Targeted Drainage Report for the *BAKER/ELLIS PROPERTY*

Prepared for:
James Pontak
Anthem Self Storage Corporation
8115 Broadway #204
Everett, WA 98203

Prepared by:
Derek I. Hann, E.I.T.

Reviewed by
Michael E. Ryan, P.E.

March 12, 2009

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CONTENTS

SUMMARY

The Baker/Ellis Property Project proposes to develop a 5.01 acre site as a commercial site with approximately 94,000 SF commercial storage/office building and 81,000 SF paved roadway and parking lot. The project site is located on the north side of 172nd Street NE (State Route 531) between 59th Avenue NE and 67th Avenue NE in the City of Arlington. The Project Site is within the SE ¼ of Section 22, Township 31 North, and Range 5 East (W.M.)

The project will be composed of four storage facility buildings. A proposed paved drive-aisle system will provide access to each of the buildings. A rain garden system is proposed to collect stormwater runoff from the drive aisles and allow it to infiltrate into the naturally well-draining native soils. The proposed rain garden system will provide water quality treatment to the stormwater prior to infiltration. Roof drains will tie into an infiltration trench to be located beneath the proposed drive aisles.

Access to the site will be provided from 172nd via a commercial driveway.

There is an existing Type 3 stream and Category IV wetland onsite. The channel, wetland and associated buffers will remain undeveloped and undisturbed.

On April 6, 2007, HBA Design Group staff visited the site and observed existing drainage patterns, topography, and ground cover.

EXISTING CONDITIONS

The proposed development has a site area of 5.01 acres and fronts 172nd St. NE. There is no existing development on the site itself. No demolition will be required onsite prior to development.

The site ground cover on the majority of the property is brush and prairie grass with the occasional shrub or small tree. There are no existing significant trees located onsite. The topography of the site is very flat with the majority of the onsite grades less than 2%. There is an existing Category IV Wetland located on the southeast corner of the site, and a small Type 3 seasonal stream along the eastern site boundary bordering the private road that services the adjacent lots. The wetland, seasonal stream and associated proposed buffers will remain undeveloped and undisturbed.

According to the SCS Soil Survey for Snohomish County the predominant soil types on this site is are Custer fine sandy loam, hydrologic group C, Symbol 13, Lynnwood loamy sand, hydrologic group A, Symbol 30 and Norma Loam, hydrologic group D, Symbol 39 (see appendix for Soils Map).

A Geotechnical Engineer was hired from Western Geotechnical Consultants to study subsurface conditions and provide the resulting data. Site exploration and piezometer monitoring during the winter indicates the high groundwater elevation is approximately 6

FT below the existing grade of the site. The groundwater is closer to the surface on the southern portion of the property than it is on the northern portion of the property. The existing onsite soils infiltrate well with a calculated long-term infiltration rate of 3.5 inches/hour.

Existing drainage patterns for the site suggest that all onsite rainwater infiltrates into the existing soils. This is consistent with the data contained within the Geotechnical Report.

The soil descriptions within the Geotechnical Report (see attached copy in the appendix) correspond with the SCS classification.

DEVELOPED CONDITIONS

The Baker/Ellis Property Project proposes to develop a 5.01 acre site as a commercial site with approximately 94,000 SF commercial storage/office building and 81,000 SF paved roadway and parking lot. The proposed development will take access from 172nd Street.

The project will be composed of four storage facility buildings. A proposed paved drive aisle system will provide access to each of the buildings. A rain garden system is proposed to collect stormwater runoff from the drive aisles and allow it to infiltrate into the naturally well-draining native soils. The proposed rain garden system will provide water quality treatment to the stormwater prior to infiltration. Roof drains will tie into an infiltration trench to be located beneath the proposed drive aisles.

Access to the site will be provided from 172nd via a commercial driveway.

The site planning for the project has incorporated several measures to minimize the impact of the development stormwater drainage. This approach is encouraged by the 2005 D.O.E. Stormwater Manual for Western Washington and its companion volume, the D.O.E.-endorsed Low Impact Development Technical Guidance Manual for Puget Sound by the Puget Sound Action Team. All stormwater runoff will be retained on site by infiltration into the porous native soil.

The following is a summary of the low-impact measures proposed for this project.

- Rain gardens will be installed around the perimeter of the project. Runoff from the proposed paved drive aisle will sheet flow to the rain gardens and infiltrate into the native soil. The vegetation and organic material within the rain gardens will provide water quality treatment for the stormwater runoff.

- Native topsoil removed during construction will be stockpiled and removed from the site. A portion of the topsoil will be retained and redistributed on the site for use in the proposed landscaping within the buffer areas. This will enhance stormwater retention and slow release and to foster vigorous reestablishment of native ground cover vegetation.

- Clearing of the site will be limited to the minimum necessary to construct buildings, roads and utilities.

- Roof runoff will be collected and infiltrated within infiltration trenches located under the proposed drive aisles.

Rain Gardens

The internal paved drive aisle system will sheet flow to long, narrow rain gardens along the perimeter of the project. The rain garden and pervious pavement has been sized according to the 2005 DOE Stormwater Management Manual for Western Washington and calculated using the DOE software WWHM version 3. The proposed rain garden will be constructed with 0.5 FT of free board, 0.5 FT of ponding depth and 1.5 FT of amended soil.

The infiltration rates for the proposed amended soils for this project are lower than for the existing native vegetation. The proposed native soils infiltrate at a long term rate of approximately 3.5 inches/hour. The amended soil mix proposed for this site infiltrates at a long term infiltration rate of approximately 2 inches/hour. The more conservative 2 inch/hour rate was implemented in the WWHM3 analysis and design of the rain garden system.

Roof and footing drains

Stormwater from roof and footing drains from the proposed buildings will be directed infiltration trenches located beneath the proposed drive aisles. Downspouts and footing drains will tie to a perforated underdrain system located within the proposed drive aisles. The perforated underdrains will empty into infiltration trenches filled with ¾ inch drain rock approximately 5 FT wide and 2 FT deep. From the trenches, stormwater will infiltrate into the onsite native soils.

Water quality- In addition to infiltration, the proposed rain garden will provide water quality treatment to the runoff from the proposed internal drive-aisles. Water infiltrating through the proposed vegetation and amended soils will be treated through filtration and adsorption by the organic material to the levels required by the Chapters 6 & 7 of the *Low Impact Development Technical Guidance Manual for Puget Sound* and Volume V of the *2005 Stormwater Management Manual for Western Washington.*

Frontage Improvements

The site frontage will not be altered except for the installation of the site driveway access. Drainage from the site will flow to existing drainage systems and will not be detained or treated.

UPSTREAM ANALYSIS

Currently Mitzels, which is located across the private street from the Site, uses the existing stream channel located on the east property line for detention and water quality for the stormwater runoff for the site. This system is to be maintained as is. Proposed development will not change upstream drainage courses or patterns, and therefore no impact on upstream drainage is anticipated.

DOWNSTREAM ANALYSIS

The onsite channel and wetland drain south into the North Fork of Edgecomb Creek. Most of the site with the exception of the small wetland in the southeast corner of the site is underlain with a very sandy rapidly draining soil and will be infiltrated onsite. As a result, there is very little if any surface water runoff flowing from the site into the stream channel.

There is an existing channel located along the southern 500 feet to 550 feet of the Site's east property line. The channel emanates from the outlet end of an 18-inch diameter culvert located on the east side of the channel. The channel which has the physical and biological characteristics of a farm ditch, continues south between the east Site boundary and the west side of the Pacific Industrial Park access road to the inlet end of an existing culvert under 172nd Street NE (see the Downstream Analysis Map in the Appendix).

APPENDIX

Basin Maps

Soils Map & Information

WWHM3 Drainage Design Report

Impervious Area Calculations

Downstream Analysis Map

Geotechnical Site Investigation.
Prepared by Western Geotechnical Consultants, Inc. on October 26, 2007

Seasonal High Water Table Determination to Date.
Prepared by Western Geotechnical Consultants, Inc. on April 04, 2008

Basin Maps

N

SCALE: 1" = 60'

0 30 60 90

BAKER/ELLIS PROPERTY
EXISTING CONDITIONS
BASIN MAP

DRAWN BY: DIH
DATE: 09-22-08

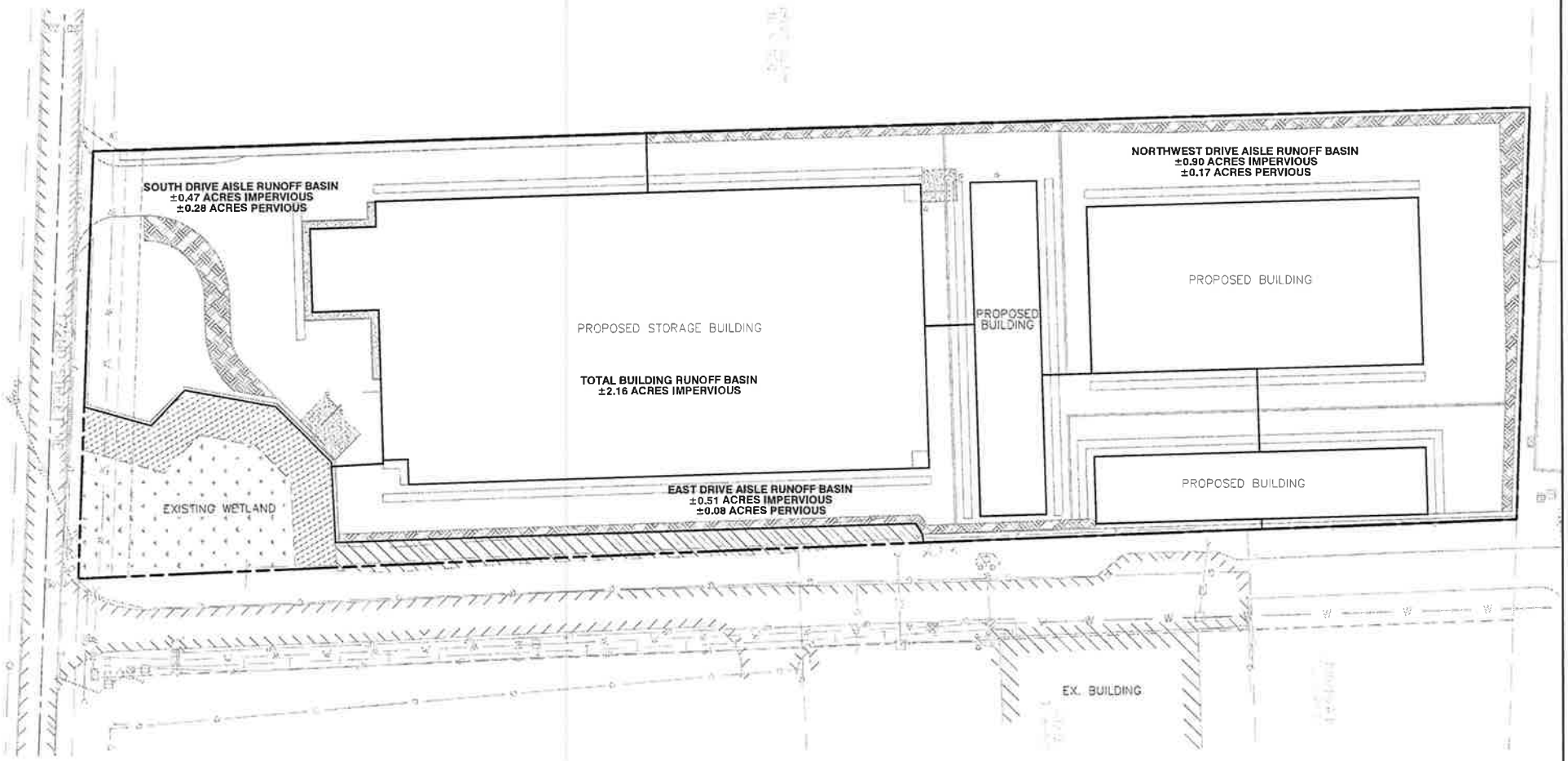
JOB NO. 1982

hba DESIGN GROUP
kind-sw planning + civil engineering

WASHINGTON
425.252.2826 phone
425.252.9551 fax
1721 Hewitt Avenue
Fourth Floor
Everett, WA 98201

OREGON
541.988.1862 phone
541.988.1863 fax
150 North 7th Street
Springfield, OR 97477

