7/24/2020

The Iris Group
Nick Taylor
420 Golf Club Rd Ste 200
Lacey, WA 98503

Subject: **Critical Area Ordinance (CAO) Report**
Finney Property - Critical Slope Consultation
Parcel # 5631500685, 5631500681 and 5631500678, Kenmore, WA

QG Project No.: QG20-021

Dear Mr. Taylor:

At your request, Quality Geo, PLLC (QG) has completed a preliminary critical area review of the above referenced property's existing site conditions, including site visual reconnaissance, slope analysis, and review of existing geologic literature for the site. The project site consists of a mostly undeveloped residential property comprising a portion of a regional slope. It is our understanding that the client intends to construct a new residence within an area designated by King County as a potential critical area.

QG understands that the County Requires a geotechnical consultation to confirm that current conditions are favorable, and to provide any additional and necessary recommendation regarding critical slope considerations including necessary setbacks. The following report presents the findings and conclusions of our literature review, addresses feasibility of proposed site development, and provides additional geotechnical recommendations for planning and design intended to reduce the inherent risks associated with site development within a potentially geologically hazardous area.

GEOLOGIC LITERATURE REVIEW

QG reviewed available map publications to assess known geologic conditions and hazards present at the site location. The Washington Geologic Information Portal (WGIP), maintained by the Department of Natural Resources Division of Geology and Earth Resources, provides 1:100,000-scale geologic mapping of the region. Geology of the site location and vicinity consists of advanced

glacial outwash (Qga) described as sand and gravel and lacustrine clay, silt, and sand, deposited during glacial advance. Composition varies locally and may be compact from overriding glacial advancement.

According to the regional-scale interactive map, a deep-seated translational slide is mapped to exist upland from the site, with its boundary straddling the southern parcel boundaries. The slide area is reported to be "Historic, greater than 150 years old".

It was reported to QG by the northwestern neighbor that several erosion events, including shallow soil creep and shallow slumps from upland parcels are common in the immediate vicinity.

King County GIS maps the site and its slope as a potential erosion area, but not as a potential landslide hazard area. Available LiDAR imagery of the site did not reveal any obvious or prominent landslide features within the site or immediate vicinity.

SITE INVESTIGATION METHODOLOGY

On 6/23/2020 a QG Licensed Geologist visited the site to perform visual reconnaissance of the surface and topographic features of the subject property and its proximal slope. While on site, we conducted site surface explorations for a geologic hazard assessment and site feasibility characterization. Relevant property dimensions and slope topography were documented and mapped at representative intervals as access allowed. Soil conditions were evaluated through local exposures. Salient slope features and existing vegetation were documented in order to assess general site stability as well as observe for signs of local instability of an erosional or subsurface nature currently or in the past.

A site region and vicinity map is provided in Appendix A, and a site plan with typical topographic contours and relevant features is presented in Appendix B. Photos showing general site features are provided in Appendix C.

SURFACE OBSERVATION

The project site is irregularly shaped, with only a narrow access to the street between two other residences. The narrow access and southern property boundary slopes upward to the south. At the base of the slope, the site is generally flat with no other oversteepened areas. The site and slope are generally wooded, and heavily choked with low lying brush. Soils were generally soft and mucky across most of the surface. Some trees were partially tilted or bowed indicating some localized shallow soil creep.

QG performed reconnaissance to observe for and document any indications of surface degradation or large-scale slope instability. No obvious features were observed that would indicate an active or prior deep-seated slope failure, such as headscarps or downslope accumulations. Topography was generally consistent, lacking prevalent oversteepened areas, channelized runout zones, or hummocky deposits. No obvious evidence of rotational or translational failures or major toppling hazards was observed on the slope in the proximity of the potential building footprint. No obvious failure features were observed on adjacent slope areas visible from the subject property during our site visit.

SUBSURFACE CONDITIONS:

A general characterization of on-site soil units observed through local exposures on site within fallen tree pits.

- **Embankment Fill – Gravel with Silt and Sand (GM):**

  QG encountered an overriding layer of gravelly fill comprising much of the slope face within the access way adjacent to the street, and portions of the southern uphill neighbor's backyard embankment.

- **Native Soil – Silt with Sand (ML):**

  Much of the lowland and flat portions is comprised of a soft saturated silty soil unit. This unit appears consistent with the mapped advanced outwash fine-grained member. Stormwater appears to perch over this unit, and remains saturated, even in the summer.

DISCUSSION & CRITICAL SLOPE RECOMMENDATIONS

The findings of QG's site reconnaissance at the subject site appear broadly consistent with available geologic literature and do not indicate any excessively prohibitive conditions exist for the site, assuming appropriate site management efforts are maintained. **It appears that the roadway slope does meet the conditions for an erosional hazard** due to saturated soils and known shallow soil creep, which over time may lead to slope erosion. In consideration of the available information, and our direct observations, at this time **QG does not consider the site to be within an active deep-seated landslide hazard area.** Erosional hazards related to soil creep and saturated soils may be mitigated per the recommendations detailed below to increase slope safety factors.

House Foundation Recommendations:

For general foundation design considerations, QG recommends referring to guidelines and parameters of the International Building Code (IBC, 2015; or most recent edition at the time of construction). Footings should be placed to a minimum depth in accordance with the setback and factor of safety criteria herein, as well as meeting minimum IBC (2015) requirements.

