CITY OF KIRKLAND
Planning and Community Development Department
123 Fifth Avenue, Kirkland, WA 98033
425.587-3225 - www.kirklandwagov

ADVISORY REPORT
FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

To: Kirkland Hearing Examiner

From: *Susan Lauinger*, Susan Lauinger, Associate Planner
Eric R. Shields, AICP, Planning Director

Date: March 16, 2017

File: Zhang Short Plat and Wetland Buffer Modification;
SUB16-01244 and SAR16-01245

Hearing Date and Place: March 16, 2017
9 a.m.
City Hall Council Chamber
123 Fifth Avenue, Kirkland

I. INTRODUCTION

A. APPLICATION

1. Applicant: CORE Design, Inc on behalf of Qian Zhang.
2. Site Location: Vacant property on 124th Avenue NE at approximately NE 102nd Street; parcel number 6639900250 (see Attachment 1).
3. Request: Proposal to subdivide a 60,891 square foot parcel into 3 lots in an RSX 7.2 zone; the site contains a Type II wetland, which requires a standard 75′ wide buffer and a 10′ wide building buffer setback. The proposal includes a request to reduce the existing 75′ wide wetland buffer to 50′ across the entire site (see Attachment 2).
4. Review Process: Process IIA, pursuant to Kirkland Zoning Code (KZC) Section 90.60.2.b, the Hearing Examiner conducts public hearing and makes final decision on a Type II Wetland Buffer Modification. Pursuant to Kirkland Municipal Code (KMC) 22.20.030 and KZC 145.10, the short plat will be reviewed as part of the Process IIA permit.
5. Summary of Key Issues and Conclusions: The key issues addressed in this report are compliance with the Development Regulations, compliance with the applicable short plat requirements, and compliance with Wetland Buffer Modification criteria in KZC Chapter 90.

B. RECOMMENDATIONS

1. Based on Statements of Fact and Conclusions (Section II), and Attachments in this report, I/we recommend approval of this application subject to the following conditions:

2. This application is subject to the applicable requirements contained in the Kirkland Municipal Code, Zoning Code, and Building and Fire Code. It is the responsibility of the applicant to ensure compliance with the various provisions contained in these ordinances. Attachment 3, Development Standards, is provided in this report to familiarize the applicant with some of the additional development regulations. This attachment does not include all of the additional regulations. When a condition of approval conflicts with a development regulation in Attachment 3, the conditions of approval shall be followed (see Conclusion II.E.2).

3. Trees shall not be removed or altered following short plat approval except as approved by the Planning Department. Attachment 3, Development Standards, contains specific information concerning tree retention requirements which shall be followed (see Conclusion II.C.5.b).

4. Prior to recording the short plat:

   a. Dedicate a 10 foot width of land along the street frontage of 124th Ave NE to install the right-of-way improvements as required in Attachment 3, Public Works Development Standards (see Conclusion II.C.6.b).

   b. Dedicate a Natural Greenbelt Protection Easement (NGPE) on the short plat plans which encompasses the modified wetland buffers on the site (see Attachment 12). All surveys shall be located on KCAS or plat bearing system and tied to known monuments (see Conclusion II.C.3.b (3).

5. As part of the application for a Land Surface Modification permit, or Building Permit, whichever comes first, the applicant shall:

   a. Submit a revised mitigation proposal that meets the conditions as listed in the Watershed memo dated January 16, 2016—see Attachment 11 (see Conclusion II.C.3.b(1).

   b. Follow the recommendations of the Geotechnical Report by Liu & Associates dated April 18, 2016 (see Attachment 4) (see Conclusion II.C.4.b).

6. Prior to issuance of any permits, the applicant shall (see Conclusions II.C.3.b(2)):

   a. Submit to the Planning Department a financial security device to cover all monitoring and maintenance activities that will need to be done including wetland consultant site visits, reports to the Planning Department, and any vegetation that needs to be replaced. The security shall be consistent with the standards outlined in Zoning Code section 90.145:

   b. Submit a signed and notarized covenant (see Attachment 13) that holds the City harmless against any future claims that may arise as a result of the development of the property.

   c. Install a six-foot high construction phase fence along the upland boundary of the entire wetland buffer with silt screen fabric installed per City standard. The fencing shall be installed prior to any development activities occurring on the site. The fence shall remain upright in the approved location for the duration of development activities.

7. Prior to final inspection of any permits, the applicant shall (see Conclusions II.C.3.b(4):

   a. Provide a final as built of the planted mitigation area for review by the City's consultant. The final inspection of the buffer mitigation installation and subsequent maintenance and monitoring work should be reviewed by the City's wetland consultant, the cost of which should be borne by the applicant.

   b. Provide proof of a written contract with a qualified professional who will perform the monitoring program, together with a completed contract and fees to fund review of the monitoring and maintenance activities, (i.e. inspection of plant materials, annual monitoring reports or revegetation activities) by the City's wetland consultant. Alternatively, the applicant shall provide a copy of a completed contract and fees to fund completion of the monitoring program by the City's wetland consultant.

   c. Provide proof of a written contract to cover maintenance activities as outlined in the buffer report.

   d. Install a permanent 3- to 4-foot-tall split rail fence. The fence should be placed at the wetland buffer line. Installation of the permanent fence should be done by hand where necessary to prevent machinery from entering the sensitive areas.

II. FINDINGS OF FACT AND CONCLUSIONS

A. SITE DESCRIPTION

1. Site Development and Zoning:

   a. Facts:

      (1) Size: 60,891 square feet (1.40 acres). The site is generally rectangular in shape and fronts on 124th Ave NE mid-block between NE 100th St. and NE 104th St. A 10′ wide dedicated area is required for public improvements along 124th Avenue NE, which brings the total square footage of the property to 59,391 square feet (see Section II.C.2 below for Maximum Development Potential).

      (2) Land Use: The site is currently vacant and has a Type II wetland that extends on to neighboring properties.

      (3) Zoning: Single Family Residential, RSX 7.2 zone with a minimum lot size of 7,200 square feet. The proposal includes three lots with the following lot sizes:

         Lot 1: 19,799 sq. ft.

         Lot 2: 19,798 sq. ft.

         Lot 3: 19,792 sq. ft.

      (4) Terrain: The property slopes downward from the southeast corner of the site at a gradient of roughly 12 percent for the first 200 feet, then slopes more gently in the wetland area at a gradient of roughly 10 percent (see Attachment 2, topographic survey). There are no landslide hazard areas as defined by KZC 85.13 on this site. However, the City's sensitive areas maps show that there

is a seismic hazard area on the subject property. The applicant has submitted a Geotechnical Report (see Attachment 4). See section II.C.4 for more information.

(5) Vegetation: Fifty significant trees found within the wetland buffer, building buffer setback, and buildable area were evaluated. There are many more trees on site that are located within the wetland area and within the buffer to the south that were not evaluated since they are located on portions of the property which are not allowed to be developed. The arborist report submitted with the application can be found as Attachment 5, and the City's arborist review can be found in Attachment 3, Development Standards.

(6) Wetland: A "Type II" Wetland exists on the western portion of the subject property, which is located within the Forbes Creek Basin, a Primary Basin. A 75' wide buffer and a 10' wide building buffer setback is required from the wetland boundary. The applicant is seeking to reduce the buffer width by one-third (25').

The wetland was delineated and typed by JS Jones, Inc, the applicant's consultant (see Attachment 6). This determination was reviewed by the City's consultant, The Watershed Co. (see Attachment 7).

b. Conclusions: Size, land use, zoning, terrain and vegetation are not constraining factors in the consideration of this application. The wetland is not a constraining factor provided that the applicant complies with the requirements and criteria for a Wetland Buffer Modification as conditioned by this report (see Section II.C.3). The terrain is not a constraining factor provided that the recommendations by the Geotechnical Engineer are followed (see Section II.C.4).

2. Neighboring Development and Zoning:

a. Facts: The subject site is bordered by the following zoning districts and uses:

North: RSX 7.2. Most of the adjoining site encompasses the same wetland that extends from the subject property, except that the western portion of the property contains the Heather Glen Townhomes which front on Slater Avenue NE (developed under a PUD).

South: RSX 7.2. Developed with single-family homes.

East: RSX 7.2. 124th Avenue NE and developed single-family homes.

West: RSX 7.2. Two vacant lots.

b. Conclusion: The neighboring development and zoning are not constraining factors in this application.

B. PUBLIC COMMENT

The public comment period for the proposed short plat and wetland buffer modification application extended from July 28, 2016 to August 16, 2016. No public comments were received during the comment period.

C. APPROVAL CRITERIA

1. GENERAL ZONING CODE CRITERIA

a. Fact: Zoning Code section 150.65.3 states that a Process IIA application may be approved if:

(1) It is consistent with all applicable development regulations and, to the extent there is no applicable development regulation, the Comprehensive Plan; and

(2) It is consistent with the public health, safety, and welfare.

b. Conclusion: The proposal complies with the criteria in section 150.65.3. It is consistent with all applicable development regulations (see Section II.E) and the Comprehensive Plan (see Section II.D). In addition, it is consistent with the public health, safety, and welfare because it will add housing stock while also enhancing and protecting a wetland buffer, which contributes to many environmental functions.

c. Facts: Municipal Code section 22.20.140 states that the Planning Director may approve a short subdivision only if:

(1) There are adequate provisions for open spaces, drainage ways, rights-of-way, easements, water supplies, sanitary waste, power service, parks, playgrounds, and schools; and

(2) It will serve the public use and interest and is consistent with the public health, safety, and welfare. The Planning Director shall be guided by the policy and standards and may exercise the powers and authority set forth in RCW 58.17.

d. Conclusion: The proposal complies with the criteria in KMC section 22.20.140. With the recommended conditions of approval, it is consistent with the Zoning Code and Subdivision regulations and there are adequate provisions for open spaces, drainage ways, rights-of-way, easements, water supplies, sanitary waste, power service, parks, playgrounds, and schools. It will serve the public use and interest and is consistent with the public health, safety, and welfare because it will add housing stock to the City of Kirkland in a manner that is consistent with applicable development regulations.

2. MAXIMUM DEVELOPMENT POTENTIAL

a. Facts:

(1) KZC Section 90.135 requires that the following formula, called Maximum Development Potential, will determine the number of units on a site which contains a wetland and/or its buffer:

Maximum Dwelling Unit Potential = (the buildable area/the prescribed minimum lot area per unit) + (the buffer area/the prescribed minimum lot area per unit) x (the development factor)

(2) The minimum lot size per lot is 7,200 sq. ft. Based on the survey provided by the applicant (see Attachment 2), the subject

property contains 60,891 SF of which 7,602 SF is buildable area, 35,040 SF is sensitive area, and 18,249 SF is buffer area. The percentage of the site in sensitive area buffers is 30%. KZC 90.135 requires a development factor of 80% be applied to the wetland buffer area. Per the formula shown above, the maximum development potential for the subject property is 3.08 lots.

b. Conclusion: The proposal for 3 lots conforms to the maximum development potential requirements of KZC Section 90.135

3. BUFFER MODIFICATION FOR A TYPE II WETLAND

a. Facts:

(1) KZC 90.60.2 establishes that a Wetland Buffer Modification may only be granted when the proposed development is consistent with all of the following 9 criteria:

a) It is consistent with Kirkland's Streams, Wetlands and Wildlife Study (The Watershed Company, 1998) and the Kirkland Sensitive Areas Regulatory Recommendations Report (Adolfson Associates, Inc., 1998);

b) It will not adversely affect water quality;

c) It will not adversely affect fish, wildlife, or their habitat;

d) It will not have an adverse effect on drainage and/or storm water detention capabilities;

e) It will not lead to unstable earth conditions or create an erosion hazard or contribute to scouring actions;

f) It will not be materially detrimental to any other property or the City as a whole;

g) Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

h) All exposed areas are stabilized with vegetation normally associated with native stream buffers, as appropriate; and

i) There is no practicable or feasible alternative development proposal that results in less impact to the buffer.

(2) The applicant's consultant, JS Jones and Associates, Inc, provided a report dated March 31st, 2016 that responds to the decisional criteria for modifying a wetland buffer (see Attachment 8). The plan indicates that 9,370 sf of buffer area will be enhanced in exchange for 5,288 sf of buffer reduction.

(3) The mitigation plans include goals and objectives, success criteria, maintenance and a monitoring schedule and contingency plan as required by KZC 90.55.4. Not included, but also required in the proposal is proof of a written contract with

a qualified professional who will perform the monitoring program.

(4) The Watershed Company, the City's wetland consultant, reviewed the applicant's initial proposal and provided comments on suggested changes to the plan (see Attachment 9).

(5) The applicant's consultant, JS Jones submitted a new mitigation plan to respond to Watershed's recommendations (see Attachment 10).

(6) Watershed reviewed the new JS Jones mitigation plan and provided a follow-up memo that includes recommendations for changes to in order to meet the criteria in KZC 90.60 (see Attachment 11).

(7) KZC Section 90.60.2.a.2 states that a wetland buffer may not be reduced by more than one-third of the standard buffer width. An additional 10-foot buffer setback is required through KZC Section 90.45.2. The reduced buffer line and 10-foot buffer setback line are shown on the applicant's plans (see Attachment 2). Preliminary measurement by Staff shows compliance with the referenced code sections.

(8) Pursuant to KZC 90.50, prior to beginning development activities, the applicant is required to install a 6-foot-high construction-phase chain link fence or equivalent fence, along the upland boundary of the entire wetland buffer with silt screen fabric installed per City standard. The construction-phase fence shall remain upright in the approved location for the duration of development activities install. Upon project completion, the applicant is required to install a permanent 3- to 4-foot-tall split rail fence at the buffer line.

(9) Pursuant to KZC 90.145: The Planning Official shall require a performance or maintenance bond to ensure compliance with any aspect of this chapter or any decision or determination made pursuant to this chapter.

(10) Pursuant to KZC 90.150, the City of Kirkland requires dedication of a Natural Greenbelt Protection Easement (NGPE) to protect sensitive areas and their buffers (see Attachment 12).

(11) KZC 90.155 requires applicants to enter in to an agreement with the City indemnifying the City from any claims, actions, liability and damages to wetlands arising out of development activity on the subject property (see Attachment 13).

b. Conclusions: Pursuant to the attachments included with this report, which include the proposed short plat site plan, buffer mitigation plan, and monitoring and maintenance plans (see Attachments 2, 8 and 10), and the review memos from The Watershed Company (see Attachments 9 and 11), the proposed development is consistent with the decisional

criteria for buffer modifications as indicated in Chapter 90 of the KZC, subject to the following conditions:

(1) The applicant should revise the mitigation plan to include the recommendations by Watershed dated January 16th 2016, found in Attachment 11.

(2) Prior to commencement of development activity, the applicant should:
   (a) Install a 6-foot-high construction-phase chain link fence along the upland boundary of the entire wetland buffer with silt screen fabric at the base. Installation of the permanent fence or planted barrier should be done by hand where necessary to prevent machinery from entering the wetland or its buffer. The construction-phase fence should remain upright in the approved location for the duration of development activities.
   (b) Submit for recording a covenant that indemnifies the City for any claims, actions, liability and damages to the wetlands arising out of development activity related to the sensitive areas on the subject property (see Attachment 13).
   (c) Submit to the Planning Department a financial security device to cover all monitoring and maintenance activities that will need to be done including wetland consultant site visits, reports to the Planning Department, and any vegetation that needs to be replaced. The security shall be consistent with the standards outlined in Zoning Code section 90.145.

(3) Prior to recording the short plat, the applicant should submit for recording a Natural Greenbelt Protection Easement (NGPE) that encompasses the entire reduced buffer and wetland area on the subject property (see Attachment 12).

(4) Prior to final inspection of the new home, the applicant should:
   a) Provide a final as-built of the planted mitigation area for review by the City's consultant. The final inspection of the buffer mitigation installation and subsequent maintenance and monitoring work should be reviewed by the City's wetland consultant, the cost of which should be borne by the applicant.
   b) Install a permanent 3- to 4-foot-tall split rail fence. The fence should be placed at the wetland buffer line. Installation of the permanent fence should be done by hand where necessary to prevent machinery from entering the sensitive areas.
   c) Provide proof of a written contract with a qualified professional who will perform the monitoring program, together with a completed contract and fees to fund review of the monitoring and maintenance activities, (i.e. inspection of plant materials, annual monitoring reports or

re-vegetation activities) by the City's wetland consultant. Alternatively, the applicant shall provide a copy of a completed contract and fees to fund completion of the monitoring program by the City's wetland consultant.

d) In order to ensure survival of the mitigation plantings: Provide proof of a contract with a maintenance company that will perform the maintenance necessary to keep the buffer plantings in good health and keep weed growth to a minimum.

4. GEOLOGICALLY HAZARDOUS AREAS

a. Facts: KMC 22.28.180 states that the applicant has the responsibility in proposing a plat to be sensitive with respect to the natural features, including topography, streams, lakes, wetlands, habitat, geologic features and vegetation, of the property. The plat must be designed to preserve and enhance as many of these valuable features as possible.

Zoning Code regulations on geologically hazardous areas address slope stability, run-off, structural concerns, and liability issues. The Planning Department evaluates proposals located in geologically hazardous zones on the criteria in KZC Chapter 85. The evaluation is based on a geotechnical report prepared by a qualified geotechnical engineer.

(1) The City's sensitive area maps indicate that the site is within a seismic hazard area.

(2) The applicant has submitted a geotechnical evaluation by Liu & Associates dated April 18, 2016 that indicates that the risk of seismic events such as liquefaction is low (see Attachment 4). There are additional requirements for home construction, erosion control, and storm water conveyance found within the report.

b. Conclusions: As part of any development permit application, the applicant should submit plans consistent with the recommendations within the applicant's geotechnical report (see Attachment 4).

5. NATURAL FEATURES-SIGNIFICANT VEGETATION

a. Facts:

(1) Regulations regarding the retention of trees can be found in Chapter 95 of the Kirkland Zoning Code. The applicant is required to retain all viable trees on the site following the short plat approval. Consistent with the Tree Retention Plan phased review process for short plats in KZC 95.30.6.a, tree removal will be considered at the land surface modification and building permit stages of development when the location of all improvements will be established.

(2) The applicant has submitted a Tree Retention Plan prepared by

AFM (American Forest Management) dated March 11th, 2016 (see Attachment 5). The report addresses the health and viability of trees within the buffer, buffer setback and buildable area. There are numerous trees within the wetland area and buffer area to the south that will not be developed; these trees are not included in the City's Urban Forestry review for this reason.

(3) The City's consulting arborist has reviewed the arborist report. The trees within the buffer, buffer setback and buildable area were typed according to their retention value; this information can be found in Attachment 3, Development Standards.

b. Conclusion: The applicant should retain all viable trees consistent with the Tree Retention Plan phased review process for short plats in KZC 95.30.6.a, during the construction of plat improvements and residences and comply with the specific recommendations of the City's arborist (see Attachment 3).

6. DEVELOPMENT REGULATIONS SHORT PLAT

a. Facts: Kirkland Municipal Code section 22.28 contains requirements governing the design of short plats.

(1) KMC section 22.28.030 requires that all lots within a subdivision meet the minimum size requirements established for the property in the Kirkland Zoning Code or other land use regulatory document.

(2) KMC 22.28.050 and 22.28.060 require that lots are of a shape and size so that reasonable development may be made of the lot, and that the general layout is designed to allow for reasonable subdivision and use of adjoining properties.

(3) KMC section 22.28.200 establishes that the City may require that any area adjacent to a Class A, B and C stream, a lake, or a wetland be kept in its natural or pre-existing state if reasonably necessary to prevent hazards to persons or property, or to protect unique and valuable environments.

(4) KMC section 22.28.180 states that the applicant has the responsibility in proposing a plat to be sensitive with respect to the natural features, including topography, streams, lakes, wetlands, habitat, geologic features and vegetation, of the property. The plat must be designed to preserve and enhance as many of these valuable features as possible.

(5) The applicant has proposed three lots, all meeting the minimum lot size for the RSX 7.2 zone. All lots are rectangular in shape, and the wetland buffer modification request complies with the criteria in KZC Chapter 90 as analyzed and conditioned in Section II.C.3.