XREF: LAKELL.DWG, LAKELL-SURV.DWG, LAKELL-BASIN.DWG



SCALE: 1" = 60'

0 30 60 90

BAKER/ELLIS PROPERTY
DEVELOPED CONDITIONS
BASIN MAP

DRAWN BY: DIH
DATE: 02-20-08

JOB NO. 1982

XREF: LAKELL.DWG, LAKELL-SURV.DWG, LAKELL-BASIN.DWG

hba DESIGN GROUP
land use planning + civil engineering

WASHINGTON
425.252.2826 phone
425.252.9531 fax
1721 Hewitt Avenue
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541.988.1162 phone
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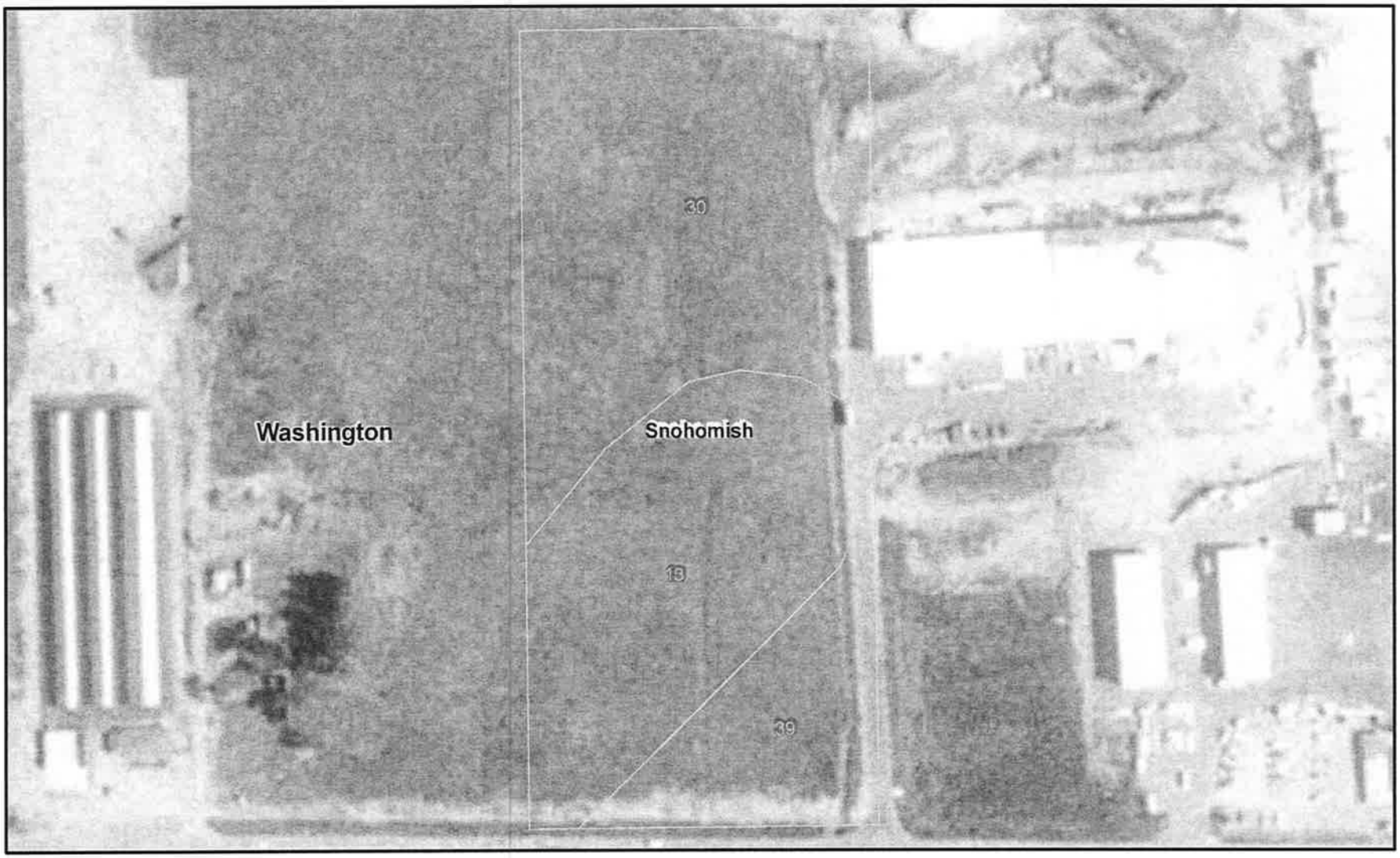
150 North 7th Street
Springfield, OR 97477

Soils Map & Information

SOIL SURVEY OF SNOHOMISH COUNTY AREA, WASHINGTON

BAKER/ELLIS SOILS MAP



Meters
0 20 40 80

Feet
0 50 100 200 300 400

Map Unit Legend Summary

Snohomish County Area, Washington

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Custer fine sandy loam	3.0	35.0
30	Lynnwood loamy sand, 0 to 3 percent slopes	4.2	48.8
39	Norma loam	1.4	16.2

WWHM3 Drainage Design Report

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Baker Ellis
Site Address: N/A
City : Arlington
Report Date : 2/27/2009
Gage : Everett
Data Start : 1948/10/01
Data End : 1997/09/30
Precip Scale: 1.20
WWHM3 Version: 3.0

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A B, Forest, Flat	4.57

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater

Name : Total Building Runoff Basin
Bypass: No

GroundWater: No

Pervious Land Use	Acres

Impervious Land Use	Acres
ROOF TOPS FLAT	2.16

Element Flows To:

Surface	Interflow	Groundwater
Total Building Runoff Infiltration Trench,	Infiltration Trench,	Total Building Runoff

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Name : Total Building Runoff Infiltration Trench
Bottom Length: 1860ft.
Bottom Width : 5ft.
Trench bottom slope 1: 0.001 To 1
Trench Left side slope 0: 0 To 1
Trench right side slope 2: 0 To 1
Material thickness of first layer : 2
Pour Space of material for first layer : 0.35
Material thickness of second layer : 0
Pour Space of material for second layer : 0
Material thickness of third layer : 0
Pour Space of material for third layer : 0
Infiltration On
Infiltration rate : 3.5
Infiltration saftey factor : 1
Discharge Structure
Riser Height: 2 ft.
Riser Diameter: 24 in.

Element Flows To:
Outlet 1 **Outlet 2**

Gravel Trench Bed Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.213	0.000	0.000	0.000
0.033	0.213	0.002	0.000	0.753
0.067	0.213	0.005	0.000	0.753
0.100	0.213	0.007	0.000	0.753
0.133	0.213	0.010	0.000	0.753
0.167	0.213	0.012	0.000	0.753
0.200	0.213	0.015	0.000	0.753
0.233	0.213	0.017	0.000	0.753
0.267	0.213	0.020	0.000	0.753
0.300	0.213	0.022	0.000	0.753
0.333	0.213	0.025	0.000	0.753
0.367	0.213	0.027	0.000	0.753
0.400	0.213	0.030	0.000	0.753
0.433	0.213	0.032	0.000	0.753
0.467	0.213	0.035	0.000	0.753
0.500	0.213	0.037	0.000	0.753
0.533	0.213	0.040	0.000	0.753
0.567	0.213	0.042	0.000	0.753
0.600	0.213	0.045	0.000	0.753
0.633	0.213	0.047	0.000	0.753
0.667	0.213	0.050	0.000	0.753
0.700	0.213	0.052	0.000	0.753
0.733	0.213	0.055	0.000	0.753
0.767	0.213	0.057	0.000	0.753
0.800	0.213	0.060	0.000	0.753
0.833	0.213	0.062	0.000	0.753
0.867	0.213	0.065	0.000	0.753
0.900	0.213	0.067	0.000	0.753
0.933	0.213	0.070	0.000	0.753
0.967	0.213	0.072	0.000	0.753

1.000	0.213	0.075	0.000	0.753
1.033	0.213	0.077	0.000	0.753
1.067	0.213	0.080	0.000	0.753
1.100	0.213	0.082	0.000	0.753
1.133	0.213	0.085	0.000	0.753
1.167	0.213	0.087	0.000	0.753
1.200	0.213	0.090	0.000	0.753
1.233	0.213	0.092	0.000	0.753
1.267	0.213	0.095	0.000	0.753
1.300	0.213	0.097	0.000	0.753
1.333	0.213	0.100	0.000	0.753
1.367	0.213	0.102	0.000	0.753
1.400	0.213	0.105	0.000	0.753
1.433	0.213	0.107	0.000	0.753
1.467	0.213	0.110	0.000	0.753
1.500	0.213	0.112	0.000	0.753
1.533	0.213	0.115	0.000	0.753
1.567	0.213	0.117	0.000	0.753
1.600	0.213	0.120	0.000	0.753
1.633	0.213	0.122	0.000	0.753
1.667	0.213	0.125	0.000	0.753
1.700	0.213	0.127	0.000	0.753
1.733	0.213	0.130	0.000	0.753
1.767	0.213	0.132	0.000	0.753
1.800	0.213	0.135	0.000	0.753
1.833	0.213	0.137	0.000	0.753
1.867	0.213	0.139	0.000	0.753
1.900	0.213	0.142	0.000	0.753
1.933	0.213	0.144	0.000	0.753
1.967	0.213	0.147	0.000	0.753
2.000	0.213	0.154	0.000	0.753
2.033	0.213	0.161	0.119	0.753
2.067	0.213	0.168	0.335	0.753
2.100	0.213	0.175	0.616	0.753
2.133	0.213	0.183	0.948	0.753
2.167	0.213	0.190	1.325	0.753
2.200	0.213	0.197	1.742	0.753
2.233	0.213	0.204	2.195	0.753
2.267	0.213	0.211	2.682	0.753
2.300	0.213	0.218	3.201	0.753
2.333	0.213	0.225	3.749	0.753
2.367	0.213	0.232	4.325	0.753
2.400	0.213	0.239	4.928	0.753
2.433	0.213	0.247	5.556	0.753
2.467	0.213	0.254	6.209	0.753
2.500	0.213	0.261	6.887	0.753
2.533	0.213	0.268	7.587	0.753
2.567	0.213	0.275	8.309	0.753
2.600	0.213	0.282	9.053	0.753
2.633	0.213	0.289	9.817	0.753
2.667	0.213	0.296	10.60	0.753
2.700	0.213	0.304	11.41	0.753
2.733	0.213	0.311	12.23	0.753
2.767	0.213	0.318	13.08	0.753
2.800	0.213	0.325	13.94	0.753
2.833	0.213	0.332	14.82	0.753
2.867	0.213	0.339	15.72	0.753

2.900	0.213	0.346	16.63	0.753
2.933	0.213	0.353	17.56	0.753
2.967	0.213	0.360	18.51	0.753
3.000	0.213	0.368	19.48	0.753

Name : South Drive Aisle Runoff Basin
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A B, Lawn, Flat	.28

Impervious Land Use	Acres
ROADS FLAT	0.45
SIDEWALKS FLAT	0.02

Element Flows To:

Surface	Interflow	Groundwater
South Drive Aise Rain Garden,	South Drive Aise Rain Garden,	

Name : South Drive Aise Rain Garden
Bottom Length: 200ft.
Bottom Width : 10ft.
Trench bottom slope 1: 0.005 To 1
Trench Left side slope 0: 0 To 1
Trench right side slope 2: 0 To 1
Material thickness of first layer : 1
Pour Space of material for first layer : 1
Material thickness of second layer : 1.5
Pour Space of material for second layer : 0.4
Material thickness of third layer : 0
Pour Space of material for third layer : 0
Infiltration On
Infiltration rate : 2
Infiltration saftey factor : 1
Discharge Structure
Riser Height: 2.5 ft.
Riser Diameter: 24 in.

