CRITICAL AREAS REPORT

Prepared for -

1650 W Lake Sammamish Pkwy NE

July 3, 2013

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I. Proposal Description

The applicant proposes to rebuild a single-family residence located on a property adjacent to Lake Sammamish. The site has both a steep slope critical area and a shoreline critical area. With the shoreline buffer and setback, the steep slope setbacks and other setbacks for an R-2.5 zone, the result is a site with overlapping critical area buffers and setbacks and no building footprint as shown in *Figure 1* below.

The applicant proposes to preserve the shoreline buffers and setbacks, use the existing non-conforming footprint and impervious areas and requests a modification of the steep slope setback from 75' to 3' as well as modification of the 15' combined side yard setbacks to 10'. The applicant also proposes to enhance the shoreline critical area with 540 sq ft of native plantings. This approach recognizes the existing developed condition of the site which was built prior to regulation of critical areas and zoning and favors modification of the steep slope setback over the more critical shoreline buffer and setback as well as improving critical areas functions and values. See modified setbacks in *Figure 2* and the shoreline native planting plan in *Figure 3* below.

Figure 1. Site Plan With Overlapping Setbacks

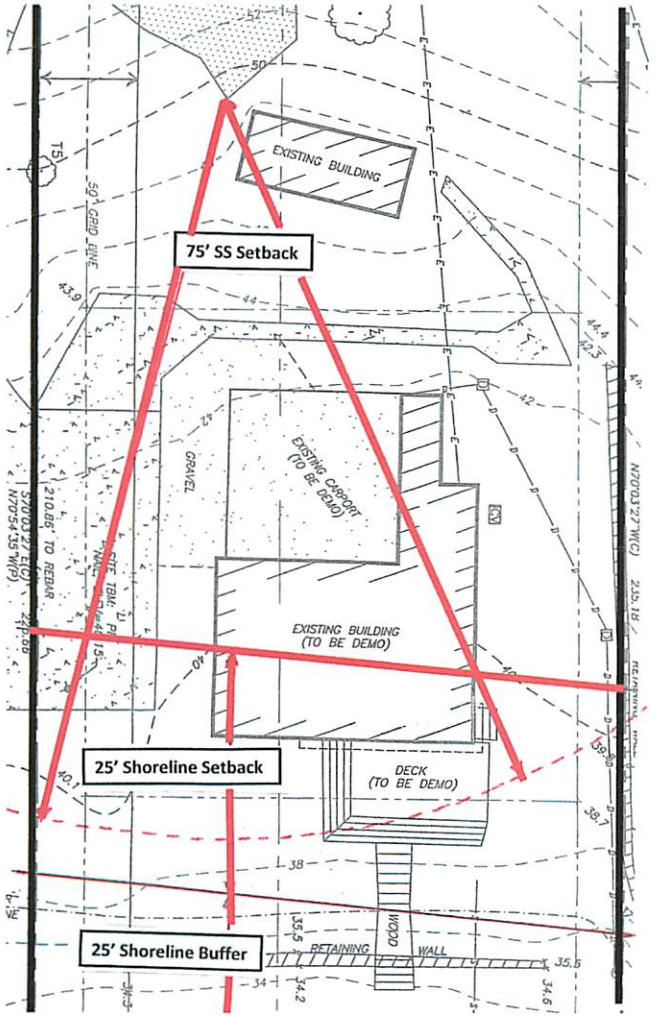


Figure 2. Site Plan with Modified Setbacks

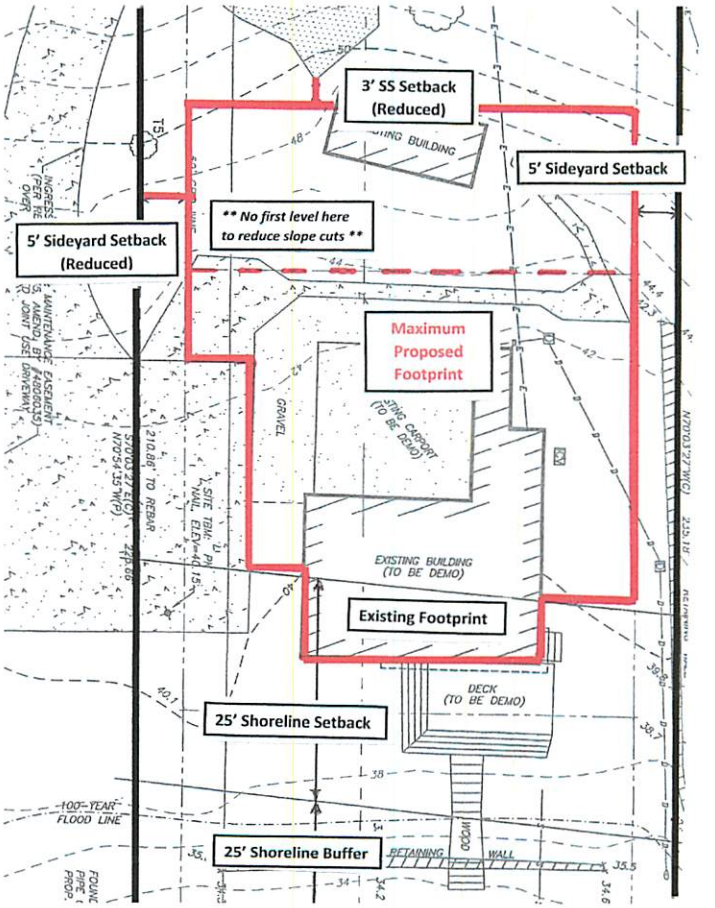
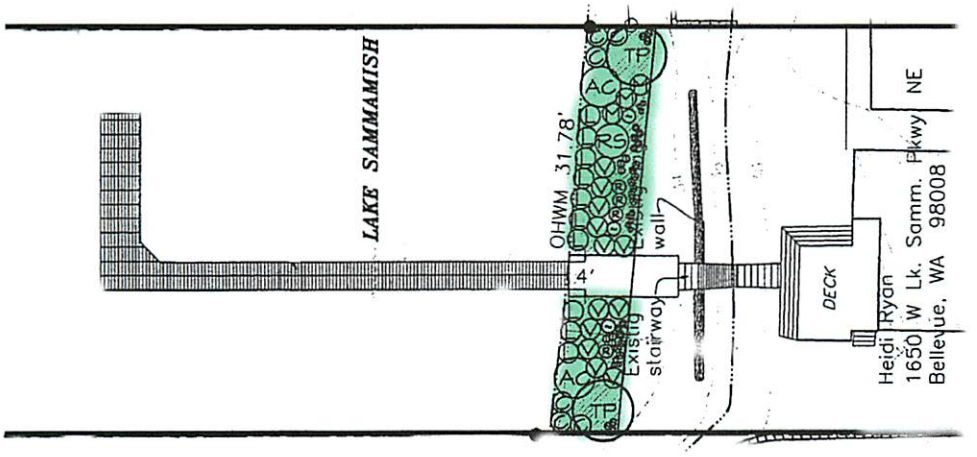


Figure 3. Shoreline Native Planting Plan



GRAPHIC SCALE
(IN FEET)
0 5 10 15 20 30
SCALE: 1:10

PLANT SCHEDULE

LARGE TREES

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN)	NOTES
TP	THUJA PLICATA	WESTERN RED CEDAR	10' O.C.	2	5 GAL.	FULL & BUSHY

SMALL TREES

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN)	NOTES
AC	ACER CIRCINATUM	VINE MAPLE	6' O.C.	2	5 GAL.	MULTI-STEM (3 MIN)

SHRUBS

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN)	NOTES
C	CORNUS SERICEA	RED OSIER DOGWOOD	4' O.C.	6	1 GAL.	MULTI-STEM (3 MIN)
L	LONICERA INVOLUCRATA	BLACK TWIN-BERRY	3' O.C.	10	1 GAL.	MULTI-STEM (3 MIN)
M	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	4' O.C.	9	2 GAL.	FULL & BUSHY
RS	RIBES SANGUINEUM	RED CURRANT	5' O.C.	1	2-5 GAL.	MULTI-STEM (3 MIN)
V	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3' O.C.	12	2 GAL.	FULL & BUSHY

GROUNDCOVER

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN)	NOTES
	ARCTOSTAPHYLLOS UVA-URSI	KINNIKINICK	3' O.C.	16	1 GAL.	FULL & BUSHY

PERENNIALS

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY.	SIZE MIN	NOTES
G	AQUILEGIA FORMOSA	WESTERN COLUMBINE	1' O.C.	8	1 GAL. OR 4" POT	FULL & BUSHY
T	ARMERIA MARITIMA	THRIFT	9" O.C.	11	1 GAL. OR 4" POT	FULL & BUSHY
R	ASTER SUBSPICATUS	DOUGLAS ASTER	2' O.C.	4	1 GAL. OR 4" POT	FULL & BUSHY
A	CAMASSIA QUAMASH	COMMON CAMAS	1' O.C.	10	1 GAL. OR 4" POT	FULL & BUSHY
I	IRIS TENAX	OREGON IRIS	1' O.C.	6	1 GAL. OR 4" POT	FULL & BUSHY
~	LUPINUS POLYPHYLLUS	LARGE-LEAVED LUPINE	2' O.C.	3	1 GAL. OR 4" POT	FULL & BUSHY
N	TELLIMA GRANDIFLORA	FRINGECUP	1' O.C.	6	1 GAL. OR 4" POT	FULL & BUSHY

II. Site Description, Zoning and Land Use Context

A. Site Description

The project site is located at 1650 W Lake Sammamish Parkway NE. The site is adjacent to Lake Sammamish to the east and surrounded by residential properties to the north, south and west. The property is served by a private access road - Mallard Lane - though the site address is W Lake Sammamish Parkway NE. From Mallard Lane, access to the site is via a shared driveway easement with the property to the south - 1630 W Lake Sammamish Pkwy NE.

The project site is developed with a single-family residence and accessory improvements. The accessory improvements include a greenhouse to the west of the house, a deck to the east of the house and a retaining wall just east of the deck. There is minimal native vegetation present. The eastern half of the site where the house resides is comprised of lawn and ornamental planting beds with no significant trees. The western half of the site which is primarily steep slope contains two significant trees – an evergreen near the center of the property and a deciduous tree along the southerly property boundary about midway between Mallard Lane and Lake Sammamish. There is also a dead maple tree near the center of the property that will need to be removed for safety reasons.

The site is approximately 120' deep by 60' wide. The steep slope critical areas are both north and south of the driveway easement on the western half of the property. See the site plan in *Figure 4* below. There is a shoreline critical area along the eastern property boundary. See the aerial photo in *Figure 5* below.

Figure 4. Site Plan

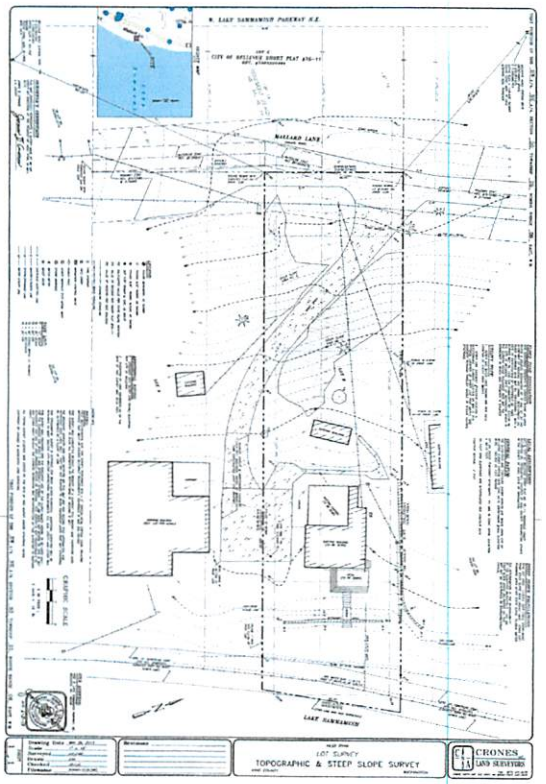
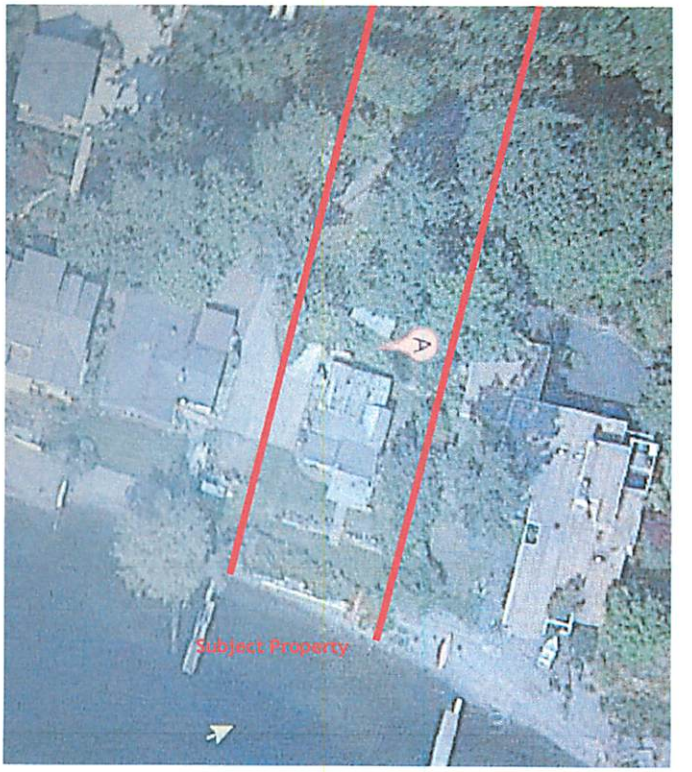


Figure 5. Aerial Photo



B. Zoning

The property is zoned R-2.5, single-family residential and the proposed house and improvements are allowed in this zone.