(6) Municipal Code section 22.28.020 states that the City may require dedication of land for school sites, parks and open space,

rights-of-way, utilities infrastructure, or other similar uses if this is reasonably necessary as a result of the subdivision.

(7) Zoning Code section 110.60 states that the Public Works Director may require the applicant to make land available, by dedication, for new rights-of-way and utility infrastructure if this is reasonably necessary as a result of the development activity.

(8) The Public Works development standards indicate that 10 feet of dedication is required along 124th Ave NE in order to install the required infrastructure and street improvements (see Attachment 3).

b. Conclusion: The application complies with the design requirements for short plats found in KMC 22.28 with respect to lot size, shape, layout and preservation of natural features. The conditions in Section II.C.3.b regarding the wetland buffer reduction should be followed.

Prior to recording the short plat, the applicant should dedicate a 10' width along the 124th Ave NE street frontage in order to install all right-of-way improvements as indicated in Attachment 3.

D. COMPREHENSIVE PLAN

1. Facts: The subject property is located within the North Rose Hill Neighborhood. Figure NRH-4 on page XV.F11 designates the subject property for LDR 6 (Low Density Residential, 6 dwelling units per acre).

a. The proposal includes division of a 59,391 square foot parcel into 3 lots in an RSX 7.2 Zone. Note that the square footage of the property is after required dedication for right-of-way improvements.

2. Conclusion: The proposed use of the subject property is consistent with the Comprehensive Plan.

E. DEVELOPMENT STANDARDS

1. Fact: Additional comments and requirements placed on the project are found on the Development Standards, Attachment 3.

2. Conclusion: The applicant should follow the requirements set forth in Attachment 3.

III. SUBSEQUENT MODIFICATIONS

Modifications to the approval may be requested and reviewed pursuant to the applicable modification procedures and criteria in effect at the time of the requested modification.

IV. APPEALS AND JUDICIAL REVIEW

The following is a summary of the deadlines and procedures for and appeals. Any person wishing to file or respond to an appeal should contact the Planning Department for further procedural information.

A. APPEALS

1. Appeal to City Council:

Section 150.80 of the Zoning Code allows the Hearing Examiner's decision to be appealed by the applicant and any person who submitted written or oral testimony or comments to the Hearing Examiner. A party who signed a petition may not appeal unless such party also submitted independent written comments or information. The appeal must be in writing and must be delivered, along with any fees set by ordinance, to the Planning Department by 5:00 p.m., fourteen (14) calendar days following the postmarked date of distribution of the Hearing Examiner's decision on the application.

B. JUDICIAL REVIEW

Section 150.130 of the Zoning Code allows the action of the City in granting or denying this zoning permit to be reviewed in King County Superior Court. The petition for review must be filed within 21 calendar days of the issuance of the final land use decision by the City.

V. LAPSE OF APPROVAL

A. Under KMC 22.20.370 Short plat documents – Recordation – Time limits:

The short plat must be recorded with King County within five (5) years of the date of approval or the decision becomes void; provided, however, that in the event judicial review is initiated, the running of the five (5) years is tolled for any period of time during which a court order in said judicial review proceeding prohibits the recording of the short plat.

B. Under KZC 150.135:

The applicant must begin construction or submit to the City a complete building permit application for the development activity, use of land or other actions approved under this chapter within five (5) years after the final approval of the City of Kirkland on the matter, or the decision becomes void; provided, however, that in the event judicial review is initiated per KZC 145.110, KZC 150.130, KZC 152.110, the running of the five (5) years is tolled for any period of time during which a court order in said judicial review proceeding prohibits the required development activity, use of land, or other actions.

The applicant must substantially complete construction for the development activity, use of land, or other actions approved under this chapter and complete the applicable conditions listed on the notice of decision within nine (9) years after the final approval on the matter, or the decision becomes void.

VI. APPENDICES

Attachments 1 through 13 are attached.

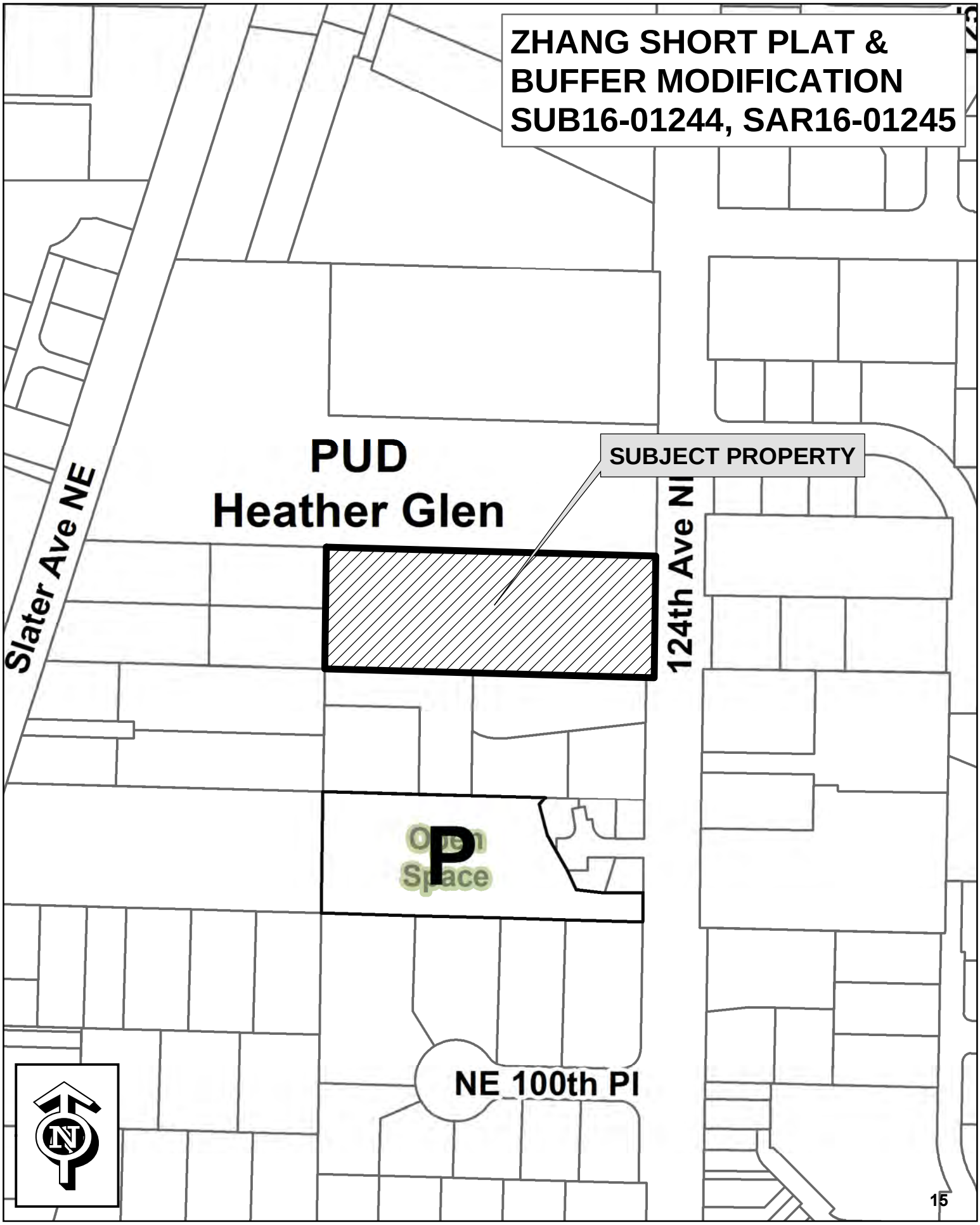
1. Vicinity Map
2. Applicant's Development Proposal
3. Development Standards
4. Geotechnical Report by Liu & Associates, Inc dated April 18, 2016
5. Arborist Report
6. JS Jones Delineation report dated October 12, 2015.
7. Watershed Company peer review delineation report dated November 20, 2015
8. JS Jones Buffer Modification plan dated March 31, 2016

9. The Watershed Company response to the original proposal dated November 29, 2016
10. JS Jones second buffer modification plan set
11. The Watershed Co. final review memo dated January 16th, 2016
12. Natural Greenbelt Protection Easement (NGPE) language
13. Wetlands Covenant

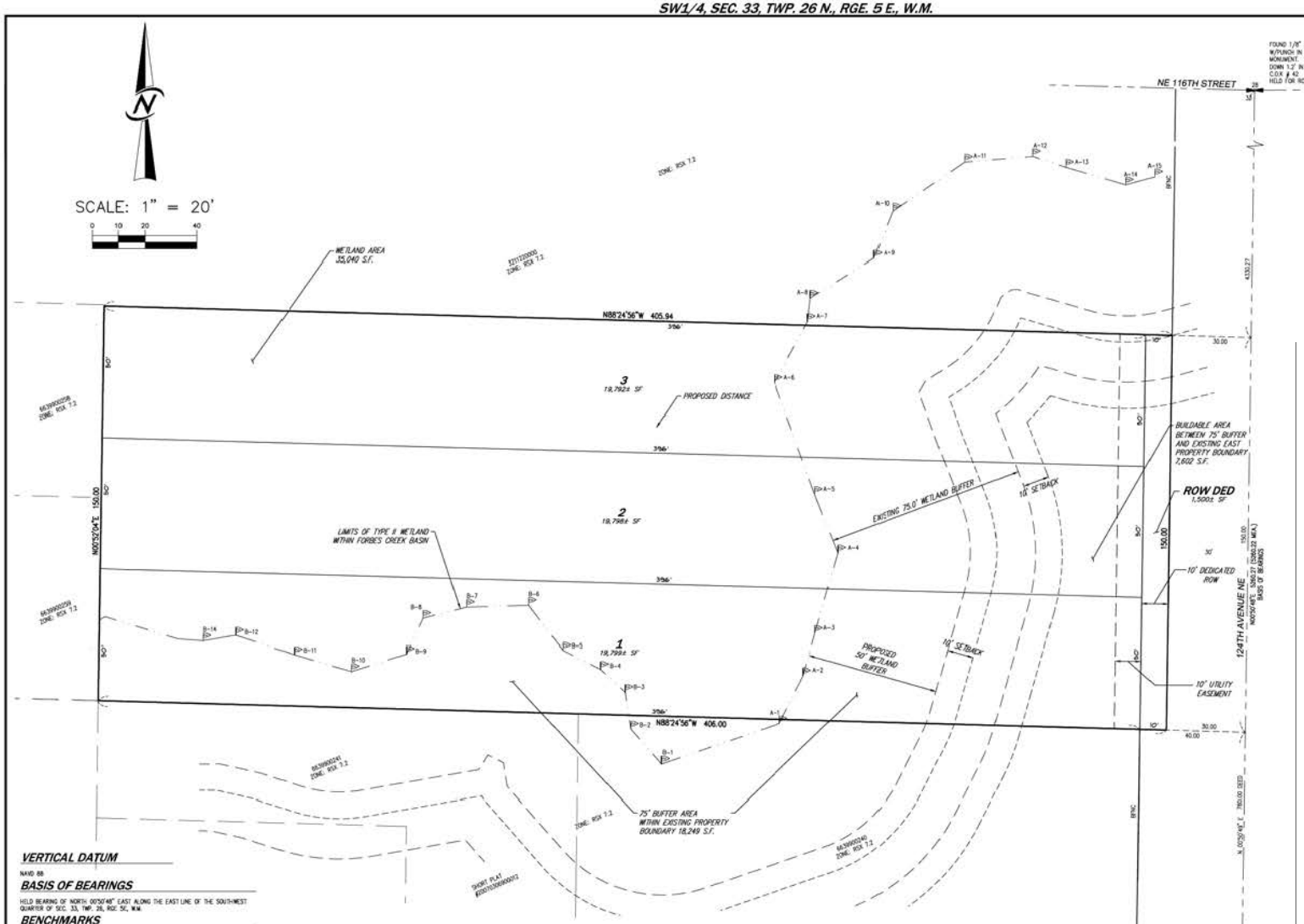
VII. PARTIES OF RECORD

Applicant
Persons submitting public comment
Department of Planning and Community Development
Department of Public Works
Department of Building and Fire Services

A written decision will be issued by the Hearing Examiner within eight calendar days of the date of the open record hearing.


ZHANG SHORT PLAT &
BUFFER MODIFICATION
SUB16-01244, SAR16-01245
PUD
Heather Glen
SUBJECT PROPERTY
Slater Ave NE
124th Ave NE
P
Open
Space
NE 100th Pl
N

SW1/4, SEC. 33, TWP. 26 N., RGE. 5 E., W.M.



VERTICAL DATUM

NAVD 88

BASIS OF BEARINGS

HELD BEARING OF NORTH 00°50'48" EAST ALONG THE EAST LINE OF THE SOUTHWEST QUARTER OF SEC. 33, TWP. 26, RGE. 5E, W.M.

BENCHMARKS

BM-1: 4"X4" CONCRETE MONUMENT WITH 1"X1" LEAD SQUARE AND TACK. ~0.6' IN CASE AT INTERSECTION NE 100TH ST AND 132ND AVE NE.
ELEV. = 356.38

BM-2: CITY OF KIRKLAND SURVEY CONTROL POINT #31, 3" BRASS DISK IN CONC. MON IN CASE AT INTX. 124TH AVE NE AND NE 100TH ST

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTHWEST QUARTER OF SECTION 33, TOWNSHIP 26 NORTH, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE QUARTER CORNER ON THE SOUTH LINE OF SECTION 33, TOWNSHIP 26 NORTH, RANGE 5 EAST, W.M.;

THENCE SOUTH 89°30'WEST 30 FEET;
THENCE NORTH 01°13' WEST 780 FEET TO THE TRUE POINT OF BEGINNING;
THENCE SOUTH 89°30' WEST 406.0 FEET;
THENCE NORTH 01°13' WEST 150.0 FEET;
THENCE NORTH 89°30' EAST 406.0 FEET;
THENCE SOUTH 01°13' EAST 150 FEET TO THE TRUE POINT OF BEGINNING;
(BEING KNOWN AS TRACT 25 PARRISH'S GARDEN TRACTS, ACCORDING TO THE UNRECORDED PLAT THEREOF).

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

DENSITY CALCULATIONS

TOTAL PROPERTY AREA:	60,891 S.F. (1.40± AC.)
WETLAND AREA:	35,040 S.F.
WETLAND BUFFER AREA:	18,249 S.F.
BUILDABLE AREA:	7,602 S.F.
MIN LOT AREA:	7,200 S.F.
WETLAND BUFFER/TOTAL PROPERTY AREA:	30%
DEVELOPMENT FACTOR:	0.8

MAXIMUM DEVELOPMENT POTENTIAL=(BUILDABLE AREA/MIN. LOT AREA) + (WETLAND BUFFER AREA/MIN LOT AREA) X DEVELOPMENT FACTOR

MAXIMUM DEVELOPMENT POTENTIAL=(7,602 S.F./7,200 S.F.) + (18,249 S.F./7,200 S.F.) X 80% = 3.08 UNITS

SETBACKS

	CODE	PROPOSED
FRONT	20	20
SIDE*	5/15	5
REAR	10	10

* CODE SECTION 15.30.080 REQUIRES SIDE YARDS TO BE 5' MIN WITH TWO SIDE YARDS TOTALING 15'. THE PROJECT IS PROPOSING 5' SIDE YARD SETBACKS FOR BOTH SIDE YARDS AS ALLOWED BY CODE SECTION 90.140.6

SITE STATISTICS

PARCEL NUMBER: 6639900250
LAND USE CODE: RSX 7.2
SITE AREA: 60,891 S.F.

	CODE RSX7.2	PROPOSED
MINIMUM LOT AREA (KZC 15.310)	7,200 S.F.	19,793 S.F.
TOTAL NUMBER OF DWELLING UNITS	3 (3.08)	3
MAXIMUM BUILDING HEIGHT	30' ABOVE ABE	
MAXIMUM BUILDING COVERAGE	50%	

APPLICANT/OWNER

QIAN (ELINA) ZHANG
16508 SE 46TH CT.
BELLEVUE, WA 98006
(919) 961-3155
CONTACT: QIAN (ELINA) ZHANG

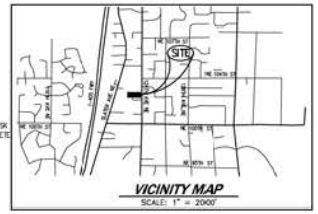
ENGINEER/SURVEYOR/ LANDSCAPE ARCHITECT

CORE DESIGN, INC.
14711 N.E. 29TH PL. SUITE 101
BELLEVUE, WA 98007
(425) 885-7877
CONTACT: GINA R. BROOKS, P.E.
ROBERT D. WEST, P.L.S.
LADSEY SOLORIO, P.L.A.

PERMIT NUMBER

SHEET INDEX

1 PRELIMINARY SHORT PLAT
2 PRELIMINARY CLEARING & GRADING PLAN
3 PRELIMINARY ROAD & UTILITY PLAN
4 PRELIMINARY TREE RETENTION PLAN



VICINITY MAP
SCALE: 1" = 2000'

No.	REVISIONS	DATE
1	REVISED PER CITY COMMENTS	2/2/16
2	REVISED PER CITY COMMENTS	7/29/16
3	REVISED PER CITY COMMENTS	8/30/16
4	REVISED PER CITY COMMENTS	9/22/16
5	REVISED PER CITY COMMENTS	12/20/16
6	REVISED PER CITY COMMENTS	2/2/17

CORE DESIGN
ENGINEERING · PLANNING · SURVEYING
14711 NE 29th Place Suite 101
Bellevue, Washington 98007
425.885.7877 Fax 425.885.7963

PRELIMINARY SHORT PLAT
ZHANG SHORT PLAT
QIAN (ELINA) ZHANG
16508 SE 46TH CT.
BELLEVUE, WA 98006

DATE: MAY 2016
DESIGNED: GINA R. BROOKS, P.E.
DRAWN: I.L. KENDALL
APPROVED: GINA R. BROOKS, P.E.
PROJECT MANAGER

SHEET 1 OF 4
PROJECT NUMBER 16036

TREE TABLE

TREE #	SIZE	TYPE	DRIP LINE DIAMATER	TAG NUMBER
T1	26"	FIR	30'	501
T2	34"	FIR	30'	502
T3	36"	MAPLE	45'	503
T4	26"	FIR	30'	504
T5	26"	MAPLE	40'	505
T6	35"	MAPLE	65'	506
T7	39"	FIR	40'	507
T8	12&8"	D	35'	508
T9	12"	FIR	16'	509
T10	12"	MAPLE	20'	510
T11	24"	SNAG	N/A	511
T12	40"	MAPLE	65'	512
T13	7"	D	15'	513
T14	15"	D	22'	515
T15	10"	D	20'	516
T16	22"	D	30'	517
T17	12"	D	30'	518
T18	12"	D	20'	519
T19	10"	D	15'	520
T20	22"	D	40'	521
T21	10"	D	25'	523
T22	10"	D	25'	524
T23	35"	D	40'	525
T24	12"	D	20'	527
T25	12"	D	20'	528
T26	15"	D	25'	529
T27	10"	D	15'	530
T28	15"	D	35'	531
T29	14"	D	20'	532
T30	15"	D	20'	533
T31	10"	D	15'	534
T32	7"	D	10'	535
T33	8"	D	10'	537
T34	10"	D	10'	538
T35	12"	D	15'	539
T36	18"	D	30'	665
T37	7"	D	25'	666
T38	10"	D	25'	667
T39	14"	D	30'	668
T40	18"	D	35'	669
T41	12"	D	20'	670
T42	20"	D	40'	671
T43	7"	D	15'	672
T44	8"	D	25'	673
T45	26"	F	40'	674
T46	32"	F	40'	675
T47	34"	F	40'	676
T48	7"	D	15'	677
T49	11"	D	20'	678
T50	42"	F	50'	679
T51	44"	F	50'	680
T52	20"	M	40'	685
T53	18"	M	35'	686
T54	26,18+16	M	60'	687
T55	12"	D	30'	688

TREE TABLE

TREE #	SIZE	TYPE	DRIP LINE DIAMATER	TAG NUMBER
T56	13"	D	25'	689
T57	24"	D	35'	691
T58	14"	D	25'	695
T59	26"	F	20'	696
T60	10"	D	25'	697
T61	16"	D	30'	700
T62	13"	D	13'	706
T63	10"	D	30'	707
T64	14"	D	25'	708
T65	10&9"	D	20'	711
T66	12""	D	20'	712
T67	12"	D	20'	713
T68	24&15"	M	50"	770
T69	24"	M	45'	771
T70	26"	M	45'	772
T71	28&26"	M	60'	773
T72	28"	M	50'	774
T73	38"	F	45"	777
T74	10"	D	20'	778
T75	10"	D	20'	779
T76	10"	D	20'	780
T77	12,8,6,4"	D	30'	783
T78	12"	D	25'	784
T79	9,10""	D	35'	787
T80	6,9""	D	25'	788
T81	8"	D	20'	789
T82	12,10"	D	50'	793
T83	14,11"	D	35'	794
T84	14"	D	40'	795
T85	13"	D	25'	802
T86	10"	D	35'	809
T87	13"	D	30'	810
T88	16,10"	M	50'	811
T89	38"	M	60'	815
T90	42&30"	M	70'	816
T91	32"	M	50'	817
T92	38"	D	60'	828
T93	10"	D	30'	829
T94	13,9,7"	D	50'	830
T95	16"	D	40'	831
T96	10"	D	15'	832
T97	8"	D	25'	833
T98	12"	D	35'	834
T99	13&9"	D	40'	835
T100	14"	D	35'	838
T101	14&15"	D	40'	839
T102	16"	D	35'	840
T103	12&2x6"	D	40'	841
T104	18&12"	SNAG	N/A'	843
T105	18"	M	35'	847
T106	10&8"	M	20'	848
T107	16,15,12"	D	55'	849
T108	16"	D	40'	850
T109	10"	D	25'	851
T110	13"	D	25'	852

TREE TABLE

TREE #	SIZE	TYPE	DRIP LINE DIAMATER	TAG NUMBER
T111	12"	P	22'	853
T112	20"	D	45'	854
T113	18"	D	40'	857
T114	18&7"	D	40'	858
T115	13"	D	35'	859
T116	16"	D	40'	860
T117	2x13"	D	45'	861
T118	8"	D	20'	862
T119	10"	D	25'	863
T120	10&8"	D	30'	865
T121	2x6,9,8,7	D	30'	866
T122	22,7,8"	D	35'	867
T123	15"	M	35'	869
T124	11"	M	20'	870
T125	24"	M	38'	871

GENERAL NOTES

1. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.

