

Source: Snohomish County PDS

File No. (ID#1) ZA 9312264
(ID#2) _____

Site Address Near 173rd St SE + 16th Drive SE.

Date Copied 7/30/01 By Chris

- 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: _____

9/19

4092

**GEOTECHNICAL ENGINEERING LETTER
EROSION AND LANDSLIDE HAZARD EVALUATION
SNOHOMISH COUNTY, WASHINGTON
FOR
LOVELL-SAUERLAND & ASSOCIATES, INC.**

RECEIVED
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PLANNING & DEVELOPMENT
SERVICES - LAND USE DIV.

ZA9312264



NELSON-COUVRETTE & ASSOCIATES, INC.

CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS
AND ENVIRONMENTAL SCIENTISTS

17311-135th Avenue NE, A-500
Woodinville, WA 98072
(206) 486-1669 • Fax 481-2510

Snohomish County (206) 337-1669

Wenatchee/Chelan (509) 784-2756

December 5, 1996

Mr. Jim Miller
Lovell-Sauerland & Associates, Inc.
19400 - 33rd Avenue West, Suite 200
Lynnwood, Washington 98036

Geotechnical Engineering Letter
Erosion and Landslide Hazard Evaluation
Twin Valley Park Division 3
Snohomish County, Washington
NCA File No. 192096
S.C.P.D.S. File No. ZA9312264

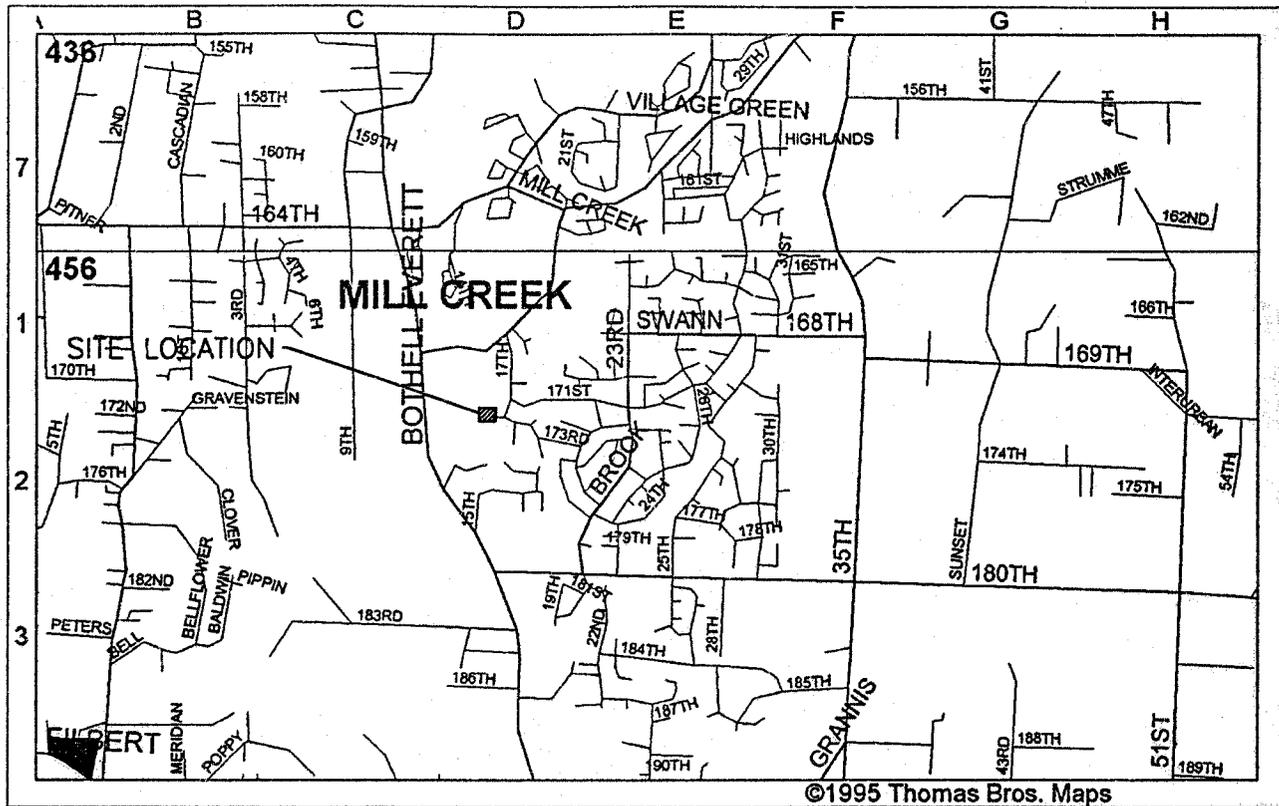
Dear Mr. Miller:

INTRODUCTION

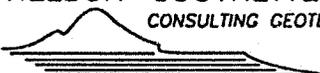
This letter summarizes our consultation regarding the erosion potential and slope stability of the proposed sports court and trail area in the northwest portion of your planned Twin Valley Park Division 3 development. The site is located at the west end of 172nd Street SE, west of 17th Avenue SE, near the Mill Creek area of Snohomish County, as shown on the Vicinity Map in Figure 1. You are planning to construct a sports court and trail on or near slopes greater than 30 percent. Snohomish County Planning and Development Services (S.C.P.D.S.) identified the on-site soils as Alderwood-Everett, gravely sandy loam, 25 to 70 percent slopes (SCS soil #4). This is listed as an Erosion Hazard soil in the Snohomish County Code (SCC), and as a Landslide Hazard soil due to slopes 33 percent or greater. They requested a geotechnical analysis to address the landslide and erosion potential in the sports court and trail area. You have requested we perform this evaluation.

You have provided us with plans titled "Preliminary Drainage and Grading Plan", "Slope Analysis Plan" and "Preliminary Plat Plan" for Twin Valley Park Division 3, by Lovell-Sauerland & Associates, Inc., dated May 24, 1996, February 15, 1996 and May 24, 1996, respectively; an undated, faxed, reduced copy

VICINITY MAP



NELSON-COUVRETTE & ASSOCIATES, INC.
 CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS
 AND ENVIRONMENTAL SCIENTISTS