C. Land Use Context

The property has a Comprehensive Plan Land Use Designation of SF-M (Single Family Medium Density). Construction of a home and improvements is consistent with this land use.

D. Critical Areas On-Site and Regulations

Shorelines. The site includes a shoreline critical area on Lake Sammamish along the eastern boundary. Shorelines provide a variety of functions including shade, temperature control, water purification, woody debris recruitment, channel, bank and beach erosion, sediment delivery, and terrestrial-based food supply. Each function is a product of physical, chemical, and biological processes at work within the overall landscape. In lakes, these processes take place within an integrated system (ecosystem) of coupled aquatic and riparian habitats.

Geologic Hazard Areas. The site includes steep slope critical areas on the western half of the property, north and south of the access easement. Geologic hazards pose a threat to the health and safety of citizens when development is inappropriately sited in areas of significant hazard. Some geologic hazards can be reduced or mitigated by engineering, design, or modified construction practices.

III. Consistency with Land Use Code Requirements

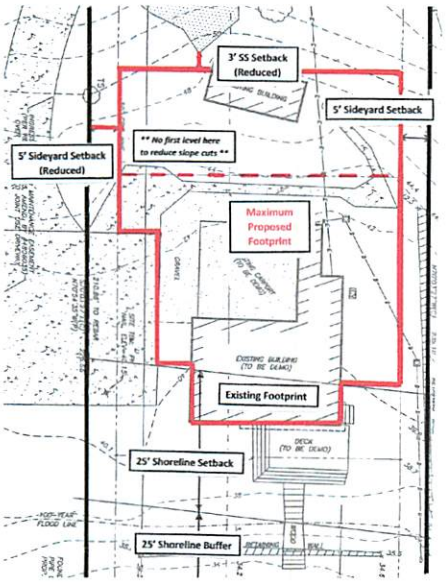
A. Zoning District Building Setbacks

The R-2.5 zoning dimensional requirements found in LUC 20.20.010 apply to the proposal. It is the intent of the proposal to comply with all dimensional requirements, including the allowed modification of the side yard setbacks under LUC 20.25H.040. LUC 202.25H.040 allows a reduction in the combined side yard setback from 15' to 10' in the R-2.5 zoning.

BUILDING SETBACK	CODE	PROPOSED
Front Yard	20 feet	Same
Rear Yard	20 feet	Same
Min. Side Yard	5 feet	Same
Combined Side Yard	15 feet	**10 feet per LUC 20.25H.040**

Pending approval of this Critical Area Land Use Permit, complete architectural drawings will be prepared which comply with all dimensional requirements. Dimensional requirements, such as maximum lot coverage by structures (50%), maximum building height (35') and maximum impervious surface (35%), will be determined as part of the architectural development and may require a reduction in the maximum proposed footprint shown in Figure 6.

Figure 6. Maximum Proposed Footprint



Architectural design and aesthetics may also result in a reduction in the maximum proposed footprint. As a result, the maximum proposed footprint should be considered conceptual in nature and any following building permit application will:

- include a footprint the same or smaller than that shown in this application
- be compliant with all dimensional requirements
- only extend beyond the maximum footprint where considered a minor building element under LUC 20.20.025C

B. Critical Areas Overlay District LUC 20.25H

The City of Bellevue Land Use Code Critical Areas Overlay District (LUC 20.25H) establishes performance standards and procedures that apply to development on any site which contains a critical area, critical area buffer or structure setback from a critical area or buffer. The project area is within the 75-foot toe-of-slope setback from a steep slope critical area and is subject to performance standards. The project area is also within the 25' shoreline structure setback; however, the proposal uses the existing footprint only, avoiding any further intrusion into the shoreline setback. The proposal does not use LUC 20.25H.115.C.3.a. which may allow further intrusion into the 25' shoreline setback where adjacent properties are further waterward than the proposed structure.

a. Consistency with LUC 20.25H.125

The steep slope critical area is located on-site, on the westerly portion of the property. The site has existed in this developed condition for many years. The current property and those adjacent are built-out. The present condition of the toe-of-slope setback is almost entirely disturbed and modified by existing development. The proposed project has been designed to:

- Avoid alteration of existing grades other than excavation for the proposed pin pile foundation
- Avoid disturbance of the steep slope itself
- Avoid further intrusion into the shoreline buffers and setbacks

Development within a 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.* No significant alteration of the slope contour is proposed. In fact, the proposal includes a tiered foundation to consider the existing topography.

B. *Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation.* The structure has been designed and located to avoid disturbance of the steep slope and any new encroachments into the 25' shoreline structure setback.

C. *The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties.* The structure will not increase the risk or increase the 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.* No retaining walls are needed to maintain the existing slope and no slopes will be graded.

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

critical area buffer. There are no new impervious surfaces in the critical area. New impervious surfaces within the critical area buffer have been minimized by proposing a three-story residence rather than a two-story residence which would require more impervious surface to achieve the same square footage.

F. *Where change in grade outside the building footprint is necessary, the site retention system should be stepped and re-grading 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;* No significant change in grade or re-grading 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.* If needed, building foundation wall will be used rather than retaining walls. No retaining walls are anticipated.

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*. No construction is proposed in slopes in excess of 40 percent.

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.* No construction is proposed in slopes in excess of 40 percent.

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.* Modification of the slope setback is required to rebuild a new single-family residence, though the steep slope will not be disturbed. The project has been evaluated by a geotechnical engineer who found that "if the steep slope is left undisturbed, mitigation in the form of planting of trees and/or vegetation is not required (Geotech Report, pg 4)." However, mitigation is proposed including a native planting plan along the 10' of shoreline landward of the Ordinary High Water Mark (OHWM), excluding a 6' wide beach access.

b. Consistency with LUC 20.25H.230

The critical areas report is intended to provide flexibility for sites where the expected critical area functions and values are not present due to degraded conditions or other unique site characteristics, or for proposals providing unique design or protection of critical area functions and values not anticipated by this part. Generally, the critical areas report must demonstrate that the proposal with the requested modifications leads to equivalent or better protection of critical area functions and values than would result from the application of the standard requirements. Where the proposal involves restoration of degraded conditions in exchange for a reduction in regulated critical area buffer on a site, the critical areas report must demonstrate a net increase in certain critical area functions

The proposal has been designed to protect critical area functions and values by requesting a reduction in the steep slope setback and a reduction in the 15' combined side yard setbacks in favor of either disturbing the steep slope and/or reducing the shoreline structure setback. It also seeks to minimize any additional impact by utilizing the footprint of the existing house and existing impervious surfaces.

The expected critical area functions and values are not present on the site due to the existing development. As the critical area functions and values are degraded, there is opportunity to improve the site. Mitigation is proposed, including a native planting plan along the 10' of shoreline landward of the Ordinary High Water Mark (OHWM), excluding a 6' wide beach access. The restored shoreline area will be approximately 540 sq ft. and will include trees, shrubs, perennials and groundcover. These plantings will result in a net increase in shoreline critical areas functions.

IV. Decision Criteria

A. 20.25H.255.B Critical Areas Report Decision Criteria

The Director may approve, or approve with modifications, a proposal to reduce the regulated critical area buffer on a site where the applicant demonstrates:

1. *The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in overall critical area or critical area buffer functions;*
   As discussed, the site has limited function and value compared to a natural undisturbed site. Existing development has degraded the site as compared to the site's potential. A 540 square-foot area along the shoreline is proposed to be restored with native plantings as mitigation for the limited impacts the project will cause. The site will have a net improvement in critical area functions.

2. *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 performance standards related to steep slopes are being met by this proposal as no critical area is proposed to be modified. As reviewed in Section III above, the project complies with all required performance standards.

3. *The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in the most important critical area or critical area buffer functions to the ecosystem in which they exist;*
   Having a shoreline buffer that provides some vegetation is an improvement over the existing condition which has limited shoreline vegetation. The vegetation will provided shade, habitat and allow for organic material input into the lake. The shoreline frontage on this site is the most important critical area, as it provides an interface between the land and the water which is critical to the aquatic ecosystem.

4. *The proposal includes a net gain in stormwater quality function by the critical area buffer or by elements of the development proposal outside of the reduced regulated critical area buffer;*
   The project is installing 540 square feet of vegetation that does not currently exist. The current site and paved surfaces drain directly to the lake. The newly installed vegetation will improve stormwater quality function by reducing sedimentation into the lake and other negative impacts.

5. *Adequate resources to ensure completion of any required restoration, mitigation and monitoring efforts;*
   The proposed mitigation of 540 sq ft of shoreline native planting is not required by the geotechnical engineer, but is proposed by the applicant. As such, no surety bond or monitoring should be required.

6. *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 modifications and performance measures in this proposal are not detrimental to the functions and values of the shoreline or steep slope critical areas off-site. Overall, the functions of the shoreline criteria area will be improved. The proposed project complies with the required performance standards. No work is proposed in the steep slope critical area. This approval will avoid modification of or further disturbance of the shoreline setback.

7. *The resulting development is compatible with other uses and development in the same land use district.* The project will construct a new single-family residence which is a compatible use with the surrounding uses which are also single-family homes.

B. 20.30P.140 Critical Area Land Use Permit Decision Criteria

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

A. *The proposal obtains all other permits required by the Land Use Code.* The applicant will obtain a building permit and other associated permits before beginning any work.

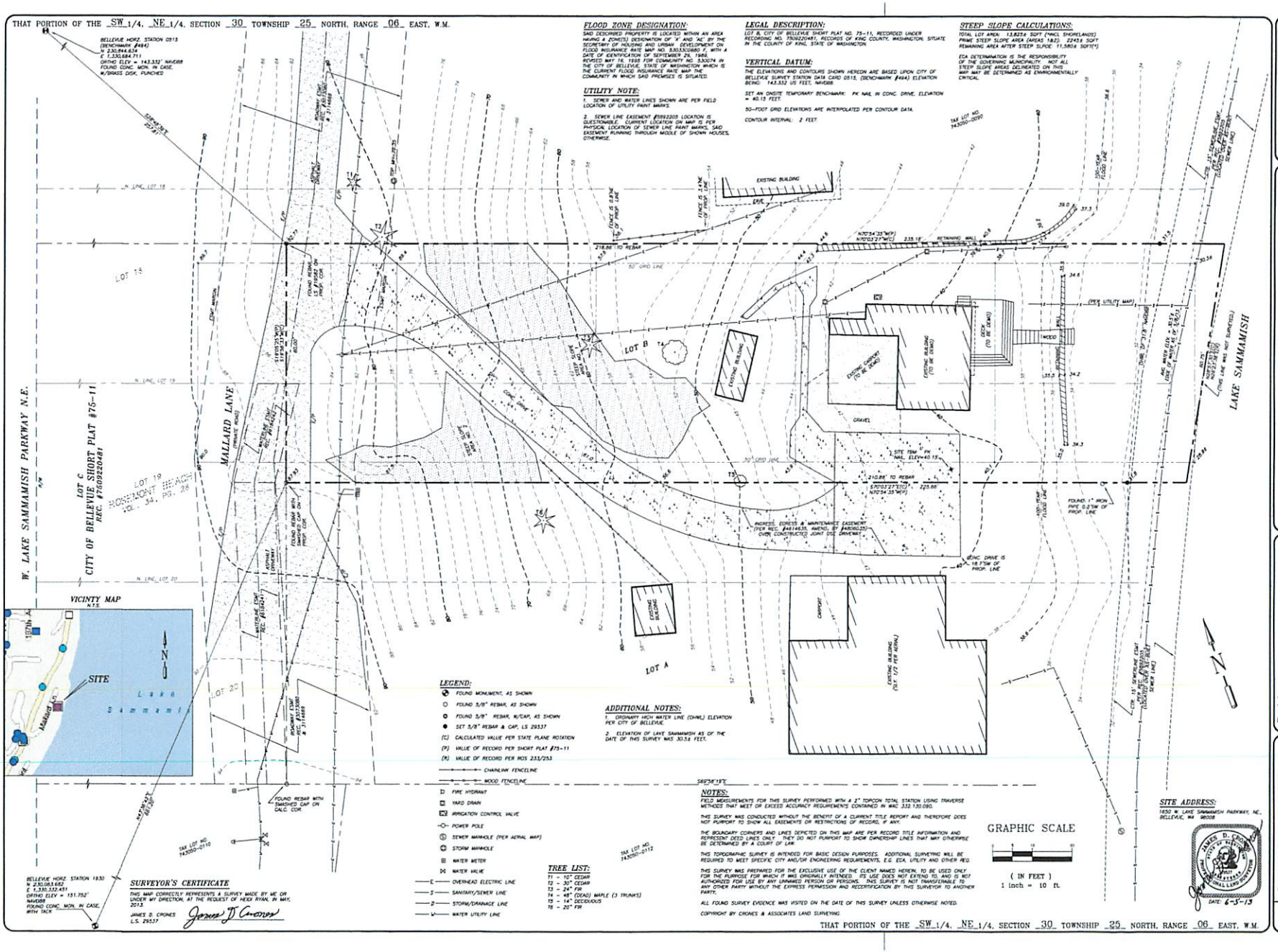
B. *The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer.* The proposal utilizes the footprint of the existing home as well as current impervious surface areas and the proposal includes a tiered foundation to minimize disturbance of the natural grade within the steep slope setback. The granting of the reduction in the steep slope setback and reduced side yard setbacks will avoid the need for a reduction in the shoreline setback.

