City of Bellevue
Department of Planning & Community Development
Land Use Division Staff Report

Proposal Name:	W & H House Critical Areas Permit
Proposal Address:	3608 Bellevue - Redmond Road
Proposal Description:	This is an application for a Critical Areas Land Use Permit to reduce the required 50-foot buffer from a Geologic Hazard Area (steep slope) by 20 feet to a total of 30 feet. The proposed work is associated with the construction of a single family home and the expansion of an existing driveway. The driveway expansion is proposed as an alternative to a separate driveway that would otherwise bisect the critical slope and eliminate habitat. In addition, small areas of unconsolidated fill at the top-of-slope may be removed and replaced with engineered fill to stabilize the slope.
File Number:	07-111307 LO
Applicant:	David Tzu-Hsiu Huang
Decisions Included:	Critical Areas Land Use Permit (Process II- LUC 20.30P)
Planner:	**Michael Paine, Environmental Planning Manager**
State Environmental Policy Act Threshold Determination:	Carol V. Helland, Environmental Coordinator Department of Planning and Community Development
Director's Decision:	**Approval with Conditions** Matthew A. Terry, Director Department of Planning and Community Development

Application Date:	03/21/2007
Notice of Application:	05/03/2007
Decision Publication Date:	05/22/2008
Appeal Deadline:	**06/05/2008**

For information on how to appeal a proposal, visit the Permit Center at City Hall or call (425) 452-6864 [TTY (425) 452-4636]. Appeal of the Decision must be made with the City Clerk by 5 PM on the date noted for appeal of the decision.

I. Background

A. Site Description :

The W & H property is located at 3608 Bel-Red Road and is situated in the northeast portion of Bellevue. (The new parcel is the result of previous parcel segregation of the parcel at 3610 Bel-Red Road.) The site is zoned single-family residential at a density of five units per acre. The site sits directly east of Bel-Red Road and abuts City of Redmond right-of-way. The site is large (46,648 square feet) and consists of a flat bench constrained by a steep and continuous slope of between 10 to 24 feet that runs southwest to northeast along the western edge of the property. Slopes in excess of 40 percent occur throughout, with some areas up to 90 percent slope. The slope is forested and dominated by a mixed coniferous and deciduous tree stand. Some trees are over 100 feet in height.

Primary access to site is via an existing gravel driveway in an easement extending northeast from Bel-Red Road. This driveway follows the toe of the critical slope and wraps around to the east near the northerly property boundary where it provides access to several residential lots. Abutting this driveway to the north is a Type N stream that parallels Bel-Red Road within the City of Redmond. The site has been modified, probably in association with the development of the single family residence on the adjacent lot to the east. Geotechnical investigation revealed some areas of unconsolidated fill at the top of the critical slope. Vehicle access to the site is proposed via a shared access drive from the north that parallels the top-of-slope. It terminates in a parking area providing direct access to the garage on the northeast side of the proposed residence.

Figure 1: Site location with slopes and Type N stream visible

B. Project Description

The applicant is proposing to build a 4,900 square foot residence with accompanying shared driveway and vehicle turnaround. As a consequence, she is asking to reduce the required 50-foot buffer from a Geologic Hazard Area by 20 feet to a total of 30 feet abutting the proposed residence. To further reduce the impact to the buffer area, the applicant is proposing to take advantage of 20.25H.040.B by reducing the required 20-foot front yard setback to 15 feet. In addition, the proposal includes removal of between three and nine feet of undocumented fill near the top of the slope should construction safety warrant it.

C. Need for Modification

Currently, this site is undeveloped. The applicant is proposing to build a new single family residence with attached garage. As part of the proposal, the applicant is asking that the buffer from the top-of-slope be reduced to 30 feet and that she be granted permission to remove unstable fill near at the top of slope. This modification will permit construction of a larger home while enhancing the stability of the slope. More importantly, these changes result in the design of a shared driveway from the north rather than construction of a new driveway up the steepest part of the slope. This is highly beneficial since the slope is heavily vegetated and likely provides habitat associated with species of local importance.

II. Site Description and Context

A. Critical Areas:

Steep Slopes: Steep Slopes are defined by the City of Bellevue Land Use Code as those areas with slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area. The subject site contains an area of regulated slope of more than 15,000 square feet within the property boundaries that runs southwest to northeast along the west property boundary.

Habitat Associated with Species of Local Importance: The steep slope and parts of the associated buffer are dominated by a mixed coniferous and deciduous tree stand with canopy coverage of roughly 70 to 90 percent. The understory is compromised of mostly native species dominated by salal (Gaultheria shallon), sword fern (Plystichum munitum) and Indian plum (Oemleria cerasiformis). Several large trees are wrapped in nonnative English ivy. Species of local importance most likely associated with this site are pileated woodpeck, Vaux's swift and Western big-eared bat. Each of these species is common in western Washington and prefers similar habitat types, including mature forests conditions like the stand found on this site. The survey completed by the applicant's biologist confirmed use of the site by pileated woodpecker (see attached habitat assessment) but concluded that conditions necessary for nesting probably do not exist. The determination was made based on the lack of available snags for roosting and nesting on the site, the relatively small size of the forest patch and the location near Bel-Red Road. However, the absence of snags is not determinative as new evidence suggests decadent trees are equally important in maintaining pileated woodpeckers. In a recent study on the west

side, pileated wookpeckers used snags and decadent trees equally for nesting (see PNW Research Station, October 2003.)

III. State Environmental Policy Act (SEPA)

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. The Environmental Checklist submitted with the application adequately discloses expected environmental impacts associated with the project. The City codes and requirements, including the Clear and Grade Code, Utility Code, Land Use Code, Noise Ordinance, Building Code and other construction codes are expected to mitigate potential environmental impacts. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under the State Environmental Policy Act (SEPA) requirements.

A. Earth and Water

According to the geotechnical report, the core of the hillside is composed of dense glacial soils and the site is underlain by dense glacial till or highly glacially consolidated transitional beds at shallow depths. Some fill exists at the top of slope and the report recommends that a portion of it be excavated and replaced with structural fill and revegetated. Impacts from erosion due to construction can be mitigated using best management practices outlined in the clearing and grading code (B.C.C. 23.76). A temporary erosion and sedimentation control plan will be required for the associated clearing and grading permit. Erosion and sediment control best management practices will include, but are not limited to the installation of silt fencing, site runoff control, catch basin inserts, straw bales, check dams, and covered stockpiles. The applicant will also be required to submit information regarding the use of pesticides, insecticides, and fertilizers to avoid impacts to water resources. See Section X for related conditions of approval.

B. Animals

The stream is wholly in Redmond and flows northeasterly toward Lake Sammamish. It has been highly modified as a result of past development and does not support salmonids at this point.

According to the supporting Habitat Assessment Report, dated November 13, 2006 and prepared by ESA Adolfson Associates, Inc., a range of species exist on or use the site. See discussion above under *Species of Local Importance* for details.

C. Impacts to Habitat

The steep slope and parts of the associated buffer are dominated by a mixed coniferous and deciduous tree stand with canopy coverage of roughly 70 to 90 percent. The understory is compromised of mostly native species dominated by salal (Gaultheria shallon), sword fern (Plystichum munitum) and Indian plum (Oemleria cerasiformis). The majority of the steep slope and buffer area is preserved under this proposal and set aside and will not be disturbed as part of this approval. Those habitat functions of trees that will be removed in the vicinity of the driveway or residence will be partially mitigated by replanting additional trees in

designated mitigation area on the southwest corner of the site. The proposed planting plan, based on the appropriate planting template from the Critical Areas Handbook, must be submitted with the building permit application and will be reviewed at that time. See Section X for a related condition of approval.

IV. Consistency with Land Use Code Requirements

A. Zoning District Dimensional Requirements

The site is located in the R-5 zoning district. The location of the proposed residence must meet all applicable dimensional requirements contained within Land Use Code 20.20.010 except as modified by 20.25H.040.B. In this case, the front yard setback was established at the point the access easement crosses the south property line, making the north property line the rear and the east and west property lines side setbacks. The front setback was reduced five feet in accordance with 20.25H.040.B thereby reducing the impact on the critical area buffer that otherwise would occur due to the existing shared driveway access and alignment.

B. Critical Areas Requirements

The City of Bellevue Land Use Code (Section 20.25H.025) designates slopes of 40 percent or more as geological hazard areas. The creation of a driveway and turnaround associated with this application is an allowed activity identified by LUC 20.25H.055.B under the category of "New or expanded public rights-of-way, private roads, access easements and driveways". As an allowed activity, the proposed development must meet the requirements identified in LUC 20.25H.055.C.2. LUC 20.25H.125 establishes performance standards for new or expanded development within landslide hazard areas or steep slope critical area and critical area buffer.

Any proposal to modify the steep slope buffers must be considered through a critical areas report as outline at LUC 20.25H.230.

