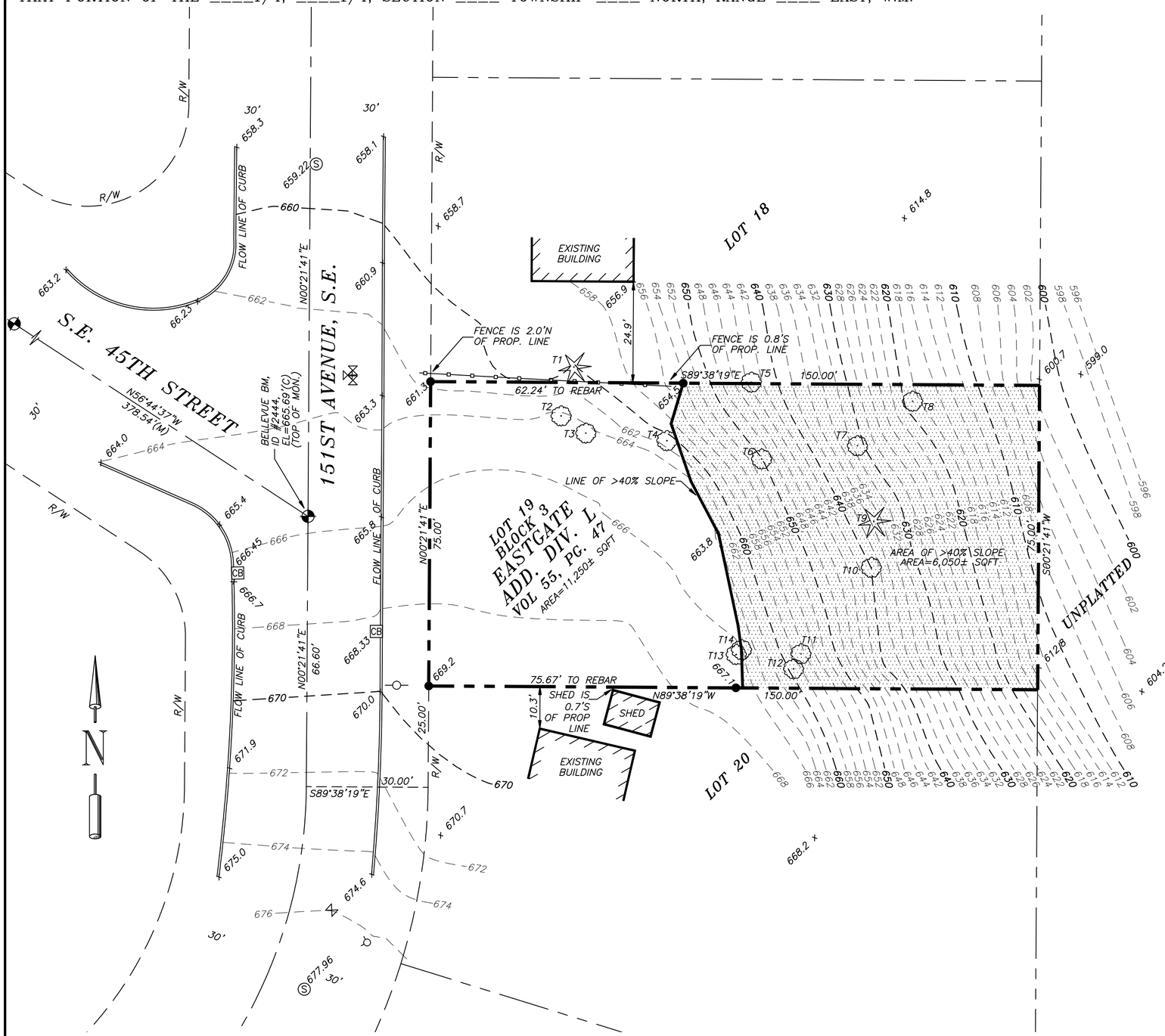
THAT PORTION OF THE NW 1/4, SW 1/4, SECTION 14 TOWNSHIP 24 NORTH, RANGE 05 EAST, W.M.



NOTES:

FIELD MEASUREMENTS FOR THIS SURVEY PERFORMED WITH A 2" TOPCON TOTAL STATION USING TRAVERSE METHODS THAT MEET OR EXCEED ACCURACY REQUIREMENTS CONTAINED IN WAC 332.130.090.

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.

THE BOUNDARY CORNERS AND LINES DEPICTED ON THIS MAP ARE PER RECORD TITLE INFORMATION AND REPRESENT DEED LINES ONLY. THEY DO NOT PURPORT TO SHOW OWNERSHIP LINES THAT MAY OTHERWISE BE DETERMINED BY A COURT OF LAW.

THIS TOPOGRAPHIC SURVEY IS INTENDED FOR GENERAL DESIGN PURPOSES. ADDITIONAL SURVEYING MAY BE REQUIRED TO MEET SPECIFIC CITY/COUNTY AND/OR ENGINEERING REQUIREMENTS.

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.

ALL FOUND SURVEY EVIDENCE WAS VISITED ON THE DATE OF THIS SURVEY UNLESS OTHERWISE NOTED.

LEGEND:

- FOUND CONC. MON. IN CASE W/NAIL
- SET 5/8" REBAR & CAP, LS 29537
- (C) INDICATES CALCULATED VALUE
- R/W RIGHT OF WAY
- WOOD FENCELINE
- E/P EDGE OF PAVEMENT
- CB CATCH BASIN
- FIRE HYDRANT
- POWER POLE
- Ⓢ SANITARY SEWER MANHOLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- WATER VALVE

LEGAL DESCRIPTION:

LOT 19, BLOCK 3, EASTGATE ADDITION, DIVISION L, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 55 OF PLATS, PAGE 47, RECORDS OF KING COUNTY, WASHINGTON.

VERTICAL DATUM:

THE ELEVATIONS AND CONTOURS SHOWN HEREON ARE BASED CITY OF BELLEVUE MONUMENT NO. 2444, ELLIPSOIDAL HEIGHT OF 579.167± 0.03 FEET. USED NGS GEOID 09 MODEL TO ADJUST TO THE NAVD88. ELEVATION BEING: 665.69 FEET.

CONTOUR INTERVAL: 2 FEET.

STEEP SLOPE CALCULATIONS:

TOTAL LOT AREA:	11,250± SQFT (100%)
AREA OF >40% SLOPE:	6,050± SQFT (53.8±%)
REMAINING AREA:	4,536± SQFT (46.2±%)

TREE LIST:

T1	32" FIR
T2	6" MAPLE
T3	8" MAPLE
T4	8" ALDER
T5	26" ALDER
T6	6" ALDER
T7	6" ALDER
T8	12" MAPLE
T9	36" CEDAR (2)
T10	40" MAPLE
T11	24" MAPLE (2)
T12	8" MAPLE
T13	32" MAPLE
T14	8" MAPLE

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 inch = 20 ft.

SURVEYOR'S CERTIFICATE

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION, AT THE REQUEST OF MAURINE NYMAN, IN MARCH, 2011.

_____

JAMES D. CRONES L.S. 29537

SITE ADDRESS:

151ST AVENUE, S.E. & S.E. 45TH STREET, BELLEVUE, WA 98006

11-9-15

THAT PORTION OF THE NW 1/4, SW 1/4, SECTION 14 TOWNSHIP 24 NORTH, RANGE 05 EAST, W.M.

CRONES & ASSOC. LAND SURVEYORS
23806 190TH AVE. S.E. KENT, WA 98042 (425) 432-5930

MAURINE NYMAN

LOT SURVEY

TOPOGRAPHIC SURVEY

STATE OF WASHINGTON

KING COUNTY

Drawing Date NOVEMBER 9, 2015
Scale 1" = 20'
Surveyed JJC/JMC
Drawn GRA/JB
Checked JMB/JJC
Filename SWEEP-03A.DWG

SHEET 1 of 1

151ST AVENUE, S.E.

STREET

LOT 18

LOT 20

UNPLATTED

EXISTING BUILDING

EXISTING BUILDING

FENCE IS 2.0'N OF PROP. LINE

FENCE IS 0.8'S OF PROP. LINE

62.24' TO REBAR

75.67' TO REBAR

S89°38'19"E 150.00'

N89°38'19"W 150.00'

N00°21'41"E 75.00'

N00°21'41"E 66.60'

S00°21'41"W 75.00'

24.9'

10.3'

25.00'

30.00'

OPTION B

OPTION A

LINE OF >40% SLOPE

AREA OF >40% SLOPE
AREA=6,050± SQFT

25' STEEP SLOPE CRITICAL

CRITICAL AREA BUFFER

STEEP SLOPE CRITICAL AREA

BELLEVUE BM, ID #2444, EL=665.69'(C) (TOP OF MON.)

