DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th 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. 13-133205-LO

Project Name/Address: Buxbaum Residence and Tram/
486 W. Lake Sammamish Pkwy NE

Planner: Heidi M. Bedwell

Phone Number: 425-452-4862/hbedwell@bellevuewa.gov

Minimum Comment Period: December 5, 2013

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; Christa.Heller@dfw.wa.gov;
- ☐ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
- ☐ Army Corps of Engineers Susan.M.Powell@nws02.usace.army.mil
- ☐ Attorney General ecyolyef@atg.wa.gov
- ☐ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

SEPA Checklist Reviewed by Heidi M. Bedwell (HMB) 11/20/2013

ENVIRONMENTAL CHECKLIST

10/9/2009

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).

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.

City of Bellevue Submittal Requirements | **27a**

ENVIRONMENTAL CHECKLIST

4/11/2013

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).

BACKGROUND INFORMATION

Property Owner: JAY + REBECCA BUXBAUM

Proponent:

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

Address: 106 NW 36TH ST, SEATTLE, WA 98107

Phone: 206.262.0820

Proposal Title: BUXBAUM RESIDENCE

CROSS STREET: NORTHUP WAY

Proposal Location: 486 W. LAKE SAMMAMISH PKWY NE
(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. SEE ATTACHED.

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

1. General description: CRITICAL AREA STRUCTURE SETBACK MODIFICATION FOR REPLACING AN EXISTING SF.R. W/A NEW S.F.R. AND FUTURE TRAM.
2. Acreage of site: 0.62 ACRES
3. Number of dwelling units/buildings to be demolished: 1
4. Number of dwelling units/buildings to be constructed: 1
5. Square footage of buildings to be demolished: 2,740 SF PER K.C. ASSESSOR
6. Square footage of buildings to be constructed: 5,062 SF
7. Quantity of earth movement (in cubic yards): 105 CY CUT/165 CY FILL
8. Proposed land use: NO CHANGE — S.F.R.
9. Design features, including building height, number of stories and proposed exterior materials:
   2 STORY + DAYLIGHT BASEMENT S.F.R.; <30' HIGH; CEDAR + CEMENT BOARD SIDING W/ALUM. CLAD WOOD WINDOWS.
10. Other
    WOOD DECK @ MAIN LEVEL.

HMB

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

CONSTRUCTION START: SPRING 2014, ESTIMATED DURATION: 12 MONTHS.

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

BUILDING PERMIT FOR S.F.R. + FUTURE TRAM.

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

GEOTECH. REPORT, DATED 03.11.2013, BY PANGEO, INC.
CRITICAL AREAS REPORT, DATED 10.22.13, BY PANGEO, INC.
CRITICAL AREAS REPORT (TRAM), DATED 05.10.13, BY PANGEO, INC.

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.

SINGLE-FAMILY COMBINATION BUILDING PERMIT (APPLYING NOV. 2013)

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% PER SURVEY

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.

PER GEOTECH: DENSE SILTY FINE SAND TO DENSE SANDY GRAVEL WITH SOME LOOSE FILL.

HMB

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

NO OBVIOUS EVIDENCE OF PAST OR ONGOING SLOPE STABILITY.

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

165 C.Y. FILL, PRIMARILY FOR BACKFILL @ FOUNDATION AND SOME GRADING TO EAST OF THE PROPOSED SFR. FILL MATERIAL BROUGHT IN FROM OFFSITE, LOCATION TBD.

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

EROSION CONTROL MEASURES TO BE TAKEN DURING CONSTRUCTION.

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

37.5%

Erosion Control per BCC 23.76

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

CONTRACTOR WILL FOLLOW CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (CSWPPP) SUBMITTED WITH BUILDING PERMIT.

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.

SOME AUTOMOBILE EXHAUST FROM CONSTRUCTION VEHICLES, DUST SHOULD BE MINIMIZED DURING DEMOLITION AND CONSTRUCTION.

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

NA.

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

NA.

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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.

SITE IS LOCATED ON LAKE SAMAMISH SHORELINE

(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.

PROJECT SITE IS WITHIN 200' OF SHORELINE.

(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.

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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.

DOWNSPOUTS, FOUNDATION AND UNDER-SLAB DRAINS CONNECTED TO EXISTING STORM WATER DRAIN.

(2) Could waste materials enter ground or surface waters? If so, generally describe. UTILIZE CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN + CONSTRUCTION SEQUENCING TO MINIMIZE ~~WASTE MATERIAL~~ GROUND WATER CONTAMINATION.

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

CSWPPP + TESC PLANS PER CIVIL (SUBMITTED WITH BUILDING PERMIT.)

4. Plants

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

- [X] deciduous tree: alder, maple, aspen, other
- [X] evergreen tree: fir, cedar, pine, other
- [X] shrubs
- [X] 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?

(1) 36" DIAMETER CEDAR EAST OF EXISTING SFR.

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

NONE THAT WE ARE AWARE OF.

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

NONE INCLUDED IN THIS PROPOSAL.

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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: HAVE NOT OBSERVED.

- ☐ 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.

HAVE NOT OBSERVED.

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

Salmon

NOT TO OUR KNOWLEDGE.

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

NA.

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.

NATURAL GAS FOR HEATING AND COOKING.

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

NO, NEIGHBORING HOUSES NOT WITHIN SHAD

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: PROPOSED SFR TO FULFILL REQUIREMENTS OF 2012 WASHINGTON STATE ENERGY CODE.

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.

NOT TO OUR KNOWLEDGE.

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

NA.

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

NA.

b. Noise

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

NONE.

BCC 9.18 Noise code

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(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.

SHORT-TERM CONSTRUCTION NOISE DURING DAYLIGHT HOURS (8AM-5PM).

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

NA.

8. **Land and Shoreline Use**

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

SINGLE FAMILY RESIDENCES.

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

NO.

c. Describe any structures on the site.

SINGLE FAMILY RESIDENCE, DETACHED GARAGE, DOCK.

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

YES, EXISTING S.F.R.

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

R-2.5

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

SINGLE FAMILY RESIDENTIAL

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

CITY OF BELLEVUE SHORELINE MASTER PROGRAM.

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

SHORELINE, FLOOD PLAIN, STEEP SLOPE

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

TWO TO SIX (2-6).

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

NONE

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

NA.

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

TYPICAL LAND USE PERMITTING PROCESS.

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9. **Housing**

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

ONE (1) HIGH INCOME HOUSING UNIT.

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:

NONE.

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'; CEDAR AND CEMENT PANEL SIDING.

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

NO VIEWS WILL BE OBSTRUCTED.

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

DESIGN BY LICENSED ARCHITECT.

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

SOME POSSIBLE GLARE FROM EAST-FACING WINDOWS IN A.M.

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

NOT THAT WE ARE AWARE OF.

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

NONE THAT WE ARE AWARE OF.

d. Proposed measures to reduce or control light or glare impacts, if any:

NONE.

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12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

LAKE SAMMAMISH.

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:

NA.

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.

NONE THAT WE ARE AWARE OF.

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

NONE.

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.

DRIVEWAY OFF WEST LAKE SAMMAMISH PKWY NE.

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

NO. 1 MILE.

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

NO CHANGE.

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.

NO CHANGE.

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

NA.

HMB

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.

NA.

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.

EXISTING UTILITIES WITH ADDITION OF NATURAL GAS.

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.

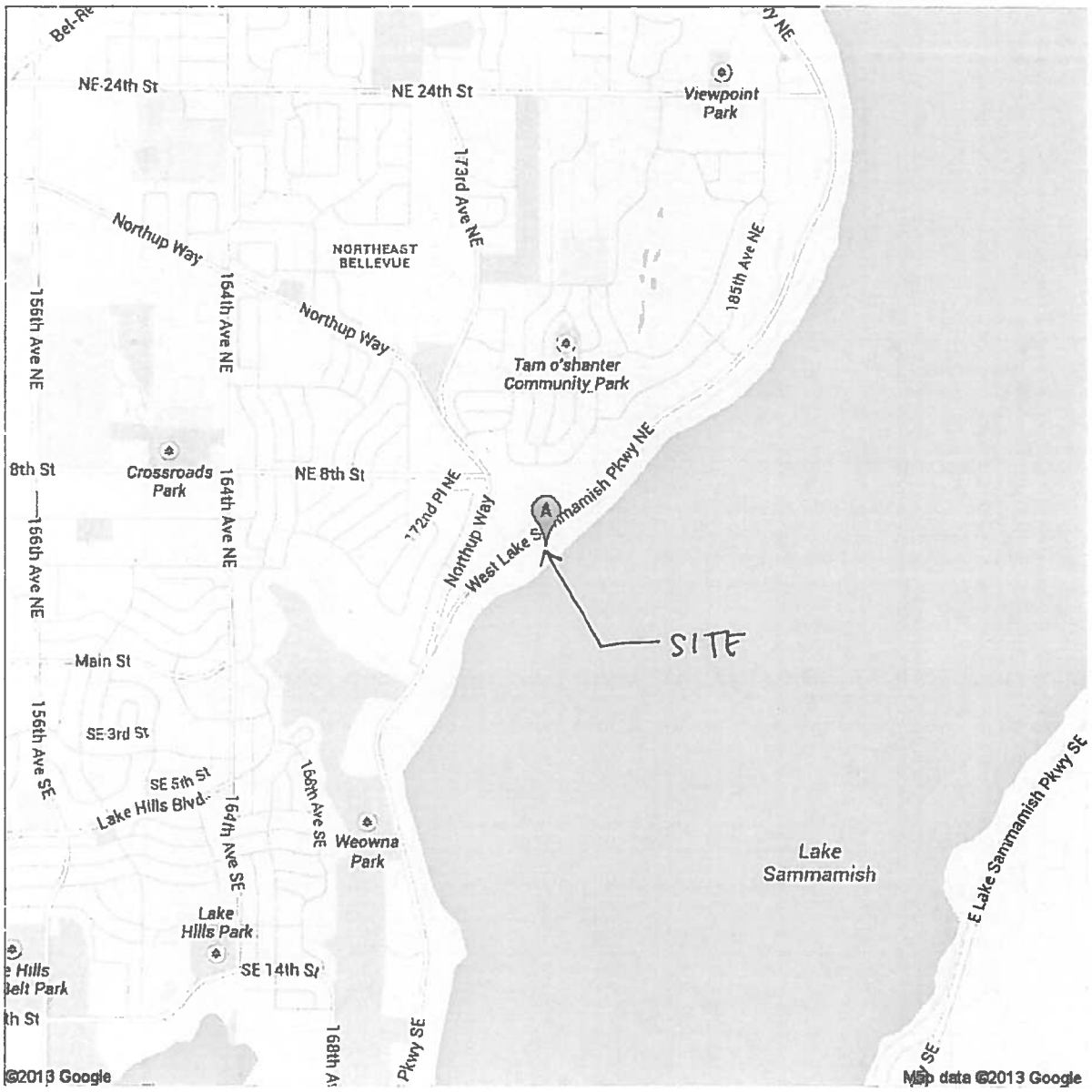
Signature.....

Date Submitted.....11/19/13.....

HMB

Google

Address **486 West Lake Sammamish Pkwy NE**
Bellevue, WA 98008



Critical Areas Land Use Permit

Modification to toe-of-slope Structure Setback

Buxbaum Residence
Property Address: 486 West Lake Sammamish Pkwy NE, Bellevue, WA 98008
King County Parcel Number: 7528300035

Date: 10.19.13
Pages: 7

DeForest Architects + 106 NW 36th Street Seattle, WA 98107 TEL 206.262.0820 FAX 206.262.0821 deforestarchitects.com

Project Team

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Owners
Jay & Rebecca Buxbaum
486 West Lake Sammamish Pkwy NE, Bellevue, WA 98008

Scope of proposal

This proposal is requesting a modification to the standard toe-of-slope structure setback. We request that the structure setback be reduced from the standard 75 feet to 0 feet. A boundary and topographic survey was completed to document the existing buildings, vegetation and area of steep slope.

The scope of work includes replacing the existing 1-story single-family residence with daylight basement and deck with a new 2-story single-family residence with daylight basement, deck and site features including concrete patios, walkways & site stairs. The existing residence is completely within the 75′ structure setback and the existing paving/landscape features are directly adjacent to the area of steep slope. The proposed residence would be within a previously developed area and would not infringe on the area of steep slope.

The existing basement foundation would be retained in order to provide slope stability. An existing cedar (36″ in diameter per survey) currently protruding through the existing deck would be removed for the new SFR, but no other trees will be removed.

The existing driveway, 3-car garage and pathway to the house to the west would remain. The existing terraced landscaped area to the east would remain as well as the paving, decking and dock.

Critical Areas

Environmental Areas Designations:
Shoreline
Floodplain
Steep Slope

The existing residence is within the Shoreline Zone (Lake Sammamish), but the proposed scope of work is outside the Shoreline Critical Area Buffer (25′) and Shoreline Structure Setback (25′). The proposed residence is not within 50′ of the Shoreline or edge of water per survey.

The property lies within a floodplain per NWMaps. The proposed building site is outside the 100 Year Floodplain.

Per the survey, an area to the west of the existing & proposed residence is considered a steep slope (with an area of greater than 1,000 SF and greater than a 40% slope). This area is bounded by a concrete pathway & stair to the west, the neighboring property to the south, and a concrete slab to the east. There is no proposed change to this environmentally critical area.

The city environmental map indicates a steep slope to the south of the house. However, per the meeting at the Land Use counter with Sally Nichols on 01/04/13, the terraced area to the south of the house is not considered a steep slope because it is a constructed area or previously developed.

Narrative description

A. A description of the project site, including landscape features, existing development, and site history as applicable.

The project site is 26,796 SF per King County Assessor records. The site contours range from 122' at the entrance to the driveway to 32' at the approximate edge of water per the survey. It is previously developed site with 2 buildings: a 2,460 SF 1-story plus daylight basement single-family residence with deck and an 864 SF 3-car garage.

Other built site features include an approximately 200' long asphalt and concrete driveway accessed from the east side of West Lake Sammamish Parkway NE; a concrete and concrete paver path and stairway from the garage to the house; terraced landscape areas to the east of the house built with railroad ties and concrete retaining walls; a large level lawn area; a wood deck with pergola; brick & concrete paved areas; and a concrete and wood dock on Lake Sammamish.

The landscape features of the site include large conifers (pine, cedar & fir), deciduous trees, groundcover, shrubs at the terraced landscape areas; grass at the level lawn area.

The existing single family residence was built in 1952 per King County Assessment records. It is believed that the house was added on to sometime after the initial construction, but before the current owners purchased the property in 1998.

The scope of work includes demolishing an existing 1-story single-family residence with daylight basement and deck to be replaced with a new 2-story single-family residence with daylight basement, deck and site features including concrete patios, walkways & site stairs. The existing residence is completely within the 75' structure setback and the existing paving/landscape features are directly adjacent to the area of steep slope. The proposed residence would be within a previously developed area and would not infringe on the area of steep slope.

The existing basement foundation would be retained in order to provide slope stability. An existing cedar (36" in diameter per survey) would be removed for the new SFR, but no other trees will be removed.

B. A description of how the design constitutes the minimum necessary impact to the critical area.

The proposed design constitutes no direct impact to the critical area (steep slope). The area of steep slope will remain unaffected.

C. A description of why there is no feasible alternative with less impact to the critical areas, critical area buffer, or critical areas structure setback.

There is no feasible alternative to the proposed design for a new single-family residence. If the house were to be built to the east of the 75' critical area structure setback, the house would infringe on the shoreline setback. The proposed SFR would be within a previously developed area.

In addition, moving the building site to the east would make access from the garage to the house more difficult with additional paths and stairs.

D. A description of alternatives considered and why the alternative selection is preferred.

Alternatives to the proposed building site would include building the new SFR to the east and to the west of the existing building site.

The area to the west of the house is where the existing area of steep slope resides. This area contains a 34" diameter cedar tree. The area above the steep slope also has many significant trees that would prohibit development. The top of slope buffer would also limit the development in this area.

If the new house were to be built further to the east (outside the standard 75' critical area structure setback) it would run up against the 50' shoreline setback. The area to the east of the house is also previously developed, but less feasible for accessibility reasons.

E. A summary of how the proposal meets each of the decision criteria contained in Land Use Code Section 20.30P.

The Director may approve or approve with modifications an application for a Critical Areas Land Use Permit if:

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

Per our Predevelopment Services Conference with Michael Paine on 09/06/2013 it is our intent to apply for the New Single-Family Combo (BS) permit after the Critical Areas Land Use Permit (LO) and for the BS and LO permits to be reviewed concurrently.

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; and

The proposed construction would not directly impact the critical area or critical area buffer. The contractor would minimize site disturbance and utilize the existing concrete pathways and existing asphalt driveway for mobilization, material storage/removal and circulation.

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

See Pangeo Critical Areas Report.

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

The proposed SFR will be accessed from West Lake Sammamish Parkway NE and the existing asphalt and concrete driveway. The proposed SFR will be served by existing public sewer, septic and water, telephone and cable. During the building permit review process, the Fire Department and plans reviewers will determine whether the building will be required to be sprinklered.

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.210; except that a proposal to modify or remove vegetation pursuant to an approved Vegetation Management Plan under LUC 20.25H.055.C.3.i shall not require a mitigation or restoration plan; and

Per the feedback from our Predevelopment Services Conference with Michael Paine on 09/06/2013, he advised that we wait for the City's recommendations for mitigation, so this information is not included with this proposal.

F. The proposal complies with other applicable requirements of this code. (Ord. 5683, 6-26-06, § 27)

To the best of our knowledge the proposal complies with all other applicable requirements of this code.

F. A summary of how the proposal meets each of the criteria and performance standards contained in Land Use Code Section 20.25H associated with the critical area you are modifying.

See Pangeo Critical Areas Report.

G. A summary of how the proposal meets each of the criteria contained in Land Use Code Section 20.25H.230 as required for applications proposing a modification through the use the Critical Areas Report process.

1. The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;

The critical areas are unaffected by the proposal and will be protected during construction.

2. Adequate resources to ensure completion of any required mitigation and monitoring efforts;

Monitoring slope stability will be part of the scope of work for Pangeo, Inc., the geotechnical engineers. The design will also incorporate any the mitigation required by the City from this proposal.

3. 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

The approval of this proposal will not have an effect on the functions and values of critical areas and critical area buffers on or off site. We are replacing the existing structure and will only impact previously developed area.

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

The scope of the proposal is in keeping with the neighboring development within the land use district.