V. Consistency with Land Use Code Critical Areas Performance Standards:

A. Consistency with LUC 20.25H.055.C.2

New and Expanded Uses or Development

a. New or expanded facilities and systems are allowed within the critical area or critical area buffer only where no technically feasible alternative with less impact on the critical area or critical area buffer exists;

The applicant removed the driveway from the steep slope and negotiated a shared access with the abutting property owner. As a consequence the driveway turnaround intrudes into the steep slope buffer up to 25 feet in some places but avoids the slope entirely. This solution complies with the performance standards

at LUC 20.25.055.C.2.b as well.

Finding: As discussed in detail above, the proposal is consistent with the performance standards of LUC 20.25H.055.C.2.

B. Consistency with LUC 20.25H.125

Performance standards – Landslide hazards and steep slopes

In addition to generally applicable performance standards set forth above, development within a steep slope critical area or critical area buffer must incorporate additional performance standards as outlined below. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function. The following standards apply to the proposed development:

a. Structures and improvements shall be located to preserve the most critical portion of the site and the natural landforms and vegetation.

As discussed above, the applicant modified his design to route the proposed driveway around the steep slope, thereby eliminating any disturbance of the slope itself and its associated habitat. However, the driveway will intrude on the outside edge of the critical area buffer disturbing as a consequence existing lawn and requiring removal of a few large fir trees. Likewise the house is set no closer than 30 feet from the slope, a location that consciously protects the slope and the majority of the buffer while ensuring long-term safety of the residence. At least four large habitat trees will be lost as a result of construction, but additional planting in a designated mitigation area will remedy that loss over time.

b. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer.

See discussion above. The applicant is requesting only a 20-foot reduction in the critical area buffer and only to accommodate the proposed structure. There is no impervious surface proposed for the critical area. A portion of the new driveway and associated turnaround is located in the buffer but the impact is relatively limited and is the minimum necessary to satisfy codes and standards.

c. 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.

The applicant will determine all areas of temporary and permanent disturbance and submit final landscape plans with the building permit sufficient to mitigate the identified impacts to the buffer. See Section X for a related condition of approval.

VII. Public Notice and Comment

Application Date:	March 21, 2007
Public Notice (500 feet):	May 3, 2007
Minimum Comment Period:	May 17, 2007 (14-days)

The Notice of Application for this project was published in the Seattle Times and the City of Bellevue weekly permit bulletin on March 21, 2007. It was mailed to property owners within 500 feet of the project site. Two comments were received from a nearby property owner specific to the shared access driveway from Bel-Red Road. The first concern had to do with the maintaining clear and unhindered access along the driveway during construction. The second issue had to do with maintenance of the gravel drive, especially during the time that the home is under construction. See Section X for a related condition of approval.

VIII. Decision Criteria

The proposal, as conditioned below, meets the applicable regulations and decision criteria for a Critical Areas Report pursuant to LUC Section 20.25H.255 and Critical Areas Land Use Permit pursuant to LUC Section 20.30P.

A. Critical Areas Report – Decision Criteria – LUC 20.25H.255

a. The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in overall critical area or critical area buffer functions;

Finding: The proposal includes a requirement for a restoration plan which should provide a net gain in critical area function with the removal of invasive species and additional planting with appropriate native species. Moreover, the design avoids placing an intrusive driveway through the critical slope and associated habitat as might otherwise have been allowed under 20.25.H.055.

b. The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in the most important critical area or critical area buffer functions to the ecosystem in which they exist;

Finding: Construction will result in the removal of some of the largest conifers on the site but this impact is offset via restoration of the buffer and ivy removal and enhancement of the habitat on the steep slope. Removal of invasive species and planting with appropriate native species will improve the ability of the remaining block of habitat to support species of local importance over time.

c. The proposal includes a net gain in stormwater quality function by the critical area buffer or by elements of the development proposal outside of the reduced regulated critical area buffer;

Finding: Planting of portions of the buffer with conifers and other species will enhance the ability of the buffer to provide additional stormwater quality function. Optional development of additional water quality treatment in the form of low impact development swales and rain gardens would further make up for the lost hydrologic value of the large firs within the buffer.

d. Adequate resources to ensure completion of any required restoration, mitigation and monitoring efforts;

Finding: The property owner has demonstrated she has adequate resources to complete the required mitigation and monitoring efforts.

e. The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and

Finding: No detrimental impacts to the functions and values of critical areas and critical area buffers off-site are expected from this proposal. The relocation of the driveway outside the critical area greatly reduced the potential impact of the proposal

f. The resulting development is compatible with other uses and development in the same land use district.

Finding: The modest buffer modification and allowance, under 20.25H.055, for the access driveway in the buffer is compatible with other uses and development

in the R-5 zoning district.

B. Critical Areas Land Use Permit – Decision Criteria – LUC 20.30P

a. The proposal obtains all other permits required by the Land Use Code;

Finding: The applicant must obtain approval of Demolition, Clearing and Grading, and building permits to complete this proposal.

b. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;

Finding: The proposal has been designed to limit disturbance outside of the immediate work area. The reliance on a shared driveway makes building a new driveway up the steep slope unnecessary. Similarly, the intrusion into the critical slope buffer is modest and the project is designed to not have an adverse affect on stream flows and volumes.

a. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and ;

Finding: As discussed in Section V of this report, the proposal meets the performance standards of LUC Section LUC 20.25H.055.C.2, (new or expanded developments within the critical area or critical area buffer) and is not subject to LUC 20.25H.080.A, performance standards for Type S and F streams.

b. The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;

Finding: Adequate public facilities are available to the site.

c. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and

Finding: The proposed buffer enhancement plan based on the City of Bellevue Critical Area templates provides mitigation consistent with the requirements of LUC 20.25H.210.

d. The proposal complies with other applicable requirements of this code.

Finding: As discussed in Section IV & V of this report, the proposal complies with all

other applicable requirements of the Land Use Code.

IX. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including Land Use Code consistency, SEPA, City Code and Standard compliance reviews, the Director of Planning and Community Development does hereby **approve with conditions** the proposal to modify the buffer from the critical slope and to locate a portion of the driveway in the buffer.

Note: Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Clearing and Grading Permit or other necessary development permits within one year of the effective date of the approval.

X. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

Applicable Ordinances	Contact Person
Clearing and Grading Code- BCC 23.76	Tom McFarlane, 425-452-5207
Land Use Code- LUC 20.25H	Michael Paine, 425-452-2729
Noise Control- BCC 9.18	Michael Paine, 425-452-2729

The following conditions are imposed under the Bellevue City Code or SEPA authority referenced:

1. **Mitigation Plan and Monitoring:** To mitigate permanent and temporary disturbance impacts resulting from location and construction of the proposed residence, location of the driveway in the critical area buffer and excavation of unconsolidated fill, the applicant must prepare a buffer and critical area preservation and restoration plan, based on the Critical Area Notebook planting templates, for final review and approval with the associated building permit for this proposal. The mitigation plan must offset the loss of mature vegetative canopy that existed within the buffer so as to produce a net benefit on the site. Maintenance and contingency measures contained in the Critical Area Notebook must be included as part of the mitigation plan. Any modifications to this plan must be submitted for review and approval by the City prior to commencing any work. Demonstration that performance standards are being met must be provided in the form of a monitoring report submitted to the Planning and Community Development Department on a yearly basis for a period of three years following installation.

Authority: Land Use Code 20.25H.220.H
Reviewer: Michael Paine, Planning and Community Development Dept

2. **Excavation of Unconsolidated Fill:** Excavation of any unconsolidated fill shall be limited to the smallest amount necessary to ensure safety of the primary structure. To ensure that this excavation is carried out with the minimum damage to the critical slope and associated habitat, applicant's geotechnical engineer shall submit a detailed plan of the proposed excavation and the subsequent stabilization with engineered fill with the building permit. Prior to beginning this work, the geotechnical engineer shall mark in the field the excavation boundaries and the contractor shall ensure the area is carefully marked and fenced to ensure that further damage to critical area functions does not occur. The geotechnical engineer shall monitor construction in the field. The area must be restored per the requirements in Condition 1.

Authority: Land Use Code 20.25H.
Reviewer: Michael Paine, Planning and Community Development Dept

3. **Rainy Season restrictions:** Due to the presence of a critical area, no clearing and grading activity may occur during the rainy season, which is defined as November 1 through April 30 without written authorization of the Planning and Community Development Department. Should approval be granted for work during the rainy season, increased erosion and sedimentation measures, representing the best available technology must be implemented prior to beginning or resuming site work.

Authority: Bellevue City Code 23.76.093.A,
Reviewer: Tom McFarlane, Planning and Community Development Dept

4. **Pesticides, Insecticides, and Fertilizers:** The applicant must submit as part of the required mitigation plan a description of how pesticides, insecticides, and fertilizers will be used on the site in accordance with the City of Bellevue's "Environmental Best Management Practices."

Authority: Land Use Code 20.25H.220.H
Reviewer: Michael Paine, Planning and Community Development Dept

5. **Noise Control:** Noise related to construction is exempt from the provisions of BCC 9.18 between the hours of 7 am to 6 pm Monday through Friday and 9 am to 6 pm on Saturdays, except for Federal holidays and as further defined by the Bellevue City Code. Noise emanating from construction is prohibited on Sundays or legal holidays unless expanded hours of operation are specifically authorized in advance. Requests for construction hour extension must be done in advance with submittal of a construction noise expanded exempt hours permit.