Element Flows To:

Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.046	0.000	0.000	0.000
0.039	0.046	0.002	0.000	0.093
0.078	0.046	0.004	0.000	0.093

0.117	0.046	0.005	0.000	0.093
0.156	0.046	0.007	0.000	0.093
0.194	0.046	0.009	0.000	0.093
0.233	0.046	0.011	0.000	0.093
0.272	0.046	0.012	0.000	0.093
0.311	0.046	0.014	0.000	0.093
0.350	0.046	0.016	0.000	0.093
0.389	0.046	0.018	0.000	0.093
0.428	0.046	0.020	0.000	0.093
0.467	0.046	0.021	0.000	0.093
0.506	0.046	0.023	0.000	0.093
0.544	0.046	0.025	0.000	0.093
0.583	0.046	0.027	0.000	0.093
0.622	0.046	0.029	0.000	0.093
0.661	0.046	0.030	0.000	0.093
0.700	0.046	0.032	0.000	0.093
0.739	0.046	0.034	0.000	0.093
0.778	0.046	0.036	0.000	0.093
0.817	0.046	0.037	0.000	0.093
0.856	0.046	0.039	0.000	0.093
0.894	0.046	0.041	0.000	0.093
0.933	0.046	0.043	0.000	0.093
0.972	0.046	0.045	0.000	0.093
1.011	0.046	0.045	0.000	0.093
1.050	0.046	0.046	0.000	0.093
1.089	0.046	0.047	0.000	0.093
1.128	0.046	0.047	0.000	0.093
1.167	0.046	0.048	0.000	0.093
1.206	0.046	0.049	0.000	0.093
1.244	0.046	0.050	0.000	0.093
1.283	0.046	0.050	0.000	0.093
1.322	0.046	0.051	0.000	0.093
1.361	0.046	0.052	0.000	0.093
1.400	0.046	0.052	0.000	0.093
1.439	0.046	0.053	0.000	0.093
1.478	0.046	0.054	0.000	0.093
1.517	0.046	0.055	0.000	0.093
1.556	0.046	0.055	0.000	0.093
1.594	0.046	0.056	0.000	0.093
1.633	0.046	0.057	0.000	0.093
1.672	0.046	0.057	0.000	0.093
1.711	0.046	0.058	0.000	0.093
1.750	0.046	0.059	0.000	0.093
1.789	0.046	0.060	0.000	0.093
1.828	0.046	0.060	0.000	0.093
1.867	0.046	0.061	0.000	0.093
1.906	0.046	0.062	0.000	0.093
1.944	0.046	0.062	0.000	0.093
1.983	0.046	0.063	0.000	0.093
2.022	0.046	0.064	0.000	0.093
2.061	0.046	0.065	0.000	0.093
2.100	0.046	0.065	0.000	0.093
2.139	0.046	0.066	0.000	0.093
2.178	0.046	0.067	0.000	0.093
2.217	0.046	0.067	0.000	0.093
2.256	0.046	0.068	0.000	0.093
2.294	0.046	0.069	0.000	0.093

2.333	0.046	0.070	0.000	0.093
2.372	0.046	0.070	0.000	0.093
2.411	0.046	0.071	0.000	0.093
2.450	0.046	0.072	0.000	0.093
2.489	0.046	0.072	0.000	0.093
2.528	0.046	0.074	0.090	0.093
2.567	0.046	0.076	0.335	0.093
2.606	0.046	0.078	0.668	0.093
2.644	0.046	0.080	1.069	0.093
2.683	0.046	0.081	1.529	0.093
2.722	0.046	0.083	2.040	0.093
2.761	0.046	0.085	2.599	0.093
2.800	0.046	0.087	3.201	0.093
2.839	0.046	0.089	3.843	0.093
2.878	0.046	0.090	4.523	0.093
2.917	0.046	0.092	5.239	0.093
2.956	0.046	0.094	5.989	0.093
2.994	0.046	0.096	6.772	0.093
3.033	0.046	0.097	7.587	0.093
3.072	0.046	0.099	8.431	0.093
3.111	0.046	0.101	9.305	0.093
3.150	0.046	0.103	10.21	0.093
3.189	0.046	0.105	11.14	0.093
3.228	0.046	0.106	12.09	0.093
3.267	0.046	0.108	13.08	0.093
3.306	0.046	0.110	14.08	0.093
3.344	0.046	0.112	15.11	0.093
3.383	0.046	0.114	16.17	0.093
3.422	0.046	0.115	17.25	0.093
3.461	0.046	0.117	18.35	0.093
3.500	0.046	0.119	19.48	0.093

Name : Northwest Drive Aisle Runoff Basin
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A B, Lawn, Flat	.17

Impervious Land Use	Acres
ROADS FLAT	0.9

Element Flows To:

Surface	Interflow	Groundwater
Northwest Drive Aisle Rain Garden,	Northwest Drive Aisle Rain Garden,	

Name : Northwest Drive Aisle Rain Garden
Bottom Length: 980ft.
Bottom Width : 5ft.
Trench bottom slope 1: 0.005 To 1

Trench Left side slope 0: 0 To 1
Trench right side slope 2: 0 To 1
Material thickness of first layer : 1
Pour Space of material for first layer : 1
Material thickness of second layer : 1.5
Pour Space of material for second layer : 0.4
Material thickness of third layer : 0
Pour Space of material for third layer : 0
Infiltration On
Infiltration rate : 2
Infiltration saftey factor : 1
Discharge Structure
Riser Height: 2.5 ft.
Riser Diameter: 24 in.

Element Flows To:
Outlet 1 **Outlet 2**

Gravel Trench Bed Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.112	0.000	0.000	0.000
0.039	0.112	0.004	0.000	0.227
0.078	0.112	0.009	0.000	0.227
0.117	0.112	0.013	0.000	0.227
0.156	0.112	0.017	0.000	0.227
0.194	0.112	0.022	0.000	0.227
0.233	0.112	0.026	0.000	0.227
0.272	0.112	0.031	0.000	0.227
0.311	0.112	0.035	0.000	0.227
0.350	0.112	0.039	0.000	0.227
0.389	0.112	0.044	0.000	0.227
0.428	0.112	0.048	0.000	0.227
0.467	0.112	0.052	0.000	0.227
0.506	0.112	0.057	0.000	0.227
0.544	0.112	0.061	0.000	0.227
0.583	0.112	0.066	0.000	0.227
0.622	0.112	0.070	0.000	0.227
0.661	0.112	0.074	0.000	0.227
0.700	0.112	0.079	0.000	0.227
0.739	0.112	0.083	0.000	0.227
0.778	0.112	0.087	0.000	0.227
0.817	0.112	0.092	0.000	0.227
0.856	0.112	0.096	0.000	0.227
0.894	0.112	0.101	0.000	0.227
0.933	0.112	0.105	0.000	0.227
0.972	0.112	0.109	0.000	0.227
1.011	0.112	0.111	0.000	0.227
1.050	0.112	0.113	0.000	0.227
1.089	0.112	0.115	0.000	0.227
1.128	0.112	0.116	0.000	0.227
1.167	0.112	0.118	0.000	0.227
1.206	0.112	0.120	0.000	0.227
1.244	0.112	0.122	0.000	0.227
1.283	0.112	0.123	0.000	0.227

1.322	0.112	0.125	0.000	0.227
1.361	0.112	0.127	0.000	0.227
1.400	0.112	0.129	0.000	0.227
1.439	0.112	0.130	0.000	0.227
1.478	0.112	0.132	0.000	0.227
1.517	0.112	0.134	0.000	0.227
1.556	0.112	0.136	0.000	0.227
1.594	0.112	0.137	0.000	0.227
1.633	0.112	0.139	0.000	0.227
1.672	0.112	0.141	0.000	0.227
1.711	0.112	0.143	0.000	0.227
1.750	0.112	0.144	0.000	0.227
1.789	0.112	0.146	0.000	0.227
1.828	0.112	0.148	0.000	0.227
1.867	0.112	0.150	0.000	0.227
1.906	0.112	0.151	0.000	0.227
1.944	0.112	0.153	0.000	0.227
1.983	0.112	0.155	0.000	0.227
2.022	0.112	0.157	0.000	0.227
2.061	0.112	0.158	0.000	0.227
2.100	0.112	0.160	0.000	0.227
2.139	0.112	0.162	0.000	0.227
2.178	0.112	0.164	0.000	0.227
2.217	0.112	0.165	0.000	0.227
2.256	0.112	0.167	0.000	0.227
2.294	0.112	0.169	0.000	0.227
2.333	0.112	0.171	0.000	0.227
2.372	0.112	0.172	0.000	0.227
2.411	0.112	0.174	0.000	0.227
2.450	0.112	0.176	0.000	0.227
2.489	0.112	0.178	0.000	0.227
2.528	0.112	0.182	0.090	0.227
2.567	0.112	0.186	0.335	0.227
2.606	0.112	0.191	0.668	0.227
2.644	0.112	0.195	1.069	0.227
2.683	0.112	0.199	1.529	0.227
2.722	0.112	0.204	2.040	0.227
2.761	0.112	0.208	2.599	0.227
2.800	0.112	0.213	3.201	0.227
2.839	0.112	0.217	3.843	0.227
2.878	0.112	0.221	4.523	0.227
2.917	0.112	0.226	5.239	0.227
2.956	0.112	0.230	5.989	0.227
2.994	0.112	0.234	6.772	0.227
3.033	0.112	0.239	7.587	0.227
3.072	0.112	0.243	8.431	0.227
3.111	0.112	0.248	9.305	0.227
3.150	0.112	0.252	10.21	0.227
3.189	0.112	0.256	11.14	0.227
3.228	0.112	0.261	12.09	0.227
3.267	0.112	0.265	13.08	0.227
3.306	0.112	0.269	14.08	0.227
3.344	0.112	0.274	15.11	0.227
3.383	0.112	0.278	16.17	0.227
3.422	0.112	0.283	17.25	0.227
3.461	0.112	0.287	18.35	0.227
3.500	0.112	0.291	19.48	0.227

Name : East Drive Aisle Runoff Basin
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A B, Lawn, Flat	.08

Impervious Land Use	Acres
ROADS FLAT	0.51

Element Flows To:

Surface	Interflow	Groundwater
East Drive Aisle Rain Garden,	East Drive Aisle Rain Garden,	

Name : East Drive Aisle Rain Garden
Bottom Length: 460ft.
Bottom Width : 5ft.
Trench bottom slope 1: 0.005 To 1
Trench Left side slope 0: 0 To 1
Trench right side slope 2: 0 To 1
Material thickness of first layer : 1
Pour Space of material for first layer : 1
Material thickness of second layer : 1.5
Pour Space of material for second layer : 0.4
Material thickness of third layer : 0
Pour Space of material for third layer : 0
Infiltration On
Infiltration rate : 2
Infiltration saftey factor : 1
Discharge Structure
Riser Height: 2.5 ft.
Riser Diameter: 24 in.

Element Flows To:

Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.053	0.000	0.000	0.000
0.039	0.053	0.002	0.000	0.106
0.078	0.053	0.004	0.000	0.106
0.117	0.053	0.006	0.000	0.106
0.156	0.053	0.008	0.000	0.106
0.194	0.053	0.010	0.000	0.106
0.233	0.053	0.012	0.000	0.106
0.272	0.053	0.014	0.000	0.106

0.311	0.053	0.016	0.000	0.106
0.350	0.053	0.018	0.000	0.106
0.389	0.053	0.021	0.000	0.106
0.428	0.053	0.023	0.000	0.106
0.467	0.053	0.025	0.000	0.106
0.506	0.053	0.027	0.000	0.106
0.544	0.053	0.029	0.000	0.106
0.583	0.053	0.031	0.000	0.106
0.622	0.053	0.033	0.000	0.106
0.661	0.053	0.035	0.000	0.106
0.700	0.053	0.037	0.000	0.106
0.739	0.053	0.039	0.000	0.106
0.778	0.053	0.041	0.000	0.106
0.817	0.053	0.043	0.000	0.106
0.856	0.053	0.045	0.000	0.106
0.894	0.053	0.047	0.000	0.106
0.933	0.053	0.049	0.000	0.106
0.972	0.053	0.051	0.000	0.106
1.011	0.053	0.052	0.000	0.106
1.050	0.053	0.053	0.000	0.106
1.089	0.053	0.054	0.000	0.106
1.128	0.053	0.055	0.000	0.106
1.167	0.053	0.055	0.000	0.106
1.206	0.053	0.056	0.000	0.106
1.244	0.053	0.057	0.000	0.106
1.283	0.053	0.058	0.000	0.106
1.322	0.053	0.059	0.000	0.106
1.361	0.053	0.060	0.000	0.106
1.400	0.053	0.060	0.000	0.106
1.439	0.053	0.061	0.000	0.106
1.478	0.053	0.062	0.000	0.106
1.517	0.053	0.063	0.000	0.106
1.556	0.053	0.064	0.000	0.106
1.594	0.053	0.064	0.000	0.106
1.633	0.053	0.065	0.000	0.106
1.672	0.053	0.066	0.000	0.106
1.711	0.053	0.067	0.000	0.106
1.750	0.053	0.068	0.000	0.106
1.789	0.053	0.069	0.000	0.106
1.828	0.053	0.069	0.000	0.106
1.867	0.053	0.070	0.000	0.106
1.906	0.053	0.071	0.000	0.106
1.944	0.053	0.072	0.000	0.106
1.983	0.053	0.073	0.000	0.106
2.022	0.053	0.074	0.000	0.106
2.061	0.053	0.074	0.000	0.106
2.100	0.053	0.075	0.000	0.106
2.139	0.053	0.076	0.000	0.106
2.178	0.053	0.077	0.000	0.106
2.217	0.053	0.078	0.000	0.106
2.256	0.053	0.078	0.000	0.106
2.294	0.053	0.079	0.000	0.106
2.333	0.053	0.080	0.000	0.106
2.372	0.053	0.081	0.000	0.106
2.411	0.053	0.082	0.000	0.106
2.450	0.053	0.083	0.000	0.106
2.489	0.053	0.083	0.000	0.106