FLOW LINE OF CURB

FLOW LINE OF CURB

R/W

R/W

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14

660 660.9 661.3 662 663.3 663.8 664 665.4 666 666.45 666.7 668 668.33 669.2 670 670.0 671.9 672 654.5 656.9 658 667.1 612.8 599.0 600.7 604.2

N

SITE PLAN-B

SCALE: 1/16" = 1'-0"

TEN DIRECTIONS DESIGN
(206) 323-6677

Nyman Residence
4560 151st Avenue SE
Bellevue, WA 98006

Date: 12/1/2015
Project # 150
Sheet 1 of 1

P-1

TALASAEA
CONSULTANTS, INC.

12 November 2015

TAL-1567

Ms. Maurine Nyman
4560 151st Avenue SE
Bellevue, WA 98006

REFERENCE: Bellevue Residential Property, Bellevue, Washington
SUBJECT: Existing Site Conditions and Mitigation Plan

Dear Ms. Nyman:

At your request, we evaluated your residential property (King County Parcel ID 2206700275) in Bellevue, WA, referenced to as the "Site" hereafter (**Figure #1**). More than half of the property is comprised of steep slopes far exceeding a 40% slope gradient, as identified on the Site Survey (by others). These areas of steep slopes occur within the eastern portion of the Site, leaving only the western portion of the Site on level ground. Vasa (also known as Squibb's) Creek flows from south to north through the valley that is located at the base of the steep slopes immediately east of the Site. The property to the south is relatively level with the Site, while the property to the north is downslope of the Site with a short, steep slope separating the two (2) properties.

The Site is located within a residential neighborhood and is maintained primarily as lawn. English ivy covers the entire eastern slope and extends onto the level ground at the top of the slope and into the disturbed area along the northwestern boundary. Deciduous trees dominate the slope area, primarily bigleaf maple, red alder, and a single large western red cedar located near the center of the slope. The remainder of the property at the top of the slope is comprised of maintained lawn with a disturbed area along the northwest property boundary. The lawn area is dominated by grass and common dandelion. The grass is regularly mowed, and is likely a *Poa* species. The disturbed northwestern boundary is slightly sloped towards the neighboring parcel to the north and is comprised of Himalayan blackberry, English Ivy, and English holly.

Background Review and Methods

As a first step in assessing the Site for critical areas, we examined aerial photographs and GIS data available from King County and the City of Bellevue. The National Wetland Inventory (NWI) database identified no wetland or stream features within the Site, though other databases identify Vasa (Squibb's) Creek. The Bellevue South quad contains the Site and shows the Site and surrounding areas as entirely developed except for the areas within the ravine/valley complex. Arents, Alderwood material, 6 to 15 percent slopes (AmC) is mapped over more than 90% of the Site. This map unit is identified as being moderately well drained, and is not identified as a hydric soil. This map unit is identified as being substantially disturbed by urban development. No fish usage was identified for the stream based on a review of the SalmonScape and StreamNet databases.

Wetlands and streams were delineated according to the Bellevue City Code (BCC) Part 20.25H *Critical Areas Overlay District* (Bellevue 2015). Wetland delineation utilized the routine approach described in the *Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Western Mountain, Valleys, and Coast Regions* (U.S. Army Corps of Engineers 2010). The ordinary high water mark (OHWM) for streams was determined and delineated using the methodology described by Washington State Department of Ecology's, *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2008).

Site Conditions

We evaluated the Site for critical areas on 29 October 2015. We noted Vasa (Squibb's) Creek immediately east of the parcel boundary, but no other streams or any wetlands were identified within the parcel boundaries (**Figure #2**). Steep slopes were identified on-site by others that require a 50-foot steep slope buffer, which cover the majority of the level, western portion of the Site.

GEO Group Northwest, Inc. (Geotech) identified an "area of groundwater seepage on the slope" that was observed "approximately 15 feet below the top of the slope, near the center of the lot when measured from north or south property lines." I did not find any evidence of this seep, nor did I find evidence of a wetland in this location based on the limited evaluation I could conduct due to the steep slopes and concern for personal safety. Groundcover is 100% English ivy, which is not a wetland species. However, given the potential for an unidentified wetland along the slope, we completed a preliminary wetland rating based on its location and known parameters using the *Washington State Wetland Rating System for Western Washington* (Washington Department of Ecology Publication 04-06-025 and 14-06-029). The area would rate as a Category IV wetland, the lowest category. Any area that might meet the parameters as a wetland would very likely be less than 2,500 square feet in size, which would not require a standard buffer for the City of Bellevue, pursuant to the BCC Section

20.25H.095 *Designation of critical area and buffers (Wetlands)*. Copies of the Wetland Rating Forms are provided as **Appendix A.** Both versions (2004 and the revised 2014) of the Wetland Rating System were conducted.

There is a feature along the northern property boundary created by the intersection of the property slope with the neighbor's solid wooden fence. Vegetation within this feature include bigleaf maple, English ivy, and English holly. There was no evidence of a bed and bank, or other components that would indicate a stream. Therefore, this small linear feature does not meet the definition of a wetland or stream that would be regulated.

Vasa Creek, also known as Squibb's Creek, is located at the toe of the slope east of the property boundary within the Horizon Heights Open Space area. A mulch trail follows the stream through this valley. It appears as though this section of stream was part of a restoration project based on the type and placement of large woody debris within the stream channel. While the lower reaches of Vasa Creek are identified as fish-bearing and have documented populations of salmonids, the documentation of fish presence does not extend to the portion of the stream near the Site. Neither StreamNet nor SalmonScape document the presence or modeled presence of salmonids within this reach. We evaluated the stream for potential fish habitat, and determined that, despite the numerous man-made blockages present between the Site and known fish populations, this reach of Vasa (Squibb's) Creek does possess fish habitat. The stream would be classified as a Type F water that would require a 100-foot standard buffer pursuant to the BCC Section 20.25H.075 *Designation of critical area and buffers (Streams)*. The stream buffer extends just to the top of the steep slope within the Site. For mapping purposes to identify the extent of the stream buffer, the OHWM was approximated based on LiDAR mapping and field verification since the OHWM was not surveyed.

<u>Mitigation Planting Plan</u>

A planting plan is provided as part of this existing conditions report to meet the City of Bellevue conditions to off-set the impacts associated with the steep slope buffer located within the Site. Supplemental plantings within the inner 25 feet of the steep slope buffer are proposed to compensate for a buffer reduction from the standard 50-foot steep slope buffer. Trees and shrubs are proposed to be planted within this area to provide additional stabilization at the top of the steep slope. A Vegetative Management Plan (VMP) is provided that outlines the restrictions and guidelines within this enhanced buffer.

It is important to note that typically the removal of noxious species is required wherever possible within mitigation areas. Noxious species removal is encouraged within the 25-foot steep slope buffer. However, despite the presence of large areas of English Ivy along the steep slope itself, this species is not recommended for removal on the slope due to its function as a slope stabilizer along the entirety of the large slope that

encompasses the eastern half of the Site. English ivy, among other noxious species, will be removed wherever practicable within the western portion of the Site.

Summary

In conclusion, while the Site does contain steep slopes in excess of 40%, no wetlands or streams were identified within the property boundaries. Vasa (Squibb's) Creek does occur at the toe of slope, and its associated buffer does extend onto the property. However, the stream buffer ends near the top of the steep slope and does not extend beyond the steep slope buffer. No wetlands were identified within the Site, though a rating of a potential wetland was conducted to ensure that no additional critical area buffers would encumber the developable portion of the Site. The steep slope buffer remains the only critical area buffer limiting development of the Site. A planting plan is provided to enhance the inner 25-feet of the steep slope buffer to offset encroachments into the outer 25-feet of the standard 50-foot steep slope buffer. A Vegetative Management Plan (VMP) is also provided to guide the buffer enhancement activities.

We trust that you will find this information to be helpful and sufficient for your current planning needs. If you have any questions or require additional information, please contact me at (425) 861-7550.

Thank you.