Within the proposed building area, an elevated risk of settlement potential exists due to the presence of shallow loose weathered and saturated soils. Additionally, perched water conditions are anticipated to exist in perpetuity across the site. Mitigation of soft and saturated soil conditions can typically be accomplished by overexcavation of these soils down to suitably medium dense conditions, and replacing them with structural fill and grade fill, in combination with lowering of footing grades.

QG assumes the project design will employ relatively shallow perimeter and spread footings as needed for residential construction. A shallow foundation and slab-on-grade floor system appears appropriate for use assuming the recommendations provided below are followed for foundation design, site preparations, and construction.

- **Subgrade Preparation**

  QG recommends removing all organic topsoil and relict organic-rich pockets if encountered, exposing firm native soils, and benching the final bottom of subgrade elevation flat.

  Excavations should be performed with a smooth blade bucket to limit disturbance of subgrade soils. Vibratory compaction of the native soils should be avoided where possible to limit the degradation of soil consistency. Manual or non-vibratory compaction alternatives may be considered.

  At bottom of subgrade, if soils remain soft, QG recommends the placement of an initial thin lift of approximate 6- or 8-inch quarry spalls (or approved alternative) be placed over the excavated and exposed bottom native subgrade. This lift may be as thin as the approximate diameter of the quarry spall material. This initial lift shall be ***static*** rolled with a large drum roller so that the spalls are driven, near flush, into the native subgrade.

- **Structural Fill Pad**

  New footings and slab-on-grade elements shall bear directly a structural fill pad as follows:

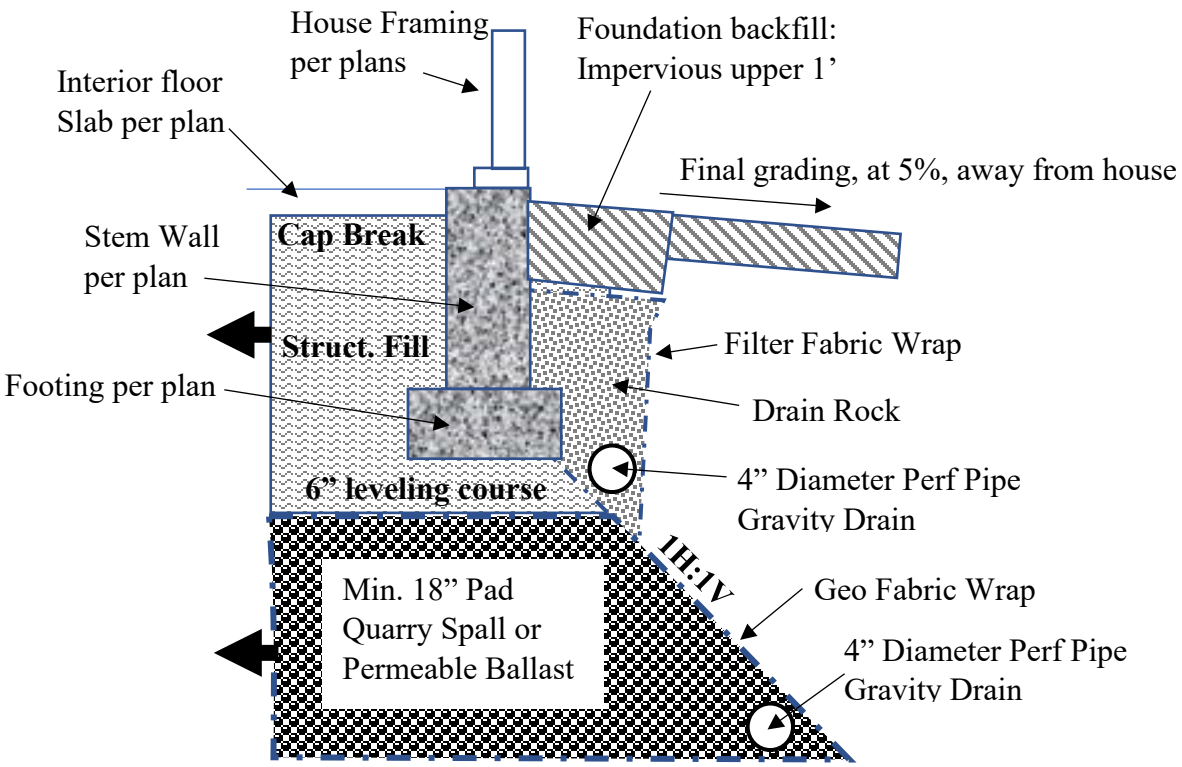
  A minimum 18-inch thick leveling structural fill pad composed of either quarry spalls per WSDOT Specification 9-13.1(5), or permeable railroad ballast per WSDOT Specification 9-03.9(2), or an approved alternative. The material shall be compacted with a large drum roller

on top to allow for maximum compaction of the grains, while avoiding liquefication of the underlying soils. This mat shall be separated from underlying and surrounding soils by a layer of rugged nonwoven permeable geofabric, with 12-inch overlaps at joints, to allow for water to escape and prevent the accumulation of fine-grained soils within the void space. Fabric shall be wrapped overtop of the mat following compaction. A final leveling course of either Gravel Borrow (WSDOT Specification 9-03.14(1)), or an approved alternative, shall be placed in a minimum 6 inches lift beneath footings and slabs, and may be thicker, to establish the desired final grade for concrete placement.