C. *The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable.* As discussed in Section III of this report, the performance standards of LUC 20.25H are being met.

D. *The proposal will be served by adequate public facilities including street, fire protection, and utilities.* The proposed activity will not affect public services or facilities any more than the existing home and will be served by adequate public facilities.

E. *The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210.* A mitigation planting plan has been submitted to install plants in a 540 square-foot area along the shoreline, though no mitigation is required by the geotechnical engineer.

F. *The proposal complies with other applicable requirements of this code.* As discussed in this report, the proposal complies with all other applicable requirements of the Land Use Code and/or will demonstrate full compliance at time of submission for a building permit.



CRONES, LLC
C | A LAND SURVEYORS
CRONES & ASSOCIATES LAND SURVEYORS
(425) 451-8175
FAX: (425) 451-8189

HEIDI RYAN
LOT SURVEY
TOPOGRAPHIC & STEEP SLOPE SURVEY
KING COUNTY WASHINGTON

Revisions

Drawing Date: MAY 29, 2013
Scale: 1" = 10'
Surveyed: JJC/JMC
Drawn: GRA
Checked: JB/JJC
Filename: RYAN1-01B.DWG

SHEET 1 of 1

SITE PLAN B

THAT PORTION OF THE SW 1/4, NE 1/4, SECTION 30 TOWNSHIP 25 NORTH, RANGE 06 EAST, W.M.

W. LAKE SAMMAMISH PARKWAY N.E.

LOT C
CITY OF BELLEVUE SHORT PLAT #75-11
REC. #7509220481

ROSECREST
VOL. 34, PG. 28

LOT 19 LOT 18 LOT 17

MALLARD LANE
(PRIVATE ROAD)

LOT 15

LOT B

LOT A

LAKE SAMMAMISH

N. LINE, LOT 20

N. LINE, LOT 19

N. LINE, LOT 18

EXISTING BUILDING (SLY. 1/2 PER KERAU)

CARPORT

EXISTING BUILDING

EXISTING BUILDING

EXISTING CARPORT (TO BE DEMO)

EXISTING BUILDING (TO BE DEMO)

DECK (TO BE REMO)

GRAVEL

WOOD RETAINING WALL

RETAINING WALL

EXISTING BUILDING

CONC. DRIVE

ASPHALT DRIVEWAY

ASPHALT DRIVEWAY

GRAPHIC SCALE

(IN FEET)
1 inch = 10 ft.

0 5 10 20

SITE ADDRESS:
1650 W. LAKE SAMMAMISH PARKWAY, NE.
BELLEVUE, WA 98008

JAMES D. CRONES
STATE OF WASHINGTON
PROFESSIONAL LAND SURVEYOR
DATE: 6-5-13

NOTES:
1. BASIS OF BEARINGS FOR THIS SURVEY PERFORMED WITH A 2" TOPCON TOTAL STATION USING TRAVERSE METHODS THAT MEET OR EXCEED ACCUIRACY REQUIREMENTS CONTAINED IN WAC 332-130-090.
2. THIS SURVEY WAS CONDUCTED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT AND THEREFORE DOES NOT PURPORT TO SHOW ALL EASEMENTS OR RESTRICTIONS OF RECORD, IF ANY.
3. THE BOUNDARY CORNERS AND LINES DEPICTED ON THIS MAP ARE PER RECORD TITLE INFORMATION AND REFRESENT DEED LINES ONLY. THEY DO NOT PURPORT TO SHOW OWNERSHIP LINES THAT MAY OTHERWISE BE DETERMINED BY A COURT OF LAW.
4. THIS TOPOGRAPHIC SURVEY IS INTENDED FOR BASIC DESIGN PURPOSES. ADDITIONAL SURVEYING WILL BE REQUIRED TO MEET SPECIFIC CITY AND/OR ENGINEERING REQUIREMENTS, E.G. EOA, UTLITY AND OTHER REG.
5. THIS SURVEY WAS PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT NAMED HEREIN, TO BE USED ONLY FOR THE PURPOSE FOR WHICH IT WAS ORIGINALLY INTENDED. ITS USE DOES NOT EXTEND TO, AND IS NOT AUTHORIZED FOR USE BY ANY UNNAMED PERSON OR PERSONS. THIS SURVEY IS NOT TRANSFERABLE TO ANY OTHER PARTY WITHOUT THE EXPRESS PERMISSION AND RECERTIFICATION BY THIS SURVEYOR TO ANOTHER PARTY.
6. ALL FOUND SURVEY EVIDENCE WAS VISITED ON THE DATE OF THIS SURVEY UNLESS OTHERWISE NOTED.

COPYRIGHT BY CRONES & ASSOCIATES LAND SURVEYING.

TREE LIST:

11 – 10"	CEDAR
12 – 30"	CEDAR
13 – 24"	FIR
14 – 48"	(DEAD) MAPLE (3 TRUNKS)
15 – 14"	DECIDUOUS
16 – 20"	FIR

TAX LOT NO. 7430500112

LEGEND:

- FOUND MONUMENT, AS SHOWN
- FOUND 5/8" REBAR, AS SHOWN
- FOUND 5/8" REBAR, W/CAP, AS SHOWN
- SET 5/8" REBAR & CAP, LS 29537
- (C) CALCULATED VALUE PER STATE PLANE ROTATION
- (P) VALUE OF RECORD PER SHORT PLAT #75-11
- (R) VALUE OF RECORD PER ROS 233/253
- WOOD FENCELINE
- CHAINLINK FENCELINE
- FIRE HYDRANT
- YARD DRAIN
- IRRIGATION CONTROL VALVE
- POWER POLE
- SEWER MANHOLE (PER AERIAL MAP)
- STORM MANHOLE
- WATER METER
- WATER VALVE
- OVERHEAD ELECTRIC LINE
- SANITARY/SEWER LINE
- STORM/DRAINAGE LINE
- WATER UTILITY LINE

ADDITIONAL NOTES:
1. ORDINARY HIGH WATER LINE (OHWL) ELEVATION PER CITY OF BELLEVUE.
2. ELEVATION OF LAKE SAMMAMISH AS OF THE DATE OF THIS SURVEY WAS 30.54 FEET.

S69°59'19"E

TAX LOT NO. 7430500110

TAX LOT NO. 7430500090

FOUND REBAR WITH CALC. COR.

FOUND REBAR WITH CALC. COR.

FOUND REBAR WITH PROP. COR.

FOUND REBAR WITH PROP. COR.

FOUND 1" IRON PIPE 0.3'SW OF PROP. LINE

FENCE IS 0.8'NE OF PROP. LINE

FENCE IS 3.9'NE OF PROP. LINE

CONC. DRIVE IS 18.7'SW OF PROP. LINE

INGRESS, EGRESS & MAINTENANCE EASEMENT (PER REC. #4614653, AMEND. BY #4606035) OVER CONSTRUCTED JOINT USE DRIVEWAY

S70°03'27"E(C) 221.66'
N70°54'35"W(P)

210.66' TO REBAR

SET TBM - PK NAIL ELEV=40.15

218.86'TO REBAR

S70°03'27"E(C) 235.18'
N70°54'35"W(P)

RETAINING WALL

RETAINING WALL

50' GRID LINE

50' GRID LINE

10' Sideyard Setback

25' Shoreline Setback

25' Shoreline Buffer

75' SS Setback

5' Sideyard Setback

STEEP SLOPE AREA NO. 1

STEEP SLOPE AREA NO. 2

60' STEP NO. 1

60' STEP NO. 2

CTR. 15' SEWERLINE ESMT (LOCATED FIELD PER REC. #8902205 AS-BUILT)

CTR. 15' SEWERLINE ESMT (LOCATED FIELD PER REC. #8902205 AS-BUILT)

100-YEAR FLOOD LINE

100-YEAR FLOOD LINE

MHE WATER ELEV = 30.54 (7/17/13)

EDGE OF WATER IS 0.8' N

(THIS LINE WAS NOT SURVEYED)

(PER UTILITY MAP)

WATERLINE ESMT REC. #6184241

ROADWAY ESMT #3073080 & 3114689

ROADWAY ESMT #3114689

ESMT MARGIN

ESMT MARGIN

ESMT MARGIN

FOUND REBAR WITH PROP. COR.

FOUND REBAR WITH PROP. COR.

FOUND REBAR WITH CALC. COR.

FOUND REBAR WITH CALC. COR.

MH=30.35

MH=29.25

MH=30.25

MH=30.25

S26°48'30"E
251.91'

S19°05'33"W(M)
S19°05'33"W(P)
60.00'

S89°59'19"E
837.20'

SURVEYOR'S CERTIFICATE

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION, AT THE REQUEST OF HEIDI RYAN, IN MAY, 2013.

JAMES D. CRONES
L.S. 29537

BELLEVUE HORZ. STATION 1930
N 230,083.682
E 1,330,332.451
ORTHO ELEV = 151.752'
NAVD88
FOUND CONC. MON. IN CASE. WITH TACK

VICINITY MAP
N.T.S.

SITE
Lake Sammamish
Lake Sammamish
NE 8th St
156th Ave NE
N

FLOOD ZONE DESIGNATION:
SAID DESCRIBED PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE(S) DESIGNATION OF 'X' AND 'AE' BY THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT ON FLOOD INSURANCE RATE MAP NO. 53033C0680 F, WITH A DATE OF IDENTIFICATION OF SEPTEMBER 29, 1989. REVISED MAY 16, 1995 FOR COMMUNITY NO. 530074 IN THE CITY OF BELLEVUE, STATE OF WASHINGTON WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED.

LEGAL DESCRIPTION:
LOT B, CITY OF BELLEVUE SHORT PLAT NO. 75-11, RECORDED UNDER RECORDING NO. 7509220481, RECORDS OF KING COUNTY, WASHINGTON; SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

VERTICAL DATUM:
THE ELEVATIONS AND CONTOURS SHOWN HEREON ARE BASED UPON CITY OF BELLEVUE SURVEY STATION DATA CARD 0515, (BENCHMARK #494) ELEVATION BEING: 143.322 US FEET, NAVD88.
SET AN ONSITE TEMPORARY BENCHMARK: PK NAIL IN CONC. DRIVE, ELEVATION = 40.15 FEET.
50-FOOT GRID ELEVATIONS ARE INTERPOLATED PER CONTOUR DATA.
CONTOUR INTERVAL: 2 FEET.

UTILITY NOTE:
1. SEWER AND WATER LINES SHOWN ARE PER FIELD LOCATION OF UTILITY PAINT MARKS.
2. SEWER LINE EASEMENT #8902205 LOCATION IS QUESTIONABLE. CURRENT LOCATION ON MAP IS PER PHYSICAL LOCATION OF SEWER LINE PAINT MARKS. SAID EASEMENT RUNNING THROUGH MIDDLE OF SHOWN HOUSES, OTHERWISE.

STEEP SLOPE CALCULATIONS:
TOTAL LOT AREA: 13,825± SQFT (*INCL. SHORELANDS)
PRIME STEEP SLOPE AREA (AREAS 1&2): 2245± SQFT
REMAINING AREA AFTER STEEP SLPOE: 11,580± SQFT(*)

ECA DETERMINATION IS THE RESPONSIBILITY OF THE COVERING MUNICIPALITY. NOT ALL STEEP SLOPE AREAS DELINEATED ON THIS MAP MAY BE DETERMINED AS ENVIRONMENTALLY CRITICAL.

