt at 4.5' | | | medium dense | 0 |
| 10 | 2C | 8 30 50/6" | DS 30 | 94 | | SAND; brown, fine, with some silt, with trace roots | SP | wet | very dense | -5 |
| 15 | 3A | 8 15 11 | | | | grades slightly coarser to fine sand with trace silt | | | medium dense | -10 |
| 20 | 4A | 1 8 23 | | | | | | | dense | -15 |
| 25 | 5A | 15 27 42 | | | | with shell fragments and organic fibers | | | very dense | -20 |
| 30 | 6A | 32 42 50/5" | | | | | | | | -25 |
| 35 | 7A | 24 27 44 | | | | | | | | -30 |
| 40 | 8A | 15 18 17 | | | | (Continued) | | | | |

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability

water level
impervious seal
piezometer tip

PROPOSED SOUTH BASE ANNEX
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Drawing No.



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A-6

DATE DRILLED:

SUMMARY: BORING NO. 6 (Cont.)

ELEVATION:

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

| DEPTH IN FEET | SAMPLE NO. SAMPLE | BLOWS/6" | OTHER TESTS** | FIELD MOISTURE % OF DRY WEIGHT | DRY DENSITY PCF | DESCRIPTION | SYMBOL | MOISTURE | CONSISTENCY | ELEV. |
|------------------|----------------------|-------------|---------------|-----------------------------------|--------------------|---|----------|----------|-------------|-------|
| 40 | | | | | | SAND; brown, fine, with some silt, with trace roots | SP | | very dense | |
| 45 | 9A | 6 2/12" | | 39 | | SILT; gray, with trace sand | ML | wet | very soft | -35 |
| 50 | 10 | push C | | 34 | 83 | grades finer to CLAYEY SILT | MH | | soft | -40 |
| 55 | 11 | push | | | | | | | | -45 |
| 60 | 12 | push | | | | | | | | -50 |
| 65 | 13 | push C | | 57 | 67 | | | | | -55 |
| 70 | 14A | 75 80/4" | | | | SILTY SAND AND GRAVEL; gray, fine to coarse sand | SM GM | wet | very dense | -60 |
| 75 | 15A | 29 76 | | | | grades cleaner to SILTY SAND, with little gravel | SM | wet | very dense | -65 |
| 80 | 16A | 100/ 4" | | | | SILTY SAND; gray, fine to medium, trace gravel | | | | -70 |

Bottom of boring at depth 78.5'
Groundwater encountered at depth 6.0'

* A. 2" split-spoon sampler

B. 3" O.D. thin-wall sampler

C. 3-1/4" O.D. x 2-1/2" liner

** A - Atterberg, C - consolidation, DS - direct shear,

D. 3-1/2" O.D. split barrel sampler X. sample not recovered

G - grain size, T - triaxial, P - permeability



water level
impervious seal
piezometer tip

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A-6 (CONT.)

HA-101 N 2358, E 1666 Elev. 6.7

| Depth | Elev. | Description |
|-----------|------------|--|
| 0.0 - 0.3 | 6.7 - 6.4 | root mat |
| 0.3 - 2.4 | 6.4 - 4.3 | brown, silty PEAT; very soft, wet |
| 2.4 - 2.5 | 4.3 - 4.2 | layer of black, fine SAND; loose, wet |
| 2.5 - 9.5 | 4.2 - -2.8 | gray and brown, clayey SILT, with some organics and trace fine sand; soft to medium stiff, wet |
| at 9.5 | -2.8 | black, fine SAND; loose, wet |
| | | groundwater at ground surface (el. 6.7) completed 12/4/83 |

HA-102 N 2358, E 1608 Elev. 6.5

| Depth | Elev. | Description |
|-----------|------------|--|
| 0.0 - 0.4 | 6.5 - 6.1 | root mat |
| 0.4 - 3.2 | 6.1 - 3.3 | brown, silty PEAT; very soft, wet |
| 3.2 - 9.0 | 3.3 - -2.5 | gray-brown, sandy SILT with occasional organics, soft, wet |
| at 9.0 | -2.5 | black, fine SAND; loose, wet |
| | | groundwater at ground surface (el. 6.5) completed 12/4/83 |

LOG OF HAND AUGER HOLES

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A-7

HA-103 N 2233, E 1608 Elev. 6.5

| Depth | Elev. | Description |
|-----------|------------|--|
| 0.0 - 5.1 | 6.5 - 1.4 | brown, silty PEAT; soft, wet |
| 5.1 - 8.3 | 1.4 - -1.8 | gray-brown, clayey SILT with occasional organics; soft, wet |
| at 8.3 | -1.8 | black, fine SAND; loose, wet |
| | | groundwater at ground surface (el. 6.5) completed 12/4/83 |