Authority: Bellevue City Code 9.18
Reviewer: Michael Paine, Planning and Community Development Dept

6. **Tree Protection**

To mitigate adverse impacts to trees to be retained during construction:

a. Clearing limits shall be established at the limit of nondisturbed areas and for retained trees within the developed portion of the site, outside of drip lines. Six-foot chain link fencing with driven posts, or an approved alternative, shall be installed at the clearing limits prior to initiation of any clearing and grading.

b. No excavation or clearing should be performed within drip lines of retained trees except as specifically approved on plans. All such work shall be done by hand to avoid damage to roots and shall be done under the supervision of an arborist approved by the city.

Authority: Land Use Code 20.25H.220 and Bellevue City Code 23.76.060
Reviewer: Michael Paine, Planning and Community Development Department

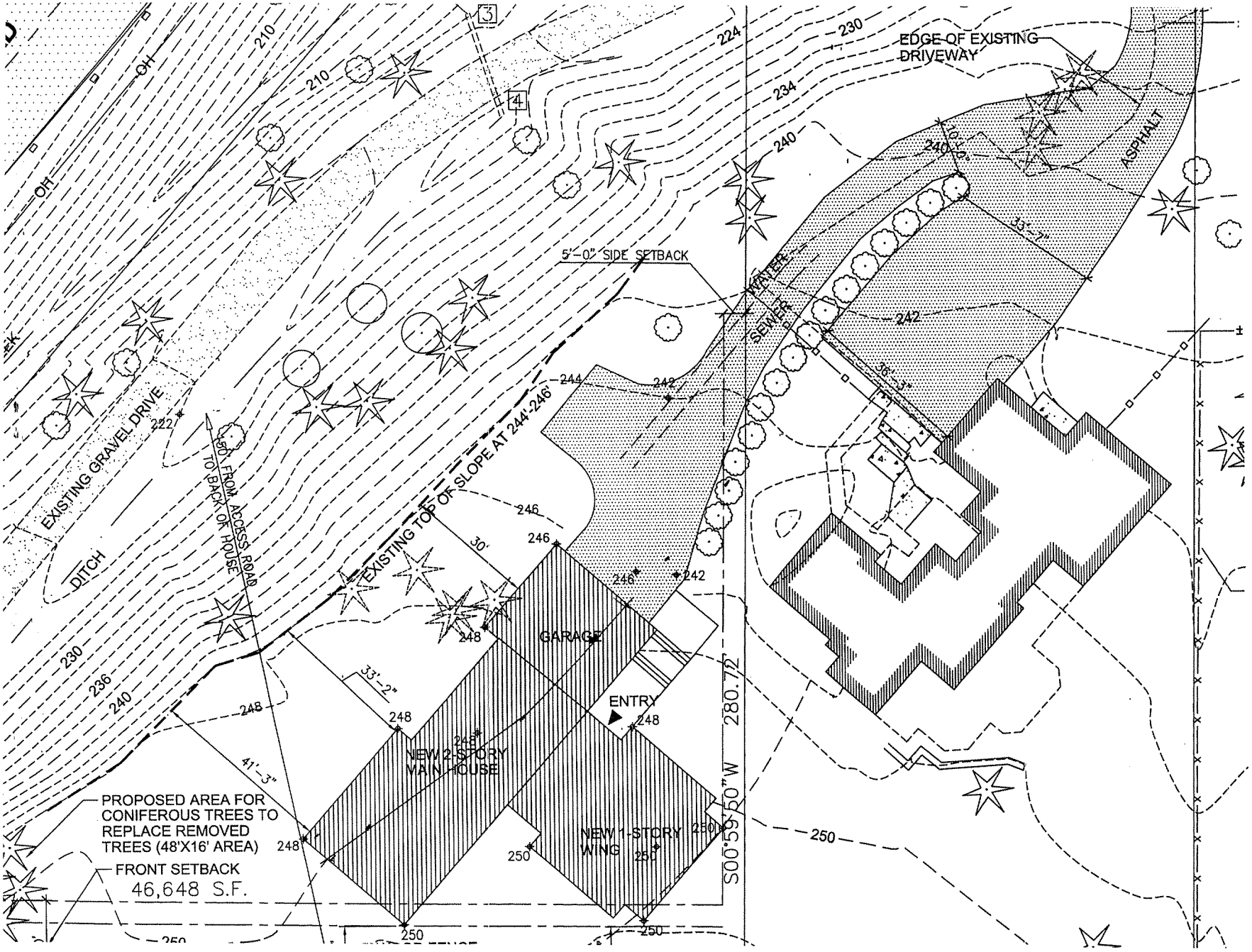
7. **Easement Protection during Construction**: To mitigate potential obstruction of the narrow easement by construction vehicles, the applicant shall guarantee open and unhindered access along the easement sufficient to ensure unimpeded access by fire and emergency apparatus during the construction of the proposed residence. The applicant shall submit a parking management plan to ensure adequate construction parking exists without impeding the easement.

Authority: Bellevue City Code 23.11.503.4
Reviewer: Adrian Jones, Fire Plans Examiner

XI. Attachments

1. Site Plan

2. Environmental Checklist
3. Habitat Assessment by ESA Adolfson
4. Geotechnical Report by Cornerstone Geotechnical



PARCEL A:

THAT PORTION OF THE NORTH
TOWNSHIP 25 NORTH, RANGE 5

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THENCE NORTH 88°24'39" WES
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THENCE NORTH 88°24'39" WES
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9606269002.

PARCEL C:

EASEMENT FOR INGRESS, EGRES
20050909001218.

NOTE:

PLEASE REFER TO GEODATUM
UPDATED SURVEY OF EXISTIN

STEEP SLOPE AREA:
27,935 SF
(INDICATED BY SHADED AREA)

City of Bellevue Submittal Requirements | 27a

ENVIRONMENTAL CHECKLIST

4/18/02

If you need assistance in completing the checklist or have any questions regarding the environmental review process, please visit or call the Permit Center (425-452-6864) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Our TTY number is 425-452-4636.

BACKGROUND INFORMATION

Property Owner: SOPHIA WONG, W & H LLC

Proponent:

Contact Person: DAVID HUANG, 206-713-1823
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Address: 2414 1ST AVE #705, SEATTLE WA 98121

Phone:

Proposal Title: W & H HOUSE

Proposal Location: 3608 BELLEVUE-REDMOND ROAD
(Street address and nearest cross street or intersection) Provide a legal description if available.

Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site. PLEASE SEE GEOTECH REPORT. FIG. 1

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

1. General description: ~~NEW construction of 6500 SF HOUSE and~~ new driveway through geohazard slope
2. Acreage of site: 1 ACRE
3. Number of dwelling units/buildings to be demolished: NONE
4. Number of dwelling units/buildings to be constructed: 1
5. Square footage of buildings to be demolished: N/A
6. Square footage of buildings to be constructed: 6500 SF
7. Quantity of earth movement (in cubic yards): 1225 CUBIC YARDS
8. Proposed land use: NEW DRIVEWAY & ~~NEW 2 STOREY HOUSE~~
9. Design features, including building height, number of stories and proposed exterior materials: 30' Building height, 2 stories, stucco exterior walls
10. Other

4/23/07

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

Completion December 2007

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

No

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

- Geotechnical Report } attached
- Habitat Assessment

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.

- Land use (Critical Areas)
- Building Permit

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. 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)? 40%

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.

- soft – medium stiff silt, gravel, organics and gravel.
- areas of slope have fill materials (See geotechnical Report)

HNI 4/20/07

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

No

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

No filling. Propose to remove existing fill in areas, see site plan

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

No

Includes work addressed by BC 23.76

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

17% - 20%

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

retaining rockeries along driveway, drainage swales and subsurface drainage pipes to direct water to storm drain

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.

During construction: general construction vehicles.

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

no

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

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

yes Stream Type N on site

mod 4/20/17

appropriate, state what stream or river it flows into.

(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.

N/A

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

N/A

(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.

N/A

4/23/07

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.

runoff along driveway will be directed to the creek along NW side of site.

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

NO

impact may be addressed using ESC measures

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

- proposing to use pervious material for driveway. (Gravel or brick/tile systems)

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?

- 22 trees will be removed.
- shrubs removed along driveway

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

NONE - SEE habitat assessment

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

4/23/07

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:~~ squirrels

☐ Fish: bass, salmon, trout, herring, shellfish, other:

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

N/A

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

NO

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

N/A

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.

ELECTRIC

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

4/23/07

b. Noise

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

N/A

(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.

N/A

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

N/A

8. Land and Shoreline Use

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

EMPTY

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

NO

c. Describe any structures on the site.

-CONCRETE PAD FOR BASKETBALL..

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

NO

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

R5

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

N/A

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.

NO

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

4-5 people

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

NONE

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

N/A

4/26/07

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

N/A

9. Housing

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

~~unit~~ N/A

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

N/A

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?

30', stucco

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?

lighting for driveway at night

b. Could light or glare from the finished project be a safety hazard or interfere with views?

NO

4/23/07

c. What existing off-site sources of light or glare may affect your proposal?

N/A

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?

