Exhibit 14 SUB18-02

Geotechnical Report

Valley View Sub-division

Camas, Washington

Prepared for:
Stan Firestone
Vancouver, Washington
30 April 2014
Updated 1 May 2018
Revised 2 August 2018

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STATE OF WASHINGTON
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1.0 PROJECT AND SITE DESCRIPTIONS

Introduction

Rapid Soil Solutions has prepared this Geotechnical Report to provide bearing capacity, roadway design values, soil parameters for earth work operations and installation of utilities for the 36 lot sub-division.

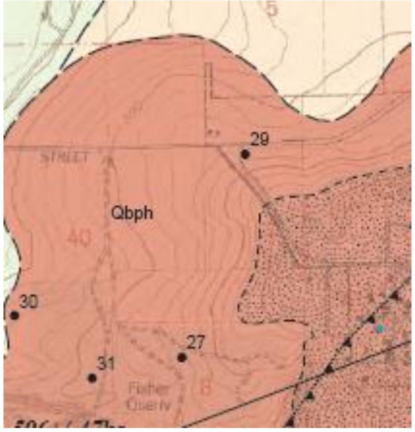
2.0 SITE CONDITIONS

2.1 Surface Conditions

The property is located in the Clark County Washington, accessed off of SE 40th Street. The site was cleared in past. The site was covered with tall grasses and weeds. See below site photo.

2.2 Regional Geology

The Camas Quadrangle developed in 2008 by Evarts and O’Connor maps the site as boring volcanic rock. However, the rock is far below the site and the site is cover with fine grained flood deposits.



2.3 Field Exploration and Subsurface Conditions

2.3.1 Field Explorations

Four (4) hand augur holes were excavated. The location of the augur holes are shown on Figure 2 in Appendix A. A registered professional engineer performed the excavation and logged the subsurface materials. Hand augur logs detailing materials encountered is in Appendix B. The logs were created using the Unified Soil Classification and Visual Manual Procedure (ASTM-D 2488).

2.3.1 Subsurface Conditions

The soil conditions were fine grained stiff damp clayey SILT. The soil conditions in all augur holes were consistent with each other and local geology map. Moistures ranged from 23.1 % to 28%.

2.3.2 Groundwater

No ground water was found during the explorations.

3.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

3.1 Foundation Design

The building foundations may be installed on either engineered fill or firm native sub-grade that is found at a depth of about 0.5 feet. This depth may be locally variable and should be confirmed by a geotechnical engineer or their representative at the time of construction.

Continuous wall and isolated spread footings should be at least 16 and 24 inches wide, respectively. The bottom of exterior footings should be at least 16 inches below the lowest adjacent exterior grade. The bottom of interior footings should be at least 12 inches below the base of the floor slab.

Footings placed on engineered fill or firm native sub-grade should be designed for an allowable bearing capacity of 2,000 *pounds per square foot* (**psf**) by IBC 2012/2015 code. The recommended allowable bearing pressure can be increased by 1/3 for short-term loads such as those resulting from wind or seismic forces.

Based on our analysis the total post-construction settlement is calculated to be less than 1 inch, with differential settlement of less than 0.5 inch over a 50-foot span for maximum column, perimeter footing loads of less than 100 kips and 6.0 kips per linear foot. Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction at the base of the footings. An allowable lateral bearing pressure of 150 *pounds per cubic foot* (**psf/f**) below grade may be used. Adjacent floor slabs, pavements or the upper 12-inch depth of adjacent, unpaved areas should not be considered when calculating passive resistance. If construction is undertaken during periods of rain, then I recommend a 2-inch (or greater) layer of compacted, crushed rock be placed over the native soil. The silty soil is moisture sensitive. Meaning when dry it is firm and non-yielding but exposed to season rains it will lose its strength and need to be excavated and replaced with rock. See section 4.1.2 for wet weather conditions.

3.2 Retaining Walls

The retaining wall design recommendations are based on the following assumptions: (1) the walls consist of conventional, cantilevered retaining walls; (2) the walls are less than 8 feet in height; (3) the backfill is drained; and (4) the backfill has a slope flatter than 4H: 1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

Unrestrained site walls that retain native soils should be designed to resist an active equivalent fluid unit weight of 35 pcf where supporting slopes are flatter than 4H: 1V. If retaining walls are restrained from rotation prior to being backfilled, the active equivalent fluid unit weight shall be increased to 50 pcf. For embedded building walls, a superimposed seismic lateral force should be calculated based on a dynamic force of $5H^2$ pounds per lineal foot of wall, where H is the height of the wall in feet, and applied at 0.6H from the base of the wall. If other surcharges (e.g., slopes steeper than 4H:1V, foundations, vehicles, etc.) are located within a horizontal distance from the back of a wall equal to twice the height of the wall, then additional pressures will need to be accounted for in the wall design. Our office should be contacted for appropriate wall surcharges based upon the actual magnitude and configuration of the applied loads.