Attachments

Critical Areas Land Use Permit Chart (with annotations from Michael Paine)
Application for Land Use Approval
"Bill To" Form
Environmental Checklist
Site plan B
Boundary & Topographic Survey by Geodimensions, Inc., dated 03/18/2013
Geotechnical Engineering Report by Pangeo, Inc., dated 03/11/2013
Critical Areas Report by Pangeo, Inc., dated 10/22/13
Notes from Predevelopment Services Conference with Michael Paine, dated 10/01/2013

PanGEO
INCORPORATED
Geotechnical & Earthquake
Engineering Consultants

March 11, 2013
File No. 13-003

Jay and Rebecca Buxbaum
c/o Ms. Meredith Kelly
DeForest Architects
106 NW 36th Street
Seattle, WA 98107

Subject: **Geotechnical Engineering Report**
Buxbaum Residence
486 West Lake Sammamish Parkway NE, Bellevue, WA

Dear Jay and Rebecca,

As requested, PanGEO has completed a geotechnical engineering study to assist you and your project team with the design and construction of a new single-family residence at the above-referenced site. This study was performed in general accordance with our mutually agreed scope of work outlined in our proposal dated December 19, 2012, which was subsequently approved by you on January 3, 2013. Our service scope included reviewing readily-available geologic and geotechnical data in the project vicinity, drilling three test borings, conducting a site reconnaissance, performing engineering analysis, and developing the conclusions and recommendations presented in this report.

SITE AND PROJECT DESCRIPTION

The subject property is an approximately 0.6-acre waterfront lot located at 486 West Lake Sammamish Parkway NE in Bellevue, Washington (see Vicinity Map, Figure 1). The site is rectangular in shape and is bordered to the north by West Lake Sammamish Parkway NE, to the east and west by single-family dwellings, and to the south by Lake Sammamish. The approximately north half of the site is relatively level, and consists of a driveway, parking areas, and landscape areas. We understand that this area will be remained as is, and will not be disturbed by the upcoming construction activities. The approximately south half of the site is an

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approximately 70-foot high south-facing slope, ranging from approximately Elevation 100 feet at the top of the slope to Elevation 30 feet along the lake front. An existing two-story house (including a daylight basement) is located on a relatively level bench near Elevation 60 feet, and an existing two-story garage, including a daylight basement, is located at the top of the slope. The area between the garage and the house is relatively steep. Topographic survey provided for our review indicated that most of the slope exceeds 40% gradient. The 40% steep slope area is indicated on Figure 2, as delineated by others. The area between the house and the lake is terraced, and several timber walls and steps have been constructed to improve the slope. We also understand that this area will also be remained as is, and will not be disturbed as part of this project.

We understand that you plan to remove the existing house and to construct a new single-family residence, roughly at the same location. The proposed residence will be a two-story wood frame structure with a daylight basement. We also understand that the proposed project will also include new walkways, patios, and a deck around the house. Based on our discussion with the project architect, the proposed lowest floor elevation will be approximately one to two feet below the existing basement floor. The existing basement walls will remain and new basement walls will be constructed on the inboard side of the existing basement walls.

The conclusions and recommendations outlined and provided in this report are based on our understanding of the proposed development, which is in turn based on the project information provided. If the above project description is incorrect, or the project information changes, we should be consulted to review the recommendations contained in this study and make modifications, if needed.

SUBSURFACE EXPLORATIONS

CURRENT EXPLORATION

Three borings (BH-1 through BH-3) were drilled on February 15, 2013, using a hand-operated portable drill rig owned and operated by CN Drilling of Seattle, Washington. The approximate boring locations were taped in the field from on-site features and are shown on Figure 2. The borings were drilled to depths of about 13½ and 16½ feet below the existing grade.

The drill rig was equipped with 4-inch outside diameter hollow stem augers. Soil samples were obtained from the borings at 2½-foot depth intervals in general accordance with Standard

Penetration Test (SPT) sampling methods (ASTM test method D-1586) in which the samples are obtained using a 2-inch outside diameter split-spoon sampler. The sampler was driven into the soil a distance of 18 inches using a 140-pound weight freely falling a distance of 30 inches. The number of blows required for each 6-inch increment of sampler penetration was recorded. The number of blows required to achieve the last 12 inches of sample penetration is defined as the SPT N-value. The N-value provides an empirical measure of the relative density of cohesionless soil, or the relative consistency of fine-grained soils.

An engineer from PanGEO was present during the field exploration to observe the drilling, assist in sampling, and to describe and document the soil samples obtained from the borings. The soil samples were described and field classified in general accordance with the symbols and terms outlined in Figure A-1, and the summary boring logs are included as Figures A-2 through A-4.

PREVIOUS EXPLORATION

In addition to our test borings, we also reviewed the results of a test boring that was completed for the construction of the existing two-story garage. The approximate location of this previous test boring B-1, which was completed by Terra Associates in 1994, is indicated on the attached Figure 2, and the summary boring log is included in Appendix C of this report.

SITE GEOLOGY

The *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* (Booth, et. al. 2006) mapped the surficial geologic unit along the lake shore in at the subject site as Alluvium (Qal). Alluvium typically consists of moderately sorted cobble gravel, pebbly sand, and sandy silt. Away from the lake shore, the geologic map indicates that pre-Fraser deposits generally underlie the site. The pre-Fraser deposits have been overridden by glaciers, and are anticipated to exhibit high strength characteristics in its undisturbed state.

SUBSURFACE CONDITIONS

SOIL CONDITION AT EXISTING HOUSE

The borings drilled at the site generally encountered fill over Alluvium deposits. The subsurface conditions encountered in the test borings are generally consistent with the mapped geology. The following is a description of the soils encountered in the three borings advanced at the site. Please refer to the summary boring logs (Figures A-2 through A-4) for additional details.

UNIT 1: Fill – The upper 2½ to 5 feet of the soil profile consists of loose silty fine sand with trace roots, wood, and organics. Test boring BH-3 encountered 3 feet of soft organic silt with some fine sand. We interpret this layer as fill.

UNIT 2: Alluvium– Below the fill, approximately 7 feet of loose to medium dense silty fine sand to sand with some gravel over medium dense to very dense sandy gravel was encountered extending to the maximum depth of 16½ feet below existing grade. This unit appears to be consistent with the alluvium mapped by Booth, et al. (2005).

SOIL CONDITION NORTH OF EXISTING HOUSE

Based on the soil boring B-1 completed by Terra associates from the top of the steep slope, the soils within the steep slope located north of existing house consists of dense to very dense sandy gravel to silty sand with interbedded sandy clay. This soil unit appears to be consistent with the mapped pre-Fraser deposits.

GROUNDWATER

Groundwater seepage was encountered in all three borings (BH-1 through BH-3) drilled near the existing house, at a depth about 4 to 5 feet deep during drilling. However, no groundwater seepage was noted on the boring log for B-1 completed by Terra Associates on top of the steep slope. It should be noted that groundwater elevations and seepage rates are likely to vary depending on the season, local subsurface conditions, and other factors. Groundwater levels and seepage rates are normally highest during the winter and early spring.

SITE STABILITY AND ECA CONSIDERATIONS

Based on a review of Geologic Hazards Map prepared by City of Bellevue, the subject site is mapped as a liquefaction hazard area. In addition, the slope between the existing garage and house is mapped as a 40% or greater steep slope (see Figure 2). However, the site is not mapped as a landslide hazard area based on King County records.

A site reconnaissance of the subject property was conducted on January 15, 2013 as part of our study. During our site reconnaissance, we did not observe obvious evidence of slope instability at the site. The existing house and garage were observed to be in a fair condition and no obvious sings of foundation movement are noted. Based on the test boring B-1, the soils to the north of

existing house consist of glacially consolidated dense soils. As such, we believe that the slope between and existing house and garage is currently in stable condition.

Minor settlements and cracking were observed on the concrete slab to the south of existing house, below wood deck. Based on the results of our test borings, it is our opinion that the distress was caused by settlement of loose undocumented fill. No signs of slope instability were observed in the area surrounding the house.

Based on our evaluation, in our opinion, the subject site is globally stable in its current configuration. Furthermore, it is also our opinion that the proposed single-family development as planned will not decrease the site stability and adversely impact the subject and surrounding properties, provided that the recommendations presented in this report are properly incorporated into the design and construction of the project.

GEOTECHNICAL DESIGN RECOMMENDATIONS

GENERAL

Based on the results of our study, in our opinion, the proposed single-family residence development at the subject site is feasible from the geotechnical engineering standpoint, provided the geotechnical engineering recommendations contained in this report are followed. To mitigate the potential settlement, the proposed building should be either support on driven pin piles, on a concrete mat, or on a structural slab with thicken edges. We understand that a deck will be constructed on the south side of the house. Due to the presence of loose fill and proximity to the top of the slope located between the house and the lake, we recommend that the deck be supported on driven pin piles. We also recommend that concrete grade beams be constructed to tie the pin piles back to the house foundation. Detailed discussion of these items and our geotechnical engineering design recommendations are presented in the following sections of this report.

SEISMIC DESIGN PARAMETERS

The following provides seismic design parameters for the site that are in conformance with the 2009 and later editions of the International Building Code (IBC), which specifies a design earthquake having a 2% probability of occurrence in 50 years (return interval of 2,475 years), and the 2002 USGS seismic hazard maps:

Table 1 – Seismic Design Parameters

Site Class	Spectral Acceleration at 0.2 sec. (g) S_S	Spectral Acceleration at 1.0 sec. (g) S_1	Site Coefficients		Design Spectral Response Parameters		Control Periods (sec.)		Design PGA (S_{DS}/2.5)
			F_a	F_v	S_{DS}	S_{D1}	T_O	T_S	
D	1.31	0.44	1.0	1.56	0.87	0.46	0.11	0.53	0.35

The spectral response accelerations were obtained from the USGS Earthquake Hazards Program Interpolated Probabilistic Ground Motion website (2002 data) for the project latitude and longitude.

Liquefaction Evaluation **-** Soil liquefaction is a condition where saturated cohesionless soils undergo a substantial loss of strength due to the build-up of excess pore water pressures resulting from cyclic stress applications induced by earthquakes. Soils most susceptible to liquefaction are loose, uniformly graded sands and loose silts with little cohesion.

In our opinion, localized liquefaction could occur at the site during the IBC-code level seismic event. As a result of soil liquefaction, ground settlement may likely occur and the ground settlement due to soil liquefaction for this event is estimated to be about one to two inches in the area of the proposed house. If the house foundations will be supported by pin piles, it is our opinion that soil liquefaction, if occurs, will have negligible impacts on the house foundations. Seismic shaking and soil liquefaction could also result in lateral movements of the slope located between the house and the lake. To reduce the risk slope instability from impacting the house, it is our opinion that the proposed house footprint should setback at least 15 feet from the top of the subject slope.

PIN PILE FOUNDATIONS

Pin piles should consist of 3-, or 4-inch diameter, Schedule 40, galvanized, steel pipes. Allowable axial compression capacities of 6 and 10 tons may be used for the 3- and 4-inch diameter pin piles, respectively. Tensile capacity of the pin piles should be ignored. Penetration resistance required to achieve the capacities will be determined based on the hammer used as

discussed in the following sections. Total and differential post-construction foundation settlements are anticipated to be on the order of about ½ inch or less.

The required pile length in order to develop the recommended pile capacity is expected to vary, depending on the depth of loose soils across the proposed building footprint. For planning and cost estimating purposes, a pile length of about 15 to 25 feet may be assumed for the site.

Three- or 4-inch diameter piles are typically installed using small (approximately 650 to 1,100 pound) hammers mounted to a small excavator. The criterion for driving refusal is defined as the minimum amount of time (in seconds) required to achieve one inch of penetration, and it varies with the size of hammer used for pile driving. For 3- or 4-inch pin piles, the following is a summary of driving refusal criteria for different hammer sizes that are commonly used:

Table 2 - Summary of Commonly-Accepted Driving Criteria for a 3- or 4-inch Pin Pile with a 6- or 10-ton Allowable Axial Compression Load

Hammer Model	Hammer Weight (lb) / Blows per minute	3" Pile Refusal Criteria (seconds per inch of penetration)	4" Pile Refusal Criteria (seconds per inch of penetration)
Hydraulic TB 225	650 / 550 - 1100	12	20
Hydraulic TB 325	850 / 550 - 1100	10	16
Hydraulic TB 425	1,100 / 550 - 1100	6	10

Please note that these refusal criteria were established empirically based on previous load tests on 3- and 4-inch pin piles. Contractors may select a different hammer for driving these piles, and propose a different driving criterion. In this case, it is the contractor's responsibility to demonstrate to the Engineer's satisfaction that the design load can be achieved based on their selected equipment and driving criteria.

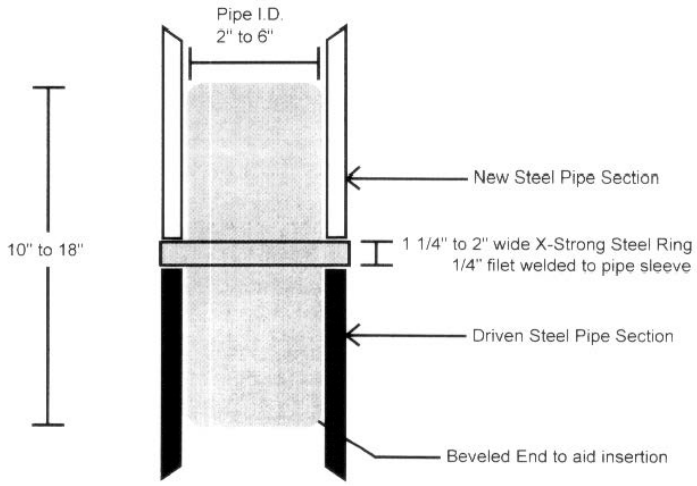
Pile splices may be made with compression fitted sleeve pipe couplers (see Typical Splicing Detail below). Splicing using welding of pipe joints should not be used, as welds will typically be broken during driving.

The quality of a pin pile foundation is dependent in part on the experience and professionalism of the installation company. Therefore, a qualified contractor with pin pile driving experience on similar projects should be selected to install the piles. We recommend that the following specifications be included on the foundation plan:

1. All piles shall consist of galvanized Schedule-40, ASTM A-53 Grade "A" pipe.

2. 3- or 4-inch pin piles shall be driven to refusal as shown in Table 2, Page 6 of this report.

3. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see detail below – Courtesy of McDowell Pile King, Kent, WA).



Typical Splicing Detail

4. A total of 3 percent of the pin piles (one pile minimum) should be load tested to verify the design capacities. All load tests shall be performed in accordance with the procedure outlined in ASTM D1143. The maximum test load shall be 2 times the design load (i.e. 2 x 10 tons = 20 tons).

5. The geotechnical engineer of record or his/her representative shall provide full time observation of pile installation and testing to verify the driving refusal criteria.

Lateral Forces - The capacity of pin piles to resist lateral loads is very limited and should not be used in design. Therefore, lateral forces from wind or seismic loading should be resisted by the passive earth pressures acting against the pile caps/grade beams or from battered piles (batter no steeper than 3(H):12(V)). ***Friction at the base of pile-supported concrete grade beam should***

be ignored in the design calculations. Passive resistance values may be determined using an equivalent fluid weight of 300 pounds per cubic foot (pcf). This value includes a safety factor of about 1.5 assuming that properly compacted granular fill will be placed adjacent to and surrounding the pile caps and grade beams.

MAT FOUNDATION OR STRUCTURAL SLAB WITH THICKEN EDGES

In lieu of driven pin piles, the proposed house (with the exception of the deck) may also be supported on a concrete mat foundation or on a structural slab with thicken edges, with the understanding that the footings could slightly settle during a strong seismic event.

We recommend that a maximum allowable soil bearing pressure of 1,500 pounds per square feet (psf), and a subgrade modulus of 200 pci may be used for designing the mat or structural slab. The recommended allowable bearing pressure is for dead plus live loads. The recommended bearing pressure should not be increased when design for seismic conditions.

We recommend that the new footings bear on a minimum of 12 inches compacted crushed rock (crushed surfacing base course) to provide a more uniform support. The structural fill should also be compacted to a firm, unyielding condition prior to form setting and rebar placement. The adequacy of footing subgrade should be verified by a representative of PanGEO, prior to placing forms or rebar.

Lateral loads on the structures may be resisted by passive earth pressure developed against the embedded faces of the foundation system and by frictional resistance between the bottom of the foundation and the supporting subgrade soils. For footings bearing on the compacted structural fill, a frictional coefficient of 0.35 may be used to evaluate sliding resistance developed between the concrete and the compacted fill.

FLOOR SLABS

If the house will be supported on pin piles, it is our opinion that the basement floor should consist of a structural slab, to prevent the potential for differential settlement between the house foundation and the slab. If a mat or a structural slab will be used to support the house, the mat or a structural slab may serve as the basement floor.

Interior concrete slab floors should be underlain by a capillary break consisting of at least of 4 inches of pea gravel or compacted ¾-inch, clean crushed rock (less than 3 percent fines). The capillary break should be placed on the subgrade that has been compacted to a dense and unyielding condition. A 10-mil polyethylene vapor barrier should also be placed directly below the slab. We also recommend that construction joints be incorporated into the floor slab to control cracking.

Subslab Drains: Due to the relatively shallow groundwater encountered in the borings, a subslab drainage system is recommended below the concrete slabs in addition to perimeter footing drains. The subslab drainage system should consist of one foot deep (measured from the bottom of the slab) gravel-filled trenches spaced no more than 15 feet apart. A 4-inch perforated PVC (Schedule 35 minimum) pipe should be placed at the bottom of the trench, and the collected water should be discharged to an appropriate drainage outlet.

RETAINING AND BASEMENT WALL DESIGN PARAMETERS

Retaining and basement walls should be properly designed to resist the lateral earth pressures exerted by the soils behind the wall. Proper drainage provisions should also be provided behind the walls to intercept and remove groundwater that may be present behind the wall. Our geotechnical recommendations for the design and construction of the retaining/basement walls are presented below.

Lateral Earth Pressures

Concrete cantilever walls should be designed for an equivalent fluid pressure of 35 pcf for level backfills behind the walls assuming the walls are free to rotate. If walls are to be restrained at the top from free movement, such as basement walls, equivalent fluid pressures of 45 pcf should be used for level backfills behind the walls. Walls with a maximum 2H:1V backslope should be designed for an active and at rest earth pressure of 45 and 55 pcf, respectively.

Permanent walls should be designed for an additional uniform lateral pressure of 6H psf for seismic loading, where H corresponds to the buried depth of the wall. The recommended lateral pressures assume that the backfill behind the wall consists of a free draining and properly compacted fill with adequate drainage provisions.

Surcharge

Surcharge loads, where present, should also be included in the design of retaining walls. We recommend that a lateral load coefficient of 0.3 be used to compute the lateral pressure on the wall face resulting from surcharge loads located within a horizontal distance of one-half wall height.

Lateral Resistance

Lateral forces from seismic loading and unbalanced lateral earth pressures may be resisted by a combination of passive earth pressures acting against the embedded portions of the foundations and by friction acting on the base of the foundations. Passive resistance values may be determined using an equivalent fluid weight of 300 pcf. This value includes a factor of safety of 1.5, assuming the footing is poured against dense native sand, re-compacted on-site sandy soil or properly compacted structural fill adjacent to the sides of footing. A friction coefficient of 0.35 may be used to determine the frictional resistance at the base of the footings. The coefficient includes a factor safety of 1.5.