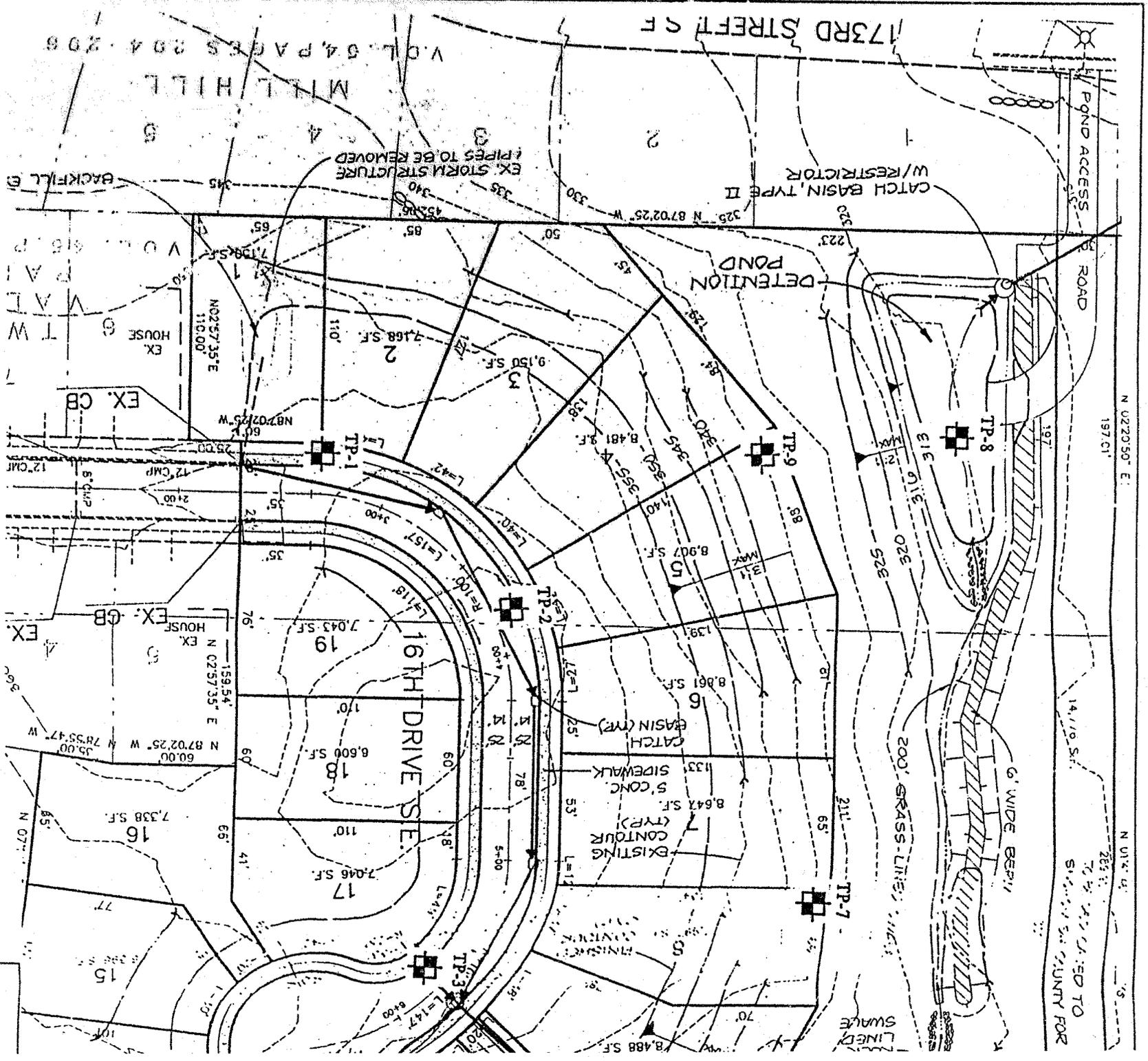
TWIN VALLEY PARK
 DIV. 3

FIGURE
 1

FILE NUMBER
 192096

DATE
 DECEMBER 1996

REFERENCE: SITE PLAN BASED ON A PRELIMINARY DRAINAGE AND GRADING PLAN FOR TWIN VALLEY PARK, DIV. 3, BY D'OVELL-SAUERLAND AND ASSOCIATES INC., DATED 5-24-96



MILL HILL
V.O.L. 54 PAGES 204-208

173RD STREET S.E.

BACKFILL 5'

EX. STORM STRUCTURE
(PIPES TO BE REMOVED)

CATCH BASIN, TYPE II
W/ RESTRICTOR

DETENTION POND

EX. HOUSE
N02°57'35"E
110.00'

EX. CB

EX. CB

EX. HOUSE
N 02°57'35" E
159.54'

EX. HOUSE
N 87°02'25" W
60.00'

EX. HOUSE
N 73°55'47" W
35.00'

EX. HOUSE
N 07°...
77'

16TH DRIVE S.E.

CATCH BASIN (TRP)
S. CONC. SIDEWALK

EXISTING CONTOUR (TRP)