Sincerely,

Jennifer M. Marriott
Senior Ecologist

Attachments: Attachment A, Figures
Attachment B, Wetland Rating Forms
Attachment C, Vegetative Management Plan

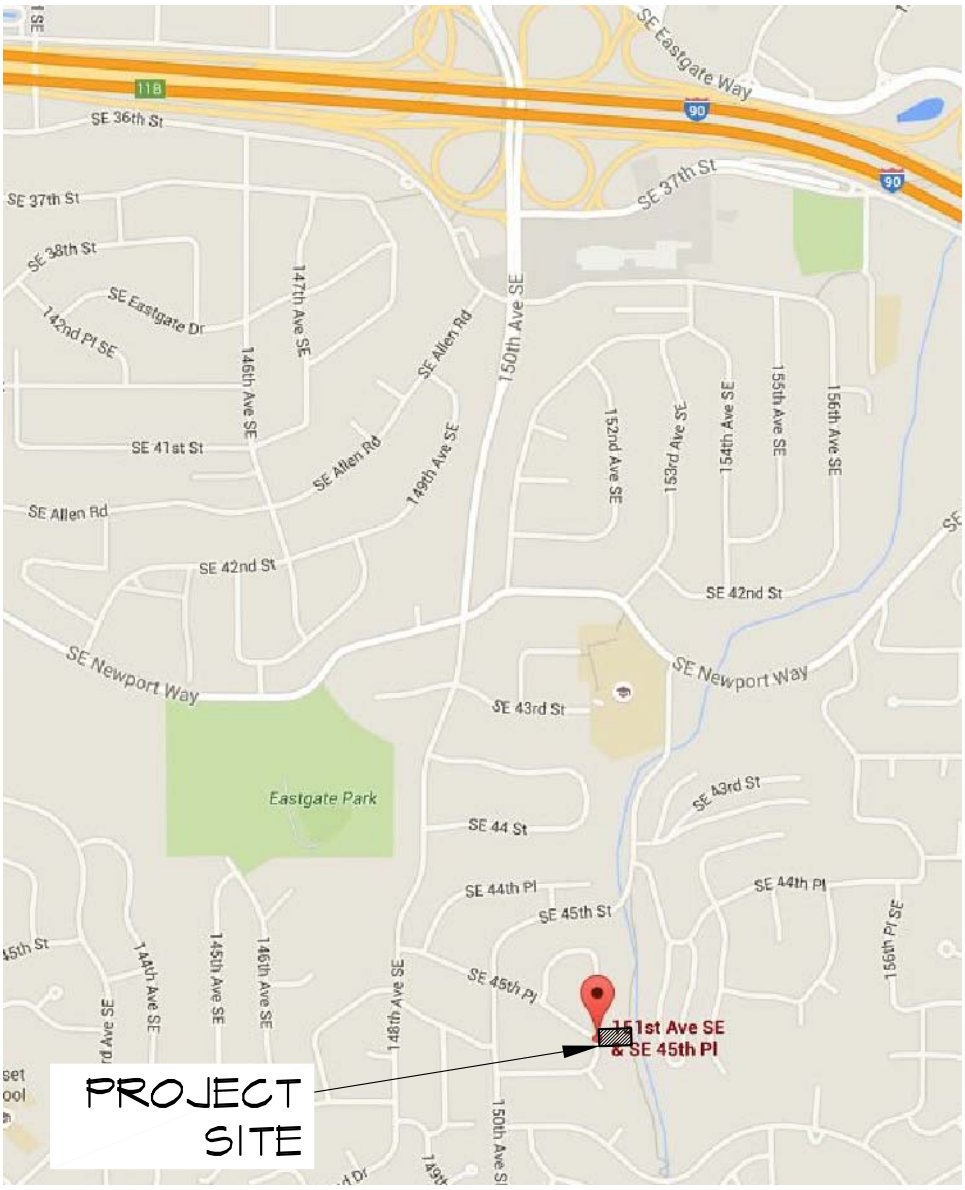
ATTACHMENT A

Figures

Figure 1 – Vicinity Map

Figure 2 – Existing Conditions

Figure 3 – Planting Plan



DRIVING DIRECTIONS

- FROM SEATTLE, TAKE INTERSTATE-90 EAST TOWARD ISSAQUAH/BELLEVUE.
- TAKE EXIT 11A FOR 150TH AVE SE TOWARD EASTGATE WAY
- KEEP RIGHT, FOLLOW SIGNS FOR 150 AVE SE/SE 37TH STREET
- TURN RIGHT ONTO 150TH AVE SE (SIGNS FOR 150TH AVENUE SOUTHEAST)
- CONTINUE ONTO 148TH PL SE
- TURN LEFT ONTO SE 45TH PLACE
- ARRIVE AT DESTINATION

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 – Fax (425)861-7549

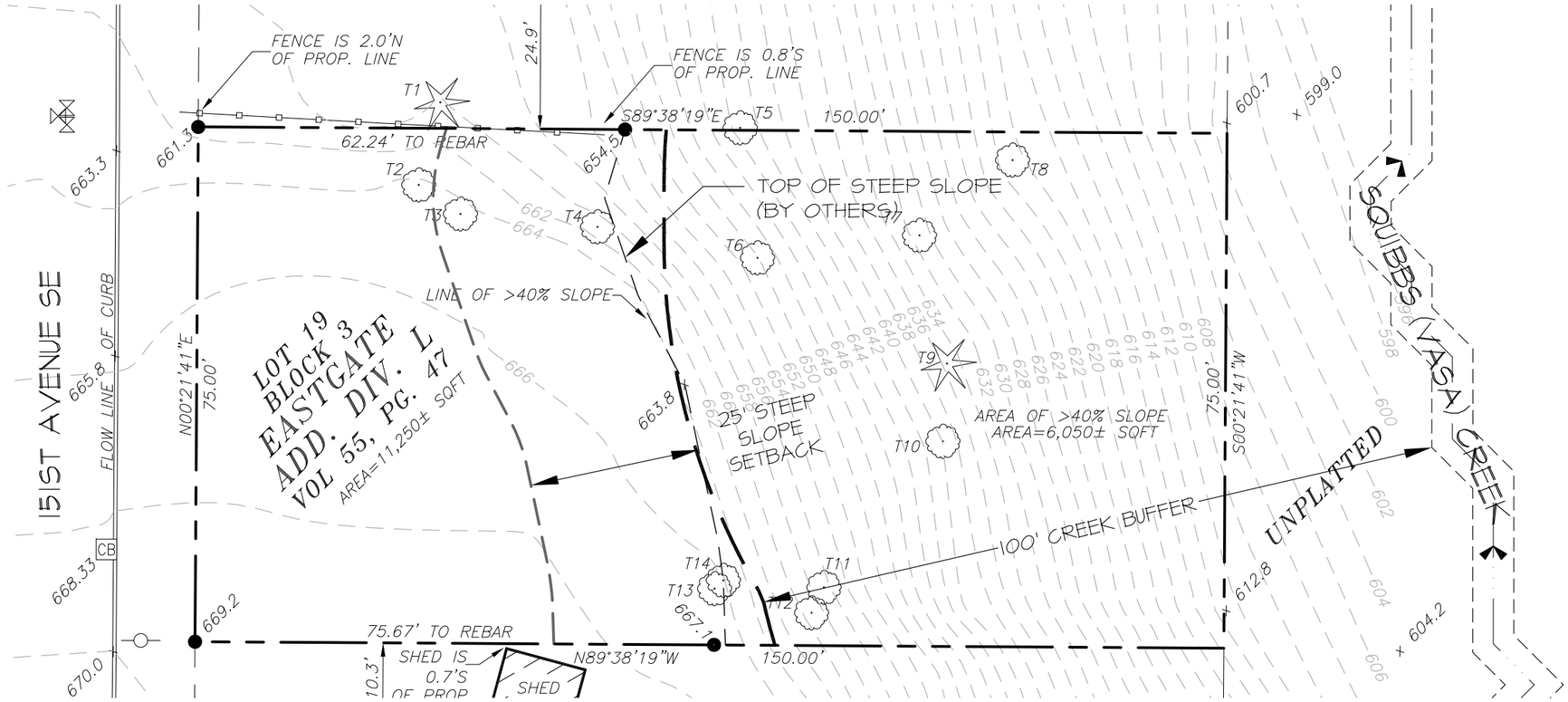
FIGURE #1

VICINITY MAP
NYMAN RESIDENCE
BELLEVUE, WASHINGTON

DESIGN	DRAWN	PROJECT
	ABS	1567
SCALE	NTS	
DATE	11/10/2015	
REVISED		

1

Z:\DRAWING\1500-1599\TAL1567\Outgoing\2015-11-10 (figures)\TAL-1567 FIGURE 1.dwg



EXISTING CONDITIONS

PLAN LEGEND

- PROPERTY LINE
- 100 EXISTING CONTOUR
- EXISTING TREES
- 25' STEEP SLOPE BUFFER
- CREEK CENTER LINE (TYPE F)*
- APPROX. ORDINARY HIGH WATER MARK (OHWM)*
- APPROX. CREEK BUFFER*

* NOTE: APPROXIMATED OHWM BASED ON LIDAR. AVERAGE 6-8' WIDE OHWM VARIES IN WIDTH, NO SURVEY DATA. APPROXIMATED STREAM BUFFER. CREEK IS TYPE F PER BCC 20.25H.075(B)

GRAPHIC SCALE
(IN FEET)
0 10 20 40
SCALE: 1"=20"

