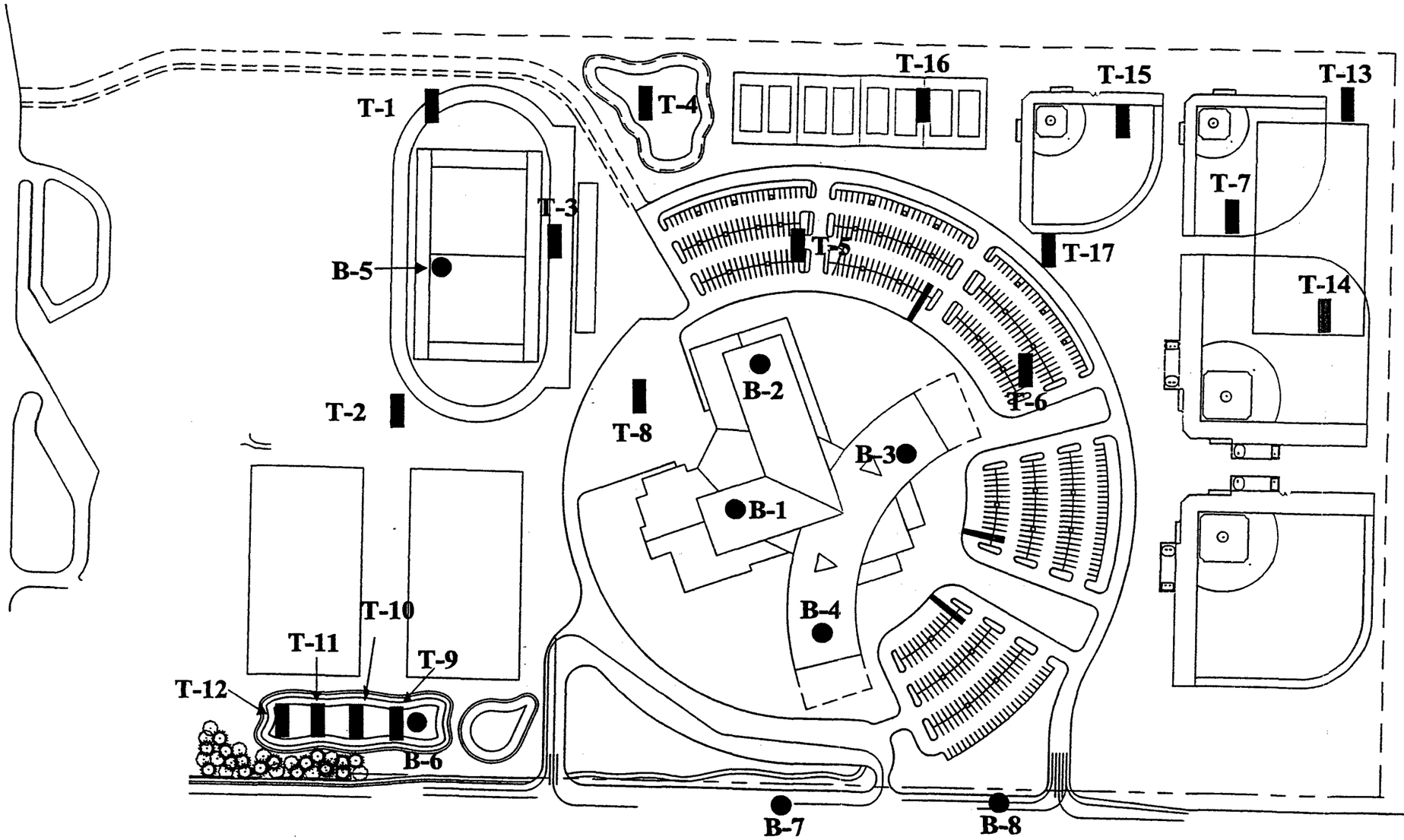
Appendix B

Soils Data



LEGEND

B-8 ●.....APPROX. LOCATION OF EXPLORATORY BORING

T-17 ▬.....APPROX. LOCATION OF EXPLORATORY TRENCH

SITE PLAN

CAMAS HIGH SCHOOL
CAMAS, WASHINGTON

GEOCON NORTHWEST
GEOTECHNICAL CONSULTANTS
8270 SW NIMBUS AVENUE - BEAVERTON, OREGON 97008
PHONE 503 626-9889 - FAX 503 626-8611