2. UNDERGROUND UTILITIES WERE LOCATED BASED ON THE SURFACE EVIDENCE OF UTILITIES (I.E. PAINT MARKS, SAW CUTS IN PAVEMENT, COVERS, LIDS ETC.) THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, ELEVATION AND SIZE OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

3. TREE SIZES WERE LOCATED & SPECIES DETERMINED TO THE BEST OF OUR ABILITY. HOWEVER, TYEE SURVEYORS DOES NOT WARRANT THE ACCURACY OF SIZE & SPECIES SHOWN HEREON. ANY TREES CONSIDERED TO BE CRITICAL SHOULD BE VERIFIED BY A TRAINED ARBORIST.

4. THIS MAP DOES NOT PURPORT TO SHOW EASEMENTS OF RECORD, IF ANY.

5. NO PROPERTY CORNERS WERE SET IN CONJUNCTION WITH THIS SURVEY.

LEGAL DESCRIPTION

PER STATUTORY WARRANTY DEED RECORDING #20151016001446

THAT PORTION OF THE SOUTHWEST QUARTER OF SECTION , TOWNSHIP 26 NORHT, RANGE 5 EAST, W.M., IN KING COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE QUARTER CORNER ON THE SOUTH LINE OF SECTION 33, TOWNSHOP 26 NORHT, RANGE 5 EAST, W.M.;
THENCE SOUTH 89°30 WEST 30 FEET;
THENCE NORHT 01°13 WEST 780 FEET TO THE TRUE POINT OF BEGINING;
THENCE SOUTH 89°30 WEST 406.0 FEET;
THENCE NORHT 01°13 WEST 150.0 FEET;
THENCE NORHT 89°30 EAST 406.0 FEET;
THENCE SOUTH 01°13 EAST 150 FEET TO THE TRUE POINT OF BEGINNING;
(BEING KNOWN AS TRACT 25 PARRISH'S GARDEN TRACTS, ACCORDING TO THE UNRECORDED PLAT THEREOF)

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

DATUM

NAVD 88

CONTOUR INTERVAL = 2'

EQUIPMENT & PROCEDURES

FIELD SURVEY CONDUCTED USING A COMBINATION OF GPS USING A REFERENCE NETWORK AND A 5" ELECTRONIC TOTAL STATION WAS USED FOR THIS FIELD TRAVERSE SURVEY.
SURVEY PROCEDURES MEET OR EXCEED STATE STANDARDS AS SPECIFIED BY W.A.C. 332-130 WITH REGARD TO LINEAR AND ANGULAR CLOSURES.
ALL MEASURING INSTRUMENTS FOR THIS SURVEY HAVE BEEN MAINTAINED ACCORDING TO MANUFACTURES SPECIFICATIONS AND HAVE BEEN COMPARED WITH A NATIONAL GEODETIC SURVEY CALIBRATED BASELINE WITHIN THE LAST 12 MONTHS.

BENCHMARKS

BM-1: 4"X4" CONCRETE MONUMNET WTIH 1"X1" LEAD SQUARE AND TACK -0.8' IN CASE AT INTERSECTION NE 100TH ST AND 132ND AVE NE.
ELEV. = 316.39

BM-2: CITY OF KIRKLAND SURVEY CONTROL POINT #31. 3" BRASS DISK IN CONC. MON IN CASE AT INTX. 124TH AVE NE AND NE 100TH ST

TBM - A: SET MAG NAIL.
ELEV. = 249.50

TBM - B: SET MAG NAIL
ELEV. = 240.20

BASIS OF BEARING

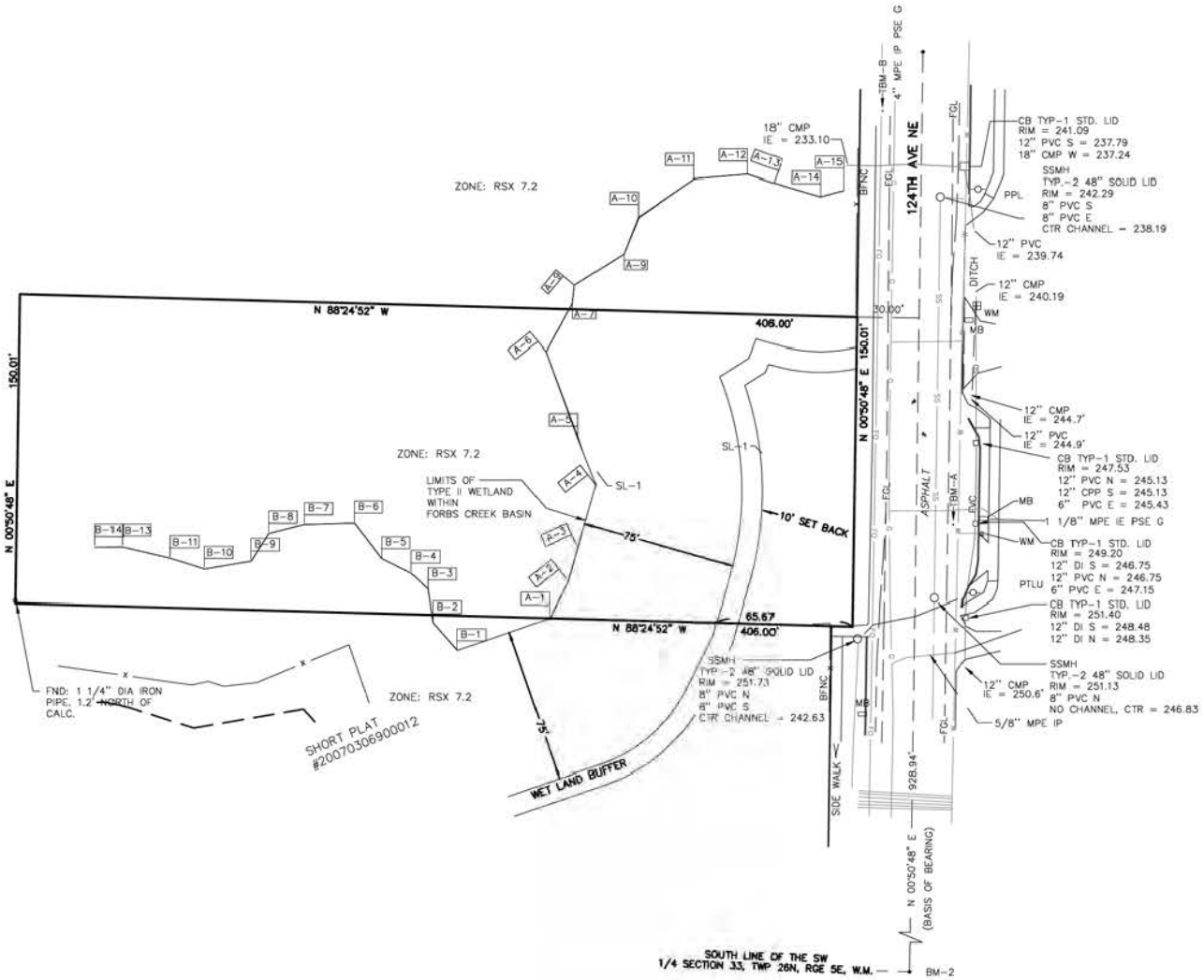
HELD BEARING OF NORTH 00°50'48" EAST ALONG THE EAST LINE OF THE SOUTHWEST QUARTHER OF SEC. 33, TWP. 26, RGE 5E, W.M. BEING THE INVERSE OF NAD 83/91 CORRDINATES AT THE NORHT 1/4 CORNER AND THE SOUTH 1/4 CORNER OF SAID SECTION 33 PUBLISHED BY THE CITY OF KIRKLAND.

SE1/4, SW1/4, SEC. 33, T. 26 N., R. 5 E., W.M.
CITY OF KIRKLAND, WASHINGTON

TOPOGRAPHIC SURVEY
for
ELINA ZHANG

TYEE SURVEYORS
Tyee Surveyors
PROFESSIONAL LAND SURVEYORS
10007 GREENWOOD AV. N. SEATTLE, WA. 98133 206-525-3660

DRAWN BY:	DATE:	JOB NO.:
RG	7-5-16	15217
CHKD BY:	SCALE:	SHEET:
TG	1" = 40'	1 of 4



LEGEND:

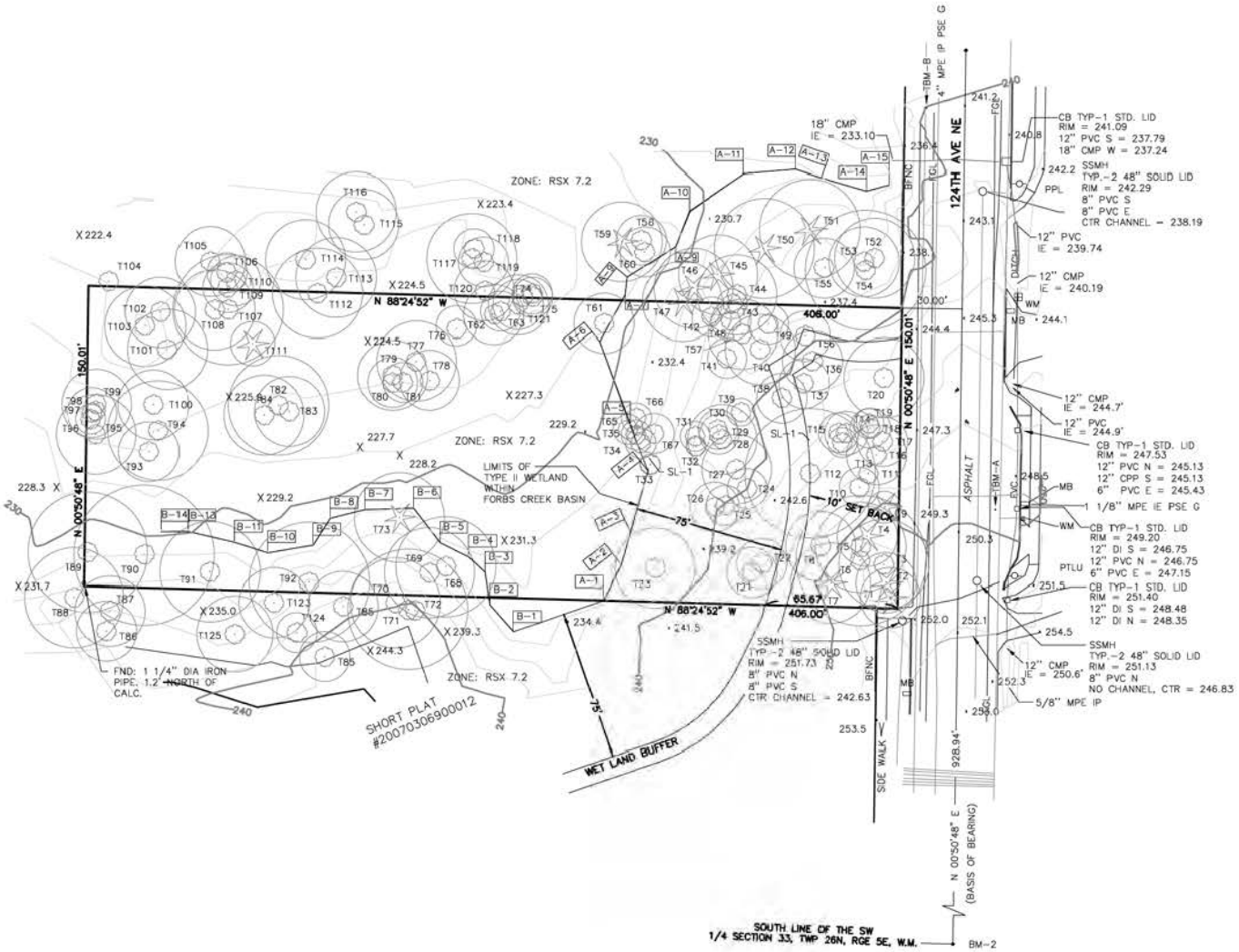
BFNC	BOARD FENCE
CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
FGL	FOG LINE
FVC	FACE VERTICAL CURB
MB	MAIL BOX
PPL	POWER POLE W/LIGHT
PPU	POWER POLE W/UNDERGROUND
PTL	POWER POLE W/XFMR&LIGHT
PTLU	POWER POLE W/XFMR&LIGHT&UG
SSMH	SANITARY SEWER MANHOLE
WM	WATER METER

SE1/4, SW1/4, SEC. 33, T. 26 N., R. 5 E., W.M.
CITY OF KIRKLAND, WASHINGTON

WETLAND SURVEY
for
ELINA ZHANG

Tyee Surveyors
PROFESSIONAL LAND SURVEYORS
10007 GREENWOOD AV. N. SEATTLE, WA. 98133 206-525-3660

DRAWN BY:	DATE:	JOB NO.:
RG	7-5-16	15217
CHKD BY:	SCALE:	SHEET:
TG	1" = 40'	2 of 4



LEGEND:

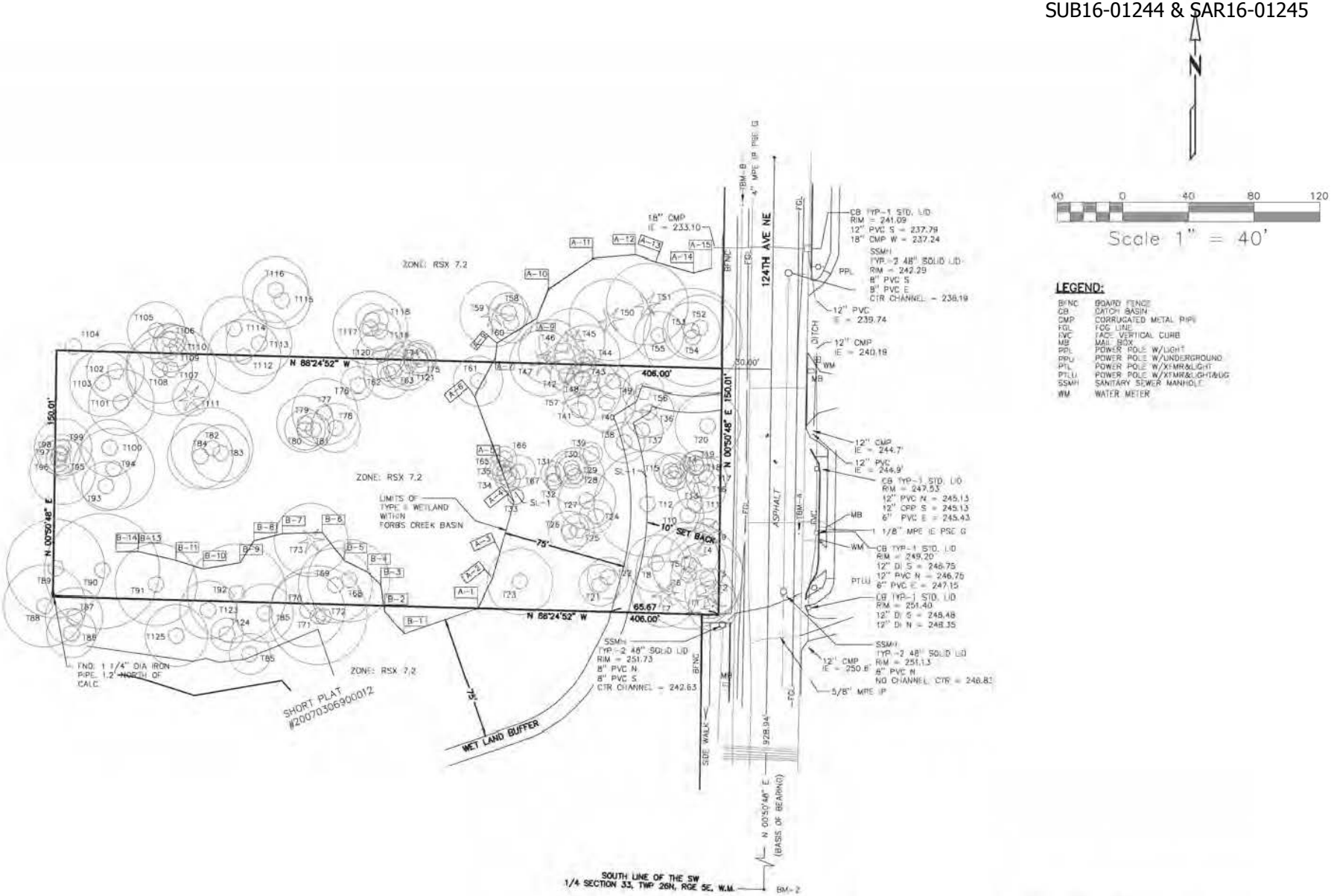
BFNC	BOARD FENCE
CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
FGL	FOG LINE
FVC	FACE VERTICAL CURB
MB	MAIL BOX
PPL	POWER POLE W/LIGHT
PPU	POWER POLE W/UNDERGROUND
PTL	POWER POLE W/XFMR&LIGHT
PTLU	POWER POLE W/XFMR&LIGHT&UG
SSMH	SANITARY SEWER MANHOLE
WM	WATER METER

SE1/4, SW1/4, SEC. 33, T. 26 N., R. 5 E., W.M.
CITY OF KIRKLAND, WASHINGTON

TOPOGRAPHIC SURVEY
for
ELINA ZHANG

Tyee Surveyors
PROFESSIONAL LAND SURVEYORS
10007 GREENWOOD AV. N. SEATTLE, WA. 98133 206-525-3660

DRAWN BY:	DATE:	JOB NO.:
RG	7-5-16	15217
CHKD BY:	SCALE:	SHEET:
TG	1" = 40'	3



SE1/4, SW1/4, SEC. 33, T. 26 N., R. 5 E., W.M.
CITY OF KIRKLAND, WASHINGTON

TREE SURVEY
for
ELINA ZHANG

Tyee Surveyors
PROFESSIONAL LAND SURVEYORS
10007 GREENWOOD AV. N. SEATTLE, WA 98133 206-525-3660

DRAWN BY:	DATE:	JOB NO.:
RG	7-5-18	15217
CHKD BY:	SCALE:	SHEET:
TG	1" = 40'	4

CITY OF KIRKLAND
Planning and Community Development Department
123 Fifth Avenue, Kirkland, WA 98033 425.587.3225
www.kirklandwa.gov

SHORT PLAT DEVELOPMENT STANDARDS LIST

File: Zhang Short Plat and Wetland Buffer Modification

This application must comply with all applicable standards. The listing below outlines those standards in a typical development sequence.
KMC refers to Kirkland Municipal Code, KZC refers to Kirkland Zoning Code

TREE PLAN SUMMARY

KMC 22.28.210 & KZC 95.30 Significant Trees.