BELLEVUE HORZ. STATION 0515
(BENCHMARK #494)
N 230,844.654
E 1,330,666.711
ORTHO ELEV = 143.322', NAVD88
FOUND CONC. MON. IN CASE, W/BRASS DISK, PUNCHED

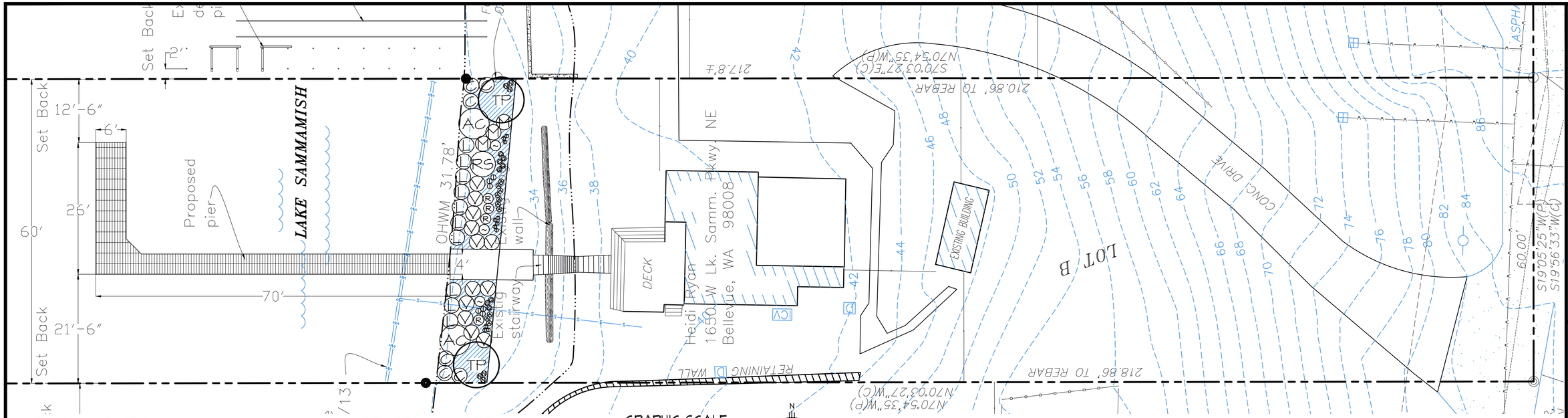
Drawing Date	MAY 29, 2013
Scale	1" = 10'
Surveyed	JJC/JMC
Drawn	GRA
Checked	JB/JJC
Filename	RYANH-01B.DWG

SHEET 1 of 1

Revisions

HEIDI RYAN
LOT SURVEY
TOPOGRAPHIC & STEEP SLOPE SURVEY
KING COUNTY WASHINGTON

CRONES LAND SURVEYORS LLC
23806 180TH AVE. S.E. KENT, WA 98042
PHONE (425) 271-8176
FAX (425) 432-8520



PLAN LEGEND

PROPERTY LINE

OHWM OF LAKE SAMMAMISH

GENERAL NOTES

1. BASE INFORMATION PROVIDED BY ASHLEY SHORELINE DESIGN & PERMITTING, 16412 NE 10TH PLACE, BELLEVUE, WA 98008, (425) 957-9381.

GRAPHIC SCALE (IN FEET)

0 5 10 15 20 30

SCALE: 1:10

N

PLANT SCHEDULE

LARGE TREES

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN.)	NOTES
TP	THUJA PLICATA	WESTERN RED CEDAR	10' O.C.	2	5 GAL.	FULL & BUSHY

SMALL TREES

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN.)	NOTES
AC	ACER CIRCINATUM	VINE MAPLE	6' O.C.	2	5 GAL.	MULTI-STEM (3 MIN.)

SHRUBS

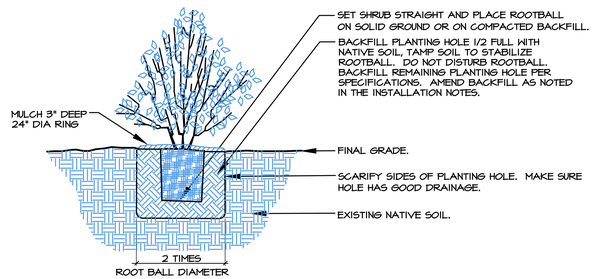
KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN.)	NOTES
C	CORNUS SERICEA	RED OSIER DOGWOOD	4' O.C.	6	1 GAL.	MULTI-STEM (3 MIN.)
L	LONICERA INVOLUCRATA	BLACK TWIN-BERRY	3' O.C.	10	1 GAL.	MULTI-STEM (3 MIN.)
M	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	4' O.C.	3	2 GAL.	FULL & BUSHY
RS	RIBES SANGUINEUM	RED CURRANT	5' O.C.	1	2-5 GAL.	MULTI-STEM (3 MIN.)
V	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3' O.C.	12	2 GAL.	FULL & BUSHY

GROUNDCOVER

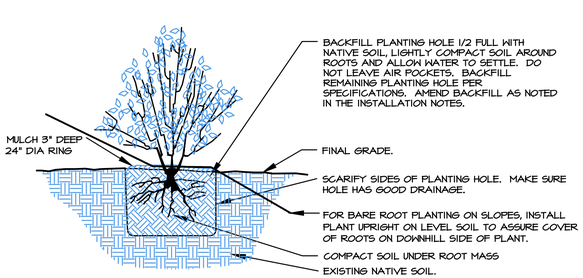
KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY	SIZE (MIN.)	NOTES
	ARCTOSTAPHYLLOS UVA-URSI	KINNIKINNICK	3' O.C.	16	1 GAL.	FULL & BUSHY

PERENNIALS

KEY	SCIENTIFIC NAME	COMMON NAME	SPACING	QTY.	SIZE MIN.)	NOTES
Q	AQUILEGIA FORMOSA	WESTERN COLUMBINE	1' O.C.	8	1 GAL. OR 4" POT	FULL & BUSHY
T	ARMERIA MARITIMA	THRIFT	9" O.C.	11	1 GAL. OR 4" POT	FULL & BUSHY
R	ASTER SUBSPICATUS	DOUGLAS ASTER	2' O.C.	4	1 GAL. OR 4" POT	FULL & BUSHY
A	CAMASSIA QUAMASH	COMMON CAMAS	1' O.C.	10	1 GAL. OR 4" POT	FULL & BUSHY
I	IRIS TENAX	OREGON IRIS	1' O.C.	6	1 GAL. OR 4" POT	FULL & BUSHY
~	LUPINUS POLYPHYLLUS	LARGE-LEAVED LUPINE	2' O.C.	3	1 GAL. OR 4" POT	FULL & BUSHY
N	TELLIMA GRANDIFLORA	FRINGECUP	1' O.C.	6	1 GAL. OR 4" POT	FULL & BUSHY



1 CONTAINER PLANTING DETAIL (TYP.)
SCALE: NTS



2 BARE-ROOT PLANTING DETAIL (TYP.)
SCALE: NTS

SPECIFICATIONS

1. CONTRACTOR INFORMATION. WHEN IT IS AVAILABLE, CONTACT INFORMATION SHALL BE PROVIDED TO THE CITY OF BELLEVUE THAT INCLUDES NAMES, ADDRESSES AND PHONE NUMBERS OF PERSONS/FIRMS THAT WILL BE RESPONSIBLE FOR INSTALLING REQUIRED PLANTS AND PERFORMING REQUIRED MAINTENANCE.
2. CONTRACTOR'S QUALIFICATIONS. ALL WORK SHALL BE PERFORMED BY A LICENSED LANDSCAPE CONTRACTOR REGISTERED IN THE STATE OF WASHINGTON. CONTRACTOR MUST BE EXPERIENCED IN MITIGATION AND RESTORATION WORK. THE CONTRACTOR SHALL PROVIDE THAT THERE IS ONE PERSON ON THE SITE AT ALL TIMES DURING WORK AND INSTALLATION WHO IS THOROUGHLY FAMILIAR WITH THE TYPE OF MATERIALS BEING INSTALLED AND THE BEST METHODS FOR THEIR INSTALLATION, AND WHO SHALL DIRECT ALL WORK BEING PERFORMED UNDER THESE SPECIFICATIONS. THIS PERSON SHALL HAVE A MINIMUM OF FIVE (5) YEARS EXPERIENCE INSTALLING NATIVE PLANT MATERIALS FOR WETLAND MITIGATION OR RESTORATION PROJECTS, UNLESS OTHERWISE ALLOWED BY THE LANDSCAPE DESIGNER, WETLAND BIOLOGIST AND/OR THE CITY OF BELLEVUE.
3. ALL PLANTS SHOULD BE INSTALLED BETWEEN DECEMBER 1ST AND MARCH 15TH UNLESS A TEMPORARY IRRIGATION SYSTEM IS INSTALLED.
4. INTERMEDIATE INSPECTIONS. ALL PLANTS SHALL BE INSPECTED AND APPROVED BY THE LANDSCAPE DESIGNER AND/OR WETLAND BIOLOGIST PRIOR TO INSTALLATION. CONDITION OF ROOTS OF A RANDOM SAMPLE OF PLANTS WILL BE INSPECTED, AS WELL AS ALL ABOVE GROUND GROWTH ON ALL PLANTS. ROOTS OF ANY BARE ROOT PLANTS, IF PERMITTED FOR USE, WILL BE INSPECTED. PLANT MATERIAL MAY BE APPROVED AT THE SOURCE, AT THE DISCRETION OF THE LANDSCAPE DESIGNER AND THE WETLAND BIOLOGIST, BUT ALL MATERIAL MUST BE RE-INSPECTED AND APPROVED ON THE SITE PRIOR TO INSTALLATION. PLANT LOCATIONS SHALL ALSO BE INSPECTED AND APPROVED PRIOR TO PLANTING.
5. PRIOR TO INSTALLATION OF PLANT MATERIAL, STRAW BALES SHALL BE INSTALLED LAKESIDE OF THE OHWL AND STAKED WITH 2"X2" STAKES ALONG THE ENTIRE LENGTH OF THE PLANTING AREA.
6. THE PLANTING AREAS WILL BE LAID OUT BASED ON THE PLANTING PLAN (10' WIDE STRIP FROM THE OHWL OF THE LAKE), AND PLANTS SHALL BE GRUBBED FROM THE PLANTING AREA WITH THE EXCEPTION OF NATIVE WOODY VEGETATION. CARE SHOULD BE TAKEN TO ENSURE COMPLETE REMOVAL OF ROOTS OF ALL HIMALAYAN BLACKBERRY, ENGLISH IVY OR OTHER INVASIVE PLANT SPECIES, CONCRETE OR OTHER NON-ORGANIC DEBRIS AND ORNAMENTAL PLANTINGS LOCATED IN THE PLANTING AREAS. ALL EXCAVATED MATERIAL SHALL BE EXPORTED OFFSITE PRIOR TO PLANTING.
7. PRIOR TO PLANTING, A MIN. 3" OF PSM (PACIFIC GARDEN MULCH), SHALL BE INSTALLED IN THE PLANTING BEDS TO PRE-CLEARING GRADES AND TILLED INTO THE TOP 6" OF NATIVE SOIL AFTER ORNAMENTAL PLANT, LAWN AND CONCRETE REMOVAL.
8. ALL PLANTS SHALL BE PIT-PLANTED IN PLANTING PITS EXCAVATED 2X THE DIAMETER OF THE PLANT AND BACKFILL WITH EXCAVATED MATERIAL FROM THE PLANTING PIT.
9. PLANTS SHALL BE INSTALLED 2" HIGH AND SURFACED MULCHED TO A DEPTH OF 2" WITH MEDIUM-COURSE BARK MULCH PLACED CONTINUOUSLY THROUGHOUT THE PLANTING BED TO MATCH OTHER LANDSCAPE BEDS.
10. ALL PLANTS SHALL BE NURSERY GROWN (IN WESTERN WA OR OR) FOR AT LEAST 1 YEAR FROM PURCHASE DATE, FREE FROM DISEASE OR PESTS, WELL-ROOTED, BUT NOT ROOT-BOUND AND TRUE TO SPECIES.
11. TREES SHALL BE SINGLE STAKED WITH A BAMBOO STAKE AS NECESSARY TO PREVENT LEANING.
12. PLANT LAYOUT SHALL BE APPROVED BY AOA PRIOR TO INSTALLATION AND APPROVED UPON COMPLETION OF PLANTING.
13. UPON COMPLETION OF PLANTING, ALL PLANTS SHALL BE THOROUGHLY WATERED.
14. UPON APPROVAL OF PLANTING INSTALLATION BY AOA, THE CITY OF BELLEVUE WILL BE NOTIFIED TO CONDUCT A SITE REVIEW FOR FINAL APPROVAL OF CONSTRUCTION.
15. MAINTENANCE SHALL BE REQUIRED IN ACCORDANCE WITH THE CITY OF BELLEVUE SENSITIVE AREAS MITIGATION GUIDELINES AND APPROVED PLANS.
16. ALL PLANTS SHALL BE HAND-WATERED OR IRRIGATED VIA A TEMPORARY IRRIGATION SYSTEM DURING THE FIRST TWO DRY SEASONS AT A RATE OF ½" OF FLOW TWICE WEEKLY BETWEEN JUNE 15 - OCTOBER 31. FLOW SHOULD ENSURE COMPLETE SATURATION OF THE ROOT ZONE.
17. MAINTENANCE SHALL BE IMPLEMENTED ON A REGULAR BASIS ACCORDING TO THE SCHEDULE BELOW.

ANNUAL MAINTENANCE SCHEDULE

MAINTENANCE ITEM	J	F	M	A	M	J	J	A	S	O	N	D
WEED CONTROL			1	1	1	1	1	1	1	1	1	
GENERAL MAINT.	1	1	1	1	1	1	1	1	1	1	1	1

1-8 = NUMBER OF TIMES TASK SHALL BE PERFORMED PER MONTH.