The wall footings should be designed in accordance with the guidelines provided in the “Foundation Design” section of this report. These design parameters have been provided assuming that back-of-wall drains will be installed to prevent buildup of hydrostatic pressures behind all walls.

The backfill material placed behind the walls and extending a horizontal distance equal to at least half of the height of the retaining wall should consist of granular retaining wall backfill as specified in the “Structural Fill” section of this report.

The wall backfill should be compacted to a minimum of 92 percent of the maximum dry density, as determined by ASTM D1557. However, backfill located within a horizontal distance of 3 feet from the retaining walls should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (e.g., jumping jack or vibratory plate compactors). If flat work (e.g., sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 92 percent of the maximum dry density, as determined by ASTM D1557.

A minimum 12-inch-wide zone of drain rock, extending from the base of the wall to within 6 inches of finished grade, should be placed against the back of all retaining walls. Perforated collector pipes should be embedded at the base of the drain rock. The drain rock should meet the requirements provided in the "Structural Fill" section of this report. The perforated collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe(s) should not be tied directly into storm water drain systems, unless measures are taken to prevent backflow into the wall's drainage system.

Settlements of up to 1 percent of the wall height commonly occur immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of flat work adjacent to retaining walls be postponed at least 4 weeks after backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

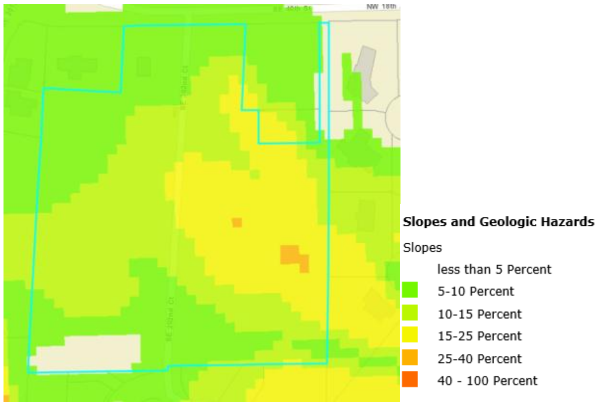
3.3 Seismic Design Criteria

The seismic design criteria for this project USGS Earthquake Hazards Program. A summary of IBC 2012/2015 seismic design criterion below: using a Lat of 45.5909 and Long of -122.4650, site class D.

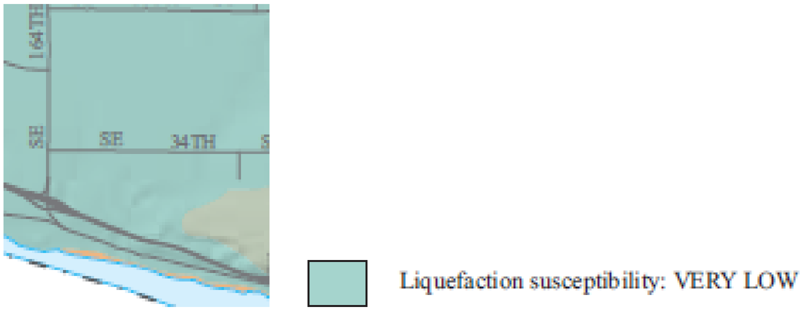
	Short Period	**1 Second**
Maximum Credible Earthquake Spectral Acceleration	Ss = 0.94	S1 = 0.38
Adjusted Spectral Acceleration	Sms = 1.05	Sm1 = 0.38
Design Spectral Response Acceleration Perimeters	Sds = 0.70	Sd1= 0.42

3.4 Hazards

Slopes: The field reconnaissance on 27 March 2014 showed the steepest slopes are located in the southern end of the property. Here the slopes vary from less than 5% to 25% in the SE corner of the lot. See below figure from Clark County GIS mapping of the site.



Liquefaction: From the Liquefaction Susceptibility Map of Clark County, Washington 2004. The site has very little susceptibility.