The total fill section shall extend beneath the entire footprint of the proposed building. There shall be a perforated drain pipe connected around the perimeter of the pad (within the spalls/ballast) and graded to gravity drain to an outfall pipe, to allow any accumulated water to be released in an existing approved drainage feature. The outfall point must be lower in elevation than the lowest point of possible water accumulation in the mat fill, so as to allow any captured water within the mat or crawlspace to completely drain away from the building footprint preventing standing water from accumulating. If the point of outfall cannot be established below the drainage features, then a sump pump may be required.

Note: For lateral and bearing support, structural fill placement below footings shall extend at minimum a distance past each edge of the base of the footing equal to the depth of structural fill placed below the footing [e.g., for a 2.0-foot wide footing, fills placed to approximately 1.5 feet below footing grade will require a minimum backfill width of 5.0 feet (1.5 feet each side plus 2.0-foot width of footing)]

Illustration 1. Building Pad & Foundation Prep



- **Minimum Footing Depth:**

  For a shallow perimeter and spread footing system, all exterior concrete footings shall have a final embedment of 18 inches and all interior footings shall be embedded 12 inches below the lowest adjacent finished grade, and not less than the depth required by design. However, no footings shall penetrate deeper than 18 inches into the existing grade fill on site. Minimum depths are referenced per IBC requirements for frost protection; other design concerns may dictate greater values be applied. Raising of exterior site grade may be utilizes to achieve required embedment.

Driven Pile Recommendations:

Due to the erosive nature of the upland slope along the sites southern border, and the intention to provide site driveway access through the narrow western street frontage along the slope, shoring will be required to support the slopes, roadway, and protect future developments. Due to the noted conditions, traditional block walls are not anticipated to have a long operational life.

The most common and efficient method of shoring for such a scenario would incorporate a soldier pile wall, composed of driven H-piles with treated wood lagging between each pile, to form a wall. In this case, a driveway terrace supported on both sides would be necessary to eliminate the

potential for settlement or movement of the newly graded driveway. Additionally, the upper wall would need to extend along the southern site boundary, shoring the adjacent slopes where they are 10' or taller in elevation. An optional extension of this wall to protect the site from sloughing of the remainder of the slope to the east where it is less than 10 feet in elevation may also be desirable.

QG recommends the design team retain a structural engineer experienced with such wall design. We recommend the pile embedment and capacities be determined using either the WSDOT Pile Driving Formula, or proprietary formulas provided by the selected pile/hammer company. Actual pile locations, sizing, spacing, and materials shall be determined by the project engineer.

Pile Installation:

Except as noted, typical design elements and construction procedures shall be in accordance with manufacturer standards. Any discrepancies encountered that are not addressed herein shall be reconciled by the design engineers during construction. All piles shall be driven to refusal per the manufacturer/installer minimum criteria as determined based on the size of the pile and proposed mechanism of installation. Piles shall be driven straight and plumb, avoiding eccentricity as much as feasible. Piles angled near to or greater than 3 degrees may need to be abandoned.

If early pile refusal is encountered, pile acceptance shall be evaluated by the retained inspector in consideration of achieved depth, driving behavior, and adjacent pile conditions. If refusal is encountered at an excessively shallow depth (within upper deposits), QG recommends an alternative driving location be attempted at minimum 3*d (three times pile diameter) and at maximum 5*d on-center from the refused pile. Final acceptance of installed piles shall be at the discretion of the inspector and project engineer.

Pile Wall Construction:

- **Excavations:**

  The duration of time that excavations behind walls remain open should be limited to only as necessary to prepare the base pad and placement of the wall features, backfilling with drain rock and approved fill immediately. Temporary worker protections such as trench boxes or temporary shoring may be required for entering excavations deeper than 4 feet, and all OSHA safety regulations should be observed. Extended open cut periods or work proceeding in wet weather may require surface coverings, lesser cut angles, and/or temporary bracing be applied. Shoring may be required to prevent the undermining of nearby existing structures, if excavations are within 5 feet of them, and should be considered by the designer or earthworker as needed.

Stockpiling of excavated tailings is to be prohibited above, near, or on slopes. Tailings should be removed to an inland area of the site, sufficiently away from the crest if temporary storage of exported/imported materials is required.

- **Wall Drainage:**

  To preclude build-up of external hydrostatic pressure, we recommend a minimum width of 1 foot of clean, granular, free-draining material extend from the footing drain at the base of the wall to the ground surface immediately behind the wall. Native soils are not considered suitable as drainage material. Imported wall drain aggregate should conform to WSDOT Standard Specification 9-03.12(4) Gravel Backfill for Drains or 9-03.12(5) Gravel Backfill for Drywells. A filter fabric suitable for use in soil separation and water transmission is recommended to be placed against retained soil cuts behind the wall (if present) to limit migration of fines into the drain corridor. Final parameters shall be determined by the wall designer.

- **Wall Backfill:**

  Native material is not considered suitable for wall backfill due to its elevated fines content. For additional wall backfills as needed, soils should be relatively granular with less than 5 percent fines (material passing the U.S. No. 200 sieve). QG recommends wall backfill import material to conform to WSDOT Standard Specification 9-03.12(2) Gravel Backfill for Walls.

- **Wall Backfill Compaction:**
  It is recommended that the upper two feet of wall backfill be compacted to 95 percent of the modified Proctor maximum dry density per ASTM D1557, and 90 percent below that to avoid added pressure on the wall. Wall backfill supporting landscaping elements and other non-structural components should be compacted to a relatively firm and unyielding condition.

