

Western Geotechnical Consultants, Inc.

4181 Saltspings Drive • Ferndale, WA 98248
Phone (360) 380-2507 • Fax (360) 380-2507

99-3516
RECEIVED
JUN 16 1999
CITY OF ARLINGTON

June 7, 1999

Smokey Point Distributing, Inc.
19430 59th Ave. N.E.
Arlington, WA 98223

Attn. Mr. John Berry

Re: Geotechnical Site Investigation
NE Corner of 59th Ave. NE and 172nd St. NE
Arlington, WA

Western Geotechnical Consultants, Inc. is pleased to present the results of our geotechnical site investigation, conducted at the above referenced property. On June 3, 1999 a geotechnical engineer from our firm oversaw the excavation of 2 test pits for development of the site. The site plan is to construct a 10,000 square foot steel building and place a 2,900 square foot pre-manufactured office building on the site with a designed on-site storm water detention system meeting city standards.

Site Conditions

Surface Conditions

The site is relatively flat and was stripped of the topsoil at the time of our investigation.

Subsurface Conditions

Subsurface conditions were explored using a rubber tire mounted backhoe. A total of 2 test pits were excavated at the site. The first test pit was excavated at the approximate steel building location and the second test pit was excavated where the storm water detention facility will be located (Figure 1). The test pits were continuously logged and soils encountered were classified using the Unified Soil Classification System (USCS). Edited tabulated test pit logs are appended to this report together with a description of the USCS.

The general subsurface profile consists of 2.4 to 3.0 feet of brown silty SAND to sandy SILT (SM/ML by USCS) which contained some roots in the upper 1 foot. This soil unit was underlain by a brown fine to medium sand and trace silt (SP/SM by USCS), which graded gray in color at about 5.3 feet. Significant ground water seepage occurred from 6 feet below ground surface.

Groundwater

Based on soil moisture and coloration, it appears that the seasonal high groundwater table is at about 5.3 feet.

Conclusions and Recommendations

Building Foundation support

The site is conducive for foundation support using continuous shallow spread footings. We recommend that the planned building be supported on isolated spread and continuous footings founded on undisturbed native sandy soil. Bearing soil that is disturbed during foundation excavation should be re-compacted or removed. All soil directly below and around footings should be compacted to at least 95% of maximum dry density (ASTM-D-1557) prior to placement of forms or reinforcing steel. All continuous and isolated spread footings should have minimum widths of 18 and 24 inches, respectively, and should be founded a minimum of 18 inches below the lowest adjacent final grade for frost protection. All footings supported on properly prepared native sandy soil may be proportioned using a net allowable bearing pressure of 2,500 psf. The term net allowable bearing pressure refers to the pressure which can be imposed on the soil at foundation level due to the total of all dead plus live loads, exclusive of the weight of the footing or any backfill placed above the footing. These values may be increased by one-third for transient wind or seismic loading.

Settlement of spread foundation depends on the foundation size and bearing pressure as well as the strength and compressibility characteristics of the underlying bearing soils. Assuming construction is accomplished as recommended above and for the loads anticipated, we estimate total settlement of the foundation should be less than about ½ inch and differential settlement between two adjacent load bearing components supported on competent soils should be less than about half the total settlement estimate. Due to the coarse grain nature of the foundation soils, most of the settlement should take place relatively rapidly during construction as loads are applied. We recommend that footing excavations be observed by a geotechnical engineer to confirm that design assumptions are met.

Based on ground water conditions we recommend that a footing drain be placed around the perimeter of the building. The drain should be placed at or below the base of the footings. The drain should consist of a 4-inch diameter perforated pipe surrounded by washed rock, and a separation geotextile such as Merafi 140N or equivalent should surround the entire drain.

(Page 3 of 3)

Groundwater Detention Facilities

The site has a permanent groundwater table estimated to be at 6 feet below grade with a seasonal high groundwater table estimated at 5.3 feet. Surface water detention facilities should be designed utilizing a seasonal high groundwater table of about 5.3 feet below present grade.

Erosion Control:

Erosion control during construction of the proposed retaining wall can be accomplished through placement of proper sedimentation control facilities. We recommend siltation control facilities, consisting of either hay bales or silt fences, be fabricated around the construction area. Typical details for siltation control using either hay bales or silt fences are attached to this report.