NORTH

TALASAEA
CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #2

EXISTING CONDITIONS
NYMAN RESIDENCE
BELLEVUE, WASHINGTON

DESIGN	DRAWN	PROJECT
ABS	ABS	1567

SCALE: AS SHOWN
DATE: 11/10/2015
REVISED

2

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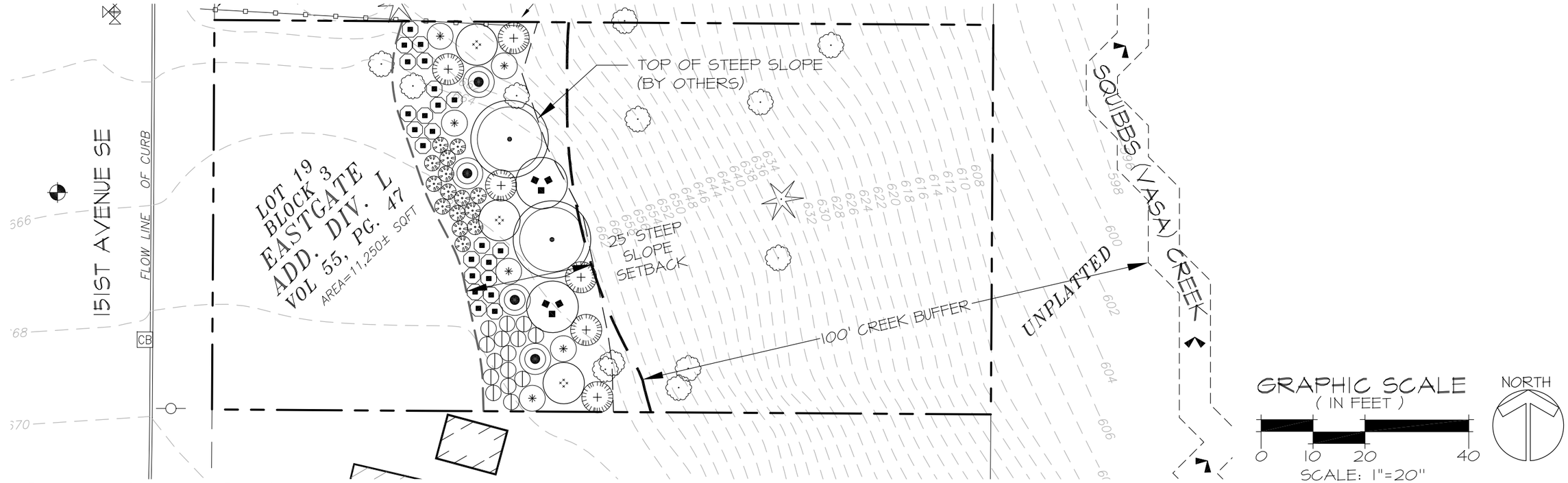


PLANTING PLAN

TREES, SMALL TREES & MASSING SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SPACING	SIZE (MIN.)	NOTES
	ACER CIRCINATUM	VINE MAPLE	FAC	3	AS SHOWN	4' HT.	MULTI-STEM (3 MIN.)
	ACER MACROPHYLLUM	BIG LEAF MAPLE	FACU	2	AS SHOWN	4-5' HT.	SINGLE TRUNK, WELL BRANCHED
	AMELANCHIER ALNIFOLIA	SERVICEBERRY	FACU	6	5' O.C.	24" HT.	MULTI-CANE (3 MIN.)
	CORYLUS CORNUTA	WESTERN HAZELNUT	FACU	2	AS SHOWN	4' HT.	MULTI-STEM (3 MIN.)
	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	FACU	20	4' O.C.	18" HT.	FULL & BUSHY
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	6	AS SHOWN	2-3' HT.	2 GAL., FULL & BUSHY
	SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	15	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
	THUJA PLICATA	WESTERN RED CEDAR	FAC	4	AS SHOWN	2-3' HT.	2 GAL., FULL & BUSHY
	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	FACU	16	4' O.C.	1 GAL.	FULL & BUSHY

PLAN LEGEND

PROPERTY LINE

100 EXISTING CONTOUR

EXISTING TREES

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #3

PLANTING PLAN
NYMAN RESIDENCE
BELLEVUE, WASHINGTON

DESIGN	DRAWN	PROJECT
ABS	ABS	1567

SCALE: AS SHOWN

DATE: 11/10/2015

REVISED

3

Z:\DRAWING\1500-1599\TAL1567\Plans\TAL1567-FIGURE.dwg

GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

G-3835

Prepared for

Mike Chaffee
6535 - 111th Ave NE
Kirkland, WA 98033

March 18, 2015

GEO GROUP NORTHWEST, INC.
13240 NE 20th Street, Suite 10
Bellevue, Washington 98005
Phone: (425) 649-8757
Email: wchang@geogroupnw.com or agaston@geogroupnw.com

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists
& Environmental Scientists

March 18, 2015

G-3835

Mike Chaffee
6535 - 111th Ave NE
Kirkland, WA 98033

SUBJECT: GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

Dear Mr. Chaffee:

GEO Group Northwest, Inc. has completed an investigation of subsurface soils at the above referenced site in Bellevue, Washington. This work was performed in accordance with our proposal to you dated February 26, 2015

GEO Group Northwest, Inc., explored subsurface soil conditions at the site by excavating four exploratory test pits on March 6, 2015. Soils encountered at the test pit locations consist of variable loose to dense fills overlying dense to very dense glacial till soils at depths ranging from 3.5 to 8.5 feet below ground surface. Based upon the investigation the competent dense site soils range in depth from 3.5 to 8.5 feet below ground surface.

Based on the results of our study, it is our professional opinion that the site is geotechnically suitable for the proposed development. The proposed building can be supported on conventional spread footings bearing on the dense native site soils or on compacted structural fill placed on top of the dense native soils. We anticipate that a significant amount of over-excavation and structural fill placement and compaction will be necessary unless an alternative pipe pile foundation is designed and installed.

The proposed building may be constructed at the subject site, located above the Critical Area - Steep Slopes and Landslide Hazard area provided that the minimum buffers/setbacks and other recommendations presented herein are properly implemented. Please refer to the text of the report for more specific recommendations regarding the site development.

We appreciate this opportunity to have been of service to you on this project. We look forward to working with you as this project progresses. Should you have any questions regarding this report or need additional consultation, please feel free to call us.

Sincerely,
GEO Group Northwest, Inc.

William Chang, P.E.
Principal

TABLE OF CONTENTS

JOB NO. G-3835

GEOTECHNICAL ENGINEERING STUDY
PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

G-3835

1.0 INTRODUCTION

1.1 Project Description

The project site is located at 4560 - 151st Ave SE in Bellevue, Washington as shown on the attached **Plate 1 - Vicinity Map**. We understand that the lot is lot #19 of the Eastgate plat, parcel No. 2206700275. The property is located at the eastern side of 151st Ave SE near the intersection of SE 45th Pl and 151st Ave SE.

The subject lot consists of an undeveloped residential parcel with a total lot area of 11,250 square feet, having a rectangular shape and dimensions of 75-feet by 150-feet. We understand that the project owner plans to construct a single family residence at the western relatively flat area at the project site. The proposed floor elevations and house extent were not defined at the time of this report at least partially due to the fact that the development will be required to obtain a Critical Areas Land Use Permit (CALUP) first in order to define which portion of the property must be developed. This report has been prepared in order to aid in the submittal for the CALUP with regard to the Steep Slope Critical Area located at the site.

1.2 Scope of Services

The tasks we completed for this study were conducted in general accordance with the scope of work presented in our proposal dated February 26, 2015. The results of our subsurface investigation and our recommendations regarding the proposed development are summarized in the following report.

2.0 SITE CONDITIONS

2.1 Site Description

The project site consists of an undeveloped residential property fronting the eastern side of 151st Ave SE and bounded on the north and south by developed single family residential lots. An undeveloped forested Park area with a walking trail is located to the east of the lot.

The western half of the property is relatively level, while the eastern half of the lot slopes steeply down to a wooded ravine. Based upon topography included in a letter provided by the City of Bellevue and included with this report as **Plate 2 - Site Plan** we understand that the steep slope area has east-facing slopes with inclinations ranging from 60 to 80 percent from the horizontal and an approximate average slope inclination of 72 percent from the horizontal. The on-site steep slope height ranges from 50-feet to 52-feet. At the base of the east-facing steep slope area a walking trail and Squibbs Creek are located just east and a little further downslope of the eastern project lot boundary. We estimate that the total height of the east-facing slope area is between 70 and 80-feet.

At the time of our subsurface investigation on March 6, 2015 we walked the eastern steep slope area at the site and observed the following conditions:

1. The slope is heavily vegetated with ivy and fern groundcover and primarily deciduous trees.
2. One area of groundwater seepage on the slope was observed approximately 15-feet below the top of the slope, near the center of the lot when measured from the north or south property lines.
3. At several locations on the upper half of the slope we observed signs of surface water related erosion such as gully formation.
4. Most trees on the slope are vertical, having little to no trunk bending, however a couple of trees near the base of the slope (on the neighboring eastern property) have a slight trunk bend at the base. Tree trunk bending can be a sign of soil creep.

2.2 Geologic Overview

According to the geologic map for the site vicinity the soils reported for the area consist of Vashon Till (Qvt). The Vashon Till soils consist of a mixture of silt, sand and gravel which was deposited and consolidated by glacial ice during the most recent period of glaciation, roughly 14,000 years ago.