Landslide Hazards

RSS site reconnaissance on 27 March 2014 found no signs of land slide hazards. Site is covered with black berries, grasses. See site photo’s of the slopes. Figure 3 shows the mapped landslides in Clark County as well as slope stability map of the Vancouver area. As well as IMS -43, this uses LIDAR to map landslides. LIDAR is a bare earth photo that shows landside and slow moving slopes as the lines on the map become fuzzy when the ground is moving. *There are no mapped slides on the project site. Figure 3 also lists the site has having little to no issues with liquefaction.*

From field reconnaissance RSS reviewed all the steep slopes surrounding the project site. There are no signs of slope instability, any sages, slumps or fan of debris from slides on the slopes in the SW corner of the property. There also no surface water features on the property. No seeps springs or other surface expressions of ground water were found when RSS was on site on 3/27/14.

RSS finds that the development of the site will not impart any geological hazards on the site as well as the surrounding areas.

4.0 CONSTRUCTION RECOMMENDATIONS

4.1 Site Preparation

Demolition should include removal of existing improvements throughout the project site. Underground utility lines, vaults, basement walls or tanks should be removed or grouted full if left in place. I recommend that soil disturbed during grubbing operations be removed to firm, undisturbed sub-grade. The excavations should then be backfilled with compacted structural fill. On this site only disturb the area in which can be covered with rock during the day. The moisture sensitive clayey SILT soil when exposed to wet weather becomes soft and yielding. See wet weather conditions below.

4.1.1 Proof Rolling

Following stripping and prior to placing aggregate base course, pavement the exposed sub-grade should be evaluated by proof rolling. The sub-grade should be proof rolled to identify soft, loose, or unsuitable areas. Please give 24 hour notice to observe the proof rolling. Soft or loose zones identified during the field evaluation should be compacted to an unyielding condition or be excavated and replaced with structural fill, as discussed in the *Structural Fill* section of this report.

4.1.2 Wet Weather Conditions

The near-surface soils will be difficult during or after extended wet periods or when the moisture content of the surface soil is more than a few percentage points above optimum. Soils that have been disturbed during site preparation activities, or soft or loose zones identified during probing or proof rolling, should be removed and replaced with compacted structural fill. Track-mounted excavating equipment will be required during wet weather. The imported granular material should be placed in one lift over the prepared, undisturbed sub-grade and compacted using a smooth drum, non-vibratory roller. Additionally, a geo-textile fabric should be placed as a barrier between the sub-grade and imported granular material in areas of repeated traffic.

4.2 Excavation

Subsurface conditions of accessible cleared areas of the project site show predominately clayey SILT soil to the depth explored (4.0 feet). Excavations in the upper soils may be readily accomplished with conventional earthwork equipment with smooth and teeth faced bucket. See below sections regarding grading activities shown on the 4/9 of the preliminary grading plans by Sterling Design.

4.3 Structural Fills

Fills should be placed over sub-grade prepared in compliance with Section 4.1 of this report. Material used, as structural fill should be free of organic matter or other unsuitable materials and should meet specifications provided in WSDOT, depending upon the application. A discussion of these materials is in the following sections.

4.3.1 Native Soils

Native soil can be used for filling operations to raise the site grades for flat backyards. Compaction testing of native soils shall use a standard ASTM D698 proctor and achieve 95%. See lab results in appendix b. Compaction testing is required as per WSDOT every 18in of fill material. Native soils can only be used if they are within optimum moisture content. ***Proposed stock pile of native soils is planned for NE corner of the site. Any stock piles shall have erosion control fences around them as well as covered for the wet weather if the project proceeds into the winter months.***

4.3.2 Imported Granular Fill

Material meeting WSDOT 9.03.12(1) B or WSDOT 9.03.11 Imported granular material should be placed in lifts 8 to12 inches and be compacted to at least 95% of the maximum dry density, as determined by ASTM D 698. Where imported granular material is placed over wet or soft soil sub-grades, we recommend that a geo-textile serve as a barrier between the sub-grade and imported granular material. Compaction testing is required as per WSDOT every 18in of fill material.

4.3.3 Floor Slab Base and Footing Base Aggregate

Base aggregate for floor slabs should be clean, crushed rock or crushed gravel meeting WSDOT 9.03.12(1) B Class B Gravel Backfill for Foundations, if acceptable WSDOT 9.03.11 Recycled Portland Cement Concrete Rubble can be used. The imported granular material should be placed in lifts and compacted to at least 95% of the maximum dry density, as determined by ASTM D 698. Compaction testing is required as per WSDOT every 18in of fill material.