Site Grading and Permanent Slopes:

We recommend that fill placed on slopes steeper than 3:1 (H:V) be 'benched' in accordance with hillside drives entry of section 2-03.3(14) of the WSDOT Standard Specifications.

QG recommends that any new permanent graded slopes be inclined no greater than 3H:1V at a minimum so as to catch natural topography at the top and toe of the new incline. QG also recommends permanent slopes and undeveloped surfaces be planted with a deep-rooting, rapid-growth vegetative cover as soon as possible after completion of slope construction. Alternatively, slopes may be covered with plastic, straw, etc., until they can be landscaped. Cut or uncontrolled fill contaminated with organic or manmade debris are not suitable for reuse as structural or grade fill.

Setback Recommendations:

The subject site contains almost no unsloped natural topography, as it is part of a greater regional slope face. Designation as a potential critical area would be based purely on the mapped regional presence of sloping conditions, rather than site specific stability concerns. Considering the inclination and conditions of the lower slope between the marsh and the primitive driveway, specific setback requirements must be followed for successful construction at this location. The local critical area ordinance delineates minimum slope toe setbacks for slopes inclined greater than 40% (~22°), which may be further reduced upon review by a licensed geotechnical professional.

Horizontal setbacks were determined based on standard International Building Code (IBC) requirements as accepted by the State of Washington, and King County. The IBC details required setback delineations for slopes less than or equal to 45 degrees. Structures in the vicinity of slopes shall maintain a minimum horizontal slope toe setback, the lesser of H/2 or 15 feet. QG made limited inclination measurements in the field and reviewed existing topographic data, in comparison to our general site observations made during our visit, to evaluate the adjusted setback requirements.

QG recommends the building maintain a minimum slope toe setback of 15 feet between the exterior (above grade) face of any new building and the toe of the main southern slope, as well as any new retaining walls shoring up the slope (See Appendix B). This does not apply to lightweight surface improvements such as pavement sections. QG does not recommend reducing the setback unless further site-specific foundation design efforts are undertaken to ensure building and slope stability is maintained.

Drainage Controls:

QG recommends proper drainage controls for stormwater runoff during and after site development to protect the site. The ground surface adjacent to the building should be sloped to drain away from the building pad and slope at a 5% minimum to prevent ponding of water adjacent to the house. Footing drains and yard drains should be incorporated for the building and site design to help maintain a dry building area.

For localized shallow stormwater control over restrictive conditions, a linear interceptor or curtain drain system may be helpful in reducing or eliminating shallow transient water inundation. Curtain drains can be particularly effective in low gradient directional upland environments where permeable soils overlie relatively impermeable conditions and groundwater is traveling from an upgradient source. Typical curtain drain construction consists of excavating a trench through permeable soils into silt and clay deposits or obviously dense glacial tills where present. Actual embedment should be adjusted for conditions encountered to limit the potential for piping (subterranean erosion). A sturdy

impermeable barrier (such as 10-mil PVC sheeting) is recommended along the downslope wall of the drain trench, tucked along the trench base and backfilled over with a lift of compacted native fine-grained soils to match existing conditions. QG recommends a perforated or slotted rigid PVC pipe of 4-inch minimum diameter wrapped in filter fabric or a filter sock be placed near the base of the trench. A greater diameter pipe will be advantageous for higher flows. Backfill with gravel drain rock shall meet WSDOT Standard Specification 9-03-12(4) Gravel Backfill for Drains or an approved equivalent. Top dressing with grass lawn or driveway fill is permitted. QG generally recommends filter fabric placed over the drain rock prior to capping with a non-free-draining material to avoid clogging over time. This description is for the client's initial consideration and planning purposes only and does not represent final endorsement of a particular system. Final stormwater design shall be the responsibility of the client's retained designer, who shall make any adjustments necessary.

QG recommends roof and footing water sources be tightlined (piped) away from the building to an existing catch basin, stormwater system, established channel, or down the slope to be released beyond the base using appropriate energy-dissipating features at the outfall to minimize point erosion. Roof and footing drains should be tightlined separately or should be gathered in an appropriately sized catch basin structure and redistributed collectively. If storm drains are incorporated for impervious flatworks (driveways, patios, etc.), collected waters should also be discharged according to the above recommendations. All drainage tightlines should be composed of appropriately sturdy material (such as rigid PVC), sized adequately according to anticipated flow, and anchored sufficiently. QG recommends slope tightlines be inspected by the owner periodically to look for signs of damage or displacement requiring repair.

QG infers on-site infiltration potential is infeasible due to the presence of impermeable soils within the subject site. QG does not recommend dispersion or infiltration of collected stormwater in-line and between the proposed development and lower critical slope, or on the slope itself if it can be avoided, as increased runoff or localized stormwater inundation can negatively impact long-term erosional and global slope stability. With city approval, dispersion within the existing drainage conveyances, or established stormwater channels may be considered for reasonable quantities of stormwater, so long as appropriate energy reducing features are established at the outfall, such as fabric and quarry spalls, or other approved methods, to prevent erosion. QG recommends the site designer follow guidelines for dispersion set forth in the local stormwater design manual, or the WA Department of Ecology 2019 Stormwater Management Manual for Western Washington (Volume V - Runoff Treatment, Flow Control, and LID BMP Library > V-3 Dispersion BMPs > BMP T5.30: Full Dispersion).