N/A

b. Would the proposed project displace any existing recreational uses? If so, describe.

N/A

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.

NO

b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.

N/A

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.

BEL-RED ROAD TO THE NORTH. THERE IS AN EXISTING ACCESS ROAD ALONG BEL-RED. PROPOSE TO ADD DRIVEWAY UP THE SLOPE

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

BUS STOPS ALONG BEL-RED.

c. How many parking spaces would be completed project have? How many would the project eliminate?

ADDITIONAL OF 3 PARKING SPACES

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

MW 4/23/07

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

3-4 trips

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.

N/A

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.

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.

- need to connect to sewer / water through neighbor's easement.

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.....

Date Submitted.....1/8/2007

4/23/07

November 13, 2006

David Pyle
City of Bellevue
Planning and Community Development
PO Box 90012
Bellevue, WA 98009-9012
Phone: (425) 452-2973

Subject: Habitat Assessment Report for ~~3610~~ 3600 Bell-Red Road, Bellevue, Washington

Dear Mr. Pyle,

ESA Adolfson Associates, Inc. (Adolfson) is pleased to present this habitat assessment report as requested by your architect, David Huang, for the City of Bellevue permit review. The proposed project is for a singe family residence. The site, approximately one-acre in size (46,222 square feet), is located at 3610 Bell-Red Road (parcel no. 2425059176). The site is mostly forested and includes a steep slope (> 40%) and gravel drive.

The slope on the site meets the definition of a steep slope critical area for the City of Bellevue (BCC 20.25H.120(A)(2)). The critical area requirements for steep slopes limits development activity near the slope, requiring a buffer of 50 feet measured from the top of the slope (BCC 20.25H.120(B)). You have requested permission from the City of Bellevue to reduce the extent of the critical area buffer, triggering the requirement for a Critical Area Report that includes the geotechnical and habitat-assessment of the site conditions (BCC 20.25H.230).

The Habitat Assessment Report provided here is consistent with the requirements outlined in BCC 20.25H.165 and BCC 20.25H.250, and meets the criteria listed in 20.25H.145 by providing (1) a detailed description of vegetation on and adjacent to the site, (2) an examination of species of local importance that have a primary association with the habitat on and adjacent to the site, and (3) an assessment of potential project impacts of any habitat with primary association to species of local importance.

The information in this report is generated from materials provided to us from our client, Mr. Huang, and a site visit conducted on October 31, 2006 by ESA Adolfson biologists Linda Krippner and Ken Yocom.

If you have any questions or comments, or if you need any additional information, please contact either Linda or myself at (206) 789-9658.

Sincerely,

Ken Yocom
Senior Associate

Habitat Assessment Report

Site Location

The site is located at 3610 Bellevue-Redmond Road, Bellevue, Washington 98008-6132.

Site Description

The parcel is roughly one-acre in size (46,222 square feet), the majority of which is a forested northwest-facing slope overlooking Bellevue-Redmond Road. An approximately 15-foot wide gravel drive bisects the site along the slope providing access to several neighboring single-family residences. The proposed building site is located at the top of the slope in the southeast corner of the parcel (see Figure 1: Project Vicinity).

There is a small stream at the base of the slope that flows to the northeast eventually discharging into Lake Sammamish. The active channel width (ACW) of the stream on the site ranges from 4 to 8 feet, with sediment dominated by small cobbles and gravel. The flow conditions on the day of the site visit on October 31, 2006 were low, less than 1 cubic feet per second (cfs). However, recent erosion scarring along the stream banks shows that the flow of the stream is variable, likely supplemented by stormwater generated from Bellevue-Redmond Road.

The top of the slope gradually rises from the north end of the site to the south (see Images 1, 2, and 3). There is an existing concrete slab (basketball court) on the property surrounded by a lawn understory extending to the top of the slope (see Image 2). A stand of mature coniferous trees is growing on the leveled area at the top of the slope. The largest of these trees is a roughly 160-foot tall Douglas fir (*Pseudotsuga menziesii*) with a DBH (diameter at breast height) of 43 inches (see Images 1 and 2).

The steep slope is forested, dominated by a mixed coniferous and deciduous tree stand with an estimated canopy cover ranging from 70% to 90% (see Image 4 and Table 1: Dominant Plant Species). A single snag (standing dead tree) was found near the creek along the northern edge of the site. There were no other snags found on the site. The understory is comprised mostly of native species dominated by salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), and Indian plum (*Oemleria cerasiformis*). Several of the large trees (both coniferous and deciduous) on the slope have non-native English ivy (*Hedera helix*) wrapping the trunk. The ivy may eventually cause a decline in the health and overall stability of the tree creating a possibly hazardous situation on a steep slope.

Table 1: Dominant plant species on the northwest-facing slope

Trees:
- Douglas fir (*Pseudotsuga menziesii*)
- Big-leaf maple (*Acer macrophyllum*)
- Black cottonwood (*Populus balsamifera*)

Understory:
- Salmonberry (*Rubus spectabilis*)
- Indian plum (*Oemleria cerasiformis*)
- Beaked hazelnut (*Corylus cornuta*)
- Bracken fern (*Pteridium aquilinum*)
- Sword fern (*Polystichum munitum*)
- Salal (*Gaultheria shallon*)
- Trailing blackberry (*Rubus ursinus*)
- Oregon grape (*Berberis aquifolium*)

Invasives:
- Himalayan blackberry (*Rubus discolor*)
- English holly (*Ilex aquifolium*)
- English ivy (*Hedera helix*)

Identified using Hitchcock and Cronquist (1973)

Species of Local Importance

The species of local importance, as defined by BCC 20.25H.150, most likely to be associated with this site are the pileated woodpecker (*Dryocopus pileatus*), the Vaux's swift (*Chaetura vauxi*), and the Western big-eared bat (*Plecotus townsendii*). Each of these species is common in western Washington, and prefer similar habitat types, including mature forests conditions like the stand found on this site. Each also utilize snags (dead-standing trees) common to these forest habitat types for nesting and roosting, while the woodpecker also uses snags for foraging purposes.

Although our survey does confirm past use of the site by the pileated woodpecker for foraging purposes we do not feel that the site provides the habitat conditions necessary for nesting, and is thus not considered an area of primary habitat association for these species as determined by the Washington Department of Fish & Wildlife (WDFW, 2003). This determination was made based on the lack of available snags for roosting and nesting on the site, the small size and condition of the forested patch, and the location of the site next to Bell-Red Road. However, several wildlife species were observed during the site visit (see Table 2).

Table 2: Wildlife species observed during site visit, October 31, 2006

Mammals:

- Eastern gray squirrel (*Sciurus carolinensis*)

Birds:

- Stellars jay (*Cyanocitta stelleri*)
- Northern flicker (*Colaptes auratus*)
- Song sparrow (*Melospiza melodia*)
- Black-capped chickadee (*Poecile atricapillus*)
- Gold-crowned kinglet (*Regulus satrapa*)
- American robin (*Turdus migratorius*)

Identified using Ingles (1965) and Morse et al. (2003)

In urbanizing areas, the greatest negative influence to pileated woodpeckers (*Dryocopus pileatus)* is likely the clearing of remnant forest patches. Based on research in greater Seattle, Rohila (2002) recommends the retention of large forest patches ranging in size from 7 acres to 74 acres to provide optimal conditions for nesting and foraging. Although the forested habitat on the slope and adjacent to the stream may provide potential habitat for the pileated woodpecker, the size of the stand does not meet the area requirements mentioned above. Residential development and the Bellevue-Redmond road fragment the forested conditions surrounding the parcel.

Although past foraging sign of pileated woodpeckers is present, the potential for nesting on this site is low. Square-shaped excavations into dead and decaying trees characterize evidence of pileated woodpecker use. Old foraging excavations were found in a decaying 14-inch dbh log adjacent to the stream (see Images 5 and 6). Potential nest cavities were found only in two partially dead big leaf maple trees located between Bellevue – Redmond road and the gravel road on the site. However, these cavities do not appear to be conducive to nesting as one is located in a small diameter trunk (approximately 10-inches dbh) and one opens upward, unprotected from precipitation. Old foraging sign was also present on one of these trees. No signs of recent foraging or of nesting were observed during the field survey. Based on these findings of low potential for nesting and foraging, and the small area of the stand, we have determined the site and adjacent areas do not meet the primary habitat requirements of the pileated woodpecker (WDFW, 2003).

Vaux's swifts are found at their highest densities in old-growth forested habitat, however they are also common in younger-aged open forests and suburban and urban areas (Carey, 1989). The primary limiting factor for the distribution of the Vaux's swift is the availability of nesting or roosting structures (Bull and Hohmann, 1993). Based on the size of the fragmented forest stand, the limited availability of snags and tree cavities, and the adjacency of the habitat to Bellevue-Redmond road we have determined that the site and adjacent areas do not meet the primary habitat requirements of the Vaux's Swift.

The western big-eared bat is common throughout much of western Washington, preferring lowland conifer-hardwood forest conditions (WDFW, 2005a; Johnson and Cassidy, 1997). Snags and hollow trees likely provide

potential roosting habitat for the western big-eared bat, but the limited number of snags on the site, the small area of the forested stand, and the adjacency of the site to the Bellevue-Redmond road severely limits the potential of this site as a habitat of primary association for the western big-eared bat.