2.528	0.053	0.085	0.090	0.106
2.567	0.053	0.087	0.335	0.106
2.606	0.053	0.090	0.668	0.106
2.644	0.053	0.092	1.069	0.106
2.683	0.053	0.094	1.529	0.106
2.722	0.053	0.096	2.040	0.106
2.761	0.053	0.098	2.599	0.106
2.800	0.053	0.100	3.201	0.106
2.839	0.053	0.102	3.843	0.106
2.878	0.053	0.104	4.523	0.106
2.917	0.053	0.106	5.239	0.106
2.956	0.053	0.108	5.989	0.106
2.994	0.053	0.110	6.772	0.106
3.033	0.053	0.112	7.587	0.106
3.072	0.053	0.114	8.431	0.106
3.111	0.053	0.116	9.305	0.106
3.150	0.053	0.118	10.21	0.106
3.189	0.053	0.120	11.14	0.106
3.228	0.053	0.122	12.09	0.106
3.267	0.053	0.124	13.08	0.106
3.306	0.053	0.126	14.08	0.106
3.344	0.053	0.129	15.11	0.106
3.383	0.053	0.131	16.17	0.106
3.422	0.053	0.133	17.25	0.106
3.461	0.053	0.135	18.35	0.106
3.500	0.053	0.137	19.48	0.106

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.001299
5 year	0.002961
10 year	0.004851
25 year	0.00863
50 year	0.012876
100 year	0.018811

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.993156
5 year	1.267979
10 year	1.448509
25 year	1.676365
50 year	1.846518
100 year	2.017396

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1950	0.001	0.000
1951	0.002	0.000

1952	0.001	0.000
1953	0.001	0.000
1954	0.001	0.000
1955	0.006	0.000
1956	0.016	0.000
1957	0.001	0.000
1958	0.001	0.000
1959	0.002	0.000
1960	0.001	0.000
1961	0.001	0.000
1962	0.003	0.000
1963	0.001	0.000
1964	0.001	0.000
1965	0.001	0.000
1966	0.001	0.000
1967	0.001	0.000
1968	0.001	0.000
1969	0.001	0.000
1970	0.001	0.000
1971	0.001	0.000
1972	0.008	0.000
1973	0.001	0.000
1974	0.001	0.000
1975	0.002	0.000
1976	0.001	0.000
1977	0.001	0.000
1978	0.001	0.000
1979	0.001	0.000
1980	0.002	0.000
1981	0.001	0.000
1982	0.001	0.000
1983	0.004	0.000
1984	0.001	0.000
1985	0.001	0.000
1986	0.007	0.000
1987	0.001	0.000
1988	0.005	0.000
1989	0.001	0.000
1990	0.001	0.000
1991	0.001	0.000
1992	0.001	0.000
1993	0.001	0.000
1994	0.001	0.000
1995	0.001	0.000
1996	0.001	0.000
1997	0.016	0.000
1998	0.030	0.000

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	0.0302	0.0000
2	0.0165	0.0000
3	0.0162	0.0000
4	0.0081	0.0000
5	0.0066	0.0000
6	0.0060	0.0000

7	0.0047	0.0000
8	0.0041	0.0000
9	0.0028	0.0000
10	0.0024	0.0000
11	0.0019	0.0000
12	0.0018	0.0000
13	0.0016	0.0000
14	0.0014	0.0000
15	0.0012	0.0000
16	0.0009	0.0000
17	0.0009	0.0000
18	0.0009	0.0000
19	0.0009	0.0000
20	0.0009	0.0000
21	0.0009	0.0000
22	0.0009	0.0000
23	0.0009	0.0000
24	0.0009	0.0000
25	0.0009	0.0000
26	0.0009	0.0000
27	0.0009	0.0000
28	0.0009	0.0000
29	0.0009	0.0000
30	0.0009	0.0000
31	0.0009	0.0000
32	0.0009	0.0000
33	0.0009	0.0000
34	0.0009	0.0000
35	0.0009	0.0000
36	0.0009	0.0000
37	0.0009	0.0000
38	0.0009	0.0000
39	0.0009	0.0000
40	0.0009	0.0000
41	0.0009	0.0000
42	0.0009	0.0000
43	0.0009	0.0000
44	0.0009	0.0000
45	0.0009	0.0000
46	0.0009	0.0000
47	0.0008	0.0000
48	0.0008	0.0000
49	0.0008	0.0000

POC #1
The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.0006	1475	0	0	Pass
0.0008	648	0	0	Pass
0.0009	207	0	0	Pass
0.0010	135	0	0	Pass
0.0011	117	0	0	Pass
0.0013	104	0	0	Pass

0.0014	97	0	0	Pass
0.0015	87	0	0	Pass
0.0016	82	0	0	Pass
0.0018	77	0	0	Pass
0.0019	69	0	0	Pass
0.0020	65	0	0	Pass
0.0021	61	0	0	Pass
0.0023	58	0	0	Pass
0.0024	57	0	0	Pass
0.0025	53	0	0	Pass
0.0026	50	0	0	Pass
0.0027	49	0	0	Pass
0.0029	46	0	0	Pass
0.0030	45	0	0	Pass
0.0031	42	0	0	Pass
0.0032	42	0	0	Pass
0.0034	40	0	0	Pass
0.0035	40	0	0	Pass
0.0036	39	0	0	Pass
0.0037	38	0	0	Pass
0.0039	36	0	0	Pass
0.0040	36	0	0	Pass
0.0041	34	0	0	Pass
0.0042	33	0	0	Pass
0.0044	29	0	0	Pass
0.0045	26	0	0	Pass
0.0046	22	0	0	Pass
0.0047	20	0	0	Pass
0.0048	19	0	0	Pass
0.0050	19	0	0	Pass
0.0051	18	0	0	Pass
0.0052	18	0	0	Pass
0.0053	17	0	0	Pass
0.0055	17	0	0	Pass
0.0056	17	0	0	Pass
0.0057	16	0	0	Pass
0.0058	15	0	0	Pass
0.0060	15	0	0	Pass
0.0061	14	0	0	Pass
0.0062	14	0	0	Pass
0.0063	13	0	0	Pass
0.0065	13	0	0	Pass
0.0066	12	0	0	Pass
0.0067	11	0	0	Pass
0.0068	11	0	0	Pass
0.0069	11	0	0	Pass
0.0071	11	0	0	Pass
0.0072	11	0	0	Pass
0.0073	11	0	0	Pass
0.0074	10	0	0	Pass
0.0076	10	0	0	Pass
0.0077	10	0	0	Pass
0.0078	10	0	0	Pass
0.0079	10	0	0	Pass
0.0081	10	0	0	Pass
0.0082	9	0	0	Pass
0.0083	9	0	0	Pass

0.0084	9	0	0	Pass
0.0086	8	0	0	Pass
0.0087	8	0	0	Pass
0.0088	8	0	0	Pass
0.0089	8	0	0	Pass
0.0090	7	0	0	Pass
0.0092	7	0	0	Pass
0.0093	7	0	0	Pass
0.0094	6	0	0	Pass
0.0095	6	0	0	Pass
0.0097	6	0	0	Pass
0.0098	6	0	0	Pass
0.0099	6	0	0	Pass
0.0100	6	0	0	Pass
0.0102	6	0	0	Pass
0.0103	6	0	0	Pass
0.0104	6	0	0	Pass
0.0105	6	0	0	Pass
0.0107	6	0	0	Pass
0.0108	6	0	0	Pass
0.0109	6	0	0	Pass
0.0110	6	0	0	Pass
0.0111	6	0	0	Pass
0.0113	6	0	0	Pass
0.0114	5	0	0	Pass
0.0115	5	0	0	Pass
0.0116	5	0	0	Pass
0.0118	4	0	0	Pass
0.0119	4	0	0	Pass
0.0120	4	0	0	Pass
0.0121	4	0	0	Pass
0.0123	4	0	0	Pass
0.0124	4	0	0	Pass
0.0125	3	0	0	Pass
0.0126	3	0	0	Pass
0.0128	3	0	0	Pass
0.0129	3	0	0	Pass

Impervious Area Calculations

BAKER/ELLIS STORAGE P OJECT

Shaded cells are calculated

BASINS				
ON-SITE BASIN	198,800.00	sf	4.56	acres
SUB TOTAL	198,800.00	sf	4.56	acres
TOTAL DRAINAGE BASIN	198,800.00	sf	4.56	acres

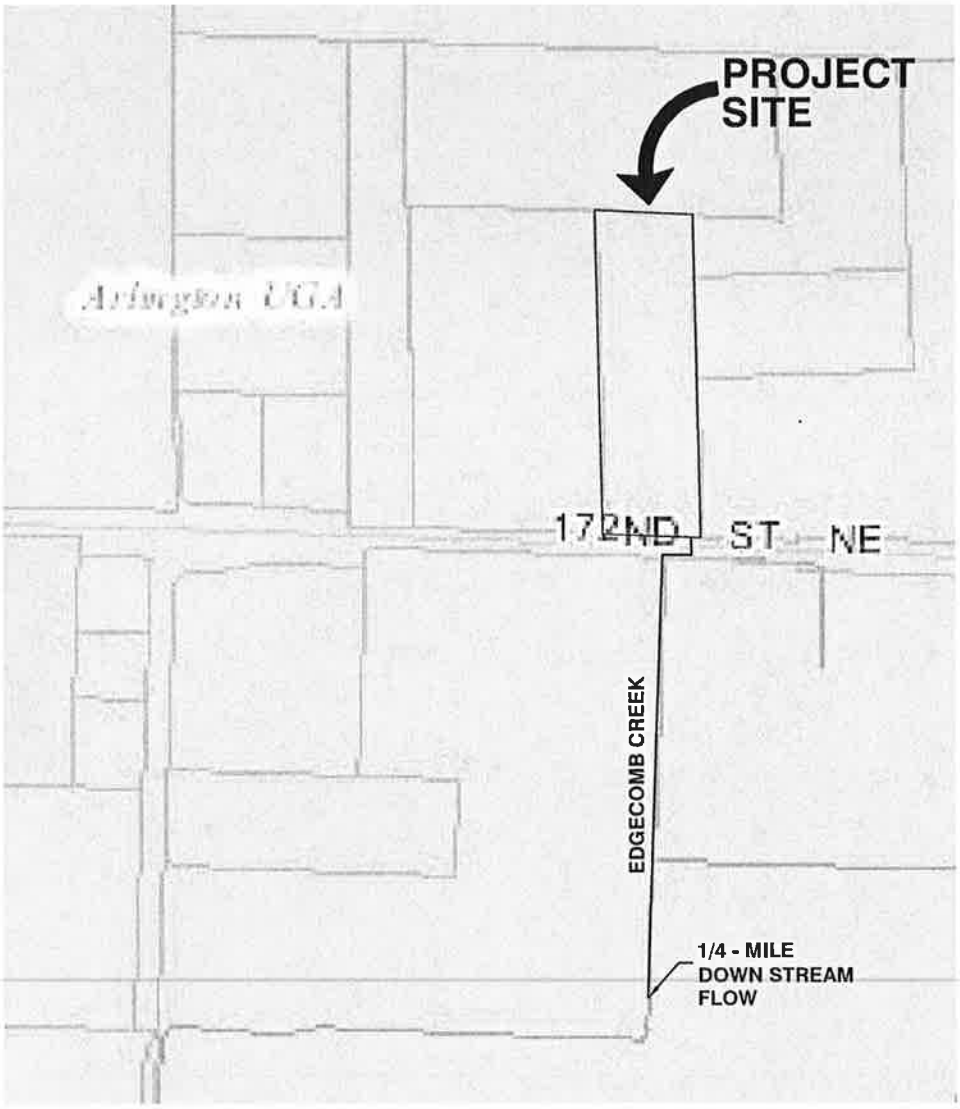
IMPERVIOUS CALCULATIONS

NEW IMPERVIOUS AREA				
NEW ROAD	80,662	sf	1.85	acres
NEW SIDEWALKS	933	sf	0.02	acres
BUILDINGS	93,875	sf	2.16	acres
TOTAL IMPERVIOUS AREA	175,470	sf	4.03	acres

TOTAL SITE AREA	5.01 acres
TOTAL ONSITE PERCENT IMPERVIOUS	80.4%

Down Stream Analysis Map

BAKER/ELLIS PROPERTY
¼ - MILE DOWNSTREAM ANALYSIS MAP



AERIAL VICINITY MAP

SCALE: 1" = 500'

Reference: Snohomish County Permit, Planning and Zoning Map
Accessed on: February 20, 2008
SE QTR, SEC 22, T31N, R 5E

N

Geotechnical Site Investigation
Prepared by Western Geotechnical Consultants, Inc. on
October 26, 2007

Western Geotechnical Consultants, Inc.