4.4 Surface and Subsurface Drainage Requirements

The Contractor shall be made responsible for temporary drainage of surface water and groundwater as necessary to prevent standing water and/or erosion at the working surface. We recommend removing only the foliage necessary for construction to help minimize erosion. Slope the ground surface around the structures to create a minimum gradient of 2% away from the building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or into a storm drainage system.

RSS has reviewed the preliminary storm water plans by Sterling Design and find plans protect the water quality and don’t proposed any geological hazards to the site.

5.0 CONSTRUCTION OBSERVATIONS

Satisfactory pavement and earthwork performance depends on the quality of construction. Sufficient monitoring of the activities of the contractor is a key part of determining that the work is completed in accordance with the construction drawings and specifications. I recommend that a geotechnical engineer observe general excavation, stripping, fill placement, and sub-grades in addition to base. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions requires experience. Therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions changes significantly from those anticipated.

6.0 LIMITATIONS

This report has been prepared for the exclusive use of the addressee, and their architects and engineers for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations. The opinions, comments and conclusions presented in this report were based upon information derived from our literature review, field investigation, and laboratory testing. Conditions between, or beyond, our exploratory borings may vary from those encountered. Unanticipated soil conditions and seasonal soil moisture variations are commonly encountered and cannot be fully determined by merely taking soil samples or soil borings. Such variations may result in changes to our recommendations and may require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

If there is more than 2years time between the submission of this report and the start of work at the site; if conditions have changed due to natural causes or construction operations at, or adjacent to, the site; or, if the basic project scheme is significantly modified from that assumed, it is recommended this report be reviewed to determine the applicability of the conclusions and recommendations.

The work has been conducted in general conformance with the standard of care in the field of geotechnical engineering currently in practice in the Pacific Northwest for projects of this nature and magnitude. No warranty, express or implied, exists on the information presented in this report. By utilizing the design recommendations within this report, the addressee acknowledges and accepts the risks and limitations of development at the site, as outlined within the report.