Wall Drainage

Provisions for wall drainage should consist of a 4-inch diameter perforated drainpipe placed behind and at the base of the wall footings, embedded in 12 to 18 inches of clean crushed rock or pea gravel wrapped with a layer of filter fabric.

Where new basement walls will be constructed against existing basement walls, a drain such as Miradrain 6000 should be placed between the basement walls, and the water may be collected at where the basement daylights on the south side of the house for proper discharge.

Where applicable, in-lieu of conventional footing drains, weep holes (2” diameter of 10 feet on center) may be used for site retaining walls. A minimum 18-inch wide zone of free draining granular soils (i.e. pea gravel or washed rock) is recommended to be placed adjacent to the wall for the full height of the wall. Alternatively, a composite drainage material, such as Miradrain 6000, may be used in lieu of the clean crushed rock or pea gravel. The drainpipe at the base of the wall should be graded to direct water to a suitable outlet.

Wall Backfill

In our opinion, the existing on-site sandy soil may be re-used as wall backfill in the dry season provided they can be compacted to a dense condition and proper wall drainage discussed above is installed. The on-site soil should not be used as wall backfill in the wet season. Fine-grained soil, if encountered at the site, should not be used as wall backfill. Use of on-site soil as wall backfill should be approved by the project geotechnical engineer. If imported wall backfill is needed, they should consist of free draining granular material, such as Seattle Type 17 or WSDOT Gravel Borrow. In areas where the space is limited between the wall and the face of excavation, pea gravel may be used as backfill without compaction.

Wall backfill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557. Within 5 feet of the wall, the backfill should be compacted with hand-operated equipment to at least 90 percent of the maximum dry density.

Damp Proofing – The exterior of all basement walls should be protected with a damp proofing compound.

CONSTRUCTION CONSIDERATIONS

TEMPORARY EXCAVATIONS AND UNDERPINNING

We understand that the existing basement walls will remain to provide temporary shoring. The elevation of proposed basement floor will be approximately one or two feet below the existing floor. Temporary excavations approximately 3 feet will be needed for the new basement construction. As such, the existing basement walls may be undermined, and underpinning of the existing footings likely will be needed to help maintain the stability of the existing wall during construction. The underpinning may be performed by undermining up to every other 6-foot long sections of the existing footings, and backfilled with lean-mix concrete. We anticipate the underpinning will need to be completed in two to three stages.

We also recommend that the stability of the existing wall be evaluated by the structural engineer, to determine if internal braces will be required.

We anticipate the excavations to mainly encounter loose to medium dense silty fine sand. All temporary excavations should be performed in accordance with Part N of WAC (Washington Administrative Code) 296-155. The contractor is responsible for maintaining safe excavation slopes and/or shoring. Based on the soil conditions at the site, for planning purposes, it is our opinion that temporary excavations may be sloped 1H:1V or flatter.

MATERIAL REUSE AND STRUCTURAL FILL

In the context of this report, structural fill is defined as compacted fill placed under any load-bearing areas. In our opinion, the on-site soil is not suitable to be used as structural fill, but can be used as wall backfill and general fill in the non-structural and landscape areas. Structural fill, if needed, should consist of imported, well-grade, granular material, such as City of Seattle Type 17 or WSDOT Gravel Borrow. Well-graded recycled concrete may also be considered as a source of structural fill. Use of recycled concrete as structural fill should be approved by the geotechnical engineer. If use of the on-site soil is planned, the excavated soil should be stockpiled and protected with plastic sheeting to prevent softening from rainfall in the wet season.

STRUCTURAL FILL PLACEMENT AND COMPACTION

Structural fill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557.

Depending on the type of compaction equipment used and depending on the type of fill material, it may be necessary to decrease the thickness of each lift in order to achieve adequate compaction. PanGEO can provide additional recommendations regarding structural fill and compaction during construction.

WET WEATHER EARTHWORK

In our opinion, the proposed site construction may be accomplished during wet weather (such as in winter) without adversely affecting the site stability. However, earthwork construction performed during the drier summer months likely will be more economical. Winter construction will require the implementation of best management erosion and sedimentation control practices to reduce the chance of off-site sediment transport. Some of the site soils contain a high percentage of fines and are moisture sensitive. Any footing subgrade soils that become softened either by disturbance or rainfall should be removed and replaced with structural fill, Controlled Density Fill (CDF), or lean-mix concrete. General recommendations relative to earthwork performed in wet conditions are presented below:

- Site stripping, excavation and subgrade preparation should be followed promptly by the placement and compaction of clean structural fill or CDF;
- The size and type of construction equipment used may have to be limited to prevent soil disturbance;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion and the movement of soil;
- Structural fill should consist of less than 5% fines; and
- Excavation slopes should be covered with plastic sheets.

SURFACE DRAINAGE AND EROSION CONSIDERATIONS

Surface runoff can be controlled during construction by careful grading practices. Typically, this includes the construction of shallow, upgrade perimeter ditches or low earthen berms in conjunction with silt fences to collect runoff and prevent water from entering excavations or to prevent runoff from the construction area from leaving the immediate work site. Temporary erosion control may require the use of hay bales on the downhill side of the project to prevent water from leaving the site and potential storm water detention to trap sand and silt before the water is discharged to a suitable outlet. All collected water should be directed under control to a positive and permanent discharge system.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is directed away from structures. Potential problems associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed addition, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical elements. The City of Seattle DPD, as part of the permitting process, will also require geotechnical construction inspection services. PanGEO can provide you a cost estimate for construction monitoring services at a later date.

We anticipate that the following additional services will be required:

- Review final project plans and specifications
- Verify implementation of erosion control measures;
- Monitor site stability and excavations;
- Monitor temporary shoring installation;
- Monitor pin pile installation;
- Verify the adequacy of subsurface drainage installation;
- Confirm the adequacy of the compaction of structural backfill; and
- Other consultation as may be required during construction

Modifications to our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

CLOSURE

We have prepared this report for Jay and Rebecca Buxbaum, and the project design team. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. 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. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

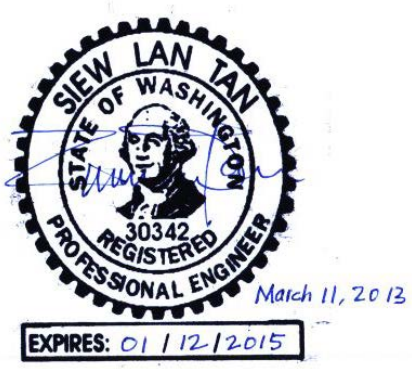
This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

We appreciate the opportunity to be of service.

Sincerely,



Chien-Lin (Johnny) Chen, P.E.
Project Geotechnical Engineer

Siew L. Tan, P.E.
Principal Geotechnical Engineer

Enclosures:

Figure 1 Vicinity Map

Figure 2 Site and Exploration Plan

Appendix A – Summary Boring Logs
- Figure A-1 Terms and Symbols for Boring and Test Pit Logs
- Figure A-2 Log of Test Boring BH-1
- Figure A-3 Log of Test Boring BH-2
- Figure A-4 Log of Test Boring BH-3

Appendix B – Laboratory Test Results
- Figure B-1 Sieve Analysis Results

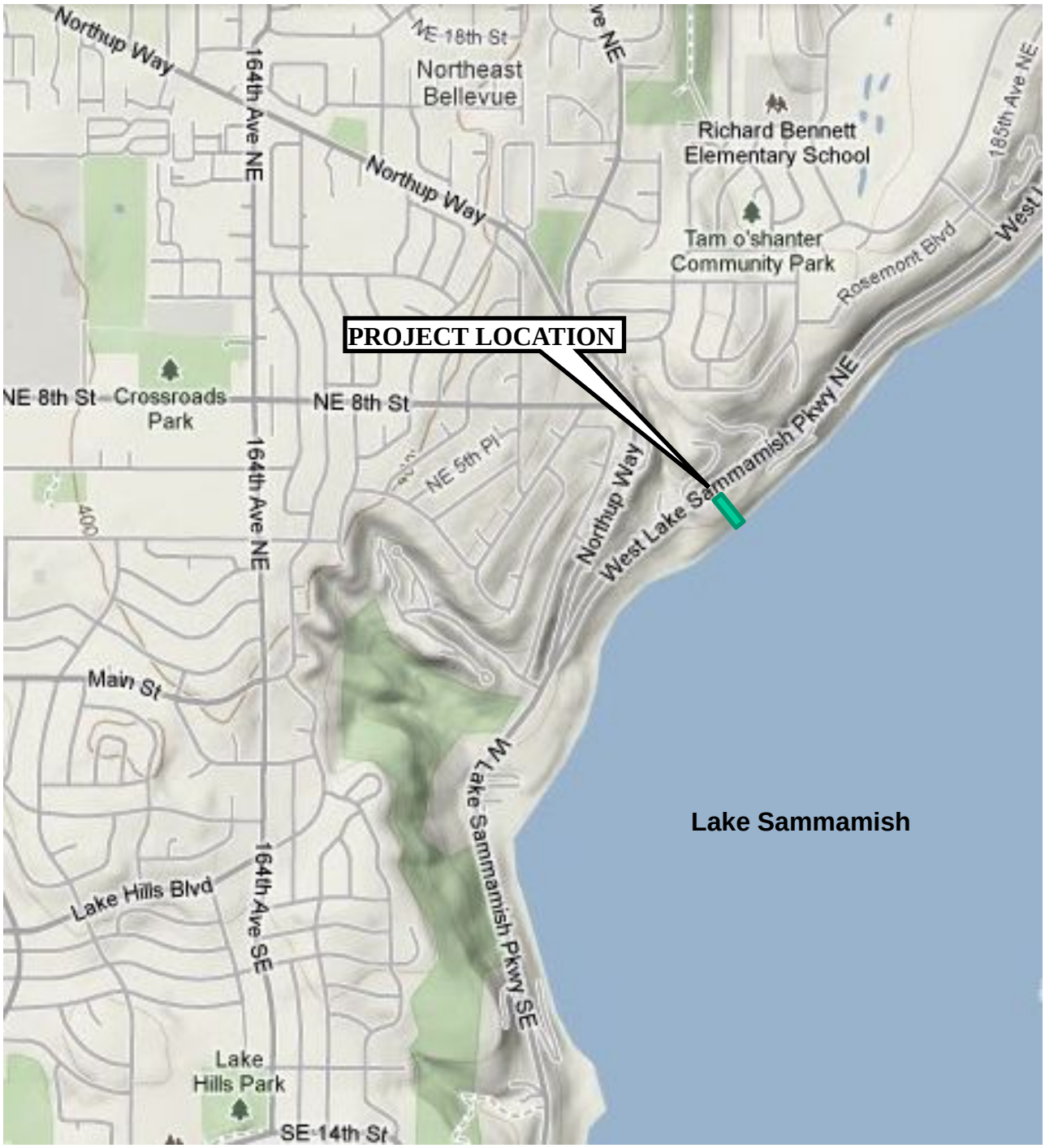
Appendix C – Previous Test Boring Log

REFERENCES

International Code Council, 2009, *International Building Code.*

Booth, D. B., Walsh, T. J., Troost, K. G., Shimel, S. A., 2005, *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* – U. S. Geological Survey, scale 1:24,000.

Terra Associates, Inc., 1994, *Geotechnical Report, McCaffray Garage, 486 West Lake Sammamish Parkway NE, Bellevue, Washington*. Consultant report prepared for S. J. McCaffray, project number T-2746.



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Reference: Google Maps

Fig1_vicinity.ppt 3/7/2013(1:12 PM) JC

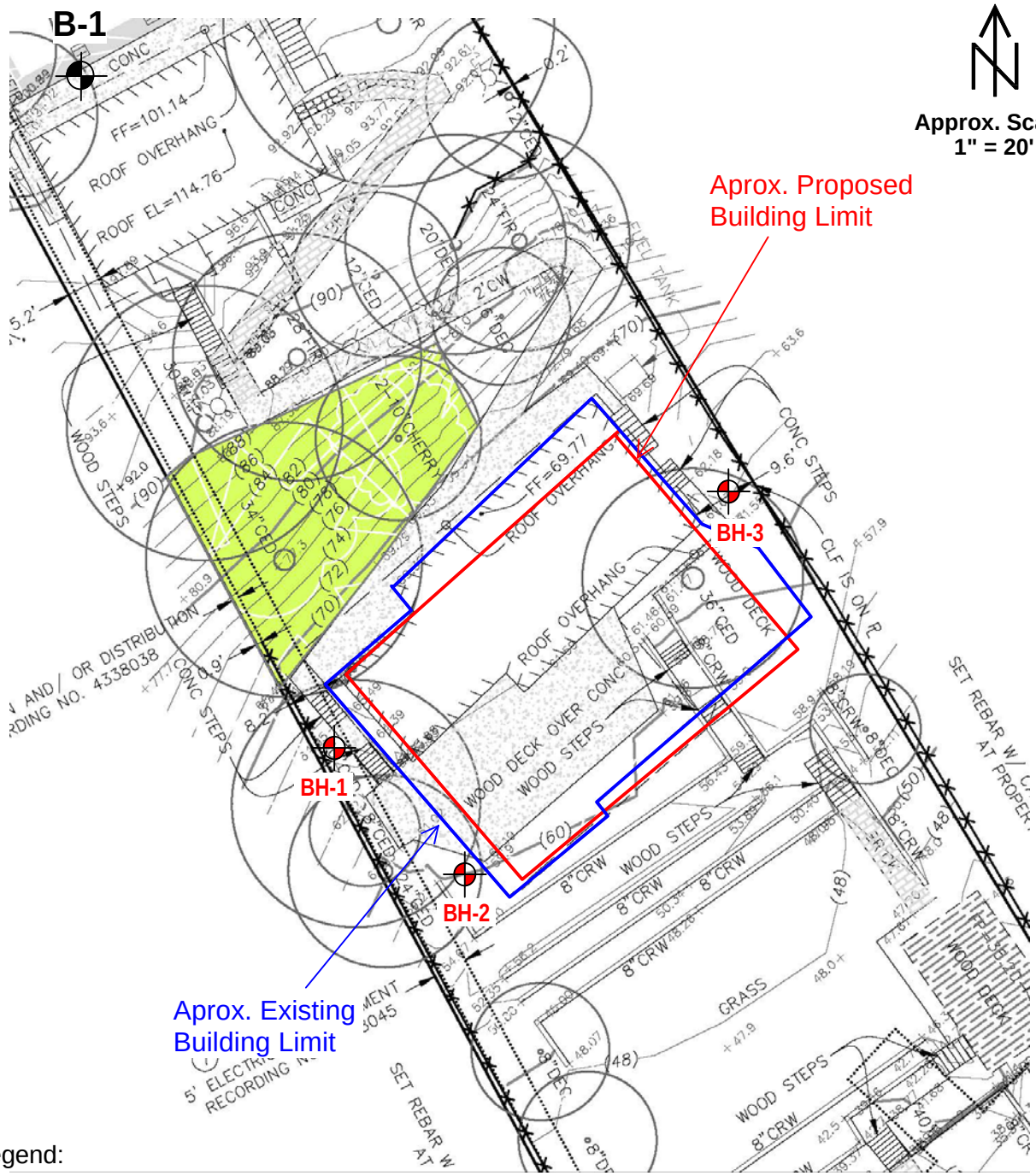
PanGEO INCORPORATED

Buxbaum Residence
486 West Lake Sammamish Parkway NE
Bellevue, Washington

VICINITY MAP

Project No. 13-003

Figure No. 1



Legend:

BH-1 Current Test Boring Location (PanGEO 2013)

B-1 Previous Test Boring Location (Terra associates 1994)

Over 40% Steep Slope (mapped by GeoDimensions)

Note:
Figure is modified from Topographic Survey prepared by GeoDimensions dated 12/26/2012.
Figure olny showns southern half portion of the site consisting of existing house and detached garage.
The northern half portion of the site consisting of asphalt driveway and parking is not shown in this figure.

PanGEO INCORPORATED	Buxbaum Residence 486 West LakeSammamish Parkway NE Bellevue, Washington	SITE AND EXPLORATION MAP	
		Project No. 13-003	Figure No. 2

13-003 Site Plan Fig 2.grf 3/7/13 (19:44) JC

APPENDIX A

SUMMARY BORING LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)	GW	Well-graded GRAVEL
		GP	Poorly-graded GRAVEL
	GRAVEL (>12% fines)	GM	Silty GRAVEL
		GC	Clayey GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)	SW	Well-graded SAND
		SP	Poorly-graded SAND
	SAND (>12% fines)	SM	Silty SAND
		SC	Clayey SAND
Silt and Clay 50%or more passing #200 sieve	Liquid Limit < 50	ML	SILT
		CL	Lean CLAY
		OL	Organic SILT or CLAY
	Liquid Limit > 50	MH	Elastic SILT
		CH	Fat CLAY
		OH	Organic SILT or CLAY
Highly Organic Soils		PT	PEAT

Notes: 1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.