4183 Saltsprings Dr., Ferndale, WA 98248 Phone/FAX (360)380-2507

October 26, 2007

Mr. John Lakhani
Integral Northwest Corporation
8115 Broadway, Suite 204
Everett, Washington 98203

Re: Report – Geotechnical Site Investigation
Baker-Ellis Property
SE ¼, sec. 22, Twp. 31N, range 5E, W.M.
City of Arlington, WA

Western Geotechnical Consultants, Inc. is pleased to present the results of our geotechnical site investigation conducted at the above reverenced property. On October 17, 2007 a representative from our firm oversaw the excavation of 5 test pits on the property. The property is a rectangular shaped parcel that is about 5 acres in size. The property is located on the north side of 172nd St. NE between 59th Ave. NE and 67th Ave. NE in the City of Arlington, Washington.

The USDA Soils Classification Service "Soil Survey of Snohomish County Area, Washington" has classified the soils on the northern approximately 3/4 of the site as Lynnwood loamy sand. This very deep, somewhat excessively drained soil that formed in glacial outwash is underlain by terraces and outwash plains. The permeability of Lynnwood soils is rapid and runoff is slow. The southern approximately 1/4 of the site has been classified as Custer fine sandy loam. This very deep, poorly drained soil is in basins on outwash plains with discontinuous hardpan. Runoff is slow and surface water ponding occurs from November to March.

The purpose of our investigation was to evaluate the site with respect to developing the site using stormwater infiltration and other Low Impact Development (LID) methods. The specific scope of our investigation for the site included the following services:

- Review available published geologic, geotechnical and topographic information for the area including soil and groundwater information for nearby properties contained in our files.
- Excavate 5 test pits and obtain samples to explore soil and groundwater conditions across the site. Piezometers were installed in all of the test pits for future monitoring of groundwater levels, and the piezometers will be read throughout the winter months to establish the seasonal high water table. Initial readings were taken on October 22, 2007, and the results are presented on the Log of Test Pits.
- Classify soils in accordance with the Unified Soils Classification System (USCS).
- Perform field and laboratory testing as deemed necessary in support of our conclusions and recommendations. Lab testing included grain size analyses performed in accordance with the USDA textural triangle methodology so as to determine design infiltration rates for the site soils. We also performed an ASTM gradation analysis to determine the silt content of the near surface siltier soils.
- Prepare this engineering report including a summary of work performed and our conclusions and recommendations regarding:

- Soil and groundwater information for use in designing infiltration facilities and possibly porous asphalt concrete access roads within the site.
- Provide design infiltration rates for use in stormwater facilities design.
- Provide recommended subgrade strength values (California Bearing Ratio) for use in designing the road section. Western Geotechnical Consultants, Inc. could provide a road design if design parameters are provided.
- Provide seismic design parameters for structural design. Seismic hazard will also be addressed.
- Provide geotechnical recommendations for building construction on the site including foundations, earth supported floor slabs and drainage.
- Provide rough stripping criteria and the depth to suitable bearing soil for relatively light foundations and paved areas.
- Structural fill criteria including the suitability of on site material for use as structural fill.
- General site development recommendations with respect to geotechnical issues identified during our field investigation.

Site Conditions

Surface Conditions

Access to the site is from the south via 172nd Avenue NE. The property is a relatively flat, rectangular parcel that is presently grass and weed covered. Drainage ditches are located along the south and east sides of the property.

Subsurface Conditions

Subsurface soil and groundwater conditions were explored on October 17, 2007 when a total of five test pits were advanced using a tracked excavator with a 1.5-foot wide bucket. The test pits were excavated at the approximate locations shown on the attached Site Plan, Figure 1, and soil and groundwater conditions were continuously logged using the Unified Soils Classification System (USCS). Edited tabulated test pit logs are included in this report together with a USCS chart explaining soil descriptions.

Subsurface conditions were found to be relatively similar across the property. The subsurface profile consists of about a foot of dark brown sandy organic SILT to silty SAND (OL/SM by USCS) (topsoil) with numerous roots and organic debris that was in a soft and wet state. Below the topsoil layer we typically encountered silty SAND (SM to SP/SM by USCS) that extended to depths of 2 to 2-1/2 feet. The exceptions were Test Pits 1 and 2 where the material was fine sandy SILT (ML by USCS) below the topsoil layer. This layer extended from depths ranging from 1-1/2 to 2 feet. Below the topsoil and silty soils we encountered a clean fine to medium SAND (SP by USCS) that

extended to depths ranging from 4 to 4-1/2 feet below grade. Below this soil unit we encountered a gravelly fine to coarse SAND (SP by USCS) that extended to the depth of the test pits (8.4 feet maximum).

Groundwater

At the time of our investigation we encountered groundwater seepage in the two eastern most test pits. In Test Pit 1 we encountered seepage at 7.2 feet and in Test Pit 2 we encountered seepage at 8.0 feet. In Test Pit 3 no groundwater was encountered, although the soil became very moist at about 7 feet. In Test Pits 4 and 5, the northern most test pits, we logged only moist soil to the depth of the test pits. Piezometers were installed in all of the test pits for future monitoring of the groundwater levels.

We returned to the site on October 22, 2007 to read the piezometers and we determined that the water table rises from north to south across the property, where the following readings were made.

Test Pit No.	Water Level (BGS)
1	6.07
2	7.51
3	Dry
4	Dry
5	dry

Laboratory Testing

Laboratory tests were performed on selected soil samples obtained during our test pit investigation. Laboratory testing included soil inspection under controlled laboratory conditions, moisture content determination, and grain size analyses performed in accordance with the USDA textural triangle methodology and one of the siltier samples was tested in accordance with ASTM D-422 test procedure to determine the silt content of the near surface soils. The moisture content test results are included in the tabulated log of test pits and the results of the grain size analyses are attached to this report in the form of grain size distribution curves. The results of the USDA grain size tests are also plotted on the attached USDA Textural Triangle.

Conclusions and Recommendations

General

Based on our geotechnical investigation, we conclude that stormwater infiltration will likely be feasible across the property. At this time it appears that there is sufficient separation between the groundwater table and infiltration facilities to develop an acceptable design. The groundwater table will be monitored throughout the winter months to establish the seasonal high groundwater table across the property.

The following section provides a description of our analyses and recommendations for the infiltration rate for the representative relatively clean (i.e. low silt content) granular soils, based on our geotechnical investigation and subsequent laboratory testing.

Infiltration Rate

We determined the infiltration rate for representative soils encountered in the Test Pits at the site in accordance with the 2005 edition of the Washington Department of Ecology (DOE) Stormwater Management Manual for Western Washington. Representative, relatively free-draining soil samples taken from beneath the topsoil and near surface silty soils were tested. The soils were classified in the field and are documented on the test pit logs as SAND (SP by the USCS). A total of four grain size analyses were performed. Grain size tests were performed to define the D_{10} size of the soils and to locate the soil gradation on the USDA textural triangle for use in determining infiltration rates.

Based on the testing the Textural Class of the soil is sand. The D_{10} measured on the site soils range from 0.14 to 0.4 millimeters, average 0.24 millimeters. Based on our laboratory data we are recommending using the estimated long term design infiltration rate of 3.5 inches per hour, which is appropriate for soils using a D_{10} of 0.2 millimeters, reference Table 3.8, Vol. 3 of the 2005 Stormwater Management Manual.

General Site Development

The following sections of this report contain recommendations for general site development. Note that these recommendations are based on the limited scope of subsurface exploration performed as a part of our geotechnical services for the project combined with subsurface information obtained from the percolation test hole logs.

Site Preparation: All topsoil or other organic, soft or deleterious material, including existing fill material, must be stripped and removed from those areas to be developed. Based on our test pit investigation, a stripping depth of about 1 foot should be anticipated. Note that deeper over-excavation may be required where deeper unsuitable soils such as old tree root balls are encountered.

IBC Site Classification: Based on our geotechnical investigation the site soils are classified as soil type D, stiff soil profile. The earthquake spectral responses (S_{ms} and S_{m1}) may be computed using Soil Class D and Tables 1615.1.2 (1) and 1615.1.2(2) of the IBC (2003 ed.).

Foundation Support: The on site non-organic soils will support moderately light structures using conventional shallow spread footings. A typical 1- to 2-story structure without heavy column loads would be considered a moderately light structure (defined below). Shallow spread foundations will perform satisfactorily on a properly prepared subgrade on firm, non-organic, native soils. Wall footings and column footings should have minimum dimensions of 16-inches and 24-inches respectively. We recommend that footings be proportioned using a maximum bearing capacity of 2000 pounds per square foot (psf). This value may be increased by 1/3 for transient wind and seismic loading. All footings should be founded a minimum of 18 inches below the lowest adjacent grade for frost protection. If continuous foundation loads exceed 4,000 plf or if column footing loads exceed 18,000 pounds when proportioning foundations using 2,000 psf, Western Geotechnical Consultants, Inc. should be contacted so we can assess foundation loading and perform additional foundation investigations, if deemed appropriate.

Structural Fill and Compaction: It is possible that some structural fill will be required. Structural fill is defined as compacted fill material supporting buildings, parking areas, driveways, etc. All structural fill should be placed and compacted on a horizontal subgrade surface. Structural fill should extend beyond the edge of any future structural improvements a distance equal to the thickness of the fill beneath the structural improvements. Structural fill should be of a uniform thickness under building foundations to reduce the potential for differential settlements.

The on site non-organic sandy soils below the silty soils can be used as structural fill provided the moisture content can be controlled and provided adequate compaction can be achieved (defined below). Otherwise, we recommend using an import fill material consisting of relatively clean sandy gravel containing less than 5% fines (GW by USCS). Structural fill should be placed in maximum 8- to 10-inch loose, horizontal lifts and be thoroughly compacted. All structural fill should be compacted to 95% of maximum dry density as determined by the ASTM D-1557 test procedure.

Floor Slab Support: We have assumed that the lower level of buildings may have an earth supported floor slab. Preparation of the building areas in a manner described in the previous sections of this report should provide an adequate base for the floor slab support. We recommend that all earth-supported floor slabs be underlain by a minimum of four inches of clean crushed gravel, which will act as a capillary break to prevent moisture wicking up to the slab.

After the sand or crushed gravel layer is placed, it should be maintained in a relatively dry condition.

It is important that drainage is provided such that the 4-inch capillary layer located below the vapor barrier will drain via gravity from beneath the floor slab. This can be accomplished by installing 2-inch diameter PVC pipes through the stem wall that outlet into the footing drain system or by extending the capillary break layer under the footing.

In addition, the Portland Cement Association recommends the following, "... to prevent problems with floor covering materials caused by concrete itself, the following steps should be taken (Design and Control of Concrete Mixture, Portland Cement Association, 13th Edition:

1) use low water-cement ratio concrete
2) moisture-cure the slab for five to seven days
3) allow the slab a two or more month drying period, and
4) test the slab moisture condition before installing the floor covering.

