LIU & ASSOCIATES, INC.

Geotechnical Engineering | Engineering Geology | Earth Science

August 20, 2017

Mr. Lucas Kragt
Village Life
19020 – 33rd Avenue West, Suite 450
Lynnwood, WA 98036

Dear Mr. Kragt:

Subject: Rain Gardens
Creekside West
134xx – 35th Avenue SE
Bothell, Washington
L&A Job No. 5A038A

INTRODUCTION

We previously completed a geotechnical investigation for a residential development project (Creekside Place) adjoining the north side of the subject project site, with our findings of its subsurface conditions and geotechnical recommendations presented in a report titled "Geotechnical Engineering Study, Creekside Place, 13417 – 35th Avenue SE, Bothell, Washington," dated June 18, 2007. Subsurface conditions of this adjoining project site had been explored by test pits.

We understand that rain gardens are proposed to dispose stormwater collected over impervious surfaces for the subject project (see Plate 1 – Site Plan attached hereto). At your request, we have completed a review of the test pits logs of the adjoining project site to provide recommendations for an infiltration rate and depth to bottom of rain gardens to be used for design of the proposed rain gardens. Presented in this report are our findings and recommendations.

19213 Kenlake Place NE · Kenmore, Washington 98028
Phone (425) 483-9134 · Fax (425) 486-2746

SUBSURFACE CONDITIONS

Soil Condition

Test pit TP-4 of the adjoining project falls within the subject project site, while the closest offsite test pits were TP-5 and TP-10. The logs of these test pits are presented in APPENDIX attached to this letter report. These test pits encountered layers of fill, sawdust, and peat underlain by a medium-dense to dense, silty, fine to coarse sand deposit, appears to be advance outwash. This deposit was encountered at about 4.5 to 8.0 feet below existing ground.

GROUNDWATER CONDITION

Trickle to minor groundwater seepage was encountered at 6.5 to 8.0 in test pit TP-4, and heavy groundwater seepage was encountered at 3.5 to 4.0 feet deep in test pit TP-10.

RECOMMENDATIONS

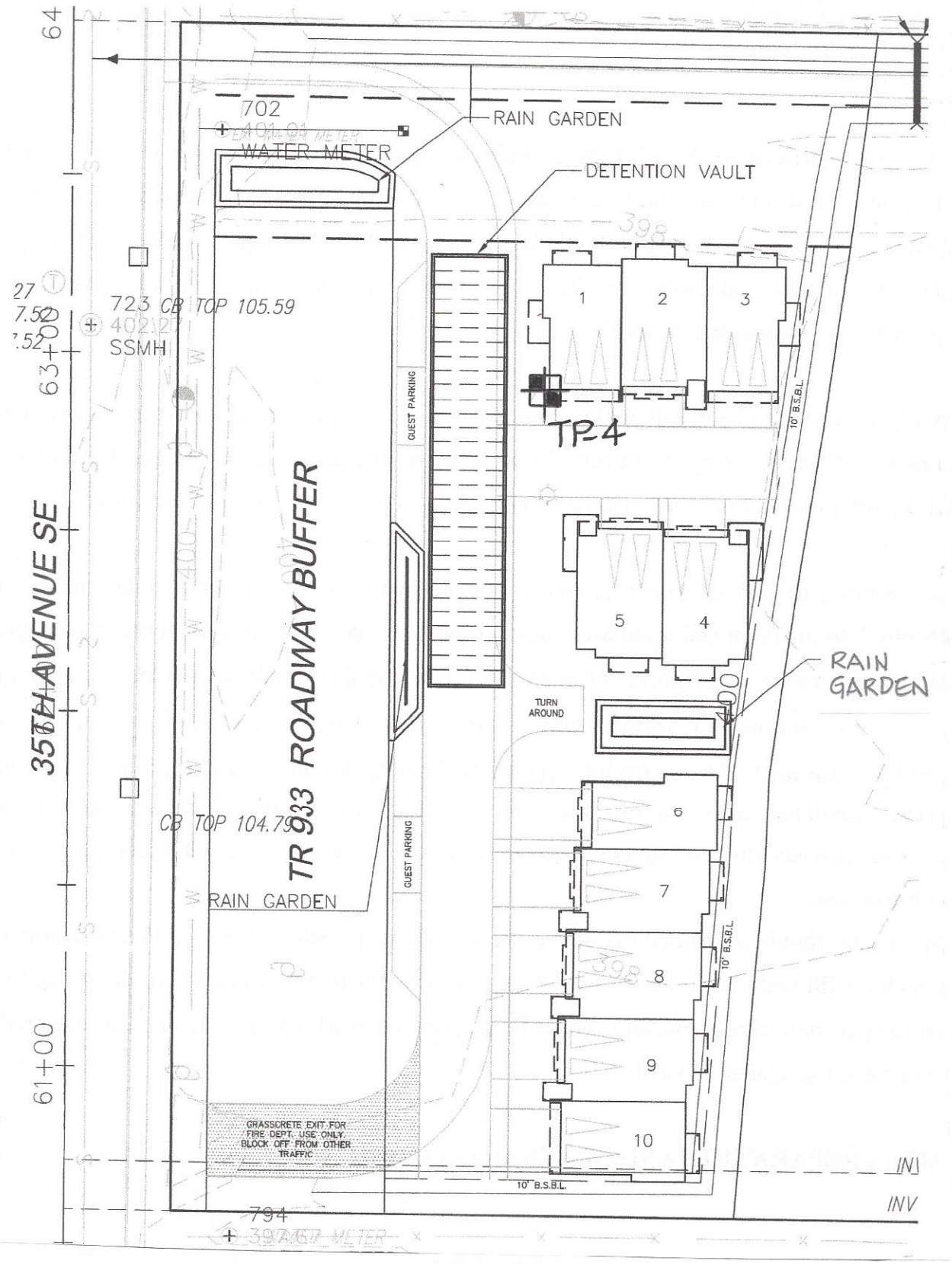
Based on the above subsurface conditions, we recommend an infiltration rate of 1.0 iph (inch per hour) be used for design of the rain gardens for the subject project. We also recommend that bottom of the rain garden be excavated to about 5.0 feet into the layer of sawdust.