18. MONITORING PLAN PROVIDED BY ASHLEY SHORELINE DESIGN & PERMITTING.

Altmann Oliver Associates, LLC | AOA
Environmental Planning & Landscape Architecture
PO Box 578 Carnation, WA 98014 Office (425) 333-4535 Fax (425) 333-4509

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT

SIMONE CATHERINE OLIVER
CERIFICATE NO. 744
EXPIRES 6/25/13

LAKE BUFFER MITIGATION PLAN
PLANTING PLAN
RYAN PROPERTY
1650 W. LAKE SAMM. PKWY. NE
BELLEVUE, WA 98008

Revisions	Date	By

Date 05-30-13
Scale AS NOTED
Project# 4374

Sheet # L1.1

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4374-MIT-05-30-13.dwg

GEOTECH
CONSULTANTS, INC.

13256 Northeast 20th Street, Suite 16
Bellevue, Washington 98005
(425) 747-5618 FAX (425) 747-8561

June 17, 2013

JN 13178

Bluewater Assets, LLC
4265 – 206th Avenue Southeast
Sammamish, Washington 98075

Attention: Heidi Ryan *via email: heidiryan@comcast.net*

Subject: **Transmittal Letter – Geotechnical Engineering Study**
Proposed New Residence
1650 West Lake Sammamish Parkway Northeast
Bellevue, Washington

Dear Ms Ryan:

We are pleased to present this geotechnical engineering report for the proposed new residence to be constructed on the subject property. The scope of our services consisted of exploring site surface and subsurface conditions, and then developing this report to provide recommendations for general earthwork, design criteria for foundations, retaining walls, temporary shoring, and slope considerations. This work was authorized by your acceptance of our proposal, P-8630, dated May 10, 2013.

The attached report contains a discussion of the study and our recommendations. Please contact us if there are any questions regarding this report, or for further assistance during the design and construction phases of this project.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

Jason L. Hinds
Geotechnical Engineer

JLH/MRM: jyb

GEOTECHNICAL ENGINEERING STUDY
Proposed New Residence
1650 West Lake Sammamish Parkway Northeast
Bellevue, Washington

This report presents the findings and recommendations of our geotechnical engineering study for the site of the proposed new residence to be located in Bellevue.

We were provided with a topographic map of the site created by Crones Land Surveyors, dated May 16, 2013. Based on conversations with Heidi Ryan, and review of a hand-sketched site plan, we understand that the existing house on the site will be removed and replaced with a new single family residence and attached garage. The new residence will be set near the existing location of the current home, but will have to extend further toward the west to accommodate the garage. The western wall of the garage and motorcourt will likely extend slightly to the west of the existing greenhouse. This will require walls at or near, the toe of an area demarcated on the survey as steep slope. This steep slope area is discussed further in the ***Surface*** section below. Excavation of 8 to 10 feet below the existing grade will be needed for the garage and the motorcourt in front of it. The existing house is already closer than 75 feet to the toe of the manmade steep slope below the driveway. Even so, a Critical Area Land Use Permit (CALUP) will likely be required to allow the new structure to encroach closer to this slope.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

SURFACE

The Vicinity Map, Plate 1, illustrates the general location of the site on the west shore of Lake Sammamish. The property is bordered to the west by Mallard Lane, a paved private road, and to the east by Lake Sammamish. To the north and south are similar residential properties currently developed with newer single-family homes. Our firm provided geotechnical services for the redevelopment of the property located two lots to the south. The subject site is currently developed with a single- family home and attached carport. This existing construction is located near the center to eastern portion of the property. The roof of the house extends eastward supported on an isolated footing. Two the east of the house is a deck and grass lawn that slopes gently down toward the lake's shore. West of the existing house and carport is a small garden area and small greenhouse.

Overall, the site slopes down to the east, towards the lake. From the existing greenhouse and extending eastward, the ground slopes gently. There are no steep areas taller than 4 to 5 feet on this portion of the property. To the west of the greenhouse, the ground slopes steeply upward to the edge of Mallard Lane. This slope has been oversteepened from the pre-existing condition by filling for the downslope side of both the paved driveway and Mallard Lane. The toe of the steep slope shown on the site survey is actually at least 5 feet further toward the west. The slope toe that is shown on the survey is a small anomaly that is not consistent with the surrounding slope. Also, the southern portion of the steep slope area shown off the southwest corner of the greenhouse is less than 10 feet in height, which should remove it from steep slope designation under City of

Bellevue guidelines. Upslope of Mallard Lane, off the edge of the site, are the steep natural slopes common below West Lake Sammamish Parkway Northeast. We saw no signs of recent instability on the steep manmade or natural slopes on, or around, the subject property.

We understand that there is a subsurface interceptor drain existing on the western, upslope, side of the house and carport. This drain and the house downspouts drain to Lake Sammamish through an existing buried pipe.

SUBSURFACE

The subsurface conditions were explored by drilling one test boring at the approximate location shown on the Site Exploration Plan, Plate 2. Our exploration program was based on the proposed construction, anticipated subsurface conditions and those encountered during exploration, and the scope of work outlined in our proposal. As discussed above, our firm also previously provided geotechnical services during redevelopment of the property two lots to the south. This provided additional geologic information about the area.

The boring was drilled on May 22, 2013 using a small rubber track-mounted, hollow-stem auger drill. Samples were taken at 5-foot intervals with a standard penetration sampler. This split-spoon sampler, which has a 2-inch outside diameter, is driven into the soil with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler a given distance is an indication of the soil density or consistency. A geotechnical engineer from our staff observed the drilling process, logged the test boring, and obtained representative samples of the soil encountered. The Test Boring Log is attached as Plate 1.

Soil Conditions

The test boring log conducted for this study encountered conditions that were similar to those found on our previous geotechnical study two lots to the south. Underlying the gravel surfacing at the existing parking area in front of the carport, we observed very soft organic silt extending to a depth of approximately 6 feet. Beneath this was loose, very silty sand that contained varying amounts of gravel. This soil became dense below a depth of approximately 15 feet, continuing to the maximum 26.5-foot depth of the boring.

No obstructions were revealed by our explorations. However, the native sands were gravelly, and they may contain larger cobbles. Also, debris, buried utilities, and old foundation and slab elements are commonly encountered on sites that have had previous development.

Groundwater Conditions

Groundwater seepage was observed at a depth of about 2.5 feet. The test boring was left open for only a short time period. Therefore, the seepage level on the log represents the location of transient water seepage and may not indicate the static groundwater level. Groundwater levels encountered during drilling can be deceptive, because seepage into the boring can be blocked or slowed by the auger itself. It should be noted that groundwater levels vary seasonally with rainfall and other factors. Considering all of the above, it is likely that the seasonal high groundwater table is within a few feet of the ground surface on the lower portion of the property.

The stratification lines on the logs represent the approximate boundaries between soil types at the exploration location. The actual transition between soil types may be gradual, and subsurface conditions can vary away from exploration locations. The log provides specific subsurface information only at the location tested. The relative densities and moisture descriptions indicated on the test boring log are interpretive descriptions based on the conditions observed during drilling.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

The test boring conducted for this study encountered dense silty sand with gravel beneath about 15 feet below the existing ground surface. The upper, loose soils are not suitable to support the new construction without undergoing significant settlement. We recommend that the new house foundation and floors, as well as other settlement-sensitive elements, be supported on a deep foundation system bearing within the underlying competent soils. Considering the soil conditions, limited access, and our experience with similar projects, it appears that the most feasibly deep foundation would consist of small-diameter steel pipe piles driven into the dense soils. Further recommendations regarding pipe pile design and installation can be found in the ***Pipe Pile*** section of this report.

It is likely that some settlement of the ground surrounding pile-supported buildings will occur over time. In order to reduce the potential problems associated with this, we recommend the following:

- Fill to the desired site grades several months prior to constructing on-grade slabs, walkways, and pavements around the buildings. This allows the underlying soils to undergo some consolidation under the new soil loads before final grading is accomplished.

- Connect all in-ground utilities beneath the structure to the pile-supported floors or grade beams. This is intended to prevent utilities, such as sewers, from being pulled out of the floor as the underlying soils settle away from the slab. Hangers or straps can be poured into the floors and grade beams to carry the piping. Alternatively, they can be hung from the pile-supported floors and grade beams. The spacing of these supporting elements will depend on the distance that the pipe material can span unsupported.

- Construct all entrance walkways as reinforced slabs that are doweled into the grade beam at the door thresholds. This will allow the walkways to ramp down and away from the building as they settle, without causing a downset at the threshold. This includes the approach apron to the new garage.

- Isolate on-grade elements, such as walkways or pavements, from pile-supported foundations and columns to allow differential movement.

We anticipate the new house will be constructed above the existing grade, with no basement. However, excavation into the sloped ground on the west side of the structure will be needed for the

garage and motorcourt. Due to the shallow groundwater and the soft near-surface soil conditions, excavation shoring will be needed for the excavation of the garage and motorcourt area. We recommend that drilled soldier piles be utilized for this shoring. Driven soldier piles should be avoided, as these can cause stronger ground vibrations that could adversely impact neighboring houses that sit on the loose soils. This shoring should be located several feet away from the permanent garage wall, in order to allow full coverage waterproofing and free-draining gravel backfill to be placed against the wall. Also, it will be necessary to provide both temporary and permanent drainage in these areas to handle the shallow groundwater table. The floor grade of the house should be above the existing ground surface. However, if there will be a crawl space under the house, an underdrainage system should be provided to make sure that the water table stays below the crawl space level.

The steep slope area to the west of the development area is limited in height and has resulted from previous grading activities. Even so, it would be classified as a landslide hazard under City of Bellevue's Code. The setback between the new construction and the western slope will be less than the prescriptive 75-foot structure setback required from the toe of slope for new construction by Bellevue Code 20.25H.035. However, the existing house and carport are already located within this setback zone. The steep slope itself is not to be disturbed by the planned construction. As a result, the proposed project will not adversely impact slope stability on the site or the adjoining properties. In fact, the use of shoring at the slope's toe, and the limited lowering of the water table from the new drainage systems will increase the stability of the slope. If the steep slope is left undisturbed, mitigation in the form of planting of trees and/or vegetation is not required. Low-growing evergreen vegetation should be promoted, and planting of additional trees on the steep slope should be avoided. The potential for future large-scale slides on this slope is negligible. However, as with any steep slopes, there is a potential for shallow, small-scale slide. In order to mitigate the potential hazard from a future landslide, we recommend that the western, upslope, foundation wall of the garage extend at least 3 feet above the existing grade. This provides a small catchment wall for any soil or debris that may travel down the slope in a slide. No penetrations, such as windows or doors, are allowed in this 3-foot extension of the foundation wall, but siding can be extended downward to cover the concrete wall. An egress door should not be installed in the west wall of the garage.

The erosion control measures needed during the site development will depend heavily on the weather conditions that are encountered during the site work. The location of the site on the shore of Lake Sammamish will make proper erosion control implementation important to prevent adverse impacts to the lake. However, we have been associated with numerous waterfront projects that have avoided siltation of the lake and surrounding properties by exercising care and being pro-active with the maintenance and potential upgrading of the erosion control system through the entire construction process. One of the most important considerations, particularly during wet weather, is to immediately cover any bare soil to prevent accumulated water or runoff from the work area from becoming silty in the first place. Silty water cannot be discharged to the lake, and would either have to be disposed of into the sanitary sewer, or into a temporary holding tank, such as a Baker tank. If earthwork is to occur in late spring or early fall/winter, the planning and budget should definitely include the potential for disposing of accumulated silty water in one of these manners. A wire-backed silt fence bedded in compost, not native soil or sand, should be erected as close as possible to the planned work area, and the existing vegetation between the fence and the lake left in place. The resulting bare ground surface from removal of the existing concrete steps and terraces should be immediately covered with coarse compost, hog fuel, or crushed rock. Rocked construction access and staging areas should be established wherever trucks will have to drive off of pavement, in order reduce the amount of soil or mud carried off the property by trucks and equipment. It will also be important to cap any existing drain lines found running toward the

lake until excavation is completed. This will reduce the potential for silty water finding an old pipe and flowing into the lake. The house excavation must extend below the surrounding grade on all sides to contain any accumulated water. Covering the base of the excavation with a layer of clean gravel is also prudent to reduce the amount of mud and silty water generated. This rock layer also provides a working surface for the foundation contractors. Utilities reaching between the house and the lake should not be installed during rainy weather, and any disturbed area caused by the utility installation should be minimized by using small equipment. Trenches for these utilities should not be backfilled with native soils. It may be most prudent to backfill the trenches with control density fill (CDF) to ease backfilling and the prevent water from flowing along the backfilled trench to the lake. Cut slopes and soil stockpiles should be covered with plastic during wet weather. Soil stockpiles should be minimized. Following rough grading, it may be necessary to mulch or hydroseed bare areas that will not be immediately covered with landscaping or an impervious surface.

