



DEVELOPMENT SERVICES DEPARTMENT  
ENVIRONMENTAL COORDINATOR  
450 110<sup>th</sup> Ave NE., P.O. BOX 90012  
BELLEVUE, WA 98009-9012

### **OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS**

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 15-119120-GJ

Project Name/Address: Lessing Restoration

Planner: Reilly Pittman

Phone Number: 425-452-4350

**Minimum Comment Period:** October 15, 2015

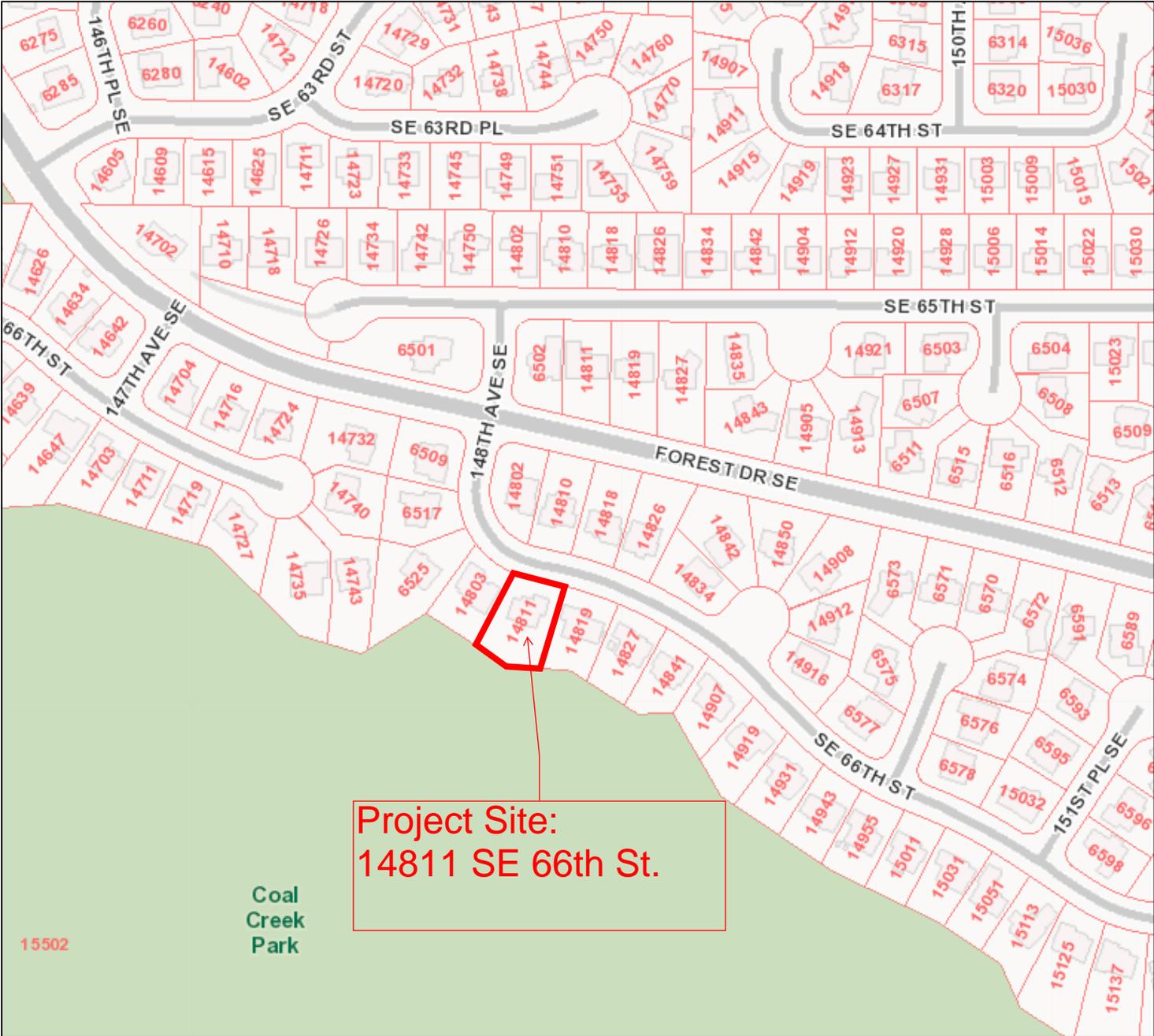
Materials included in this Notice:

- Blue Bulletin
- Checklist
- Vicinity Map
- Plans
- Other:

#### **OTHERS TO RECEIVE THIS DOCUMENT:**

- State Department of Fish and Wildlife / [Sterwart.Reinbold@dfw.gov](mailto:Sterwart.Reinbold@dfw.gov); [Christa.Heller@dfw.wa.gov](mailto:Christa.Heller@dfw.wa.gov);
- State Department of Ecology, Shoreline Planner N.W. Region / [Jobu461@ecy.wa.gov](mailto:Jobu461@ecy.wa.gov); [sepaunit@ecy.wa.gov](mailto:sepaunit@ecy.wa.gov)
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# Lessing Restoration Vicinity Map



City of Bellevue Submittal Requirements	<b>27</b>
<b>ENVIRONMENTAL CHECKLIST</b>	
<p style="text-align: right;">10/9/2009</p> <p>Thank you in advance for your cooperation and adherence to these procedures. If you need assistance in completing the checklist or have any questions regarding the environmental review process, please visit or call Development Services (425-452-6800) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Assistance for the hearing impaired: Dial 711 (Telecommunications Relay Service).</p>	
<p><b>INTRODUCTION</b></p> <p><b>Purpose of the Checklist:</b></p> <p>The State Environmental Policy Act (SEPA), Chapter 43.21c RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the City of Bellevue identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the City decide whether an EIS is required.</p> <p><b>Instructions for Applicants:</b></p> <p>This environmental checklist asks you to describe some basic information about your proposal. Answer the questions briefly, with the most precise information known, or give the best description you can. You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer or if a question does not apply to your proposal, write "do not know" or "does not apply." Giving complete answers to the questions now may avoid unnecessary delays later.</p> <p>Some questions ask about governmental regulations such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the Planner in the Permit Center can assist you.</p> <p>The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. Include reference to any reports on studies that you are aware of which are relevant to the answers you provide. The City may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impacts.</p> <p><b>Use of a Checklist for Nonproject Proposals:</b> <i>A nonproject proposal includes plans, policies, and programs where actions are different or broader than a single site-specific proposal.</i></p> <p>For nonproject proposals, complete the Environmental Checklist even though you may answer "does not apply" to most questions. In addition, complete the Supplemental Sheet for Nonproject Actions available from Permit Processing.</p> <p>For nonproject actions, the references in the checklist to the words <i>project</i>, <i>applicant</i>, and <i>property</i> or <i>site</i> should be read as <i>proposal</i>, <i>proposer</i>, and <i>affected geographic area</i>, respectively.</p> <p><b>Attach an 8 ½" x 11 vicinity map which accurately locates the proposed site.</b></p>	



## BACKGROUND INFORMATION

Property Owner: Yoel and Robin Lessing - City of Bellevue (Two Properties)

Proponent: Robin Lessing

Contact Person:  
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Address: 14811 SE 66th Street

Phone: (425) 643-0247

Proposal Title: Coal Creek Park Encroachment Mitigation

Proposal Location: 14811 SE 66th Street and into Coal Creek Park  
(Street address and nearest cross street or intersection) Provide a legal description if available.

14811 SE 66th Street  
Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site.

Give an accurate, brief description of the proposal's scope and nature:

1. General description: Remove short wood retaining walls, replace fill into excavations and hydroseed with native plant seeds. Monitor mitigation for 3 years.
2. Acreage of site: about 1/2 acre
3. Number of dwelling units/buildings to be demolished: None
4. Number of dwelling units/buildings to be constructed: None
5. Square footage of buildings to be demolished: None
6. Square footage of buildings to be constructed: None
7. Quantity of earth movement (in cubic yards): Less than 10
8. Proposed land use: Mitigate affected areas back to natural, pre-construction conditions.
9. Design features, including building height, number of stories and proposed exterior materials:  
None
10. Other

Estimated date of completion of the proposal or timing of phasing:

Fall, 2015. Less than 1 month of periodic work.

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

None

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Critical Areas Report/Geotechnical Investigation by Stantec Consulting June 19, 2015.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

No

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

Clearing and grading

Please provide one or more of the following exhibits, if applicable to your proposal. (Please check appropriate box(es) for exhibits submitted with your proposal):

Land Use Reclassification (rezone) Map of existing and proposed zoning

Preliminary Plat or Planned Unit Development  
Preliminary plat map

Clearing & Grading Permit  
Plan of existing and proposed grading  
Development plans

Building Permit (or Design Review)  
Site plan  
Clearing & grading plan

Shoreline Management Permit  
Site plan

***A clearing and grading permit is required and associated with this SEPA application***

## A. ENVIRONMENTAL ELEMENTS

### 1. Earth

a. General description of the site:  Flat  Rolling  Hilly  Steep slopes  Mountains  Other

b. What is the steepest slope on the site (approximate percent slope)? 150 percent.

c. What general types of soil are found on the site (for example, clay, sand, gravel, peat, and muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Glacial Till (silty-sand with gravel).

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No. (see geotechnical report for additional information on stability)

- e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Remove unstable undocumented fills and compact into excavations. Remove unstable wood walls. Fill will consist of on site native soils.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Work will mitigate and reduce erosion potential through proper placement and compaction (& seeding)

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

BMPs as needed during re-grading. Includes coir logs and jute mat, followed by hydroseed placement.