Please feel free to contact us if you have questions.

Yours very truly,
LIU & ASSOCIATES, INC.

J. S. (Julian) Liu, Ph.D., P.E.
Principal

One plate and appendix attached



LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

SITE PLAN
CREEKSIDE WEST
134XX - 35TH AVENUE SE
BOTHELL, WASHINGTON

JOB NO. 5A038a	DATE 8/20/2017	PLATE 1

TEST PIT NO. 3

Logged By: JSL Date: 3/24/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Grass on surface Dark-brown, loose, organic, silty fine SAND, with fine roots, moist			
2					
3	SM	Light-brown, medium-dense, silty fine SAND, moist			
4					
5					
6	SW	Gray, dense to very-dense, silty fine SAND, trace to some gravel, (fresh VASHON TILL)			
7					
8					
9					
10		Test pit terminated @ 9.0 ft, groundwater not encountered.			

TEST PIT NO. 4

Logged By: JSL Date: 3/24/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	GP	Gravel base of 1.5-inch-minus GRAVEL			
2	SW/SM	Gray, medium-dense to dense, gravelly fine to coarse SAND and silty fine SAND with trace gravel, moist (FILL)			
3					
4					
5		Brown SAWDUST			
6					
7					
8					
9	SM	Light-brown, medium-dense, slightly silty, fine SAND, very moist (ADVACE OUTWASH)			
10					
11					
12					
13		Test pit terminated @ 12.0 ft, trickle groundwater seepage (less than 1 gpm) encountered @ 6.5 to 8.0 ft.			

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
CREEKSIDE PLACE
13417 - 35TH AVENUE SE
BOTHELL, WASHINGTON

JOB NO. 5A038 | DATE 4/6/2005 | PLATE 6

TEST PIT NO. 5

Logged By: JSL Date: 3/31/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		Grass on surface Brown, shreaded WOOD CHIP			
4	OL	Brown, loose, organic, silty PEAT, moist to wet			
6	SM	Gray, dense, silty, fine to medium SAND, occasional cobble, moist			
9		Test pit terminated @ 7.0 ft, groundwater seepage (less than 1.0 gpm) encountered @ 3.0 to 3.5 ft.			

TEST PIT NO. 6

Logged By: JSL Date: 3/31/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		Shredded WOOD CHIP intermixed with TREE BRANCHES and TWIGS			
7	SM	Gray, medium-dense to dense, gravelly, silty, fine to coarse SAND, very-moist to saturated			
9		Test pit terminated @ 7.5 ft, groundwater table @ 5.5 ft.			

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
CREEKSIDE PLACE
13417 - 35TH AVENUEN SE
BOTHELL, WASHINGTON

JOB NO. 5A038 | DATE 2/12/2007 | PLATE 7

TEST PIT NO. 9

Logged By: JSL Date: 3/31/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown to black, loose to soft, silty PEAT, moist			
2					
3					
4					
5	OL	Brown, loose, silty PEAT, moist to wet			
6	ML	Blue-gray, stiff, fine sandy SILT, moist			
7	SM	Gray, medium-dense, silty, fine to medium SAND, trace gravel, moist			
8					
9		Test pit terminated @ 8.0 ft, trickle groundwater seepage (less than 0.5 gpm) encountered @ 6.0 ft.			
10					

TEST PIT NO. 10

Logged By: JSL Date: 3/31/2005 Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Grass on surface Dark-brown, loose, organic, silty fine SAND, trace gravel, with fine roots, moist (TOPSOIL)			
2	SW/SM	Gray, medium-dense, slightly silty, fine to coarse SAND, trace gravel, moist (FILL)			
3	OL	Brown, loose, silty PEAT, moist to wet			
4					
5	SM	Gray, medium-dense to dense, silty, fine to coarse SAND, moist (ADVACE OUTWASH)			
6					
7					
8					
9		Test pit terminated @ 7.0 ft, heavy groundwater seepage (4.0 to 5.0 gpm) encountered @ 3.5 to 4.0 ft.			
10					

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
CREEKSIDE PLACE
13417 - 35TH AVENUE SE
BOTHELL, WASHINGTON

JOB NO. 5A038 | DATE 4/6/2005 | PLATE 9