Access Road Subgrade Strength Design Parameters

On the basis of our review of site soil conditions along the road alignment, a minimum CBR value of 7 has been assumed for the near surface soils. This value is based on correlation of soil type and our experience at sites with similar soil conditions.

Some of the important factors that affect the durability of pavement surfacing include stability and permeability of the subgrade soils and base materials, the presence of ground water, design life of the road section, the traffic volume, and the frequency of heavy truck traffic. The road section design should include the factors listed above or should meet the Snohomish County standards for low volume residential roads.

The pavement section should be installed over firm sub-grade. Following excavation and/or filling to establish sub-grade elevation, but immediately prior to paving, the sub-grade surface should be proof rolled with a loaded 10 cubic yard dump truck, or equivalent. Any soft areas exposed by the proof rolling, which cannot be easily compacted should be over-excavated and back filled with compacted granular fill.

Erosion Control: Erosion control during construction of the proposed facilities 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 all construction areas. Typical details for siltation control facilities using either hay bales or silt fences are attached to this report.

Siltation devices should be placed down gradient of all construction areas and cleared areas to provide siltation control during construction. All siltation control devices should

fabricated around all construction areas. Typical details for siltation control facilities using either hay bales or silt fences are attached to this report.

Siltation devices should be placed down gradient of all construction areas and cleared areas to provide siltation control during construction. All siltation control devices should be maintained in operable condition 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.

Closure

The scope of our services was limited to five test pits excavated across the site to obtain subsurface information for stormwater infiltration design and general site development. If subsurface soil conditions encountered during the site development are different or appear to be different from those indicated in this report, we should be advised immediately so we can review and revise our recommendations, if necessary.

Thank you for 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

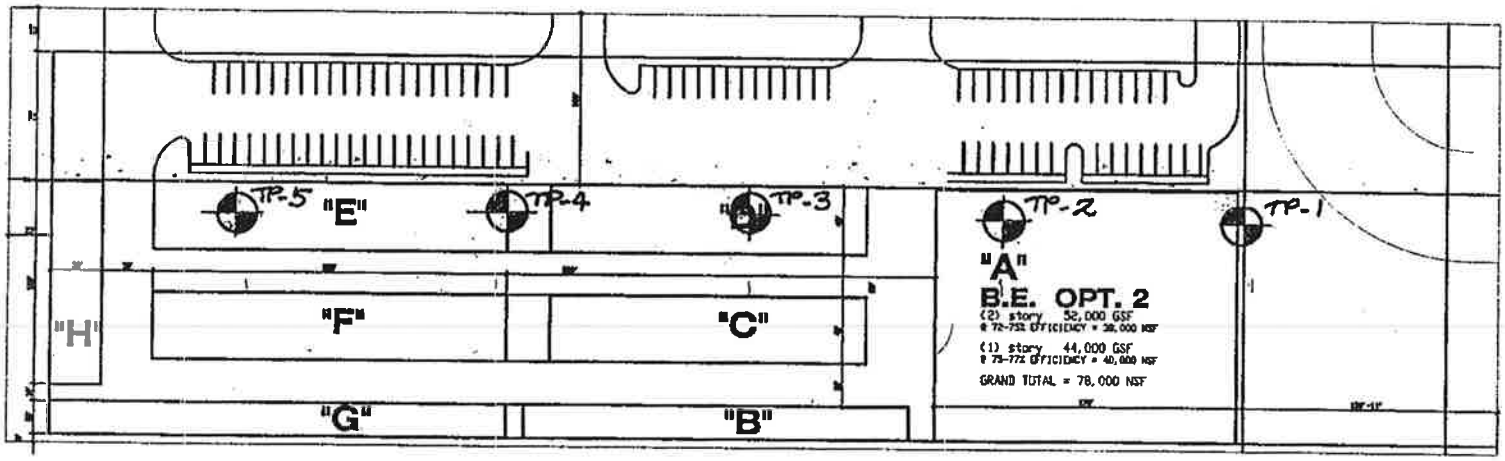
EXPIRES 12/27/07

Inclusions: Figure 1, Site Plan
USCS Classification Chart
Log of Test Pits

Attachments: Grain Size Distribution Curves
USDA Textural Triangle

File: 07 43 1

Figure 1
Site Plan & Test Pit Locations
Baker-Ellis Property
North Side of 172nd Ave. NE
Arlington, WA



BAKER ELLIS SITE - (2) STORY

1=100

SELLENTIN
TRUE DESIGN BUILD

NOT TO SCALE

Geotechnical Site Investigation
Baker-Ellis Property
North Side of 172nd Avenue, NE
Snohomish County, WA
October 26, 2007

Western Geotechnical Consultants, Inc.
07 129 1

USCS Chart & Key to Test Pit Descriptions

UNIFIED SOIL CLASSIFICATION CHART (USCS)

MAJOR DIVISIONS		GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES) <5%	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES) <5%	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) <12%	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

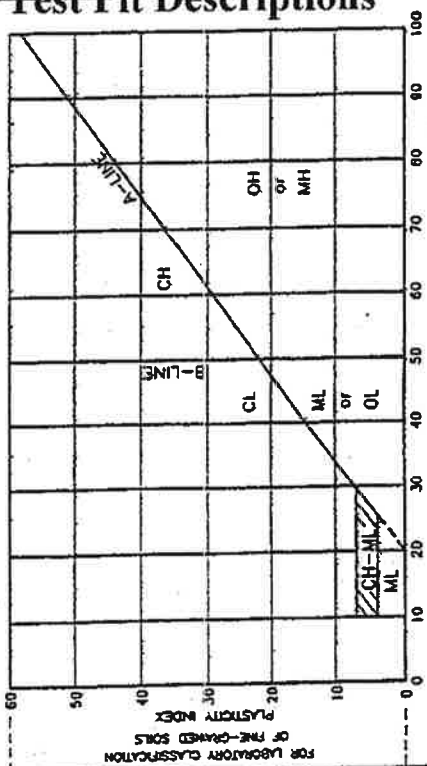
GRADATION CHART

MATERIAL SIZE		PARTICLE SIZE: LOWER LIMIT MILLIMETERS	LOWER LIMIT SIEVE SIZE	UPPER LIMIT MILLIMETERS	UPPER LIMIT SIEVE SIZE
SAND	FINE	.074	#200 *	0.42	#40 *
	MEDIUM	0.42	#40 *	2.00	#10 *
	COARSE	2.00	#10 *	4.76	#4 *
GRAVEL	FINE	4.76	#4 *	191	3/4" *
	COARSE	191	3/4" *	762	3" *
COBBLES		76.2	3" *	304.8	12" *
BOULDERS		304.8	12" *	914.4	

* 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

DWG: 8/11/05 SCALE: N.T.S. N/A

A:TEST PITS

			Log of Test Pits		File: 07 129 1	
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Lab Testing
TP-1	0.0-0.9	OL/SM	Dark brown sandy organic SILT to silty SAND with numerous roots and organic debris (soft, wet) (topsoil)			
	0.9-1.5	ML	Chalky gray fine sandy SILT (very moist, relatively compact)	1-1/1.3	29.6%	
	1.5-4.0	SP	Light brown fine to medium SAND, trace to some gravel, trace silt (moist, relatively compact)	1-2/2.5	4.3%	GS*
	4.0-8.0	SP	Gray gravelly fine to coarse SAND, occasional cobbles (moist, grading wet at 7 feet, relatively compact)	1-3/7.0	17.9%	

Notes:

- Test Pit terminated on 10/17/07 at 8 feet.
- Groundwater seepage encountered at 7.2 feet. Piezometer reading on 10/22/07 measured the static water level at 6.07 feet.
- Test pit loosely backfilled upon completion.
- Piezometer installed full depth.

* GS indicates grain size performed in accordance with USDA Textural Triangle methodology.

			Log of Test Pits		File: 07 129 1	
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Lab Testing
TP-2	0.0-1.0	OL/SM	Dark brown sandy organic SILT to silty SAND with numerous roots and organic debris (soft, wet) (topsoil)			
	1.0-2.0	ML	Chalky gray fine sandy SILT (moist, relatively compact)			
	2.0-4.5	SP	Light brown fine to medium SAND, trace to some gravel, trace silt (moist, relatively compact)	2-1/3.5	6.2%	
	4.5-8.2	SP	Gray gravelly fine to coarse SAND, occasional cobbles (moist, grading wet at 7 feet, relatively compact)	2-2/5.5 2-3/8.0	5.9% 10.2%	

Notes:

- Test Pit terminated on 10/17/07 at 8.2 feet.
- Groundwater seepage encountered at 8.0 feet. Piezometer reading on 10/22/07 measured the static water level at 7.51 feet.
- Test pit loosely backfilled upon completion.
- Piezometer installed full depth.
- GS indicates grain size performed in accordance with USDA methodology.

* GS indicates grain size performed in accordance with USDA Textural Triangle methodology.

			Log of Test Pits		File: 07 129 1	
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Lab Testing
TP-3	0.0-1.1	OL/SM	Dark brown sandy organic SILT to silty SAND with numerous roots and organic debris (soft, wet) (topsoil)			
	1.1-2.6	SP/SM	Reddish brown slightly silty fine to medium SAND (moist, relatively compact)	3-1/1.8	9.4%	
	2.6-8.4	SP	Gray gravelly fine to coarse SAND, occasional cobbles (very moist at 7 feet) (no groundwater seepage)	3-2/4.5 3-3/8.0	6.7%	GS*

Notes:

- Test Pit terminated on 10/17/07 at 8.4 feet.
- No groundwater encountered. Piezometer read on 10/22/07 was dry full depth.
- Test pit loosely backfilled upon completion.
- Piezometer installed full depth.

* GS indicates grain size performed in accordance with USDA Textural Triangle methodology.

Geotechnical Site Investigation
Baker-Ellis Property
North Side of 172nd Avenue, NE
Snohomish County, WA
October 26, 2007

Western Geotechnical Consultants, Inc.
07 129 1

			Log of Test Pits		File: 07 129 1	
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Lab Testing
TP-4	0.0-1.0	OL/SM	Dark brown sandy organic SILT to silty SAND with numerous roots and organic debris (soft, wet) (topsoil)			
	1.0-2.0	SM	Orange brown silty fine to medium SAND (very moist, relatively compact)	4-1/1.5	13.2%	
	2.0-4.5	SP	Light brown fine to medium SAND, trace to some gravel, trace silt (moist, relatively compact)	4-2/3.5	6.9%	GS*
	4.5-8.4	SP	Gray gravelly fine to coarse SAND, occasional cobbles (increased gravel and cobles at 7 ft.) (increased cobbles at 7.5 ft.)	4-3/8.0	4.3%	

Notes:

- Test Pit terminated on 10/17/07 at 8.4 feet.
- No groundwater encountered. Piezometer read on 10/22/07 was dry full depth.
- Test pit loosely backfilled upon completion.
- Piezometer installed full depth.

* GS indicates grain size performed in accordance with USDA Textural Triangle methodology.