While soils appear generally prohibitive to in-ground infiltration systems, this should not be interpreted to preclude the installation and design of in-ground septic systems, which should be

evaluated and designed by a locally licensed reputable septic professional. Generally, the hydrogeologic input of septic systems is of such a small impact, that they do not have a perceptible effect on site stability.

Vegetation Improvements:

Any trees showing the potential to fall within the building envelope should be considered for removal, if possible. Where revegetation is not possible, stumps should be left in the ground to offer some stabilization of shallow surface soils. QG ultimately recommends the client consult a local arborist and the county code when determining which trees may be removed.

Following construction and for long-term site use, maintaining existing downslope vegetation and installing additional beneficial deep rooting ground plantings within the vicinity of the improvements and over the slopes is encouraged assuming installation is done in a manner that minimizes slope face disturbance and erosional hazard in the long term. Adding vegetation will increase the erosional and hydrologic resistance of the slope and assist in retaining cover soils. Further information and recommendations for erosion control including typical beneficial native plantings for sloping areas are provided herein.

Based on the structure setback determined above, we recommend that the completed project should maintain a portion of the space between the slope and structures as a non-disturbance vegetated buffer with no permanent clearing of vegetation, extending uphill from the slope toe. The non-disturbance area should begin as close to the structure envelope as is feasible. In the long term, we recommend the client consider maintaining native vegetation along the tract between the structure and toe as an additional means of protection from potential drainage and erosion control issues.

Erosion Controls:

Erosion is one of the most common driving forces leading to slope instability. In addition to the above commentary, the following general recommendations should be implemented in general to reduce long-term erosion potential of the slope below the project site and maintain slope stability:

- Minimize the volume and velocity of water that travels toward and down the slope face (via proper choice of site development features including stormwater controls discussed above).
- Avoid accelerating slope erosion and mass wasting due to human activity such as:
  - ✓ Adding side-cast such as dumping landscape debris or fallen trees on or above the slopes.
  - ✓ Using heavy construction equipment on or near steep slopes.
  - ✓ Excavating near adjacent steep slopes toe or on slope face.
  - ✓ Placing excavated soil near the steep slope crest.

- Prior to construction, a silt fence and/or a continuous line of straw bales should be placed on the slopeward edge of the construction area. Heavy construction equipment, construction materials, or native and imported soils should not be placed behind the erosion control devices. Suitable temporary erosion and sediment control measures should be implemented at the construction site during and immediately after ground disturbance occurs. Temporary areas bare of vegetation should be protected from erosion via a blanket of straw or rolled erosion control product (RECP) during prolonged breaks in site work and prior to reseeding or revegetation.
- At the end of the project, all bare surfaces and areas of disturbed vegetation should be replanted and maintained until fully reestablished. Concentrated surface water should not be allowed to traverse the slope during or after the construction phase of the project. Roof downspouts and footing drains should be routed into closed separate pipes which outfall into appropriate drainages. Outlets for these pipes should be protected from erosion through the use of rip-rap (quarry spalls) or some other energy dissipating device. Similarly, concentrated drainages should be captured in closed pipe systems and routed down slope to appropriate outfalls.
- Clearing of existing vegetation outside the proposed building area on and adjacent to the existing slopes should be avoided except as approved by a qualified professional. This provides additional stability to the loose top soil and minimizes the effects of down-slope water movement. This is excepting removal of problem, dead, or dying, trees if posing a direct hazard to site installations or adjacent roadways.
- Grading or excavation of soils during construction should be accompanied by grass reseeding and re-vegetation as the project is completed. According to "Vegetation Management: A Guide for Puget Sound Bluff Property Owners" (Manashe, 1993) the following types of vegetation provide good to excellent erosion control:

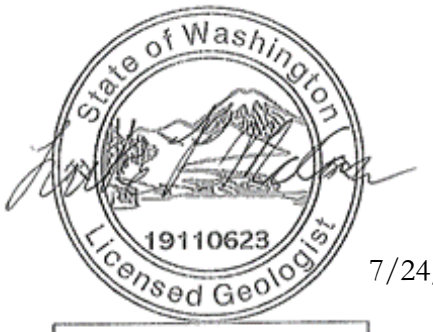
Common Name	***Botanical Name***	***Deciduous/Evergreen***	***Mature Height (ft)***
Bigleaf Maple	Acer macrophyllum	Deciduous	60
Douglas Fir	Pseudotsuga menziesii	Evergreen	200+
Evergreen	Vaccinium ovatum	Evergreen	To 8
Oceanspray	Holodiscus discolor	Deciduous	10+
Oregon Grape	Mahonia spp.	Evergreen	To 6
Pacific Madrone	Arbutus menziesii	Evergreen	70
Red huckleberry	Vaccinium parvifolium	Deciduous	To 12
Rose	Rose spp.	Deciduous	2-10
Salal	Gaultheria shallon	Evergreen	To 4
Salmonberry	Rubus spectabilis	Deciduous	To 12
Serviceberry	Amelanchier alnifolia	Deciduous	12+
Snowberry	Symphoricarpos albus	Deciduous	3+
Vine Maple	Acer cricinatum	Deciduous	10+
Willow	Salix spp.	Deciduous	10+

CLOSING:

We trust this letter satisfies your project needs currently and thank you for the opportunity to be of service. QG wishes you the best while completing the project.