The drainage and/or waterproofing recommendations presented in this report are intended only to prevent active seepage from flowing through concrete walls or slabs. Even in the absence of active seepage into and beneath structures, water vapor can migrate through walls, slabs, and floors from the surrounding soil, and can even be transmitted from slabs and foundation walls due to the concrete curing process. Water vapor also results from occupant uses, such as cooking and bathing. Excessive water vapor trapped within structures can result in a variety of undesirable conditions, including, but not limited to, moisture problems with flooring systems, excessively moist air within occupied areas, and the growth of molds, fungi, and other biological organisms that may be harmful to the health of the occupants. The designer or architect must consider the potential vapor sources and likely occupant uses, and provide sufficient ventilation, either passive or mechanical, to prevent a build up of excessive water vapor within the planned structure.

The installation of pipe piles and drilled soldier piles will not cause strong ground vibrations. As a result, these activities should not cause any additional settlement of surrounding houses that sit on the loose soils. However, given that older nearby homes have likely already undergone noticeable settlement, and this settlement can be worsened by strong ground vibrations. It is important that the earthwork, demolition and piling contractors be cautioned of this. During demolition, pounding on the ground with the excavator to break up concrete should not be allowed. Large vibratory compactors, such as rollers or hoe-packs, should not be used at the site. Even driving equipment rapidly over the site should be avoided. Even if strong ground vibrations are not caused by the work, neighbors may still have *perceived* damage. Unfortunately, it is becoming more and more common for adjacent property owners to make unsubstantiated damage claims on new projects that occur close to their developed lots. Therefore, we recommend making an extensive photographic and visual survey of the project vicinity, prior to demolition activities, installing shoring, and/or commencing with the excavation. This documents the condition of buildings, pavements, and utilities in the immediate vicinity of the site in order to avoid, and protect the owner from, unsubstantiated damage claims by surrounding property owners. Additionally, any adjacent structures should be monitored during construction to detect soil movements. To monitor their performance, we recommend establishing a series of survey reference points to measure any horizontal deflections of the shoring system. Control points should be established at a distance well away from the walls and slopes, and deflections from the reference points should be measured throughout construction by survey methods.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include

revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site soil profile within 100 feet of the ground surface is best represented by Site Class Type D (Stiff Site Class). As noted in the USGS website, the mapped spectral acceleration value for a 0.2 second (S_s) and 1.0 second period (S_1) equals 1.28g and 0.43g, respectively.

The IBC states that a site-specific seismic study need not be performed provided that the peak ground acceleration be equal to $S_{DS}/2.5$, where S_{DS} is determined in ASCE 7. It is noted that S_{DS} is equal to $2/3S_{MS}$. S_{MS} equals F_a times S_S, where F_a is determined in Table 11.4-1. For our site, F_a = 1.0. Thus, the calculated peak ground acceleration that we utilized for the seismic-related parameters of this report equals 0.34g.

The site soils that will support the foundation system are not susceptible to seismic liquefaction because of their dense nature.

PIPE PILES

Three- or 4-inch-diameter pipe piles driven with a 650- or 800- or 1,100-pound hydraulic jackhammer to the following final penetration rates may be assigned the following compressive capacities.

INSIDE PILE DIAMETER	FINAL DRIVING RATE (650-pound hammer)	FINAL DRIVING RATE (800-pound hammer)	FINAL DRIVING RATE (1,100-pound hammer)	ALLOWABLE COMPRESSIVE CAPACITY
3 inches	12 sec/inch	10 sec/inch	6 sec/inch	6 tons
4 inches	20 sec/inch	15 sec/inch	10 sec/inch	10 tons

Note: The refusal criteria indicated in the above table are valid only for pipe piles that are installed using a hydraulic impact hammer carried on leads that allow the hammer to sit on the top of the pile during driving. If the piles are installed by alternative methods, such as a vibratory hammer or a hammer that is hard-mounted to the installation machine, numerous load tests to 200 percent of the design capacity would be necessary to substantiate the allowable pile load. The appropriate number of load tests would need to be determined at the time the contractor and installation method are chosen.

As a minimum, Schedule 40 pipe should be used. Based on our test boring, we recommend a minimum pile length of 20 feet to achieve embedment into competent native soils. However, from our experience with installation of small-diameter pipe piles, it is likely that the driven pile lengths will be more than this minimum length in order to achieve refusal.

Pile caps and grade beams should be used to transmit loads to the piles. Isolated pile caps should include a minimum of two piles to reduce the potential for eccentric loads being applied to the piles. Subsequent sections of pipe can be connected with slip or threaded couplers, or they can be welded together. If slip couplers are used, they should fit snugly into the pipe sections. This may require that shims be used or that beads of welding flux be applied to the outside of the coupler.

Lateral loads due to wind or seismic forces may be resisted by passive earth pressure acting on the vertical, embedded portions of the foundation. For this condition, the foundation must be either poured directly against relatively level, undisturbed soil or surrounded by level, structural fill. We recommend using a passive earth pressure of 250 pounds per cubic foot (pcf) for this resistance. If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. We recommend a safety factor of at least 1.5 for the foundation's resistance to lateral loading, when using the above ultimate passive value.

FOUNDATION AND RETAINING WALLS

Retaining walls backfilled on only one side should be designed to resist the lateral earth pressures imposed by the soil they retain. The following recommended parameters are for walls that restrain level backfill:

PARAMETER	VALUE
Active Earth Pressure *	40 pcf (Level Condition) 60 pcf (West wall of Garage and Motorcourt)
Passive Earth Pressure	300 pcf
Soil Unit Weight	125 pcf

Where: (i) pcf is pounds per cubic foot, and (ii) active and passive earth pressures are computed using the equivalent fluid pressures.
*** For a restrained wall that cannot deflect at least 0.002 times its height, a uniform lateral pressure equal to 10 psf times the height of the wall should be added to the above active equivalent fluid pressure.**

The design values given above do not include the effects of any hydrostatic pressures behind the walls and assume that no surcharges, such as those caused by slopes, vehicles, or adjacent foundations will be exerted on the walls. If these conditions exist, those pressures should be added to the above lateral soil pressures. Where sloping backfill is desired behind the walls, we will need to be given the wall dimensions and the slope of the backfill in order to provide the appropriate design earth pressures. The surcharge due to traffic loads behind a wall can typically be accounted for by adding a uniform pressure equal to 2 feet multiplied by the above active fluid density. Heavy construction equipment should not be operated behind retaining and foundation walls within a distance equal to the height of a wall, unless the walls are designed for the additional lateral pressures resulting from the equipment.

The values given above are to be used to design only permanent foundation and retaining walls that are to be backfilled, such as conventional walls constructed of reinforced concrete or masonry. It is not appropriate to use the above earth pressures and soil unit weight to back-calculate soil strength parameters for design of other types of retaining walls, such as soldier pile, reinforced earth, modular or soil nail walls. We can assist with design of these types of walls, if desired. The values for friction and passive resistance are ultimate values and do not include a safety factor.

We recommend a safety factor of at least 1.5 for overturning and sliding, when using the above values to design the walls. Restrained wall soil parameters should be utilized for a distance of 1.5 times the wall height from corners or bends in the walls. This is intended to reduce the amount of cracking that can occur where a wall is restrained by a corner.

Wall Pressures Due to Seismic Forces

The surcharge wall loads that could be imposed by the design earthquake can be modeled by adding a uniform lateral pressure to the above-recommended active pressure. The recommended surcharge pressure is 7**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

Retaining Wall Backfill and Waterproofing

Backfill placed behind retaining or foundation walls should be coarse, free-draining structural fill containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter. The percentage of particles passing the No. 4 sieve should be between 25 and 70 percent. The on-site soils are not free-draining, and should not be used for backfill of walls taller than about 2 feet.

The purpose of these backfill requirements is to ensure that the design criteria for a retaining wall are not exceeded because of a build-up of hydrostatic pressure behind the wall. Also, subsurface drainage systems are not intended to handle large volumes of water from surface runoff. The top 12 to 18 inches of the backfill should consist of a compacted, relatively impermeable soil or topsoil, or the surface should be paved. The ground surface must also slope away from backfilled walls to reduce the potential for surface water to percolate into the backfill. Water percolating through pervious surfaces (pavers, gravel, permeable pavement, etc.) must also be prevented from flowing toward walls or into the backfill zone. The compacted subgrade below pervious surfaces and any associated drainage layer should therefore be sloped away. Alternatively, a membrane and subsurface collection system could be provided below a pervious surface.

It is critical that the wall backfill be placed in lifts and be properly compacted, in order for the above-recommended design earth pressures to be appropriate. The wall design criteria assume that the backfill will be well-compacted in lifts no thicker than 12 inches. The compaction of backfill near the walls should be accomplished with hand-operated equipment to prevent the walls from being overloaded by the higher soil forces that occur during compaction. The section entitled ***General Earthwork and Structural Fill*** contains additional recommendations regarding the placement and compaction of structural fill behind retaining and foundation walls.

The above recommendations are not intended to waterproof below-grade walls, or to prevent the formation of mold, mildew or fungi in interior spaces. Over time, the performance of subsurface drainage systems can degrade, subsurface groundwater flow patterns can change, and utilities can break or develop leaks. Therefore, waterproofing should be provided where future seepage through the walls is not acceptable. This typically includes limiting cold-joints and wall penetrations, and using bentonite panels or membranes on the outside of the walls. There are a variety of different waterproofing materials and systems, which should be installed by an experienced contractor familiar with the anticipated construction and subsurface conditions. Applying a thin coat of asphalt

emulsion to the outside face of a wall is not considered waterproofing, and will only help to reduce moisture generated from water vapor or capillary action from seeping through the concrete. As with any project, adequate ventilation of basement and crawl space areas is important to prevent a build up of water vapor that is commonly transmitted through concrete walls from the surrounding soil, even when seepage is not present. This is appropriate even when waterproofing is applied to the outside of foundation and retaining walls. We recommend that you contact an experienced envelope consultant if detailed recommendations or specifications related to waterproofing design, or minimizing the potential for infestations of mold and mildew are desired.

FLOOR SLABS

Any settlement-sensitive floors, including slabs, should be structurally supported to span between the piles. Additionally, due to the presence of shallow groundwater, a subdrain system should be installed beneath the lower floor slab. This is depicted on Plate 5.

Even where the exposed soils appear dry, water vapor will tend to naturally migrate upward through the soil to the new constructed space above it. This can affect moisture-sensitive flooring, cause imperfections or damage to the slab, or simply allow excessive water vapor into the space above the slab. All interior slabs-on-grade should be underlain by a capillary break or drainage layer consisting of a minimum 4-inch thickness of gravel or crushed rock that has a fines content (percent passing the No. 200 sieve) of less than 3 percent and a sand content (percent passing the No. 4 sieve) of no more than 10 percent. This capillary break/drainage layer is not necessary if an underslab drainage system is installed.

As noted by the American Concrete Institute (ACI) in the *Guides for Concrete Floor and Slab Structures*, proper moisture protection is desirable immediately below any on-grade slab that will be covered by tile, wood, carpet, impermeable floor coverings, or any moisture-sensitive equipment or products. ACI also notes that vapor *retarders*, such as 6-mil plastic sheeting, have been used in the past, but are now recommending a minimum 10-mil thickness. A vapor retarder is defined as a material with a permeance of less than 0.3 perms, as determined by ASTM E 96. It is possible that concrete admixtures may meet this specification, although the manufacturers of the admixtures should be consulted. Where vapor retarders are used under slabs, their edges should overlap by at least 6 inches and be sealed with adhesive tape. The sheeting should extend to the foundation walls for maximum vapor protection. If no potential for vapor passage through the slab is desired, a vapor *barrier* should be used. A vapor barrier, as defined by ACI, is a product with a water transmission rate of 0.01 perms when tested in accordance with ASTM E 96. Reinforced membranes having sealed overlaps can meet this requirement. Considering the shallow groundwater conditions, it would be prudent to install a vapor barrier beneath any floor slabs that are cut below the existing grade.

TEMPORARY SHORING

Cantilevered soldier pile systems have proven to be an efficient and economical method for providing excavation shoring. Soldier pile walls would be constructed after making planned cut slopes, and prior to commencing the mass excavation by setting steel H-beams in a drilled hole and grouting the space between the beam and the soil with concrete for the entire height of the drilled hole. Excessive ground loss in the drilled holes must be avoided to reduce the potential for settlement on adjacent properties. Due to the shallow groundwater and loose condition of the soils,

we anticipate that the holes with have to be drilled using casing and slurry methods. If water is present in a hole at the time the soldier pile is poured, concrete must be tremied to the bottom of the hole.

As excavation proceeds downward, the space between the piles should be lagged with treated timber, and any voids behind the timbers should be filled with pea gravel, or a slurry comprised of sand and fly ash. Temporary vertical cuts will be necessary between the soldier piles for the lagging placement. The prompt and careful installation of lagging is important, particularly in loose or caving soil, to maintain the integrity of the excavation and provide safer working conditions. Additionally, care must be taken by the excavator to remove no more soil between the soldier piles than is necessary to install the lagging. Caving or overexcavation during lagging placement could result in loss of ground on neighboring properties. Timber lagging should be designed for an applied lateral pressure of 30 percent of the design wall pressure, if the pile spacing is less than three pile diameters. For larger pile spacings, the lagging should be designed for 50 percent of the design load.