A Tree Retention Plan was submitted with the short plat. During the review of the short plat, all proposed improvements were unknown. Therefore KZC Section 95.30 (6)(a) – Phased Review applies in regards to tree retention. There are 50 significant trees within the buffer, building buffer setback and buildable area. These trees have been assessed by staff and the City's Arborist. They are identified by number in the following chart.

Significant Trees:	High Retention Value	Moderate Retention Value	Low Retention Value (V) – viable (NV) – not viable
1			NV - UDI
2			NV - UDI
3			NV - UDI
4			NV - UDI
5			NV - UDI
6			NV - UDI
7			NV - UDI
8			NV - UDI
9			NV - UDI
201			NV - UDI
10			NV - UDI
11			NV - UDI
12			NV - UDI
13			NV - UDI
14			NV - UDI
15			NV - UDI
16			NV - UDI
17			NV - UDI
18			NV - UDI
20			NV - UDI
21			NV-UDI

22			NV - UDI
23	X		
24			NV-UDI
25	X		
26	X		
27	X		
28	X		
29			NV
30			NV
31	X		
32	X		
33	X		
34	X		
35	X		
36			NV - UDI
37			NV - UDI
38			NV - UDI
39			NV
40			NV - UDI
41			NV - UDI
42	X		
43			NV - UDI
47	X		
48			NV
49			NV - UDI
56			NV - UDI
57			NV
66	X		
67	X		
Snag SE of 61	X		

Trees within the building footprints are reasonably proposed for removal due to unavoidable development impacts (UDI).

Trees # 23, 25 through 28, 31 through 35, 42, 47, 66 and 67 are high retention value trees because they are either in good health and condition or are far enough away from the proposed construction that they do not constitute a high risk for the proposed construction. Also noteworthy for retention is the existing snag approximately 25 feet southeast of tree 61. It is more than 50 feet away from the proposed houses and contains active nesting cavities.

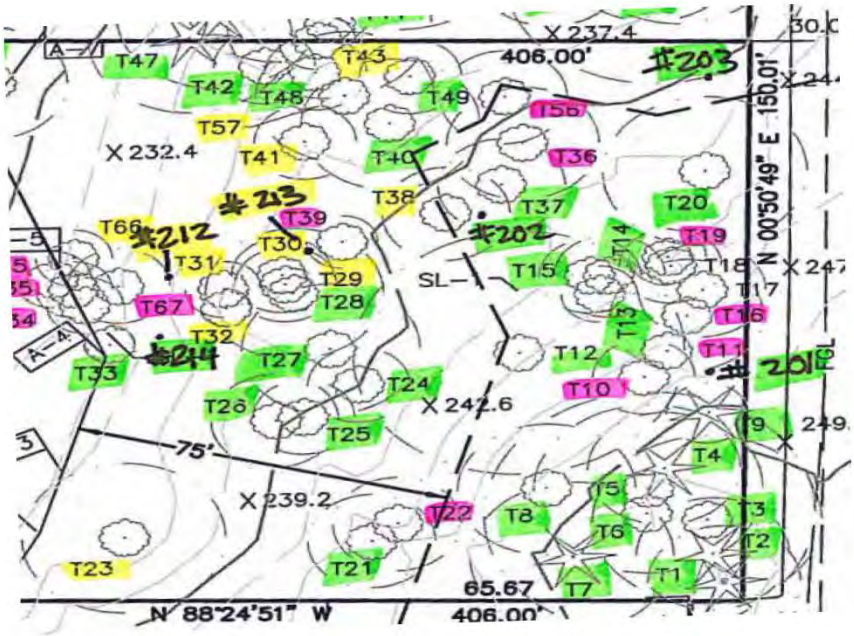
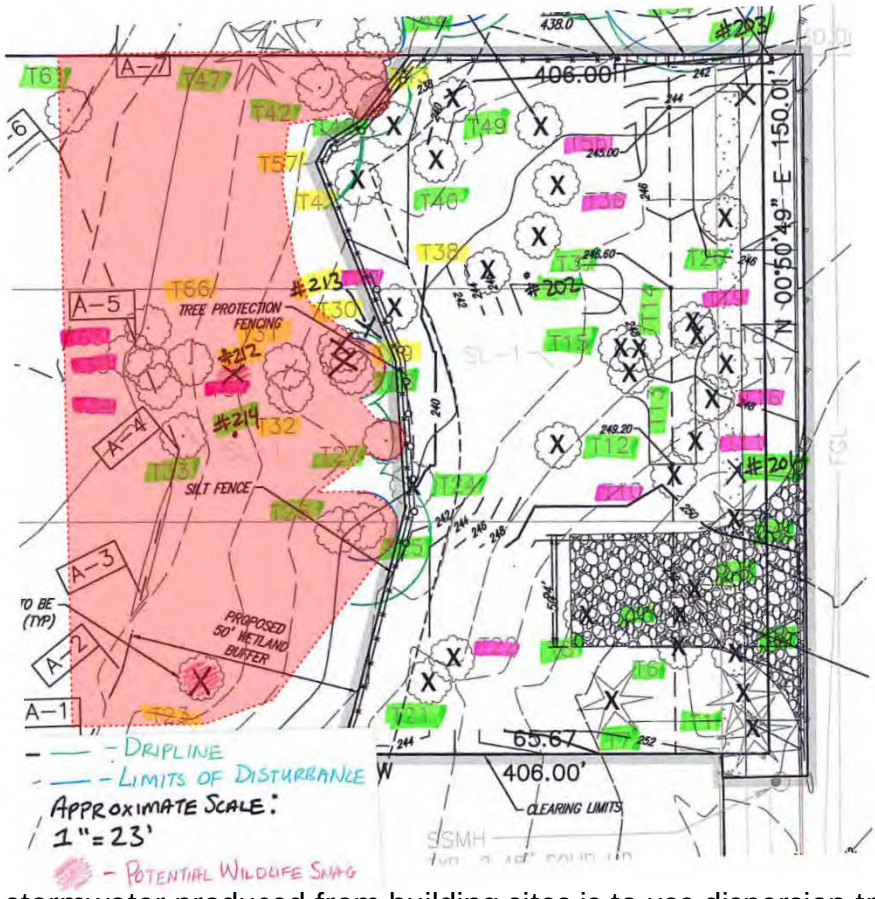


Figure 1: on-site trees and wetland buffer trees



Current thinking in stormwater produced from building sites is to use dispersion trenches. Unfortunately, the arborist report does not include their tree table with the limits of disturbance for each tree but the graphic included accurately depicts locations where dispersal trenches should stay away from, see figure 2.

No trees are to be removed with an approved short plat or subdivision permit. Based on the approved Tree Retention Plan, the applicant shall retain and protect all viable trees throughout the development of each single family lot except for those trees allowed to be removed for the installation of the plat infrastructure improvements with an approved Land Surface Modification permit. Subsequent approval for tree removal is granted for the construction of the house and other associated site improvements with a required Building Permit. The Planning Official is authorized to require site plan alterations to retain High Retention value trees at each stage of the project. In addition to retaining viable trees, new trees may be required to meet the minimum tree density per KZC Section 95.33.

PRIOR TO RECORDING

KMC 22.20.362 Short Plat - Title Report. The applicant shall submit a title company certification which is not more than 30 calendar days old verifying ownership of the subject property on the date that the property owner(s) (as indicated in the report) sign(s) the short plat documents; containing a legal description of the entire parcel to be subdivided; describing any easements or restrictions affecting the property with a description, purpose and reference by auditor's file number and/or recording number; any encumbrances on the property; and any delinquent taxes or assessments on the property.

KMC 22.20.366 Short Plat - Lot Corners. The exterior short plat boundary and all interior lot corners shall be set by a registered land surveyor. If the applicant submits a bond for construction of short plat improvements and installation of permanent interior lot corners, the City may allow installation of temporary interior lot corners until the short plat improvements are completed.

KMC 22.20.390 Short Plat - Improvements. The owner shall complete or bond all required right-of-way, easement, utility and other similar improvements.

KMC 22.32.010 Utility System Improvements. All utility system improvements must be designed and installed in accordance with all standards of the applicable serving utility.

KMC 22.32.020 Water System. The applicant shall install a system to provide potable water, adequate fire flow and all required fire-fighting infrastructure and appurtenances to each lot created.

KMC 22.32.030 Stormwater Control System. The applicant shall comply with the construction phase and permanent stormwater control requirements of the Municipal Code.

KMC 22.32.040 Sanitary Sewer System. The developer shall install a sanitary sewer system to serve each lot created.

KMC 22.32.050 Transmission Line Undergrounding. The applicant shall comply with the utility lines and appurtenances requirements of the Zoning Code.

KMC 22.32.080 Performance Bonds. In lieu of installing all required improvements and components as part of a plat or short plat, the applicant may propose to post a bond, or submit evidence that an adequate security device has been submitted and accepted by the service provider (City of Kirkland and/or Northshore Utility District), for a period of one year to ensure completion of these requirements within one year of plat/short plat approval.

KZC 90.55 Monitoring and Maintenance of Wetland Buffer Modifications:
Modification of a wetland buffer will require that the applicant submit a 5-year monitoring and maintenance plan consistent with the criteria found in 95.55 and which is prepared by a qualified professional and reviewed by the City's wetland consultant. The cost of the plan and the City's review shall be borne by the applicant.

LAND SURFACE MOFICIATION AND/OR BUILDING PERMIT REQUIREMENTS

KMC 27.06.030 Park Impact Fees. New residential units are required to pay park impact fees prior to issuance of a building permit. Please see KMC 27.06 for the current rate. Exemptions and/or credits may apply pursuant to KMC 27.06.050 and KMC 27.06.060. If a

property contains an existing unit to be removed, a “credit” for that unit shall apply to the first building permit of the subdivision.

KZC 90.45 Wetlands and Wetland Buffers. No land surface modification may take place and no improvement may be located in a wetland or within the environmentally sensitive area buffers for a wetland, except as specifically provided.

KZC 90.50 Wetland Buffer Fence. Prior to development, the applicant shall install a six-foot high construction phase fence along the upland boundary of the wetland buffer with silt screen fabric installed per City standard. The fence shall remain upright in the approved location for the duration of development activities. Upon project completion, the applicant shall install between the upland boundary of all wetland buffers and the developed portion of the site, either 1) a permanent 3 to 4 foot tall split rail fence, or 2) permanent planting of equal barrier value.

KZC 90.150 Natural Greenbelt Protective Easement. The applicant shall submit for recording a natural greenbelt protective easement, in a form acceptable to the City Attorney, for recording with King County (see Attachment 11).

KZC 90.155 Liability. The applicant shall enter into an agreement with the City which runs with the property, in a form acceptable to the City Attorney, indemnifying the City for any damage resulting from development activity on the subject property which is related to the physical condition of the stream, minor lake, or wetland (see Attachment 12).

KZC 95.35.2.b.(3)(b)i Tree Protection Techniques. A description and location of tree protection measures during construction for trees to be retained must be shown on demolition and grading plans.

KZC 95.34 Tree Protection. Prior to development activity or initiating tree removal on the site, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities. Protection measures for trees to be retained shall include (1) placing no construction material or equipment within the protected area of any tree to be retained; (2) providing a visible temporary protective chain link fence at least 4 feet in height around the protected area of retained trees or groups of trees until the Planning Official authorizes their removal; (3) installing visible signs spaced no further apart than 15 feet along the protective fence stating “Tree Protection Area, Entrance Prohibited” with the City code enforcement phone number; (4) prohibiting excavation or compaction of earth or other damaging activities within the barriers unless approved by the Planning Official and supervised by a qualified professional; and (5) ensuring that approved landscaping in a protected zone shall be done with light machinery or by hand.

KZC 95.45 Tree Installation Standards. All supplemental trees to be planted shall conform to the Kirkland Plant List. All installation standards shall conform to Kirkland Zoning Code Section 95.45.

KZC 110.60.5 Street Trees. All trees planted in the right-of-way must be approved as to species by the City. All trees must be two inches in diameter at the time of planting as measured using the standards of the American Association of Nurserymen with a canopy that starts at least six feet above finished grade and does not obstruct any adjoining sidewalks or driving lanes.

KZC 95.52 Prohibited Vegetation. Plants listed as prohibited in the Kirkland Plant List shall not be planted in the City.

105.10.2 Pavement Setbacks. The paved surface in an access easement or tract shall be set back at least 5 feet from any adjacent property which does not receive access from that easement or tract. An access easement or tract that has a paved area greater than 10 feet in width must be screened from any adjacent property that does not receive access from it. Screening standards are outlined in this section.

KZC 105.47 Required Parking Pad. Except for garages accessed from an alley, garages serving detached dwelling units in low density zones shall provide a minimum 20-foot by 20-foot parking pad between the garage and the access easement, tract, or right-of-way providing

access to the garage.

KZC 115.25 Work Hours. It is a violation of this Code to engage in any development activity or to operate any heavy equipment before 7:00 am. or after 8:00 pm Monday through Friday, or before 9:00 am or after 6:00 pm Saturday. No development activity or use of heavy equipment may occur on Sundays or on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas Day. The applicant will be required to comply with these regulations and any violation of this section will result in enforcement action, unless written permission is obtained from the Planning Official.

KZC 115.40 Fence Location. Fences over 6 feet in height may not be located in a required setback yard. A detached dwelling unit abutting a neighborhood access or collector street may not have a fence over 3.5 feet in height within the required front yard. No fence may be placed within a high waterline setback yard or within any portion of a north or south property line yard, which is coincident with the high waterline setback yard.

KZC 115.42 Floor Area Ratio (F.A.R.) Limits. Floor area for detached dwelling units is limited to a maximum floor area ratio in low density residential zones. See Use Zone charts for the maximum percentages allowed. This regulation does not apply within the disapproval jurisdiction of the Houghton Community Council.

KZC 115.43 Garage Requirements for Detached Dwelling Units in Low Density Zones. Detached dwelling units served by an open public alley, or an easement or tract serving as an alley, shall enter all garages from that alley. Whenever practicable, garage doors shall not be placed on the front façade of the house. Side-entry garages shall minimize blank walls. For garages with garage doors on the front façade, increased setbacks apply, and the garage width shall not exceed 50% of the total width of the front façade. These regulations do not apply within the disapproval jurisdiction of the Houghton Community Council. Section 115.43 lists other exceptions to these requirements.

KZC 115.75.2 Fill Material. All materials used as fill must be non-dissolving and non-decomposing. Fill material must not contain organic or inorganic material that would be detrimental to the water quality, or existing habitat, or create any other significant adverse impacts to the environment.

KZC 115.90 Calculating Lot Coverage. The total area of all structures and pavement and any other impervious surface on the subject property is limited to a maximum percentage of total lot area. See the Use Zone charts for maximum lot coverage percentages allowed. Section 115.90 lists exceptions to total lot coverage calculations See Section 115.90 for a more detailed explanation of these exceptions.

KZC 115.95 Noise Standards. The City of Kirkland adopts by reference the Maximum Environmental Noise Levels established pursuant to the Noise Control Act of 1974, RCW 70.107. See Chapter 173-60 WAC. Any noise, which injures, endangers the comfort, repose, health or safety of persons, or in any way renders persons insecure in life, or in the use of property is a violation of this Code.

KZC 115.115 Required Setback Yards. This section establishes what structures, improvements and activities may be within required setback yards as established for each use in each zone.

KZC 115.115.3.g Rockeries and Retaining Walls. Rockeries and retaining walls are limited to a maximum height of four feet in a required yard unless certain modification criteria in this section are met. The combined height of fences and retaining walls within five feet of each other in a required yard is limited to a maximum height of 6 feet, unless certain modification criteria in this section are met.

KZC 115.115.3.n Covered Entry Porches. In residential zones, covered entry porches on dwelling units may be located within 13 feet of the front property line if certain criteria in this section are met. This incentive is not effective within the disapproval jurisdiction of the Houghton Community Council.

KZC 115.115.3.o Garage Setbacks. In low density residential zones, garages meeting

certain criteria in this section can be placed closer to the rear property line than is normally allowed in those zones.

KZC 115.115.3.p HVAC and Similar Equipment: These may be placed no closer than five feet of a side or rear property line, and shall not be located within a required front yard; provided, that HVAC equipment may be located in a storage shed approved pursuant to subsection (3)(m) of this section or a garage approved pursuant to subsection (3)(o)(2) of this section. All HVAC equipment shall be baffled, shielded, enclosed, or placed on the property in a manner that will ensure compliance with the noise provisions of KZC 115.95.

KZC 115.115.5.a Driveway Width and Setbacks. For a detached dwelling unit, a driveway and/or parking area shall not exceed 20 feet in width in any required front yard, and shall be separated from other hard surfaced areas located in the front yard by a 5-foot wide landscape strip. Driveways shall not be closer than 5 feet to any side property line unless certain standards are met.

KZC 115.135 Sight Distance at Intersection. Areas around all intersections, including the entrance of driveways onto streets, must be kept clear of sight obstruction as described in this section.

KZC 145.22.2 Public Notice Signs. Within seven (7) calendar days after the end of the 21-day period following the City's final decision on the permit, the applicant shall remove all public notice signs.

PRIOR TO OCCUPANCY

KZC 90.145 Bonds. The City may require a bond and/or a perpetual landscape maintenance agreement to ensure compliance with any aspect of the Drainage Basins chapter or any decision or determination made under this chapter.

KZC 95.50.2.b Tree Maintenance. For detached dwelling units, the applicant shall submit a 5-year tree maintenance agreement to the Planning Department to maintain all pre-existing trees designated for preservation and any supplemental trees required to be planted.

KZC 110.60.6 Mailboxes. Mailboxes shall be installed in the development in a location approved by the Postal Service and the Planning Official. The applicant shall, to the maximum extent possible, group mailboxes for units or uses in the development.

KZC 110.75 Bonds. The City may require or permit a bond to ensure compliance with any of the requirements of the Required Public Improvements chapter.

Permit #: SUB16-01244
Project Name: 3 lots SPL on 124th Ave
Project Address: 102XX 124th Ave NE
Date: February 17, 2017

PUBLIC WORKS CONDITIONS

Building and Land Surface Modification (Grading) Permit Process:
Philip Vartanian, Development Engineer
Phone: 425-587-3856 Fax: 425-587-3807
E-mail: pvartanian@kirklandwa.gov

General Conditions:

1. All public improvements associated with this project including street and utility improvements, must meet the City of Kirkland Public Works Pre-Approved Plans and Policies

Manual. A Public Works Pre-Approved Plans and Policies manual can be purchased from the Public Works Department, or it may be retrieved from the Public Works Department's page at the City of Kirkland's web site.

2. This project will be subject to Public Works Permit and Connection Fees. It is the applicant's responsibility to contact the Public Works Department by phone or in person to determine the fees. The applicant should anticipate the following fees:

o Water, Sewer, and Surface Water Connection Fees (paid with the issuance of a Building Permit)

o Side Sewer Inspection Fee (paid with the issuance of a Building Permit)

o Water Meter Fee (paid with the issuance of a Building Permit)

o Right-of-way Fee

o Review and Inspection Fee (for utilities and street improvements).

o Building Permits associated with this proposed project will be subject to the traffic, park, and school impact fees per Chapter 27 of the Kirkland Municipal Code. The impact fees shall be paid prior to issuance of the Building Permit(s). Any existing buildings within this project which are demolished will receive a Traffic Impact Fee credit, Park Impact Fee Credit and School Impact Fee Credit. This credit will be applied to the first Building Permits that are applied for within the project. The credit amount for each demolished building will be equal to the most currently adopted Fee schedule.