## 2. AIR

- a. What types of emissions to the air would result from the proposal (i.e. dust, automobile odors, and industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

None

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None

- c. Proposed measures to reduce or control emissions or other impacts to the air, if any:

N/A

## 3. WATER

- a. Surface

- (1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Coal Creek is located several hundred feet south of the area. Will not be affected by runoff.

- (2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If Yes, please describe and attach available plans.

No.

- (3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

- (4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

- (5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No

- (6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

b. Ground

- (1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description.

No

- (2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.) Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None

c. Water Runoff (Including storm water)

- (1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Rainfall (surface water) is the only potential runoff. The water currently disperses and is contained within native forest duff and eventually infiltrates slowly into the near surface soils. The mitigation will increase this potential in areas that are currently bare glacial till soils (from excavations)

- (2) Could waste materials enter ground or surface waters? If so, generally describe.

No

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:  
Mitigation will reduce any ongoing potential impacts, which are relatively low currently.

#### 4. Plants

a. Check or circle types of vegetation found on the site:

- deciduous tree: alder, maple, aspen, other
- evergreen tree: fir, cedar, pine, other
- shrubs
- grass
- pasture
- crop or grain
- wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
- water plants: water lily, eelgrass, milfoil, other
- other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

None. Vegetation will be added in bare soil areas.

c. List threatened or endangered species known to be on or near the site.

None known

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native seeds via hydroseed placement.

#### 5. ANIMALS

a. Check or circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

- Birds: hawk, heron, eagle, songbirds, other:
- Mammals: deer, bear, elk, beaver, other:
- Fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

Unknown.

d. Proposed measures to preserve or enhance wildlife, if any:

Mitigation will provide additional plant life.

## 6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy need? Describe whether it will be used for heating, manufacturing, etc.

None

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No

c. What kinds of energy conservation features are included in the plans of the proposal? List other proposed measures to reduce or control energy impacts, if any:

N/A

## 7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

No

(1) Describe special emergency services that might be required.

N/A

(2) Proposed measures to reduce or control environmental health hazards, if any.

N/A

b. Noise

(1) What types of noise exist in the area which may affect your project (for example, traffic, equipment, operation, other)?

None

(2) What types and levels of noise would be created by or associated with the project on a short-term or long-term basis (for example, traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Minor vehicle traffic for workers. Likely 8 a.m. until 3 p.m.

**Noise regulated by BCC  
9.18**

(3) Proposed measures to reduce or control noise impacts, if any:

None

**8. Land and Shoreline Use**

a. What is the current use of the site and adjacent properties?

Residential and park

b. Has the site been used for agriculture? If so, describe.

No

c. Describe any structures on the site.

House in north portion of area, generally none within site area other than short wood walls.

d. Will any structures be demolished? If so, what?

Wood walls and steps to be removed.

e. What is the current zoning classification of the site?

Address is residential, park is recreational

f. What is the current comprehensive plan designation of the site?

Unknown

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as an “environmentally sensitive” area? If so, specify.

Yes. Entire area is a steep slope and erosion hazard area.

i. Approximately how many people would reside or work in the completed project?

None

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

i. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Mitigation follows intended use of the space.

## 9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None

c. Proposed measures to reduce or control housing impacts, if any:

N/A

## 10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

N/A

b. What views in the immediate vicinity would be altered or obstructed?

None

c. Proposed measures to reduce or control aesthetic impacts, if any:

N/A

## 11. Light and Glare

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?  
None
- b. Could light or glare from the finished project be a safety hazard or interfere with views?  
No
- c. What existing off-site sources of light or glare may affect your proposal?  
None
- d. Proposed measures to reduce or control light or glare impacts, if any:  
N/A

## 12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity?  
Trails within Coal Creek Park
- b. Would the proposed project displace any existing recreational uses? If so, describe.  
No
- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:  
N/A

## 13. Historic and Cultural Preservation

- a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.  
Unknown.
- b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.  
Coal Creek Park contains mining artifacts; however, these are located at least several hundred feet downslope.
- c. Proposed measures to reduce or control impacts, if any:  
N/A

## 14. Transportation

- a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.  
SE 66th Street. No changes or alterations planned.
- b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?  
N/A
- c. How many parking spaces would be completed project have? How many would the project eliminate?  
None

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None

g. Proposed measures to reduce or control transportation impacts, if any:

N/A

**15. Public Services**

a. Would the project result in an increased need for the public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No

b. Proposed measures to reduce or control direct impacts on public services, if any:

N/A

**16. Utilities**

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

None in affected area.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

None

**Signature**

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature.....*Robin Lessing*.....Date Submitted.....08/25/2015.....





**Geotechnical Evaluation  
& Critical Areas Report**

Slope Encroachment Mitigation  
Bellevue, Washington

June 19, 2015

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**GEOTECHNICAL EVALUATION  
& CRITICAL AREAS REPORT**

June 19, 2015

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## GEOTECHNICAL EVALUATION & CRITICAL AREAS REPORT

June 19, 2015

### 1.0 Introduction

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In accordance with your authorization, Stantec has completed a Geotechnical Evaluation and Critical Areas Report as part of a critical area encroachment mitigation project located in a portion of Coal Creek Park located south of 14811 SE 66<sup>th</sup> Street in Bellevue, Washington (Figure 1).

The purpose of our evaluation was to observe the topography and soil conditions in the area of recent and previous illegal grading activities and construction, and to provide a Critical Areas Report with recommendations for Critical Area Mitigation as outlined in Chapter 20 of the City of Bellevue Land Use Code (LUC).

The scope of work for the study consisted of a field investigation followed by cross section development, slope stability analyses, and other analyses to prepare this report. This report provides an overview of the geologic conditions, geologic hazards, and recommendations for critical area mitigation and monitoring.

### 2.0 Background

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It is our understanding that excavations, wall construction, fill placement, and other access construction has been occurring within Coal Creek Park just south of 14811 SE 66<sup>th</sup> Street over a period of months or years. The homeowner at this address constructed wood steps, wood retaining walls, trail areas, and various access benches up to approximately 100 feet south of this property into Coal Creek Park. The City of Bellevue issued stop work orders once they became aware of the encroachment work in the park.

### 3.0 Site Description

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For the purposes of this report, the term “property” refers to 14811 SE 66<sup>th</sup> Street. The term “site” refers to the relevant affected portions of Coal Creek Park located generally south of the property. The site includes affected portions of Coal Creek Park located generally south and southwest of the residence located at 14811 SE 66<sup>th</sup> Street in Bellevue, Washington (Figures 1 and 2). In general, the site is approximately 100 feet in the north to south direction and 200 feet in the east to west direction.

The property consists of one irregularly shaped parcel (No. 2597510250) with a total area of 13,048 square feet. A two story wood-framed residence is located within the parcel and the property is nearly level to gently sloping.

The site is situated near the top of steep slope areas that extend downward to the south toward Coal Creek. The slope extending down from the property to Coal Creek has an average magnitude of approximately 60 percent with an overall topographic relief of approximately 155 feet. The site area has variable slope magnitudes ranging from nearly level (bench areas) up to vertical. A majority of the slopes



## GEOTECHNICAL INVESTIGATION & CRITICAL AREAS REPORT

June 19, 2015

within the site area range from 100 to 150 percent (1H:1V to 3/4H:1V (horizontal to vertical)). The topographic relief within the site is approximately 50 feet.

A drainage gully extends downward toward the south-southwest toward Coal Creek from an area just west of the site. The gully is currently dry and we did not observe evidence of stream activity in the recent past. There is evidence of periodic soil movements; however, there are not large areas of exposed soils that would indicate ongoing erosion and sedimentation. Near the top of the gully, we observed a near vertical to vertical area of exposed glacial till. Slight seepage (spring activity) emanated from the lower half of the slope face, which is approximately 20 feet in height.

Within the site, recent and previous grading activities have created multiple paths, wood retaining walls, wall backfill zones, wood steps, excavated benches, filled areas, and very steep cut slopes. In general, the excavations made in the near surface soils removed the overlying forest duff and extended into weathered native soils (glacial till). Excavated benches range in width from 2 to 10 feet and near vertical to vertical cuts along the upslope sides of the benches are up to 8 feet in height. Localized fill areas are present along the downslope sides of many of the benches. Fill is also present behind several short wood retaining walls that are present in the east portion of the site. While most of these walls are less than 2 feet in height, a taller wall (up to 3.5 feet tall) is present near the central portion of the site. All of these walls have been backfilled and there are multiple areas where fill has been placed along the upslope sides of trees.

The site is vegetated with an understory of ferns, Oregon grape, Salal, and a variety bushes and herbs. Trees include sparse Cedar and Alder, along with more prevalent Hemlock-Fir and Maple. The site is bordered to the north by single family residences and to the west, east, and south by Coal Creek Park.

## 4.0 Subsurface Data

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### 4.1.1 Site Investigation Program

The geotechnical field evaluation was completed on April 27, 2015 and included a site reconnaissance, slope traverses, local soil probing, and the excavation of several hand borings. The soil probing was conducted to determine the relative density of the near surface soils in affected and non-affected areas. The hand borings were advanced through the upper topsoil in order to determine forest duff thickness and relative density of the underlying weathered glacial soils.

The soils encountered were logged in the field during the exploration and are described in accordance with the Unified Soil Classification System (USCS).