APPENDIX A

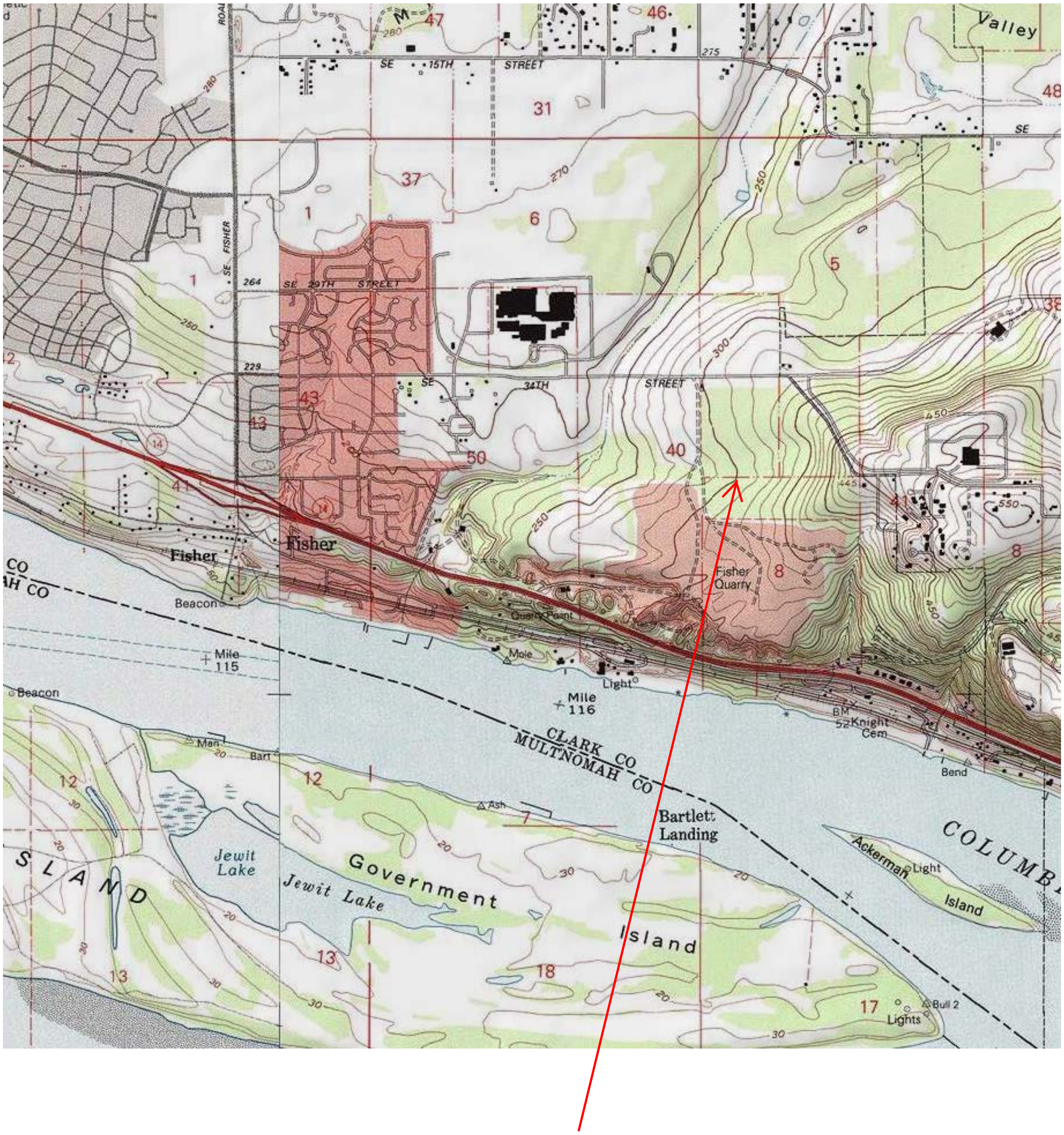


Figure 1 – Site locations

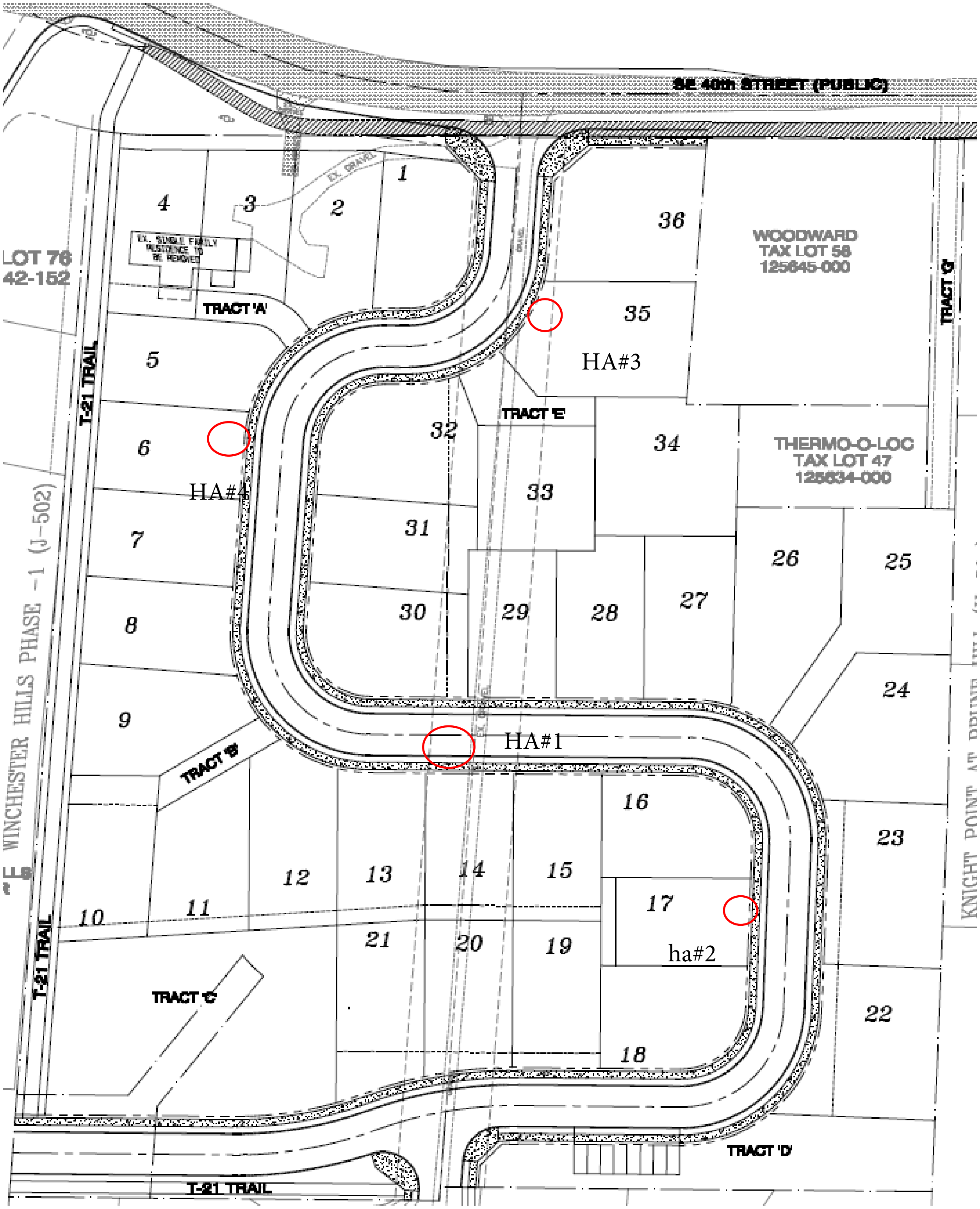


Figure 2 – site plan