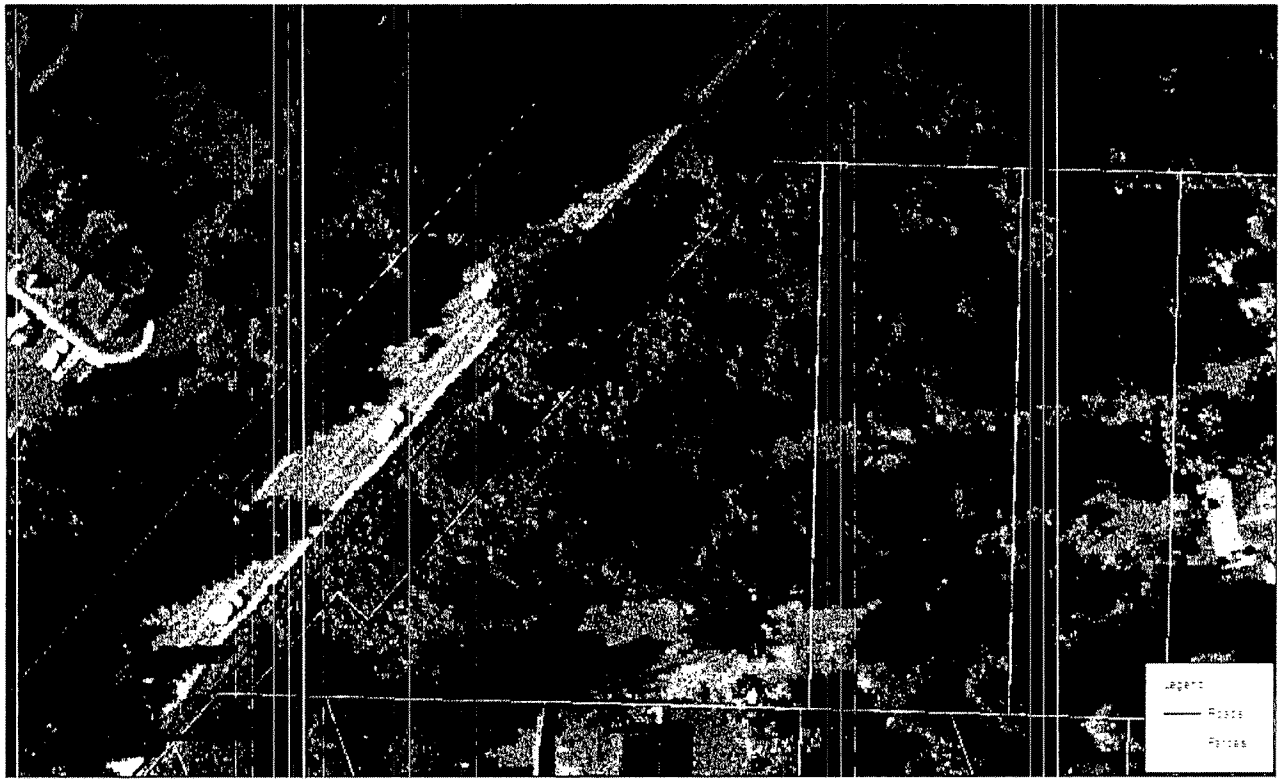
Although the mature trees on the top of the slope where the proposed development is sited are healthy, and provide habitat for a several avian species, they do not provide primary foraging or nesting habitat for local species of concern described above.

Recommendations

Based on a site-survey and the habitat requirements provided by WDFW for the species of concern, we *did not* identify any habitat of primary association. Therefore, no mitigation requirements for development on this site should be required.

Limitations

Within the limitations of schedule, budget, and scope-of-work, we warrant that this study was conducted in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time that this study was performed. The results and conclusions expressed herein represent our best professional judgment, based upon information provided by the project proponent, in addition to that obtained during the course of this assessment. No other warranty, expressed or implied, is made.



SOURCE: KING COUNTY, 2006.

Sophie Site .26117
Figure 1
Vicinity Map
Bellevue/King County, Washington

IMAGE 1: VIEW OF PROPOSED BUILDING SITE (WEST)

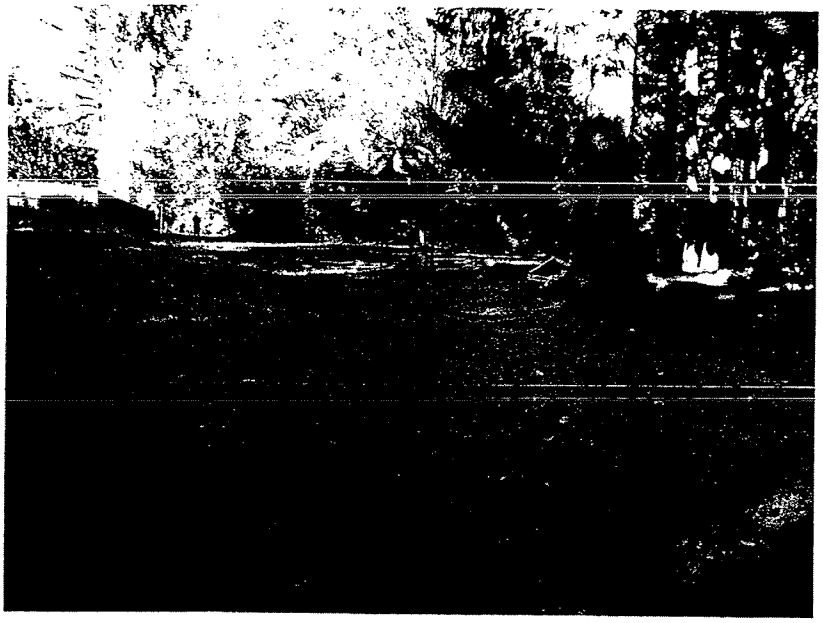


IMAGE 2: VIEW OF PROPOSED BUILDING SITE (NORTH)

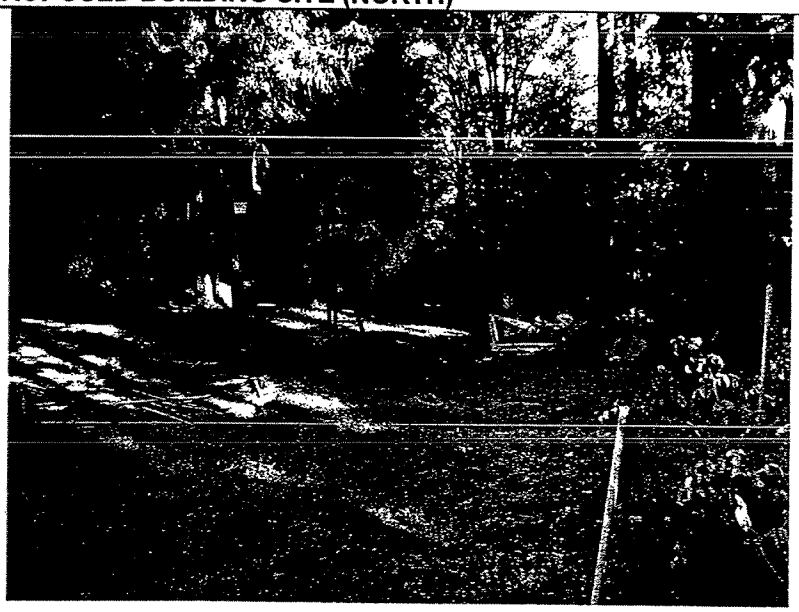


IMAGE 3: VIEW OF PROPOSED BUILDING SITE (EAST)