If permanent building walls are to be constructed against the shoring walls, drainage should be provided by attaching a geotextile drainage composite with a solid plastic backing, similar to Miradrain 6000, to the entire face of the lagging, prior to placing waterproofing and pouring the foundation wall. These drainage composites should be hydraulically connected to the foundation drainage system through weep holes placed in the foundation walls.

Soldier Pile Wall Design

Temporary soldier pile shoring that is cantilevered, and that has a level backslope, should be designed for an active soil pressure equal to that pressure exerted by an equivalent fluid with a unit weight of 35 pounds per cubic foot (pcf). Traffic surcharges can typically be accounted for by increasing the effective height of the shoring wall by 2 feet. Slopes above the shoring walls will exert additional surcharge pressures. Temporary shoring below the existing western slope should be designed for an active soil pressure of 55 pcf.

It is important that the shoring design provides sufficient working room to drill and install the soldier piles, without needing to make unsafe, excessively steep temporary cuts. Cut slopes should be planned to intersect the backside of the drilled holes, not the back of the lagging.

Lateral movement of the soldier piles below the excavation level will be resisted by an ultimate passive soil pressure equal to that pressure exerted by a fluid with a density of 350 pcf. No safety factor is included in the given value. This soil pressure is valid only for a level excavation in front of the soldier pile; it acts on two times the grouted pile diameter. Cut slopes made in front of shoring walls significantly decrease the passive resistance. This includes temporary cuts necessary to install internal braces or rakers. The minimum embedment below the floor of the excavation for cantilever soldier piles should be equal to the height of the "stick-up."

DRAINAGE CONSIDERATIONS

Foundation drains should be used where (1) crawl spaces or basements will be below a structure, (2) a slab is below the outside grade, or (3) the outside grade does not slope downward from a building. Drains should also be placed at the base of all earth-retaining walls. These drains should be surrounded by at least 6 inches of 1-inch-minus, washed rock and then wrapped in non-woven,

geotextile filter fabric (Mirafi 140N, Supac 4NP, or similar material). At its highest point, a perforated pipe invert should be at least 6 inches below the bottom of a slab floor or the level of a crawl space, and it should be sloped for drainage. All roof and surface water drains must be kept separate from the foundation drain system. A typical drain detail is attached to this report as Plate 4. For the best long-term performance, perforated PVC pipe is recommended for all subsurface drains.

As previously discussed, an underslab drain should be provided as defined in the ***Floor Slabs*** section. A typical detail for an underdrainage system is attached as Plate 5. This detail should also be used in crawl space areas.

Groundwater was observed during our field work, and should be expected in even shallow foundation excavations. Where seepage is encountered in an excavation, it should be drained from the site by directing it through drainage ditches, perforated pipe, or French drains, or by pumping it from sumps interconnected by shallow connector trenches at the bottom of the excavation.

The excavation and site should be graded so that surface water is directed off the site and away from the tops of slopes. Water should not be allowed to stand in any area where foundations, slabs, or pavements are to be constructed. Final site grading in areas adjacent to buildings should slope away at least 2 percent, except where the area is paved. Surface drains should be provided where necessary to prevent ponding of water behind foundation or retaining walls. Additionally, a drainage swale should be provided upslope of the garage and motor court wall to intercept surface run-off and direct it into the storm drains. Water from roof, storm water, and foundation drains should not be discharged onto slopes; it should be tightlined to a suitable outfall located away from any slopes.

GENERAL EARTHWORK AND STRUCTURAL FILL

All building and pavement areas should be stripped of surface vegetation, topsoil, organic soil, and other deleterious material. It is important that existing foundations be removed before site development. The stripped or removed materials should not be mixed with any materials to be used as structural fill, but they could be used in non-structural areas, such as landscape beds.

Structural fill is defined as any fill, including utility backfill, placed under, or close to, a building, behind permanent retaining or foundation walls, or in other areas where the underlying soil needs to support loads. All structural fill should be placed in horizontal lifts with a moisture content at, or near, the optimum moisture content. The optimum moisture content is that moisture content that results in the greatest compacted dry density. The moisture content of fill is very important and must be closely controlled during the filling and compaction process.

The allowable thickness of the fill lift will depend on the material type selected, the compaction equipment used, and the number of passes made to compact the lift. The loose lift thickness should not exceed 12 inches. We recommend testing the fill as it is placed. If the fill is not sufficiently compacted, it can be recompacted before another lift is placed. This eliminates the need to remove the fill to achieve the required compaction.

The following table presents recommended relative compactions for structural fill:

LOCATION OF FILL PLACEMENT	MINIMUM RELATIVE COMPACTION
Beneath slabs or walkways	95%
Filled slopes and behind retaining walls	90%
Beneath pavements	95% for upper 12 inches of subgrade; 90% below that level

Where: Minimum Relative Compaction is the ratio, expressed in percentages, of the compacted dry density to the maximum dry density, as determined in accordance with ASTM Test Designation D 1557-91 (Modified Proctor).

Structural fill that will be placed in wet weather should consist of a coarse, granular soil with a silt or clay content of no more than 5 percent. The percentage of particles passing the No. 200 sieve should be measured from that portion of soil passing the three-quarter-inch sieve.

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the test boring are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in test boring. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

The recommendations presented in this report are directed toward the protection of only the proposed structures from damage due to slope movement. Predicting the future behavior of steep slopes and the potential effects of development on their stability is an inexact and imperfect science that is currently based mostly on the past behavior of slopes with similar characteristics. Landslides and soil movement can occur on steep slopes before, during, or after the development of property. As a result, any owner of a sloped property must ultimately accept the possibility that some slope movement could occur, resulting in possible loss of ground or damage to the facilities around the proposed residence.

This report has been prepared for the exclusive use of Bluewater Assets, and its representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with current standards of practice within the scope of our services and within budget and time constraints. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Our services

also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew and fungi in either the existing or proposed site development.

ADDITIONAL SERVICES

In addition to reviewing the final plans, Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

The following plates are attached to complete this report:

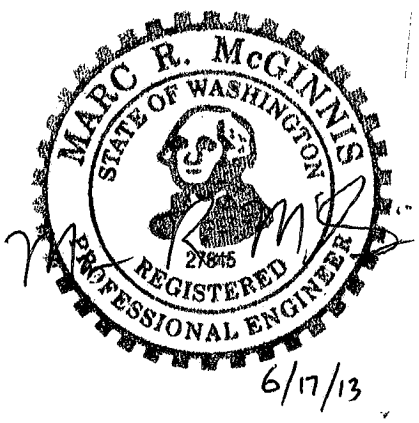
Plate 1	Vicinity Map
Plate 2	Site Exploration Plan
Plate 3	Test Boring Log
Plate 4	Typical Footing Drain Detail
Plate 5	Typical Underslab Drainage Detail

We appreciate the opportunity to be of service on this project. If you have any questions, or if we may be of further service, please do not hesitate to contact us.

Respectfully submitted,

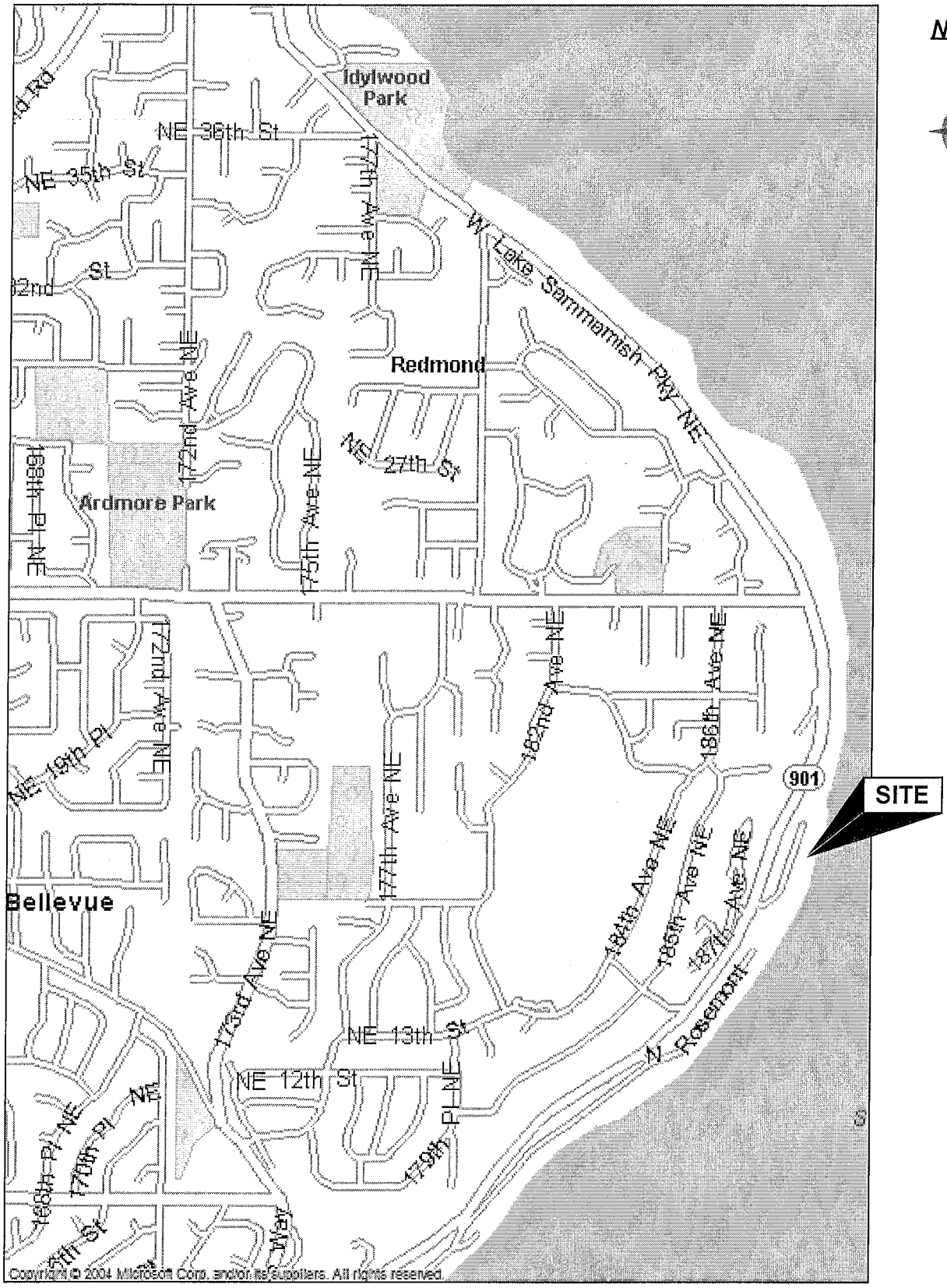
GEOTECH CONSULTANTS, INC.

Jason L. Hinds
Geotechnical Engineer



Marc R. McGinnis, P.E.
Principal

JLH/MRM: jyb



(Source: Microsoft Streets and Trips, 2004)

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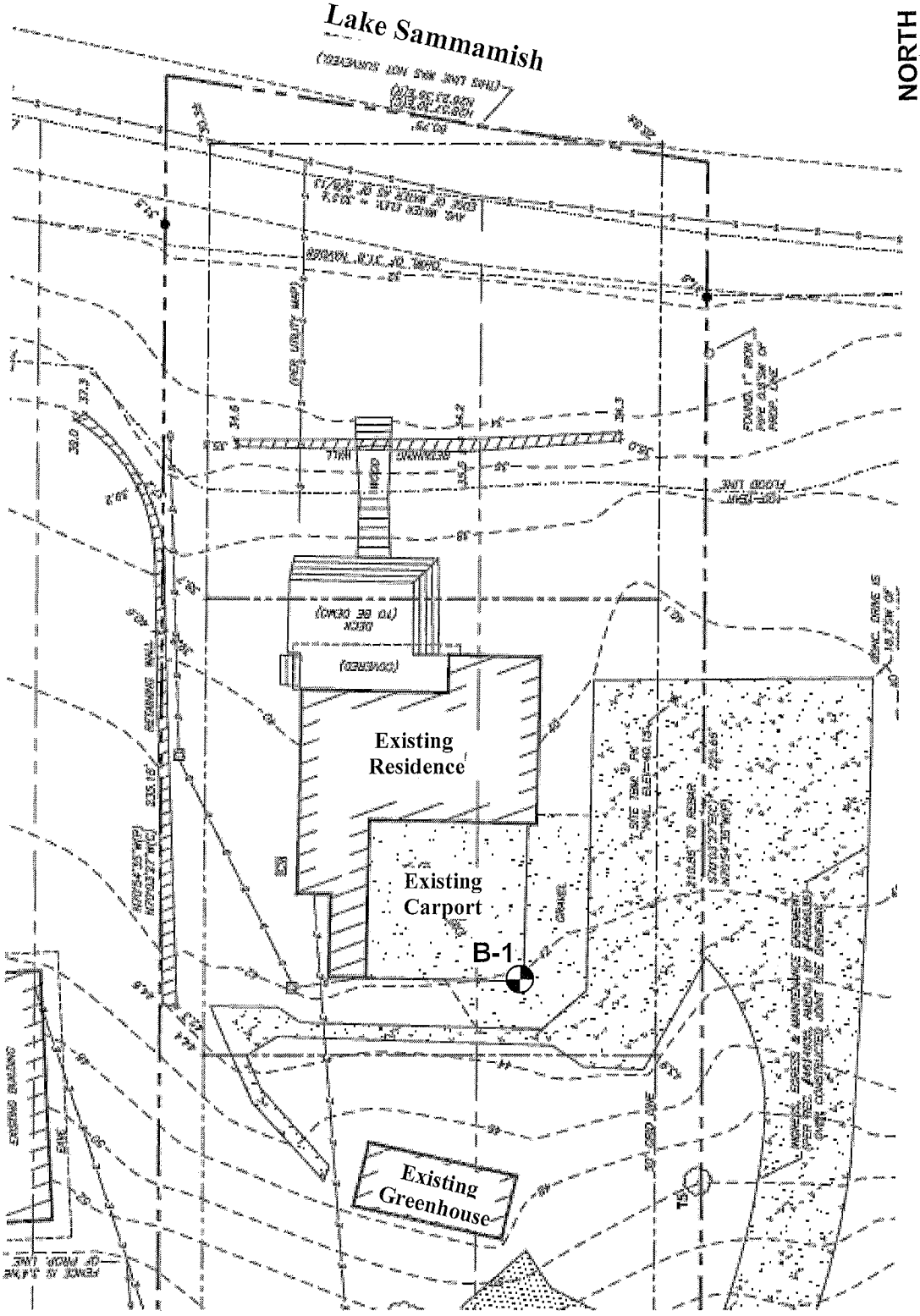
VICINITY MAP