SCALE	NO SCALE	DATE	07 - 27 - 2000
PROJECT NO.	P1007 - 05 - 02	FIGURE	2
SHEET	OF		

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5. INFILTRATION TESTING

5.1. Methodology

The infiltration tests were conducted as falling head permeability tests in general accordance with the King County Surface Water Design Manual. The tests were conducted by pushing a six-inch diameter infiltrometer standpipe into the soil at the desired test depth. The soil was prepared for infiltration testing under saturated conditions by filling the standpipe with water and thoroughly soaking the test zone for approximately one-half hour. Beginning with a three-foot head of water in the standpipe, the elapsed time required for the head to drop six inches is recorded. In soils with low permeability, the hydraulic head is allowed to drop for one hour and the measured drop in head is recorded.

5.2. Infiltration Test Results

Field infiltration tests were conducted in seven of the exploratory trenches, at varying depths, to evaluate soil infiltration capacity for use in design. The field infiltration rates provided in Table 1 are field measured infiltration rates in native soil and do not include a factor of safety.

Table 1: Infiltration Test Results

Exploratory Trench No.	Test Depth (ft)	Infiltration Rate (in/hr)	Depth to Groundwater (ft)
1	4	7.6	Not Encountered
1	10	250	Not Encountered
2	5	4.5	8
3	6	27	Not Encountered
4	8	14	Not Encountered
5	6	48	Not Encountered
7	7	250	10
8	8	<1	Not Encountered
9	6	<1	Not Encountered
11	5	<1	Not Encountered
13	9	45	Not Encountered
14	7	250	10
15	6.5	90	Not Encountered
16	7	<1	10

Soil types can vary significantly over relatively short distances. The infiltration rates noted above are representative of one discrete location and depth. Moderate to high infiltration rates were measured on the northeast and northwest portions of the site. In general, the

soils within the southwest portion of the site have low measured infiltration rates. Installation of infiltration systems within the layer in which the field rate was measured is considered critical to proper performance of the systems. Because of near-surface fines content in the native soil, and the potential for eventual siltation of subsurface infiltration facilities, a conservative design safety factor should be applied to the field rate. If filter fabric is used to protect drain rock, the permeability of the geotextile should be considered in the design. Care should be taken during construction to avoid unnecessary compaction or contamination of native soils in the proposed infiltration zone. Construction disturbance, siltation and compaction with construction equipment can dramatically reduce soil infiltration capacity. Regular maintenance of the infiltration system is critical for proper performance.

A member of Geocon Northwest's geotechnical engineering staff should be retained to observe installation of the infiltration system to verify that subsurface conditions are consistent with those encountered during this investigation.

6. LABORATORY TESTING

Laboratory testing was performed on selected soil samples to evaluate moisture content, grain size distribution, plasticity index, expansion index, compaction characteristics, and California Bearing Ratio. Visual soil classification was performed both in the field and laboratory, in general accordance with the Unified Soil Classified System. Moisture content determinations (ASTM D2216) were performed on soil samples to assist in their evaluation. Compaction characteristics and the California Bearing Ratio for near surface samples were evaluated in substantial accordance with ASTM D1557 and ASTM D1883, respectively. Grain size analyses were performed on selected samples using procedures ASTM D421 and ASTM D422. The plasticity index was determined in general accordance with ASTM D4318. The expansion index was determined using procedure ASTM D4829. Moisture contents are indicated on the exploration logs, which are located in Appendix A of this report. The remaining laboratory test results for this project are included in Appendix B.