2.3 Field Investigation

GEO Group Northwest, Inc., explored subsurface soil conditions at the site by excavating and logging four exploratory test pits labeled TP-1 through TP-4 and located as shown on **Plate 2 - Site Plan**, on March 6, 2015.

The test pits were excavated to depths of up to 9 feet below ground surface (bgs). Soil samples at varying depths were classified and logged as shown on the attached **Appendix A - Test Pit Logs and Soil Legend**.

The test pits were backfilled with the excavated site soils. Backfilled soils were not compacted. Efforts were made to attempt to locate the test pits outside of the likely potential building footprint. However at the time this work was done the actual building footprint location was not known. When the footprint is determined we recommend that the owner verify that if the test pits are located within the building footprint, that work be done to over-excavate at these areas and compact any fills which will provide structural support to the Structural Fill compaction standards noted herein. Footings and slabs should not be constructed on top of the loose soils placed at the test pit locations. We recommend that GEO Group Northwest, Inc., be retained at the time of foundation/building pad excavation to verify that any and all loose soils are removed from below the proposed building foundation and slab areas.

2.4 Soil Conditions

Soils encountered at the test pit locations consist of variable loose to dense gravelly sandy SILT, gravelly silty SAND and sandy SILT with some gravel (FILLS) also containing angular siltstone rocks, asphalt debris, wood pieces and a varying amount of cobbles and boulders overlying dense to very dense gray/mottled gravelly sandy SILT (unweathered glacial till) at depths ranging from 3.5 to 8.5 feet below the ground surface (bgs). The underlying dense to very dense soils appear

to be the unweathered glacial till soils. Some of the overlying fills appear to be derived from a siltstone bedrock deposit. The geologic map indicates that similar siltstone deposits are located relatively close to the project site.

Copies of the **Test Pit Logs** are presented in **Appendix A: Test Pit Logs and Soil Legend.**

2.5 Groundwater Conditions

No groundwater seepage was observed at the test pit locations. It should be noted that groundwater conditions may fluctuate seasonally, depending on rainfall, surface runoff and other factors.

3.0 SEISMIC CONSIDERATIONS

Based upon our subsurface investigation at the site, it is our opinion that the project building may be designed using the Class C soil profile from the International Building Code provided that the building is founded on top of the underlying dense site soils or on compacted structural fill placed directly on top of the dense site soils or on pipe piles bearing on the dense site soils, as recommended herein. It is our opinion that the soils at the project site are not susceptible to liquefaction, due to the absence of groundwater within the overlying loose soil zone.

4.0 GEOLOGICALLY HAZARDOUS CRITICAL AREAS

Based upon the site plan and our observations at the site there is a roughly 70 to 80-foot tall east-facing steep slope with an average inclination of 72% from the horizontal located at the eastern side of the subject lot. The City of Bellevue regulates this area as a Geologic Hazard Critical Area - Steep Slopes due to its slope inclination in excess of 40 percent from the horizontal. Additionally, due to the presence of groundwater seepage at the slope the City of Bellevue regulations require that this slope area also be classified as a Landslide Hazard Area. The City's critical area regulations require that a 50-foot critical area buffer be applied to the top of the slope for either of the Critical Area designations. We are not aware of any Critical Area structure setback requirements which would apply other than the aforementioned buffer. The implementation of a 50-foot buffer would restrict the size of any potential development to approximately 1,443 square feet. We understand that the property owner would like to increase the potential size of the development and will potentially request a reasonable use exception to

the critical areas requirements. We understand that the reasonable use exception will potentially allow:

- A permanent disturbance of up to 2,625 square feet to develop the lot with a single-family home, including deck, patio, driveway, sidewalks etc;

- A maximum lot coverage for the structure of up to 35% of the net lot area (1,820 sf) after deducting the critical area;

As noted above we observed seepage at the eastern steep slope area, roughly 15-feet below the top of the steep slope. In addition, we observed signs of gully formation and erosion at the steep slope area. The subsurface investigation indicates that a thickness of up to 8.5-feet of loose fill soils is present at the top of the steep slope area. These soils are not acceptable for building support and also present some risk that they will erode from the top of the steep slope or slide if allowed to become saturated. The underlying dense to very dense glacial till soils are stable and present very little risk of soil movement at the critical areas. Therefore, the risks related to soil movement are completely related to the overlying fills at the top of the slope and likely presence of some loose weathered surficial soils located on the slope itself. In summary, it is our opinion that the existing eastern steep slope and landslide hazard area presents a moderate risk for erosion and soil movement. It is our opinion that these risks can be adequately mitigated with regard to the proposed development with the following development restrictions:

1. The new building structures must be founded on top of the underlying dense glacial till soils or on top of compacted structural fills placed on top of the competent glacial till soils. Recommendations for building foundations are presented in the Conclusions and Recommendations section of this report.

2. Stormwater collected from impervious surfaces should not be allowed to be discharged at the top of the steep slope. We recommend that collected stormwater be either tightlined to a public stormwater system or discharged at an approved location with appropriate energy dissipation at the toe of the slope.

3 A minimum combined buffer and setback of 25-feet should be maintained between the top of the steep slope and the proposed structure. We recommend that a minimum 20-foot vegetated buffer be maintained between the proposed development and the top of the

steep slope and landslide hazard- Critical Area. This means that some temporary ground disturbance may occur between the 25-foot combined setback/buffer line and the 20-foot vegetated buffer in order to allow for anticipated earthwork, adjacent to the eastern side of the proposed building.

Responses to LUC 20.25H.145

Per the requirement of the City of Bellevue code we have prepared the following statements with regard to the list presented in the Land Use Code 20.25H.145 - the geotechnical engineer must confirm that:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if provisions of this part were not modified;

Response: The reduction of the buffer from 50-feet to 25-feet (20-feet vegetated buffer) will not increase the geological hazard to the adjacent properties, since the 25-foot buffer/setback is sufficient provided that the home is founded on the underlying dense site soils, no stormwater is allowed to be discharged at or near the top of the steep slope and a vegetated buffer of 20-feet remains between the top of the slope and the new development.

B. Will not adversely impact other critical areas;

Response: The proposed buffer reduction will not adversely impact the Steep Slope and Landslide Hazard critical areas. GEO Group Northwest, Inc., is not aware of any other critical areas at the site.

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;

Response: It is our opinion that the proposed development may be designed to mitigate the risk related to Critical Area - Steep Slopes and Landslide Hazards to equal or less than what would exist if the 50-foot buffer was not reduced to 25-feet (20–feet vegetated buffer).

D. Is certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington;

Response: It is our opinion that the proposed development may be certified as safe under anticipated conditions provided that we are retained to review and approve the development plans and monitor the building construction with regard to the verification of foundation bearing conditions and installation of drainage.

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;

Response: This geotechnical report has been prepared in order to meet this requirement.

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

Response: We recommend that the recommendations contained herein be fully incorporated into the project plans.

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.

Response: GEO Group Northwest, Inc., is not aware of any habitat which may or may not be significantly impacted as a result of the buffer reduction. Other professionals may be able to comment with regard to this requirement.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 General

Based upon the results of our study, it is our professional opinion that the site is geotechnically suitable for the proposed development. The proposed building may be supported on conventional spread footings bearing on the dense native site soils or on compacted structural fill placed on top of the dense native site soils. The overlying loose fill soils encountered at the test pits up to a depth of 8.5 feet below ground surface are not acceptable for foundation support. We anticipate that over-excavation and replacement with compacted structural fill will be necessary or the building will need to be constructed on top of a small diameter pipe pile supported foundation. Specific details regarding foundation subgrade preparation are included below in the section **5.3 - Spread Footing Foundations** and **5.4 - Pipe Pile Foundations**.

5.1.1 City of Bellevue Performance Standards

According to the City of Bellevue Land Use Code, 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 the design of the development, as applicable.

A. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;

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

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

D. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall;

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

F. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 40 percent, grading for yard area may be disallowed where inconsistent with this criteria;

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

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

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

J. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

5.2 Site Preparation and General Earthwork

The building pad areas should be stripped and cleared of surface vegetation and topsoil. Silt fences should be installed around areas disturbed by construction activity to prevent sediment-laden surface runoff from being discharged off-site. We recommend that construction fencing be installed at the critical area vegetated buffer location (20-feet from the top of the steep slope) in order to mitigate the risk of disturbance within this area.

5.2.1 Temporary Excavations and Slopes

Under no circumstances should temporary excavation slopes be greater than the limits specified in local, state and national government safety regulations. Temporary cuts greater than four feet in height should be sloped at an inclination no steeper than 1H:1V (Horizontal:Vertical) in the

loose site soils. Temporary cuts in the dense site soils may be excavated no steeper than 1H:2V provided that no seepage is encountered. If groundwater seepage is encountered during construction, excavation of cut slopes should be halted and the cut slopes should be re-evaluated by GEO Group Northwest, Inc. If the proposed temporary excavation slopes encroach upon adjacent properties then it may be necessary to obtain an excavation easement or plan for temporary shoring at those locations. Permanent cut and fill slopes at the site should be inclined no steeper than 3H:1V.