Siltation devices should be placed downgradient of all construction areas and cleared areas to provide siltation control during construction. All siltation control devices should be maintained during construction, and left in operable condition until the site has been revegetated and siltation is no longer a threat. At that time the siltation facilities should be removed.

We appreciate the opportunity to be of assistance to you on this project. If you have any questions regarding the contents of this report, or if we can be of further assistance, please contact our office.

Sincerely,

Western Geotechnical Consultants, Inc.


Theodore A. Hammer, P.E.
Geotechnical Engineer

Cc: Higa Engineering
Attachments: USCS Log of Test Pits
Typical Erosion Control Facility



UNIFIED SOIL CLASSIFICATION CHART (USCS)

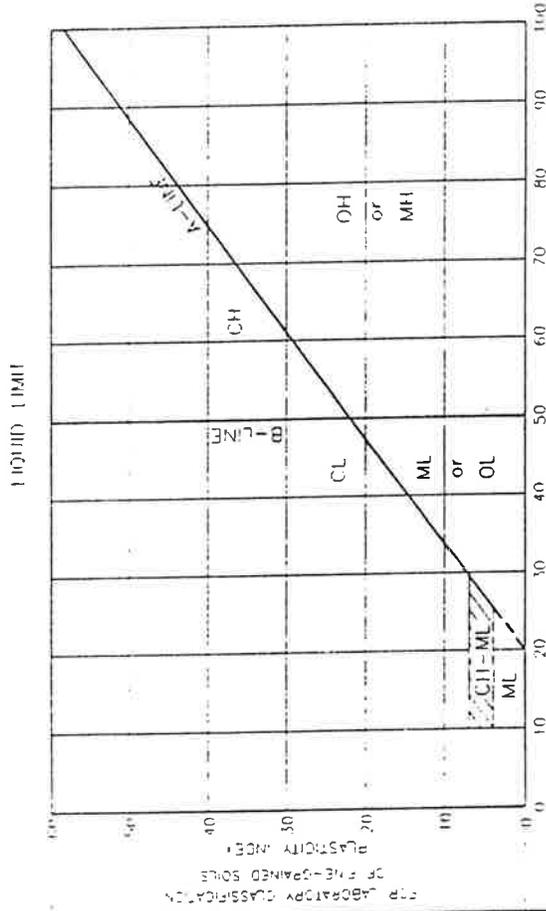
MAJOR DIVISIONS	GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
GRAVEL AND GRAVELLY SOILS	(CLEAN GRAVELS (LITTLE OR NO FINES) <5%)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION REMAINED ON #40 & SIEVE	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
COARSE GRAINED SOILS	(GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	CLEAN SANDS (LITTLE OR NO FINES) <5%	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
SAND AND SANDY SOILS	(SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%)	SW	WELL-GRADED SANDS, GRANULY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SP	POORLY-GRADED SANDS, GRANULY SANDS, LITTLE OR NO FINES
FINE GRAINED SOILS	(SILTS AND CLAYS)	SM	SILTY SANDS, SAND-SILT MIXTURES
	MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	(SILTS AND CLAYS)	ML	INORGANIC SILTS AND SILTY SILTS WITH APPRECIABLE PLASTICITY
	MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY (SHALLOWS, SANDY CLAYS, CLAYS)
FINE GRAINED SOILS	(SILTS AND CLAYS)	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	MH	INORGANIC SILTS, MICALTIONS OR DIATOMACEOUS-FINE SANDS SILTY SOILS
FINE GRAINED SOILS	(SILTS AND CLAYS)	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
	MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
OTHER ORGANIC SOILS		PT	PEATS, MUDS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT MILLIMETERS	UPPER LIMIT MILLIMETERS	LOWER LIMIT MILLIMETERS	UPPER LIMIT MILLIMETERS
SAND	0.75	2.00	0.42	0.42
	0.42	0.42	0.42	2.00
	2.00	2.00	0.42	4.76
GRAVEL	4.76	4.76	191	191
	191	191	3/4"	3/4"
COBBLES	76.2	76.2	304.8	304.8
	304.8	304.8	12"	12"

• U.S. STANDARD • CLEAR SQUARE OPENINGS
 5 - 12% FINES (SILT & CLAY) DUAL CLASS

PLASTICITY CHART



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Key to Test Pit Logs Using the Unified Soil Classification System

