

Associated Earth Sciences, Inc.



Celebrating Over 25 Years of Service

September 11, 2008
Project No. KE060290A

Ms. SoUn Yang
c/o Smokey Point Jewelry and Pawn
3405 172nd Avenue NE
Arlington, Washington 98223

Subject: Infiltration Testing Results
SY Plaza
18706 and 18726 Smokey Point Boulevard
Arlington, Washington

RECEIVED
SEP 23 2008
Utilities Div.

RECEIVED
SEP 19 2008
COA PERMIT CENTER
PLN 20080073

Dear Ms. Yang:

Associated Earth Sciences, Inc. (AESI) is pleased to provide this letter presenting the results of the subsurface exploration and infiltration testing recently completed at the above-referenced site. Our work has been completed in general accordance with our scope of work letter, dated August 18, 2008, and in accordance with generally accepted hydrogeologic practices in effect at the time of this study.

SITE AND PROJECT CONDITIONS

The subject site consists of two adjoining lots comprising a total of approximately 1.5 acres located at the southwest corner of the intersection of 188th Street NE and Smokey Point Boulevard in Arlington, Washington (Figure 1). The addresses of the two lots are 18706 and 18726 Smokey Point Boulevard. The northern lot (18726) is occupied by a mobile home. The area surrounding the mobile home consists predominantly of lawn and gravel driveway. The eastern portion of the northern parcel contains foundation and floor slab remnants of a former building. A water well is also located in this portion of the site. The southern lot (18706) is occupied by a single-family home and two small outbuildings. The area surrounding the buildings is mostly forested with some area of lawn and natural underbrush. The topography of the site is relatively flat.

It is our understanding that current plans include demolition of the existing buildings and construction of a one-story commercial building with associated paved parking and driveway areas. Conceptual plans also include on-site infiltration of storm water. The locations of the existing and proposed buildings, the water well, and the approximate location of the proposed storm water infiltration area are shown on the "Site and Exploration Plan," Figure 2.

It should be noted that a geotechnical engineering study was previously conducted at the site by AESI. The findings of that study were documented in our report titled "Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report," dated August 15, 2008.

SUBSURFACE CONDITIONS

In order to evaluate subsurface conditions in the proposed infiltration area, exploration pits EP-5 and EP-6 were excavated approximately where shown on Figure 2. The locations of exploration pits EP-1 through EP-4, excavated for our August 2008 geotechnical study, are also depicted on Figure 2. Exploration pit EP-5 was initially excavated to a depth of approximately 2.5 feet, at which depth an infiltration test was conducted, as subsequently described. Immediately after completion of the infiltration test, this exploration pit was excavated to a depth of approximately 14 feet. Conditions encountered in the exploration pits were observed and logged by an engineering geologist from our firm.

As shown on the attached field logs, exploration pits EP-5 and EP-6 encountered sediments interpreted to be representative of Vashon recessional outwash. The upper portion of the outwash consisted of loose to medium dense, reddish tan to reddish brown sand with moderately high to high silt and gravel content. These sediments, which were interpreted to be a weathered soil horizon, extended to depths of approximately 2.5 feet and 1.5 feet at the locations of exploration pits EP-5 and EP-6, respectively. Unweathered outwash sediments encountered below the weathered soil horizon generally consisted of loose to medium dense sand with moderately high to high gravel content and trace amounts of silt. The unweathered recessional outwash sediments extended beyond the maximum depths explored in exploration pits EP-5 and EP-6 of approximately 14 feet and 8.5 feet, respectively. The subsurface conditions encountered in exploration pits EP-5 and EP-6 are generally consistent with the conditions observed in the four exploration pits excavated for our previous study.

Review of the regional geologic map titled *Distribution and Description of the Geologic Units in the Arlington West Quadrangle, Washington*, by James Minard (1980), indicates that the project area is underlain by the Marysville Sand member of the Vashon recessional outwash. Our interpretation of the sediments encountered in our explorations is in general agreement with the regional geologic map.

Hydrology

As previously discussed, an existing water well is located on the site. This well is currently the sole source of water at the site and is located approximately 15 feet north of exploration pit EP-5 (Figure 2). The water level in the well at the conclusion of our infiltration test was approximately 15 feet below the ground surface. Because this well provided a portion of the water for our infiltration test, it is possible that the water level in the well at the time of our measurement may have been drawn down slightly from pre-test conditions.

Upon completion of infiltration testing at the location of exploration pit EP-5, the exploration pit was excavated to a depth of approximately 14 feet. Ground water seepage in this exploration pit was observed below a depth of approximately 13 feet below the ground surface.

Because over 2,500 gallons of water was introduced into EP-5 during infiltration testing, it is possible that ground water mounding may contribute to the 2-foot difference in the ground water levels measured in the water well and exploration pit EP-5; however, the ground surface elevation at the location of EP-5 was visually estimated to be approximately 1 foot lower than the ground surface elevation at the water well. Consequently, the actual difference in the ground water surface elevation at these two locations was only about 1 foot. It should be noted that the depth to ground water seepage at the site may vary in response to such factors as changes in season, amount of precipitation, and ground water withdrawal.