3. All street and utility improvements shall be permitted by obtaining a Land Surface Modification (LSM) Permit, including the required LSM Checklist.

4. Submittal of Building Permits within a subdivision prior to recording:

• Submittal of a Building Permit with an existing parcel number prior to subdivision recording: A Building Permit can be submitted prior to recording of the subdivision for each existing parcel number in the subject project, however in order for the Building Permit to be deemed a complete application, all of the utility and street improvements for the new home must be submitted with application. However, the Building Permit will not be eligible for issuance until after the Land Surface Modification Permit is submitted, reviewed, and approved to ensure the comprehensive storm water design required by the subdivision approval is reviewed and approved, and then shown correctly on the Building Permit plans to match the Land Surface Modification Permit.

• Submittal of Building Permits within an Integrated Development Plan (IDP): If this subdivision is using the IDP process, the Building Permits for the new homes can only be applied for after the Land Surface Modification Permit has been submitted, reviewed, and approved.

• Review of Expedited or Green Building Permits: A new single family home Building Permit within a subdivision can only be review on an expedited or green building fast track if submitted electronically through MBP and the Land Surface Modification permit has been submitted, reviewed, and approved.

5. Subdivision Performance and Maintenance Securities:

• The subdivision can be recorded in advance of installing all the required street and utility improvements by posting a performance security equal to 130% of the value of work. This security amount will be determined by using the City of Kirkland's Improvement Evaluation Packet (available in either Excel or PDF). Contact the Development Engineer assigned to this project to assist with this process.

• If the Developer will be installing the improvements prior to recording of the subdivision, there is a standard right of way restoration security ranging from $10,000.00 to 30,000.00 (value determined based on amount of right-of-way disruption). This security will be held until the project has been completed.

• Once the subdivision has been completed there will be a condition of the permit to establish a two year Maintenance security.

• If a recording Performance Security has not yet been posted, then prior to issuance of the LSM Permit a standard right of way restoration security ranging from $10,000.00 to 30,000.00 (value determined based on amount of ROW disruption) shall be posted with Public Works Department. This security will be held until the project has been completed

6. All civil engineering plans which are submitted in conjunction with a building, grading, or right-of-way permit must conform to the Public Works Policy G-7, Engineering Plan Requirements. This policy is contained in the Public Works Pre-Approved Plans and Policies manual.

7. All street improvements and underground utility improvements (storm, sewer, and water) must be designed by a Washington State Licensed Engineer; all drawings shall bear the engineers stamp.

8. All plans submitted in conjunction with a building, grading or right-of-way permit must have elevations which are based on the King County datum only (NAVD 88).

9. A completeness check meeting is required prior to submittal of any Building Permit applications.

10. The required tree plan shall include any significant tree in the public right-of-way along the property frontage.

11. All subdivision recording documents shall include the following language:

o Utility Maintenance: Each property owner shall be responsible for maintenance of the sanitary sewer, storm water stub, rain garden, permeable pavement, or any infiltration facilities (known as Low Impact Development) from the point of use on their own property to the point of connection in the City sanitary sewer main or storm water main. Any portion of a sanitary sewer, surface water stub, rain garden, permeable pavement, or any infiltration facilities, which jointly serves more than one property, shall be jointly maintained and repaired by the property owners sharing such stub. The joint use and maintenance shall “run with the land” and will be binding on all property owners within this subdivision, including their heirs, successors and assigns.

o Public Right-of-way Sidewalk and Vegetation Maintenance: Each property owner shall be responsible for keeping the sidewalk abutting the subject property clean and litter free. The property owner shall also be responsible for the maintenance of the vegetation within the abutting landscape strip. The maintenance shall “run with the land” and will be binding on all property owners within this subdivision, including their heirs, successors and assigns.

If the lots have on-site private storm water facilities, include this language on the subdivision recording document:

o Maintenance of On-site Private Stormwater Facilities: Each Lot within the Subdivision has a stormwater facility (infiltration trench, dry wells, dispersion systems, rain garden, and permeable pavement) which is designed to aid storm water flow control for the development. The stormwater facility within the property shall be owned, operated and maintained by the Owner. The City of Kirkland shall have the right to ingress and egress the Property for inspection of and to reasonable monitoring of the performance, operational flows, or defects of the stormwater/flow control facility.

If the City of Kirkland determines related maintenance or repair work of the stormwater facility is required, the City of Kirkland shall give notice to the Owner of the specific maintenance and/or repair work required. If the above required maintenance or repair is not completed within the time set by the City of Kirkland, the City of Kirkland may perform the required maintenance or repair, or contract with a private company capable of performing the stormwater facility maintenance or repair and the Owner will be required to reimburse the City for any such work performed.

The Owner is required to obtain written approval from the City of Kirkland prior to replacing, altering, modifying or maintaining the storm water facility.

If the project contains LID storm improvements that will be installed as a condition of the new

home Building Permit, then include this condition on the Short Plat recording documents:

o Installation of Low Impact Development (LID) storm drainage improvements with Building Permits: All LID storm drainage features depicted on Sheet ____ of ____ of issued permit LSM1X-0XXXX shall be installed in conjunction with the construction of each new home on lots X to X. The LID improvements include, but are not limited to the rain gardens and the pervious driveways. The Building Permit for the new signal family home on lots X to X will not receive a final inspection until said LID improvements are installed. The pervious access road/Tract serving lots X and X shall be constructed or secured by a performance bond prior to recording of the short plat

Sanitary Sewer Conditions:

1. The existing sanitary sewer main within the public right-of-way along the front of the property is adequate to serve all the lots within the proposed project.

2. Provide a 6-inch minimum side sewer stub for each lot.

3. All side sewer stubs serving the property shall be PVC type pipe per Public Works Pre-approved Plans Sanitary Sewer Design Criteria.

Water System Conditions:

1. The existing water main in the public right-of-way along the front of the subject property is adequate to serve this proposed development.

2. Provide a separate 1" minimum water service from the water main to the meter for each lot; City of Kirkland will set the water meter. The water size is determined when the Building Permit is submitted and is sized per the Uniform Plumbing Code. A ¾" meter is the typical size for new single-family home.

3. If parcel is subdivided in to three lots, a single manifold water service tap can be used to provide water service to the lots. See CK-W.33

Surface Water Conditions:

1. Provide temporary and permanent storm water control per the 2009 King County Surface Water Design Manual and the Kirkland Addendum (Policy D-10). See Policies D-2 and D-3 in the PW Pre-Approved Plans for drainage review information, or contact city of Kirkland Surface Water staff at (425) 587-3800 for help in determining drainage review requirements. The drainage review levels can be determined using the Drainage Review Flow Chart. Summarized below are the levels of drainage review based on site and project characteristics:

• Full Drainage Review

☐ A full drainage review is required for any proposed project, new or redevelopment, that will:

☐ Adds 5,000ft2 or more of new impervious surface area or 10,000ft2 or more of new plus replaced impervious surface area,

☐ Propose 7,000ft2 or more of new pervious surface or,

☐ Be a redevelopment project on a single or multiple parcel site in which the total of new plus replaced impervious surface area is 5,000ft2 or more and whose valuation of proposed improvements (including interior improvements but excluding required mitigation and frontage improvements) exceeds 50% of the assessed value of the existing site improvements.

2. The preliminary drainage report (Technical Information Report) submitted with the SUB application indicates that project can meet the exception for 0.1 CFS post/pre development conditions. The Storm design will focus on Dispersion and other low impact development facilities to meet flow control onsite. The storm and other utilities design will be finalized with future LSM permit.

3. Evaluate the feasibility and applicability of dispersion, infiltration, and other stormwater

low impact development facilities on-site (per section 5.2 in the 2009 King County Surface Water Design Manual). If feasible, stormwater low impact development facilities are required. See PW Pre-Approved Plan Policy L-1 or L-2 (depending on drainage review) for more information on this requirement.

4. If a storm water detention system is required, it shall be designed to Level II standards. Historic (forested) conditions shall be used as the pre-developed modeling condition.

5. Provide a level one off-site analysis (based on the King County Surface Water Design Manual, core requirement #2).

6. Any work within an existing ditch will be required, however the developer has been given notice that the Army Corps of Engineers (COE) has asserted jurisdiction over upland ditches draining to streams. Either an existing Nationwide COE permit or an Individual COE permit may be necessary for work within ditches, depending on the project activities.

Applicants should obtain the applicable COE permit; information about COE permits can be found at: U.S. Army Corps of Engineers, Seattle District Regulatory Branch http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx

Specific questions can be directed to: Seattle District, Corps of Engineers, Regulatory Branch, CENWS-OD-RG, Post Office Box 3755, Seattle, WA 98124-3755, Phone: (206) 764-3495

7. A Hydraulic Project Approval (HPA) from WA State Department of Fish and Wildlife (WDFW) may be required for this project. Contact WDFW at 425-313-5681 or Christa.Heller@dfw.wa.gov for determination, obtain an HPA if required, and submit a copy to COK. If an HPA is not required, the applicant may be required to provide written documentation from WDFW as verification. More information on HPAs can be found at the following website: http://wdfw.wa.gov/licensing/hpa/

8. Provide an erosion control report and plan with Building or Land Surface Modification Permit application. The plan shall be in accordance with the 2009 King County Surface Water Design Manual.

9. Construction drainage control shall be maintained by the developer and will be subject to periodic inspections. During the period from May 1 and September 30, all denuded soils must be covered within 7 days; between October 1 and April 30, all denuded soils must be covered within 12 hours. Additional erosion control measures may be required based on site and weather conditions. Exposed soils shall be stabilized at the end of the workday prior to a weekend, holiday, or predicted rain event.

10. Provide collection and conveyance of right-of-way storm drainage

11. Provide a separate storm drainage connection for each lot. All roof and driveway drainage must be tight-lined to the storm drainage system or utilize low impact development techniques. The tight line connections shall be installed with the individual new houses.

12. Provide a plan and profile design for the storm system.

Street and Pedestrian Improvement Conditions:

1. The subject property abuts 124th Ave NE. This street is an Arterial type street. Zoning Code sections 110.10 and 110.25 require the applicant to make half-street improvements in rights-of-way abutting the subject property. Section 110.30-110.50 establishes that this street must be improved with the following:

A. Widen the street to 23 ft. from centerline to face of curb. Match existing curb line and improvement to the South.
B. Install storm drainage, curb and gutter, an 11.5 ft. planter strip with street trees 30 ft. on-center, and a 5 ft. wide sidewalk. Matching improvement to the South.
C. Provide 10' dedicate along 124th Ave NE to encompass required improvements. See Policy R-12 and R-12.C

D. Only two driveway cuts will be allowed for the project, two lots will have to share one driveway cut.

2. When three or more utility trench crossings occur within 150 lineal ft. of street length or where utility trenches parallel the street centerline, the street shall be overlaid with new asphalt or the existing asphalt shall be removed and replaced per the City of Kirkland Street Asphalt Overlay Policy R-7.
   - Existing streets with 4-inches or more of existing asphalt shall receive a 2-inch (minimum thickness) asphalt overlay. Grinding of the existing asphalt to blend in the overlay will be required along all match lines.
   - Existing streets with 3-inches or less of existing asphalt shall have the existing asphalt removed and replaced with an asphalt thickness equal or greater than the existing asphalt provided however that no asphalt shall be less than 2-inches thick and the subgrade shall be compacted to 95% density.

3. Remove and replace all broken existing curb, gutter, and sidewalk along property frontage.

4. Meet the requirements of the City of Kirkland Driveway Pre-Approved Policy R-4. Provide capacity for an onsite turn-around for each lot.

2. When three or more utility trench crossings occur within 150 lineal ft. of street length or where utility trenches parallel the street centerline, the street shall be overlaid with new asphalt or the existing asphalt shall be removed and replaced per the City of Kirkland Street Asphalt Overlay Policy R-7.

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- Existing streets with 3-inches or less of existing asphalt shall have the existing asphalt removed and replaced with an asphalt thickness equal or greater than the existing asphalt provided however that no asphalt shall be less than 2-inches thick and the subgrade shall be compacted to 95% density.

3. Remove and replace all broken existing curb, gutter, and sidewalk along property frontage.

4. Meet the requirements of the City of Kirkland Driveway Pre-Approved Policy R-4. A shared/common driveway access must be used to serve 2 of the future lots. Provide capacity for an onsite turn-around for each lot.

5. The driveway for each lot shall be long enough so that parked cars do not extend into the access easement or right-of-way (20 ft. min.) and wide enough to park two cars (20 ft. min.).

6. All street and driveway intersections shall not have any visual obstructions within the sight distance triangle. See Public Works Pre-approved Policy R.13 for the sight distance criteria and specifications.

7. Prior to the final of the building or grading permit, pay for the installation of stop and street signs at the new intersections.

8. It shall be the responsibility of the applicant to relocate any above-ground or below-ground utilities which conflict with the project associated street or utility improvements.

9. Underground all new and existing on-site utility lines and overhead transmission lines.

10. Underground any new off-site transmission lines.

11. Zoning Code Section 110.60.9 establishes the requirement that existing utility and

transmission (power, telephone, etc.) lines on-site and in rights-of-way adjacent to the site must be underground. The Public Works Director may determine if undergrounding transmission lines in the adjacent right-of-way is not feasible and defer the undergrounding by signing an agreement to participate in an undergrounding project, if one is ever proposed. In this case, the Public Works Director has determined that undergrounding of existing overhead utility on 124th Ave NE is not feasible at this time and the undergrounding of off-site/frontage transmission lines should be deferred with a Local Improvement District (LID) No Protest Agreement. The final recorded subdivision mylar shall include the following note:

Local Improvement District (LID) Waiver Agreement. Chapter 110.60.7.b of the Kirkland Zoning Code requires all overhead utility lines along the frontage of the subject property to be converted to underground unless the Public Works Director determines that it is infeasible to do so at the time of the subdivision recording. If it is determined to be infeasible, then the property owner shall consent to the formation of a Local Improvement District, hereafter formed by the City or other property owners. During review of this subdivision it was determined that it was infeasible to convert the overhead utility lines to underground along the frontage of this subdivision on 124th Ave NE. Therefore, in consideration of deferring the requirement to underground the overhead utility lines at the time of the subdivision recording, the property owner and all future property owners of lots within this subdivision hereby consent to the formation of a Local Improvement District hereafter formed by the City or other property owners

12. New street lights may be required per Puget Power design and Public Works approval. Contact the INTO Light Division at PSE for a lighting analysis. If lighting is necessary, design must be submitted prior to issuance of a grading or building permit. New street lighting must be LED.

13. A striping plan for the street must be submitted with the building or grading permit.

Links

- City of Kirkland Pre-Approved Plans and Policies
- Public Works Development Fees
- Stormwater FAQs
- Application Forms (Electronic, Paper)
- KZC105 – Private Drive, Private and Pedestrian Walkway Requirements
- KZC110 - Public Right-of-way Improvement Requirements

FIRE DEPARTMENT COMMENTS

Contact: Grace Steuart at 425-587-3660; or gsteuart@kirklandwa.gov

NO COMMENT

The Fire Department has no specific comments or conditions on the proposed project.

All 3 lots front on the ROW. The Fire Department has no additional requirements for access.

Fire flow in the area is approximately 4300 gpm, which is adequate for development.

Existing hydrants are adequate to provide coverage for the proposed project. The closest hydrant is already equipped with a 5" Storz fitting.

SPRINKLER THRESHOLD

Per Kirkland Municipal Code, all new buildings which are 5,000 gross square feet or larger require fire sprinklers. Included are single family homes, duplexes, and zero lot line townhouses where the aggregate area of all connected townhouses is greater than 5,000 square feet; garages, porches, covered decks, etc, are included in the gross square footage. (This comment is included in the short plat conditions for informational purposes only.)

LIU & ASSOCIATES, INC.

Geotechnical Engineering | Engineering Geology | Earth Science

April 18, 2016

Ms. Qian Zhang
16508 SE 46th Court
Bellevue, WA 98006

Dear Ms. Zhang:

Subject: Geotechnical Investigation
3-Lot Plat
102xx - 124th Avenue NE
Kirkland, Washington
L&A Job No. 16-057

INTRODUCTION

We understand that the development a 3-lot plat residential project is proposed for the subject property located at the above address in Kirkland, Washington. A single-family residence will be constructed on each of the lots. At your request, we have completed a geotechnical investigation for the proposed development. The purpose of this investigation is to explore and characterize subsurface conditions of the project site, evaluate feasibility of onsite stormwater disposal, and provide geotechnical recommendations on grading, erosion mitigation, surface and ground water drainage control, foundation support to residences for the proposed development. Presented in this report are our findings, conclusion, and recommendations.

PROJECT DESCRIPTION

The development area is to be limited to about the east 80 feet of the site, as the remaining area of the site is occupied by a wetland and its buffer zones. We understand

19213 Kenlake Place NE · Kenmore, Washington 98028
Phone (425) 483-9134 · Fax (425) 486-2746

the new residences are to be three-story, wood-framed structures, with the lower level partly below grade. They will be supported on perimeter concrete foundations, interior bearing walls, and beams and columns. The site is gently to moderately sloped and, construction of the residences will require some cut and fill. The residences will be accessed from 124th Avenue NE via paved driveways.

SCOPE OF SERVICES

Our scope of services for this investigation comprises specifically the following:

1 Review geologic and soil conditions at the project site based on a published geologic map.

2. Explore subsurface conditions of the site with test pits excavated to a firm bearing soil stratum or to the maximum depth (about 10 feet) capable by the backhoe used in excavating the test pits, whichever occurs first.

3. Perform geotechnical analyses based on subsurface conditions encountered by the test pits and results of our geotechnical analyses.

4. Prepare a written report to present our findings and recommendations.

SITE CONDITIONS

SURFACE CONDITION

The general location of the project site is shown on Plate 1 – Vicinity Map, attached hereto. The site is situated on a gentle, westerly to northwesterly declining slope. Within the site, the ground in the site generally slopes down gently to moderately southward for about the eastern 90 to 140 feet, then turns and descends gently northerly to northwesterly

for the remaining area of the site. The wetland covers about the western two-thirds of the site, with buffers zones along its east and south sides.

The site is currently vacant and undeveloped. It is dotted by mature deciduous trees with occasional evergreen trees mixed in and is covered by thick underbrush.

GEOLOGIC SETTING

Two geologic maps published by U.S. Geological Survey were referenced for the geologic and soil conditions at and in the vicinity of the project site: 1) Geologic Map of the Kirkland Quadrangle, King County, Washington, by James P. Minard, 1985, and 2) Geologic Map of King County, by D. B. Booth, K. A. Troost and A. P. Wisher (2007). The surficial soil unit at and in the vicinity of the project site is mapped by both maps as Vashon till (Q_{vt}) deposits.

The geology of the Puget Sound Lowland has been modified by the advance and retreat of several glaciers in the past one million years and the subsequent deposits and erosion. The last glacier advanced to the Puget Sound Lowland is referred to as the Vashon Stade of the Fraser Glaciation, which has occurred during the later stages of the Pleistocene Epoch and retreated from the region some 12,500 years ago.

The deposits of the Vashon till soil unit (Q_{vt}) was plowed directly under glacial ice during the most recent glaciation period as the glacier advanced over an eroded, irregular surface of older formations and sediments. It is composed of a mixture of unsorted clay, silt, sand, gravel, and scattered cobbles and boulders. The glacial till soil over the top two

to three feet is normally weathered to a medium-dense state, and is moderately permeable and compressible. The underlying fresh till soil, commonly referred to as "hard pan", is very dense and weakly-cemented. The fresh till deposits are practically impervious to stormwater infiltration. The fresh till deposits possess a compressive strength comparable to that of low-grade concrete and can stand in steep natural slopes or man-make cuts for a long period.

SOIL CONDITION

Subsurface conditions of the to-be-developed area of the project site were explored with six backhoe test pits excavated on April 7, 2016. The approximate locations of the test pits are shown on Plate 2 - Site and Exploration Location Plan. The test pits were located with either a tape measure or by visual reference to existing topographic features in the field and on the topographic survey map, and their locations should be considered as only accurate to the measuring method used.