There appears to be little correlation between laboratory grain size analyses and the field measured infiltration rates. This is likely due to the combination of the presence of cobbles and boulders skewing the laboratory test results and the in situ weathering of the material.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. General

7.1.1. It is our opinion that the proposed project is geotechnically feasible, provided the recommendations within this report are followed.

APPENDIX A

FIELD INVESTIGATION

The field investigation was performed on July 6,7,17, and 18, 2000, and consisted of a site reconnaissance, the advancement of six borings, the excavation of seventeen exploratory trenches, and fourteen field-infiltration tests. The approximate locations of the exploratory excavations are shown in Figure 2.

Borings were advanced to approximately 8 to 44 feet below the ground surface. In general, the borings were terminated due to refusal. Two additional shallow borings were advanced within SE 15th Street to evaluate the existing pavement section. The exploratory trenches were excavated to depths varying from 6 to 12 feet below the ground surface using a John Deere 550 rubber tired backhoe. Samples were obtained at selected depths during the field investigation and returned to the laboratory for additional testing. Logs of the exploratory borings and trenches are provided in the following pages.

PROJECT NO. P1007-05-02

BORING B 1

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2	B1-1			ML	Medium stiff, moist, reddish-brown, SILT	21		21.6
4					Medium dense, moist, reddish-brown, Silty GRAVEL			
6	B1-2			GM		15		36.1
8	B1-3			CL	Stiff, moist, mottled, CLAY, occasional gravels	10		31.8
10	B1-4					18		25.6
12								
14								
16	B1-5			GM	Very dense, wet, brown, Silty SAND and gravel	>50		30.5
18								
20	B1-6		▼			48		23.8
					Very dense, saturated, brown to gray SAND and gravel			
					BORING TERMINATED AT 21.5 FEET Groundwater encountered at 20 feet			

Figure A-1, Log of Boring B 1

NCHS

SAMPLE SYMBOLS

□ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 2

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2	B2-1			GM	Medium dense, moist, brown, Silty SAND and GRAVEL	16		26.2
4								
6	B2-2					10		40.8
8	B2-3				-Becomes loose	7		38.0
10	B2-4					21		38.2
12				CL	Stiff, moist, mottled, Clayey SILT, some gravel			
14								
16	B2-5					50/5.5"		31.5
					BORING TERMINATED AT 16.5 FEET DUE TO REFUSAL Groundwater was not encountered			

Figure A-2, Log of Boring B 2

NCHS

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 3

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2					Stiff, moist, mottled, Silty CLAY			
2	B3-1			CL		13		24.6
4								
6	B3-2					14		36.3
8	B3-3				-Occasional gravels	27		28.3
10	B3-4				Medium dense, moist, mottled, Silty SAND and gravel, some clay	33		30.0
12								
14								
16	B3-5			GM	-Cobbles	>50		21.5
18								
20	B3-6					50/3.5"		16.9
					BORING TERMINATED AT 21.5 FEET DUE TO REFUSAL Groundwater was not encountered			

Figure A-3, Log of Boring B 3

NCHS

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ▨ ... DISTURBED OR BAG SAMPLE; ◥ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 4

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2					Stiff, damp, yellowish-brown SILT, some clay			
4	B4-1			ML/CL		20		41.4
6	B4-2				Stiff, damp, mottled, CLAY, some silt	12		36.6
8	B4-3				Medium dense, moist, brown, Silty, medium to coarse-grained SAND, some clay	12		28.6
10	B4-4			SM/GM		47		27.2
12					-Gravels below 10.5 feet			
14								
16	B4-5					41		21.7
18					-Becomes wet to saturated, decreased fines, increased gravel and cobbles			
20	B4-6		▼			>50		18.7
					BORING TERMINATED AT 21 FEET DUE TO REFUSAL Groundwater encountered at 20 feet			