INFILTRATION TESTING

Infiltration testing at the location of exploration pit EP-5 was conducted using a method generally corresponding to the procedure described for the Pilot Infiltration Test (PIT) in the 2005 Washington State Department of Ecology *Stormwater Management Manual for Western Washington* (Ecology Manual). This test is conducted by discharging water into a flat-bottomed pit of known dimensions for a 4-hour "soaking period" to allow the receptor soils in the immediate vicinity of the pit to become saturated. After completion of the soaking period, water is discharged into the pit at a rate sufficient to maintain a constant head in the pit. This is continued until the discharge rate required to maintain a constant head remains fairly consistent over a period of 1 hour.

As previously discussed, two exploration pits (EP-5 and EP-6) were excavated in the proposed infiltration area, approximately where shown on Figure 2. The gradation of the unweathered recessional outwash at both locations visually appeared similar to each other and similar to that observed in the four exploration pits excavated at the site during our August 2008 study. Laboratory sieve analyses were conducted on samples of the unweathered outwash collected from both of the exploration pits excavated within the proposed infiltration area. The sieve analyses confirmed that the gradation of the sediments at both locations is fairly consistent. Copies of the laboratory testing results are attached.

The water sources used for the infiltration testing consisted of a water faucet on the northern parcel (18726 Smokey Point Boulevard) and a water faucet on the southern parcel (18706). The water supply for the northern parcel is a well located approximately 15 feet north of exploration pit EP-5. Because we observed a water meter on the southern parcel, it appears that the faucet on this lot is supplied by City water. Because the water from the northern parcel was supplied by a well, the water pressure varied as the pump in the well cycled, making it difficult to maintain a constant flow during testing. This resulted in some fluctuations in the data, but in our opinion, these fluctuations are not large enough to adversely impact the test results.

Water was discharged into the pit through a fabric diffuser to minimize turbulence and scouring in the pit bottom. An electronic flow meter/totalizer was used to monitor the water discharge rate and total flow into the pit. A staff gauge with 0.01-foot divisions was installed in the pit to monitor the depth of water (stage) during testing. For the constant head test, a head of approximately 0.50 foot was maintained in the pit. Following completion of the

constant head testing, the flow of water into the pit was discontinued and the rate of water level decline (falling head) in the pit was monitored.

All infiltration test data was recorded by hand in the field and subsequently transferred to an electronic spreadsheet to allow more accurate and consistent infiltration rate calculations. The results of the infiltration test are summarized below in Table 1. Copies of the infiltration test data sheets are attached.

Table 1
Summary of Infiltration Testing Results

Test No.	Infiltration Rate (inches per hour)	
	Constant Head Test	Falling Head Test
EP-5	72	44.4

DESIGN RECOMMENDATIONS

Storm Water Infiltration

The infiltration rate measured during the constant head portion of the test was greater than the rate measured during the falling head test. This is typical and is likely reflective of the falling head in the pit below the level maintained during the constant head test.

Infiltration rates achievable on full-scale infiltration facilities typically are less than those measured during short-term infiltration testing. For this reason, design infiltration rates should be determined by applying suitable correction factors to the infiltration rates shown in Table 1. Ranges of correction factors are presented in Table 3.9 of the Ecology Manual for: (1) site variability and number of locations tested, (2) degree of long-term maintenance to prevent siltation and bio-buildup, and (3) degree of influent control to prevent siltation and bio-buildup. For the subject site, we recommend a design infiltration rate of 20 inches per hour. The recommended design infiltration rate includes a correction factor of at least 3.5 from the measured constant head test rate.

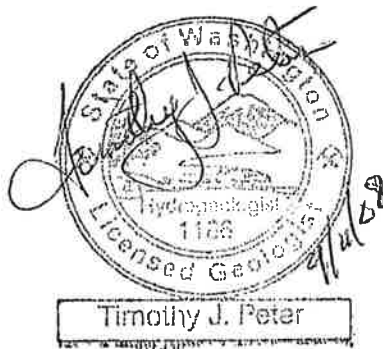
The recommended design infiltration rates are based on infiltration into the unweathered recessional outwash sediments at the infiltration test locations and depths. Soil conditions may vary outside these areas. Soil characteristics for infiltration facilities constructed outside of the test locations should be evaluated by AESI to verify if the recommended design infiltration rates are suitable.