The results of the hand boring exploration program are presented on the hand boring logs enclosed in Appendix C.



**GEOTECHNICAL INVESTIGATION  
& CRITICAL AREAS REPORT**

June 19, 2015

## **5.0 Soil and Groundwater Conditions**

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### **5.1.1 Area Geology**

The site lies within the Puget Lowland. The lowland is part of a regional north-south trending trough that extends from southwestern British Columbia to near Eugene, Oregon. North of Olympia, Washington, this lowland is glacially carved, with a depositional and erosional history including at least four separate glacial advances/retreats.

The Puget Lowland is bounded to the west by the Olympic Mountains and to the east by the Cascade Range. The lowland is filled with glacial and non-glacial sediments consisting of interbedded gravel, sand, silt, till, and peat lenses. Near the foothills of the Cascade Mountains and in some areas south of I-90, areas of Tertiary Bedrock are exposed. These materials include sandstone, siltstone, conglomerate, and shale which were locally mined for coal. These rocks are in varying stages of weathering.

The Geologic Map of King County, Washington, indicates that the site is located near the contact between Vashon Glacial Till and Renton Formation.

Vashon Glacial Till is typically characterized by an unsorted, non-stratified mixture of clay, silt, sand, gravel, cobbles and boulders in variable quantities. These materials are typically dense and relatively impermeable. The poor sorting reflects the mixing of the materials as these sediments were overridden and incorporated by the glacial ice.

Tertiary Bedrock in this area consists of the Renton Formation. The Renton Formation includes feldspathic fine to medium grained sandstone with beds of coal, carbonaceous siltstone, and claystone. Tertiary Bedrock locally outcrops south of I-90 and the Seattle Fault Zone due to uplift associated with seismic activity.

### **5.1.2 Soil Conditions**

Details of the encountered soil conditions are presented on the hand boring logs in Appendix C. The detailed soil description on these logs should be referred to in preference to the generalized descriptions below.

#### **Hand Borings HB-1 through HB-3**

Hand Borings HB-1 through HB-3 encountered approximately 12 to 18 inches of loose forest duff (vegetation/topsoil) underlain by approximately 6 to 12 inches of loose, silty-fine to medium grained sand with variable amounts of gravel (Weathered Glacial Till). These soils became denser with depth and refusal was achieved less than 4 feet below grade in medium dense weathered glacial till.



## GEOTECHNICAL INVESTIGATION & CRITICAL AREAS REPORT

June 19, 2015

### Hand Boring HB-4

Hand Boring HB-4 encountered approximately 3.5 feet of very loose to loose, silty-fine to medium grained sand with variable amounts of gravel (Undocumented Fill). These materials were underlain by medium dense to dense, silty-fine to medium grained sand with variable amounts of gravel (Weathered Glacial Till). Refusal was achieved in these soils approximately 4.5 feet below existing site grade.

### Groundwater

Groundwater was not encountered in any of the explorations at the date and time of our investigation. The groundwater level at each of the site locations will depend on a variety of factors that may include seasonal precipitation, land use, climatic conditions, and soil permeability.

The yard area within the property was observed to be very wet within the upper 12 to 18 inches. This is consistent with poorly draining soil conditions where the subsurface materials are very fine grained and the underlying soil contacts are nearly level. Perched groundwater commonly occurs in Vashon Glacial Till near the contact between the upper weathered glacial till and underlying unweathered glacial till. The upper soils are weathered and slightly more permeable than the underlying materials. The perched groundwater either remains static and slowly migrates downward, or migrates laterally along the above-described contact. The groundwater will migrate along the subsurface contacts downgradient and either continues below grade or daylight as a spring. At this site, we observed groundwater emanating as spring activity near the top of a channel in the west portion of the site.

## 6.0 Geologic Hazards

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### 6.1.1 Landslide Hazard

The LUC defines landslide hazard areas as having any of the following characteristics:

1. Landslide Hazards. Areas of slopes of 15 percent or more with more than 10 feet of rise, which also display any of the following characteristics:
  - a. Areas of historic failures, including those areas designated as quaternary slumps, earthflows, mudflows, or landslides.
  - b. Areas that have shown movement during the Holocene Epoch (past 13,500 years) or that are underlain by landslide deposits.
  - c. Slopes that are parallel or subparallel to planes of weakness in subsurface materials.
  - d. Slopes exhibiting geomorphological features indicative of past failures, such as hummocky ground and back-rotated benches on slopes.
  - e. Areas with seeps indicating a shallow ground water table on or adjacent to the slope face.



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f. Areas of potential instability because of rapid stream incision, stream bank erosion, and undercutting by wave action.

2. Steep Slopes. Slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area.

The site area has an average slope gradient of approximately 100 percent. Therefore, the entire site area meets the criteria of number 2 described above. Due to the presence of a spring in the northwest corner of the site, portions of the site also meet the criteria described in number 1e.

It is our opinion that the site area and slope extending south and downslope from the site has a low to moderate potential for shallow landslide activity and soil erosion.

It is our opinion that relatively shallow slide activity could occur along steep slope areas at any time of the year, with a higher probability of occurrence during/following periods of rainy weather, typically November through June.

It is our opinion that the geologic units that underlie the slope system are generally dense and resistant to deep seated slide activity.

During our field assessment, we traversed slope areas at all of the site locations, where accessible. As we conducted the traverses, we looked for any signs that would indicate past slope failures or features indicating possible future instability.

Overall, the steep slope areas and adjacent areas within 200 feet of the slopes appear stable at this time with no evidence of severe erosion, exposed soils, hummocky terrain, or other signs of landslide activity. There is evidence of moderate to high levels of soil creep within the site and likely throughout the steep slope areas throughout the park. In general, we observed curved tree trunks in approximately half of the trees greater than 8 inches in diameter within the eastern three-quarters of the site. We observed curved tree trunks in approximately 80 percent of trees greater than 8 inches in diameter within the western quarter of the site. This generally corresponds to overall slope magnitudes in these two areas.

### 6.1.2 Erosion Hazard

The Natural Resources Conservation Services (NRCS) maps for King County indicate that the generally level areas near the top of the slope and to the north are underlain by Beausite gravelly sandy loam (6 to 15 percent slopes). These soils have a “Moderate” to “Severe” erosion potential in a disturbed state. A majority of the encroachment area, including all of the steep slope areas below the residential property, are underlain by Alderwood and Kitsap soils (very steep designation). These soils have a “Severe” to “Very Severe” erosion potential in a disturbed state.

Due to the magnitude of the site slopes and observed soil conditions, the entire mitigation area should be considered as having “Severe” to “Very Severe” erosion potential.

It is our opinion that soil erosion potential at the project sites can be reduced through surface water runoff control and Best Management Practices (BMPs). Typically erosion of exposed soils will be most noticeable during periods of rainfall and may be controlled by the use of normal temporary erosion control measures, such as silt fences, coir logs, jute mats, hay bales, mulching, control ditches and



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diversion trenches. The typical wet weather season, with regard to site grading, is from October 31st to April 1st. Erosion control measures should be in place before the onset of wet weather. More specific erosion control recommendations and mitigation options are presented in Section 8.1.5.

### 6.1.3 Seismic Hazard

The overall subsurface profile corresponds to a Site Class *D* as defined by Chapter 20 of ASCE 7 (Table 20.3-1) and referenced in Table 1613.3.2 of the 2012 International Building Code (2012 IBC). A Site Class *D* applies to an overall profile consisting of medium dense/stiff to very dense/hard materials within the upper 100 feet.

We referenced the U.S. Geological Survey (USGS) Earthquake Hazards Program Website (seismic calculator) to obtain values for  $S_S$  and  $S_I$  for consideration in our slope stability analyses. The USGS website includes the most updated published data on seismic conditions. The site specific seismic design parameters and adjusted maximum spectral response acceleration parameters are as follows:

PGA	(Peak Ground Acceleration, in percent of g)
31.62	(10% Probability of Exceedence in 50 years)
62.94	(2% Probability of Exceedence in 50 years)
$S_S$	141.7% of g
$S_I$	48.30% of g

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft/loose soil deposits. The liquefaction potential is highest for loose sand with a high groundwater table. The relatively dense soils within and adjacent to the project area have a low potential for liquefaction.

### 6.1.4 Critical Area Report Summary

In this section, we present a generalized discussion of the relevant sections of the City of Bellevue Land Use Code pertaining to geologically hazardous areas, landslide hazard mitigation plans, and critical area reports. **The highlighted sections are applicable to the site conditions.** Comments follow each section.

## VII. GEOLOGIC HAZARD AREAS

### 20.25H.120 Designation of critical area and buffers.

#### A. Designation of Critical Areas.

The following geologic hazard areas are hereby designated critical areas subject to the regulations of this part.

#### 1. Landslide Hazards. Areas of slopes of 15 percent or more with more than 10 feet of rise, which also display any of the following characteristics:

- a. Areas of historic failures, including those areas designated as quaternary slumps, earthflows, mudflows, or landslides.



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- b. Areas that have shown movement during the Holocene Epoch (past 13,500 years) or that are underlain by landslide deposits.
  - c. Slopes that are parallel or subparallel to planes of weakness in subsurface materials.
  - d. Slopes exhibiting geomorphological features indicative of past failures, such as hummocky ground and back-rotated benches on slopes.
  - e. Areas with seeps indicating a shallow ground water table on or adjacent to the slope face.
  - f. Areas of potential instability because of rapid stream incision, stream bank erosion, and undercutting by wave action.
2. Steep Slopes. Slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area.
- The highlighted criteria are present at the site. See Section 6.1.1 for a discussion of landslide hazards. Analysis of these hazards with regard to current topography and conditions, estimated former topography, and conditions following mitigation can be found in Section 6.1.5 as well as in the Conclusions portion of this report.