2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered:	Units of material distinguished by color and/or composition from material units above and below	Fissured:	Breaks along defined planes
Laminated:	Layers of soil typically 0.05 to 1mm thick, max. 1 cm	Slickensided:	Fracture planes that are polished or glossy
Lens:	Layer of soil that pinches out laterally	Blocky:	Angular soil lumps that resist breakdown
Interlayered:	Alternating layers of differing soil material	Disrupted:	Soil that is broken and mixed
Pocket:	Erratic, discontinuous deposit of limited extent	Scattered:	Less than one per foot
Homogeneous:	Soil with uniform color and composition throughout	Numerous:	More than one per foot
		BCN:	Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel		Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
Coarse Gravel:	3 to 3/4 inches	Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Fine Gravel:	3/4 inches to #4 sieve	Silt	0.074 to 0.002 mm
		Clay	<0.002 mm

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

CBR	California Bearing Ratio
Comp	Compaction Tests
Con	Consolidation
DD	Dry Density
DS	Direct Shear
%F	Fines Content
GS	Grain Size
Perm	Permeability
PP	Pocket Penetrometer
R	R-value
SG	Specific Gravity
TV	Torvane
TXC	Triaxial Compression
UCC	Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

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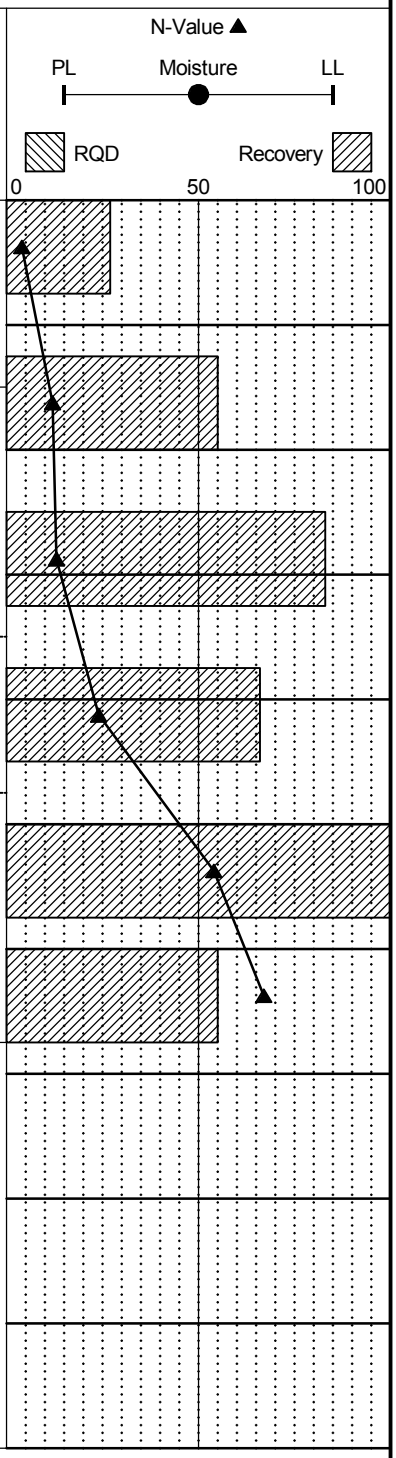
Phone: 206.262.0370

Terms and Symbols for Boring and Test Pit Logs

Figure A-1

Project:	Buxbaum Residence	Surface Elevation:	65.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		1, 2, 2			**UNIT1: Fill** Loose, moist, dark brown to gray, silty SAND with trace roots and organics.
2						
4	S-2		3, 4, 8			**UNIT 2: Alluvium** Medium dense, moist, gray with mottled brown, silty fine SAND.
6	S-3		4, 6, 7			- becomes wet, some iron oxide stainings.
8	S-4		7, 9, 15			Medium dense, brown to gray, silty SAND with some gravel.
10	S-5		17, 27, 27			Very dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		14, 29, 38			
14						Bottom of boring at 13.5 feet below ground surface. Groundwater was encountered at about 5 feet deep during drilling.
16						
18						
20						



Completion Depth:	13.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

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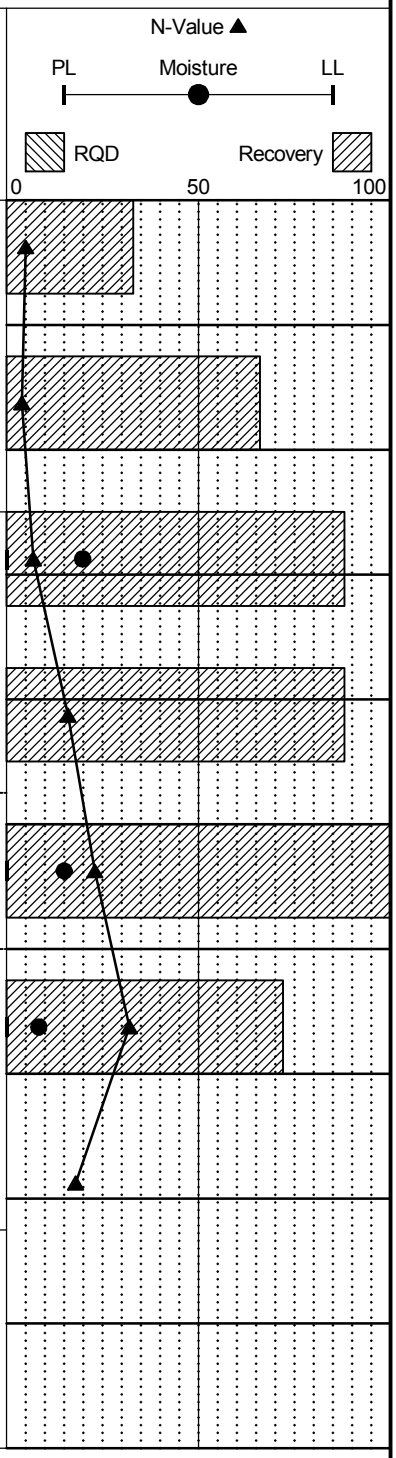
LOG OF TEST BORING BH-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	59.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1	X	2 2 3			**UNIT1: Fill** Loose, moist, dark brown to gray, silty fine SAND with trace roots and organics.
2	S-2	X	4 2 2			- some organic silt with trace wood, becomes wet.
4						
6	S-3	X	4 3 4	GS		**UNIT 2: Alluvium** Loose to medium dense, wet, gray with mottled brown, silty fine SAND, some iron oxide stainings.
8	S-4	X	6 6 10			
10	S-5	X	4 10 13	GS		Medium dense, wet, brown-gray, SAND with some gravel and silt.
12	S-6	X	9 16 16	GS		Medium dense to dense, wet, brown, sandy GRAVEL with some silt.
14						
16	S-7	X	15 9 9			Bottom of boring at 16.5 feet below ground surface. Groundwater was encountered at about 4.5 feet deep during drilling.
18						
20						



Completion Depth:	16.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

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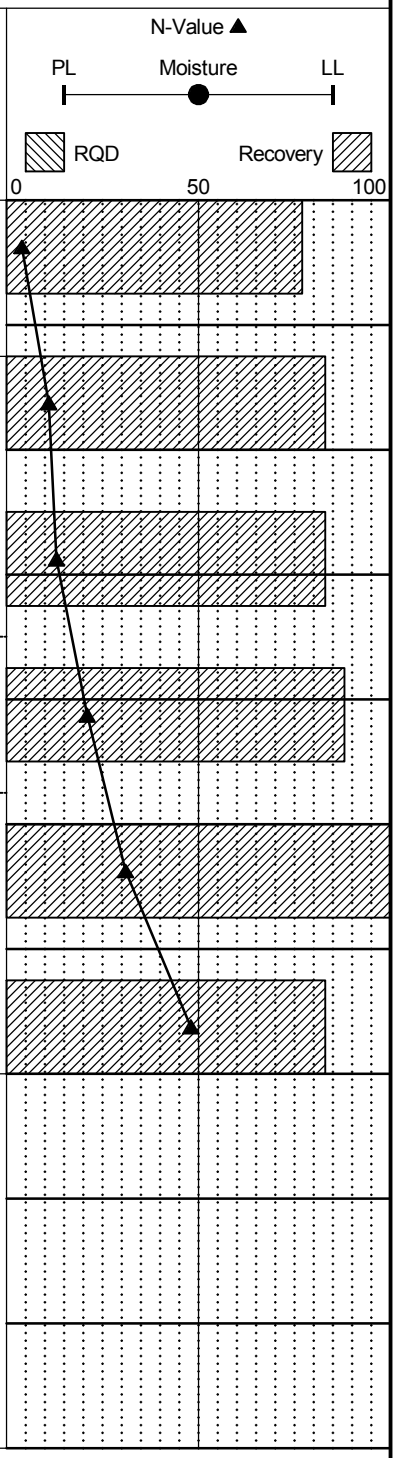
LOG OF TEST BORING BH-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	62.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		2 2 2			**UNIT1: Fill** Soft, moist, dark brown, organic silt with some fine sand and trace roots.
2	S-2		3 6 5			**UNIT 2: Alluvium** Medium dense, wet, gray-brown, silty fine SAND.
4	S-3		5 6 7			
6						Medium dense, moist to wet, brown, silty medium SAND with some gravel.
8	S-4		6 7 14			
10	S-5		12 13 18			Dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		19 23 25			- some heaving.
14						Bottom of boring at 14 feet below ground surface. Groundwater was encountered at about 4 feet deep during drilling.
16						
18						
20						



Completion Depth:	14.0ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

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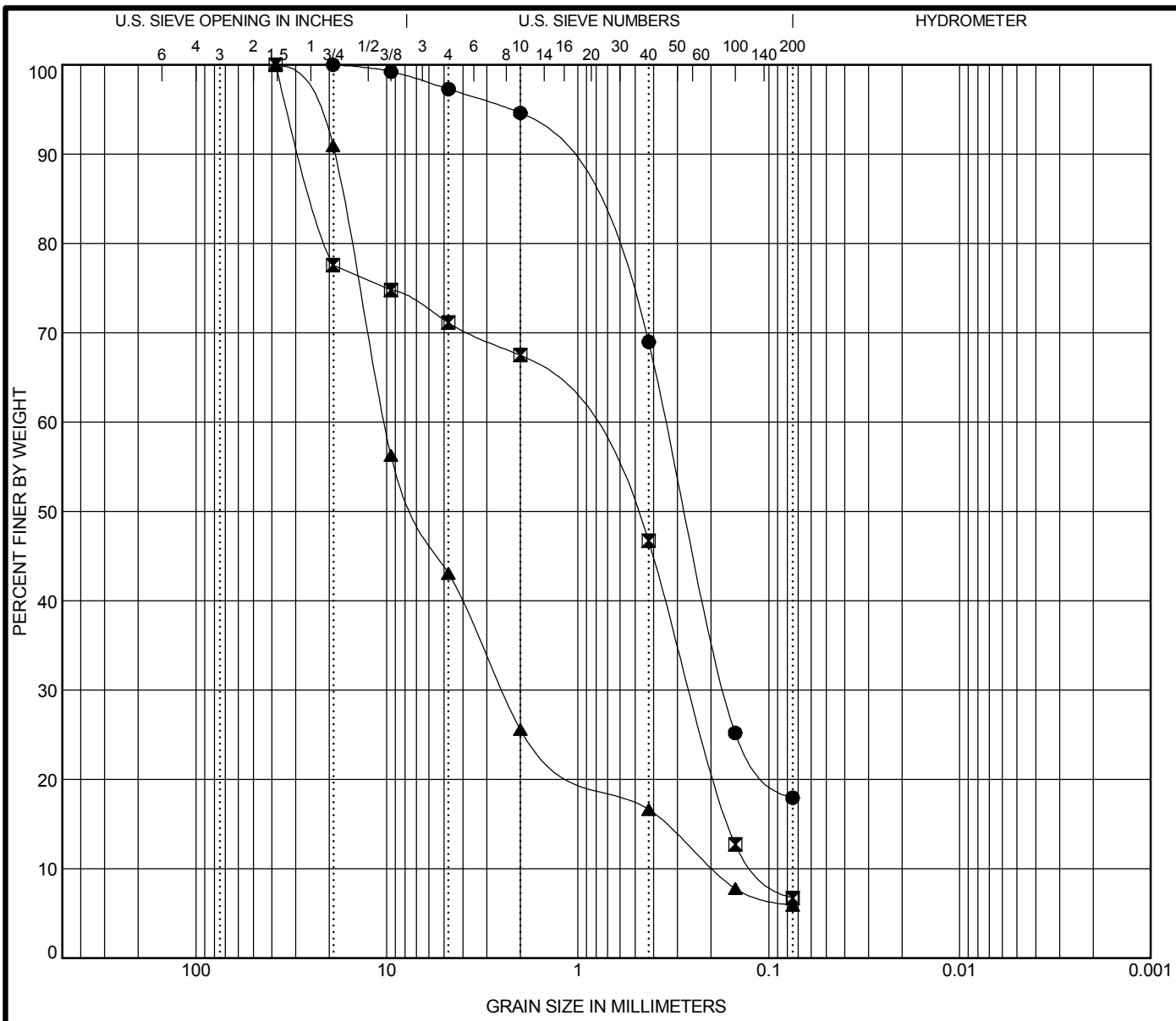
LOG OF TEST BORING BH-3

Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

APPENDIX B

LABORATORY TEST RESULTS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	BH-2	@ 5.0 ft.	SILTY SAND(SM)	NP	NP	NP		
⊠	BH-2	@ 10.0 ft.	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.52	10.47
▲	BH-2	@ 12.5 ft.	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	NP	NP	NP	3.11	52.64

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-2	5.0	19.1	0.343	0.168		2.7	79.3	18.0	
⊠	BH-2	10.0	38.1	1.145	0.255	0.109	28.9	64.4	6.7	
▲	BH-2	12.5	38.1	10.241	2.49	0.195	56.9	37.1	5.9	

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GRAIN SIZE DISTRIBUTION

Project: Buxbaum Residence
Job Number: 13-003
Location: 486 W Lake Sammamish Pky NE, Bellevue, WA

Figure B-1

APPENDIX C

PREVIOUS TEST BORING LOG

Boring No. B-1

Logged by: DBG

Date: 10-19-94

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)		
GM/SM	Light brown sandy GRAVEL with silt to gravelly SAND with silt, dry.	Dense to Very Dense			50/4"	6		
			5		50/6"	3		
SM/CL	Brown silty SAND with sandy CLAY interbeds, moist.	Dense			39	24		
			10		52	4		
SM	Gray silty SAND, fine grained, dry to moist.	Very Dense			50/6"	8		
			15		91	7		

Boring terminated at 16.5 feet
No groundwater seepage encountered.

TERRA ASSOCIATES
Geotechnical Consultants

BORING LOG
McCaffray Garage
Bellevue, Washington

Proj. No. T-2746	Date 10/94	Figure 4

PanGEO
INCORPORATED
Geotechnical & Earthquake
Engineering Consultants

October 22, 2013
File No. 13-003.300

Jay and Rebecca Buxbaum
c/o Ms. Meredith Kelly
DeForest Architects
106 NW 36th Street
Seattle, WA 98107

Subject: **Critical Areas Report**
Proposed Buxbaum Residence – Main House
486 West Lake Sammamish Parkway NE, Bellevue, WA

Dear Jay and Rebecca,

As requested, PanGEO has completed a geotechnical engineering evaluation of the site slopes located above and below the proposed residence. The purpose of this report is to assist you with the Critical Areas Land Use Permit (LO) required by the City of Bellevue. Our service scope included reviewing readily-available geologic data and geotechnical study, conducting a site reconnaissance, and developing the conclusions and recommendations presented in this report.

SITE AND SLOPE CONDITIONS

The subject site is an approximately 0.6-acre waterfront lot located at 486 West Lake Sammamish Parkway NE in Bellevue, Washington (see Vicinity Map, Figure 1). The site is rectangular in shape and is bordered to the north by West Lake Sammamish Parkway NE, to the east and west by single-family dwellings, and to the south by Lake Sammamish. The approximately north half of the site is relatively level, and consists of a driveway, parking areas, and landscape areas.

The approximately south half of the site is an approximately 70-foot high south-facing slope, ranging from approximately Elevation 100 feet at the top of the slope to Elevation 30 feet along

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the lake front. An existing two-story garage, including a daylight basement, is located at the top of the slope; and an existing two-story house, including a daylight basement, is located on a relatively level bench within the south facing slope near Elevation 60 feet. The area between the garage and the house is a steep slope. The slope is currently heavily vegetated with ivy, shrubs, and trees (see Plate 1, below). Topographic survey provided for our review indicated that most of the slope exceeds 40% gradient. The 40% steep slope area is indicated on Figure 2, as delineated by GeoDimensions. We understand that this area will be remained as is, and will not be disturbed by the upcoming construction activities.

Plate 1. View of the steep slope above the existing house. The slope is currently heavily vegetated with ivy, shrubs, and trees (looking west).

The area between the house and the lake is terraced, and two tiered timber walls and wood steps have been constructed (see Plate 2, next page). One 4-tiered timber wall is located below the house, and another 4-tiered timber wall is located at the lower portion of slope along the lake front. A level bench is located between these two 4-tier timber walls. The level bench occupies

approximately half of the area between the house and the lake. We also understand that this area will also be remained as is, and will not be disturbed as part of this project.

Plate 2. View of the slop area below the existing house. The slope has been improved with tiered timber walls, wood steps and landscaping (looking north).

We understand that you plan to remove the existing house and to construct a new single-family residence, roughly at the same location as the existing house. The proposed residence will be a two-story wood frame structure with a daylight basement and supported on pine piles. We also understand that the proposed project will also include new walkways, patios, and a deck around the house. Based on our discussions with the project architect, the proposed lowest floor elevation will be approximately one to two feet below the existing basement floor. The existing basement walls will remain and new basement walls will be constructed on the inboard side of the existing basement walls.

SUBSURFACE CONDITIONS

The subsurface conditions at the slopes are inferred from our review of published geology map and geotechnical engineering reports completed at the project site. Specifically, the following geotechnical data were reviewed:

- Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington complied by Booth, D. B., Walsh, T. J., Troost, K. G., Shimel, S. A. (2006).
- Test boring logs for the Buxbaum Residence located at 486 West Lake Sammamish Parkway NE, Bellevue, Washington completed by PanGEO, Inc. (2013).
- Test boring log for the McCaffray Garage located at 486 West Lake Sammamish Parkway NE, Bellevue, Washington completed by Terra Associates, Inc. (1994).

GEOLOGY

Away from the lake shore, the *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* (Booth, et. al. 2006) indicates that pre-Fraser deposits generally underlain the slope above the proposed building. The pre-Fraser deposits have been overridden by glaciers, and are anticipated to exhibit high strength characteristics in its undisturbed state. The geology map mapped the surficial geologic unit along the lake shore in at the slope below the proposed building site as Alluvium (Qal). Alluvium typically consists of moderately sorted cobble gravel, pebbly sand, and sandy silt.

SOIL CONDITION AT UPPER SLOPE

Based on the soil boring B-1 completed by Terra Associates, Inc. (1994) from the top of the steep slope (i.e. near the existing garage located above the house), the soils within the steep slope located north of existing house consists of dense to very dense sandy gravel to silty sand with interbedded sandy clay. This soil unit appears to be consistent with the mapped pre-Fraser deposits.

SOIL CONDITION AT LOWER SLOPE

Test boring BH-2 completed by PanGEO, Inc. (2013), near the top of lower slope (i.e. below the house), encountered 5 feet of loose fill over medium dense silty fine sand to dense sandy gravel to the maximum depth explored at about 16 feet. We interpret the soil units encountered in BH-2 as alluvium, consistent with the mapped geology.

GROUNDWATER

Groundwater seepage was encountered in test boring BH-2 drilled near the top of lower slope, at a depth of about 4 to 5 feet deep during drilling. However, no groundwater seepage was noted on the summary log for boring B-1 drilled on the top of upper slope. It should be noted that groundwater elevations and seepage rates are likely to vary depending on the season, local subsurface conditions, and other factors. Groundwater levels and seepage rates are normally highest during the winter and early spring.

SLOPE EVALUATIONS

Based on a review of Geologic Hazards Map prepared by City of Bellevue, the slope above the existing house is mapped as a 40% or greater steep slope (see Figure 2). However, the slope below the existing house is not mapped as a steep slope area. In addition, based on King County records, the project vicinity is not mapped as a landslide hazard area.