with testing locations

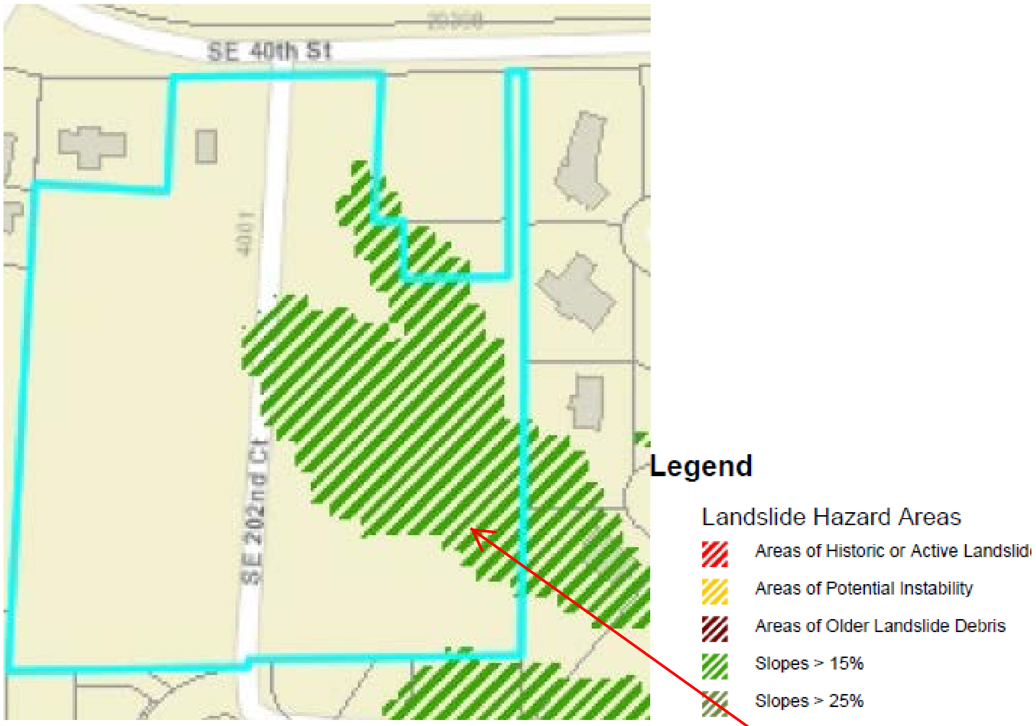
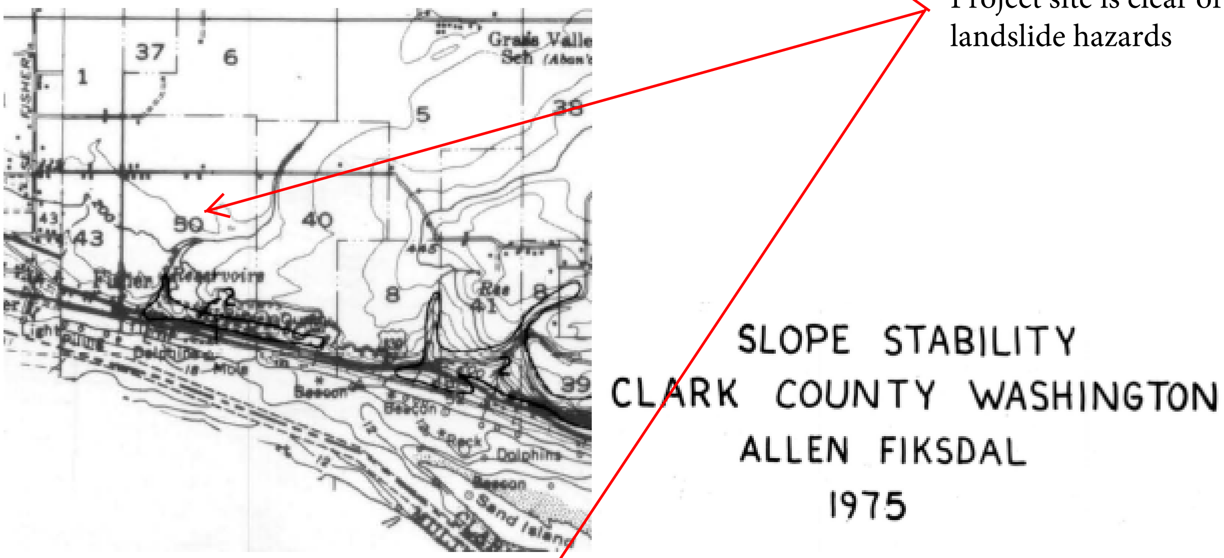
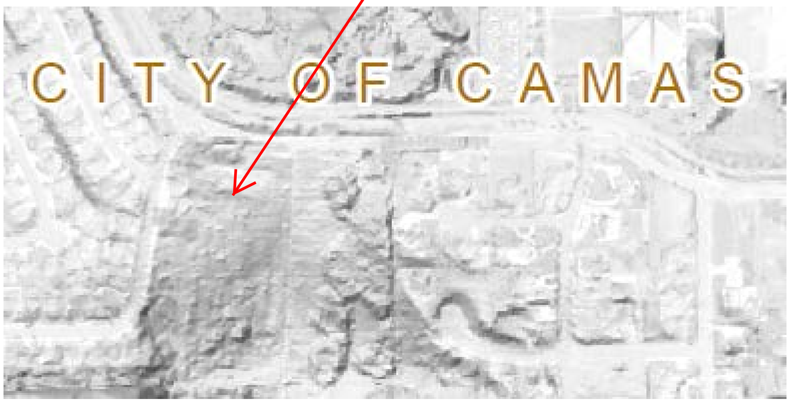