### **20.25H.125 Performance standards – Landslide hazards and steep slopes.**

In addition to generally applicable performance standards set forth in LUC [20.25H.055](#) and [20.25H.065](#), development within a landslide hazard or steep slope critical area or the critical area buffers of such hazards shall incorporate the following additional performance standards in design of the development, as applicable. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function.

- A. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;
- B. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;
- C. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;
- D. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall;
- E. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer;
- F. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria;



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G. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation;

H. On slopes in excess of 40 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification;

I. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types; and

**J. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210. (Ord. 5680, 6-26-06, § 3)**

- The proposed mitigation work will remove recently constructed wood retaining walls, steps, and loose fills from critical slope areas that have landslide and erosion hazards. Overall, the work will reduce impervious surfaces (exposed soils) and will not increase the risk to adjacent properties or require increased buffers.

**20.25H.135 Mitigation and monitoring – Additional provisions for landslide hazards and steep slopes.**

In addition to the general mitigation and restoration plan requirements of LUC 20.25H.210, each mitigation or restoration plan for geologic hazard critical areas shall include:

A. Erosion and Sediment Control Plan.

The erosion and sediment control plan shall be prepared in compliance with requirements set forth in Chapter 23.76 BCC, now or as hereafter amended. Such plans shall also include, if not otherwise addressed in Chapter 23.76 BCC, the location and methods of drainage, surface water management, locations and methods of erosion control, a vegetation management and/or replanting plan, and/or other means for maintaining long-term soil stability;

- The primary considerations for erosion and sediment control during mitigation include conducting the mitigation during the summer months (July through September), phasing the fill removal and replacement work to minimize the amount of exposed soils present

B. Drainage Plan.

The technical information shall include a drainage plan for the collection, transport, treatment, discharge, and/or recycle of water prepared in accordance with applicable City codes and standards. The drainage plan should consider on-site septic system disposal volumes where the additional volume will affect the erosion or landslide hazard area;

- Not applicable

C. Monitoring Surface Waters.



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If the Director determines that there is a significant risk of damage to downstream receiving waters due to potential erosion from the site, based on the size of the project, the proximity to the receiving waters, or the sensitivity of the receiving waters, the technical information shall include a plan to monitor the surface water discharge from the site. (Ord. [5680](#), 6-26-06, § 3)

- The site is located approximately 500 feet from Coal Creek. It is our opinion that the risk of siltation to downslope receiving waters (Coal Creek) is minimal. If precipitation occurs during mitigation, we anticipate that surface water will disperse adequate into the 12 to 18 inches of forest duff. It is our opinion that turbidity monitoring is not warranted.

### XI. GENERAL MITIGATION AND RESTORATION REQUIREMENTS

#### **20.25H.210 Applicability.**

Where a mitigation or restoration plan is required under this part or Part [20.25E](#) LUC, the plan shall be developed in accordance with the standards of LUC [20.25H.210](#) through [20.25H.225](#) inclusive. Any mitigation or restoration plan shall be approved as part of the permit or approval required for the underlying activity. Where a project requires a critical areas report and a mitigation or restoration plan, the mitigation or restoration plan may be included with the critical areas report. (Ord. [5680](#), 6-26-06, § 3)

#### **20.25H.215 Mitigation sequencing.**

Applicants shall demonstrate that all reasonable efforts have been examined with the intent to avoid and minimize impacts to the critical area and/or critical area buffer. When an alteration to a critical area is proposed, such alteration shall be avoided, minimized, or compensated for in the following order of preference:

- A. Avoiding the impact altogether by not taking a certain action or parts of an action;
- B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;
- C. Performing the following types of mitigation (listed in order of preference):
  1. **Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;**
  2. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
  3. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
- D. **Monitoring the hazard or other required mitigation and taking remedial action when necessary.**

Mitigation for individual actions may include a combination of the above measures. (Ord. [5680](#), 6-26-06, § 3)

- The above-highlighted sections are applicable for the slope mitigation project. Since the mitigation will not fully replicate the soil, slope, and vegetation conditions prior to the encroachment work, periodic monitoring of the mitigation is warranted. Monitoring of the



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conditions of the mitigation work should be conducted at least once a year (generally winter-spring timeframe) for a period of at least 3 years until vegetation is fully established.

**20.25H.220 Mitigation and restoration plan requirements.**

The applicant shall submit a mitigation or restoration plan for approval as part of the review of the underlying proposal. Where standard restoration requirements or templates have been approved by the Director for the proposal in question, those requirements or templates may be followed without need for submission of an individual mitigation or restoration plan. These general requirements shall be modified for areas of temporary disturbance included as part of an approved Critical Areas Land Use Permit or use or development allowed under LUC [20.25H.055](#), so long as the requirements of subsection H of this section are met.

A. Plan Phases.

Where an applicant is seeking modifications to this part or Part [20.25E](#) LUC through a critical areas report pursuant to LUC [20.25H.230](#), the mitigation plan required for the proposal may be submitted in phases. A conceptual plan shall be submitted as part of the critical areas report and approved with the land use approval for the proposal. A detailed plan shall be approved prior to or with approval of the first permit or other approval required to perform work associated with the proposal.

B. Restoration and Mitigation Project Details.

The plan shall be prepared by a qualified professional and shall at minimum include the content identified in this section. Additional requirements may be found for specific critical areas in LUC [20.25H.085](#) (streams); [20.25H.105](#) (wetlands); and [20.25H.135](#) (geologic hazard areas). Additional detail about the contents of restoration and mitigation plans may be developed by the Director in submittal requirements. The Director may waive any of the plan requirements where, in the Director's discretion, the information is not necessary to develop a mitigation or restoration plan that addresses the impacts of the proposed action.

1. A written report identifying environmental goals and objectives of the restoration or compensation proposed, based on replacing or restoring the critical area and critical area buffer functions and values impacted by the proposal;
2. Measurable specific criteria for evaluating whether or not the goals and objectives of the mitigation or restoration project have been successfully attained and whether or not the requirements of this part have been met; and
3. Written specifications and descriptions of the restoration or mitigation proposed.
  - a. When the mitigation plan is submitted as a single-phase, or for the detailed plan phase when submitted in two phases, these written specifications shall be accompanied by detailed site diagrams, scaled cross sectional drawings, topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome.
  - b. When the mitigation plan is submitted in phases pursuant to subsection A of this section, the written specifications may be general in nature for the conceptual phase, including general identification of areas



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for work, planting species, size and number. The more precise details may be provided in the detailed plan phase.

### C. Timing of Work.

Unless a different time period is established in another section of this part, or is established by the Director in the approval for a specific project, all work required in a mitigation or restoration plan shall be completed prior to final inspection or issuance of a temporary certificate of occupancy or certificate of occupancy, as applicable, for the development.

### D. Monitoring Program.

The plan shall include a program for monitoring construction of the mitigation project and for assessing a completed project. The mitigation project shall be monitored for a period necessary to establish that performance standards have been met, but not for a period less than five years. The required monitoring period for a plan involving restoration only shall be reduced to a period of not less than three years.

### E. Contingency Plan.

The mitigation plan shall include identification of potential courses of action, and any corrective measures to be taken if monitoring or evaluation indicates project performance standards are not being met and such failure would result in significant impact on the critical area or buffer. A plan involving restoration only is not required to include a contingency plan.

### F. Assurance Devices.

The Director may require assurance devices in compliance with LUC [20.40.490](#) to ensure that the approved mitigation, monitoring program, contingency plan and any conditions of approval are fully implemented.

### G. Mitigation for City Park Projects.

Through a critical areas report, impacts of City park projects on critical areas and critical area buffers may be mitigated through restoration or enhancement of critical areas on other City park sites. Such restoration or enhancement may include restoration or enhancement projects completed prior to the proposal for which mitigation is required, so long as the restoration or enhancement project was not performed as mitigation for any other public or private project. The critical areas report shall demonstrate that the proposed mitigation restores the impacted critical area functions and values at least as well as mitigation performed on-site and in-kind associated with the development proposal. The Director may require an NGPE or NGPA be recorded for the mitigation area to ensure that it is maintained in perpetuity.

### H. Restoration for Areas of Temporary Disturbance.

The Director may impose conditions for the restoration of areas of temporary disturbance included as part of an approved Critical Areas Land Use Permit or use or development allowed under LUC [20.25H.055](#), without requiring the restoration plan and other measures described in this section, so long as the following requirements are satisfied:



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1. All areas of temporary disturbance shall be identified in the plans approved with the Critical Areas Land Use Permit or allowed use or development and shall be the minimum necessary to allow the completion of the approved use or development. For uses and development involving the repair or renovation of existing structures that can be accessed from non-critical area or critical area buffer, the minimum necessary area of temporary disturbance shall be no greater than 10 feet around the perimeter of the existing structure. Proposals involving areas of greater disturbance shall require a full restoration plan under this section. The Director may impose conditions requiring areas of temporary disturbance to be marked in the field through the use of markers, fencing, or other means;
2. The condition of the areas of temporary disturbance existing prior to undertaking any development activity shall be documented with the proposal. The Director may require photographic evidence, site plans showing the size, location and type of existing vegetation, or other materials to document existing conditions;
3. The Director shall impose a condition that the area be restored to existing conditions prior to final approval of the work performed, or within 30 days following completion of the work if no final approval is required; and
4. The Director shall impose a condition requiring monitoring of the restored area and additional restoration to achieve existing conditions, consistent with subsection D of this section; provided that the Director may reduce the monitoring period to not less than one year from completion of the original restoration. (Ord. [5680](#), 6-26-06, § 3)
  - The mitigation work should only be performed during the summer months (July through September) and will result in slope restoration to a condition similar to what existed before the encroachment. At this time, we recommend a 3 year monitoring period (once yearly).