A geotechnical engineer from our office was present during subsurface exploration, examined the soil and geologic conditions encountered, and completed logs of test holes. Soil samples obtained from each soil layer in the test pits were visually classified in general accordance with United Soil Classification System, a copy of which is presented on Plate 3. Detailed descriptions of soils encountered during site exploration are presented in test pit logs on Plates 4 through 6.

All six test pits encountered a layer of topsoil soil, about 12 to 15 inches thick, mantling the site. The topsoil is underlain by a layer of weathered soil of brown to light-brown, loose to medium-dense, silty fine sand, about 2.3 to 4.0 feet thick. In Test Pits 2, 3, and 6,

the weathered soil is underlain by a layer of light-gray, dense, weakly-cemented, silty fine sand, about 3.0 to 4.5 feet thick, which is till-like in texture but not as compact and contains less gravel. The till-like soil in these test pits and the weathered soil in other test pits are underlain by a gray deposits of medium-dense to dense, silty to slightly-silty, fine to medium sand, to the depths explored, except in Test Pit 2 this deposit is underlain by a light-brown and light-gray mottled, very-stiff to hard, fine sandy silt.

GROUNDWATER CONDITION

Groundwater seepage was encountered in Test Pits 1 and 4. The seepage volume was moderately heavy (about 3.0 gpm at 6.5 feet in Test Pit 1) to very light (just a trickle at 8.75 feet in Test Pit 4. The test pits were excavated in early spring and we estimate winter high groundwater would occur in somewhat greater volume and higher elevation than that encountered by the test pits. The generally silty fine sand soil layers and the till-like weakly-cemented soil are of low to very-low permeability and would perch stormwater infiltrating into the more permeable surficial soils. The perched groundwater may completely dry up in dryer summer months and accumulate and rise in wet winter months. The seasonal fluctuation of groundwater level would depend on precipitation, topography, surface runoff, ground vegetation cover, site utilization, and other factors.

GEOLOGIC HAZARDS AND MITIGATION

Landslide Hazard

The to-be-developed area of the project site is gently to moderately sloped. It is underlain at shallow depth by a discontinuous layer of dense weakly-cemented till-like soil and a medium-dense to dense, silty to slightly-silty, fine to medium sand deposit. These soils are of moderately-high to high shear strength and have high resistance against slope

failures. Therefore, the potential for deep-seated slides to occur on the to-be-developed area of the site is minimal.

Erosion Hazard

The surficial topsoil and weathered soil in the to-be-developed area of the site are of low resistance against erosion, while the underlying dense till-like soil and the medium-dense to dense, silty to slightly-silty, fine to medium sand soil are of high to moderately-high resistance against erosion. The to-be-developed area, however, is gently to moderately sloped, and this area and the adjacent wetland buffer zone is well vegetated. Therefore, the erosion hazard of the site should be minimal if the erosion mitigation and drainage control measures recommended in this report are fully implemented.

Seismic Hazard

The Puget Sound region is in an active seismic zone. The site is underlain at shallow depth by dense cemented till-like soil and medium-dense to dense, silty to slightly silty, fine to medium sand soil, with locally occurred groundwater seepage. Therefore, the potential for seismic hazards, such as liquefaction and lateral soil spreading, to occur on the to-be-developed area of the site should be minimal. The proposed new residences, however, should be designed for seismic forces induced by strong earthquakes. Based on the soil conditions encountered by the test pits, it is our opinion that Seismic Use Group I and Site Class D should be used in the seismic design of the proposed residences in accordance with the 2012 International Building Code (IBC).

DISCUSSION AND RECOMMENDATIONS

GENERAL

Based on the subsurface conditions encountered by the test pits excavated on the project site, it is our opinion that the to-be-developed area of the project site is suitable for the proposed development from the geotechnical engineering viewpoint, provided that the recommendations in this report are fully implemented and observed during and following completion of construction. Conventional footing foundations constructed on or into the underlying dense till-like soil and the medium-dense to dense sand soil may be used to support the proposed residences. Unsuitable surficial topsoil and weak weathered soil should be stripped off within footprints of paved driveways and areas of structural fill.

The surficial topsoil and weathered soil contain a high percentage of fines and can be easily disturbed when saturated. Earthwork in wet winter season can cause significant complications for construction work. To minimize weather-related complications, grading and foundation construction work should proceed and be completed during the dryer period from April 1st to October 31st, if possible. Erosion protection and drainage control measures recommended in this report should be implemented for site stabilization if construction is to be carried out beyond the above dryer period.

TEMPORARY DRAINAGE AND EROSION CONTROL

The onsite surficial weak soils are sensitive to moisture and can be easily disturbed by construction traffic. A layer of clean, 2-to-4-inch quarry spalls should be placed over areas of frequent traffic, such as the entrance to and exit from the site, as required, to protect the subgrade soils from disturbance by construction traffic.

A silt fence should be installed along the downhill sides of construction areas to minimize transport of sediment by storm runoff onto neighboring properties or the wetland. The bottom of the filter cloth of the silt fence should be anchored in a trench filled with onsite soil.

Intercepting ditches or trench drains should be installed around construction areas, as required, to intercept and drain away storm runoff and near-surface groundwater seepage. Water captured by such ditches or interceptor trench drains should be stored in temporary holding and settling pits onsite. Only clear and clean water may be released with a perforated PVC spreader pipe onto the adjacent wetland buffer zone.

Spoil soils should be hauled off of the site as soon as possible. Spoil soils and imported structural fill material to be stored onsite should be securely covered with plastic tarps, as required, for erosion protection.

SITE PREPARATION AND GENERAL GRADING

Vegetation within construction limits should be cleared and grubbed. Loose topsoil and weak weathered soil should be completely stripped down to the dense till-like soil or medium-dense to dense sand soil within building pads of the residences; while unsuitable topsoil and weathered soil should be stripped down to firm bearing soils within footprints of paved driveways. The exposed soils should be compacted to a non-yielding state with a mechanical compactor and proof-rolled with a piece of heavy earthwork equipment.

EXCAVATION AND FILL SLOPES

Under no circumstance should cut slopes be steeper than the limits specified by local, state and federal safety regulations if workers have to perform construction work in excavated areas. Unsupported temporary cuts greater than 4 feet in height should be no steeper than 1H:1V in topsoil and weathered soil, and no steeper than 3/4H:1V in underlying till-like and sand soils. Permanent cut banks should be no steeper than 2-1/4H:1V in topsoil and weathered soil, and no steeper than 1-3/4H:1V in the underlying till-like and sand soil. The soil units and stability of cut slopes should be observed and verified by a geotechnical engineer during excavation. Exposed ground should be covered and protected by plastic tarps.

Permanent fill embankments required to support structural or traffic load should be constructed with compacted structural fill placed over undisturbed, proof-rolled, firm, native, till-like and silty to slightly-silty sand soils after the surficial unsuitable soils are completely stripped. The slope of permanent fill embankments should be no steeper than 2-1/4H:1V. Upon completion, the sloping face of permanent fill embankments should be thoroughly compacted to a non-yielding state with a hoe-pack.

The above recommended cut and fill slopes are under the assumption that groundwater seepage would not be encountered during construction. If groundwater is encountered, excavation work should be immediately halted and slope stability re-evaluated. The slopes may have to be flattened and other measures taken to stabilize the slopes. Stormwater should not be allowed to flow uncontrolled over cut and fill slopes. Permanent cut slopes or fill embankments should be seeded and vegetated as soon as possible for erosion protection and long-term slope stability, and should be covered with

clear plastic sheets, as required, to protect them from erosion until the vegetation is fully established.

STRUCTURAL FILL

Structural fill is the fill that supports structural or traffic load. Structural fill for grading work should consist of clean granular soils free of organic, debris and other deleterious substances and with particles not larger than three inches. Structural fill should have a moisture content within one percent of its optimum moisture content at the time of placement. The optimum moisture content is the water content in the soils that enables the soils to be compacted to the highest dry density for a given compaction effort. Onsite clean soils meeting the above requirements may be used as structural fill. Imported material to be used as structural fill should be clean, free-draining, granular soils containing no more than 5 percent by weight finer than the No. 200 sieve based on the fraction of the material passing No. 4 sieve, and should have individual particles not larger than three inches.

The ground over which structural fill is to be placed should be prepared in accordance with recommendations in the SITE PREPARATION AND GENERAL GRADING and EXCAVATION AND FILL SLOPES sections of this report. Structural fill placed on ground steeper than 20% should be structurally supported. Ground steeper than 15% should be step-cut with vertical step no more than 3 feet before placing structural fill. Structural fill should be placed in lifts no more than 10 inches thick in its loose state, with each lift compacted to a minimum percentage of the maximum dry density determined by ASTM D1557 (Modified Proctor Method) as follows:

Application	% of Maximum Dry Density
Within building pads and under foundations	95%
Roadway/driveway subgrade	95% for top 3 feet and 90% below
Retaining/foundation wall backfill	92%
Utility trench backfill	95% for top 4 feet and 90% below

In-situ density of structural fill should be tested with a nuclear densometer by a testing agency specialized in fill placement and construction work. Testing frequency should be one test per every 250 square feet per lift.

BUILDING FOUNDATIONS

Conventional footing foundations may be used to support the proposed residences. Footing foundations should be constructed on or into the underlying dense weakly-cemented till-like soil and/or medium-dense to dense, silty to slightly-silty, fine to medium sand soil. Water should not be allowed to accumulate in footing trenches. Disturbed soils in footing trenches should be completely removed down to native undisturbed till soil prior to pouring concrete for the footings.

If the above recommendations are followed, our recommended design criteria for footing foundations are as follows:

- The allowable soil bearing pressure for design of footing foundations, including dead and live loads, should be no greater than 3,000 psf. The footing bearing soil should be verified by a geotechnical engineer after the footing trenches are excavated and before the footings poured.

- The minimum depth to bottom of perimeter footings below adjacent final exterior grade should be no less than 18 inches. The minimum depth to bottom of the interior footings below top of floor slab should be no less than 12 inches.

- The minimum width should be no less than 16 inches for continuous footings, and no less than 24 inches for individual footings, except those footings supporting light-weight decks or porches.

A one-third increase in the above recommended allowable soil bearing pressure may be used when considering short-term, transitory, wind or seismic loads. For footing foundations designed and constructed per recommendations above, we estimate that the maximum total post-construction settlement of the buildings should be 1/2 inch or less and the differential settlement across building width should be 3/8 inch or less.

Lateral loads on the proposed buildings may be resisted by the friction force between the foundations and the subgrade soils or the passive earth pressure acting on the below-grade portion of the foundations. For the latter, the foundations must be poured "neat" against undisturbed soils or backfilled with a clean, free-draining, compacted structural fill. We recommend that an equivalent fluid density (EFD) of 300 pcf (pounds per cubic foot) for the passive earth pressure be used for lateral resistance. The above passive pressure assumes that the backfill is level or inclines upward away from the foundations for a horizontal distance at least twice the depth of the foundations below the final grade. A coefficient of friction of 0.55 between the foundations and the subgrade soils may be used. The above soil parameters are unfactored values, and a proper factor of safety should be used in calculating the resisting forces against lateral loads on the buildings.

SLAB-ON-GRADE FLOORS

Slab-on-grade floors, if used for the proposed residences, should be placed on firm subgrade soil prepared as outlined in the SITE PREPARATION AND GENERAL EARTHWORK and the STRUCTURAL FILL sections of this report. Where moisture control is critical, the slab-on-grade floors should be placed on a capillary break which is in turn placed on the compacted subgrade. The capillary break should consist of a minimum four-inch-thick layer of clean, free-draining, 5/8-inch crushed rock, containing no more than 5 percent by weight passing the No. 4 sieve. A vapor barrier, such as a 6-mil plastic membrane, may be placed over the capillary break, as required, to keep moisture from migrating upwards.

CAST-IN-PLACE CONCRETE WALLS

Building foundation walls restrained at the top from lateral movement are considered unyielding and should be designed for a lateral soil pressure under the at-rest condition. Retaining walls unrestrained at the top from lateral movement may be designed for active soil pressure. For static loading condition, we recommend that an at-rest soil pressure of 50 pcf EFD (equivalent fluid density) and an active soil pressure of 35 pcf EFD be used for the design of building foundation walls and retaining walls, respectively, with a level or descending backslope. For walls with ascending backslope, an additional pressure of 0.75 pcf per degree of the backslope angle above the horizontal should be added to the above design pressures. To counter the above active or at-rest pressure, a passive lateral soil pressure of 300 pcf EFD may be used. This passive pressure value is applicable only to walls with a level or ascending backslope away from the walls for a horizontal distance at least 1.5 times the wall height. For seismic loading condition (100-year earthquake), an additional uniform distribution pressure of 8H psf should be added to the above pressures

for wall design. H is the overall height of walls in feet. To resist against sliding, the friction force between the footings and the subgrade soils may be calculated based on a coefficient of friction of 0.55. The above soil parameters are ultimate values based on a fully drained condition of the walls, and proper factors of safety should be applied in the design of the retaining and basement walls against sliding and overturning failures for static and seismic loadings.

Retaining walls may be supported on footing foundations. Preparation of footing bearing soil, allowable soil bearing pressure, drainage provision, and wall backfill should be in compliance with the recommendations for building foundations in this report.

PAVED DRIVEWAYS

Performance of driveway pavement is critically related to conditions of the underlying subgrade soils. We recommend that the subgrade soils under road and driveways be treated and prepared as described in the SITE PREPARATION AND GENERAL EARTHWORK section of this report. Prior to constructing pavement, the subgrade soils should be compacted to a non-yielding state with a vibratory roller compactor and proof-rolled with a piece of heavy construction equipment, such as a fully-loaded dump truck. Any areas with excessive flexing or pumping should be over-excavated and replaced with compacted structural fill in accordance with the recommendations provided in the STRUCTURAL FILL section of this report.

We recommend that a layer of compacted, 7/8-inch crushed rock base (CRB), be placed for the driveways. This crushed rock base should be at least 4-inch thick for private

driveways. The crushed rock base should be overlain with a 3-inch-thick Class B asphalt concrete (AC) surficial course for private driveways.

STORMWATER DISPOSAL

General

The project site is underlain by layers of silty fine sand soil of low permeability and a discontinuous dense weakly-cemented till-like soil of extremely-low permeability. Groundwater seepage was encountered in various influx rates at 6.5 to 8.75 feet deep. The volume of and depth to groundwater seepage may increase and rise in winter months. Therefore, disposal of stormwater onsite by infiltration may not work well.

LID Methods

Other LID (low impact development) methods may be considered for onsite stormwater disposal include: splash blocks, storage and reuse, surface dispersion, rain gardens, and porous pavement may be considered. These methods are be discussed below.

Splash Blocks

The proposed residences will be of limited total roof area. Therefore, using splash blocks under roof downspouts to spread roof runoff onto grass covered yards would be sufficient to dispose roof runoff. Downspouts should be extended to at least 6 feet away from the house where plash blocks are placed to create sheet flow onto the yards.

Storage and Reuse

Roof runoff may be stored in cisterns or barrels during rainstorms. Water stored may be used later for watering plants and irrigating lawns.

Surface Dispersion

Runoff over roofs and paved driveways may be disposed onsite by surface dispersion. A surface dispersion system would consist of a distribution trench and a vegetated flowpath on the downhill side of the houses. The distribution trench should be 50 feet long for each residence of impervious surface not more than 5,000 s.f., while the flowpath should be at least 25 feet long in the direction perpendicular to the distribution trench. The flowpaths should be graded to a very gentle slope, as required, to spread stormwater in a uniform sheet flow. A shallow earth berm should be constructed along the downhill side of the flowpath on each lot to keep disposed stormwater from flowing onto the neighboring property or street. Water flowing over flowpaths would mostly be evaporating into the air and absorbed by the root system of vegetation in the flowpath, with only a small fraction infiltrating into the ground. Flowpaths should be covered by well-established native plants. Vegetation cover within flowpaths should be dense enough to help disperse water without causing erosion. Vegetation in flowpaths should be fully established and firmly rooted down before the systems may be used for stormwater disposal.

The distribution trenches should be at least 2 feet wide by 2.5 feet deep. The downstream rim of a distribution trench should be a few inches lower than the upstream rim, and should be level to spread overflowing water into uniform sheet flow onto the vegetated flowpath. The side walls and bottom of the distribution trenches should be lined with a layer of non-woven filter fabric. The trenches should then be filled with clean 3/4 to 1-1/2 inch washed gravel or crushed rock to within about 10 inches of the top of the trench. A 4-inch perforated PVC spreader pipe should be placed level in the distribution trench

and embedded at about 16 to 18 inches below top of the trenches. The top of the gravel or crushed rock fill should also be covered with a filter fabric liner. The remaining trenches should then be filled with additional gravel or crushed rock to the surface. The tightlines conveying stormwater into the distribution trench should have sufficient grade to generate flow by gravity. A clay or lean concrete dam should be constructed in the tightline trenches to keep water from flowing backward to the residences.

Rain Gardens

Rain gardens with a storage pond about 3 to 5 feet deep may be used to dispose stormwater collected over impervious surfaces. Water stored in rain gardens would mostly be evaporating into the air and absorbed by vegetation root systems, with only a small fraction infiltrating into the ground. With the silty fine sand and till-like soils underlying the site at shallow depth, we recommend a design infiltration rate not the exceed 0.15 iph (inch per hour) be used for sizing rain gardens.

The bank slopes of rain gardens should be no steeper than 2.5H:1V for cut banks and no steeper than 3H:1V for fill embankments. Footprints of fill embankments should be cleared and thoroughly grubbed and surficial topsoil and weathered soils should be completely stripped down to weathered soil. Fill embankments should be constructed of clean, fine-grained, fine-sandy to clayey silt or clay soil, free of organics and other deleterious substances, with the following gradation requirements:

% Passing	U.S. Standard Sieve No.
100	10
65 - 90	20
50 - 75	40
40 - 70	60
35 - 60	100
30 - 50	200

Fill embankments should be placed in lifts no more than 8-inch thick in loose state and compacted to at least 95% of the maximum dry density determined by ASTM D1557 (Modified Proctor method). After completion, the sloping face of cut banks and fill embankments should be compacted to a non-yielding state with a hoe-pack.

For water quality purpose, rain gardens should be lined with a layer of amended soil at least 18 inches thick. The amended soil should have 30 to 35 percent of compost tilled into the rain garden native soil to achieve an organic content of 10% by dry weight.

Rain gardens should be vegetated for erosion control and the vegetation should be fully established before they can be put in use. Planted vegetation should be tolerant of ponding water and saturated soil conditions in the winter months and drought in the summer months. In general, the predominant plants should be of facultative species adapted to stresses associated with wet and dry conditions. Typically, the plants may comprise of red twig dogwood, rushes, sedges, salmonberry and twinberry and ornamentals such as royal ferns, big-leaved ligularias or various primroses.

Porous Pavement

Porous pavement may be used for driveways of the residences to allow runoff over the driveways to infiltrate into the ground under the pavement. A design infiltration rate of 0.15 iph (inch per hour) may be used for design of porous pavement. Fill and topsoil should be stripped down to the medium-dense weathered soil. A 10-inch thick layer of railroad ballast rocks (3/4 to 2-1/2 inch crushed rock) is then placed over the prepared subgrade soil and compacted to a non-yielding state with a vibratory mechanical compactor. The railroad road ballast rocks should be covered with a layer of non-woven filter fabric, such as Mirafi 140NS or equal and topped with a 4-inch layer of 5/8-inch crushed rock. This crushed rock base should also be compacted to a non-yielding state with a vibratory compactor. The porous pavement with a minimum thickness of 4 inches should then be constructed over the crushed 5/8-inch crush rock base.

DRAINAGE CONTROL

Building Footprint Excavation

Footprint excavation for proposed residences, if encountering groundwater seepage, should have bottom of excavation sloped slightly and a trench excavated along the base of cut banks to intercept seeping groundwater. Water in the trenches should be directed into sump pits from which water can be pumped out. A layer of 2-inch crushed rock should be placed over footing bearing subgrade soils, as required, to protect the soils from disturbance by construction traffic. This crushed rock base should be built to a few inches above groundwater level, but not less than 6 inches thick. The crush rock base should be compacted in 12-inch lifts to a non-yielding state with a vibratory mechanical compactor.