Figure 3 – Landslide hazards

Project site is clear of landslide hazards





IMS-43

APPENDIX B

ASPHALT CONCRETE SOILS TESTING, INC
503.443.3799

7409 SW Tech Center Dr, #145
Tigard, OR 97223
phn: 503-443-3799
fax: 503-620-2748

RAPID SOIL SOLUTIONS
3915 SW PLUM STREET
PORTLAND, OR 97219-6018

PROJECT: RSS 2014 LAB SERVICES
LOCATION: VALLEY VIEW ESTATES
SAMPLE SOURCE: SEE BELOW

JOB NO: 14-4790
WORK ORDER NO: N/A
DATE SAMPLED: 4/18/14

MECHANICAL SIEVE ANALYSIS
GROUP SYMBOL, USCS (ASTM D-2487)

PERCENT PASSING BY WEIGHT

				Silt or Clay	SAND								GRAVEL									COBBLES	
					Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
HA1@2'		27	3																				7267
HA2@ 4'		28	9																				7267

BORING	DEPTH	MC%
HA1@2'		25.9
HA2 @ 4'		28.0
HA3@ 4'		23.1
HA4@ 4'		24.9

REVIEWED BY DE/js

#1

Surface Elevation: 414
Boring Date: 4/23/14
Boring Location: Camas, WA
Drilling Method: Hand Augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table		
0								Top Soil
							ML	Damp, medium light brown, fine grained medium plastic SILT
1								
2	PI=3, LL=27	25.9						
							ML	End hand augur hole
3								
4								
5								
6								
7								

LOG OF BORING

Rapid Soil Solutions	**Valley View Sub-division** **Stan Firestone**	**Plate 1**

SuperLog CivilTech Software, USA www.civiltech.com File: D:\Users\Mia\Desktop\MIA WORK\2014\Reports\Report to end April\Happy Valley Dental Clinic\HA 1.log Date: 4/30/2014

#2

Surface Elevation: 464
Boring Date: 4/23/14
Boring Location: Camas, WA
Drilling Method: Hand Augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table		
0								Top Soil
							ML	Damp, dark brown, fine grained medium plastic SILT
1								
							ML	Damp, dark to medium brown clayey SILT trace gray
2								
3								
4		28					ML	End hand augur hole
5								
6								
7								