Respectfully Submitted,

Quality Geo, PLLC



7/24/2020

Luke Preston McCann, L.G.
Principal Geologist

7/24/2020

Nick Taylor, P.E.
Subcontracted P.E. Review

Attachments: *Limitations*
Appendix A. Site Region and Vicinity Maps
Appendix B. Aerial Site Map
Appendix C. Site Photos

LIMITATIONS

Upon acceptance and use of this report, and its interpretations and recommendations, the owner shall agree to indemnify and hold harmless QG, including its owners, employees and subcontractors, from any adverse effects resulting from development and occupation of the subject site. Ultimately, it is the owner's choice to develop and live in such an area of possible geohazards (which exist in perpetuity across the earth in one form or another), and therefore the future consequences, both anticipated and unknown, are solely the responsibility of the owner. By using this report for development of the subject property, the owner must accept and understand that it is not possible to fully anticipate all inherent risks of development. The recommendations provided above are intended to reduce (but may not eliminate) such risks.

This report does not represent a construction specification or plan and shall not be used or referenced as such. The information included in this report should be considered supplemental to the requirements contained in the project plans & specifications and should be read in conjunction with the above referenced information. The selected recommendations presented in this report are intended to inform only the specific corresponding subjects. All other requirements of the above-mentioned items remain valid, unless otherwise specified.

Recommendations contained in this report are based on our understanding of the proposed development and construction activities, field observations and explorations, and laboratory test results. It is possible that soil and groundwater conditions could vary and differ between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, or If the scope of the proposed construction changes from that described in this report, QG should be notified immediately in order to review and provide supplemental recommendations.

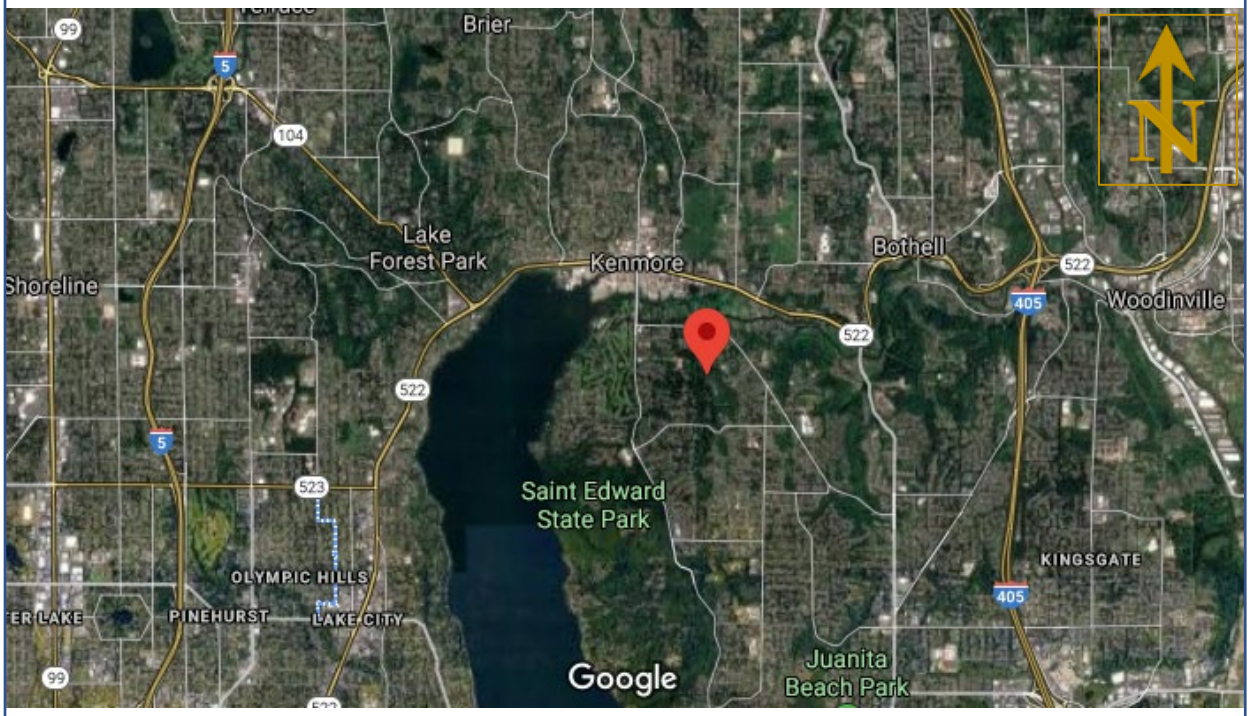
The findings of this study are limited by the level of scope applied. We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the subject region. No warranty, expressed or implied, is made. The recommendations provided in this report assume that an adequate program of tests and observations will be conducted by a WABO approved special inspection firm during the construction phase in order to evaluate compliance with our recommendations.

This report may be used only by the Client and their design consultants and only for the purposes stated within a reasonable time from its issuance, but in no event later than 18 months from the date of the report. It is the Client's responsibility to ensure that the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. Note that if another firm assumes Geotechnical Engineer of Record responsibilities they need to review this report and either concur with the findings, conclusions, and recommendations or provide alternate findings, conclusions and recommendation.