Figure A-4, Log of Boring B 4

NCHS

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 5

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				SM	Dense, moist, brown, Silty SAND, occasional rounded gravel			
4								
6								
8				GM	Dense, moist, brown, Silty SAND, gravel and cobbles			
10								
12								
14								
16								
18			▼					
20				ML/CL	Medium stiff, wet, brown, Clayey SILT to Silty CLAY, some sand			
22								
24								
26								
28					-Stiff layer from 28 to 29.5 feet			

Figure A-5, Log of Boring B 5

NCHS

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 5

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30								
32					-Stiff layer from 33 to 34.5 feet			
34				ML/CL				
36								
38								
40								
42					-Becomes hard at 42 feet			
44					BORING TERMINATED AT 44 FEET DUE TO REFUSAL Groundwater encountered at 18 feet			

Figure A-6, Log of Boring B 5

NCHS

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ⧩ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 6

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium stiff, moist, brown, SILT			
4				GM	Medium dense, moist, reddish-brown, Silty GRAVEL and cobbles -Scattered boulders			
6								
8					BORING TERMINATED AT 8 FEET DUE TO REFUSAL Groundwater was not encountered			

Figure A-7, Log of Boring B 6

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 7

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 3 INCHES ASPHALT			
					BASEROCK			
2					BORING TERMINATED AT NATIVE SOIL (2')			

Figure A-8, Log of Boring B 7

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

BORING B 8

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT B-57 HOLLOW STEM AUG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 2 INCHES ASPHALT			
					BASEROCK			
2					BORING TERMINATED AT NATIVE SOIL (2.25')			

Figure A-9, Log of Boring B 8

NCHS

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 1

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
2					Dense, moist, light reddish-brown, Silty SAND, sub-rounded GRAVEL and COBBLES			
4	T1-1			GM				23.5
6					-Decreasing fines with depth			
8								
10	T1-2							25.6
12								
					TRENCH TERMINATED AT 12.5 FEET Infiltration test at 4 feet Infiltration test at 10 feet Groundwater was not encountered			

Figure A-10, Log of Trench T 1

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▩ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 2

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
				ML	Medium stiff, damp, brown, SILT			
2					Medium dense, moist, light reddish-brown, Silty SAND, occasional sub-rounded gravel and cobbles, some clay			
4								
6	T2-1			SM/GM				
8			▼					
					TRENCH TERMINATED AT 8.5 FEET Infiltration test at 5 feet Groundwater was encountered at 8 feet			

Figure A-11, Log of Trench T 2

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 3

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				ML	APPROX. 6 INCHES TOPSOIL Medium stiff, damp, brown, SILT			
2								
4					Dense, moist, reddish-brown, Silty SAND, sub-rounded GRAVEL and COBBLES			
6	T3-1			GM				19.2
8								
					TRENCH TERMINATED AT 9 FEET DUE TO CAVING Infiltration test at 6 feet Groundwater was not encountered			

Figure A-12, Log of Trench T 3

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◣ ... CHUNK SAMPLE ⧗ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 4

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				ML	APPROX. 4 INCHES TOPSOIL Medium stiff, damp, brown SILT			
2								
4					Dense, moist, light reddish-brown, Silty SAND, some sub-rounded gravel and cobbles, decreasing fines with depth			
6								
8	T4-1			SM/GM				28.4
10								
					TRENCH TERMINATED AT 11 FEET DUE TO CAVING Infiltration test at 8 feet Groundwater was not encountered			

Figure A-13, Log of Trench T 4

NCHS

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ◥ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 5

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				ML	APPROX. 4 INCHES TOPSOIL			
					Medium stiff, damp, brown SILT			
2					Dense, moist, yellowish-brown, Silty SAND, sub-rounded GRAVEL and COBBLES			
4								
6	T5-1							18.9
	T5-2							26.5
8				CL	Stiff, moist, brown and gray, Silty CLAY			
					TRENCH TERMINATED AT 9 FEET Infiltration test at 6 feet Groundwater was not encountered			