The City of Arlington has adopted the 1992 Ecology Manual. The 1992 Ecology Manual specifies that a minimum separation distance of at least 3 feet must be maintained between the elevation of the infiltration facility and the ground water table, bedrock, or other impervious surfaces. Review of a topographic site plan prepared by Harmsen and Associates, Inc. (Figure 2) indicates a ground surface elevation at the location of infiltration test EP-5 of approximately 117 feet. Ground water seepage was encountered at this location at a depth of approximately 13 feet, which is equivalent to an elevation of approximately 104 feet. Given

that the top of the unweathered recessional outwash sediments were encountered at a depth of approximately 2.5 feet (elevation 114.5), this equates to approximately 10.5 feet of suitable receptor soils above the ground water surface. It should be noted that our exploration and infiltration testing was conducted in late summer when ground water levels are typically at or near their seasonal low. During our exploration, no mottling or other soil discoloration suggestive of a seasonal high water table was observed, and no historical ground water level data was found for the existing water well. We recommend that the water level in the on-site well be monitored during the coming wet season to verify that the specified minimum separation between the water table and the base of the proposed infiltration facility will be maintained at the seasonal high water table. Finalization of the infiltration system design should be contingent on verification of a minimum infiltration facility – ground water surface separation of at least 3 feet.

We appreciate this opportunity to have been of service to you with this project. If you should have any questions, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington



Timothy J. Peter, P.E.G., P.Hg.
Senior Project Geologist



Jon N. Sondergaard, P.G., P.E.G.
Principal Geologist

Attachments: Figure 1: Vicinity Map
Figure 2: Site and Exploration Plan
Exploration Logs
Laboratory Testing Results
Infiltration Test Data Sheets (2 pages)