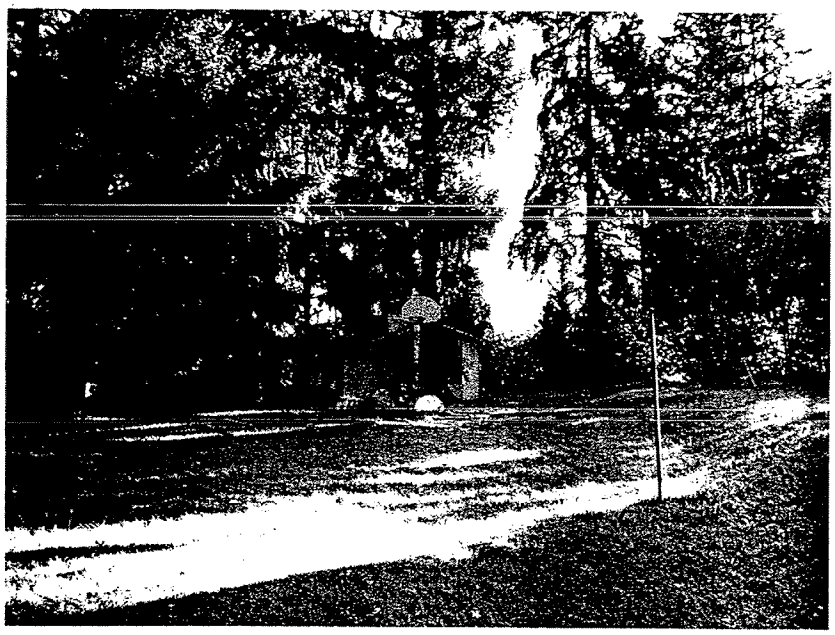


IMAGE 4: GRAVEL ROAD AND STEEP SLOPE

IMAGE 5: EVIDENCE OF PREVIOUS SITE USE BY THE PILEATED WOODPECKER

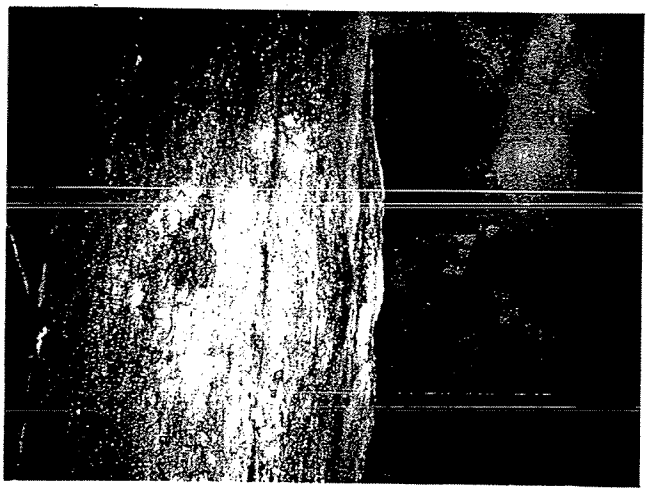
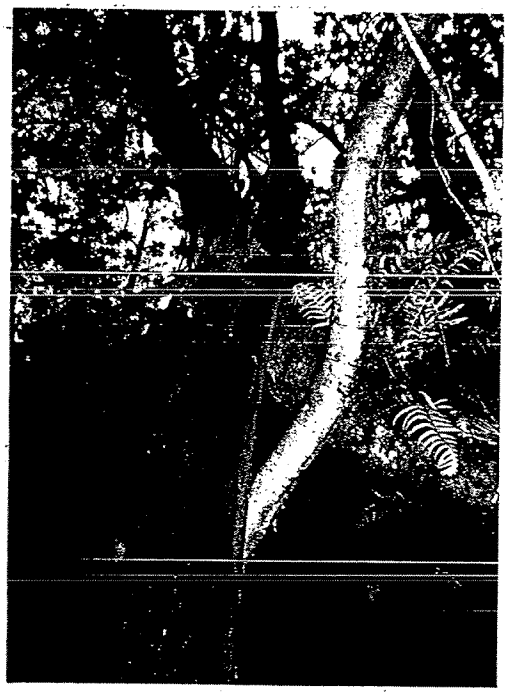


IMAGE 6: EVIDENCE OF PREVIOUS SITE USE BY THE PILEATED WOODPECKER



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Ingles, L.G. (1965) *Mammals of the Pacific States: California, Oregon, and Washington* (Stanford, CA: Stanford University Press)

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Morse, B., T. Aversa, and H. Opperman (2003) *Birds of the Puget Sound Region* (Olympia, WA: R.W. Morse Company)

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Washington Department of Fish and Wildlife (WDFW) (2005a) Washington Natural Heritage and priority Habitat and Species databases (Olympia, WA: WDFW Wildlife Program)

_____ (2005b) Priority Habitat and Species Management Recommendations, Volume V: Mammals

_____ (2003) Priority Habitat and Species Management Recommendations, Volume IV: Birds

ENVIRONMENTAL CHECKLIST

4/18/02

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 the Permit Center (425-452-6864) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Our TTY number is 425-452-4636.

INTRODUCTION

Purpose of the Checklist:

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.

Instructions for Applicants:

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.

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.

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.

Use of a Checklist for Nonproject Proposals: *A nonproject proposal includes plans, policies, and programs where actions are different or broader than a single site-specific proposal.*

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.

For nonproject actions, the references in the checklist to the words *project*, *applicant*, and *property* or *site* should be read as *proposal*, *proposer*, and *affected geographic area*, respectively.

Attach an 8 ½" x 11 vicinity map which accurately locates the proposed site.

Revised Geotechnical Engineering Report
3608 Bel-Red Road
Bellevue, Washington
For
Sophia Wong

Cornerstone
Geotechnical, Inc.

17625-130th Ave. NE, C102, Woodinville, WA 98072
Phone: 425-844-1977
Fax: 425-844-1987

March 28, 2006

Ms. Sophia Wong
W&H, LLC
6220 – 141st Ave SE
Bellevue, WA 98006

Geotechnical Engineering Report - Revised
3608 Bellevue-Redmond Road
Bellevue, Washington
CG File No. 2071.1

Dear Ms. Wong

INTRODUCTION

This report presents the results of our geotechnical engineering investigation at your proposed residential development in the Bellevue area of King County, Washington. The site is located at 3608 Bellevue-Redmond Road, as shown on the Vicinity Map in Figure 1.

You have requested that we complete this report to evaluate subsurface conditions and provide recommendations for site development. For our use in preparing this report, we have been provided with an undated site plan that shows the existing topography, structures, and pavement areas. You have requested that we evaluate the subsurface soil and ground water conditions, steep slope stability, and provide recommendation for development.

PROJECT DESCRIPTION

The project site will include the development of a single-family residence planned for the west parcel labeled "Parcel C", as shown in the Site Plan, Figure 2. We understand that the existing single-family residence, located in Parcel B, will remain and an extension of the existing driveway will continue southwest to provide access to Parcel C. We expect that the grading for both the planned residence and driveway will include minor cuts and fills. Steep slopes exist along the west portion of the site. According to the Bellevue Sensitive Area Overlay District Code 20.25H.070 and 20.25H.090, a combined 50-foot Primary Setback for Land Alteration and a 15-foot structure setback is required for development. With a geotechnical report, the Bellevue Director of Planning and Community Development may waive

or modify the Primary Setback and Structure Setback provided special mitigative measures are implemented, including compliance with all applicable standards and criteria of LUC 20.25H.110. We understand you are trying to reduce the buffer requirements in accordance with the City Code.

The construction of the single-family residence will most likely require minor grading. A significant amount of fill on this site is not recommended unless there is additional geotechnical review.

SCOPE

The purpose of this study is to explore and characterize the subsurface conditions and present recommendations for site development. Specifically, our scope of services as outlined in our Services Agreement, dated March 1, 2006, includes the following:

1. Review available geologic maps of the area.
2. Explore the subsurface conditions with a backhoe.
3. Complete a site evaluation to observe surface conditions and map the slopes at the western portion of the property.
4. Laboratory tests consisting of Direct Shear tests.
5. Provide an evaluation of the steep slope portion of the site, including stability analysis using XSTABL, a computer-based slope stability analyses tool.
6. Provide recommendations for support of the planned foundations, including recommendations for slope setbacks.
7. Provide recommendations for site preparations and grading.
8. Prepare a report summarizing our conclusions and recommendations.

SITE CONDITIONS

Surface Conditions

The roughly-triangular shaped project site is approximately 1.9 acres in size and has maximum dimensions of 406 feet in the east-west direction and 280 feet in the north-south direction. Access to the site is provided by an existing gravel driveway extending northeast from Bellevue-Redmond Road, which is on the northwest side of the site. This gravel driveway continues along the northwest portion of the site and is also used as access to other residences to the north and northwest of the site. The site is bordered

The geologic unit mapped for this area is shown on the Geologic Map of the Redmond Quadrangle, King County, Washington, by James P. Minard (U.S. Geological Society, 1988). The site is shown to be underlain by glacial till and transitional beds. Glacial till consists of an assortment of sand, silt and gravel deposited at the leading edge of the advancing glacier. Transitional beds consist of massive to bedded clay and silt with very fine sand, deposited in still to slowly moving water. The glacial till has been consolidated under the weight of the glacier and exhibits both high strength and low permeability. The transitional beds have also been consolidated under the weight of the glacier and exhibits moderate to high shear strength and low permeability. Our site explorations encountered material that we have characterized as till and transitional beds.

Explorations

Subsurface conditions were explored at the site on March 10, 2006, by excavating a total of five test pits. The test pits were excavated to depths of 4.0 to 12.5 feet below the ground surface. The explorations were located in the field by a representative from this firm who also examined the soils and geologic conditions encountered, and maintained logs of the test pits. The approximate locations of the explorations are shown on the Site Plan in Figure 2. The soils were visually classified in general accordance with the Unified Soil Classification System, a copy of which is presented as Figure 3.

Subsurface Conditions

A brief description of the conditions encountered in our explorations is included below. For a more detailed description of the soils encountered, review the Test Pit logs in Figures 4 and 5.

Test Pits 1 through 5 encountered a surficial layer of topsoil approximately 0.1 to 1.5 feet in depth. Below the topsoil in Test Pits 1, 2, and 3, we encountered soft to medium stiff, gray-brown silt with gravel, organics, and pockets of buried topsoil, to orange-brown silt with gravel and trace organics. The fill material was encountered down to depths of 3.0 to 9.0 feet below the existing ground surface.