Surface runoff should not be allowed to flow uncontrolled over the top of slopes into the excavated area. During wet weather exposed cut slopes should be covered with plastic sheeting during construction to minimize erosion.

5.2.2 Structural Fill

All fill material used to achieve design site elevations below the building areas and below non-structurally supported slabs, parking lots, sidewalks, driveways, and patios, should meet the requirements for structural fill. During wet weather conditions, material to be used as structural fill should have the following specifications:

1. Be free draining, granular material containing no more than five (5) percent fines (silt and clay-size particles passing the No. 200 mesh sieve);
2. Be free of organic material and other deleterious substances, such as construction debris and garbage;
3. Have a maximum size of three (3) inches in diameter.

All fill material should be placed at or near the optimum moisture content. The optimum moisture content is the water content in soil that enables the soil to be compacted to the highest dry density for a given compaction effort.

The majority of the surficial site soils will be moisture-sensitive because they consist of silty soils. We anticipate that the site soils will most likely be too wet to achieve the compaction requirements unless work is performed during the dry summer months. Alternatively, an

imported granular fill material may provide more uniformity and be easier to compact to the required structural fill specification.

If the on-site soils are to be used as engineered structural fill, it will be necessary to segregate the topsoil and any other organic- or debris-containing soil, because such soils would be unsuitable for use as structural fill. Excavated on-site material that is stockpiled for later use as structural fill should be protected from rainfall or contamination with unsuitable materials by covering it with plastic sheeting until it is used. Stockpiled soils should not be placed within the Critical Area buffer.

Structural fill should be placed in thin horizontal lifts not exceeding ten inches in loose thickness. Structural fill under building areas (including foundation and slab areas), should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM Test Designation D-1557-91 (Modified Proctor).

Structural fill under driveways, parking lots and sidewalks should be compacted to at least 90 percent maximum dry density, as determined by ASTM Test Designation D-1557-91 (Modified Proctor). Fill placed within 12-inches of finish grade should meet the 95% requirement.

We recommend that GEO Group Northwest, Inc., be retained to evaluate the suitability of structural fill material and to monitor the compaction work during construction for quality assurance of the earthwork.

5.3 Spread Footing Foundations

The proposed building can be supported on conventional spread footings bearing on the underlying dense native glacial till soils or on compacted structural fill placed on top of the dense native site soils. Based upon the findings from our soil investigation at the site, we anticipate that the dense competent soils are present at depths ranging from around 3.5 to 8.5 feet below ground surface. Over-excavation and placement of structural fill are anticipated to be required at all foundation subgrade areas unless the building is supported on small diameter pipe piles. The pipe pile support alternative is presented below in the **Section 5.4 - Pipe Pile Foundations**. If new footings will be placed on top of compacted structural fills then we recommend that the over-excavation trench areas extend outward on both sides of the proposed footing by a dimension of at least 1-foot horizontal for each 1-foot in depth for the structural fill thickness.

It is also important to note that our exploratory test pits were backfilled with the native soils and no compaction was completed. Therefore, if the test pits are located within the proposed building pad area then over-excavation and replacement with compacted structural fill will also be necessary at these locations.

We recommend that GEO Group Northwest, Inc., be retained to verify competent soils are present at all building foundation locations, at the time of construction, and to observe and monitor the over-excavation and replacement with compacted structural fills.

Individual spread footings may be used for supporting columns and strip footings for bearing walls. Our recommended minimum design criteria for foundations bearing on the dense site soils or on compacted structural fill are as follows:

- Allowable bearing pressure, including all dead and live loads
  Dense native soil = 2,000 psf
  Compacted structural fill = 2,000 psf

- Minimum depth to bottom of perimeter footing below adjacent final exterior grade = 18 inches

- Minimum depth to bottom of interior footings below top of floor slab = 18 inches

- Minimum width of wall footings = 16 inches

- Minimum lateral dimension of column footings = 24 inches

- Estimated post-construction settlement = 1/4 inch

- Estimated post-construction differential settlement; across building width = 1/4 inch

A one-third increase in the above allowable bearing pressures can be used when considering short-term transitory wind or seismic loads.

Lateral loads can also be resisted by friction between the foundation and the supporting compacted fill subgrade or by passive earth pressure acting on the buried portions of the

foundations. For the latter, the foundations must be poured "neat" against the existing undisturbed soil or be backfilled with a compacted fill meeting the requirements for structural fill. Our recommended parameters are as follows:

- Passive Pressure (Lateral Resistance)
  - 350 pcf equivalent fluid weight for compacted structural fill
  - 350 pcf equivalent fluid weight for native dense soil.

- Coefficient of Friction (Friction Factor)
  - 0.35 for compacted structural fill
  - 0.35 for native dense soil

We recommend that footing drains be placed around all perimeter footings. More specific details of perimeter foundation drains are provided below in **Section 5.6 - Drainage**.

5.4 Pipe Pile Foundations

Because there is a significant thickness of overlying loose soils which are not acceptable for foundation support an acceptable alternative to the over-excavation and compacted structural fill replacement discussed above would be to support the building on small diameter pipe piles, commonly referred to as pin piles. These piles may consist of 2-inch diameter schedule 80 steel pipe piles driven by a 90lb jackhammer or 140lb "Rhino"-hammer to meet the refusal criteria. The pipe piles should be driven into the underlying dense to very dense soils until a refusal criteria of less than 1-inch of penetration per minute is met or exceeded for a period of at least 3-minutes. Because the overlying fills also contain some wood and boulders we anticipate that the contractor will need to be ready to excavate to remove obstructions if pipe piles are to be used. The piles should not be founded on top of obstructions without the approval of GEO Group Northwest, Inc. We recommend that GEO Group Northwest, Inc., be on-site at the time of pipe pile installation in order to verify that the refusal criteria is met and that the piles are bearing on the dense to very dense soils. Provided that the piles are driven vertically into the dense to very dense soils and the refusal criteria is met than the 2-inch diameter pipe piles may be assumed to provide an allowable axial capacity of up to 3-tons per pile. The piles should be connected to the new building by means of a concrete grade beam which spans between pile locations. These piles may also be used to support structural concrete slabs if necessary.

If pipe piles are used to support the new building foundation then we recommend that resistance to lateral loads be developed by driving battered piles.

5.5 Slab-on-Grade Concrete Floors

Loose site soils should be excavated from all concrete slab subgrade areas and replaced with compacted structural fills. The loose overlying soils are not acceptable for support for new concrete slab-on-grade floors. Based upon the subsurface investigation there is a significant thickness of loose fills at the property (up to 8.5-foot thickness). Because of the thickness of loose fills and anticipated costs related to over-excavation and replacement we recommend that structural floors be used for the proposed residence. If concrete slabs are necessary for a potential garage area then over-excavation and replacement with structural fill may occur or the new slab may be structurally supported on top of pipe piles.

To avoid moisture build-up on the subgrade, slab-on-grade floors should be placed on a capillary break, which is in turn placed on the prepared subgrade. The capillary break should consist of a minimum of a six (6) inch thick layer of free-draining crushed rock or gravel containing no more than five (5) percent finer than the No. 4 sieve. A vapor barrier, such as a 10-mil plastic membrane, is recommended to be placed over the capillary break beneath the slab to reduce water vapor transmission through the slab. Two to four inches of sand may be placed over the barrier membrane for protection during construction.

5.6 Drainage

All temporary construction drainage and drainage collected from permanent impervious surfaces should be tightlined to the public stormwater system or to an appropriately designed and permitted discharge location at the base of the eastern slope. No stormwater should be allowed to discharge on the subject site steep slopes or at the top of the steep slope.

We recommend that drains be installed around the perimeter of the foundation footings. The drains should consist of a four (4) inch minimum diameter perforated rigid drain pipe laid at or near the bottom of the footing with a gradient sufficient to generate flow. The drain line should be bedded on, surrounded by, and covered with a free-draining rock, pea gravel, or other free-draining granular material. The drain rock and drain line should be completely surrounded by a

geotextile filter fabric, Mirafi 140N or equivalent. Once the drains are installed, the excavation should be backfilled with a compacted fill material. The footing drains should be tightlined to discharge to the stormwater collection system.

Under no circumstances should roof downspout drain lines be connected to the footing drainage system. All roof downspouts must be separately tightlined to discharge into the storm water collection system. We recommend that sufficient cleanouts be installed at strategic locations to allow for periodic maintenance of the footing drains and downspout tightline systems.

6.0 LIMITATIONS

This report has been prepared for the specific application to this site for the exclusive use of Mr. Mike Chaffee and his authorized representatives. We recommend that this report be included in its entirety in the project contract documents for use by the contractor.