## XII. CRITICAL AREAS REPORT

### **20.25H.230 Critical areas report – Purpose.**

A critical areas report is a mechanism by which the requirements of this part, certain requirements of Part [20.25E](#) LUC as set forth in that part, and the impervious surface standards set forth in LUC [20.20.010](#) may be modified for a specific proposal.

The critical areas report is intended to provide flexibility for sites where the expected critical area functions and values are not present due to degraded conditions or other unique site characteristics, or for proposals providing unique design or protection of critical area functions and values not anticipated by this part. The scope and complexity of information required in a critical areas report will vary, depending on the scope and complexity and magnitude of impact on critical areas and critical area buffers associated with the proposed development. **Generally, the critical areas report must demonstrate that the proposal with the requested modifications leads to equivalent or better protection of critical area functions and values than would result from the application of the standard requirements.** Where the proposal involves restoration of degraded conditions in exchange for a reduction in regulated critical area buffer on a site, the critical areas report must demonstrate a net increase in certain critical area functions. (Ord. [5680](#), 6-26-06, § 3)



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- The proposed mitigation work will result in better protection of critical area functions than what currently exist. While the slope areas cannot be mitigated to a pre-encroachment grading condition, the mitigation will increase the overall slope stability and reduce the potential for severe erosion due to surface water runoff.

### **20.25H.250 Critical areas report – Submittal requirements.**

#### A. Specific Proposal Required.

A critical areas report must be submitted as part of an application for a specific development proposal. In addition to the requirements of this section, additional information may be required for the permit applicable to the development proposal.

- The development proposal consists of mitigation of illegal grading, fill placement, wall construction, and other wood structure placement within Coal Creek Park. Mitigation recommendations are contained within this report.

#### B. Minimum Report Requirements.

The critical areas report shall be prepared by a qualified professional and shall at minimum include the content identified in this section. The Director may waive any of the report requirements where, in the Director's discretion, the information is not necessary to assess the impacts of the proposal and the level of protection of critical area function and value accomplished. At a minimum, the report shall contain the following:

1. Identification and classification of all critical areas and critical area buffers on the site;
  - Shown on Figure 2.
2. Identification and characterization of all critical areas and critical area buffers on those properties immediately adjacent to the site;
  - Shown on Figure 2.
3. A habitat assessment consistent with the requirements of LUC [20.25H.165](#);
  - Not included within this study.
4. An assessment of the probable cumulative impacts to critical areas resulting from development of the site and the proposed development;
  - The mitigation work should result in conditions similar to pre-encroachment conditions within the critical areas. Annual mitigation monitoring will be performed to verify suitability and mitigation conditions (3 years minimum).
5. An analysis of the level of protection of critical area functions and values provided by the regulations or standards of this code, compared with the level of protection provided by the proposal. The analysis shall include:
  - a. A discussion of the functions and values currently provided by the critical area and critical area buffer on the site and their relative importance to the ecosystem in which they exist;



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- b. A discussion of the functions and values likely to be provided by the critical area and critical area buffer on the site through application of the regulations and standards of this Code over the anticipated life of the proposed development; and
- c. A discussion of the functions and values likely to be provided by the critical area and critical area buffer on the site through the modifications and performance standards included in the proposal over the anticipated life of the proposed development;
  - A discussion on how the mitigation work will result in critical area conditions similar to those prior to the encroachment is included in Section 6.1.5 and in the Conclusions sections. In general, vegetation will be re-introduced to areas affected by excavation and fill placement and critical area functions will be similar to pre-construction conditions.
6. A discussion of the performance standards applicable to the critical area and proposed activity pursuant to LUC [20.25H.160](#), and recommendation for additional or modified performance standards, if any;
  - Mitigation monitoring once annually for a period of no less than 3 years is recommended.
7. A discussion of the mitigation requirements applicable to the proposal pursuant to LUC [20.25H.210](#), and a recommendation for additional or modified mitigation, if any; and
8. Any additional information required for the specific critical area as specified in the sections of this part addressing that critical area.

### 6.1.5 Slope Stability Analyses

In order to determine suitable and reasonable slope mitigation options, we performed slope stability analyses on four critical sections. Analyses were performed for each of the four cross sections in consideration of the following:

- Existing topography, including excavations, fill areas, and wood walls;
- Estimated topography and soil conditions prior to grading activities; and,
- Topography and near surface soil conditions following mitigation.

The commercially available slope stability computer program Slope/W was used to evaluate the global stability of the slopes at these two site locations. The slope stability was analyzed under static and seismic (pseudo-static method) conditions for the existing topography.

The computer program calculates factors of safety for potential slope failures and generates the potential failure planes. This software calculates the slope stability under seismic conditions using pseudo-static methods. The stability of the described configuration was analyzed by comparing observed factors of safety to minimum values as set by standard geotechnical practice.

A factor of safety of 1.0 is considered equilibrium and less than 1.0 is considered failure. The required factor of safety for global stability is 1.5 for static conditions and 1.2 for seismic conditions. In accordance with typical engineering standards, we used a horizontal peak ground acceleration of 0.2g for seismic analysis.



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The following estimated soil parameters were used in our analyses:

Soil Description	Unit Weight (pcf)	Cohesion (psf)	Friction (degrees)
Loose Undocumented Fill (SM)	115	0	24
Medium Dense Weathered Glacial Till (SM)	120	50	36
Dense to Very Dense Unweathered Glacial Till (SM)	120	250	38
Compacted Backfill	115	0	32

**Slope Stability Results**

<b>Cross Section A to A'</b>	Static Factor of Safety	0.2g Seismic Factor of Safety
Existing Topography (Local)	0.463*	0.315
Estimated Original Topography	1.485	1.051
Anticipated Post-Mitigation Topography	1.475	1.040

<b>Cross Section B to B'</b>	Static Factor of Safety	0.2g Seismic Factor of Safety
Existing Topography (Local)	0.786*	0.384
Existing Topography (Global)	1.107	0.840
Estimated Original Topography	1.350	0.946
Anticipated Post-Mitigation Topography	1.200	0.859



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<b>Cross Section C to C'</b>	Static Factor of Safety	0.2g Seismic Factor of Safety
Existing Topography (Local)	1.187	0.844
Estimated Original Topography	1.282	0.908
Anticipated Post-Mitigation Topography	1.252	0.896

<b>Cross Section D to D'</b>	Static Factor of Safety	0.2g Seismic Factor of Safety
Existing Topography (Local)	0.664*	0.474
Estimated Original and Mitigated Topography	1.842	1.240

The slope stability analyses for the existing conditions are generally consistent with our observations of the site topography and slope stability. Our localized analyses of the current stability of wood retaining walls and/or filled areas (denoted by an asterisk \*) indicate results lower than equilibrium (1.0 FOS). It should be noted that we would anticipate that the actual values would be closer to 1.0 since the structures have not fully failed. The analyses are difficult to use on very small scales and in these cases, yield results somewhat below what is likely based on the soil conditions at these locations.

All of the analyses indicate that mitigation should result in factors of safety nearing those for pre-grading conditions.

## **7.0 Discussion**

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### **7.1.1 General**

Our analyses indicate that the slope stability within the site area has decreased following excavation and fill placement. These analyses also indicate that localized wood retaining walls and undocumented fill are unstable and appear prone to localized slope failures.

Excavations have resulted in exposed soils that are highly susceptible to erosion. Excavations have also created preferential pathways for surface waters, removed stable soil masses from the site slope systems, and resulted in areas where surface water may pond.



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Filled areas, wood retaining walls, and wall backfill zones should be removed completely from within the site as part of critical area mitigation. The fill materials should be replaced in the adjacent excavations and compacted to at least 90 percent of the modified proctor (ASTM D1557 Test Method).

Mitigation and permanent erosion control measures should be in place before the wet season begins (typically October). Annual monitoring of the effectiveness and suitability of the mitigation work should occur for at least 3 years.

## 8.0 Recommendations

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### 8.1.1 Mitigation Sequencing

All mitigation work should occur during the summer months (July through September) and during extended periods of dry weather. We recommend mitigation occur in the following order:

- In general, we expect that it will be easiest to mitigate the site working from lower elevations up to the top of the site, although variations may be reasonable depending on the mitigation task;
- Wood retaining walls should be de-constructed and removed from the site. Access stairs may remain in order to provide access to lower portions of the site until mitigation is nearly complete. In-place log steps below the wood framed stairs may remain in place permanently;
- Excavation of drainage trenches at the large bench areas (Area Type A) along with rock backfill of these areas;
- Undocumented fill removal and backfill of excavated benches;
- Additional topsoil and other more permanent erosion control measures (jute, hydroseed); and,
- Wood stair removal and completion of permanent erosion control features near the property.