200' GRASS-LINED SWALE

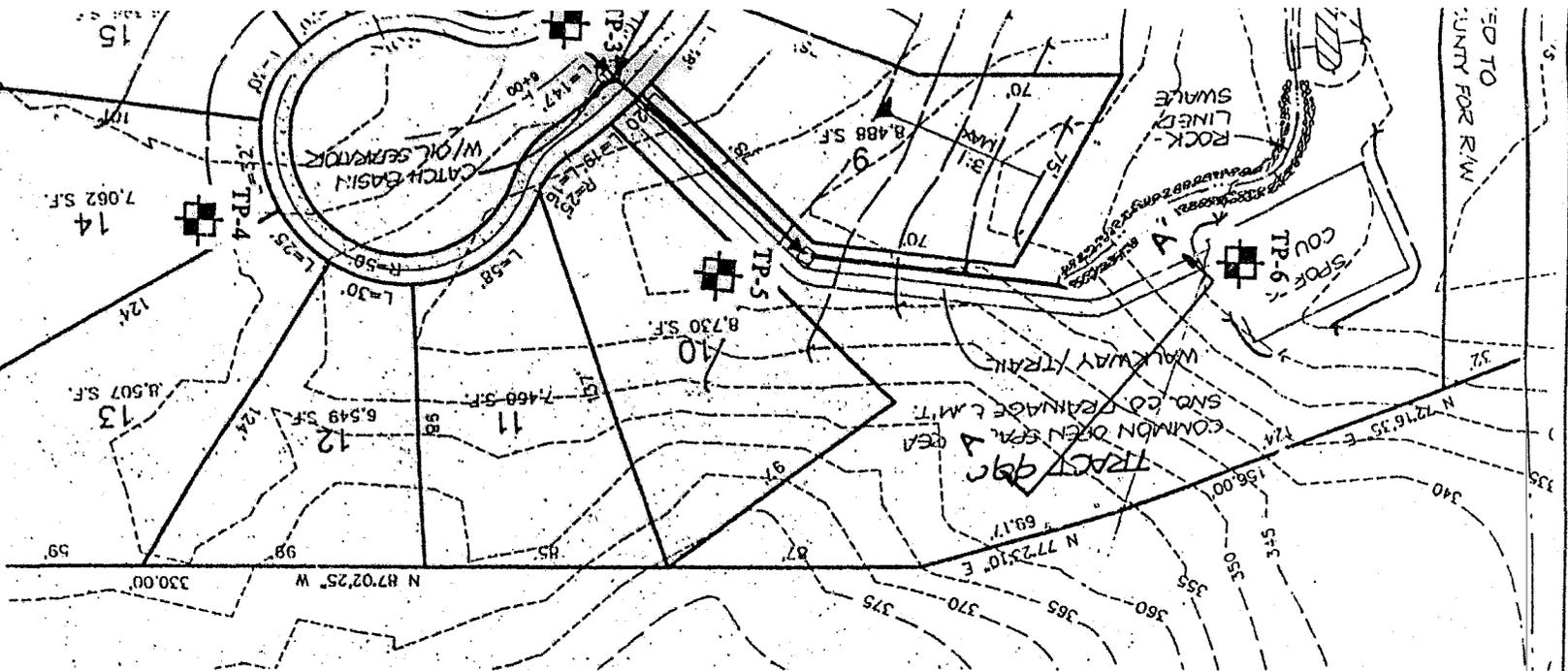
6' WIDE BEP11

TO BE ADJUSTED TO
S. COUNTY FOR



NELSON

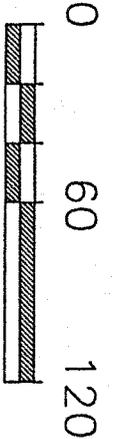
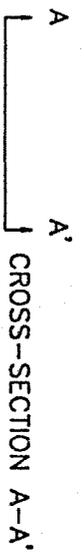
SITE PLAN



LEGEND



APPROXIMATE LOCATION OF TEST PITS



SCALE: 1" = 60'