DATE 5/11/95 SCALE H N/A

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Table A-1						file:997511
Log of Test Pits						
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Pocket Pen. (Kg/sq. cm)
TP-1	0.0 - 2.4	SM/ML	Brown silty fine SAND to sandy SILT with some roots in the upper 1 foot			
	2.4 - 5.5	SP/SM	Brown fine to medium SAND with trace silt (moist, red, compact) (grades gray in color at 5.3 feet)	1-1/5.2	9.2%	

Notes:

- Test Pit terminated on 6/3/99 at 5.5 feet.
- Test Pit backfilled upon completion
- No ground water encountered
- No instrumentation installed

Table A-1						file:997512
Log of Test Pits						
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Pocket Pen. (Kg/sq. cm)
TP-2	0.0 - 3.0	SM/ML	Brown silty fine SAND to sandy SILT with some roots in the upper 1 foot			
	3.0 - 7.0	SP/SM	Brown fine to medium SAND with trace silt (moist, red, compact) (grades gray in color at 5.3 feet) (ground water seepage at 6.0 feet to 6.5 feet before being backfilled)	2-1/6.0	24.5%	

Notes:

- Test Pit terminated on 6/3/99 at 7.0 feet.
- Test Pit backfilled upon completion.
- Ground water encountered at 6.0 feet.
- No instrumentation installed

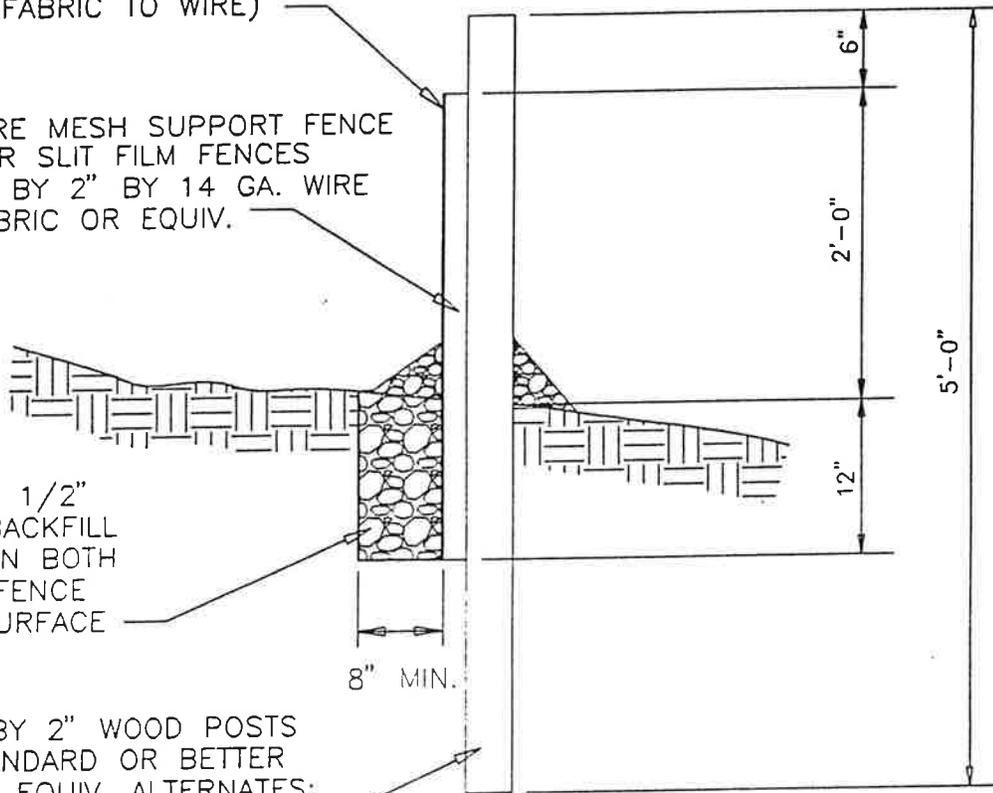
FILTER FABRIC MATERIAL 60" WIDE ROLLS
(USE STAPLES OR WIRE RINGS TO ATTATCH FABRIC TO WIRE)

NOTE: SPACING BETWEEN POSTS NOT TO EXCEED 6'

WIRE MESH SUPPORT FENCE FOR SLIT FILM FENCES
2" BY 2" BY 14 GA. WIRE FABRIC OR EQUIV.