cc: Marty Reimers
Concept Architecture
MReimers@conceptarchitecture.com

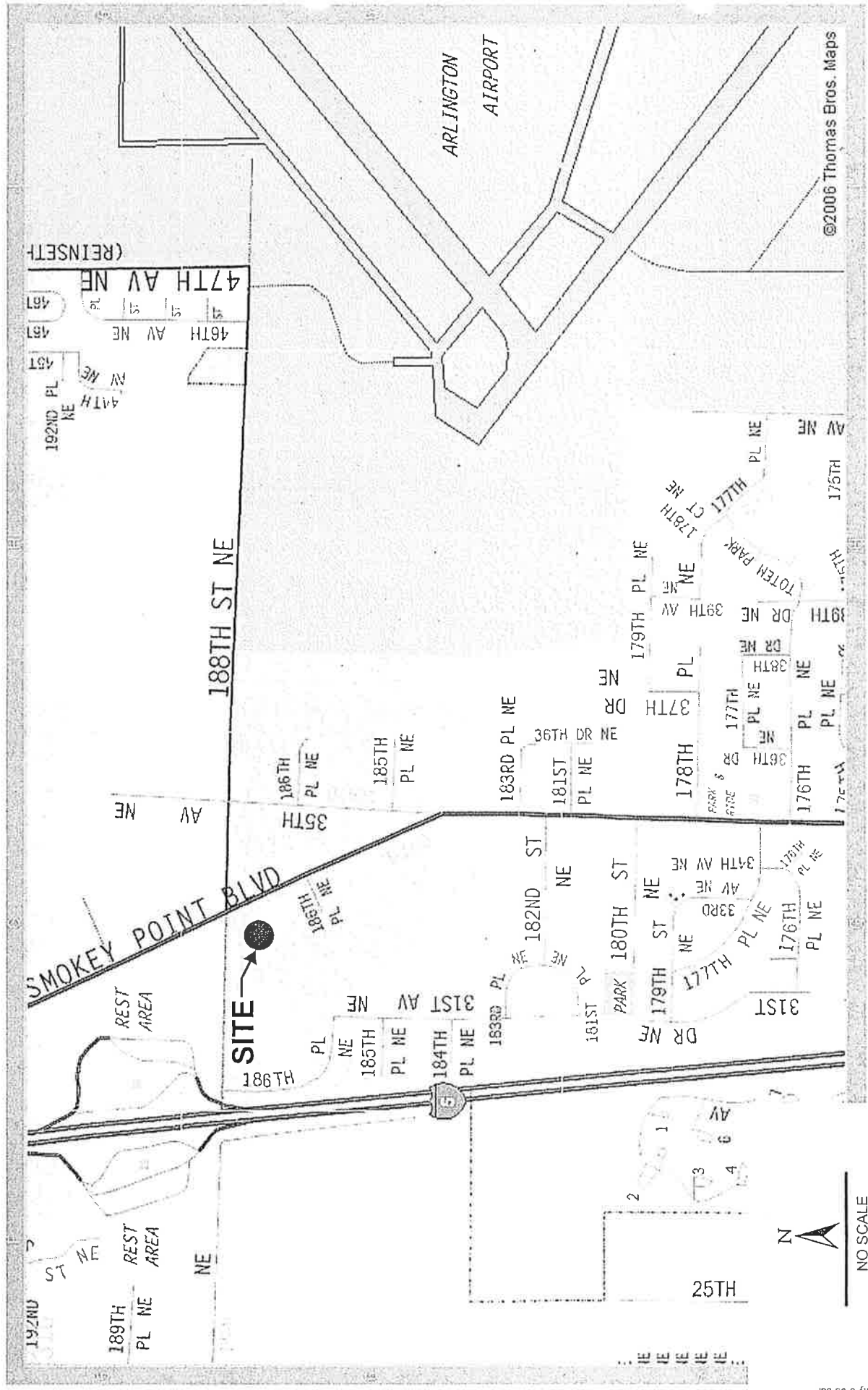
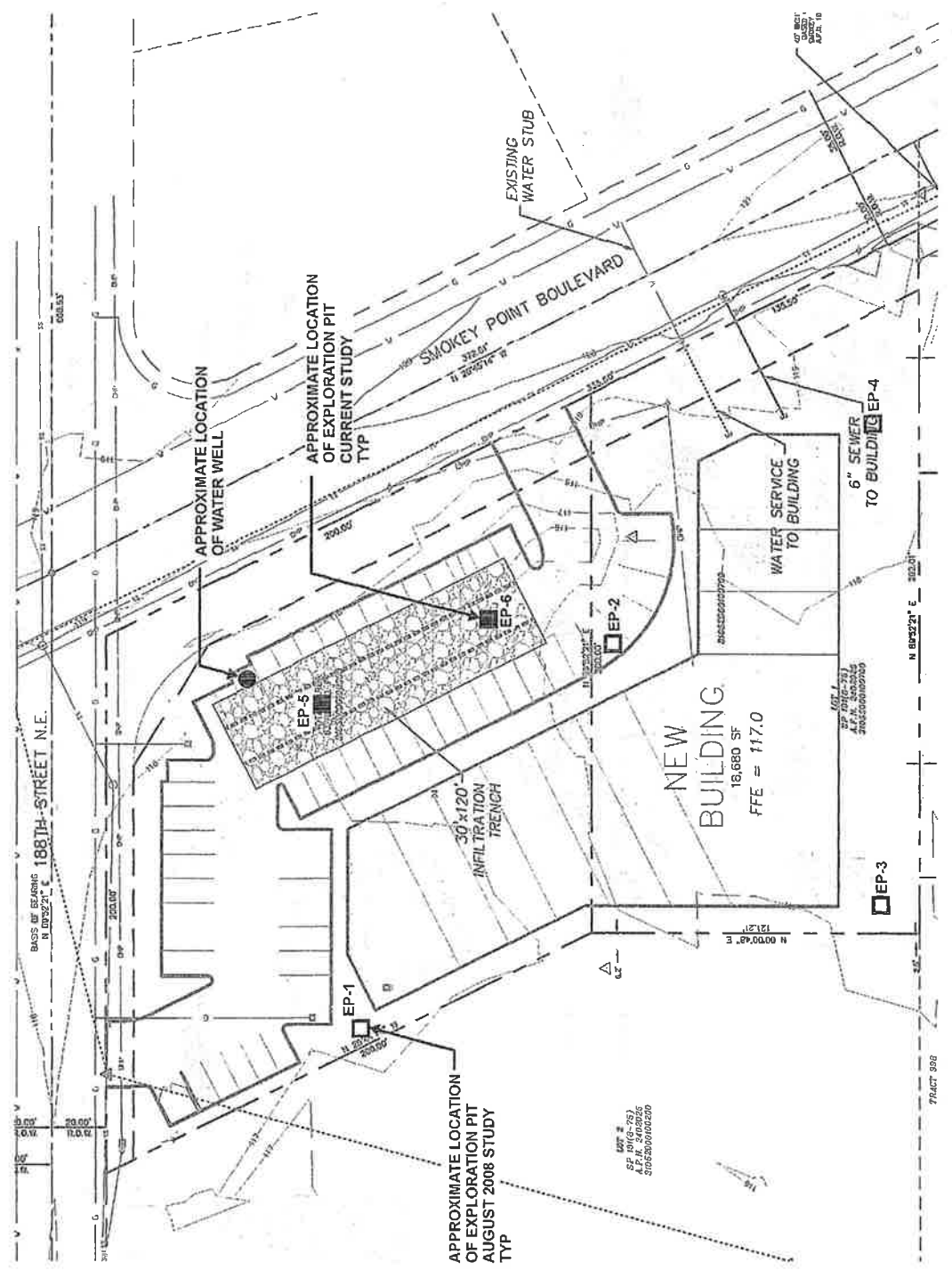


FIGURE 1
 DATE 9/08
 PROJ. NO. KE060290A

VICINITY MAP
 SY PLAZA
 ARLINGTON, WASHINGTON





SCALE IN FEET
0 40

FIGURE 2
DATE 9/08
PROJ. NO. KE060290A

SITE AND EXPLORATION PLAN
SY PLAZA
ARLINGTON, WASHINGTON

Reference: Harmsen and Associates, Inc.

Associated Earth Sciences, Inc.