			Log of Test Pits		File: 07 129 1	
Test Pit No.	Depth Interval (feet)	USCS Class.	Soil Description	Sample No./ Depth (feet)	Water Content (%)	Lab Testing
TP-5	0.0-1.2	OL/SM	Dark brown sandy organic SILT to silty SAND with numerous roots and organic debris (soft, wet) (topsoil)			
	1.2-2.0	SM	Orange brown silty fine to medium SAND (very moist, relatively compact)	5-1/1.5	8.0%	GS**
	2.0-4.5	SP	Light brown fine to medium SAND, trace to some gravel, trace silt (moist, relatively compact)			
	4.5-8.4	SP	Gray gravelly fine to coarse SAND, occasional cobbles (moist, grading wet at 7 feet, relatively compact) (cobbly at 5 feet) (moist at 8.4 feet, no seepage)	5-2/5.0 5-3/8.0	3.9% 6.4%	GS*

Notes:

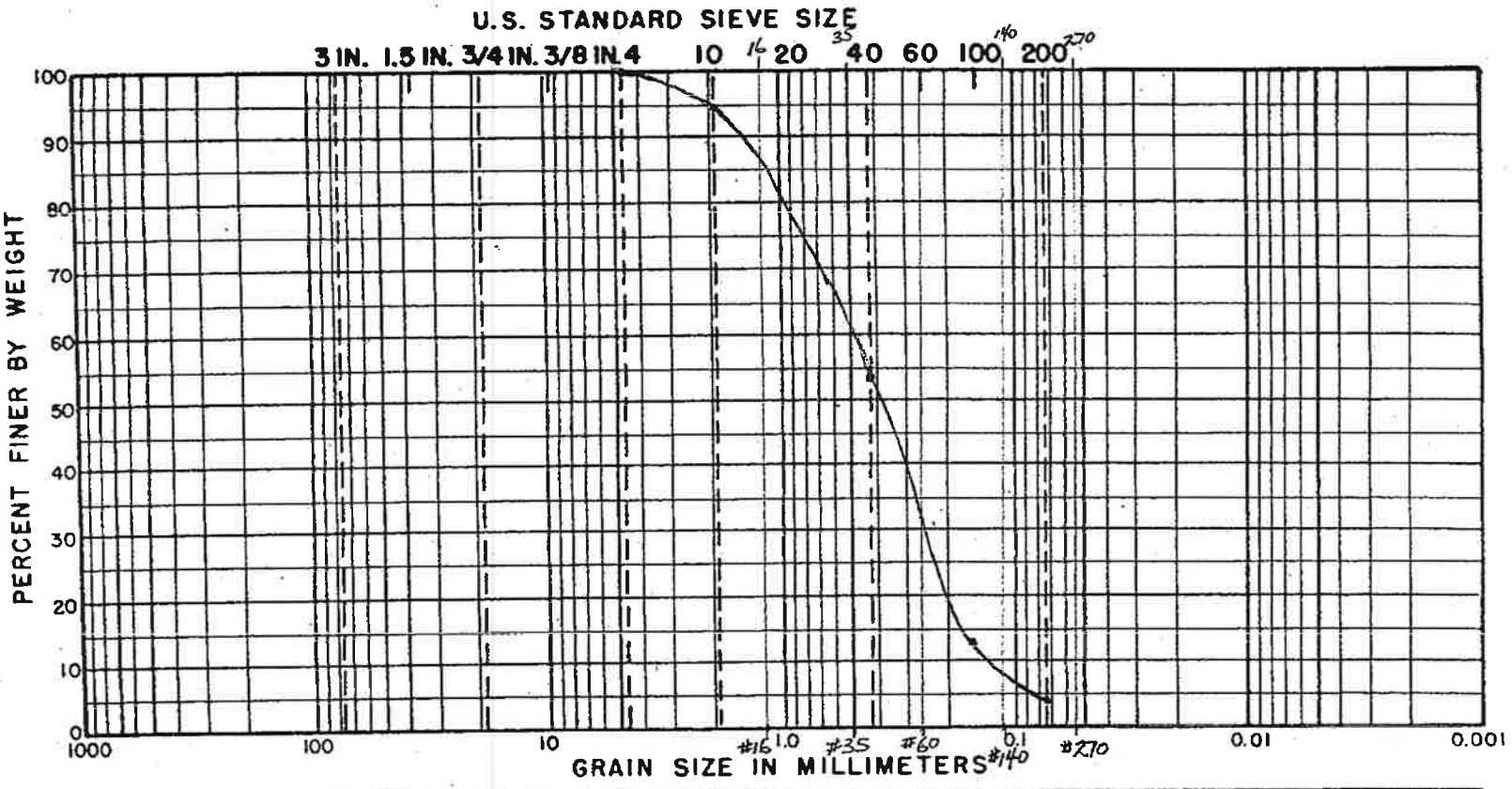
- Test Pit terminated on 10/17/07 at 8.4 feet.
- No groundwater encountered. Piezometer read on 10/22/07 was dry full depth.
- Test pit loosely backfilled upon completion.
- Piezometer installed full depth.

* GS indicates grain size performed in accordance with USDA Textural Triangle methodology.

** GS indicates ASTM D 422 Test Procedure to measure 200¯ of siltier soil unit.

BY _____ DATE _____
CHECKED BY _____ DATE _____

BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

USDA texture	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
triangle	TP-4/5-2@3.5'	SP	Fine to medium SAND	5.9%				D_{10} = 0.14mm

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GRADATION CURVE

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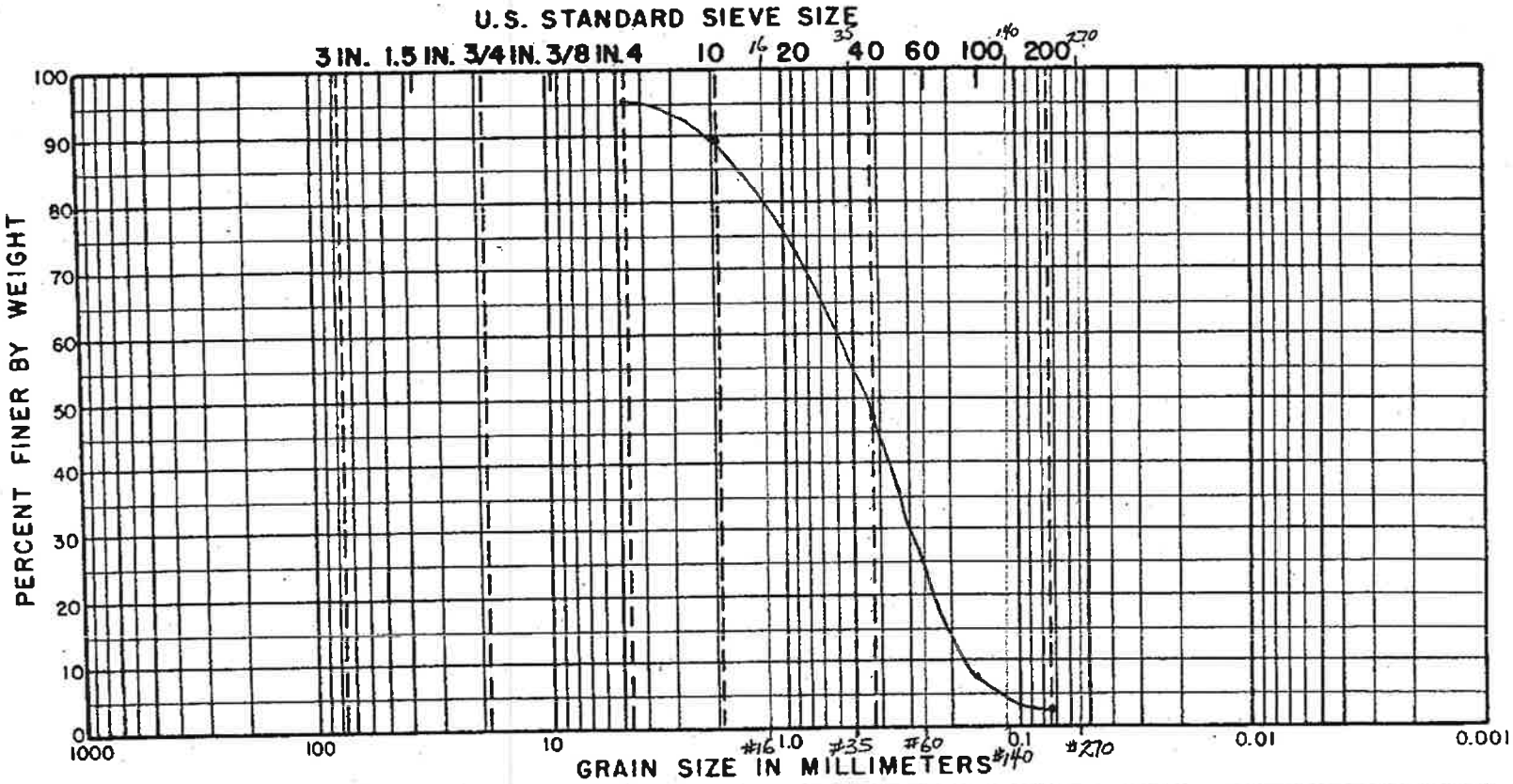

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

USDA texture	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
triangle	TP-1/S-2@2.5'	SP	Fine to medium SAND	3.6%				D_{10} = 0.18 mm

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GRADATION CURVE

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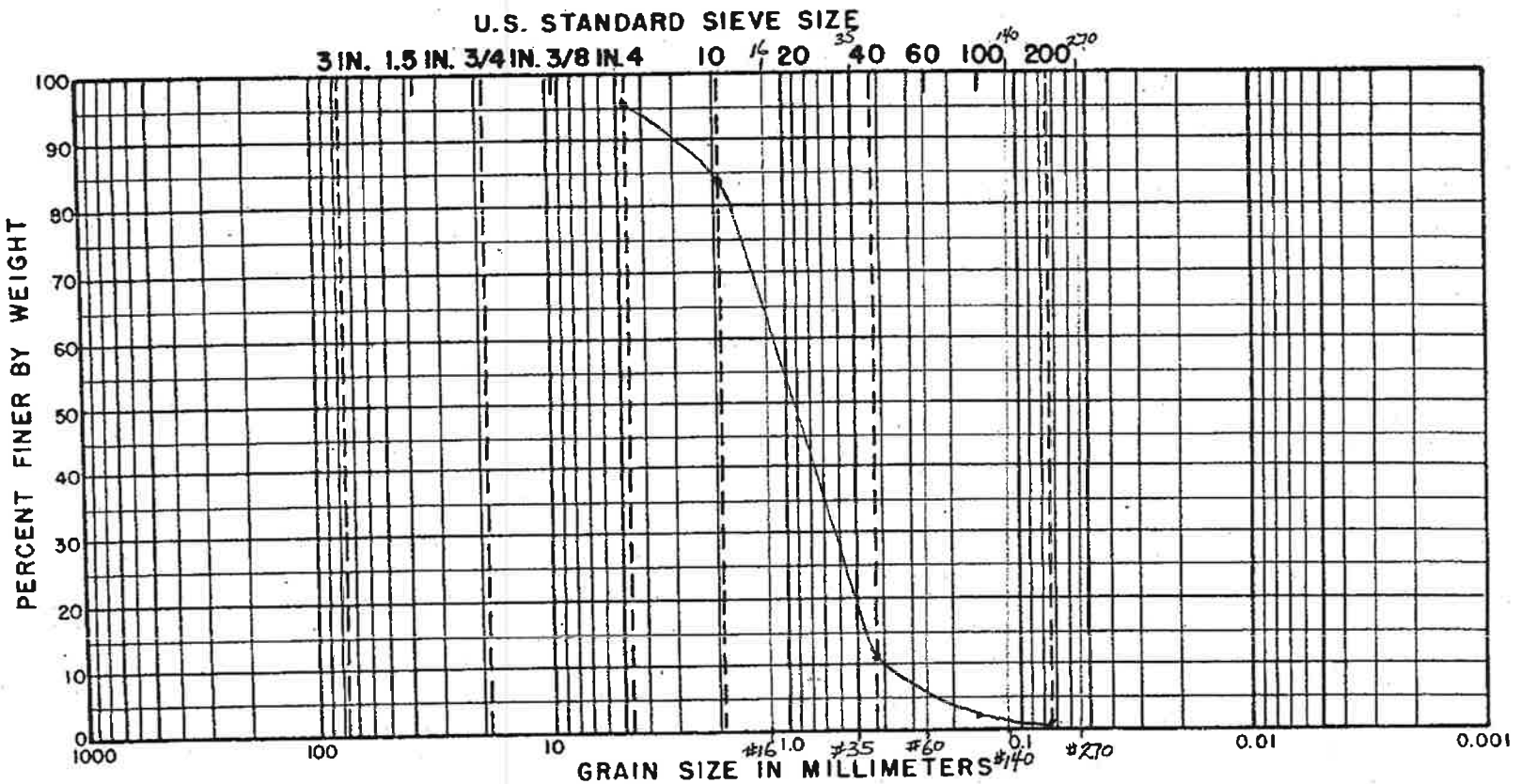

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

USDA texture triangle	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
	TP-5/S-2@5.0'	SP	Medium SAND	3.4%				D_{10} = 0.4 mm