1650 W Lake Sammamish Parkway NE
Bellevue, Washington

Job No:	Date:		Plate:
13178	June 2013		1



APPROXIMATE BORING LOCATION

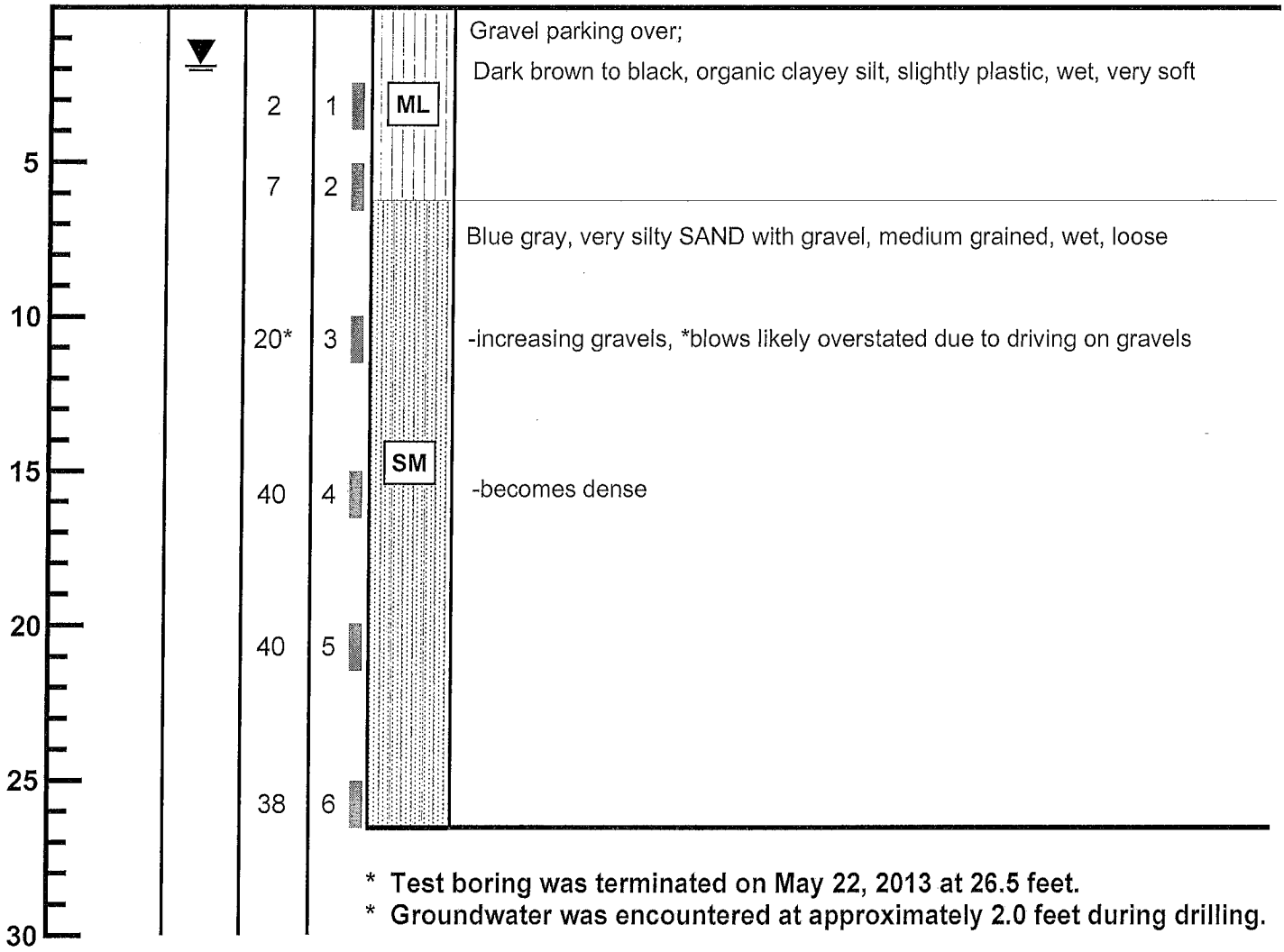
GEOTECH CONSULTANTS, INC.

SITE EXPLORATION PLAN

1650 W Lake Sammamish Parkway NE
Bellevue, Washington

Job No:	Date:		Plate:
13178	June 2013	No Scale	2

BORING 1



* Test boring was terminated on May 22, 2013 at 26.5 feet.
* Groundwater was encountered at approximately 2.0 feet during drilling.

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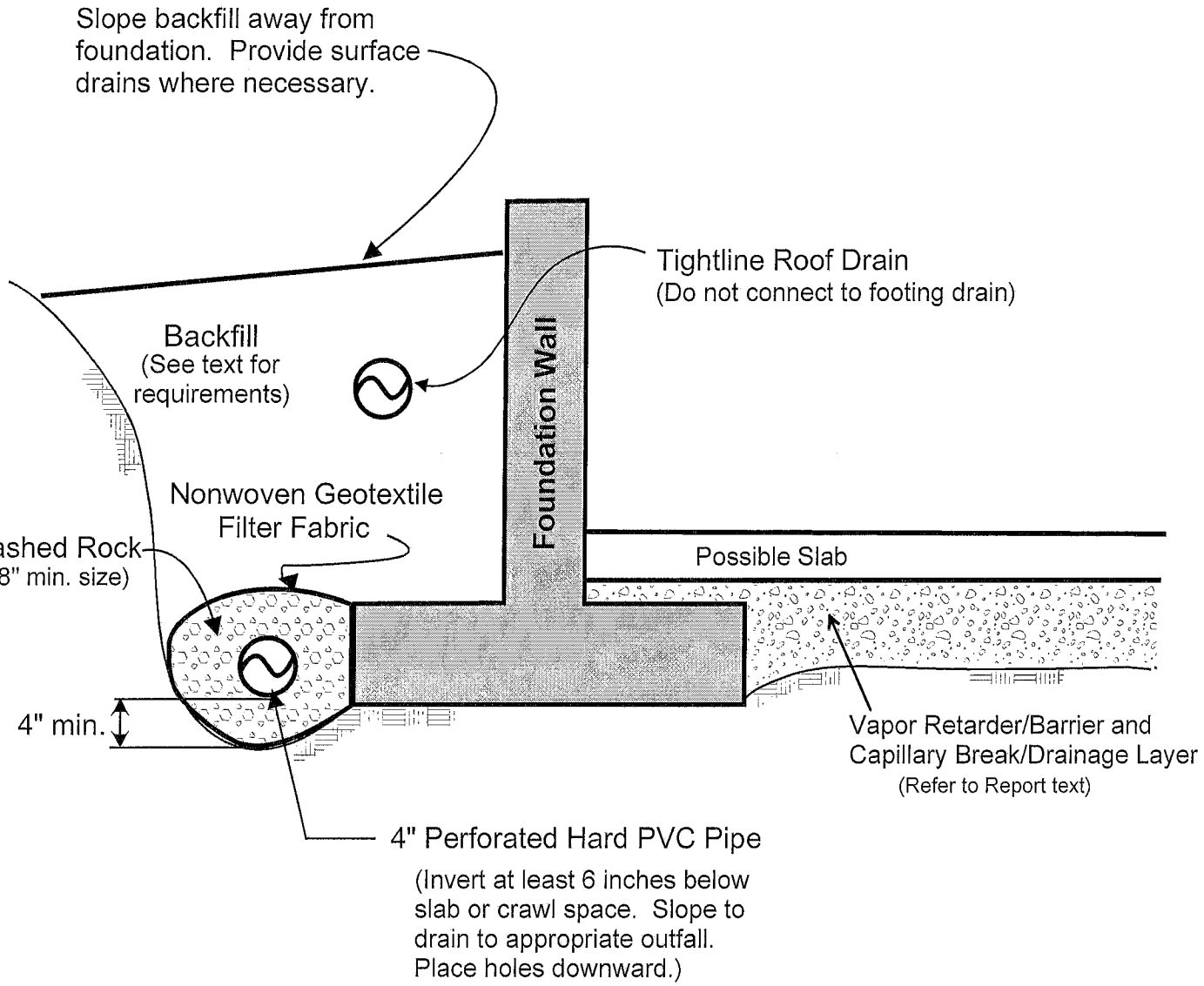
TEST BORING LOG

1650 W Lake Sammamish Parkway NE
Bellevue, Washington

Job	Date:	Logged by:	Plate:
13178	June 2013	JLH	3



NOTES:

(1) In crawl spaces, provide an outlet drain to prevent buildup of water that bypasses the perimeter footing drains.

(2) Refer to report text for additional drainage, waterproofing, and slab considerations.

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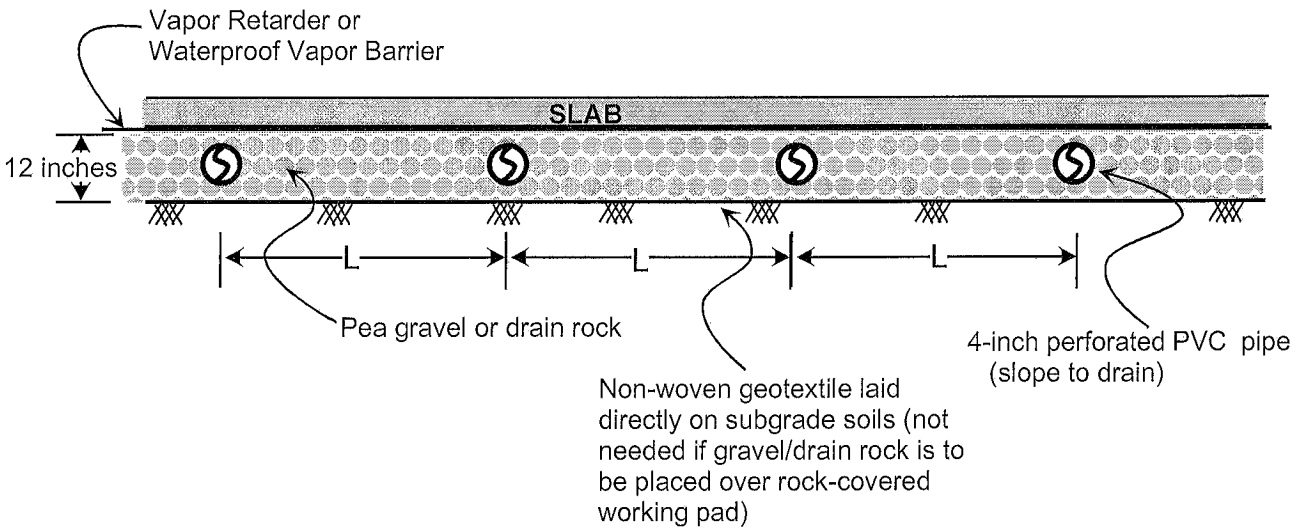
FOOTING DRAIN DETAIL

1650 W Lake Sammamish Parkway NE
Bellevue, Washington

Job No:	Date:		Plate:
13178	June 2013		4



NOTES:

(1) Refer to the report text for additional drainage and waterproofing considerations.
(2) The typical maximum underslab drain separation (L) is 15 feet.
(3) The underslab drains and foundation drains should discharge to a suitable outfall.

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TYPICAL UNDERSLAB DRAINAGE

1650 W Lake Sammamish Parkway NE
Bellevue, Washington

Job No:	Date:		Plate:
13178	June 2013		5