PROVIDE 3/4" - 1 1/2" WASHED GRAVEL BACKFILL IN TRENCH AND ON BOTH SIDES OF FILTER FENCE FABRIC ON THE SURFACE

2" BY 2" WOOD POSTS (STANDARD OR BETTER OR EQUIV. ALTERNATES: STEEL FENCE POSTS)



FILTER FABRIC FENCE

NOT DRAWN TO SCALE

JOB NO.: **Western Geotechnical Consultants, Inc.**

DESIGNED BY: _____

DRAWN BY: **4181 Saltsprings Drive • Ferndale, WA 98248**

CHECKED BY: **Phone (360) 380-2507 • Fax (360) 380-2507**

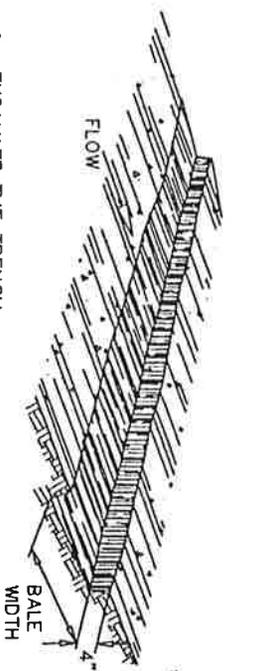
SEDIMENT CONTROL
FILTER FABRIC FENCE

DATE:

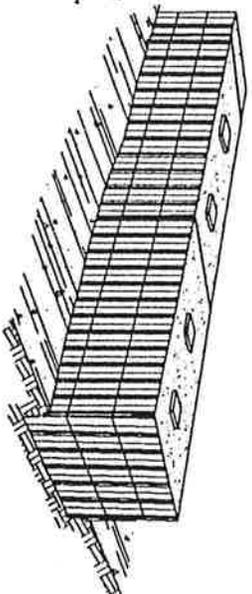
SCALE:

H: N/A

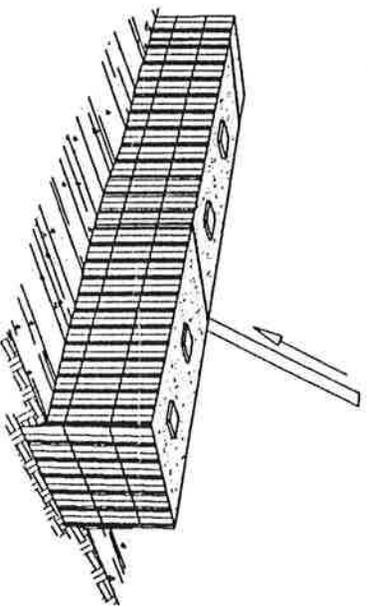
V: N/A



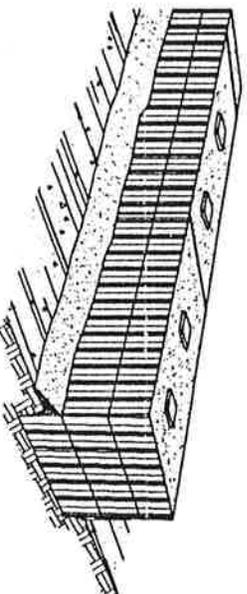
1. EXCAVATE THE TRENCH.



2. PLACE AND STAKE STRAW BALES.



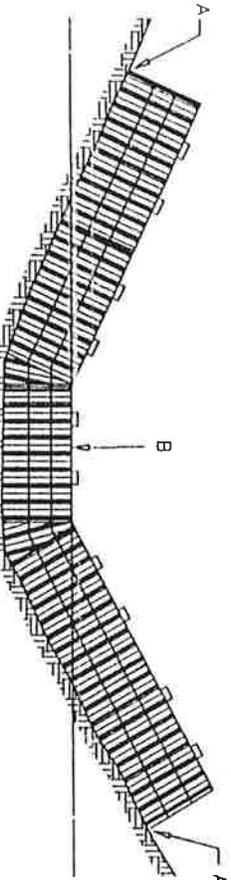
3. WEDGE LOOSE STRAW BETWEEN BALES.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

CONSTRUCTION OF A STRAW BALE BARRIER

NOT DRAWN TO SCALE



POINTS A SHOULD BE HIGHER THAN POINT B

PROPER PLACEMENT OF STRAW BALE BARRIER IN DRAINAGE WAY

NOT DRAWN TO SCALE

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SEDIMENT CONTROL
 STRAW BALE BARRIER

DATE

SCALE
 H: N/A

V: N/A