Soil Classification		Terms Describing Relative Density and Consistency		
		Density	SPT ⁽²⁾ blows/foot	
Coarse-Grained Soils - More than 50% ⁽¹⁾ Retained on No. 200 Sieve	Gravels - More than 50% ⁽¹⁾ of Coarse Fraction Retained on No. 4 Sieve	GW	Well-graded gravel and gravel with sand, little to no fines	
	Sands - 50% ⁽¹⁾ or More of Coarse Fraction Passes No. 4 Sieve	GP	Poorly-graded gravel and gravel with sand, little to no fines	
		GM	Silty gravel and silty gravel with sand	
		GC	Clayey gravel and clayey gravel with sand	
		SW	Well-graded sand and sand with gravel, little to no fines	
Fine-Grained Soils - 50% ⁽¹⁾ or More Passes No. 200 Sieve	Sands - 50% ⁽¹⁾ or More of Coarse Fraction Passes No. 4 Sieve	SP	Poorly-graded sand and sand with gravel, little to no fines	
		SM	Silty sand and silty sand with gravel	
		SC	Clayey sand and clayey sand with gravel	
		Silt and Clays	ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
	OL		Organic clay or silt of low plasticity	
	Silt and Clays		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
		OH	Organic clay or silt of medium to high plasticity	
	Highly Organic Soils	PT	Peat, muck and other highly organic soils	

Component Definitions	
Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

(3) Estimated Percentage		Moisture Content
Component	Percentage by Weight	
Trace	<5	Dry - Absence of moisture, dusty, dry to the touch
Few	5 to 10	Slightly Moist - Perceptible moisture
Little	15 to 25	Moist - Damp but no visible water
With	- Non-primary coarse constituents: ≥ 15% - Fines content between 5% and 15%	Very Moist - Water visible but not free draining
		Wet - Visible free water, usually from below water table

Symbols	
Sampler Type	Blows/6" or portion of 6"
2.0" OD Split-Spoon Sampler (SPT)	10 20
3.0" OD Split-Spoon Sampler	
3.25" OD Split-Spoon Ring Sampler	
Bulk sample	
3.0" OD Thin-Wall Tube Sampler (including Shelby tube)	
Grab Sample	
	○ Portion not recovered

Moisture Content	
Symbol	Description
▽	ATD = At time of drilling
∇	Static water level (date)

Footnotes	
(1) Percentage by dry weight	(4) Depth of ground water
(2) (SPT) Standard Penetration Test (ASTM D-1586)	(5) Combined USCS symbols used for fines between 5% and 15%
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)	

blockslog_key.dwg LAYOUT: Layout2

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.



LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)	DESCRIPTION
1	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p>Sod/Topsoil</p> <hr/> <p style="text-align: center;">Weathered Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, tan, silty fine SAND, trace gravel (SM).</p>
2	
3	<hr/> <p style="text-align: center;">Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, grayish tan, fine to medium SAND, with gravel, trace cobbles, trace silt (SP).</p>
4	
5	
6	
7	
8	
9	<hr/> <p>Bottom of exploration pit at depth 8 feet Moderate caving below 2.5 feet. No seepage.</p>
10	
11	
12	
13	
14	
15	

**S Y Plaza
Arlington, WA**

Associated Earth Sciences, Inc.

Project No. KE060290A

Logged by: TJP

Approved by:



8/12/08

LOG OF EXPLORATION PIT NO. EP-2

Depth (ft)	DESCRIPTION
1	<p style="margin: 0;">This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p style="margin: 0; text-align: center;">Topsoil</p> <hr/> <p style="margin: 0; text-align: center;">Weathered Vashon Recessional Outwash</p> <p style="margin: 0;">Loose, slightly moist, tan, silty fine SAND, few gravel (SM); abundant roots.</p>
2	
3	<hr/> <p style="margin: 0; text-align: center;">Vashon Recessional Outwash</p> <p style="margin: 0;">Loose to medium dense, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP).</p>
4	
5	
6	
7	
8	
9	<hr/> <p style="margin: 0;">Bottom of exploration pit at depth 8 feet No seepage. Moderate caving.</p>
10	
11	
12	
13	
14	
15	

**S Y Plaza
Arlington, WA**

Associated Earth Sciences, Inc.

Project No. KE060290A

Logged by: TJP

Approved by: *TJP*



8/12/08

LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)	DESCRIPTION
1	<p style="text-align: center;">Sod/Topsoil</p> <p style="text-align: center;">Weathered Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, tan, silty fine SAND (SM); contains pockets of clean sand and gravel below ~2.5 feet; abundant roots 0 to 3 feet.</p>
2	
3	
4	<p style="text-align: center;">Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP).</p>
5	
6	
7	
8	
9	<p>Bottom of exploration pit at depth 8 feet No seepage. Minor caving.</p>
10	
11	
12	
13	
14	
15	

**S Y Plaza
Arlington, WA**

Associated Earth Sciences, Inc.