Below the topsoil and fill in Test Pits 1 and 4, we encountered very dense, gray silty fine sand with gravel, which we interpret to be till. In Test Pit 4, the till extended to the depths explored. Underlying the till in Test Pit 1, we encountered hard, blue-gray silt with localized reddish-light brown lenses, which we interpret to be transitional beds. The transitional beds extended to the depths explored.

Below the topsoil and fill in Test Pits 2 and 3, we encountered medium dense to very dense, rust-mottled, gray-brown silty fine sand to fine sand with gravel, which we interpret to be weathered till. Below the weathered till, we encountered very dense till, which extended to the depths explored.

Below the topsoil in Test Pit 5, we encountered a thin 0.5 layer of soft to medium stiff, brown-gray silt, overlying hard transitional beds. The transitional beds extended to the depths explored.

Hydrologic Conditions

Slight ground water seepage was encountered in Test Pits 3 and 5 at depths of 5.0 feet and 1.5 feet. This water represents perched water on top of the transitional beds or till. The very dense till and hard transitional beds interpreted to underlie the site are considered poorly draining because both soils have a low permeability. During the wetter times of the year, we expect perched water conditions will occur as pockets of water on top of the silty soils, as observed during our explorations. The contact between the fill and the underlying silty soils is many times a good conduit for perched ground water. This agrees with the findings in our test pits. This upper perched water does not represent a regional ground water "table" within the upper soil horizons. Volumes of perched ground water vary depending upon the time of year and the upslope recharge conditions. We observed a consistent surficial water flow in the creek adjacent to Bellevue-Redmond Road and a small amount of water flow in a small ditch on the south side of the gravel driveway near the north end of the site. This ditch drains southwest and flows under the gravel driveway via a cross culvert which outfalls into the creek. No other concentrated surficial flow was observed on site.

Direct Shear Tests (ASTM D3080)

Direct shear tests were completed on remolded bulk samples of the existing fill in order to evaluate the soil strengths. The tests were performed with a constant-shear rate direct-shear machine at a very slow speed. The slow speed was used to avoid the increase in pore water pressure in the sample. Specimens to be tested were saturated and then sheared under various normal loads without appreciable drainage of the samples. The internal strength value for the existing fill is 36 degrees.

Slope Stability

The site does not show evidence of having slope stability problems. Based on our explorations, it is our opinion that the core of the hillside is composed of dense glacial soils, and the subject site is underlain by very dense glacial till or glacially consolidated transitional beds at shallow depths. The glacially consolidated soil exhibit moderate to high shear strength and have moderate to high resistance against slope failure. It appears that the slope has performed well for many years. We would expect that any failures associated with the slope to be a shallow slough-type movement. If these failures did occur, we expect that they would not pose a significant risk to the planned development.

We analyzed a typical section of the site using a global stability computer program known as XSTABL, version 5.2. XSTABL is a two-dimensional, limit-equilibrium, slope stability program. The sections were analyzed using the Bishops method of slices. XSTABL generates random potential failure surfaces and determines their corresponding factors of safety with respect to failure. The factor of safety is defined as the ratio of the internal soil strength divided by the gravity driving forces that cause failure. By generating a large number of random surfaces, the factor of safety can be obtained as the lowest number calculated.

We have assigned soil strengths as shown below:

Soil Type	Cohesion (psf)	Phi-value (deg)
Fill (silt with sand)	0	30*
Till	500	34
Silt	250	28

*Even though the laboratory results show a higher value can be used, we have assigned a lower value in the event existing fill does not have a consistent strength as concluded from our laboratory results.

The global stability analysis using the existing geometry, the planned building location, and subsurface soil conditions at Cross-Section A-A' resulted in a factor of safety of 1.800 for a static condition, as shown on Figure 7. Based on a dynamic condition, the factor of safety is 1.230, as shown on Figure 8. The seismic horizontal acceleration of 0.158g is based on the Mean Peak Acceleration determined from the USGS data in the **Seismic Hazard** subsection of this report.

GEOLOGIC HAZARDS

Erosion Hazard

The erosion hazard criteria used for determination of affected areas includes soil type, slope gradient, vegetation cover, and ground water conditions. The erosion sensitivity is related to vegetative cover and the specific surface soil types (group classification), which are related to the underlying geologic soil units. The Soil Survey of Snohomish County Area, Washington, by the Soil Conservation Service (SCS), was reviewed to determine the erosion hazard of the on-site soils. The surface soils were classified using the SCS classification system as Alderwood gravelly sandy loam, 6 to 15 percent slopes (Unit AgC), and Alderwood gravelly sandy loam, 15 to 30 percent slopes (Unit AgD). The corresponding geologic unit for these soils is till, which is in general agreement with the silty soils encountered in our site explorations. The erosion hazard for the soil is listed as being moderate for the gently- and moderately-sloping conditions at the site and severe for the steeply-sloping conditions at the site. We expect the hard silts encountered near the elevation may have a high erosion potential if disturbed.

Seismic Hazard

It is our opinion, based on our subsurface explorations, that the Soil Profile in accordance with Table 1615.1.1 of the 2003 International Building Code (IBC) is Soil Class C. We referenced the 2002 map from the US Geological Survey (USGS) website to obtain values for S_s and S_1. The USGS website includes the most updated published data on seismic conditions. The seismic design parameters are:

S_s	126.24% g	
S_1	42.02% g	
F_a	1.0	From Table 1615.1.2(1) of the 2003 IBC
F_v	1.38	From Table 1615.1.2(2) of the 2003 IBC

Site specific coefficients and adjusted maximum considered earthquake spectral response acceleration parameters apply as shown in Section 1615.1 of the IBC.

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft soil deposits. The liquefaction potential is highest for loose sand with a high ground water table. The

glacially-consolidated soils interpreted to underlie the site are considered to have a very low potential for liquefaction and amplification of ground motion

CONCLUSIONS AND RECOMMENDATIONS

General

It is our opinion that the site is compatible with the planned use as a residential development. The underlying medium dense/stiff or firmer deposits are capable of supporting the planned structures and pavements. We recommend that the foundations for the structures extend through any fill, topsoil, loose, or disturbed soils, and bear on the underlying medium dense or firmer, native soils, or on structural fill extending to these soils. Based on the explorations, the fill extends to 9.0 feet in depth and could be deeper in areas.

Based on our explorations, the original top of the steep slope prior to placement of the existing fill is northwest of the existing top of slope. If the non-structural fill is removed, the original top of slope would be approximately as shown in Figure 6. It is our opinion that the site with the planned improvements would be more stable especially if some, if not all, of the fill is removed from the top of the slope.

Structure and Primary Setback

Uncertainties related to building along the top of steep slopes are typically addressed by the use of building setbacks. The purpose of the setback is to establish a "buffer zone" between the structure and the top of the slope, so that ample room is allowed for normal slope recession during a reasonable life span of the structure (usually taken to be 100 years). In a general sense, a greater setback will result in a lower risk to the structure. From a geological standpoint, the setback dimension is based on the slopes physical characteristics, such as slope height, surface angle, material composition and hydrology. Other factors such as historical undercutting activity, rate of sidewall regression, and the type and desired life span of the structures are important considerations as well.

Based on our observations, explorations, and slope stability analyses, it is our opinion that a combined primary setback and structure setback, totaling 20 feet from the existing or original top of the slope, should be adequate for the planned residence. In our opinion, the original top of slope could be used if

moisture may also be necessary. We expect that compaction of the native soils to structural fill specifications would be difficult during wet weather.

Fill Placement: Following subgrade preparation, placement of the structural fill may proceed. Fill should be placed in 8- to 10-inch-thick uniform lifts, and each lift should be spread evenly and be thoroughly compacted prior to placement of subsequent lifts. All structural fill underlying building areas, and within a depth of 2 feet below pavement and sidewalk subgrade, should be compacted to at least 95 percent of its maximum dry density. Maximum dry density, in this report, refers to that density as determined by the ASTM D 1557 compaction test procedure. Fill more than 2 feet beneath sidewalks and pavement subgrades should be compacted to at least 90 percent of the maximum dry density. The moisture content of the soil to be compacted should be within about 2 percent of optimum so that a readily compactable condition exists. It may be necessary to overexcavate and remove wet surficial soils in cases where drying to a compactable condition is not feasible. All compaction should be accomplished by equipment of a type and size sufficient to attain the desired degree of compaction.

Temporary and Permanent Slopes

Temporary cut slope stability is a function of many factors, such as the type and consistency of soils, depth of the cut, surcharge loads adjacent to the excavation, length of time a cut remains open, and the presence of surface or ground water. It is exceedingly difficult under these variable conditions to estimate a stable temporary cut slope geometry. Therefore, it should be the responsibility of the contractor to maintain safe slope configurations, since the contractor is continuously at the job site, able to observe the nature and condition of the cut slopes, and able to monitor the subsurface materials and ground water conditions encountered.

We anticipate temporary cuts for installation of utilities. For planning purposes, we recommend that temporary cuts in the near-surface weathered soils be no greater than 1.5 Horizontal to 1 Vertical (1.5H:1V). Cuts in the dense to very dense till may stand at a 0.75H:1V inclination or possibly steeper. If ground water seepage is encountered, we would expect that flatter inclinations would be necessary.