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TWIN VALLEY PARK

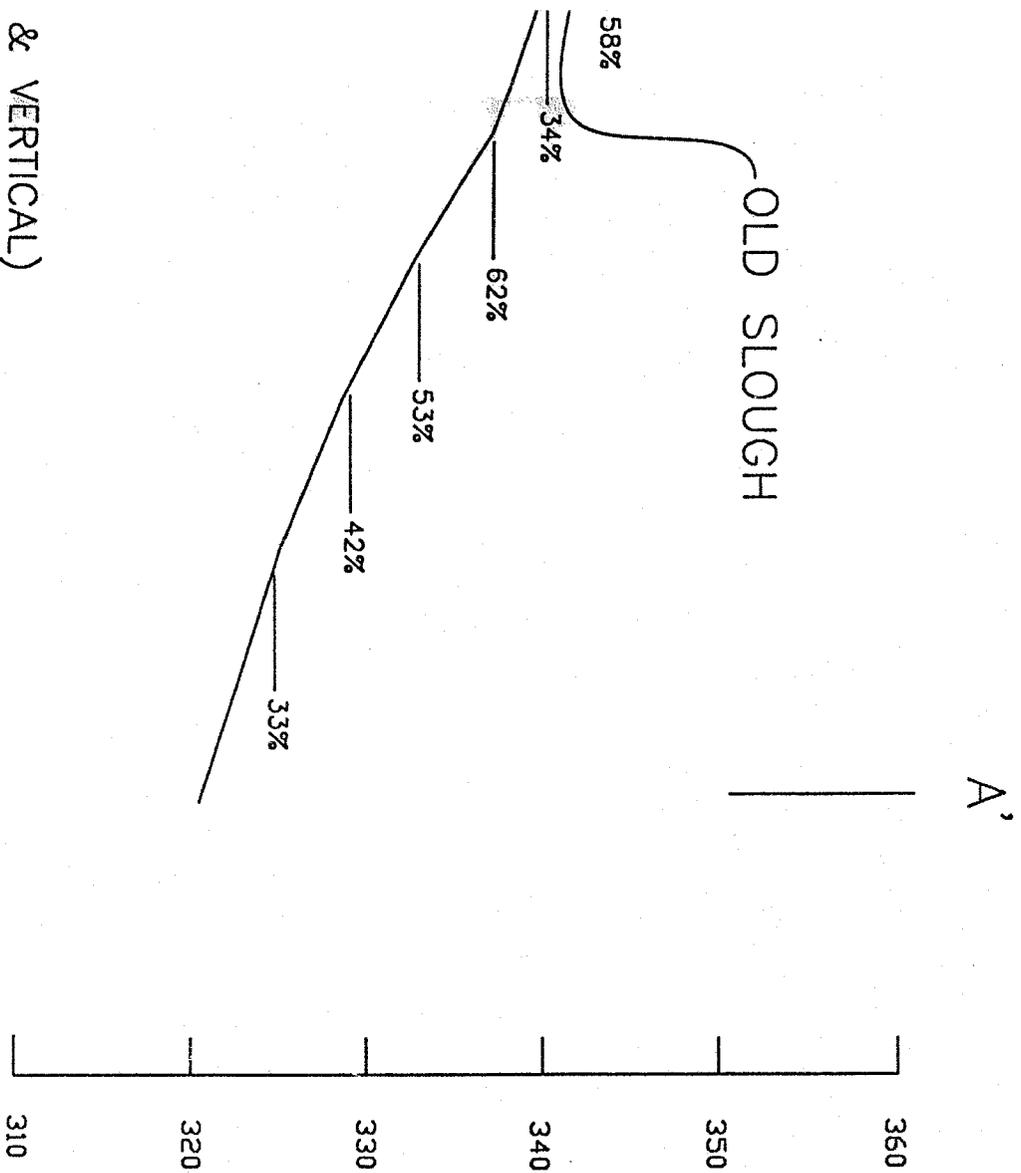
DIV. 3

FIGURE 2

FILE NUMBER
192096

DATE
DECEMBER 1996

CROSS SECTION A-A'



& VERTICAL)