Project No. KE060290A

Logged by: TJP

Approved by:



8/12/08

LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)	DESCRIPTION
	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.
	Forest Duff/Topsoil
1	Weathered Vashon Recessional Outwash Loose, slightly moist, tan, silty fine SAND, trace gravel, abundant roots.
2	
3	
4	
	Vashon Recessional Outwash
5	Loose, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP); becomes well graded below 8 feet (SW).
6	
7	
8	
9	
10	Bottom of exploration pit at depth 9 feet No seepage. Moderately severe to severe caving below 4.5 feet.
11	
12	
13	
14	
15	

**S Y Plaza
Arlington, WA**

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Project No. KE060290A

8/12/08

LOG OF EXPLORATION PIT NO. EP-5

Depth (ft)	DESCRIPTION
1	Crushed rock. Weathered Vashon Recessional Outwash Loose to medium dense, moist, reddish tan, SAND, with gravel, little silt (SM).
2	
3	Vashon Recessional Outwash Loose to medium dense, moist, grayish tan, fine SAND, with gravel, trace silt (SP); little gravel below 6'; sand becomes well graded and gravelly below 8 1/2'; becomes wet below 13'.
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	Bottom of exploration pit at depth 14 feet Moderately rapid seepage below 13'. Moderate caving becoming severe below 13'. note: Excavated pit to 2.5' and conducted infiltration test; moisture conditions noted on log below 2.5' represents post-test condition.
16	
17	
18	
19	
20	

**SY Plaza
Arlington, WA**

Associated Earth Sciences, Inc.



Logged by: TJP

Approved by: *TJP*

Project No. KE060290A

9/4/08

LOG OF EXPLORATION PIT NO. EP-6

Depth (ft)	DESCRIPTION
	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.
1	Crushed rock. Weathered Vashon Recessional Outwash Loose to medium dense, moist, reddish brown, silty SAND, with gravel (SM).
2	Vashon Recessional Outwash Loose to medium dense, moist, grayish tan, fine SAND, with gravel, trace silt (SP); slight increase in moisture and gravel content below approximately 6'.
3	
4	
5	
6	
7	
8	
9	Bottom of exploration pit at depth 8.5 feet No seepage. Moderate caving.
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

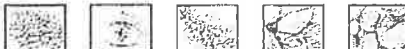
**SY Plaza
Arlington, WA**

Associated Earth Sciences, Inc.

Project No. KE060290A

Logged by: TJP

Approved by:



9/4/08

CONSTANT HEAD DATA

Project Name	SY Plaza	Pit Size	3'1" x 3'4"
Job No.	KE060290A		
Date	9/5/2008	Test Depth	2.5 ft.
Weather	Sun, 60s	Receptor Soils	Qvr
Test No.	EP-5		
Meter	3.0 to 50 gpm electronic		
Water Source	On-site faucet (supplied by on-site well)	Testing Performed By	TJP
	combined with faucet from neighboring property to south (City water)		

Time	Elapsed Time (minutes)		Flow Rate (gpm)*	Stage (feet)	Totalizer (gallons)	Infiltration Rate (inches/hour)
	Incremental	Total				
9:15	0	0	0.00	0.00	0.00	---
9:40	25	25	8.41	0.02	210.17	78.7
10:02	22	47	11.12	0.45	454.80	104.1
10:06	4	51	12.34	0.50	504.17	115.6
10:16	10	61	8.42	0.32	588.34	78.8
10:39	23	84	*	0.50	0.00	*
10:45	6	90	10.11	0.50	60.65	94.7
10:55	10	100	10.14	0.50	162.08	95.0
11:10	15	115	9.94	0.50	311.19	93.1
11:25	15	130	9.68	0.50	456.34	90.6
11:40	15	145	9.55	0.50	599.61	89.5
11:55	15	160	9.26	0.50	738.54	86.7
12:10	15	175	9.09	0.50	874.89	85.1
12:25	15	190	8.73	0.50	1005.82	81.7
12:35	10	200	8.70	0.50	1092.82	81.5
12:50	15	215	8.60	0.50	1221.75	80.5
13:05	15	230	8.41	0.50	1347.97	78.8
13:15	10	240	8.05	0.50	1428.48	75.4
13:25	10	250	8.26	0.50	1511.07	77.3
13:35	10	260	8.04	0.50	1591.46	75.3
13:45	10	270	8.03	0.50	1671.8	75.2
13:55	10	280	7.65	0.49	1748.28	71.6
14:05	10	290	8.06	0.50	1828.83	75.4
14:15	10	300	7.68	0.49	1905.65	71.9
14:27	12	312	7.98	0.50	2001.46	74.8

*Technical problems with the flow meter caused the totalizer to re-zero at this time.