Runoff over Impervious Surfaces

Storm runoff over impervious surfaces, such as roofs and paved road and driveways, should be collected by underground drain line systems connected to roof downspouts and by catch basins installed in paved road and driveways. Stormwater thus collected should be tightlined to discharge into a storm sewer or suitable stormwater disposal facilities.

Building Footing Drains

A subdrain should be installed, around the perimeter footings of each residence. The subdrains should consist of a 4-inch-minimum-diameter, perforated, rigid, drain pipe, laid a few inches below bottom of the perimeter footings of the buildings. The trenches and the drain lines should have a sufficient gradient (0.5% minimum) to generate flow by gravity. The drain lines should be wrapped in a non-woven filter fabric sock and completely enclosed in clean washed gravel. The remaining trenches should be backfilled with clean washed gravel to within 18 inches of finish grade, then topped with clean onsite soils. Water collected by the perimeter footing subdrain systems should be tightlined, separately from the roof and surface stormwater drain lines, to discharge into a storm sewer or suitable stormwater disposal facility.

Surface Drainage

Water should not be allowed to stand in any areas where footings, on-grade slabs, or pavement is to be constructed. Finish ground surface should be graded to direct surface runoff away from the adjacent buildings. We recommend the finish ground be sloped at a gradient of 3 percent minimum for a distance of at least 10 feet away from adjacent buildings, except in the areas to be paved.

Cleanouts

Sufficient number of cleanouts at strategic locations should be provided for underground drain lines. The underground drain lines should be cleaned and maintained periodically to prevent clogging.

LIMITATIONS

This report has been prepared for the specific application to this project for the exclusive use by Ms Qian Zhang, and her associates, representatives, consultants and contractors. We recommend that this report, in its entirety, be included in the project contract documents for the information of prospective contractors for their estimating and bidding purposes and for compliance with the recommendations in this report during construction. The conclusions and interpretations in this report, however, should not be construed as a warranty of subsurface conditions of the site. The scope of this investigation 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 this report for design considerations. All geotechnical construction work should be monitored by a geotechnical engineer during construction.

Our recommendations and conclusions are based on the geologic and soil conditions encountered in the test pits, and our experience and engineering judgment. The conclusions and recommendations are professional opinions 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. No warranty, expressed or implied, is made.

The actual subsurface conditions of the site may vary from those encountered by the test pits excavated on the site. The nature and extent of such variations may not become evident until construction starts. If variations appear then, we should be retained to re-evaluate the recommendations of this report, and to verify or modify them in writing prior to proceeding further with the construction of the proposed development.

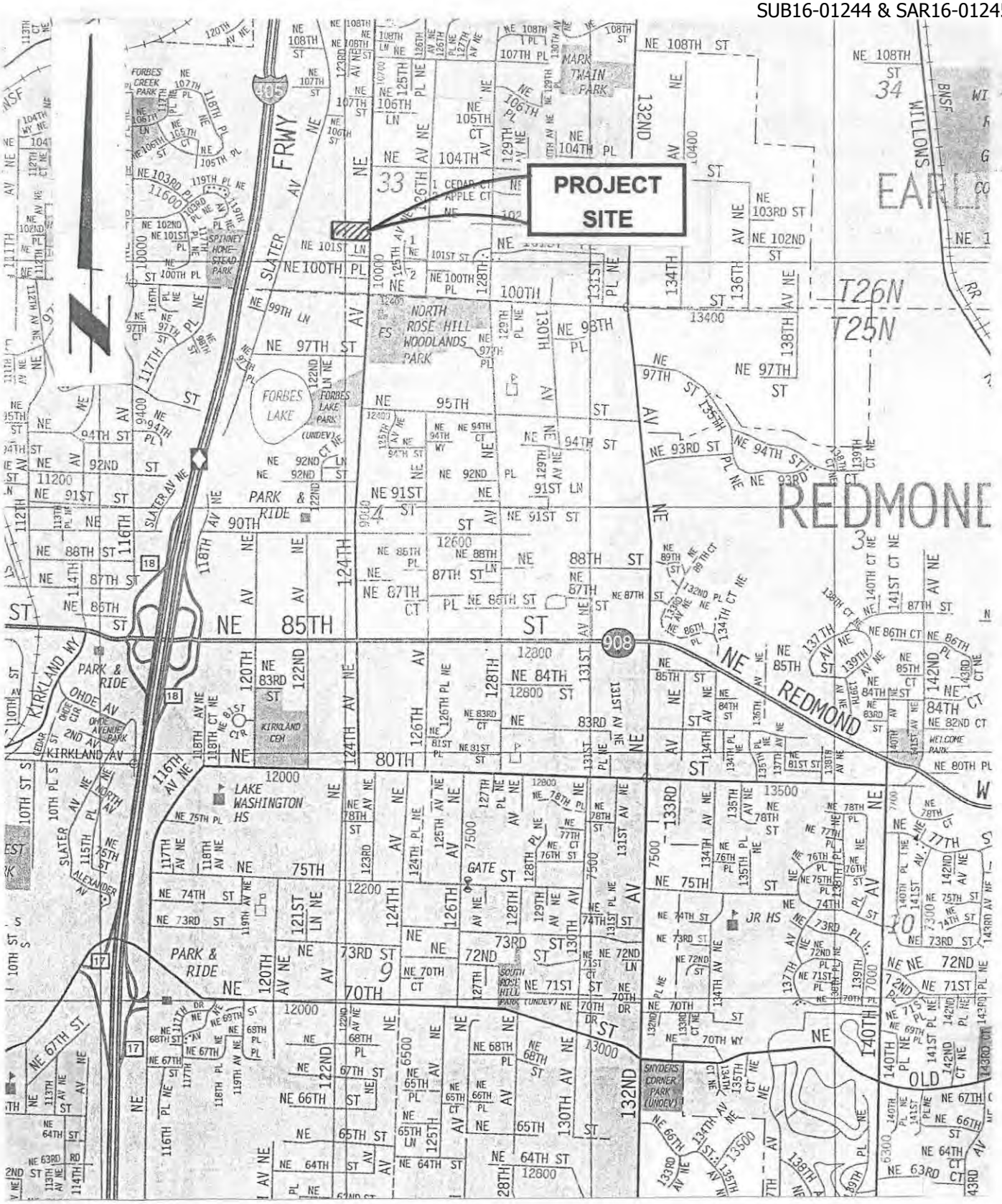
CLOSURE

We are pleased to be of service to you on this project. Please feel free to contact us if you have any questions regarding this report or need further consultation.

Yours very truly,
LIU & ASSOCIATES, INC.

J. S. (Julian) Liu, Ph.D., P.E.
Principal

Six plates attached



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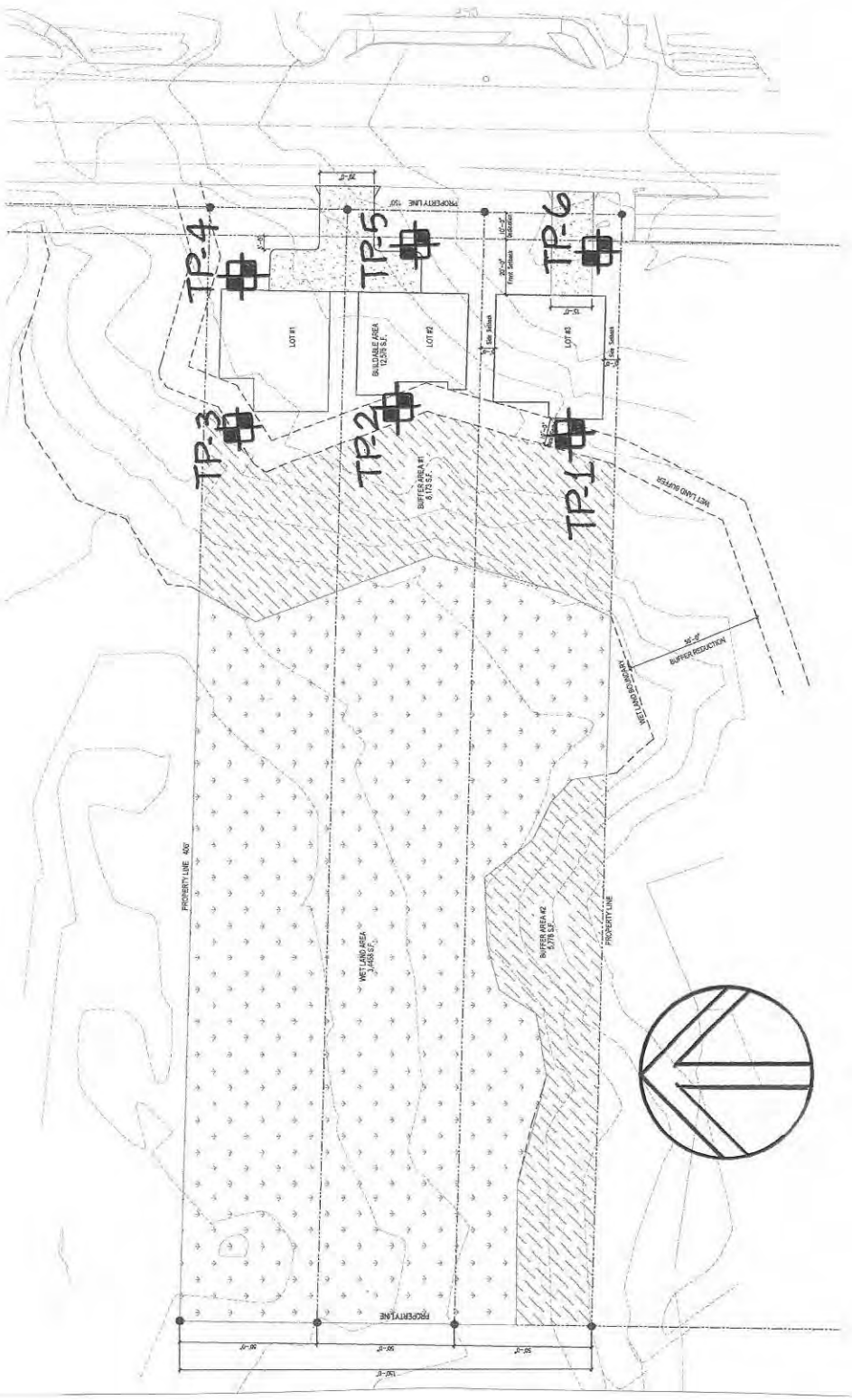
VICINITY MAP
3-LOT PLAT
102XX - 124TH AVENUE NE
KIRKLAND, WASHINGTON

JOB NO. 16-057	DATE 4/10/2016	PLATE 1



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SITE AND EXPLORATION LOCATION PLAN
3-LOT PLAT
102XX - 124TH AVENUE NE
KIRKLAND, WASHINGTON

JOB NO. 16-057	DATE 4/10/2016	PLATE 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON THE NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE-GRAINED SOILS MORE THAN 50% PASSING ON THE NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50%	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILTY AND CLAY LIQUID LIMIT 50% OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC SILT, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

NOTES:

1. FIELD CLASSIFICATION IS BASED ON VISUAL EXAMINATION OF SOIL IN GENERAL ACCORDANCE WITH ASTM D2488-83.
2. SOIL CLASSIFICATION USING LABORATORY TESTS IS BASED ON ASTM D2487-83.
3. DESCRIPTIONS OF SOIL DENSITY OR CONSISTENCY ARE BASED ON INTERPRETATION OF BLOW-COUNT DATA, VISUAL APPEARANCE OF SOILS, AND/OR TEST DATA.

SOIL MOISTURE MODIFIERS:

DRY - ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH

SLIGHTLY MOIST - TRACE MOISTURE, NOT DUSTY

MOIST - DAMP, BUT NO VISIBLE WATER

VERY MOIST - VERY DAMP, MOISTURE FELT TO THE TOUCH

WET - VISIBLE FREE WATER OR SATURATED, USUALLY SOIL IS OBTAINED FROM BELOW WATER TABLE

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UNIFIED SOIL CLASSIFICATION SYSTEM

PLATE 3

TEST PIT NO. 1

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2		SM	Brown, medium-dense, silty fine SAND, abundant roots, moist			
3						
4						
5						
6		SM	Gray, medium-dense to dense, slightly silty, fine to medium SAND, very-moist to wet			
7						
8						
9						
10			Test pit terminated at 8.5 ft; groundwater seepage (about 3 gpm) encountered @ 6.5 ft.			

TEST PIT NO. 2

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2		SM	Brown to light-brown, medium-dense, silty fine SAND, abundant roots, moist			
3						
4			Light-gray, dense, silty fine sand, trace gravel, weakly-cemented, moist (till like)			
5						
6						
7		SM	Gray, medium-dense to dense, slightly-silty, fine to medium SAND, moist to wet			
8						
9		ML	Light-brown to light-gray, very-stiff to hard, fine sandy SILT, moist			
10						
11			Test pit terminated at 10.0 ft; groundwater not encountered.			
12						

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TEST PIT LOGS
3-LOT PLAT
102XX - 124TH AVENUE NE
KIRKLAND, WASHINGTON

JOB NO.	16-057	DATE	4/10/2016	PLATE	4

TEST PIT NO. 3

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, with roots, moist (TOPSOIL)			
2		SM	Brown, loose to medium-dense, silty fine SAND, moist			
3						
4						
5		SM	Light-gray, dense, silty fine SAND, trace gravel, weakly-cemented, moist (till like)			
6						
7						
8		SM	Gray, medium-dense to dense, slightly-silty, fine to medium SAND, moist			
9						
10						
11			Test pit terminated at 10.0 ft; groundwater not encountered.			
12						

TEST PIT NO. 4

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2		SM	Brown, loose to medium-dense, silty fine SAND, moist			
3						
4						
5		SM	Gray, medium-dense to dense, silty fine sand, trace gravel and occasional cobble, moist			
6						
7						
8						
9						
10			Test pit terminated at 9.0 ft; trickle groundwater seepage @ 8.75 ft.			

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TEST PIT LOG
3-LOT PLAT
102XX - 124TH AVENUE NE
KIRKLAND, WASHINGTON

JOB NO. 16-057 DATE 4/10/2016 PLATE 5

TEST PIT NO. 5

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2		SM	Brown to light-brown, medium-dense, silty fine SAND, trace gravel, abundant roots, moist			
3						
4						
5						
6		SM	Gray, medium-dense to dense, slightly silty, fine to medium SAND, moist			
7						
8						
9			Test pit terminated at 8.5 ft; groundwater not encountered.			
10						

TEST PIT NO. 6

Logged By: JSL Date: 4/7/2016 Ground El. ±

Depth ft.		USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1		OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2		SM	Brown, medium-dense, silty fine SAND, trace gravel, moist			
3						
4						
5		SM	Light-brown light-gray mottled, dense, silty fine sand, trace gravel, weakly-cemented, moist (till like)			
6						
7						
8						
9		ML	Gray, medium-dense to dense, silty fine SAND, slightly-moist			
10						
11			Test pit terminated at 10.0 ft; groundwater not encountered.			
12						

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
3-LOT PLAT
102XX - 124TH AVENUE NE
KIRKLAND, WASHINGTON

JOB NO. 16-057 | DATE 4/10/2016 | PLATE 6

AFM
American Forest Management
11415 NE 128th St Suite 110 Kirkland WA 98034 • (425)820-3420 • FAX (425)820-3437
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ARBORIST REPORT
FOR
Parcel # 6639900250
Kirkland, WA

March 11th, 2016

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City of Kirkland Tree Protection Fencing Detail - attached

1. Introduction

American Forest Management, Inc. was contacted by Elina Zhang of HGL Investment Properties, and was asked to compile an 'Arborist Report' for a parcel located within the City of Kirkland.

The proposed short plat encompasses parcel #6639900250. Our assignment is to prepare a written report on present tree conditions, which is to be filed with the preliminary permit application.

This report encompasses all of the criteria set forth under the City of Kirkland's tree regulations (Chapter 95 of the Kirkland Zoning Code). The required minimum tree density for the parcel (60,984 sq. ft.) is 42 tree credits.

Date of Field Examination: May 4th and 5th, 2016

2. Description

86 significant trees were identified and assessed on the property. All of the trees are native. Over half of the property is a forested wetland.

Most of the trees were tagged from a previous survey. Any tree without a number was assigned a new number and a numbered aluminum tag was attached to the lower trunk of the subject trees. The tree number and tag number are not the same. Tree numbers are the numbers used on the maps and in this report. Tree tag numbers are the tag numbers on the tree. Both numbers are on the tree table for reference.

An additional 15 neighboring trees were identified with drip-lines encroaching upon the subject parcel.

3. Methodology

Each tree in this report was visited. Tree diameters were measured by tape. The tree heights were measured using a Spiegel Relaskop. Each tree was visually examined for defects and vigor. The tree assessment procedure involves the examination of many factors:

- The crown of the tree is examined for current vigor. This is comprised of inspecting the crown (foliage, buds and branches) for color, density, form, and annual shoot growth, limb dieback and disease. The percentage of live crown is estimated for coniferous species only and scored appropriately.

- The bole or main stem of the tree is inspected for decay, which includes cavities, wounds, fruiting bodies of decay (conks or mushrooms), seams, insects, bleeding, callus development, broken or dead tops, structural defects and unnatural leans. Structural defects include crooks, forks with V-shaped crotches, multiple attachments, and excessive sweep.

- The root collar and roots are inspected for the presence of decay, insects and/or damage, as well as if they have been injured, undermined or exposed, or original grade has been altered.

Based on these factors a determination of condition is made. The four condition categories are described below based on the species traits assessed:

Excellent – free of structural defects, no disease or pest problems, no root issues, excellent structure/form with uniform crown or canopy, foliage of normal color and density, above average vigor, it will be wind firm if isolated, suitable for its location

Good – free of significant structural defects, no disease concerns, minor pest issues, no significant root issues, good structure/form with uniform crown or canopy, foliage of normal color and density, average or normal vigor, will be wind firm if isolated or left as part of a grouping or grove of trees, suitable for its location

Fair – minor structural defects not expected to contribute to a failure in near future, no disease concerns, moderate pest issues, no significant root issues, asymmetric or unbalanced crown or canopy, average or normal vigor, foliage of normal color, moderate foliage density, will be wind firm if left as part of a grouping or grove of trees, cannot be isolated, suitable for its location

Poor – major structural defects expected to fail in near future, disease or significant pest concerns, decline due to old age, significant root issues, asymmetric or unbalanced crown or canopy, sparse or abnormally small foliage, poor vigor, not suitable for its location

A 'viable' tree, as defined by the City of Kirkland is "*A significant tree that a qualified professional has determined to be in good health, with a low risk of failure due to structural defects, is wind firm if isolated or remains as part of a grove, and is a species that is suitable for its location."* Trees considered 'non-viable' are trees that are in poor condition due to disease, age related decline, have significant decay issues and/or cumulative structural defects, which exacerbate failure potential.

The attached tree map indicates the 'condition' of the subject trees found at the site.

4. Observations

The following observations are general species observation for subject property and neighboring trees. See the attached Tree Summary Table for information on specific trees.

Red alder
The red alder trees on the subject property range in age and condition. Many are at the end of their productive lifespan and are in decline. Common defects observed included crown dieback, small live crown ratios, poor trunk taper and large branch failures. The red alder trees are in good to poor condition.

Bitter cherry
The bitter cherry trees on the property are mature and declining. Most of the significant trees have some evidence of dieback. Small live crown ratios were observed in many of the trees. Poor trunk taper and leaning trunks was additionally very common. The bitter cherry trees on the property range from fair to poor condition. Additionally, there are many recently dead bitter cherry trees on the property.

Big leaf maple
The big leaf maple trees range in age and condition. Common defects observed were uneven crowns and co-dominant stems with poor attachments. The big leaf maple trees range from poor to good condition.

Western hemlock
Tree #111 and #73 are two western hemlock trees in the wetland. Both trees have good taper and full crown. The western hemlock trees are viable.

Douglas-fir
The Douglas-fir trees range in age and condition. The majority of the Douglas-fir trees are on the east side of the property and are mature. Sap exuding from the base of the trunk was observed in two trees, #45 and #50. This is a sign of root disease. The crowns of both trees were full and healthy. Tree #41 has a small live crown ratio, is in poor condition and is non-viable. The Douglas-fir trees range in condition and root rot is suspected to be in the area.