Figure A-14, Log of Trench T 5

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 6

ELEV. (MSL.) _____ DATE COMPLETED 7/6/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
2	T6-1			GM	Medium dense to dense, moist to wet, light yellowish-brown, Clayey SILT, SAND and sub-rounded GRAVEL, occasional cobbles			32.9
4								
6								
8								
10				SM	Dense, moist, reddish-brown, Silty SAND and sub-rounded gravel			
					TRENCH TERMINATED AT 11 FEET Groundwater was not encountered			

Figure A-15, Log of Trench T 6

NCHS

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 7

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
2					Moist, reddish-brown, Silty GRAVEL and COBBLES, some clay			
4								
6				GM	-Decreasing fines with depth -Loose gravels and cobbles			
8								
10			▼		TRENCH TERMINATED AT 10 FEET Infiltration test at 7 feet Groundwater encountered at 10 feet			

Figure A-16, Log of Trench T 7

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 8

ELEV. (MSL.) _____ DATE COMPLETED 7/7/00

EQUIPMENT FORD 555 BACKHOE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
2	T8-1			GM	Moist, reddish-brown, Clayey GRAVEL, some medium to coarse-grained sand			18.6
4								
6					-Decreasing gravel and cobbles with depth			
8	T8-2							
10								
12					TRENCH TERMINATED AT 12 FEET DUE TO CAVING Infiltration test at 8 feet Groundwater was not encountered			

Figure A-17, Log of Trench T 8

NCHS

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 9

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
				SM	Medium stiff, damp, reddish-brown, Sandy SILT, some clay			
2					Very dense, moist, brown, Silty, coarse SAND, gravel, cobbles and boulders			
4								
6	T9-1			GM				
8								
					TRENCH TERMINATED AT 9 FEET DUE TO REFUSAL Infiltration test at 6 feet Groundwater was not encountered			

Figure A-18, Log of Trench T 9

NCHS1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 10

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
				ML	Medium stiff, reddish-brown, SILT			
2					Dense, moist, Silty, coarse SAND. gravel, cobbles, and boulders			
4				GM	-Decreasing fines with depth			
6					-Weathering to clay			
					TRENCH TERMINATED AT 7 FEET Groundwater was not encountered			

Figure A-19, Log of Trench T 10

NCHS1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 11

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				ML	Dense, moist, reddish-brown, Gravelly SILT with cobbles			
4					Medium dense, moist, subrounded GRAVEL and cobbles, some sand, silt and clay -Scattered boulders, caving observed			
6	T11-1			GM				
8					-Weathering to clay			
					TRENCH TERMINATED AT 8 FEET Infiltration test at 5 feet Groundwater was not encountered			

Figure A-20, Log of Trench T 11

NCHS1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 12

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium stiff, moist, reddish-brown, SILT, scattered boulders			
4								
6								
8	T12-1			GM	Medium dense, Silty SAND, gravel, and cobbles, weathering to clay			
10					TRENCH TERMINATED AT 10 FEET Groundwater was not encountered			

Figure A-21, Log of Trench T 12

NCHS1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 13

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium dense to dense, moist, reddish-brown, Gravelly SILT with some cobbles			
4				GM	Medium dense to dense, moist, brown, Silty, coarse SAND and gravel, occasional cobbles -			
6								
8	T13-1			SM	Medium dense, moist, brown, coarse SAND, some gravel, occasional cobbles			
10								
					TRENCH TERMINATED AT 11 FEET Infiltration test at 8 feet Groundwater was not encountered			

Figure A-22, Log of Trench T 13

NCHS1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 14

ELEV. (MSL.) _____ DATE COMPLETED 7/17/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium dense, damp to moist, reddish-brown, SILT, scattered cobbles			
4					Medium dense, moist, brown, Silty SAND and gravel, scattered cobbles, occasional boulders			
6								
8	T14-1			GM				
10			▼		TRENCH TERMINATED AT 10 FEET Infiltration test at 7 feet Groundwater encountered at 10 feet			