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LOG OF BORING

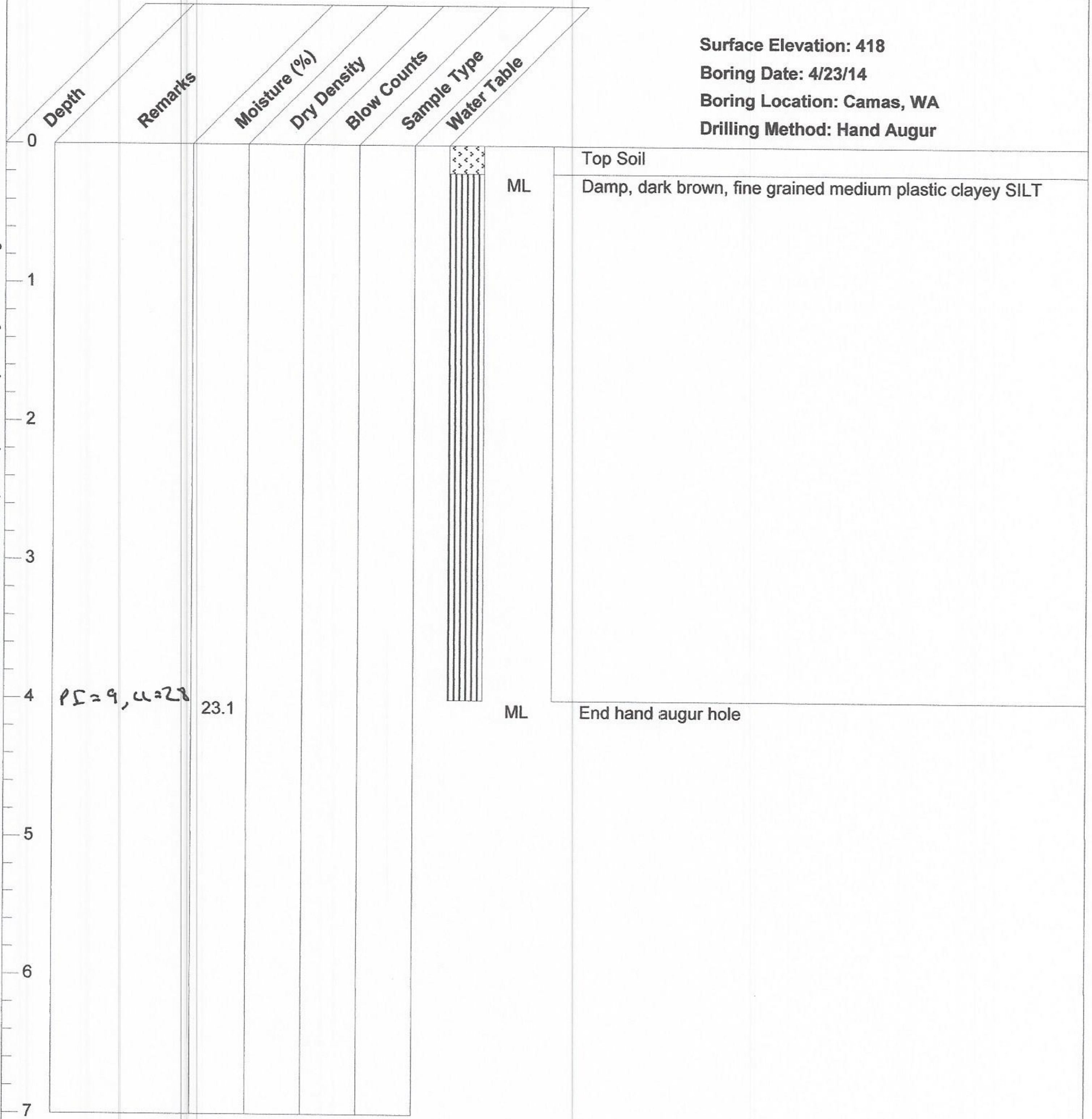
Rapid Soil Solutions

Valley View Sub-division
Stan Firestone

Plate 1

#3

Surface Elevation: 418
Boring Date: 4/23/14
Boring Location: Camas, WA
Drilling Method: Hand Augur



Top Soil

ML Damp, dark brown, fine grained medium plastic clayey SILT

4 PI=9, LL=28 23.1

ML End hand augur hole

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LOG OF BORING

Rapid Soil Solutions	**Valley View Sub-division** **Stan Firestone**	**Plate 1**

#4

Surface Elevation: 448
Boring Date: 4/23/14
Boring Location: Camas, WA
Drilling Method: Hand Augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table		
0								Top Soil
							ML	Damp, dark brown, fine grained medium plastic clayey SILT
1								
2								
3								
4		23.1					ML	End hand augur hole
5								
6								
7								

LOG OF BORING

Rapid Soil Solutions	**Valley View Sub-division** **Stan Firestone**	**Plate 1**

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