### 8.1.2 Wall and Undocumented Fill Removal

All wood structures, including timber and wood retaining walls should be removed from Coal Creek Park. All undocumented fill materials, which include weathered glacial till and forest duff/organic debris, should be removed from behind the retaining walls and from the downslope edges of excavated benches (where present).

### 8.1.3 Drainage Improvements

There are two relatively large bench areas that may allow surface water to pond. This could lead to shallow slope instability and/or downslope erosion over time. We recommend that several shallow hand excavations be made to create preferential paths for any stormwater that collects in these areas to disperse through the weathered soils and forest duff. We recommend that these channels be no greater than 6 inches wide and only deep enough to achieve a minimum 1 percent slope to the south (or to drain). These trenches should be backfilled with coarse clean gravel (5/8" to 2" angular rock).



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### 8.1.4 Fill Replacement

We recommend that the weathered glacial till soils (silty-sand with gravel) be replaced in the adjacent bench excavation area and compacted in maximum 6 inch thick loose lifts using a jumping jack.

Fill soils should be compacted to at least 90 percent of the maximum dry density based on ASTM Test Method D1557. Observation of relative compaction by the geotechnical engineer or engineering geologist is also suitable.

Loose forest duff and larger organic debris may be placed over the replaced fill materials and areas of exposed soils.

There are local excavated paths that are very steep; particularly near the south part of the site. We recommend placement of several inches of coarse angular rock over exposed soils in these areas.

Once all fill materials have been placed, any exposed soils should be covered with several inches of topsoil. Hydroseed should be spread over all mitigated areas (except for areas of angular rock).

### 8.1.5 Erosion and Sediment Control

Erosion and sediment control (ESC) is used to reduce the transportation of eroded sediment to wetlands, streams, lakes, drainage systems, and adjacent properties. Erosion and sediment control measures should be implemented and these measures should be in general accordance with local regulations. At a minimum, the following basic recommendations should be incorporated into the design of the erosion and sediment control features for the site:

- Schedule the soil, foundation, utility, and other work requiring excavation or the disturbance of the site soils, to take place during the dry season (generally June through September). However, provided precautions are taken using Best Management Practices (BMP's), certain activities may continue into the wet season (with City and Stantec approval).
- All site work should be completed and stabilized as quickly as possible.
- At the end of each day, all exposed soils should be covered with clear visqueen if precipitation is forecasted.

#### Specific Erosion Control Recommendations

Permanent site mitigation may include several of the following elements:

- Jute mat should be placed over all slope areas, extending at least 24 inches onto undisturbed areas. Mats should be overlapped and stapled in accordance with the manufacturer's recommendations and should be placed flat against the soils;
- Coir log placement every 10 feet vertically down the affected slope area(s) generally across level topographic contours through the cleared/disturbed areas, extending onto adjacent undisturbed



## **GEOTECHNICAL INVESTIGATION & CRITICAL AREAS REPORT**

June 19, 2015

areas. The logs should be placed in an angled stepped pattern to allow water to dissipate in volume and flow rate, while allowing slow dispersal onto adjacent undisturbed areas. Staking should be in accordance with the manufacturer's recommendations;

- Hydroseed should be placed on the affected areas and all exposed soil areas. A rye seed mix with Pacific Northwest native plant seeds is recommended; and,
- Mitigation area should be re-vegetated per plan and maintained until fully established (typically 3 years).

### **8.1.6 Mitigation Monitoring**

We recommend that completion of the mitigation work be verified and approved by Stantec and the City of Bellevue before the wet season (typically October). The mitigation work should be well documented through photographs and observed at least once per year (generally winter-spring months) for at least 3 years to verify the adequacy of the mitigation. Photographs should be used to compare the conditions from prior site visits.

## **9.0 Construction Field Reviews**

---

Stantec should be retained to provide part time field review during construction in order to verify that the soil conditions encountered are consistent with our design assumptions and that the intent of our recommendations is being met. This will require field and engineering review to:

- Monitor fill and wall/wood removal and fill placement
- Observe temporary and permanent erosion control implementation
- Observe drainage placement
- Annual mitigation monitoring (3 years)

## **10.0 Closure**

---

This report was prepared for the exclusive use of Robin Lessing in conjunction with the City of Bellevue along with their appointed consultants/contractors. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved in writing by Stantec.

The recommendations contained in this report are based on assumed continuity of soils with those of our test holes, and currently proposed construction. Stantec should be provided with final civil drawings when they become available in order that we may review our design recommendations and advise of any revisions, if necessary.



**GEOTECHNICAL INVESTIGATION  
& CRITICAL AREAS REPORT**

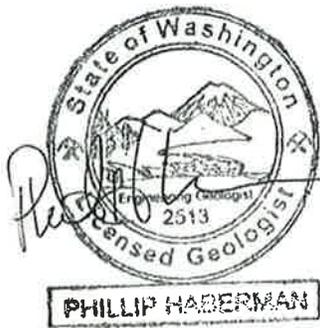
June 19, 2015

Use of this report is subject to the Statement of General Conditions provided in Appendix A. It is the responsibility of Robin Lessing care of the City of Bellevue who is identified as “the Client” within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied.

Respectfully submitted,

**Stantec Consulting Services, Inc.**

**Original signed by:**



Phil Haberman, P.G., P.E.G.  
Senior Engineering Geologist

PH/sc

**Original signed by:**



Sean Caraway, P.E.  
Senior Geotechnical Engineer

6/19/15



**APPENDIX A**  
Statement of General Conditions



## Statement of General Conditions

**USE OF THIS REPORT:** This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec Consulting Services, Inc. and the Client. Any use which a third party makes of this report is the responsibility of such third party.

**BASIS OF THE REPORT:** The information, opinions, and/or recommendations made in this report are in accordance with Stantec Consulting Services, Inc.'s present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec Consulting Services, Inc. is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

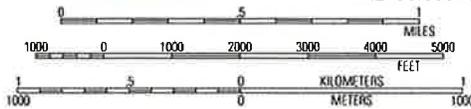
**STANDARD OF CARE:** Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state of execution for the specific professional service provided to the Client. No other warranty is made.

**INTERPRETATION OF SITE CONDITIONS:** Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec Consulting Services, Inc. at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

**VARYING OR UNEXPECTED CONDITIONS:** Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec Consulting Services, Inc. must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec Consulting Services, Inc. will not be responsible to any party for damages incurred as a result of failing to notify Stantec Consulting Services, Inc. that differing site or sub-surface conditions are present upon becoming aware of such conditions.

**PLANNING, DESIGN, OR CONSTRUCTION:** Development or design plans and specifications should be reviewed by Stantec Consulting Services, Inc., sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec Consulting Services, Inc. cannot be responsible for site work carried out without being present.