A site reconnaissance of the property was conducted on October 19, 2013 as part of our evaluation. During our site reconnaissance, we did not observe obvious evidence of past or on-going slope instability may be indicated by the presence of pistol-butted or severely leaning trees. We did not observe slump blocks, scarps, or tension cracks at the ground surface that would also be indicative of past or on-going slope instability. The existing buildings and timber walls were observed to be in a fair condition and no obvious sings of foundation movement are noted. The slope below the existing house has been terraced and improved with a landscaped backyard. The existing timber walls and stairways were observed to be in a stable condition and no signs of movement are noted. As such, we believe that the slopes above and below the existing building is currently in stable condition.

CONCLUSIONS AND RECOMMENDATIONS

As discussed above, the proposed building will be constructed roughly at the same location of existing house. The existing basement wall will be remained and used as a temporary shoring wall. The proposed building will be supported on pin pile foundation to minimize ground disturbance. The steep slope above the existing house and the terraced slope below the house will remain and will not be disturbed by construction. The existing landform and vegetation will remain in its existing condition.

Based on our evaluation, in our opinion, the slopes above and below the proposed building are stable in its current configuration. Furthermore, it is also our opinion that the proposed single-

family development as planned will not decrease the site stability and adversely impact the subject and surrounding properties. Additional discussions regarding relevant land use codes for critical areas report are included in the Appendix B.

CLOSURE

We have prepared this report for Jay and Rebecca Buxbaum, and the project design team. Recommendations contained in this report are based on a site reconnaissance, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. 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. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

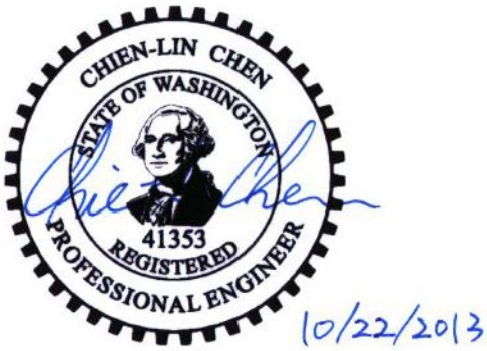
This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

We appreciate the opportunity to be of service.

Sincerely,



Chien-Lin (Johnny) Chen, P.E.
Project Geotechnical Engineer

Siew L. Tan, P.E.
Principal Geotechnical Engineer

Enclosures:

Figure 1 Vicinity Map

Figure 2 Site and Exploration Plan

Appendix A – Summary Test Boring Logs

Borings BH-1 through BH-3 (PanGEO, 2013)

Boring B-1 (Terra Associates, 1994)

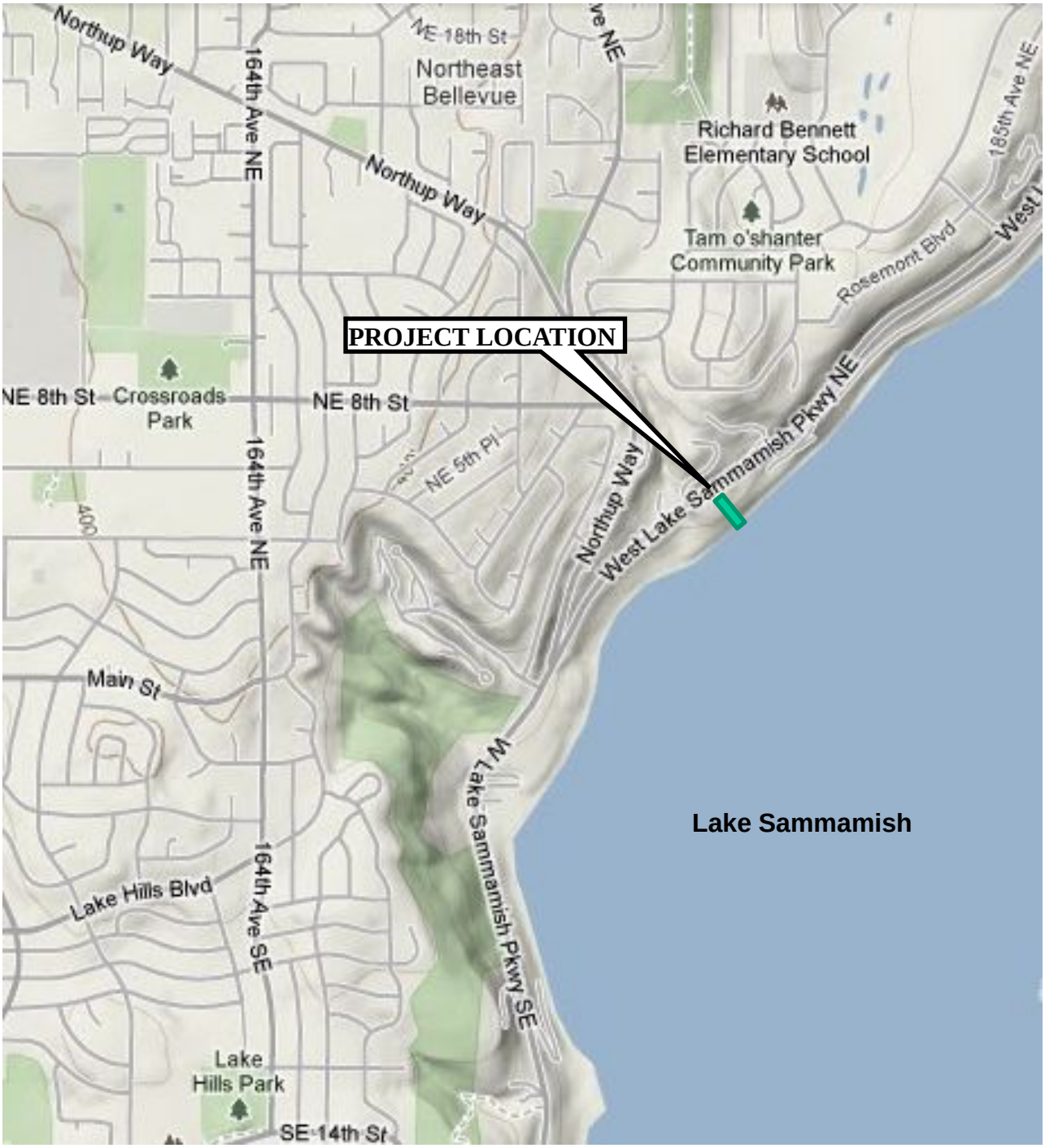
Appendix B – Relevant Codes for Critical Areas Report

REFERENCES

Booth, D. B., Walsh, T. J., Troost, K. G., Shimel, S. A., 2006, *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* – U. S. Geological Survey, scale 1:24,000.

PanGEO, Inc., 2013, *Geotechnical Engineering Report, Buxbaum Residence, 486 West Lake Sammamish Parkway NE, Bellevue, Washington*. Consultant report prepared for Jay Buxbaum, project number 13-003.

Terra Associates, Inc., 1994, *Geotechnical Report, McCaffray Garage, 486 West Lake Sammamish Parkway NE, Bellevue, Washington*. Consultant report prepared for S. J. McCaffray, project number T-2746.



NTS

Reference: Google Maps

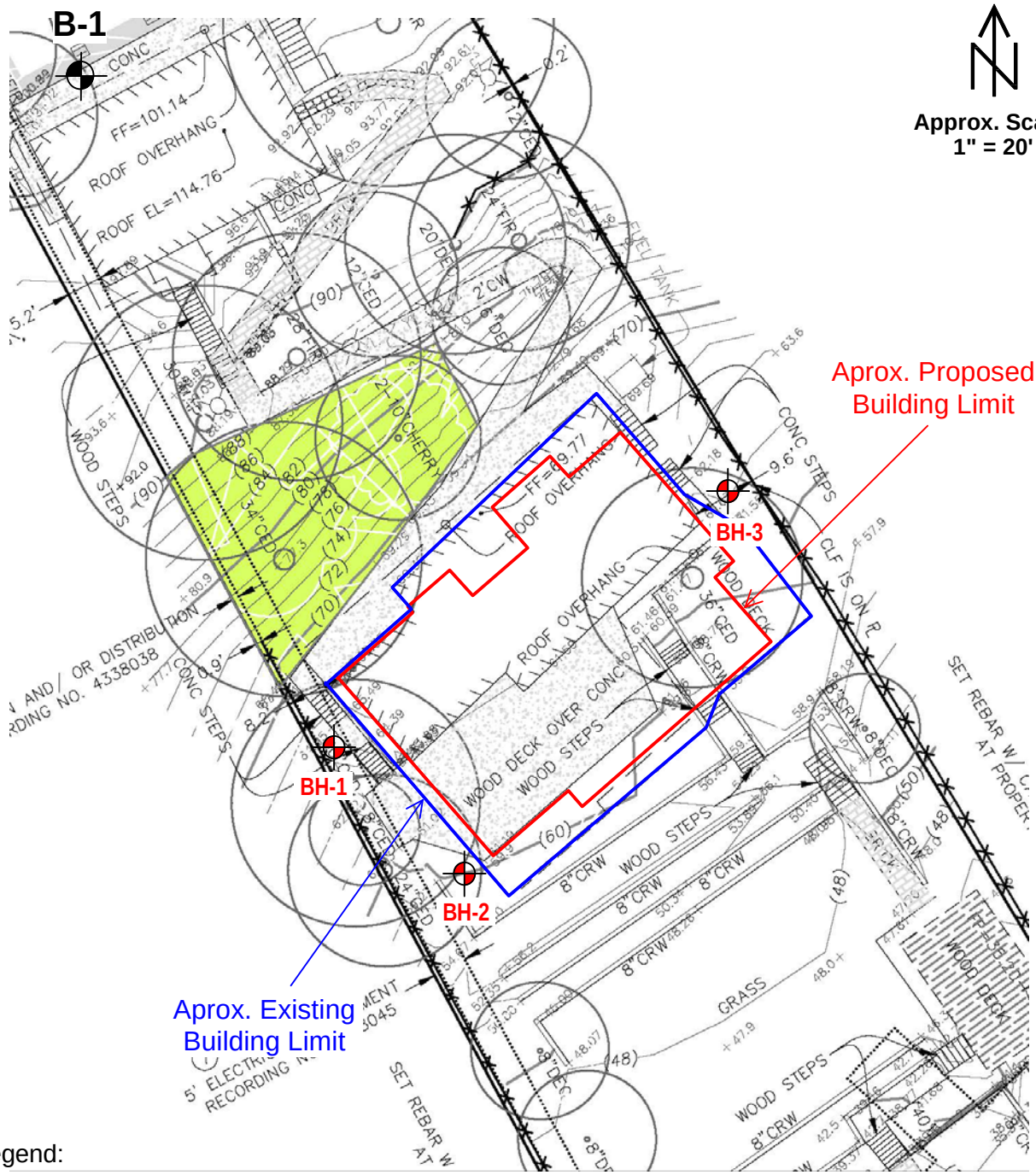
PanGEO INCORPORATED

Buxbaum Residence
486 West Lake Sammamish Parkway NE
Bellevue, Washington

VICINITY MAP

Project No.	13-003.300	Figure No.	1

Fig1_vicinity.ppt 10/16/2013(1:12 PM) JC



Legend:

BH-1 Test Boring Location by PanGEO 2013

B-1 Test Boring Location by Terra associates 1994

Over 40% Steep Slope mapped by GeoDimensions

Note:
Figure is modified from Topographic Survey prepared by GeoDimensions dated 12/26/2012.
Figure olny showns southern half portion of the site consisting of existing house and detached garage.
The northern half portion of the site consisting of asphalt driveway and parking is not shown in this figure.

PanGEO INCORPORATED	Buxbaum Residence 486 West LakeSammamish Parkway NE Bellevue, Washington	SITE AND EXPLORATION MAP	
		Project No. 13-003.300	Figure No. 2

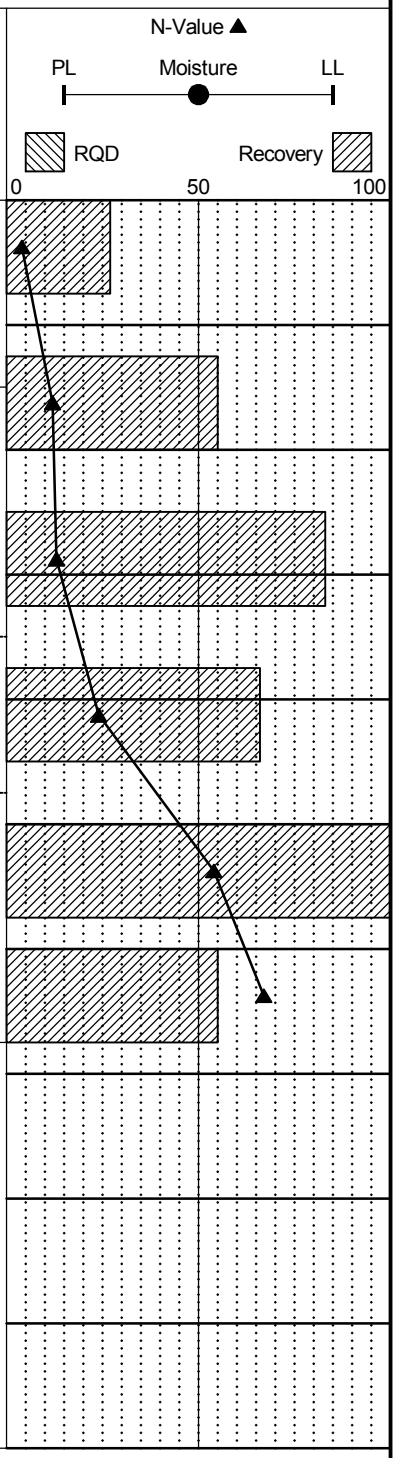
13-003 Site Plan Fig 2.grf 10/16/13(16:46) JC

APPENDIX A

SUMMARY TEST BORING LOGS

Project:	Buxbaum Residence	Surface Elevation:	65.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		1, 2, 2			**UNIT1: Fill** Loose, moist, dark brown to gray, silty SAND with trace roots and organics.
2						
4	S-2		3, 4, 8			**UNIT 2: Alluvium** Medium dense, moist, gray with mottled brown, silty fine SAND.
6	S-3		4, 6, 7			- becomes wet, some iron oxide stainings.
8	S-4		7, 9, 15			Medium dense, brown to gray, silty SAND with some gravel.
10	S-5		17, 27, 27			Very dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		14, 29, 38			
14						Bottom of boring at 13.5 feet below ground surface. Groundwater was encountered at about 5 feet deep during drilling.
16						
18						
20						



Completion Depth:	13.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

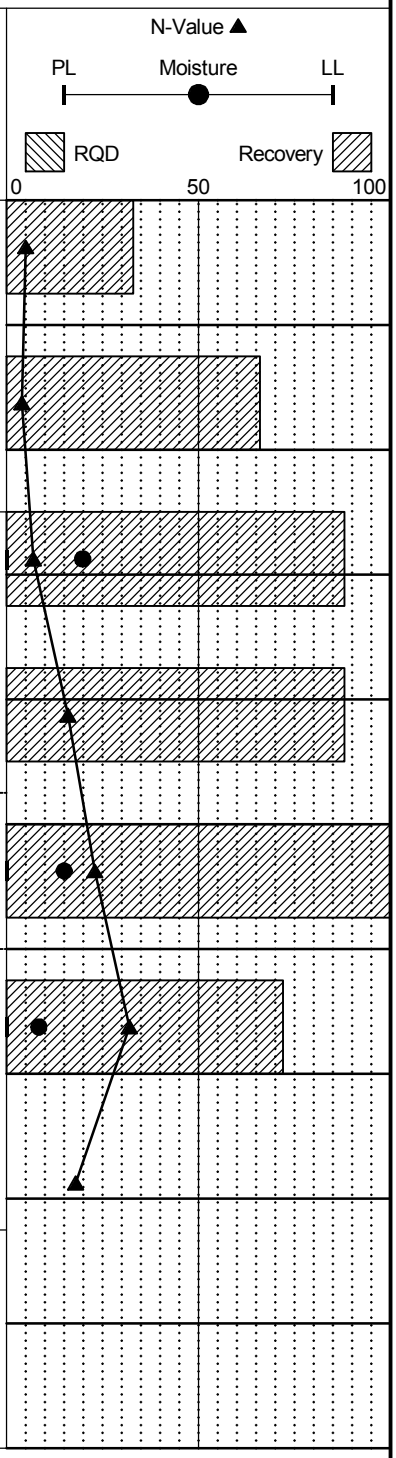
LOG OF TEST BORING BH-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	59.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1	X	2 2 3			**UNIT1: Fill** Loose, moist, dark brown to gray, silty fine SAND with trace roots and organics.
2	S-2	X	4 2 2			- some organic silt with trace wood, becomes wet.
4						
6	S-3	X	4 3 4	GS		**UNIT 2: Alluvium** Loose to medium dense, wet, gray with mottled brown, silty fine SAND, some iron oxide stainings.
8	S-4	X	6 6 10			
10	S-5	X	4 10 13	GS		Medium dense, wet, brown-gray, SAND with some gravel and silt.
12	S-6	X	9 16 16	GS		Medium dense to dense, wet, brown, sandy GRAVEL with some silt.
14						
16	S-7	X	15 9 9			Bottom of boring at 16.5 feet below ground surface. Groundwater was encountered at about 4.5 feet deep during drilling.
18						
20						



Completion Depth:	16.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

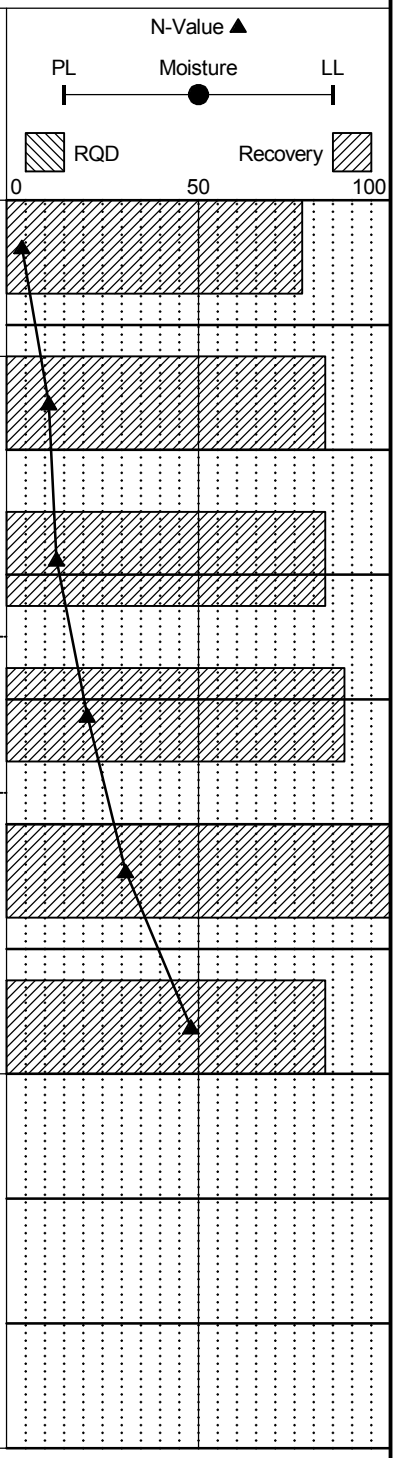
LOG OF TEST BORING BH-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	62.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		2 2 2			**UNIT1: Fill** Soft, moist, dark brown, organic silt with some fine sand and trace roots.
2	S-2		3 6 5			**UNIT 2: Alluvium** Medium dense, wet, gray-brown, silty fine SAND.
4	S-3		5 6 7			
6						Medium dense, moist to wet, brown, silty medium SAND with some gravel.
8	S-4		6 7 14			
10	S-5		12 13 18			Dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		19 23 25			- some heaving.
14						Bottom of boring at 14 feet below ground surface. Groundwater was encountered at about 4 feet deep during drilling.
16						
18						
20						



Completion Depth:	14.0ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

LOG OF TEST BORING BH-3

Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

Boring No. B-1

Logged by: DBG

Date: 10-19-94

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)		
GM/SM	Light brown sandy GRAVEL with silt to gravelly SAND with silt, dry.	Dense to Very Dense			50/4"	6		
			5		50/6"	3		
SM/CL	Brown silty SAND with sandy CLAY interbeds, moist.	Dense			39	24		
			10		52	4		
SM	Gray silty SAND, fine grained, dry to moist.	Very Dense			50/6"	8		
			15		91	7		

Boring terminated at 16.5 feet
No groundwater seepage encountered.

