ZENOVIC & ASSOCIATES
INCORPORATED

CIVIL ENGINEERING

301 East 6th Street, Suite 1
Port Angeles, Washington 98362
(360) 417-0501
E-mail: office@zenovic.net

November 2, 2022

Grubb Construction
Attn: Mr. Caleb Grubb
234 West Hammond Street
Sequim, WA 98382

Re: N. Garry Oak Drive, Sequim, WA 98382
Parcel #03-30-19-84-0060
Onsite Soils Analysis

Dear Caleb:

As per the City of Sequim's requirements for building permit approval, we completed an onsite soils analysis on the property referenced above to determine onsite soil infiltration rates. The site a 0.77 acre lot located on the east side of N. Garry Oak Drive on the south side of W. Hendrickson Road in Sequim. The site is currently vacant. This analysis consisted of excavation of one test pit to determine the soil profile and to collect as soil sample for a sieve analysis. The test pit was excavated on the west side of the site (generally central in the north-south direction) and a soil sample was obtained at a depth of approximately 48 inches below ground surface

The soil profile observed in the test pit was as follows:

Test pit log:

0 – 8" Topsoil
8 - 30" Very Cobbly Loamy Sandy Gravel
30 – 72" Very Cobbly Sandy Gravel

No water was encountered or other indication of high groundwater table.
No restrictive layer was observed.

Sieve Analysis

To determine a design infiltration rate for the site, a sieve analysis was performed on the soil sample in accordance with section 5.4 of Volume V of the *2019 Stormwater Management Manual for Western Washington (ECY)*. This method utilizes the soil distribution curve to estimate infiltration rates for unconsolidated outwash soils. Based on this analysis, an infiltration rate of 25.7 inches per hour was estimated. It is recommended that an additional factor of safety of 2 be applied and a design infiltration rate of 12.5 inches per hour to be utilized. The sieve analysis and calculations are included with this letter.

Please contact me if you have any questions or if you need further information.

Sincerely,
Zenovic & Associates, Inc.



11/2/2022

Seth J. Rodman, P.E.
Senior Design Engineer

Enclosures

Fc: JN 22403

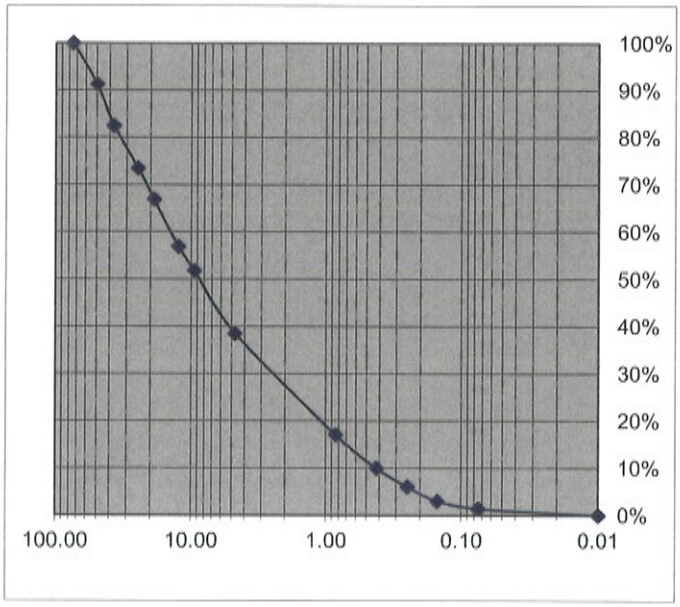
CONSTRUCTION INSPECTION SERVICES LLC
PO Box 3129 Port Angeles WA 98362
360-809-3329 cis.si@outlook.com

ASTM C136 - SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

D10/ D30/ D60/ D90 DETERMINATION

DATE:	10/27/2022
CLIENT:	Zenovic & Associates
ADDRESS:	301 East 6th St. Suite 1, PA WA
EMAIL:	seth@zenovic.net
PROJECT:	Caleb Grubb property
MATERIAL TYPE:	GW or GP
MATERIAL SOURCE:	North Gary Oak Drive, Sequim WA
TESTED BY:	Sean Wright
SAMPLE ID:	3020-29

DIA -MM	Sieve Size	Wt. (grams)	% Retained	% Passing
75.000	3"	0.0	0.0%	100.0%
50.000	2"	1855.1	8.7%	91.3%
37.500	1 1/2"	1870.4	8.8%	82.5%
25.000	1"	1902.7	9.0%	73.5%
19.000	3/4"	1413.5	6.7%	66.8%
12.500	1/2"	2126.5	10.0%	56.8%
9.500	3/8"	1079.4	5.1%	51.8%
4.750	No. 4	2814.7	13.3%	38.5%
0.850	No. 20	4559.1	21.5%	17.0%
0.425	No. 40	1490.6	7.0%	10.0%
0.250	No. 60	839.8	4.0%	6.1%
0.150	No. 100	641.4	3.0%	3.0%
0.075	No. 200	344.2	1.6%	1.4%
	Pan	301.7	1.4%	



D10	D30	D60	D90
0.42	2.50	15.00	48.00

End Weight:	20937.4	Cu:	35.71
Start Weight:	21239.1	Cc:	0.99
Washed Weight:	20937.4		

REMARKS:

Material sampled by Zenovic and Associates. Material was tested using ASTM C 136 Procedure A.

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INFILTRATION RATE CALCULATION - GRAIN SIZE ANALYSIS

PROJECT: Grubb Construction
LOCATION: N. Garry Oak Drive, Sequim
PARCEL NO: 03-30-19-84-0060

ZENOVIC & ASSOCIATES
301 EAST 6TH STREET, SUITE 1
PORT ANGELES, WA 98362
DATE: 11/2/2022
JOB NO. 22403
AUTHOR: SJR

Location TP #1

D_{10}	0.42
D_{60}	15
D_{90}	48
Fines	0.014

K_{sat}initial (cm/s)	0.063
CF_v	0.8
CF_t	0.4
CF_m	0.9
K_{sat}design (cm/s)	0.0182
K_{sat}design (in/hr)	25.7

Location

D_{10}	
D_{60}	
D_{90}	
Fines	

K_{sat}initial (cm/s)	
CF_v	
CF_t	
CF_m	
K_{sat}design (cm/s)	
K_{sat}design (in/hr)	

Location

D_{10}	
D_{60}	
D_{90}	
Fines	

K_{sat}initial (cm/s)	
CF_v	
CF_t	
CF_m	
K_{sat}design (cm/s)	
K_{sat}design (in/hr)	

$$\log_{10}(K_{sat}) = -1.57 + 1.90D_{10} + 0.015D_{60} - 0.013D_{90} - 2.08f_{fines}$$

Total Correction Factor, $CF_T = CF_v \times CF_t \times CF_m$

K_{sat} design $= K_{sat}$ initial $\times CF_T$

Table 3.3.1
Correction Factors to be Used With In-Situ Saturated Hydraulic Conductivity Measurements to Estimate Design Rates.

Issue	Partial Correction Factor
Site variability and number of locations tested	CF_v = 0.33 to 1.0
Test Method	
Large-scale PIT	CF_t = 0.75
Small-scale PIT	= 0.50
Other small-scale (e.g. Double ring, falling head)	= 0.40
Grain Size Method	= 0.40
Degree of influent control to prevent siltation and bio-buildup	CF_m = 0.9