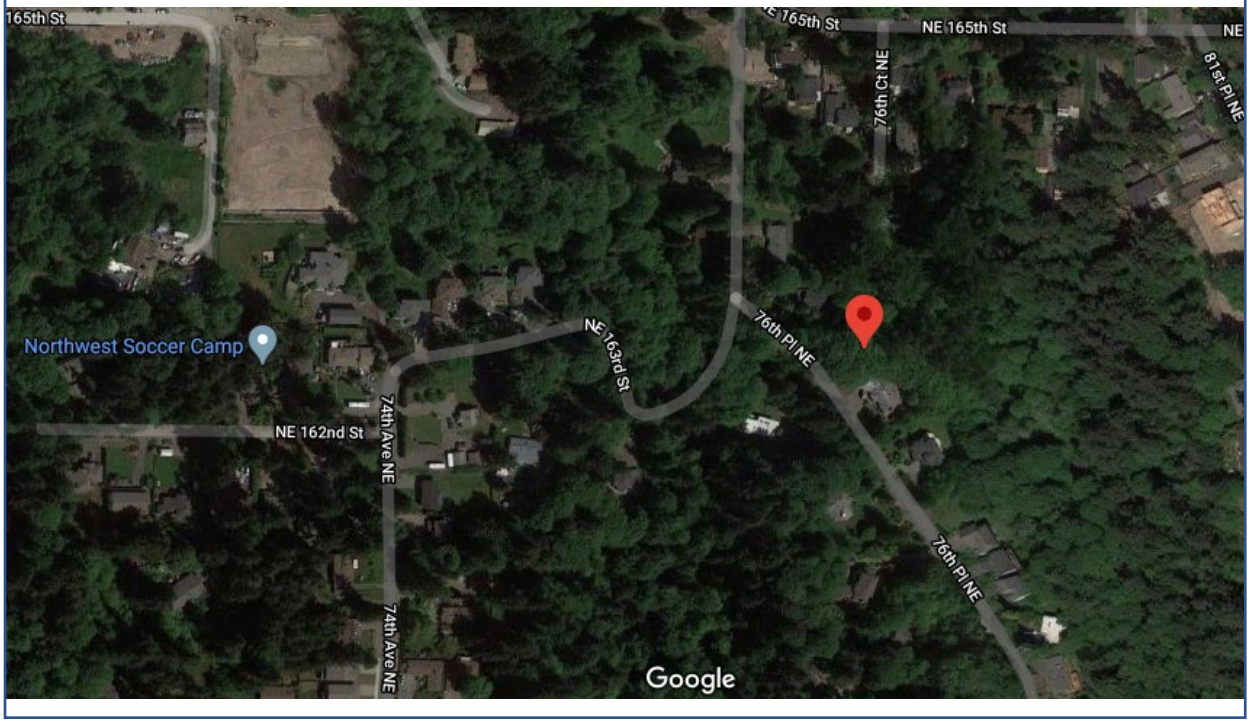
Land or facility use, on- and off-site conditions, regulations, or other factors may change over time, and additional work may be required. Based on the intended use of the report, QG may recommend that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release QG from any liability resulting from the use of this report. The Client, the design consultants, and any unauthorized party, agree to defend, indemnify, and hold harmless QG from any claim or liability associated with such unauthorized use or non-compliance. We recommend that QG be given the opportunity to review the final project plans and specifications to evaluate if our recommendations have been properly interpreted. We assume no responsibility for misinterpretation of our recommendations.