Figure A-23, Log of Trench T 14

NCHS1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 15

ELEV. (MSL.) _____ DATE COMPLETED 7/18/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium stiff, damp, reddish-brown, Gravelly SILT, scattered cobbles and boulders			
4					Dense, moist, brown, Silty SAND and gravel, occasional cobbles			
6	T15-1			GM	-Decreasing fines with depth			
8								
10					-Slight weathering to clay			
					TRENCH TERMINATED AT 10 FEET Infiltration test at 6.5 feet Groundwater was not encountered			

Figure A-24, Log of Trench T 15

NCHS1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 16

ELEV. (MSL.) _____ DATE COMPLETED 7/18/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 6 INCHES TOPSOIL			
2				ML	Medium stiff, damp to moist, reddish-brown, Gravelly SILT			
4								
6	T16-1			SM	Medium dense, moist, reddish-brown, Gravelly, medium-grained SAND			
8								
10			▼		-Slightly weathering to clay			
					TRENCH TERMINATED AT 10 FEET Infiltration test at 7 feet Groundwater encountered at 10 feet			

Figure A-25, Log of Trench T 16

NCHS1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. P1007-05-02

TRENCH T 17

ELEV. (MSL.) _____ DATE COMPLETED 7/18/00

EQUIPMENT FORD 555E

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					APPROX. 4 INCHES TOPSOIL			
2				ML	Medium stiff, damp to moist, reddish-brown, Gravelly SILT			
4								
6					Very dense, Cobbly SAND and GRAVEL, weathering to clay			
8	T17-1			GM				
10								
					TRENCH TERMINATED AT 11 FEET Groundwater was not encountered			

Figure A-26, Log of Trench T 17

NCHS1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▩ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

TABLE B-I
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557-91

Sample No.	Depth (ft)	Material Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
Composite	1.0 – 3.0	SILT	103.2	20.8

TABLE B-2
SUMMARY OF PARTICLE SIZE DISTRIBUTION
ASTM D421 AND D422

Sample No.	Depth (ft)	% Gravel	% Sand	% Silt	% Clay
T1 – S2	7 – 8	16.1	51.1	32.8	
T2 – S3	6 - 7	21.4	37.5	27.6	13.5
T3 – S2	5.5 - 6	0.9	73.5	25.6	
T4 – S1	7 - 8	56.4	33.3	10.3	
T6 – S1	5 - 6	43.3	37.6	19.1	
T10 – S1	2 – 2.5	0	30.7	34	35.3
T11 – S1	7 - 8	0	51.7	26.3	22

TABLE B-3
SUMMARY OF LABORATORY PLASTICITY INDEX TEST RESULTS
ASTM D 4318

Sample No.	Depth (ft)	Plastic Limit	Liquid Limit	Plasticity Index
T1 – S2	7 - 8	31	59	28
T5 – S2	4 - 5	21	77	56
T6 – S1	5 – 6	26	56	30
T8 – S1	2 – 2.5	21	80	59
T8 – S2	4 - 5	24	70	46
T10 – S2	2 – 2.5	25	45	20

TABLE B-4
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D4829

Sample No.	Depth (ft)	Water Content	Expansion Index
T5 – S2	4 - 5	16.9	93

GEOCON
NORTHWEST

GEOTECHNICAL CONSULTANTS

April 16, 2001
P1007-05-04

Mr. Doug McCudden
c/o Camas School District
2041 NE Ione Street
Camas, Washington 98607

Subject: NEW CAMAS HIGH SCHOOL
CAMAS, WASHINGTON
CONSULTATION

Dear Mr. McCudden,

Geocon Northwest, Inc. is pleased to provide this letter summarizing the results of the additional geotechnical evaluation requested by the project civil engineers to satisfy Clark County permitting requirements. The fieldwork was completed on April 6, 2001. A total of eleven exploratory trenches were excavated in locations requested by Otak. Table 1, Depth to Groundwater, summarizes the groundwater depth and soil conditions encountered during the field investigation.