Our findings and recommendations stated herein are based on field observations, our experience and judgement. The recommendations are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the budget constraint. No warranty is expressed or implied. In the event the soil conditions are found to vary during site excavation, GEO Group Northwest, Inc. should be notified and the above recommendation should be re-evaluated.

7.0 ADDITIONAL SERVICES

We recommend that GEO Group Northwest Inc. be retained to perform a general review of the final design and specifications of the proposed development to verify that the earthwork and foundation recommendations have been properly interpreted and implemented in the design and in the construction documents. We also recommend that GEO Group Northwest Inc. be retained to provide monitoring and testing services for geotechnically-related work during construction. This is to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event subsurface conditions differ from those anticipated prior to

the start of construction. We anticipate the following construction monitoring inspections may be necessary:

1. Over-excavation and structural fill placement at foundations and/or slab-on-grade areas;

2. Verification of bearing soil conditions for foundations;

3. Pipe Pile Installation;

4. Structural fill placement and compaction;

5. Subsurface drainage installation;

We appreciate this opportunity to have been of service to you on this project. We look forward to working with you as this project progresses. Should you have any questions regarding this report or need additional consultation, please feel free to call us.

Sincerely,
GEO Group Northwest, Inc.

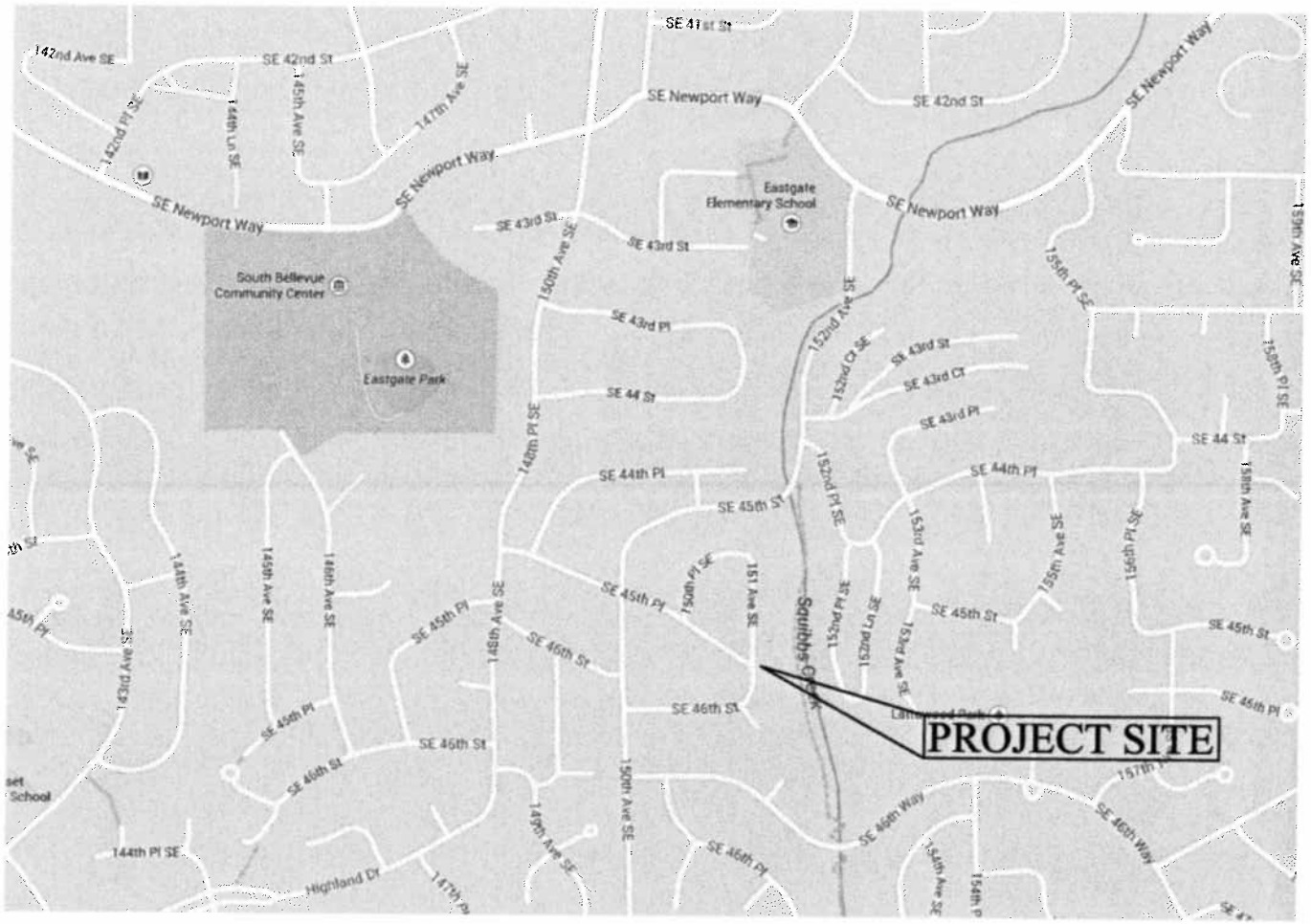
Adam Gaston
Project Engineer

William Chang, P.E.
Principal

ILLUSTRATIONS

G-3835

GEO Group Northwest, Inc.



GEO Group Northwest, Inc.
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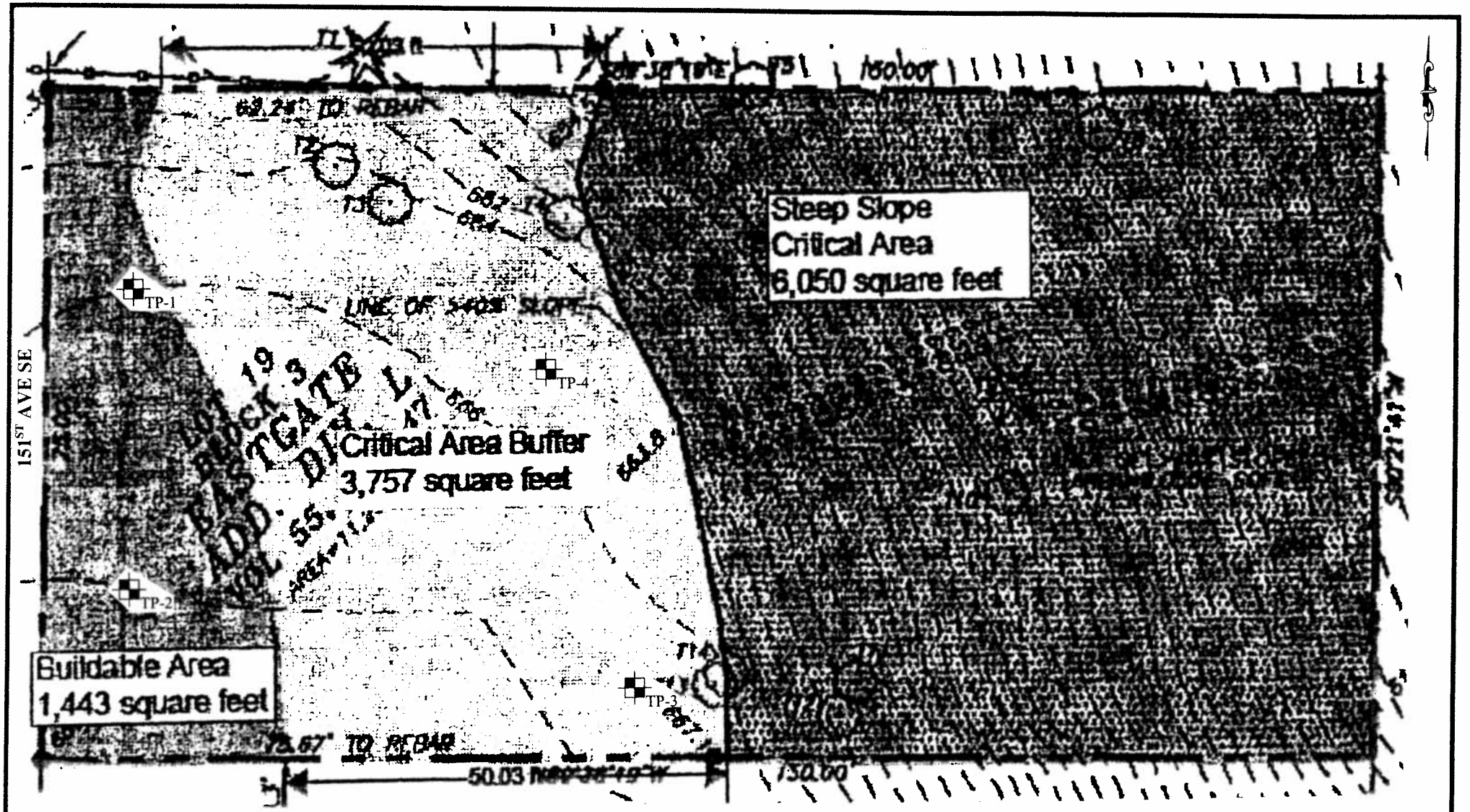
VICINITY MAP

PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

SCALE: NTS	DATE: 3/13/15	MADE: AG	JOB NO.: G-3835	PLATE: 1



SITE PLAN BASED UPON FIGURE 1 FROM CITY OF BELLEVUE LETTER, APRIL 13, 2012 (GEO GROUP NW FILE)

LEGEND

TP-1 = TEST PIT NUMBER AND APPROXIMATE LOCATION

GEO Group Northwest, Inc.
13240 NE 20th Street, Suite 10, Bellevue, WA 98005
Phone 425/649-8757 FAX 425/649-8758
Email mfox@geogroupnw.com

SITE PLAN
PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

PROJECT #:	G-3835
DATE:	3/13/15
DRAWN:	AG
CHECKED:	WC
SCALE:	1" = 10'

PLATE: 2

APPENDIX A:

TEST PIT LOGS AND SOIL LEGEND

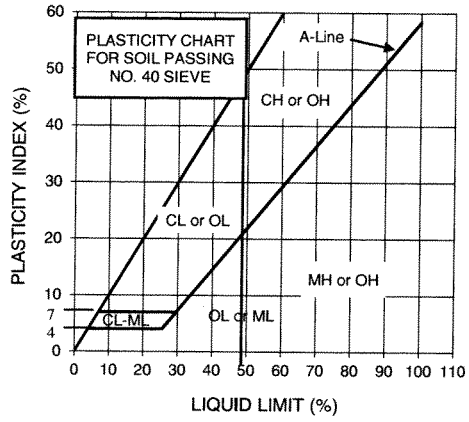
G-3835

GEO Group Northwest, Inc.

LEGEND OF SOIL CLASSIFICATION AND PENETRATION TEST

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS	GRAVELS (More Than Half Coarse Grains Larger Than No. 4 Sieve)	CLEAN GRAVELS (little or no fines)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURE, LITTLE OR NO FINES	DETERMINE PERCENTAGES OF GRAVEL AND SAND FROM GRAIN SIZE DISTRIBUTION CURVE	Cu = (D60 / D10) greater than 4 Cc = (D302) / (D10 * D60) between 1 and 3
			GP	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES LITTLE OR NO FINES		NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (with some fines)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE. or P.I. LESS THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE. or P.I. MORE THAN 7
More Than Half by Weight Larger Than No. 200 Sieve	SANDS (More Than Half Coarse Grains Smaller Than No. 4 Sieve)	CLEAN SANDS (little or no fines)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LIITLE OR NO FINES	COARSE GRAINED SOILS ARE CLASSIFIED AS FOLLOWS:	Cu = (D60 / D10) greater than 6 Cc = ($D30^2$) / (D10 * D60) between 1 and 3
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	< 5% Fine Grained: GW, GP, SW, SP	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (with some fines)	SM	SILTY SANDS, SAND-SILT MIXTURES	> 12% Fine Grained: GM, GC, SM, SC	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS BELOW "A" LINE with P.I. LESS THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	5 to 12% Fine Grained: use dual symbols	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS ABOVE "A" LINE with P.I. MORE THAN 7
FINE-GRAINED SOILS	SILTS (Below A-Line on Plasticity Chart, Negligible Organic)	Liquid Limit < 50%	ML	INORGANIC SILTS, ROCK FLOUR, SANDY SILTS OF SLIGHT PLASTICITY		
		Liquid Limit > 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOIL		
	CLAYS (Above A-Line on Placticity Chart, Negligible Organic)	Liquid Limit < 30%	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, CLEAN CLAYS		
		Liquid Limit > 50%	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
More Than Half by Weight Smaller Than No. 200 Sieve	ORGANIC SILTS & CLAYS (Below A-Line on Placticity Chart)	Liquid Limit < 50%	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
		Liquid Limit > 50%	OH	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS		



SOIL PARTICLE SIZE

FRACTION	U.S. STANDARD SIEVE			
	Passing		Retained	
	Sieve	Size (mm)	Sieve	Size (mm)
SILT / CLAY	#200	0.075		
SAND				
FINE	#40	0.425	#200	0.075
MEDIUM	#10	2	#40	0.425
COARSE	#4	4.75	#10	2
GRAVEL				
FINE		19	#4	4.75
COARSE		76		19
COBBLES	76 mm to 203 mm			
BOULDERS	> 203 mm			
ROCK FRAGMENTS	> 76 mm			
ROCK	>0.76 cubic meter in volume			

GENERAL GUIDANCE OF SOIL ENGINEERING PROPERTIES FROM STANDARD PENETRATION TEST (SPT)

SANDY SOILS				SILTY & CLAYEY SOILS		
Blow Counts N	Relative Density %	Friction Angle ϕ, degree	Description	Blow Counts N	Unconfined Strength Qu, tsf	Description
0 - 4	0 -15		Very Loose	< 2	< 0.25	Very soft
4 - 10	15 - 35	26 - 30	Loose	2 - 4	0.25 - 0.50	Soft
10 - 30	35 - 65	28 - 35	Medium Dense	4 - 8	0.50 - 1.00	Medium Stiff
30 - 50	65 - 85	35 - 42	Dense	8 - 15	1.00 - 2.00	Stiff
> 50	85 - 100	38 - 46	Very Dense	15 - 30	2.00 - 4.00	Very Stiff
				> 30	> 4.00	Hard

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists
13240 NE 20th Street, Suite 10 Bellevue, WA 98005
Phone (425) 649-8757 Fax (425) 649-8758

PLATE A1

TEST PIT NO. TP-1

LOGGED BY AG TEST PIT DATE: 03/06/2015

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	Water %	OTHER TESTS/ COMMENTS
	ML	Brown gravelly sandy SILT with angular siltsone rocks and occ. asphalt debris, medium dense and dense (FILL)			Probe <2" Probe 1-4" Probe 2"
5	ML	Dark brown fine gravelly sandy SILT with occ. wood pieces, moist, loose to medium dense (FILL)			
	ML	Gray/mottled fine gravelly sandy SILT with occ. cobble, wet to moist, dense to very dense (unweathered TILL)			Probe <1"
10		Total depth of test pit = 7.7 feet bgs No groundwater seepage observed Competent soils at 6-feet bgs			
15					

TEST PIT NO. TP-2

LOGGED BY AG TEST PIT DATE: 03/06/2015

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	Water %	OTHER TESTS/ COMMENTS
	ML	Brown gravelly sandy SILT with angular siltstone rocks and occ. asphalt debris, moist, dense becoming medium dense (FILL)			Probe 2" Probe 3-8" Probe 5-13"
	ML	Dark brown sandy SILT with some gravel and wood pieces, moist, variable loose and medium dense (FILL)			
5	ML	Gray/mottled gravelly sandy SILT with occ. cobbles and boulders, moist, dense to very dense (unweathered TILL)			Probe <1.5"
		Total depth of test pit = 5 feet bgs No groundwater seepage observed Competent soils at 3.5-feet bgs			
10					
15					

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

TEST PIT LOGS

PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

JOB NO. G-3835 | DATE 3/9/15 | PLATE A2

TEST PIT NO. TP-3

LOGGED BY AG TEST PIT DATE: 03/06/2015

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	Water %	OTHER TESTS/ COMMENTS
5	ML	Brown gravelly sandy SILT with angular siltsone rocks, cobbles, boulders, occ. asphalt debris and apparent concrete drain tile debris, moist to wet, variable dense to loose (FILL)			Probe 1-3" Probe 12-19" Probe 12" Probe 10-12"
	ML	Gray/mottled fine gravelly sandy SILT, moist, dense to very dense (unweathered TILL)			
10		Total depth of test pit = 8 feet bgs No groundwater seepage observed Competent soils at 6.5-feet bgs			
15					

TEST PIT NO. TP-4

LOGGED BY AG TEST PIT DATE: 03/06/2015

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	Water %	OTHER TESTS/ COMMENTS
	ML	Brown gravelly sandy SILT with angular siltstone rocks and occ. asphalt debris, moist, dense becoming loose (FILL)			Probe 2" Probe 5-15"
5	SM	Tan gravelly silty SAND with some asphalt pieces, cobbles and boulders, moist to wet, loose (FILL)			Probe 8-18" Probe 12-18"
10	ML	Gray/mottled gravelly sandy SILT with occ. cobbles and boulders, moist, dense to very dense (unweathered TILL)			
		Total depth of test pit = 9 feet bgs No groundwater seepage observed Competent soils at 8.5-feet bgs			
15					

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

TEST PIT LOGS

PROPOSED RESIDENCE
4560 - 151ST AVE SE
BELLEVUE, WASHINGTON

JOB NO. G-3835 DATE 3/9/15 PLATE A3