TERRA ASSOCIATES
Geotechnical Consultants

BORING LOG
McCaffray Garage
Bellevue, Washington

Proj. No. T-2746	Date 10/94	Figure 4

APPENDIX B

RELEVANT CODES FOR CRITICAL AREAS REPORT

SCOPE OF PROPOSAL

This proposal is requesting a modification to the standard **toe-of-slope structure setback** pursuant to LUC 20.25H.120.C.3. We hereby request that the 75-foot toe-of slope setback be waived due to the existing landform and vegetation, including critical area, will be remained, and will not be disturbed by upcoming development.

The proposed development includes replacing the existing house with a new single-family residence roughly at same location. The proposed residence consists of a two-story structure with a daylight basement. The existing basement walls will remain and new basement walls will be constructed on the inboard side of the existing basement walls. The propose residence will be supported by pin pile foundation to minimize the ground disturbance.

CRITICAL AREA AFFECTED

The critical area affected by this proposal consists of a steep slope area between the existing garage and house. The proposed residence will be located within the 75-foot toe-of-slope structure setback. Since the proposed residence will be constructed roughly at the same location of existing house, the existing setback will not be changed. This setback has existed for decades with no evidence of any negative impact to the steep slope and the downslope structure.

To minimize the ground disturbance, pin piles will be utilized to support the proposed building. No stripping and grading on the steep slope is planned. The vegetation and natural landform will remain in its existing condition. In addition, the proposal will not create additional impervious surface on the slope. As such, the impact to the critical area is minimal.

RELEVANT CODE SECTIONS

Relevant code sections include:

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

20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

20.25H.145 Critical areas report – Approval of modification.

20.30P.140 Decision criteria for a Critical Areas Land Use Permit.

The criteria and requirements of these sections has been addressed and justifications given in detail in the following section.

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;

The proposed residence will be constructed roughly at the same location of existing house and supported on pin piles to minimize ground disturbance on the slope.

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

The recommended foundation support option (pin piles) is intended to minimize ground disturbance on the slope. The existing contour of slope and the vegetation on the slope will remain as is.

C. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;

The proposed residence will not result in greater risk to the neighboring properties, and it will not result in the 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;

Not applicable in this case. No retaining structures are proposed.

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

No impervious surface is planned within the critical area.

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;

Not applicable in this case. No grading on steep slope is proposed.

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;

Building foundation walls will be built as retaining walls. No freestanding retaining structures are proposed.

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;

The proposed residence will be supported on pin piles to minimize the topographic modification. However, the proposed residence is not located within the steep slope.

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

Not applicable in this case.

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.

Since this proposal residence will be constructed roughly at the same location of existing house, the disturbed area is minimal. In addition, the existing landform and vegetation on the slope will remain as is. Mitigation and restoration plan may be needed and will be addressed by others.

20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

In addition to the provisions of LUC 20.25H.230, any proposal to modify a landslide hazard or steep slope or associated critical area buffer through a critical areas report shall comply with the requirements of this section.

A. Limitation on Modification.

The provisions for coal mine hazard areas in LUC 20.25H.130 may not be modified through a critical areas report.

Not applicable in this case.

B. Area Addressed in Critical Area Report.

In addition to the general requirements of LUC 20.25H.230, the following areas shall be addressed in a critical areas report for geologically hazardous areas:

1. Site and Construction Plans. The report shall include a copy of the site plans for the proposal and a topographic survey;

Please see the Figure 2, Site and Exploration Plan, in this report.

2. Assessment of Geological Characteristics. The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems in use in the region;

Please see the Subsurface Conditions in this report.

3. Analysis of Proposal. The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and

its potential impact upon the hazard area, the subject property, and affected adjacent properties; and
Please see the Slope Evaluations in this report.

4. Minimum Critical Area Buffer and Building Setback. The report shall make a recommendation for a minimum geologic hazard critical area buffer, if any, and minimum building setback, if any, from any geologic hazard based upon the geotechnical analysis.
This proposal intends to request a modification to the standard toe-of-slope building setback. Please see the Conclusions and Recommendations in this report.

20.25H.145 Critical areas report – Approval of modification.

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the Director determines that the modification:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of this part were not modified;
This slope has been stable for decades and the work of this proposal will not impact to the slope and adjacent properties. The proposed residence will be constructed roughly at the existing house location and supported on pin piles. It is our opinion that the proposed residence will not increase the threat of geologic hazard to adjacent properties.

B. Will not adversely impact other critical areas;
There is no stripping and grading within the critical area Planned. The existing contour of slope and the vegetation on the slope will remain as is. The proposal will not impact the Steep Slope or other Critical Area.

C. Is designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of this part were not modified;
The proposed residence will be supported on pin piles to minimize the ground disturbance. The critical area will remain as is, and no additional hazard will be created.

D. Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington;
*Provided that the project design is consistent with the recommendations outlined in the referenced **Geotechnical Engineering Report** (PanGEO, 2013), the proposed tramp will be safe from the geotechnical engineering perspective.*

E. The applicant provides a geotechnical report prepared by a qualified professional demonstrating that modification of the critical area or critical area buffer will have no adverse impacts on stability of any adjacent slopes, and will not impact stability of any existing structures. Geotechnical reporting standards shall comply with requirements developed by the Director in City of Bellevue Submittal Requirements Sheet 25, Geotechnical Report and Stability Analysis Requirements, now or as hereafter amended;
*Please see the reference **Geotechnical Engineering Report** (PanGEO, 2013).*

F. Any modification complies with recommendations of the geotechnical support with respect to best management practices, construction techniques or other recommendations; and

*All construction will be done in strict adherence with the recommendations, practices and techniques outlined in the reference **Geotechnical Engineering Report** (PanGEO, 2013) and subsequent communication with the Geotechnical Engineer. The Geotechnical Engineer will monitor the construction work in progress.*

G. The proposed modification to the critical area or critical area buffer with any associated mitigation does not significantly impact habitat associated with species of local importance, or such habitat that could reasonably be expected to exist during the anticipated life of the development proposal if the area were regulated under this part.

Since there is no stripping and grading within the critical area, the vegetation and slope will remain in its existing condition. In our opinion, the impact to the habitat associated with species of local importance is minimal.

20.30P.140 Decision criteria.

The Director may approve or approve with modifications an application for a Critical Areas Land Use Permit if:

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

It is the client's intent to apply for the construction permits for the proposed residence concurrently with this Critical Areas Report.

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; and

We are proposing to utilize low-impact construction techniques (i.e. pin piles) within the critical area buffer.

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

*Please see responses for **20.25H.125 Performance standards – Landslide hazards and steep slopes** on Page P3.*

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

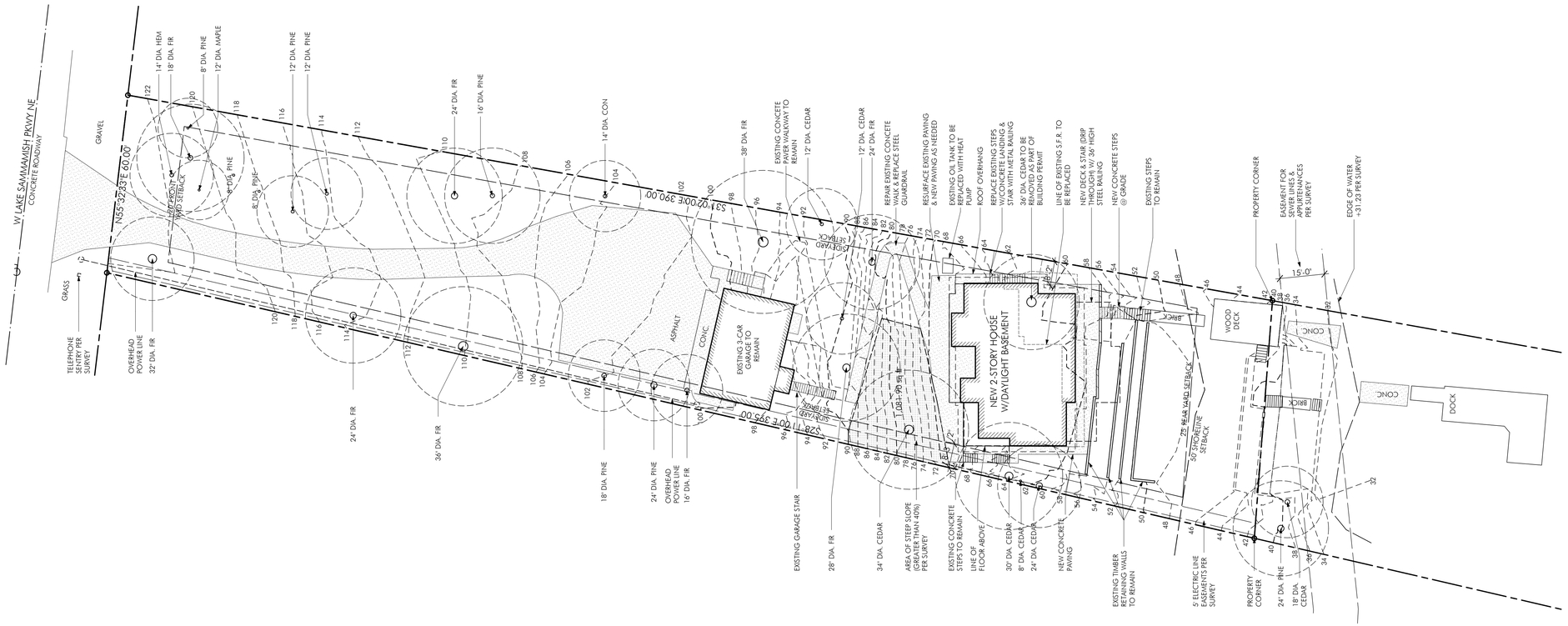
Streets, utilities, and public services already exist in the area for the existing residence.

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.210; except that a proposal to modify or remove vegetation pursuant to an approved Vegetation Management Plan under LUC 20.25H.055.C.3.i shall not require a mitigation or restoration plan; and

The existing landform and vegetation on the slopes will remain as is. A mitigation or restoration plan, if needed, will be addressed by others.

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

We have addressed other requirements of this codes as outlined here in. As long as the proposed improvements will be designed and constructed in accordance with our recommendations, it is our opinion that the proposal also complies with other applicable requirements of this code.



1 Site Plan

SCALE: 1" = 20'

0 10 20' 40'

PLAN NORTH

Bx

Buxbaum Residence

Jay + Rebecca Buxbaum
486 West Lake
Sammamish Pkwy NE
Bellevue, WA 98008

KC PARCEL #:
7528300035

7522 REGISTERED ARCHITECT JOHN A. DEFOREST STATE OF WASHINGTON

Site Plan for Critical Areas Land Use Permit

City of Bellevue Submittal Requirements | 4

STATISTICAL INFORMATION SHEET

10/24/06

Note: If Site Plan B is required for your project, this information must also appear on the Site Plan.

	Required/ Allowed	Proposed
1. Land Use Zone	R-2.5	
2. Site Area, in square feet and acres	26,796 SF / .62 ACRES	
3. Site Data Summary		
a. Number of dwelling units per acre	2.5	1
b. Total number of dwelling units	1	1
c. Area of each proposed structure		
Net	—	5,062 SF
Net leasable (for Shopping Center)	—	—
Gross	—	4,697 SF
d. Floor Area Ratio (F.A.R.) GROSS BLDG AREA/SITE AREA	0.5	.18-OK
e. Area of proposed building by use		
Net	—	5,062 SF
Gross	—	4,697 SF
4. Percentage of lot coverage — 35%. 2880/26,796 SF — 10%	35%	11.2%
5. Amount of impervious area in square feet — 50%.	12,398 SF	10,040 SF
6. Cut/fill (cubic yards)	—	CUT 105CY / FILL 165CY
7. Building height: Measured from avg. existing grade in Shoreline & Transition Areas; measured from average finished grade for all other areas.	30'/35'	<30'
8. Parking: Total # of spaces for the project. — NO CHANGE	NA	NA
a. # of spaces by each proposed use	—	—
b. The percentage of compact stalls	—	—
c. The percentage of handicapped stalls	—	—
9. Area of Proposed Landscaping or mitigation		
a. Adjacent to right-of-way	—	—
b. Adjacent to interior property lines	—	—
c. Within the parking area	—	—
d. Significant Trees to be retained — ALL BUT 1 TO REMAIN (36" DIA. CEDAR)		

PROJECT TEAM

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E john@deforestarchitects.com

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NICK BOSSOFF
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E nick@nbengineering.com

SITE INFORMATION

PROJECT ADDRESS
486 WEST LAKE SAMMAMISH PKWY NE
BELLEVUE, WA 98008

OWNERS
JAY & REBECCA BUXBAUM

KING COUNTY ASSESSOR'S PARCEL NUMBER
7528300035

LEGAL DESCRIPTION
LOT 7 OF SAMMAVISTA ADDITION, AS PER PLAT RECORDED IN VOLUME 46 OF PLATS, PAGE 90, RECORDS OF KING COUNTY;

SITUATE IN THE CITY OF BELLEVUE, COUNTY OF KING, STATE OF WASHINGTON.

EASEMENTS
GRANTEE: PUGET SOUND POWER AND LIGHT COMPANY
PURPOSE: ELECTRIC TRANSMISSION AND/ OR DISTRIBUTION LINE
AREA AFFECTED: SOUTHWESTERLY PORTION, AS DESCRIBED THEREIN
RECORDING NO.: 4338038

GRANTEE: PUGET SOUND POWER & LIGHT COMPANY
PURPOSE: ELECTRIC LINE
AREA AFFECTED: THE WESTERLY 5 FEET
RECORDING NO.: 5898045

GRANTEE: LAKE HILLS SEWER DISTRICT
PURPOSE: SANITARY SEWER LINE OR LINES AND APPURTENANCES
AREA AFFECTED: STRIP OF LAND 15 FEET IN WIDTH, AS DESCRIBED THEREIN
RECORDING NO.: 5906990

VICINITY MAP

106 NW 36TH STREET
SEATTLE, WA 98107
PHONE: 206.262.0820

ISSUE	DATE
1 LAND USE PERMIT	10.25.13
2	
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PanGEO
INCORPORATED
Geotechnical & Earthquake
Engineering Consultants

May 10, 2013
File No. 13-003.200

Jay and Rebecca Buxbaum
486 West Lake Sammamish Parkway NE
Bellevue, WA 98008

Subject: **Geotechnical & Critical Areas Report**
Buxbaum Residence – Proposed Tram
486 West Lake Sammamish Parkway NE, Bellevue, WA

Dear Jay and Rebecca,

As requested, PanGEO has completed a geotechnical and critical areas report to assist you with the design and construction of a tram system at the above-referenced site. Our service scope included reviewing readily-available geologic data and geotechnical study, conducting a site reconnaissance, meeting with City staff, and developing the conclusions and recommendations presented in this report.

SITE AND PROJECT DESCRIPTION

The property is an approximately 0.6-acre waterfront lot located at 486 West Lake Sammamish Parkway NE in Bellevue, Washington (see Vicinity Map, Figure 1). The property is rectangular in shape and is bordered to the north by West Lake Sammamish Parkway NE, to the east and west by single-family dwellings, and to the south by Lake Sammamish. The approximately north half of the site is relatively level, and consists of a driveway, parking areas, and landscape areas. The approximately south half of the site is an approximately 70-foot high south-facing slope, ranging from approximately Elevation 100 feet at the top of the slope to Elevation 30 feet along the lake front. An existing two-story garage, including a daylight basement, is located at the top of the slope. An existing two-story house, including a daylight basement, is located on a relatively level bench near Elevation 60 feet.

3213 Eastlake Ave E, Ste B
Seattle, WA 98102
Tel (206) 262-0370
Fax (206) 262-0374

The area between the garage and the house, which is the subject slope for tram system, is relatively steep. The subject slope is currently heavily vegetated with ivy, shrubs, and trees (see Plate 1, below). Topographic survey provided for our review indicates that most of the slope exceeds 40% gradient. The 40% steep slope area is indicated on Figure 2, as delineated by GeoDimensions.

Plate 1. View of existing subject slope between garage and house (looking west)

We understand that you plan to build a tram along the west property line to provide access between the house and the garage. The approximate location of the proposed tram is shown in Figure 2. The tram system is likely to include an upper deck near the top of the slope, a mechanical system, an inclined elevator, and two at-grade tram tracks on the slope. The tram tracks are estimated to be about 100 feet long, extending from the main garage level (elevation 100 feet) to the lower level of the house (elevation 60 feet). Based on the site condition, we anticipate that the upper deck and mechanical system may be supported on conventional footing

at the garage level. The tram tracks between the garage and house will be support on pin piles on the slope.

The conclusions and recommendations outlined and provided in this report are based on our understanding of the proposed tram system, which is in turn based on the project information provided. If the above project description is incorrect, or the project information changes, we should be consulted to review the recommendations contained in this report and make modifications, if needed.

SUBSURFACE CONDITIONS

The subsurface conditions at the site are inferred from our review of published geology map and geotechnical engineering reports completed at the project site. Specifically, the following geotechnical data were reviewed:

- Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington complied by Booth, D. B., Walsh, T. J., Troost, K. G., Shimel, S. A. (2006).
- Test boring logs for the Buxbaum Residence located at 486 West Lake Sammamish Parkway NE, Bellevue, Washington completed by PanGEO, Inc. (2013).
- Test boring log for the McCaffray Garage located at 486 West Lake Sammamish Parkway NE, Bellevue, Washington completed by Terra Associates, Inc. (1994).