NEILSON-COUVRETTE & ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS
AND ENVIRONMENTAL SCIENTISTS

TWIN VALLEY PARK
DIV. 3
FILE NUMBER
192096

FIGURE
3
DATE
DECEMBER 1996

LOG OF EXPLORATION

| DEPTH | USCS | SOIL DESCRIPTION |
|-----------------------|-------|--|
| TEST PIT ONE | | |
| 0.0 - 0.5 | SM | GRAY-BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED GRAVEL (LOOSE, MOIST) (FILL) |
| 0.5 - 3.5 | SM | GRAY-BROWN TO ORANGE-BROWN FINE TO MEDIUM SAND WITH SILT, SCATTERED COBBLES AND ROOTS (MEDIUM DENSE, MOIST) (QTB) |
| 3.5 - 7.0 | SM/ML | GRAY SILTY FINE SAND TO FINE SANDY SILT WITH TRACE GRAVEL (DENSE, MOIST) (QTB) |
| 7.0 - 9.0 | ML/SM | GRAY TO GRAY-BROWN FINE SANDY SILT AND SILTY FINE SAND (STIFF TO VERY STIFF, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 2.0, 4.0 AND 9.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 9.0 FEET ON 11-18-96 |
| TEST PIT TWO | | |
| 0.0 - 0.6 | | TOPSOIL |
| 0.6 - 3.5 | SM | ORANGE-BROWN TO GRAY-BROWN FINE TO MEDIUM SAND WITH SILT, SCATTERED ROOTS AND TRACE COBBLES (LOOSE TO DENSE, MOIST) (QTB) |
| 3.5 - 6.5 | SM | TAN TO GRAY SILTY FINE SAND WITH TRACE GRAVEL (DENSE, MOIST) (QTB) |
| 6.5 - 9.5 | ML/SM | GRAY CLAYEY SILT, FINE SANDY SILT AND SILTY FINE SAND (STIFF TO HARD, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 3.0, 4.0 AND 8.5 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 9.5 FEET ON 11-18-96 |
| TEST PIT THREE | | |
| 0.0 - 0.3 | | TOPSOIL |
| 0.3 - 3.0 | SP | ORANGE-BROWN TO GRAY-BROWN FINE TO MEDIUM SAND WITH SCATTERED COARSE SAND, GRAVEL AND TRACE COBBLES (MEDIUM DENSE TO DENSE, MOIST) (QTB) |
| 3.0 - 6.5 | ML/SM | TAN FINE SANDY SILT, SILTY FINE SAND AND FINE TO MEDIUM SAND WITH IRON STAINING (STIFF, MOIST) (QTB) |
| 6.5 - 10.0 | ML/SM | TAN TO GRAY FINE SANDY SILT, CLAYEY SILT AND SILTY FINE SAND (STIFF TO VERY STIFF, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 3.0, 4.0 AND 10.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 10.0 FEET ON 11-18-96 |