Appendix A. Site Region & Vicinity

REGION

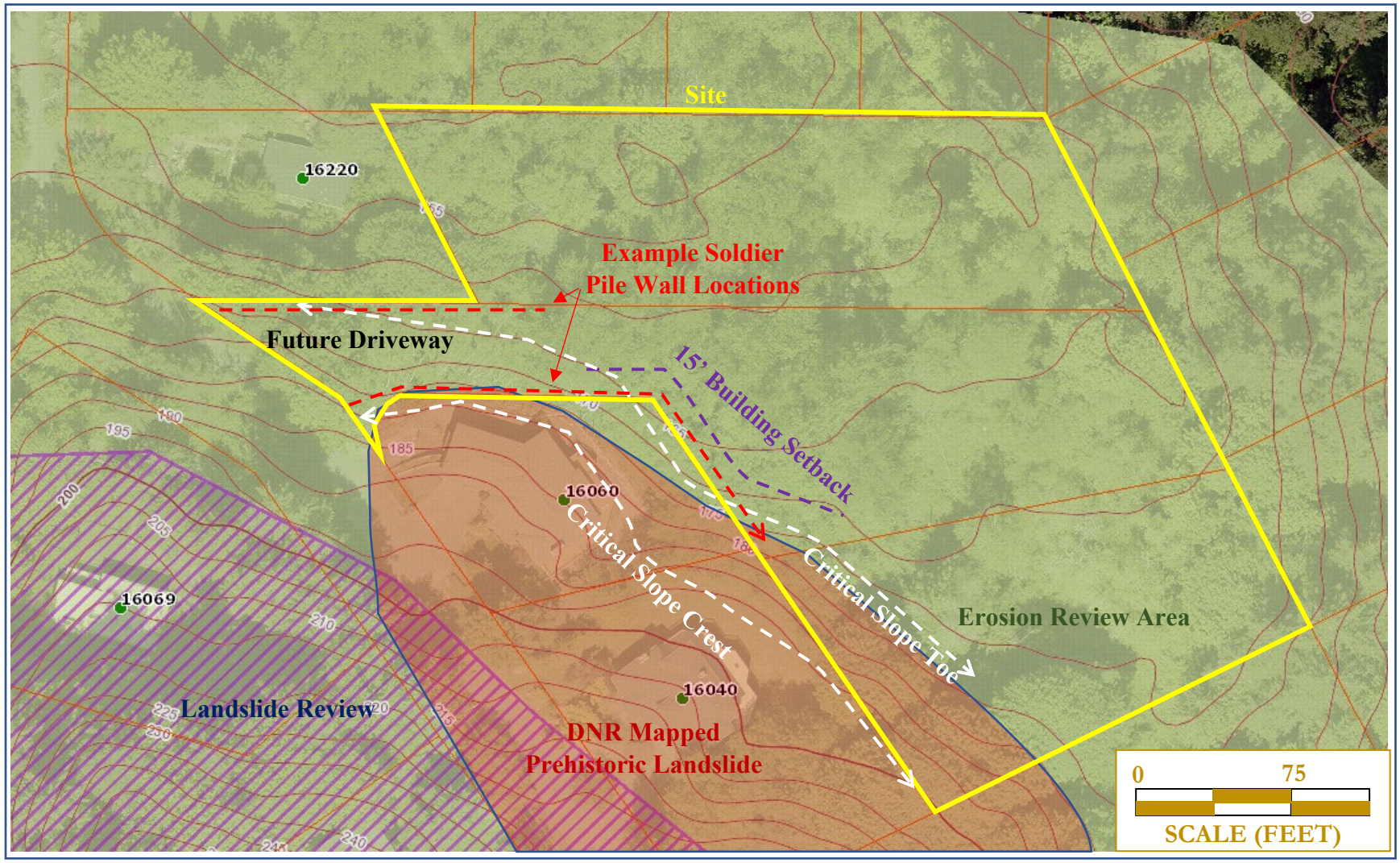


VICINITY



Quality Geo, PLLC	**Site Region** Finney Property	Source: Google Imagery, 2020 **Scale & Locations are approx.** **Not for Construction**	**Figure 1**

Appendix B. Aerial Site Map



Quality Geo, PLLC	**Site Map** Finney Property	Source: King County GIS & WA DNR **Scale & Locations are approximate** **Not for Construction**	**Figure 2**

Appendix C. Site Photos

Photo 1. Upland site access from main roadway, crest of slope

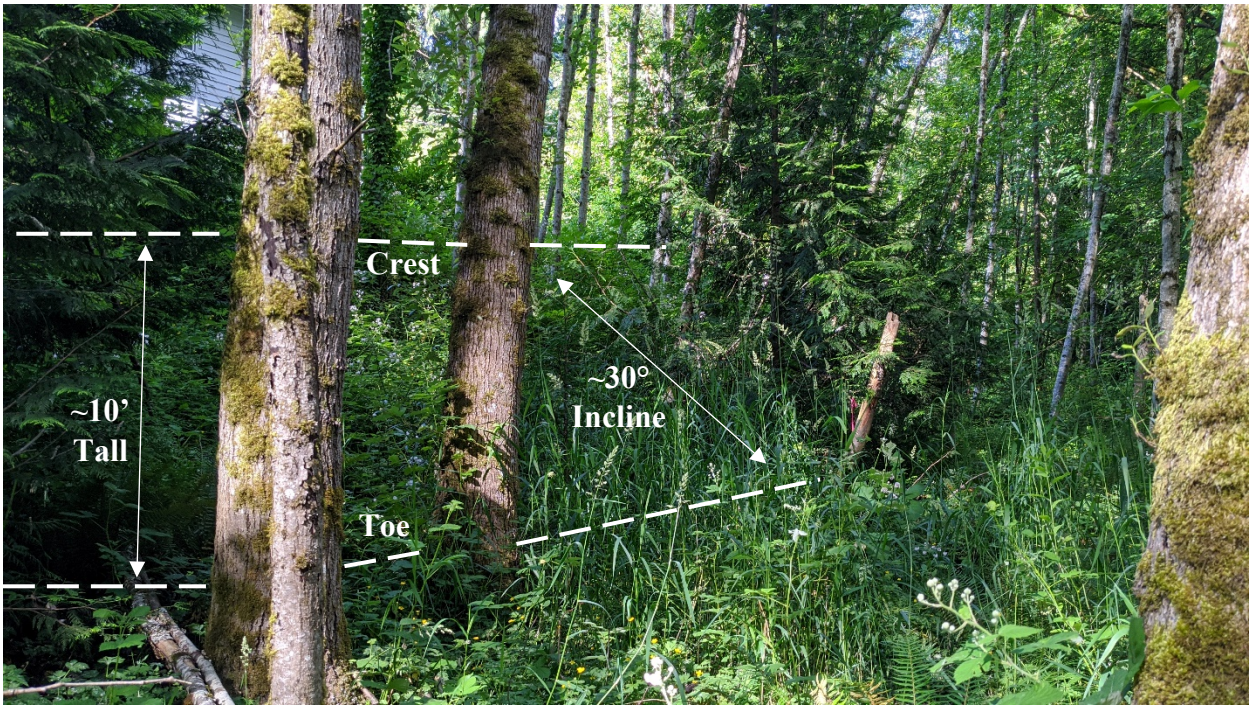


Photo 2. Typical slope conditions.