FALLING HEAD DATA

Project Name	SY Plaza	Pit Size	3'1" x 3'4"
Job No.	KE060290A	Test Depth	2.5 ft.
Date	9/4/2008	Receptor Soils	Qvr
Weather	Sun 60s	Testing Performed By	TJP
Test No.	EP-5		
Meter	3.0 to 50 gpm electronic		
Water Source	On-site faucet (supplied by on-site well) combined with faucet from neighboring property to south (City water)		

Shutdown Flow at 14:28

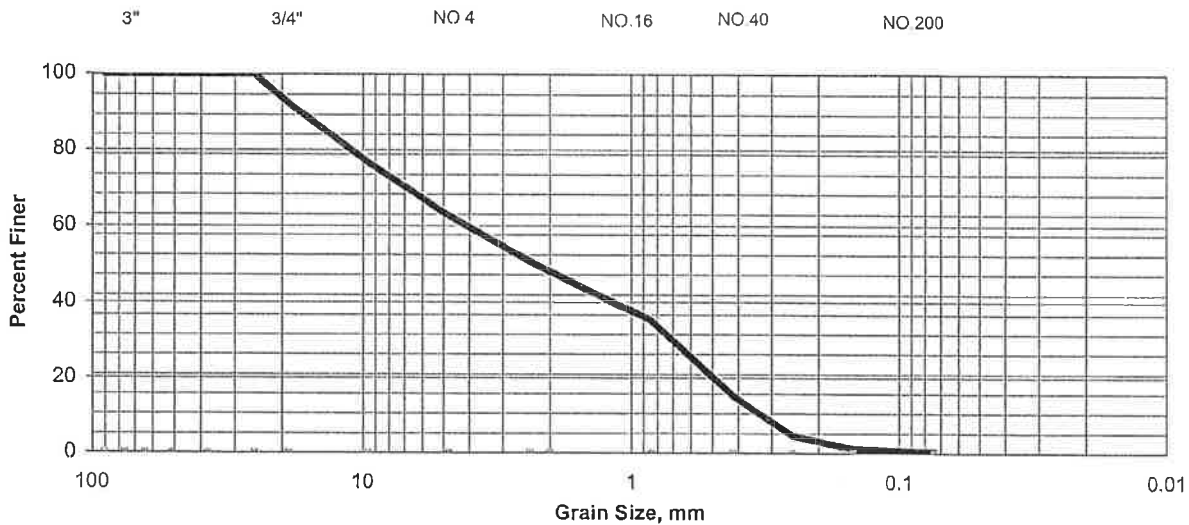
Time	Elapsed Time (minutes)	Stage (feet)	Infiltration Rate (inches/hour)
14:28	0	0.50	---
14:29	1	0.45	36.00
14:30	1	0.39	43.20
14:31	1	0.33	43.20
14:32	1	0.26	50.40
14:33	1	0.20	43.20
14:34	1	0.13	50.40
Average	6	---	44.40

GRAIN SIZE ANALYSIS - MECHANICAL

Date 9/5/2008	Project SY Plaza	Project No. KE060290A		Soil Description	
Tested By MS	Location Onsite	EB/EP No EP-5	Depth 2 1/2-3'	SAND with gravel trace silt	
Wt. of moisture wet sample + Tare	544.83	Total Sample Tare			411.51
Wt. of moisture dry Sample + Tare	525.76	Total Sample wt + tare			1529.42
Wt. of Tare	99.87	Total Sample Wt			1117.9
Wt. of moisture Dry Sample	425.89	Total Sample Dry Wt			1070.0
Moisture %	4%				

Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Specification Requirements	
					Minimum	Maximum
3.5	90		-	100.00		
3	76.1		-	100.00		
2.5	64		-	100.00		
2	50.8		-	100.00		
1.5	38.1		-	100.00		
1	25.4		-	100.00		
3/4	19	81.5	7.62	92.38		
3/8	9.51	251.74	23.53	76.47		
#4	4.76	400.01	37.38	62.62		
#8	2.38	524.84	49.05	50.95		
#10	2	554.67	51.84	48.16		
#20	0.85	690.99	64.58	35.42		
#40	0.42	905.9	84.66	15.34		
#60	0.25	1020.56	95.38	4.62		
#100	0.149	1056.66	98.75	1.25		
#200	0.074	1066.08	99.63	0.37		

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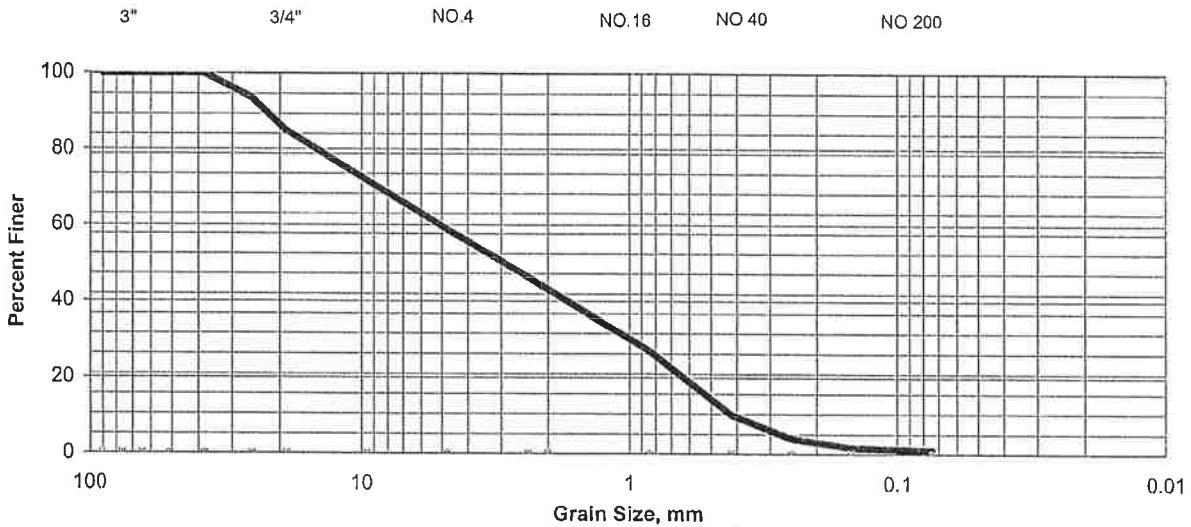
911 5th Ave, Suite 100 Kirkland, WA 98033 425-827-7701 FAX 425-827-5424