LOG OF EXPLORATION

| DEPTH | USCS | SOIL DESCRIPTION |
|----------------------|-------|---|
| TEST PIT FOUR | | |
| 0.0 - 0.5 | | CONCRETE FRAGMENTS AND SILTY SAND (FILL) |
| 0.5 - 0.8 | | TOPSOIL |
| 0.8 - 4.0 | SW | GRAY-BROWN FINE TO COARSE SAND WITH GRAVEL (DENSE, MOIST) |
| 4.0 - 6.0 | SM | GRAY SILTY FINE TO MEDIUM SAND WITH GRAVEL (DENSE TO VERY DENSE, MOIST) (QTB) |
| 6.0 - 10.0 | ML/SM | GRAY FINE SANDY SILT AND SILTY FINE SAND WITH LENSES OF GRAVELLY SAND WITH SILT (STIFF TO VERY STIFF, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 2.0, 4.5 AND 8.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 10.0 FEET ON 11-18-96 |
| TEST PIT FIVE | | |
| 0.0 - 2.0 | SM | BROWN TO ORANGE-BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED GRAVEL AND ORGANICS (LOOSE TO MEDIUM DENSE, MOIST TO WET) (SLOPE WASH) |
| 2.0 - 4.0 | SM/ML | GRAY-BROWN SILTY FINE SAND AND FINE SANDY SILT WITH SCATTERED GRAVEL (DENSE, MOIST) (QTB) |
| 4.0 - 9.0 | ML/SM | GRAY-BROWN SILTY FINE SAND AND FINE SANDY SILT WITH SCATTERED GRAVEL (MEDIUM STIFF TO VERY STIFF, MOIST TO WET) (QTB) |
| | | SAMPLES WERE COLLECTED AT 1.5, 3.5 AND 9.0 FEET GROUND WATER SEEPAGE WAS ENCOUNTERED AT 2.0 FEET TEST PIT CAVING WAS ENCOUNTERED ABOVE 2.0 FEET TEST PIT WAS COMPLETED AT 9.0 FEET ON 11-18-96 |
| TEST PIT SIX | | |
| 0.0 - 2.0 | SM | BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED GRAVEL (LOOSE TO MEDIUM DENSE, MOIST TO WET) (SLOPE WASH) |
| 2.0 - 3.5 | SM/ML | ORANGE-BROWN SILTY FINE SAND AND FINE SANDY SILT (MEDIUM DENSE TO DENSE, MOIST TO WET) (QTB) |
| 3.5 - 8.0 | ML/SM | GRAY-BROWN SILTY FINE SAND AND FINE SANDY SILT WITH SCATTERED GRAVEL (MEDIUM STIFF TO HARD, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 1.5, 3.0 AND 8.0 FEET GROUND WATER SEEPAGE WAS ENCOUNTERED AT 2.0 FEET TEST PIT CAVING WAS ENCOUNTERED ABOVE 2.0 FEET TEST PIT WAS COMPLETED AT 8.0 FEET ON 11-18-96 |

LOG OF EXPLORATION

| DEPTH | USCS | SOIL DESCRIPTION |
|-----------------------|-------|---|
| TEST PIT SEVEN | | |
| 0.0 - 0.5 | | TOPSOIL |
| 0.5 - 3.0 | SM | ORANGE-BROWN SILTY FINE TO MEDIUM SAND, SCATTERED GRAVEL AND COARSE SAND (MEDIUM DENSE TO DENSE, MOIST) (QTB) |
| 3.0 - 6.0 | ML | TAN TO GRAY FINE SANDY SILT (STIFF TO HARD, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 2.0 AND 4.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 6.0 FEET ON 11-18-96 |
| TEST PIT EIGHT | | |
| 0.0 - 1.6 | SM | BROWN TO GRAY-BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED GRAVEL, COARSE SAND, TRACE COBBLES AND ORGANICS (MEDIUM DENSE, MOIST) |
| 1.6 - 2.8 | SM | ORANGE-BROWN FINE TO MEDIUM SAND WITH SILT AND SCATTERED GRAVEL (MEDIUM DENSE TO DENSE, MOIST) (QTB) |
| 2.8 - 4.0 | ML | GRAY FINE SANDY SILT (STIFF TO HARD, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 2.0 AND 4.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 4.0 FEET ON 11-18-96 |
| TEST PIT NINE | | |
| 0.0 - 0.5 | | TOPSOIL |
| 0.5 - 1.4 | SM | BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED COARSE SAND AND GRAVEL (LOOSE TO MEDIUM DENSE, MOIST) |
| 1.4 - 3.5 | SM | ORANGE-BROWN SILTY FINE TO MEDIUM SAND WITH SCATTERED GRAVEL AND COARSE SAND (MEDIUM DENSE TO DENSE, MOIST) (QTB) |
| 3.5 - 6.5 | SP | GRAY SAND WITH GRAVEL (DENSE TO VERY DENSE, MOIST) (QTB) |
| 6.5 - 7.0 | ML/SM | TAN FINE SANDY SILT AND SILTY FINE SAND (VERY STIFF TO HARD, MOIST) (QTB) |
| | | SAMPLES WERE COLLECTED AT 2.0 AND 4.0 FEET GROUND WATER SEEPAGE WAS NOT ENCOUNTERED TEST PIT CAVING WAS NOT ENCOUNTERED TEST PIT WAS COMPLETED AT 7.0 FEET ON 11-18-96 |