An additional pit was excavated in the location of an existing culvert, where the outlet of two drainage tiles was observed. One tile consisted of a 6-inch-diameter clay pipe while the other consisted of a 10-inch-diameter cement mortar pipe. The general direction of the drainage systems was northeasterly from the outlet. A field measurement of the flow rate was obtained at the outlet. During the field investigation, the flow rate was measured at approximately 50 to 60 gallons per minute. This value includes the outflow from both sources.

Table1: Depth to Groundwater

	TEST PIT LOCATION		STATIC GROUNDWATER (ft)	GROUNDWATER SEEPAGE (ft)	GENERAL SOIL TYPE
	Site Reference	E/W distance (ft)	N/S distance (ft)		
1	NE Corner	300 W	350 S	8	None	Sand, gravel, cobbles
2	NE Corner	200 W	370 S	8	None	Sand, gravel, cobbles
3	NE Corner	100 W	400 S	8	None	Sand, gravel, cobbles
4	NE Corner	150 W	320 S	9	None	Sand, gravel, cobbles
5	NE Corner	250 W	320 S	8.5	None	Sand, gravel, cobbles
6	NW Corner	60 E	70 S	Not Encountered*	None	Silty sand, gravel, cobbles
7	NW Corner	60 E	140 S	Not Encountered*	None	Silty sand, gravel, cobbles
8	East Driveway	350 E	50 N	Not Encountered*	3, 8, and 9	Gray clay
9	East Driveway	600 E	50 N	Not Encountered*	7.5	Clayey gravel and cobbles
10	East Driveway	800 E	200 N	3	None	Silty sand, gravel, cobbles
11	East Driveway	400 E	200 N	5.5	None	Silty sand, gravel, cobbles

*Exploratory trenches where groundwater was not encountered were excavated to a depth of approximately 10 to 12 feet.

We have been requested to provide an estimate of the maximum "base flow" which may occur within the two drainage tiles to assist Otak in their assessment of the existing site drainage conditions. The measured flow of 50 to 60 gallons per minute (0.13 cubic feet per second, cfs) represents a value less than the theoretical maximum flow rate. Review of existing topographic maps indicated the area of capture of the drainage tiles is approximately 13 acres. Assuming a conservative (i.e. high) permeability value of 10^{-3} cm/sec for the soil within the capture area, a maximum theoretical base flow of 0.5 cubic feet per second was calculated for the existing two drain tile system.

It was also requested that we estimate a post construction (as built) value of the water flow into the proposed drainage swales to be constructed within the southeast portion of the property. A total surface area of approximately 9,161 square feet was determined by Otak for the swale area exposed to groundwater flow. Assuming a permeability value of 10^{-3} cm/sec and a hydraulic gradient of 10%, a maximum flow rate of 0.03 cubic feet per second was estimated for the post construction flow within the swale system. The assumed soil permeability value of 10^{-3} cm/sec is conservative as it represents the flow characteristics of a medium to fine grained sand. The majority of soils within the potential zone of groundwater flow are silts and clays.

We appreciate the opportunity to work with you on this project. If you have any questions, or require additional information, please contact the undersigned at your convenience.