HA-104 N 2400, E 1608 Elev. 8.0

| Depth | Elev. | Description |
|------------|------------|--|
| 0.0 - 3.0 | 8.0 - 5.0 | brown, silty SAND with organics; loose, very moist |
| 3.0 - 5.1 | 5.0 - 2.9 | PEAT with wood fragments; very soft, wet |
| 5.1 - 10.5 | 2.9 - -2.5 | gray-brown, silty CLAY with organics; soft, wet |
| at 10.5 | -2.5 | brown, silty SAND; loose, wet |
| | | groundwater at depth 2.0' (el. 6.0) completed 12/4/83 |

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~~HA-105~~ N 2400, E 600 Elev. 8.0

| Depth | Elev. | Description |
|------------|------------|---|
| 0.0 - 2.0 | 8.0 - 6.0 | brown, silty SAND with occasional organics and roots (possible topsoil or fill); loose, moist |
| 2.0 - 3.5 | 6.0 - 4.5 | brown, silty PEAT; soft, wet |
| 3.5 - 10.5 | 4.5 - -2.5 | gray, silty CLAY with some organics; soft, wet |
| at 10.5 | -2.5 | black, medium SAND with some silt; loose, wet |
| | | groundwater at depth 3.1' (el. 4.9) completed 12/4/83 |

~~HA-106~~ N 2300, E 700 Elev. 6.5

| Depth | Elev. | Description |
|-----------|-------------|---|
| 0.0 - 3.2 | 6.5 - 3.3 | brown, silty PEAT; soft, wet |
| 3.2 - 7.5 | 3.3 - -1.0 | gray, silty CLAY with occasional organics and thin sand layers; soft, wet |
| 7.5 - 9.0 | -1.0 - -2.5 | gray, silty SAND; loose, wet |
| | | groundwater at depth 2.8' (el. 3.7) completed 12/4/83 |

LOG OF HAND AUGER HOLES

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HA 107 N 2225, E 730 Elev. 7.0

| Depth | Elev. | Description |
|-----------|-------------|--|
| 0.0 - 2.5 | 7.0 - 4.5 | brown, silty PEAT; very soft, wet |
| 2.5 - 8.0 | 4.5 - -1.0 | gray, clayey SILT with occasional organics; soft, wet (6" thick layer of black fine sand at depth 5.0') |
| 8.0 - 9.0 | -1.0 - -2.0 | gray, silty SAND/sandy SILT; loose, wet groundwater at depth 2.8' (el. 4.2) completed 12/4/83 |

LOG OF HAND AUGER HOLE

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A-10

HA-108 N 2358, E 1740 Elev. 6.7

| Depth | Elev. | Description |
|---|-------------|---|
| 0.0 - 2.7 | 6.7 - 4.0 | brown SILT; very soft, wet grades with increasing peat content |
| 2.7 - 8.5 | 4.0 - -1.8 | gray to brown-gray, organic SILT, trace clay; soft, wet |
| 8.5 - 10.5 | -1.8 - -3.8 | gray, fine SAND; loose, wet |
| groundwater at ground surface (elev. 6.7) completed 12/13/83 | | |

HA-109 N 2255, E 1740 Elev. 6.8

| Depth | Elev. | Description |
|---|-------------|---|
| 0.0 - 1.2 | 6.8 - 5.6 | brown SILT, scattered roots and organics; soft, wet |
| 1.2 - 3.4 | 5.6 - 3.4 | brown SILT, grading to fibrous PEAT at 2.5'; soft, wet |
| 3.4 - 7.8 | 3.4 - -1.0 | gray SILT, scattered lenses of peat; soft, wet |
| 7.8 - 10.0 | -1.0 - -3.2 | gray, fine SAND; loose, wet |
| groundwater at ground surface (elev. 6.8) completed 12/13/83 | | |

LOG OF HAND AUGER HOLES

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Drawing No.