**APPENDIX B**  
Figures: Vicinity Map, Site Plan, & Cross Sections



TN / MN  
16°  
06/07/15

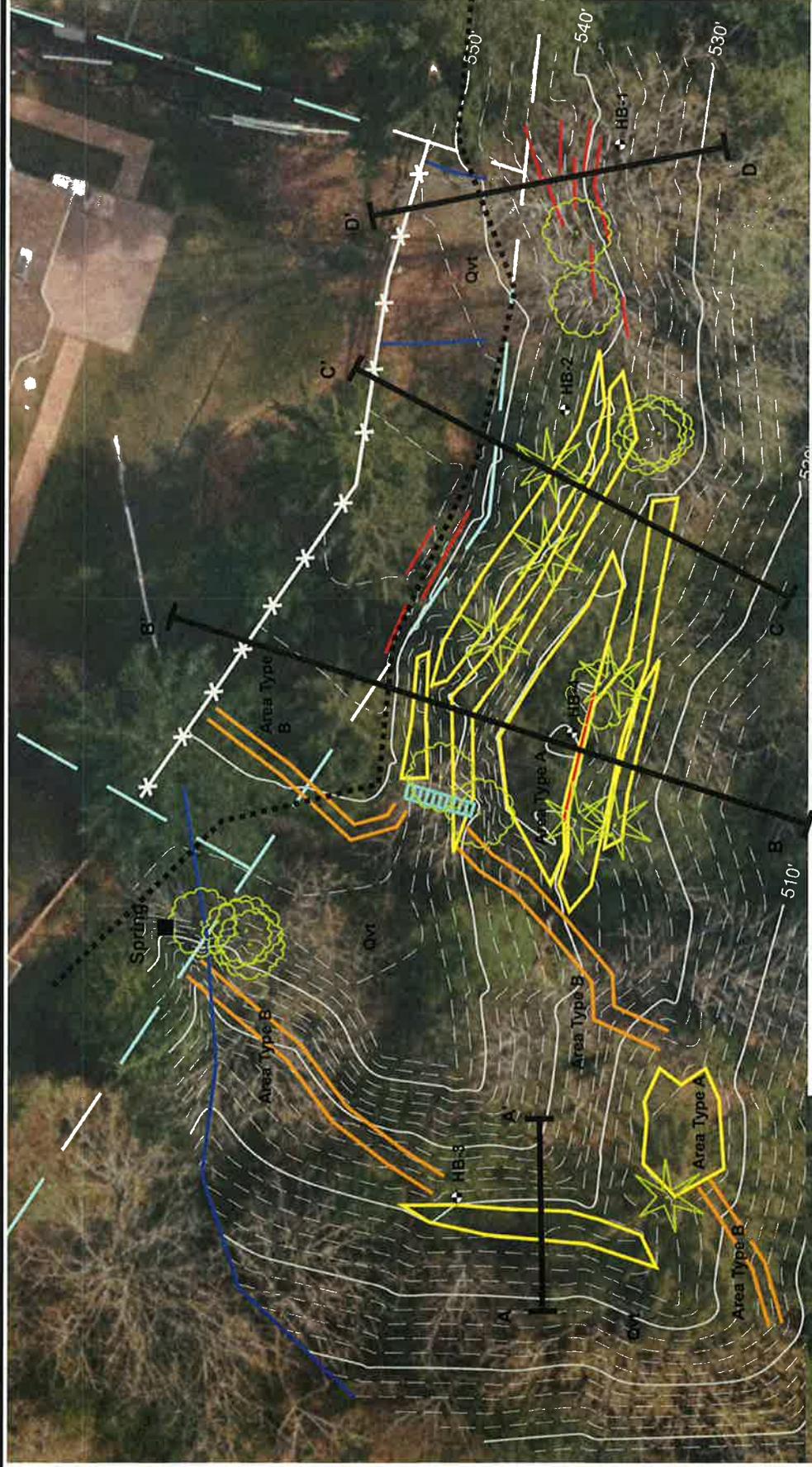


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**Vicinity Map  
Figure 1**





Approximate Top  
of Landslide &  
Erosion Hazard  
Area

- LEGEND:**
- EXCAVATED LANDING
  - EXCAVATED TRAIL/PATH
  - WOODEN STAIRS
  - CHERRY WOOD RETAINING WALLS
  - 4" CORRUGATED PIPE
  - 4" WOOD FENCE
  - PROPERTY LINE

Area Type A Areas where additional drainage trenching is necessary prior to fill placement.  
 Area Type B Areas where exposed soils should be covered with several inches of topsoil and hydroseeded.  
 All other benches have areas of fill for removal and replacement into the adjacent bench excavations.  
 Qvt Vashon Glacial Till



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Site Plan  
 Figure 2





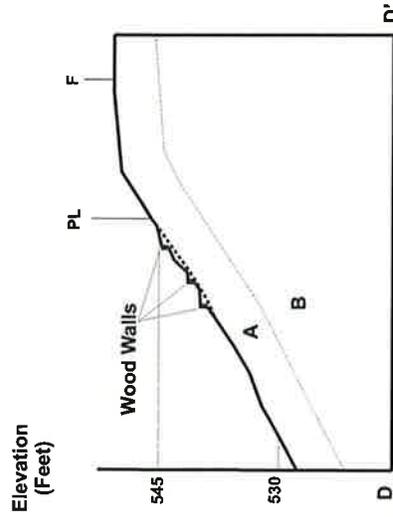
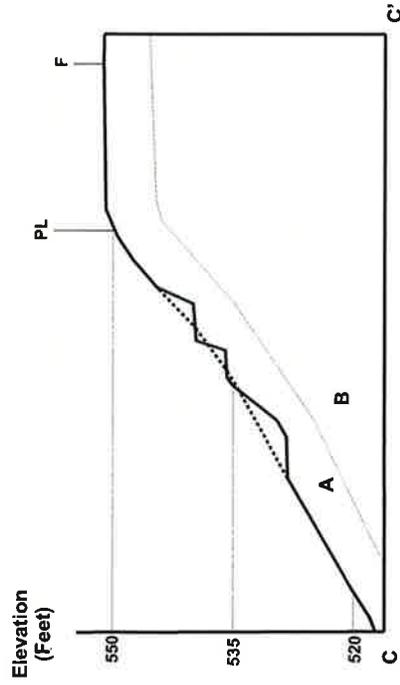
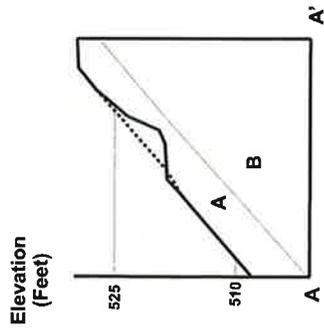
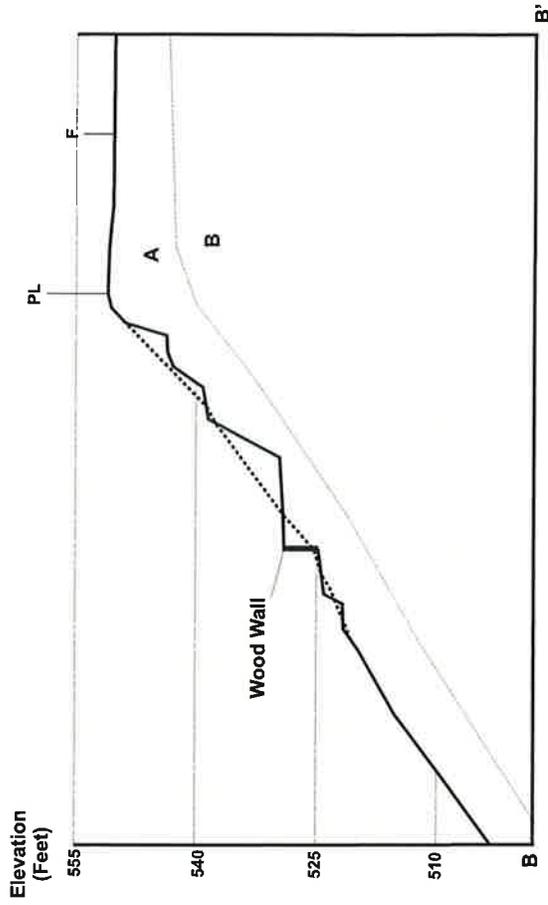
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Lidar Image  
 Figure 3





- F Fence
- PL Property Line
- Unit A Weathered Glacial Till (loose to medium dense silty sand with gravel)
- Unit B Unweathered Glacial Till (dense to very dense silty sand with gravel)

— Current Topography  
 - - - Generalized Previous Topography  
 ..... Approximate Geologic Contact

All contacts & elevations approximate/estimated



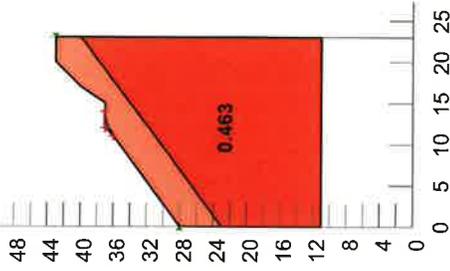
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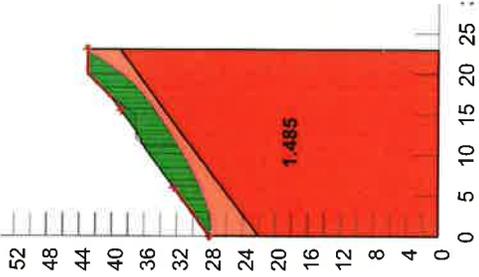
Cross Sections  
Figure 4



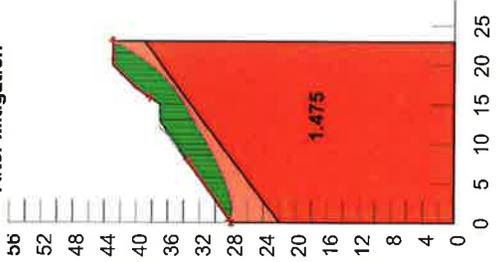
Existing Topography  
(Local Stability)



Previous Topography

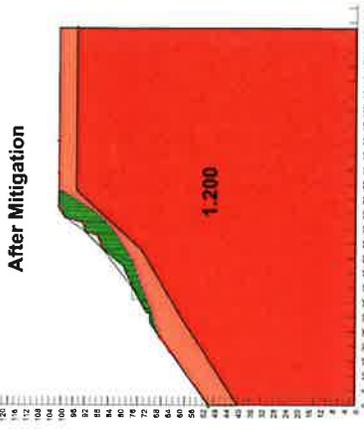
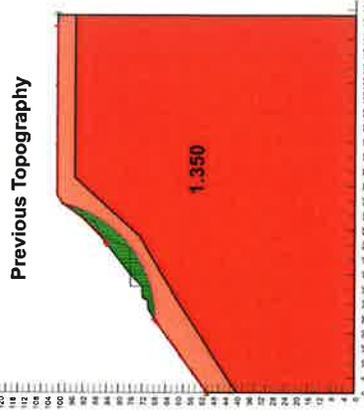
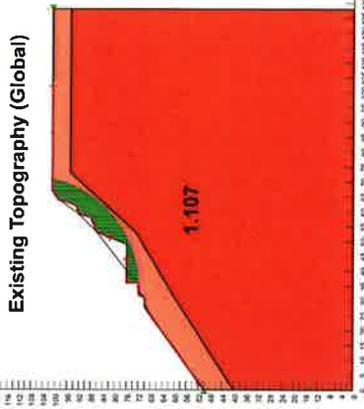
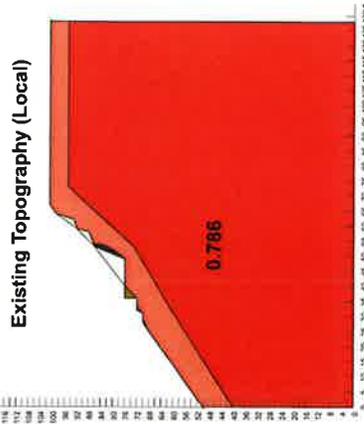


After Mitigation



Cross Section A to A'

Cross Section B to B'