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GRADATION CURVE

BY_____ DATE_____
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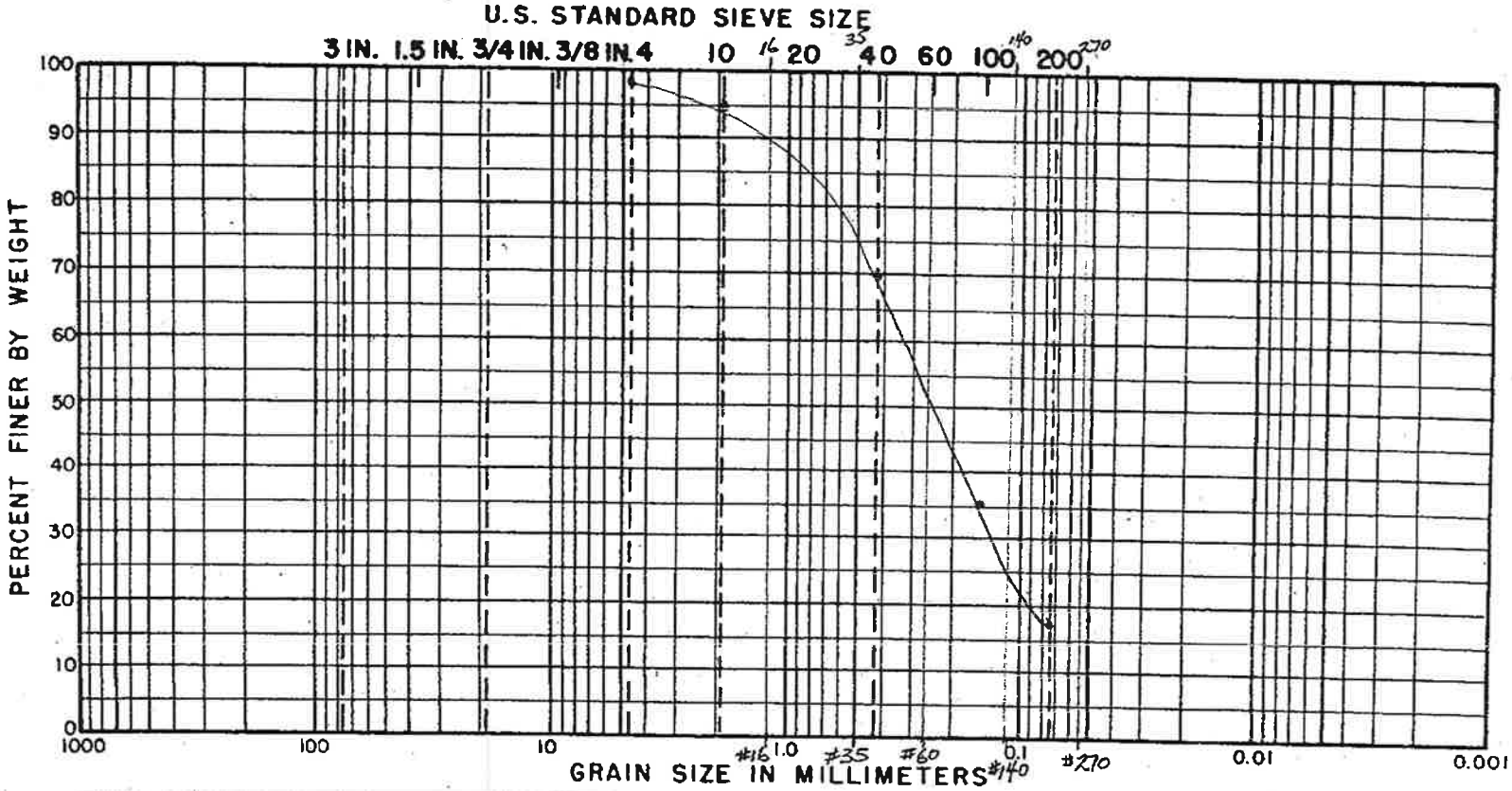
BY_____ DATE_____
BY_____ DATE_____
PLATE_____ OF_____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

USDA texture triangle	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
	TP-3/S-2@4.5'	SM	silty fine to medium SAND	4.4%				Loamy sand

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GRADATION CURVE

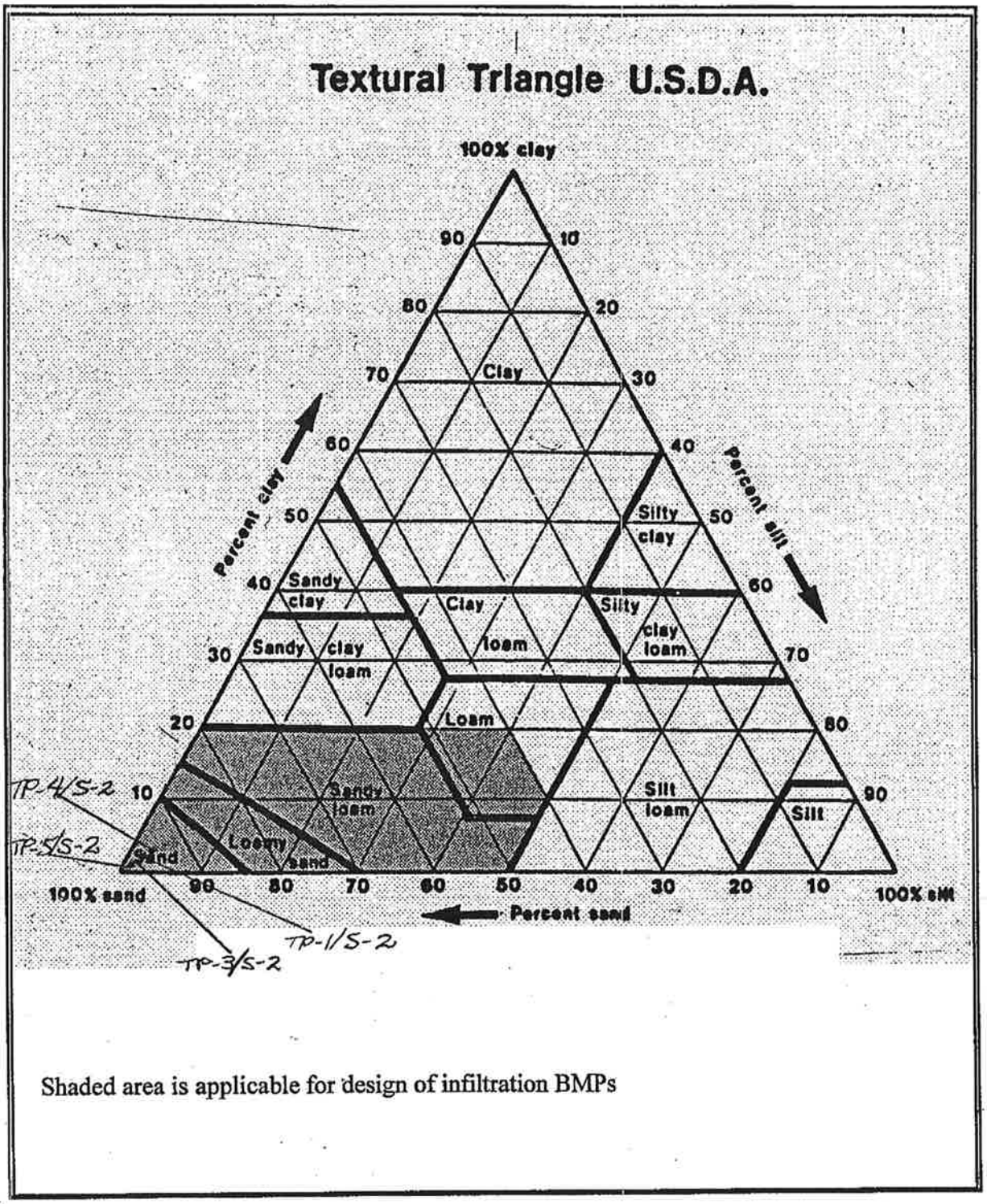


Figure 3.27 USDA Textural Triangle

Source: U.S. Department of Agriculture

Seasonal High Water Table Determination to Date.
Prepared by Western Geotechnical Consultants, Inc. on
April 04, 2008

Western Geotechnical Consultants, Inc.
4183 Saltsprings Dr., Ferndale, WA 98248 Phone/FAX (360)380-2507

April 4, 2008

Mr. John Lakhani
Integral Northwest Corporation
8115 Broadway, Suite 204
Everett, Washington 98203

Re: Seasonal High Water Table Determination to Date
Baker-Ellis Property
SE ¼, sec. 22, Twp. 31N, range 5E, W.M.
City of Arlington, WA

Western Geotechnical Consultants, Inc. is issuing this report to document the results of our monitoring of 5 piezometers installed at the above referenced property. On October 17, 2007 a geotechnical engineer from our firm traveled to the site to excavate a total of 5 test pits across the site. At that time we noted groundwater seepage in the test pits at the approximate depths indicated below. We have since measured the static groundwater level in the 5 monitoring wells on the four dates indicated below. The piezometer locations are shown on the attached Site Plan and the results of our water level readings are summarized below. The last column provides the seasonal high water table at each piezometer location.

Piezo. No.	Date of Piezo. Read [1]10/17/07	Date of Piezo. Read 10/22/07	Date of Piezo. Read 12/7/07	Date of Piezo. Read 1/23/08	Date of Piezo. Read 2/27/08	Date of Piezo. Read 4/2/08	Seasonal High Water Level to Date
1	7.2'	6.07'	4.08'	2.82'	3.48'	2.31'	2.31'
2	8.0'	7.51'	5.66'	3.92'	4.65'	3.48'	3.48'
3	Dry	Dry	6.50'	4.10'	4.95'	3.66'	3.66'
4	Dry	Dry	8.13'	5.58'	6.18'	5.11'	5.11'
5	Dry	Dry	Dry	7.00'	7.40'	6.51'	6.51'

As the results show, the water table becomes progressively lower from south to north across the property.

[1] Readings measured within the test pit during the field investigation.

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.

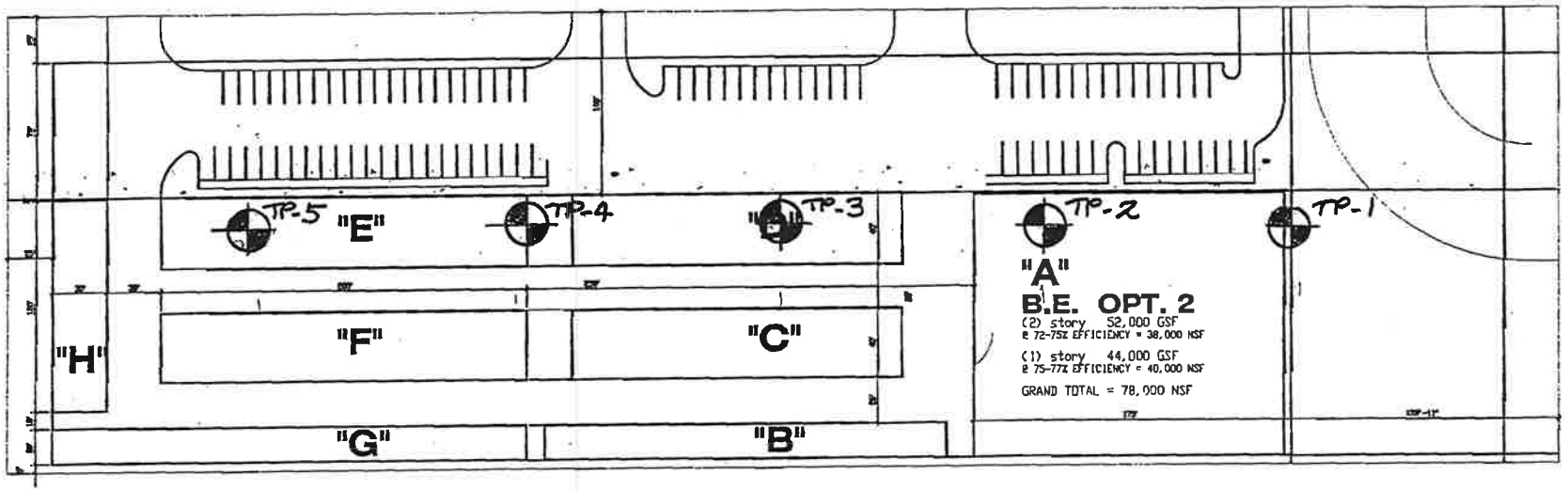
Sincerely,

Western Geotechnical Consultants, Inc.

Theodore A. Hammer, P.E.
Geotechnical Engineer

Attachment: Figure 1, Site Plan Sketch

File: 07 129 5



BAKER ELLIS SITE - (2) STORY

1=100

SELLENTIN
TRUE DESIGN BUILD

NOT TO SCALE