GRAIN SIZE ANALYSIS - MECHANICAL

Date 9/5/2008	Project SY Plaza	Project No. KE060290A		Soil Description
Tested By MS	Location Onsite	EB/EP No EP-6	Depth 1 1/2'-2'	SAND with gravel trace silt
Wt. of moisture wet sample + Tare	673.36	Total Sample Tare	337.48	
Wt. of moisture dry Sample + Tare	650.79	Total Sample wt + tare	1514.73	
Wt. of Tare	97.82	Total Sample Wt	1177.3	
Wt. of moisture Dry Sample	552.97	Total Sample Dry Wt	1131.1	
Moisture %	4%			

Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Specification Requirements	
					Minimum	Maximum
3.5	90		-	100.00		
3	76.1		-	100.00		
2.5	64		-	100.00		
2	50.8		-	100.00		
1.5	38.1		-	100.00		
1	25.4	73.8	6.52	93.48		
3/4	19	169.45	14.98	85.02		
3/8	9.51	320.5	28.34	71.66		
#4	4.76	464.99	41.11	58.89		
#8	2.38	604.89	53.48	46.52		
#10	2	642.67	56.82	43.18		
#20	0.85	824	72.85	27.15		
#40	0.42	1014.93	89.73	10.27		
#60	0.25	1085.29	95.95	4.05		
#100	0.149	1112.45	98.35	1.65		
#200	0.074	1119.6	98.98	1.02		

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LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)	DESCRIPTION
1	<p style="text-align: center;">Sod/Topsoil</p> <p style="text-align: center;">Weathered Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, tan, silty fine SAND, trace gravel (SM).</p>
2	
3	<p style="text-align: center;">Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, grayish tan, fine to medium SAND, with gravel, trace cobbles, trace silt (SP).</p>
4	
5	
6	
7	
8	
9	<p>Bottom of exploration pit at depth 8 feet Moderate caving below 2.5 feet. No seepage.</p>
10	
11	
12	
13	
14	
15	

KCTPS 080280A.GPJ August 13, 2008

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8/12/08

LOG OF EXPLORATION PIT NO. EP-2

Depth (ft)	DESCRIPTION
1	<p style="text-align: center;">Topsoil</p> <p style="text-align: center;">Weathered Vashon Recessional Outwash</p> <p>Loose, slightly moist, tan, silty fine SAND, few gravel (SM); abundant roots.</p>
2	
3	
4	<p style="text-align: center;">Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP).</p>
5	
6	
7	
8	
9	<p>Bottom of exploration pit at depth 8 feet No seepage. Moderate caving.</p>
10	
11	
12	
13	
14	
15	

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LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)	DESCRIPTION
1	<p style="text-align: center;">Sod/Topsoil</p> <p style="text-align: center;">Weathered Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, tan, silty fine SAND (SM); contains pockets of clean sand and gravel below ~2.5 feet; abundant roots 0 to 3 feet.</p>
2	
3	
4	
5	<p style="text-align: center;">Vashon Recessional Outwash</p> <p>Loose to medium dense, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP).</p>
6	
7	
8	
9	<p>Bottom of exploration pit at depth 8 feet No seepage. Minor caving.</p>
10	
11	
12	
13	
14	
15	

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

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LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)	DESCRIPTION
1	Forest Duff/Topsoil
2	<p style="margin: 0;">Weathered Vashon Recessional Outwash Loose, slightly moist, tan, silty fine SAND, trace gravel, abundant roots.</p> <div style="text-align: right; color: blue; font-size: 1.2em; font-weight: bold; margin-top: 10px;"> RECEIVED SEP 23 2008 Utilities Div. </div>
3	
4	
5	
6	<p style="margin: 0;">Vashon Recessional Outwash Loose, slightly moist, gray, fine to medium SAND, with gravel, trace silt (SP); becomes well graded below 8 feet (SW).</p>
7	
8	
9	
10	<p style="margin: 0;">Bottom of exploration pit at depth 9 feet No seepage. Moderately severe to severe caving below 4.5 feet.</p>
11	
12	
13	
14	
15	

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Project No. KE060290A

8/12/08

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