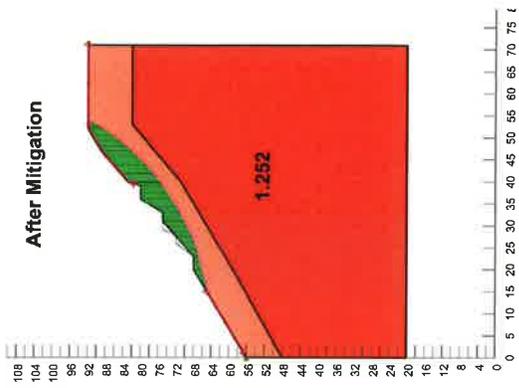
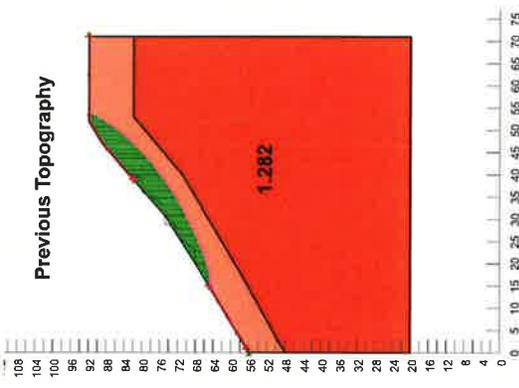
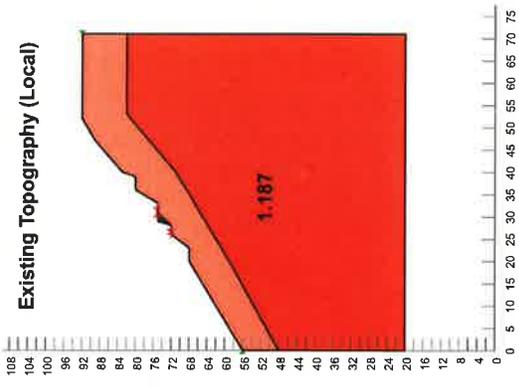


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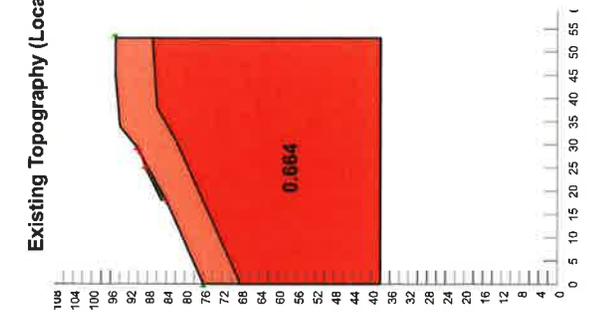
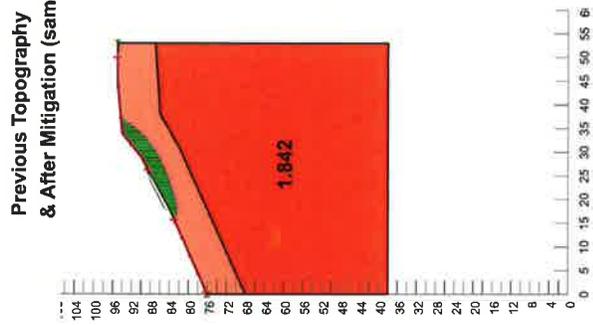
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Slope Stability  
Figure 5





**Cross Section C to C'**



**Cross Section D to D'**



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**Slope Stability**  
 Figure 6



## **APPENDIX C**

### Hand Boring Logs

PROJECT: **Coal Creek Park Mitigation**  
 LOCATION: **Bellevue, Washington**  
 PROJECT NUMBER: **185750351**

WELL / PROBEHOLE / BOREHOLE NO

**HB-1** PAGE 1 OF 1



DRILLING / INSTALLATION:  
 STARTED **4/27/15** COMPLETED: **4/27/15**  
 DRILLING COMPANY:  
 DRILLING EQUIPMENT: **Auger, Shovel**  
 DRILLING METHOD:  
 SAMPLING EQUIPMENT: **Grab**

NORTHING (ft): EASTING (ft):  
 LAT: LONG:  
 GROUND ELEV (ft): TOC ELEV (ft):  
 INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft): ---  
 STATIC DTW (ft): **Not Encountered** BOREHOLE DEPTH (ft): **3.0**  
 WELL CASING DIA. (in): --- BOREHOLE DIA. (in): **2**  
 LOGGED BY: **PH** CHECKED BY: **SC**

Depth (feet)	Graphic Log	USCS	Description	Sample	Sample Information	Measured Recov. (feet)	Blow Count	Headspace FID/PID (PPM)	Depth (feet)
			Topsoil/Forest Duff						
		SM	SM; Loose to medium dense, silty-fine to medium grained sand with gravel, yellowish brown, moist. (Weathered Glacial Till)						
Borehole terminated at 3 feet.									

PROJECT: **Coal Creek Park Mitigation**  
 LOCATION: **Bellevue, Washington**  
 PROJECT NUMBER: **185750351**

WELL / PROBEHOLE / BOREHOLE NO  
**HB-2** PAGE 1 OF 1  **Stantec**

DRILLING / INSTALLATION:  
 STARTED **4/27/15** COMPLETED: **4/27/15**  
 DRILLING COMPANY:  
 DRILLING EQUIPMENT: **Auger, Shovel**  
 DRILLING METHOD:  
 SAMPLING EQUIPMENT: **Grab**

NORTHING (ft):  
 LAT:  
 GROUND ELEV (ft):  
 INITIAL DTW (ft): **Not Encountered**  
 STATIC DTW (ft): **Not Encountered**  
 WELL CASING DIA. (in): **---**  
 LOGGED BY: **PH**

EASTING (ft):  
 LONG:  
 TOC ELEV (ft):  
 WELL DEPTH (ft): **---**  
 BOREHOLE DEPTH (ft): **4.0**  
 BOREHOLE DIA. (in): **2**  
 CHECKED BY: **SC**

Depth (feet)	Graphic Log	USCS	Description	Sample	Sample Information	Measured Recov. (feet)	Blow Count	Headspace FID/PID (PPM)	Depth (feet)
			Topsoil/Forest Duff						
		SM	SM; Loose to medium dense, silty-fine to medium grained sand with gravel, yellowish brown, moist. (Weathered Glacial Till)						
									
			Borehole terminated at 4 feet.						
5									

PROJECT: **Coal Creek Park Mitigation**  
 LOCATION: **Bellevue, Washington**  
 PROJECT NUMBER: **185750351**

DRILLING / INSTALLATION:  
 STARTED **4/27/15** COMPLETED: **4/27/15**  
 DRILLING COMPANY:  
 DRILLING EQUIPMENT: **Auger, Shovel**  
 DRILLING METHOD:  
 SAMPLING EQUIPMENT: **Grab**

WELL / PROBEHOLE / BOREHOLE NO  
**HB-3** PAGE 1 OF 1  **Stantec**

NORTHING (ft):  
 LAT:  
 GROUND ELEV (ft):  
 INITIAL DTW (ft): **Not Encountered**  
 STATIC DTW (ft): **Not Encountered**  
 WELL CASING DIA. (in): ---  
 LOGGED BY: **PH**

EASTING (ft):  
 LONG:  
 TOC ELEV (ft):  
 WELL DEPTH (ft): ---  
 BOREHOLE DEPTH (ft): **3.5**  
 BOREHOLE DIA. (in): **2**  
 CHECKED BY: **SC**

Depth (feet)	Graphic Log	USCS	Description	Sample	Sample Information	Measured Recov. (feet)	Blow Count	Headspace FID/PID (PPM)	Depth (feet)
			Topsoil/Forest Duff						
		SM	SM; Loose to medium dense, silty-fine to medium grained sand with gravel, yellowish brown, moist. (Weathered Glacial Till)						
			Borehole terminated at 3.5 feet.						

GEO FORM 304 LESSING.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 6/18/15

PROJECT: <b>Coal Creek Park Mitigation</b> LOCATION: <b>Bellevue, Washington</b> PROJECT NUMBER: <b>185750351</b>	WELL / PROBEHOLE / BOREHOLE NO <b>HB-4</b> PAGE 1 OF 1	 <b>Stantec</b>
DRILLING / INSTALLATION: STARTED <b>4/27/15</b> COMPLETED: <b>4/27/15</b> DRILLING COMPANY: DRILLING EQUIPMENT: <b>Auger, Shovel</b> DRILLING METHOD: SAMPLING EQUIPMENT: <b>Grab</b>	NORTHING (ft): LAT: GROUND ELEV (ft): INITIAL DTW (ft): <b>Not Encountered</b> STATIC DTW (ft): <b>Not Encountered</b> WELL CASING DIA. (in): --- LOGGED BY: <b>PH</b>	EASTING (ft): LONG: TOC ELEV (ft): WELL DEPTH (ft): --- BOREHOLE DEPTH (ft): <b>4.5</b> BOREHOLE DIA. (in): <b>2</b> CHECKED BY: <b>SC</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Sample Information	Measured Recov. (feet)	Blow Count	Headspace FID/PID (PPM)	Depth (feet)
		SM	SM; Loose, silty-fine to medium grained sand with gravel and roots, yellowish brown, moist. (Fill)						
		SM	SM; Medium dense, silty-fine to medium grained sand with gravel, yellowish brown, moist. (Weathered Glacial Till)						

Borehole terminated at 4.5 feet.

5