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~~NA-110~~ N 2540, E 1775 Elev. 9.0

| Depth | Elev. | Description |
|---|-----------|---|
| 0.0 - 2.4 | 9.0 - 6.6 | gray-brown SAND, little gravel and silt; loose, very moist |
| 2.4 - 4.2 | 6.6 - 4.8 | brown SILT, increasing organic content below 3.8'; soft, very moist |
| 4.2 - 6.6 | 4.8 - 2.4 | interbedded gray organic SILT and red-brown fibrous PEAT; soft, wet |
| 6.6 - 7.0 | 2.4 - 2.0 | black, fine to medium SAND; loose, wet |
| groundwater at depth 2.4' (elev. 6.6) completed 12/13/83 | | |

~~NA-111~~ N 2565, E 1707 Elev. 8.0

| Depth | Elev. | Description |
|---|-----------|--|
| 0.0 - 1.9 | 8.0 - 6.1 | gray-brown, fine to coarse SAND, little silt and gravel (Fill), grades to silty and gravelly; loose, moist |
| 1.9 - 2.2 | 6.1 - 5.8 | brown SILT; soft, wet |
| no free groundwater encountered completed 12/13/83 | | |

LOG OF HAND AUGER HOLES

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NA-112 N 2400, E 540 Elev. 10.5

| Depth | Elev. | Description |
|---|-------------|---|
| 0.0 - 0.4 | 10.5 - 10.1 | brown, sandy SILT; soft, moist |
| 0.4 - 1.8 | 10.1 - 8.7 | gray-brown, very fine, sandy SILT, scattered organics; soft, very moist |
| 1.8 - 3.9 | 8.7 - 6.6 | interbedded SAND, SILTY SAND, and SILT, trace clay; soft, very moist |
| 3.9 - 5.5 | 6.6 - 5.0 | black, silty PEAT, trace sand; very soft, wet |
| 5.5 - 11.9 | 5.0 - -1.4 | gray-brown, clayey SILT, some organics and sand lenses; soft, wet |
| 11.9 - 13.0 | -1.4 - -2.5 | gray, fine SAND |
| groundwater at 3.9' (elev. 6.6) completed 12/14/83 | | |

NA-113 N 2300, E 635 Elev. 7.0

| Depth | Elev. | Description |
|---|-------------|---|
| 0.0 - 1.8 | 7.0 - 5.2 | gray, very fine, sandy SILT to SILT, numerous organics; very soft, very moist |
| 1.8 - 2.5 | 5.2 - 4.5 | interbedded SAND and SILT, trace clay; soft, wet |
| 2.5 - 3.8 | 4.5 - 3.2 | gray, fine, silty SAND; loose, wet |
| 3.8 - 5.1 | 3.2 - 1.9 | brown, silty PEAT, trace sand; soft, wet |
| 5.1 - 10.2 | 1.9 - -3.2 | gray, silty CLAY, scattered organic fragments and fine sand; soft, wet |
| 10.2 - 12.0 | -3.2 - -5.0 | gray, fine SAND; loose, wet |
| groundwater at 4.0' depth (elev. 3.0) completed 12/14/83 | | |

LOG OF HAND AUGER HOLES

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~~114~~ 114 N 2200, E 635 Elev. 7.8

| Depth | Elev. | Description |
|-------------|-------------|--|
| 0.0 - 1.2 | 7.8 - 6.6 | brown, fine, sandy SILT, trace roots; very soft, wet |
| 1.2 - 1.8 | 6.6 - 6.0 | gray SILT, trace sand; soft, wet |
| 1.8 - 3.8 | 6.0 - 4.0 | gray, silty SAND, lenses of organics; loose, wet |
| 3.8 - 5.2 | 4.0 - 2.6 | interbedded gray, silty SAND and sandy SILT, numerous organics; loose, wet |
| 5.2 - 7.8 | 2.6 - 0.0 | gray-brown, silty PEAT, trace clay and sand; soft, wet |
| 7.8 - 12.2 | 0.0 - -4.4 | gray, clayey SILT, organic, trace fine sand; soft, wet |
| 12.2 - 13.0 | -4.4 - -5.2 | gray, fine SAND; loose, wet groundwater at 1.9' depth (elev. 5.9) completed 12/14/83 |

~~115~~ 115 N 2125, E 560 Elev. 13.2

| Depth | Elev. | Description |
|-------------|-------------|--|
| 0.0 - 1.2 | 13.2 - 12.0 | gray-brown, fine sandy SILT, trace gravel and organics; soft, very moist |
| 1.2 - 1.5 | 12.0 - 11.7 | brown SILT, lenses of organics; soft, wet |
| 1.5 - 5.2 | 11.7 - 8.0 | gray, interbedded SAND/SILT, organic layers, woody in places; loose, wet |
| 5.2 - 7.8 | 8.0 - 5.4 | gray-brown, sandy SILT, pockets of peat; soft, wet |
| 7.8 - 10.4 | 5.4 - 2.8 | gray-brown, clayey SILT, some organics; soft, wet |
| 10.4 - 12.4 | 2.8 - 0.8 | gray, fine SAND; loose, wet groundwater at 5.2' depth (elev. 8.0) completed 12/14/83 |

LOG OF HAND AUGER HOLES

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