SITE GEOLOGY

The *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* (Booth, et. al. 2006) mapped the surficial geologic unit along the lake shore in at the subject site as Alluvium (Qal). Alluvium typically consists of moderately sorted cobble gravel, pebbly sand, and sandy silt. Away from the lake shore, the geologic map indicates that pre-Fraser deposits generally underlie the site. The pre-Fraser deposits have been overridden by glaciers, and are anticipated to exhibit high strength characteristics in its undisturbed state.

SOIL

The soil conditions in the area of the proposed tram tracks are based on the results of previous test borings completed at the site. Specifically, boring BH-1 completed by PanGEO in 2013 was located at the lower termini of the proposed tram tracks, and boring B-1 completed by Terra

Associates in 1994 was located on top of the slope, near the upper termini of the proposed tracks. The approximate locations of these two borings are indicated on the attached Figure 2, and the summary logs are included in Appendix A of this report.

The soil conditions in these two test borings vary quite significantly. Boring BH-1, near the lower termini of the proposed tracks, encountered loose to medium dense sand with variable amounts of silt and gravel in the upper 10 feet, and very dense sandy gravel was encountered at a depth of about 10 feet and extended to the maximum depth explored at about 14 feet. We interpret the soil units encountered in BH-1 as alluvium, consistent with the mapped geology.

Boring B-1, completed by Terra Associates near the top of the slope in 1994, encountered dense to very dense sandy gravel to silty sand with interbedded sandy clay from ground surface to the termination depth of the test boring at about 15 feet. The soil conditions appeared consistent with the Pre-Fraser Deposits mapped by Booth, et al. (2006).

GROUNDWATER

Groundwater seepage was encountered in test boring BH-1, at a depth of about 4 to 5 feet deep during drilling. However, no groundwater seepage was noted on the summary log for boring B-1. It should be noted that groundwater elevations and seepage rates are likely to vary depending on the season, local subsurface conditions, and other factors. Groundwater levels and seepage rates are normally highest during the winter and early spring.

CRITICAL AREAS CONSIDERATIONS

Based on a review of the City's Geologic Hazards Map, the subject slope located between the existing garage and the house is mapped as a shoreline area 40% or greater steep slope (see Figure 2). However, the site is not mapped as a landslide hazard area based on King County records. In addition, the south half of the site is mapped as shoreline jurisdiction area.

For developments near a steep slope, the City's critical areas ordinance specifies a 50-foot top of slope buffer and a 75-foot toe of slope structure setback. Due to the special character of hillside trams, the tram tracks need to be placed on the slope. The slope buffer and structure setback may not be applicable for this project. To minimize the disturbance to the slope, the tram tracks may be supported on the pin piles. The upper deck and the mechanical system will be situated on a level area adjacent to the garage, approximately 20 feet away from the top of the slope (see

Figure 2), and may be supported on conventional footings. No structure is planned within the 75-foot setback within the toe of the slope.

To minimize ground disturbance on the slope, we recommend that any foundation support needed within the slope be founded on small diameter driven steel pipe piles (i.e. pin piles). The existing landform and vegetation will remain in its existing condition. As a result, a mitigation and restoration plan may not be needed for the project.

The City also specifies a 25-foot shoreline critical area buffer measured from the ordinary high water mark of the lake. Since the south (lower) end of tram is located approximately 50 feet away from the lake, this buffer does not need to be modified. Additional discussions regarding relevant land use codes are included in the Critical Areas Report in the Appendix B.

A site reconnaissance of the subject slope was conducted on May 2, 2013. During our site reconnaissance, we did not observe obvious evidence of slope instability at the site. The existing house and garage were observed to be in a fair condition and no obvious sings of foundation movement are noted. Based on the test boring B-1, the soils within the subject slope consist of glacially consolidated dense soils. As such, we believe that the subject slope is currently stable. Furthermore, it is also our opinion that the proposed tram system as planned will not decrease the slope stability and adversely impact the site and surrounding properties, provided that the recommendations presented in this report are properly incorporated into the design and construction of the project.

GEOTECHNICAL DESIGN RECOMMENDATIONS

GENERAL

Based on our evaluation of the site soils and our field observations, in our opinion, the proposed tram system at the site is feasible from the geotechnical engineering standpoint, provided the geotechnical engineering recommendations contained in this report are followed. The upper deck and mechanical system may be supported on conventional footings. Foundation supports within the slope and at the toe of the slope should be founded on driven pin piles. Detailed discussions of these items and our geotechnical engineering design recommendations are presented in the following sections of this report.

CONVENTIONAL FOOTING

Based on the soils encountered in test boring B-1, the proposed upper deck and mechanical system may be supported on conventional footings bearing on dense, undisturbed native soils. We recommend that a maximum allowable soil bearing pressure of 2,500 pounds per square feet (psf) be used for sizing the footings.

Lateral Resistance – Lateral loads on the structure may be resisted by passive earth pressure developed against the embedded portion of the foundation system and by frictional resistance between the bottom of the foundation and the supporting subgrade soils. We recommend a frictional coefficient of 0.35 be used to evaluate sliding resistance developed between the concrete and the compacted subgrade soil. Passive soil resistance may be calculated using an equivalent fluid weight of 350 pcf, assuming properly compacted structural fill will be placed against the footings, and the edge of footings are located at least 10 feet away from top of slope. The above values include a factor of safety of 1.5.

Footing Subgrade Preparation **–** Footing excavation should be trimmed neat and footing subgrades should be carefully prepared. Any loose or softened soil should be removed from the footing excavation and backfilled with properly compacted structural fill. Footing excavations should be observed by PanGEO to confirm that the exposed footing subgrade is consistent with the expected conditions and adequate to support the design bearing pressure.

STEEL PIN PILES

Recommendations for steel pin piles are outlined below:

Pin Pile Sizes **–** Based on the limited site access and the desire to minimize ground disturbance on the slope, it is our opinion that 2-inch diameter pin piles installed using hand-held equipment are appropriate to support the tracks.

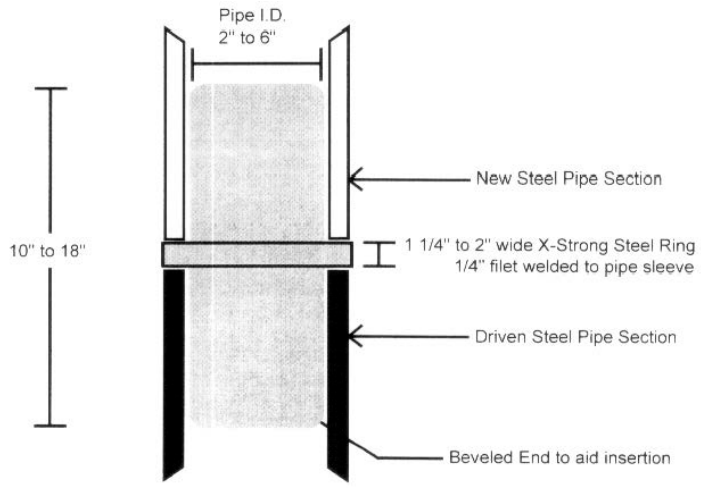
Pin Pile Capacity **–** The number of piles required depends on the magnitude of the design load. Two-inch diameter pin piles are typically installed with a minimum 90-lb jackhammer. An allowable axial compression capacity of 3 tons per pile may be utilized for design with an approximate factor of safety of 2 when piles are driven to practical refusal (less than 1 inch of penetration for 1 minute of continuous driving). Tensile and lateral capacities of 2-inch diameter pin piles should be ignored in design calculations.

Pin Pile Specifications – We recommend that the following specifications be included on the foundation plan:

1. Two-inch diameter piles should consist of galvanized Schedule-80, ASTM A-53 Grade "A" pipe.

2. Two-inch piles shall be driven to refusal with a minimum 90-lb jackhammer. Refusal is defined as no more than 1 inch of penetration for 1 minute of continuous driving.

3. Piles shall be driven in nominal sections and connected with compression fitted sleeve couplers (see detail below – Courtesy of McDowell Pile King, Kent, WA). We discourage welding of pipe joints, particularly when galvanized pipe is used, as we have frequently observed welds broken during driving.



Typical Splicing Detail

4. The geotechnical engineer of record or his/her representative shall provide full time observation of pile installation.

The quality of a pin pile foundation is dependent, in part, on the experience and professionalism of the installation company. We recommend that a company with experienced personnel be selected to install the piles. In particular, for installation of 2-inch pin piles with a 90-lb jackhammer, the hammer operator should lean heavily on the hammer during driving, to be certain that maximum drive and penetration is achieved.

Lateral Forces – Lateral capacity of vertical pin piles should be ignored in design calculations. Some resistance to lateral loads may be accomplished by battering the piles to a slope of 3(H):12(V), or steeper.

Estimated Pile Length – The required pile length in order to develop the recommended pile capacity is expected to vary across the footprint of the structure, depending on the actual driving conditions encountered. For planning and cost estimating purposes, we suggest that a 5- to 10-foot penetration into the underlying competent soil for cost estimating purposes. As such, we estimate that an average pile length of about 10 to 15 feet will be needed. We recommend a minimum pile length of 6 feet.

Obstructions –Where encountered, the obstructions should be removed to facilitate the pile driving. If obstructions cannot be removed, the structural engineer of record should be notified to revise the pile layout to accommodate moving the piles.

CONSTRUCTION CONSIDERATIONS

MATERIAL REUSE

In the context of this report, structural fill is defined as compacted fill placed under footing. In our opinion, the on-site soil has high fines content and will be difficult to compact to a dense condition. As such, on-site soil is not suitable to be used as structural fill. Structural fill, if needed, should consist of imported, well-grade, granular material, such as City of Seattle Type 2 or 17 material, or WSDOT Gravel Borrow should be used as structural fill.

STRUCTURAL FILL PLACEMENT AND COMPACTION

Structural fill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557.

WET WEATHER EARTHWORK

In our opinion, the proposed site construction may be accomplished during wet weather (such as in winter) without adversely affecting the site stability. However, earthwork construction performed during the drier summer months likely will be more economical. Winter construction

will require the implementation of best management erosion and sedimentation control practices to reduce the chance of off-site sediment transport. Some of the site soils contain a high percentage of fines and are moisture sensitive. Any footing subgrade soils that become softened either by disturbance or rainfall should be removed and replaced with structural fill. General recommendations relative to earthwork performed in wet conditions are presented below:

- The size and type of construction equipment used may have to be limited to prevent soil disturbance;
- Bales of straw and/or geotextile silt fences may be strategically located to control erosion and the movement of soil;
- Structural fill should consist of less than 5% fines; and

ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed addition, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical elements. The City of Bellevue, as part of the permitting process, may also require geotechnical construction inspection services. PanGEO can provide you a cost estimate for construction monitoring services at a later date.

We anticipate that the following additional services will be required:

- Review final project plans and specifications
- Verify implementation of erosion control measures;
- Monitor site stability and excavations;
- Monitor pin pile installation;
- Confirm the adequacy of the compaction of structural backfill; and
- Other consultation as may be required during construction

Modifications to our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

CLOSURE

We have prepared this report for Jay and Rebecca Buxbaum, and the project design team. Recommendations contained in this report are based on a site reconnaissance, review of pertinent

subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. 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. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report

be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

We appreciate the opportunity to be of service.

Sincerely,

Chien-Lin (Johnny) Chen, P.E.
Project Geotechnical Engineer

Siew L. Tan, P.E.
Principal Geotechnical Engineer

Enclosures:

Figure 1 Vicinity Map

Figure 2 Site and Exploration Plan

Appendix A – Summary Test Boring Logs

Borings BH-1 through BH-3 (PanGEO, 2013)

Boring B-1 (Terra Associates, 1994)

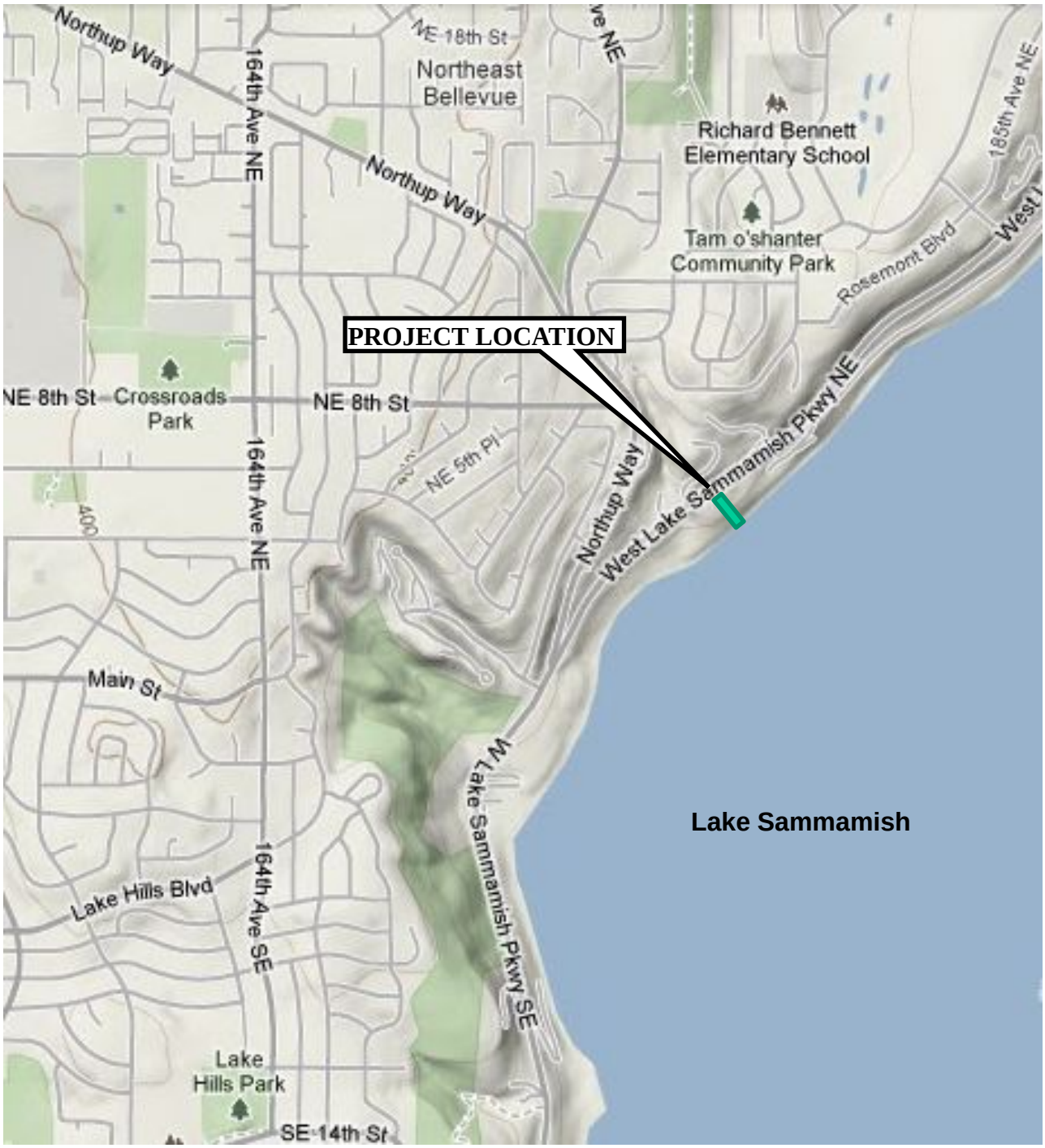
Appendix B – Critical Area Report

REFERENCES

Booth, D. B., Walsh, T. J., Troost, K. G., Shimel, S. A., 2006, *Geologic Map of Issaquah 7.5' Quadrangle, King County, Washington* – U. S. Geological Survey, scale 1:24,000.

PanGEO, Inc., 2013, *Geotechnical Engineering Report, Buxbaum Residence, 486 West Lake Sammamish Parkway NE, Bellevue, Washington*. Consultant report prepared for Jay Buxbaum, project number 13-003.

Terra Associates, Inc., 1994, *Geotechnical Report, McCaffray Garage, 486 West Lake Sammamish Parkway NE, Bellevue, Washington*. Consultant report prepared for S. J. McCaffray, project number T-2746.



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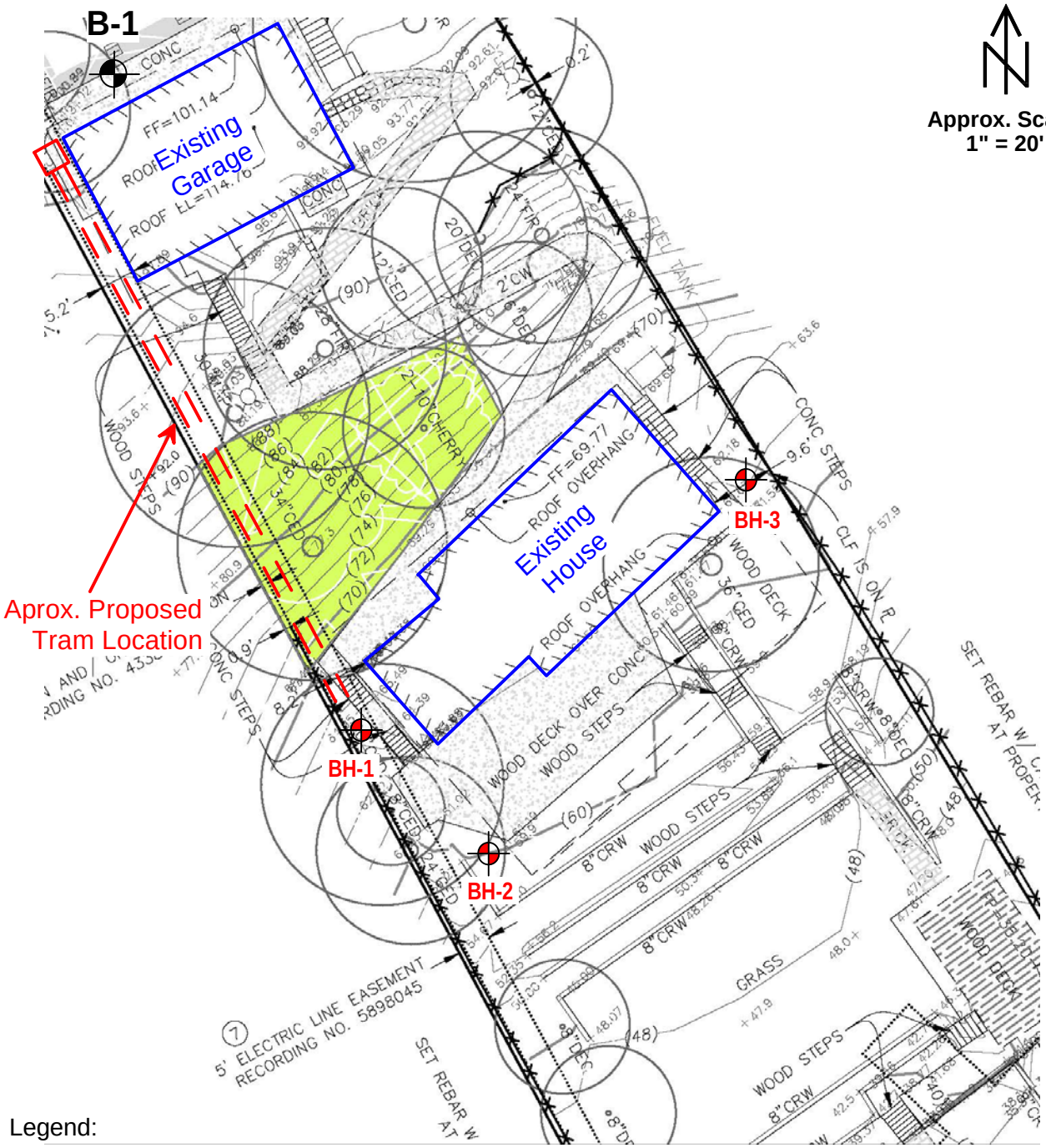
NTS

Reference: Google Maps

PanGEO INCORPORATED	**Buxbaum Residence** **486 West Lake Sammamish Parkway NE** **Bellevue, Washington**	**VICINITY MAP**	
		Project No. 13-003.200	Figure No. 1

Fig1_vicinity.ppt 5/2/2013(1:12 PM) JC



Legend:

BH-1 Test Boring Location by PanGEO 2013

B-1 Test Boring Location by Terra Associates 1994

Over 40% Steep Slope (mapped by GeoDimensions)

Note:
Figure is modified from Topographic Survey prepared by GeoDimensions dated 12/26/2012.
Figure olny showns southern half portion of the site consisting of existing house and detached garage.
The northern half portion of the site consisting of asphalt driveway and parking is not shown in this figure.