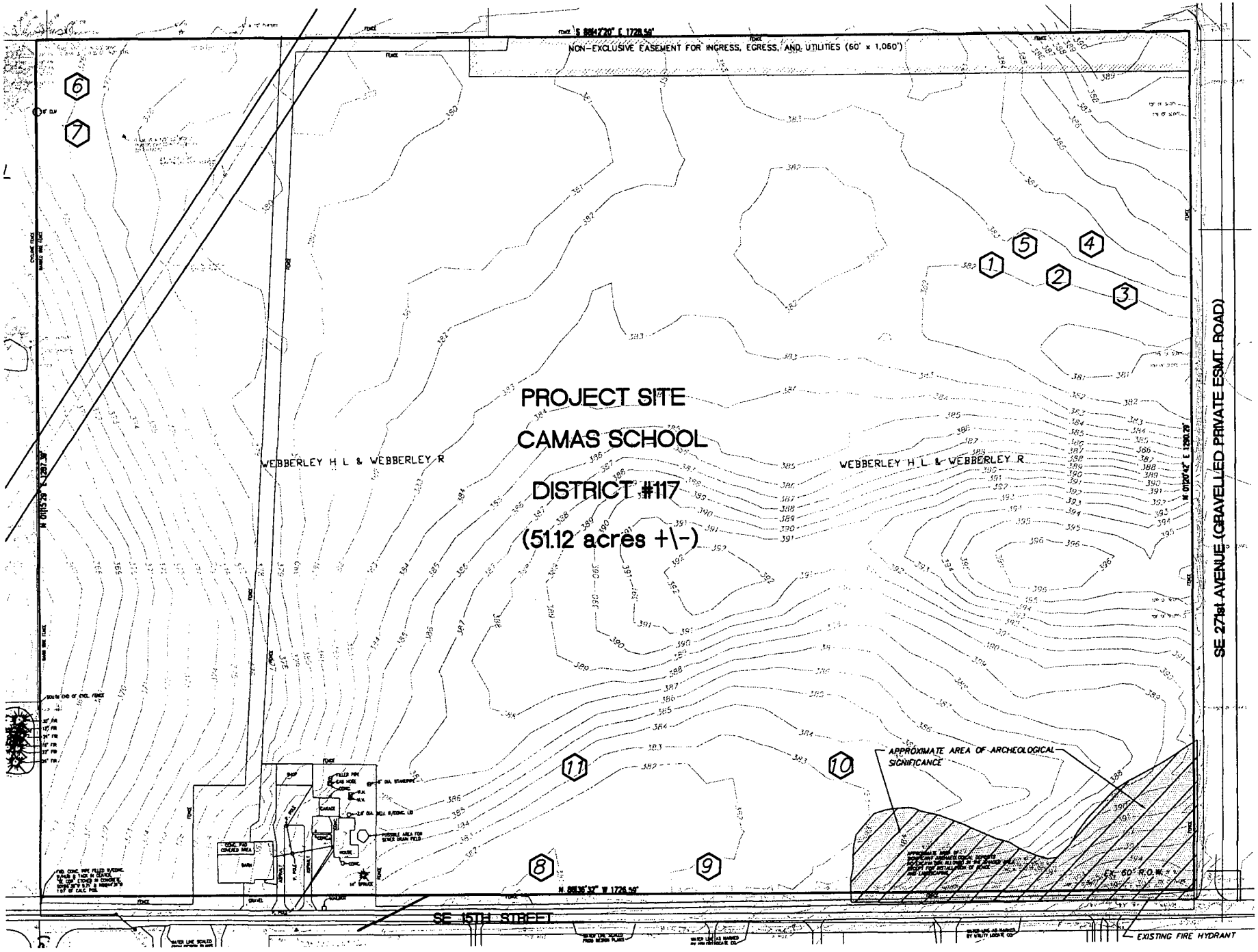
Sincerely,

GEOCON NORTHWEST, INC.

Heather Devine, P.E.
Geotechnical Engineer

Wesley Spang, Ph.D., P.E
President

cc: Mr. Don Proctor, Otak


NON-EXCLUSIVE EASEMENT FOR INGRESS, EGRESS, AND UTILITIES (60' x 1,060')
PROJECT SITE
CAMAS SCHOOL
DISTRICT #117
(51.12 acres +\-)
WEBBERLEY H L & WEBBERLEY R
WEBBERLEY H L & WEBBERLEY R
SE 27st AVENUE (GRAVELLED PRIVATE ESMT. ROAD)
APPROXIMATE AREA OF ARCHEOLOGICAL SIGNIFICANCE
SE 15TH STREET
EX. 60' R.O.W.
EXISTING FIRE HYDRANT
1
2
3
4
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