We recommend that cut slopes be protected from erosion. Measures taken may include covering cut slopes with plastic sheeting and diverting surface runoff away from the top of cut slopes. We do not

recommend vertical slopes for cuts deeper than 4 feet, if worker access is necessary. We recommend that cut slope heights and inclinations conform to local and WISHA/OSHA standards.

Final slope inclinations for structural fill and the cuts in the native soils should be no steeper than 2H:1V. Lightly compacted fills or common fills should be no steeper than 3H:1V. Common fills are defined as fill material with some organics that are "trackrolled" into place. They would not meet the compaction specification of structural fill. Final slopes should be vegetated and covered with straw or jute netting. The vegetation should be maintained until it is established.

Foundations

Conventional, shallow spread foundations should be founded on undisturbed, medium dense or firmer, native soils, or be supported on structural fill extending to those soils. If the soil at the planned bottom of footing elevation is not medium dense or firmer, it should be overexcavated to expose suitable bearing soil, and the excavation should be filled with structural fill, or the footing may be overpoured with extra concrete. Depending on site ground water conditions and the ability to compact the upper weathered till, some over excavation of this material may be necessary.

Footings should extend at least 18 inches below the lowest adjacent finished ground surface for frost protection and bearing capacity considerations. International Building Code (IBC) guidelines for minimum foundation widths should be followed for both continuous and isolated spread footings. Standing water should not be allowed to accumulate in footing trenches. All loose or disturbed soil should be removed from the foundation excavation, or recompacted, prior to placing concrete.

If planned footings are located in areas where deep fill materials are encountered, the foundations can be founded on trenches backfilled with controlled-density fill (CDF). CDF is a lean concrete product that substitutes fly ash for most of the cement in the mix. Although the resulting strength is lower than concrete, it has a considerably higher strength than soil. CDF is poured from a cement truck and should have strength of at least 300 pounds per square inch (psi).

The main advantages of CDF over other types of materials, such as structural fill or rock spalls, are that CDF does not need to be compacted, CDF can be placed in wet conditions, and the trench needs to be excavated only 6 inches wider than the footing. The CDF becomes cost effective in deep overexcavation

situations or if ground water is encountered. If caving of the footing trenches occurs prior to pouring the CDF, overages should be expected. The CDF could be poured simultaneously with the over-excavation. This sometimes reduces the caving conditions.

For foundations constructed as outlined above, we recommend an allowable design bearing pressure of 2,500 pounds per square foot (psf) be used for the footing design. An increase of one-third is allowed when using the alternate load combination in Section 1601.3.2 of the IBC that includes wind or earthquake loads. Potential foundation settlement using the recommended allowable bearing pressure is estimated to be less than 1-inch total and ½-inch differential between footings or across a distance of about 30 feet. Higher soil bearing values may be appropriate for footings founded on the unweathered materials, and with wider footings. These higher values can be determined after a review of a specific design.

Lateral Loads

The lateral earth pressure acting on retaining walls is dependent on the nature and density of the soil behind the wall, the amount of lateral wall movement, which can occur as backfill is placed, and the inclination of the backfill. Walls that are free to yield at least one-thousandth of the height of the wall are in an "active" condition. Walls restrained from movement by stiffness or bracing are in an "at-rest" condition. Active earth pressure and at-rest earth pressure can be calculated based on equivalent fluid density. Equivalent fluid densities for active and at-rest earth pressure of 35 pounds per cubic foot (pcf) and 55 pcf, respectively, may be used for design for a level backslope. These values assume that the on-site soils or imported granular fill are used for backfill, and that the wall backfill is drained. The preceding values do not include the effects of surcharges, such as due to foundation loads or other surface loads. Surcharge effects should be considered where appropriate. The above drained active and at-rest values should be increased by a uniform pressure of 7.0H and 21.1H psf, respectively, when considering seismic conditions. H represents the wall height.

Lateral pressures may be resisted by friction at the base of the wall and passive resistance against the foundation. A coefficient of friction of 0.45 may be used to determine the base friction in the native glacial soils. Passive resistance may be calculated as a triangular equivalent fluid pressure distribution. We recommend that an equivalent fluid density of 250 pounds per cubic foot (pcf) be used to calculate the allowable lateral passive resistance for the case of a level ground surface adjacent to the footing. To

achieve this value of passive pressure, the foundations should be poured "neat" against the native dense soils, or compacted fill should be used as backfill against the front of the footing, and the soil in front of the wall should extend a horizontal distance at least equal to three times the foundation depth. A factor of safety of 2.0 has been applied to the passive pressure to account for required movements to generate these pressures. The friction coefficient does not include a factor of safety.

All wall backfill should be well compacted. Care should be taken to prevent the buildup of excess lateral soil pressures due to overcompaction of the wall backfill. This can be accomplished by placing wall backfill in 8-inch loose lifts and compacting with small, hand-operated compactors.

Slabs-On-Grade

Slab-on-grade areas should be prepared as recommended in the **Site Preparation and Grading** subsection. Slabs should be supported on medium dense to very dense native soils, or on structural fill extending to these soils. Where moisture control is a concern, we recommend that slabs be underlain by 6 inches of free-draining coarse sand or pea gravel for use as a capillary break. A suitable vapor barrier, such as heavy plastic sheeting, should be placed over the capillary break. An additional 2-inch-thick damp sand blanket should be used to cover the vapor barrier to protect the membrane and to aid in curing the concrete. This will also help prevent cement paste bleeding down into the capillary break through joints or tears in the vapor barrier. The capillary break material should be connected to the footing drains to provide positive drainage.

Slope Protection

Protection of the setback and steep slope areas should be performed as required. It should be understood that the closer the site disturbance and development are to the slope, the more risk there is of affecting slope stability. Care should be taken to minimize disturbance to the slope face.

Of great importance to the long-term stability of the slope is the control of surface and near-surface water, and erosion protection. We recommend that all drains, including foundation, roof and yard drains, be directed away from the top of slope and outfall at an approved area. Uncontrolled surface drainage over the slope should not be permitted.

Drainage

We recommend that runoff from impervious surfaces, such as roofs, driveway and access roadways, be collected and routed to an appropriate storm water discharge system, described below. Final site grades should allow for drainage away from any buildings. We suggest that the finished ground surface be sloped at a gradient of 3 percent minimum for a distance of at least 10 feet away from the buildings, as indicated in IBC Section 1803.3. Surface water should be collected by permanent catch basins and drain lines, and be discharged into a storm drain system. Surface water should not be allowed to flow onto the steep slope.

We recommend that footing drains be used around all of the structures where moisture control is important. It is good practice to use footing drains installed at least 1 foot below the planned finished floor slab or crawl space elevation to provide drainage for the crawl space. At a minimum, the crawl space should be sloped to drain to an outlet tied to the drainage system. If drains are omitted around slab-on-grade floors where moisture control is important, the slab should be a minimum of 1 foot above surrounding grades.

Where used, footing drains should consist of 4-inch-diameter, perforated PVC pipe that is surrounded by free-draining material, such as pea gravel. Footing drains should discharge into tightlines leading to an appropriate collection and discharge point. Crawl spaces should be sloped to drain, and a positive connection should be made into the foundation drainage system. For slabs-on-grade, a drainage path should be provided from the capillary break material to the footing drain system. Roof drains should not be connected to wall or footing drains.

CONSTRUCTION SERVICES

We should be retained to provide observation and consultation services during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, and to provide recommendations for design changes, should the conditions revealed during the work differ from those anticipated. As part of our services, we would also evaluate whether or not earthwork and foundation installation activities comply with contract plans and specifications.

USE OF THIS REPORT

We have prepared this report for Ms. Sophia Wong and her agents, for use in planning and design of this project. The data and report should be provided to prospective contractors for their bidding and estimating purposes, but our report, conclusions and interpretations should not be construed as a warranty of subsurface conditions.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report, for consideration in design. There are possible variations in subsurface conditions. We recommend that project planning include contingencies in budget and schedule, should areas be found with conditions that vary from those described in this report.

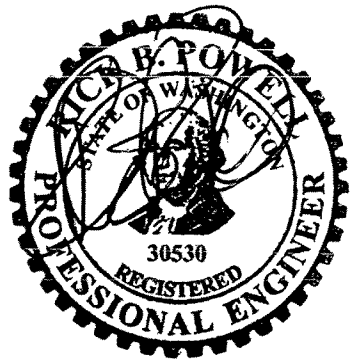
Within the limitations of scope, schedule and budget for our services, we have strived to take care that our services have has been completed in accordance with generally accepted practices followed in this area at the time this report was prepared. No other conditions, expressed or implied, should be understood.

o O o

We appreciate the opportunity to be of service to you. If there are any questions concerning this report or if we can provide additional services, please call.

Sincerely,

Cornerstone Geotechnical, Inc.



12/29/06

EXPIRES 08/16/ 06

Rick B. Powell, PE
Principal Engineer

MAS:RBP:nt

Three Copies Submitted
Eight Figures
Information about this Geotechnical Engineering Report