PanGEO INCORPORATED	Buxbaum Residence 486 West LakeSammamish Parkway NE Bellevue, Washington	SITE AND EXPLORATION MAP	
		Project No. 13-003.200	Figure No. 2

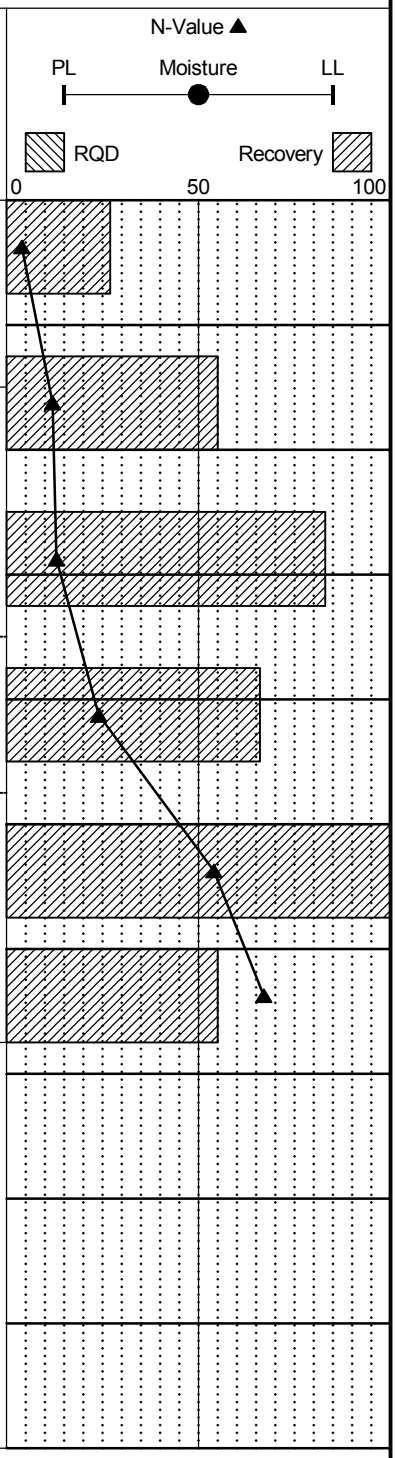
13-003 Site Plan Fig 2.grf 5/2/13 (18:18) JC

APPENDIX A

SUMMARY TEST BORING LOGS

Project:	Buxbaum Residence	Surface Elevation:	65.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		1, 2, 2			**UNIT1: Fill** Loose, moist, dark brown to gray, silty SAND with trace roots and organics.
2						
4	S-2		3, 4, 8			**UNIT 2: Alluvium** Medium dense, moist, gray with mottled brown, silty fine SAND.
6	S-3		4, 6, 7			- becomes wet, some iron oxide stainings.
8	S-4		7, 9, 15			Medium dense, brown to gray, silty SAND with some gravel.
10	S-5		17, 27, 27			Very dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		14, 29, 38			
14						Bottom of boring at 13.5 feet below ground surface. Groundwater was encountered at about 5 feet deep during drilling.
16						
18						
20						



Completion Depth:	13.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

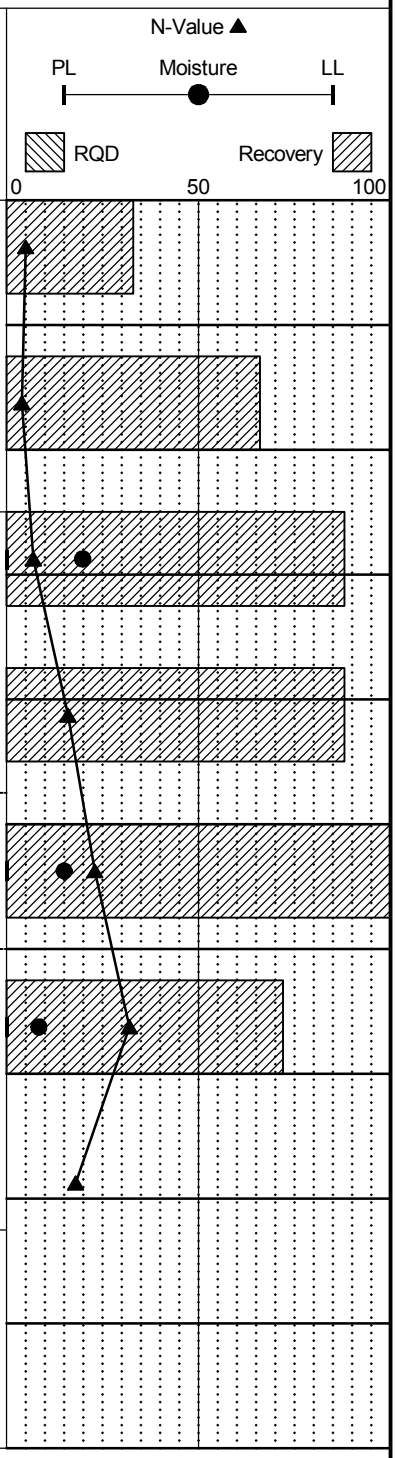
LOG OF TEST BORING BH-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	59.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1	X	2 2 3			**UNIT1: Fill** Loose, moist, dark brown to gray, silty fine SAND with trace roots and organics.
2	S-2	X	4 2 2			- some organic silt with trace wood, becomes wet.
4						
6	S-3	X	4 3 4	GS		**UNIT 2: Alluvium** Loose to medium dense, wet, gray with mottled brown, silty fine SAND, some iron oxide stainings.
8	S-4	X	6 6 10			
10	S-5	X	4 10 13	GS		Medium dense, wet, brown-gray, SAND with some gravel and silt.
12	S-6	X	9 16 16	GS		Medium dense to dense, wet, brown, sandy GRAVEL with some silt.
14						
16	S-7	X	15 9 9			Bottom of boring at 16.5 feet below ground surface. Groundwater was encountered at about 4.5 feet deep during drilling.
18						
20						



Completion Depth:	16.5ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

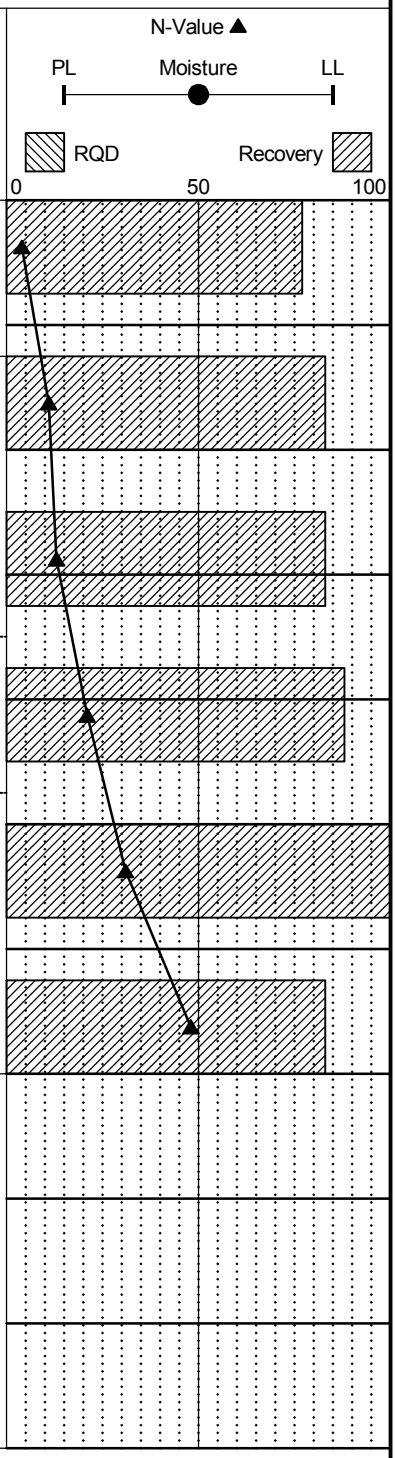
LOG OF TEST BORING BH-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Project:	Buxbaum Residence	Surface Elevation:	62.0ft
Job Number:	13-003	Top of Casing Elev.:	n/a
Location:	486 West Lake Sammamish Parkway NE, Bellevue, WA	Drilling Method:	Hollow Stem Auger
Coordinates:	Northing: , Easting:	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0	S-1		2 2 2			**UNIT1: Fill** Soft, moist, dark brown, organic silt with some fine sand and trace roots.
2	S-2		3 6 5			**UNIT 2: Alluvium** Medium dense, wet, gray-brown, silty fine SAND.
4	S-3		5 6 7			
6						Medium dense, moist to wet, brown, silty medium SAND with some gravel.
8	S-4		6 7 14			
10	S-5		12 13 18			Dense, wet, gray to brown, sandy GRAVEL with some silt.
12	S-6		19 23 25			- some heaving.
14						Bottom of boring at 14 feet below ground surface. Groundwater was encountered at about 4 feet deep during drilling.
16						
18						
20						



Completion Depth:	14.0ft
Date Borehole Started:	1/15/13
Date Borehole Completed:	1/15/13
Logged By:	JC
Drilling Company:	CN Drilling

Remarks: Acker Portable Drill. Standard Penetration Test (SPT) sampler driven with a 140 lb hammer using a rope and cathead dropping 30 inches per stroke.

PanGEO INCORPORATED

LOG OF TEST BORING BH-3

Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

Boring No. B-1

Logged by: DBG

Date: 10-19-94

Graph/ USCS	Soil Description	Consistency	Depth (ft.)	Sample	(N) Blows (ft)	Water Content (%)		
GM/SM	Light brown sandy GRAVEL with silt to gravelly SAND with silt, dry.	Dense to Very Dense			50/4"	6		
			5		50/6"	3		
SM/CL	Brown silty SAND with sandy CLAY interbeds, moist.	Dense			39	24		
			10		52	4		
SM	Gray silty SAND, fine grained, dry to moist.	Very Dense			50/6"	8		
			15		91	7		

Boring terminated at 16.5 feet
No groundwater seepage encountered.

TERRA ASSOCIATES
Geotechnical Consultants

BORING LOG
McCaffray Garage
Bellevue, Washington

Proj. No. T-2746	Date 10/94	Figure 4

APPENDIX B

CRITICAL AREAS REPORT

INTRODUCTION AND SCOPE OF PROPOSAL

This proposal is requesting a modification to the standard **top-of- slope buffer** pursuant to LUC 20.25H.120.B.3. We hereby request that the 50-foot top-of-slope buffer be waived due to the special character of hillside tram system.

The scope of the work includes building a hillside tram system on the west portion of steep slope between the existing garage and house. The tram system may include the upper deck, mechanical system, inclined elevator, and tram tracks. Up to 100 feet long of tracks will be installed on the slope. The tram may start at garage level (elevation 100 feet) and land at house level (elevation 60 feet). Based on the site condition, the upper deck and mechanical system may be supported on conventional footing at the garage level. The tram tracks between the garage and house will be support on small diameter pin piles on the slope.

CRITICAL AREA AFFECTED

The critical area affected by this proposal consists of a steep slope area between the existing garage and house. The area is approximately 5 feet wide along the west property line for proposed tram tracks. To minimize the disturbance to the slope, small diameter pin piles will be utilized to support the tram tracks. No stripping and grading on the slope is planned. The vegetation and natural landform will remain in its existing condition. In addition, the proposal will not create impervious surface on the slope. As such, the impact to the critical area is minimal.

RELEVANT CODE SECTIONS

Relevant code sections include:

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

20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

20.25H.145 Critical areas report – Approval of modification.

20.30P.140 Decision criteria for a Critical Areas Land Use Permit.

The criteria and requirements of these sections has been addressed and justifications given in detail in the following section.

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;*

The proposed tram tracks will be supported on pin piles to minimize ground disturbance on the slope. The existing contour of slope and the vegetation on the slope will remain as is.

B. *Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;*

The recommended foundation support option (pin piles) is intended to minimize ground disturbance on the slope.

C. *The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;*

The proposed tram system will not result in greater risk to the neighboring properties, and it will not result in the 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;*

Not applicable in this case. No retaining structures are proposed.

E. *Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer;*

No impervious surface is planned within the critical area. The only impervious surface is limited to the upper deck located 20 feet away from the top of the slope.

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;*

Not applicable in this case. No grading on slope is proposed.

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;*

Not applicable in this case. No retaining structures are proposed.

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;
The proposed tram tracks will be supported on pin piles on steep slope, consistent with the intent of this article.

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
Not applicable in this case.

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.
Since this proposal utilizes small diameter pin piles, the disturbed area is minimal. In addition, the existing landform and vegetation on the slope will remain as is. Mitigation and restoration plan may not be needed in this proposal.

20.25H.140 Critical areas report – Additional provisions for landslide hazards and steep slopes.

In addition to the provisions of LUC 20.25H.230, any proposal to modify a landslide hazard or steep slope or associated critical area buffer through a critical areas report shall comply with the requirements of this section.

A. Limitation on Modification.
The provisions for coal mine hazard areas in LUC 20.25H.130 may not be modified through a critical areas report.
Not applicable in this case.

B. Area Addressed in Critical Area Report.
In addition to the general requirements of LUC 20.25H.230, the following areas shall be addressed in a critical areas report for geologically hazardous areas:
1. Site and Construction Plans. The report shall include a copy of the site plans for the proposal and a topographic survey;
*See the FIGURE 2, SITE AND EXPLORATION PLAN, in this **Geotechnical Report.***

2. Assessment of Geological Characteristics. The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems in use in the region;
*See the Critical Areas Considerations in this **Geotechnical Report.***

3. Analysis of Proposal. The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and its potential impact upon the hazard area, the subject property, and affected adjacent properties; and
*See the Critical Areas Considerations in this **Geotechnical Report.***

4. Minimum Critical Area Buffer and Building Setback. The report shall make a recommendation for a minimum geologic hazard critical area buffer, if any, and minimum building setback, if any, from any geologic hazard based upon the geotechnical analysis.
*See the Critical Areas Considerations in this **Geotechnical Report.***

20.25H.145 Critical areas report – Approval of modification.

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the Director determines that the modification:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of this part were not modified;
This slope has been stable for decades and the work of this proposal will not impact to the slope and adjacent properties. The proposed tram tracks will be supported on pin piles. It is our opinion that the proposed tram will not increase the threat of geologic hazard to adjacent properties.

B. Will not adversely impact other critical areas;
The disturbance on the slope will be minimum based on the recommended construction method (i.e., driven pin piles) and will not impact the Steep Slope or other Critical Area.

C. Is designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of this part were not modified;
The proposed tram tracks will be supported on pin piles on the steep slope. The critical area will remain as is, and no additional hazard will be created.

D. Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington;
*Provided that the project design is consistent with the recommendations outlined in the **Geotechnical Report,** the proposed tramp will be safe from the geotechnical engineering perspective.*

E. The applicant provides a geotechnical report prepared by a qualified professional demonstrating that modification of the critical area or critical area buffer will have no adverse impacts on stability of any adjacent slopes, and will not impact stability of any existing structures. Geotechnical reporting standards shall comply with requirements developed by the Director in City of Bellevue Submittal Requirements Sheet 25, Geotechnical Report and Stability Analysis Requirements, now or as hereafter amended;
*See the **Geotechnical Report.***

F. Any modification complies with recommendations of the geotechnical support with respect to best management practices, construction techniques or other recommendations; and

*All construction will be done in strict adherence with the recommendations, practices and techniques outlined in the **Geotechnical Report** and subsequent communication with the Geotechnical Engineer. The Geotechnical Engineer will monitor the construction work in progress.*

G. The proposed modification to the critical area or critical area buffer with any associated mitigation does not significantly impact habitat associated with species of local importance, or such habitat that could reasonably be expected to exist during the anticipated life of the development proposal if the area were regulated under this part.

Since there is no stripping and grading within the critical area, the vegetation and slope will remain in its existing condition. In our opinion, the impact to the habitat associated with species of local importance is minimal.

20.30P.140 Decision criteria.

The Director may approve or approve with modifications an application for a Critical Areas Land Use Permit if:

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

It is the client's intent to apply for the construction permits for the proposed tram system concurrently with this Critical Areas Report.

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; and

We are proposing to utilize low-impact construction techniques (i.e. pin piles) within the critical area.

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

*See responses for **20.25H.125 Performance standards – Landslide hazards and steep slopes** on Page P3.*

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

Streets, utilities, and public services already exist in the area for the existing residence.

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.210; except that a proposal to modify or remove vegetation pursuant to an approved Vegetation Management Plan under LUC 20.25H.055.C.3.i shall not require a mitigation or restoration plan; and

*See the Critical Areas Considerations in this **Geotechnical Report.***

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

We have addressed other requirements of this codes as outlined here in. As long as the proposal will be designed in accordance with our recommendations, it is our opinion that the proposal also complies with other applicable requirements of this code.