Red alder
The red alder on the subject property has a range of issues. The slope has caused many of the red alders to lean heavily south. Many of the alders have co-dominant stems with poor attachments and included bark at the point of attachment. Trees have poor trunk taper. Decay was observed on the trunks of many of the alders caused by sunscald damage. Decay was evident because of seams in the trunks of trees or visible decay where branches had failed. Several past stem failures were observed in the study area.

5. Discussion

The extent of drip-lines (farthest reaching branches) for the subject trees can be found on the tree summary table at the back of this report. These have also been delineated on a copy of the site survey for trees with a potentially reasonable chance of retention. The information plotted on the attached survey plan may need to be transferred to a final tree retention/protection plan to meet City submittal requirements. The trees that are to be removed shall be shown "X'd" out on the final plan.

The Limits of Disturbance (LOD) measurements can also be found on the tree summary table. These have been delineated on a copy of the site plan for parcel trees with a reasonable chance of retention and for neighboring trees. The LOD measurements are based on species, age, condition, drip-line, prior improvements, proposed impacts and the anticipated cumulative impacts to the entire root zone.

Tree Protection fencing shall be located beyond the drip-line edge of retained trees per the attached plan.

There are no major conflicts concerning neighboring trees. The tree protection measures as delineated on the attached survey will serve to protect neighboring trees.

Finished landscaping work within the drip-lines of retained trees shall maintain existing grades and not disturb fine root mass at the ground surface. Finish landscape with beauty bark or new lawn on top of existing grade. Add no more than 2" to 4" of mulch/beauty bark or 2" of composted soil to establish new lawn. Raising the grade more than a few inches will have adverse impacts on fine roots by cutting off oxygen. Remove ivy from all retained trees.

Bitter cherry
Bitter cherry trees are a relatively short lived species with productive lifespans ranging from 30 to 40 years. The majority of the bitter cherry trees are on the older end of the spectrum and are in severe decline. Leaning trunks and large branch failures are common. Many of the bitter cherry trees are recommended for removal.

Red alder
Red alder is a pioneer species, as they grow fast and vigorously. Typically red alders live to about 60 to 80 years. As they die they decline from the top downwards, shedding large lateral branches and upper crown components. Many of the red alders have extensive decay and are already losing large branches. The red alders on this property are in various stages of decline. Many of the red alders are recommended for removal.

Poor taper
A significant portion of the red alders and bitter cherry trees on the subject property have poor taper. The change in diameter over length is called taper. Taper is an important indicator of mechanical strength of a trees bole and crown. Tall, skinny trees are considered to have poor taper. The subjects have extremely high height to diameter ratios, ranging from 70 to 110. Trees with height to diameter ratios greater than 50 are considered potentially hazardous due to poor structure. Trees with poor taper and high height to diameter ratios are predisposed to stem failure when placed under heavy stress loads, such as strong winds, ice and snowstorms; or are exposed to unfamiliar environmental stresses.

Hazard trees
Trees in the wetland buffer that are hazardous are recommended for removal. It is not necessary to remove all of the non-viable and dead trees in the wetland or buffer because they are far from the future home sites. The non-viable trees in the wetland buffer that are suggested for removal can be wildlife snagged to 20' rather than removed. See the attached plan for recommendations for removal or habitat snagging of hazard trees.

Re-inspection
The current conditions of trees on this site warrants a re-inspection post-construction. After construction has finished, all trees within the striking distance of home-sites should be re-assessed prior to occupancy.

6. Tree Protection Measures

The following general guidelines are recommended to ensure that the designated space set aside for the preserved trees are protected and construction impacts are kept to a minimum.

1. Tree protection fencing should be erected around retained trees and positioned just beyond the drip-line edge prior to moving any heavy equipment on site. Doing this will set clearing limits and avoid compaction of soils within root zones of retained trees.

2. Any existing infrastructure to be removed within the drip-line or tree protection zone shall be removed by hand or utilizing a tracked mini-excavator.

3. Excavation limits should be laid out in paint on the ground to avoid over excavating.

4. Excavations within the drip-lines shall be monitored by a qualified tree professional so necessary precautions can be taken to decrease impacts to tree parts. A qualified tree professional shall monitor excavations when work is required and allowed within the "limits of disturbance".

5. To establish sub grade for foundations, curbs and pavement sections near the trees, soil should be removed parallel to the roots and not at 90 degree angles to avoid breaking and tearing roots that lead back to the trunk within the drip-line. Any roots damaged during these excavations should be exposed to sound tissue and cut cleanly with a saw. Cutting tools should be sterilized with alcohol.

6. Areas excavated within the drip-line of retained trees should be thoroughly irrigated weekly during dry periods.

7. Preparations for final landscaping shall be accomplished by hand within the drip-lines of retained trees. Large equipment shall be kept outside of the tree protection zones at all times. Simply finish landscape within 10' of retained trees with a 2" to 4" layer of organic mulch.

7. Tree Replacement

Supplemental trees will not be necessary to meet the required minimum tree density for the parcel.

New tree plantings shall be given the appropriate space for the species and their growing characteristics. Refer to the *Kirkland Plant List* on the City's website for desirable species.

For planting and maintenance specifications, refer to chapters 95.50 and 51 of the Kirkland Zoning Code.

There is no warranty suggested for any of the trees subject to this report. Weather, latent tree conditions, and future man-caused activities could cause physiologic changes and deteriorating tree condition. Over time, deteriorating tree conditions may appear and there may be conditions, which are not now visible which, could cause tree failure. This report or the verbal comments made at the site in no way warrant the structural stability or long term condition of any tree, but represent my opinion based on the observations made.

Nearly all trees in any condition standing within reach of improvements or human use areas represent hazards that could lead to damage or injury.

Please call if you have any questions or I can be of further assistance.

Sincerely,

Kelly Wilkinson
ISA Certified Arborist #PN-7673A
ISA Tree Risk Assessment Qualified

Tree Density Calculation
Lot Size – +/- 60,984 sq.ft.
60,984/43,560 X 30 = 42
Required Minimum Tree Density = 42 tree credits
Tree Credits Existing = 221
Supplemental Trees Required =0

City of Kirkland - Tree Protection Standards

1. Tree Protection Fencing shall be erected at prescribed distance per arborist report. Fences shall be constructed of chain link and be at least 4 feet high.
2. Install highly visible signs on protection fencing spaced no further than 15 feet apart. Signs shall state “Tree Protection Area-Entrance Prohibited”, and “City of Kirkland” code enforcement phone number.
3. No work shall be performed within protection fencing unless approved by Planning Official. In such cases, activities will be approved and supervised by a “Qualified Professional”.
4. The original grade shall not be elevated or reduced within protection fencing without the Planning Official authorization based on recommendations from a qualified professional.
5. No building materials, spoils, chemicals or substances of any kind will be permitted within protection fencing.
6. Protection Fencing shall be maintained until the Planning Official authorizes its removal.
7. Ensure that any approved landscaping within the protected zone subsequent to the approved removal of protection fencing be performed with hand labor.

In addition to the above, the Planning Official may require the following:

a. If equipment is authorized to operate within the root zone, the area will be mulched to a depth of 6” or covered with plywood or similar material to protect roots from damage caused by heavy equipment.
b. Minimize root damage by excavating a 2-foot deep trench, at edge of protection fencing to cleanly sever the roots of protected trees.
c. Corrective pruning to avoid damage from machinery or building activity.
d. Maintenance of trees throughout construction period by watering and fertilization.

Photos

East side of the property

East portion of the property

Tree #23 – non-viable red alder in the wetland buffer

Center of the property, forested wetland

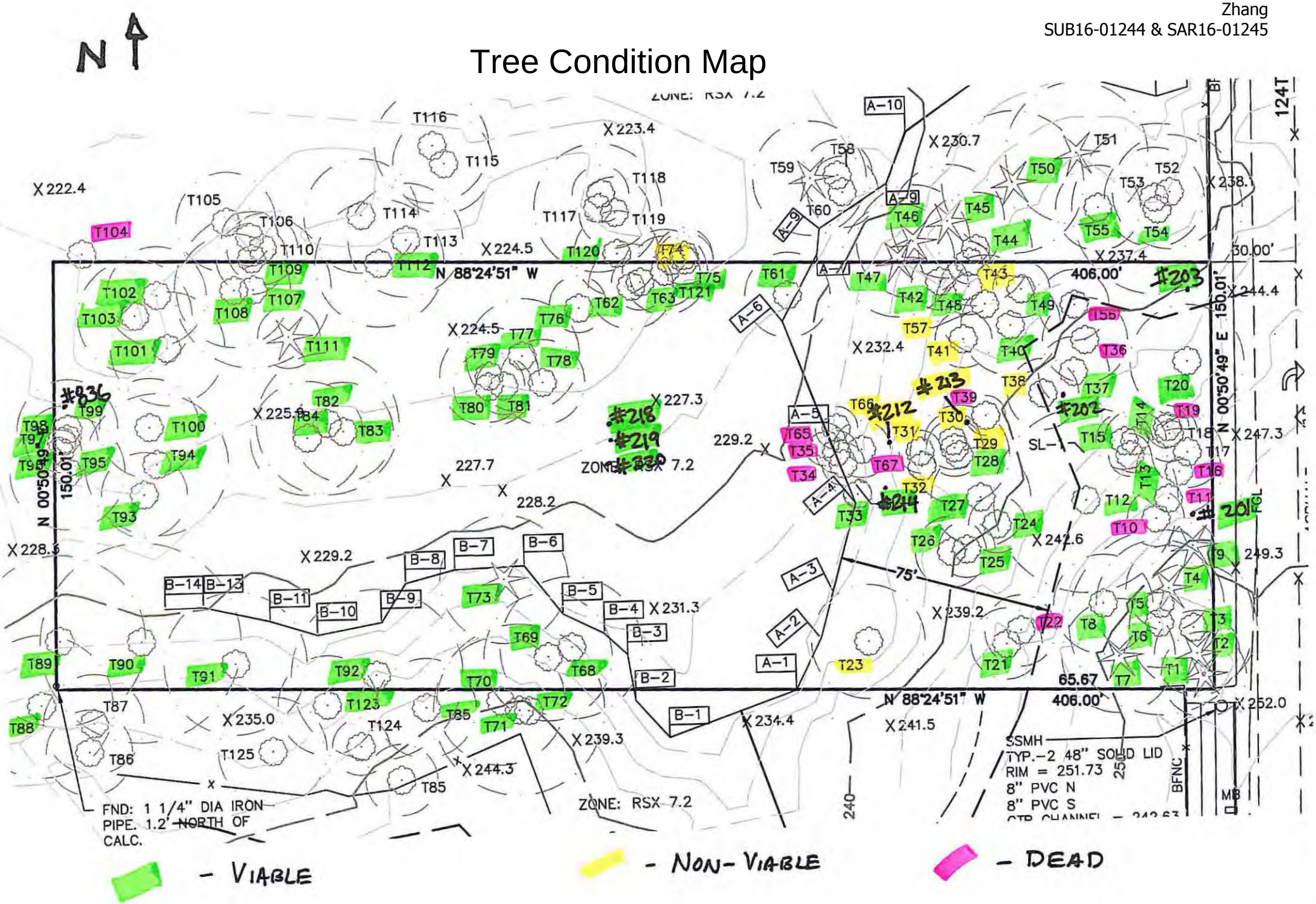
Tree #57 – bitter cherry with 45 degree lean, lifting root plate, high risk

Tree #50 – Douglas-fir with bleeding on lower trunk

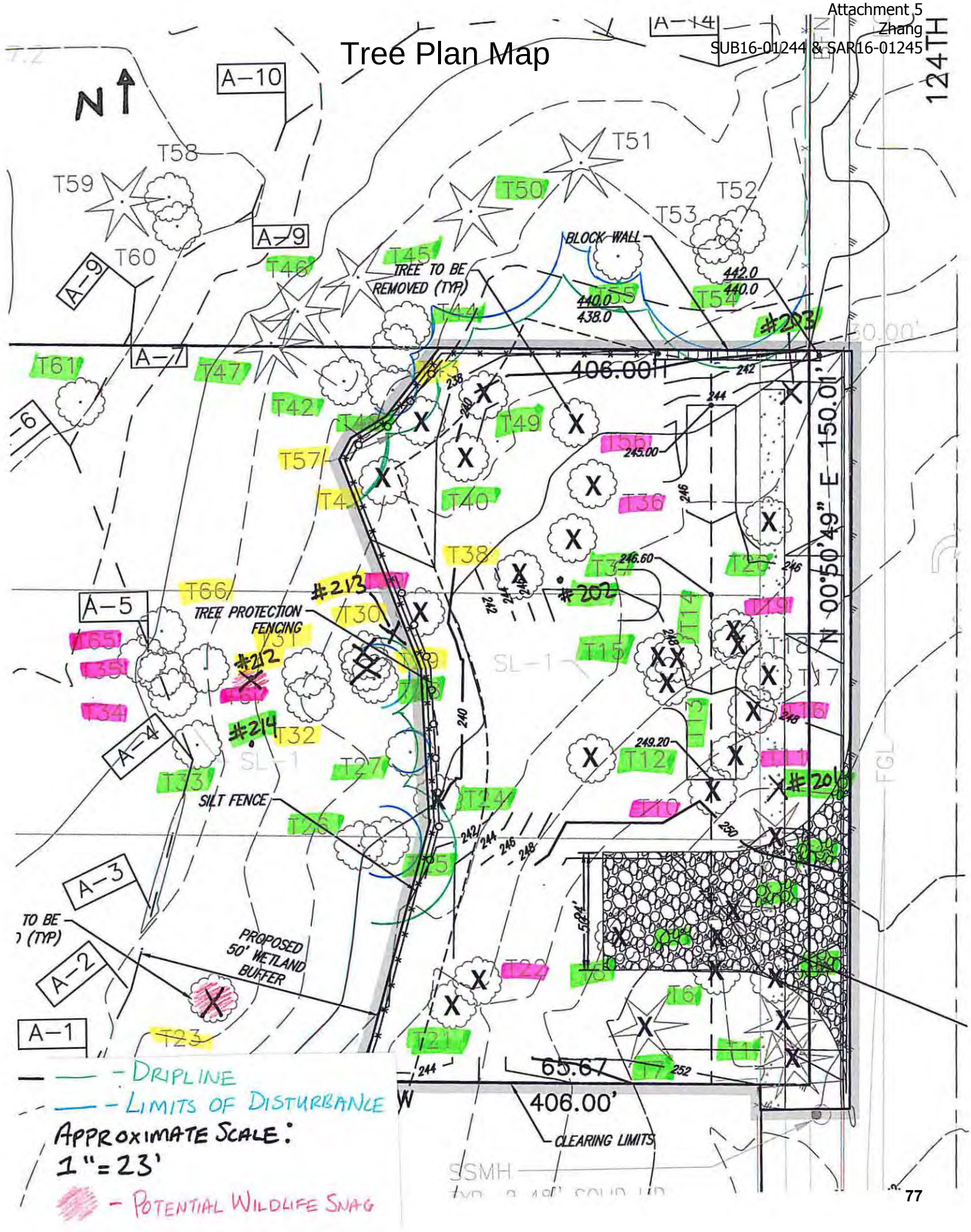
Dead and declining bitter cherry trees in the wetland buffer

Tree #90 – big leaf maple with decay in the lower trunk

Tree Condition Map



Tree Plan Map



Tree Summary Table
Parcel #: 6639900250
City of Kirkland

American Forest Management, Inc
Date: 5/9/2016
Inspector: Wilkinson

Tree #	Tag #	Old Tree #	Species	Native/ Planted/ Volunteer	DBH (inches)	Height (feet)	Tree Credit	Drip-Line/Limits of Disturbance (feet) N	S	E	W	Condition	Viability	Comments
1	501		Douglas-fir	native	25	111		8	9	11	12	fair	viable	ivy on trunk, exuding sap on North trunk side
2	502		Douglas-fir	native	33	115		9	12	10	10	fair	viable	ivy on trunk, exuding sap on North trunk side
3	503		big leaf maple	native	33	101		9	13	33	3	fair	viable	ivy, three forked trunks, unbalanced crown
4	504		big leaf maple	native	27	120		9	13	16	12	good	viable	ivy on trunk
5	505		Douglas-fir	native	21	60		19	0	26	0	fair	viable	lean NE, ivy on trunk
6	506		bitter cherry	native	31	111		12	22	9	19	fair	viable	burls on trunk, ivy on trunk
7	507		Douglas-fir	native	40	130		9	17	6	15	good	viable	ivy on trunk
8	508		bitter cherry	native	9, 11	62		6	9	8	13	fair	viable	ivy on trunk, forks 1' from the ground
9	509		Douglas-fir	native	14	77		6	4	4	3	fair	viable	ivy on trunk, thin crown
10	510													dead
11	511													dead
12	512		big leaf maple	native	40, 7, 10	105		28	27	17	24	good	viable	ivy on trunk, some dead branches
13	514		bitter cherry	native	7	47		5	4	12	4	fair	viable	ivy, leans East, data is different from survey table
14	515		bitter cherry	native	14	61		15	3	8	6	fair	viable	ivy on trunk
15	516		bitter cherry	native	7	45		11	0	0	0	fair	viable	ivy on trunk, leans North
16	517													dead
17	518		bitter cherry	native	14	64		4	0	5	0	fair	viable	20% lcr
18	519		bitter cherry	native	13	57		9	8	7	5	fair	viable	
19	520													dead
20	521		big leaf maple	native	23	129		19	22	18	23	fair	viable	sapsucker holes
21	523		vine maple	native	11	36		6	10	0	24	fair	viable	leans W
22	524													dead
23	525		red alder	native	33	68		22	7	11	18	poor	non-viable	severe decline, dead top
24	527		bitter cherry	native	10	74		14	7	5	16	fair	viable	some dieback
25	528		bitter cherry	native	13	82	2	16 / 6	8 / 6	15 / 6	5 / 6	fair	viable	dieback, early stage of decline
26	204	529	bitter cherry	native	14, 6	81	4	12 / 8	10 / 8	6 / 8	14 / 8	fair	viable	dieback, early stage of decline
27	530		bitter cherry	native	11	82	1	7 / 5	0 / 5	0 / 5	8 / 5	fair	viable	some dieback
28	531		big leaf maple	native	15	70	3	15 / 8	11 / 8	10	17	good	viable	
29	532		bitter cherry	native	13	76						poor	non-viable	20% lcr
30	533		bitter cherry	native	13	74						poor	non-viable	10% lcr
31	534		bitter cherry	native	10	74						poor	non-viable	dieback
32	535		bitter cherry	native	7	69						poor	non-viable	dieback
33	215	537	bitter cherry	native	12	86	2	17	0	0	14	fair	viable	leans NW
34	538													dead

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35	539													dead
36	665													dead
37	666		vine maple	native	6	56		12	9	3	11	fair	viable	
38	667		red alder	native	10	58						poor	non-viable	nead dead, 10% lcr
39	668													dead
40	669		bitter cherry	native	12	88		6	14	12	11	fair	viable	
41	670		Douglas-fir	native	12	58						poor	non-viable	20% lcr
42	207	671	big leaf maple	native	21	104	6	5	24	18	24	good	viable	trunk forks at 15', minor included bark
43	211	672	big leaf maple	native	6	51		6 / 4	7 / 4	5 / 4	8 / 4	poor	non-viable	
44	210	673	big leaf maple	native	8	55		22 / 5	0 / 5	4 / 5	15 / 5	fair	viable	
45	674		Douglas-fir	native	28	120			12			fair	viable	some trunk bleeding
46	675		Douglas-fir	native	35	135			10			good	viable	
47	676		Douglas-fir	native	32	137			13		16	good	viable	
48	208	677	bitter cherry	native	8	86	1	10 / 4	4 / 4	8 / 4	3 / 4	fair	viable	poor taper
49	678		bitter cherry	native	12	85		12	7	11	9	fair	viable	
50	679		Douglas-fir	native	42	141			24 / 20			fair	viable	severe trunk bleeding
51	680													neighboring - dripline does not cross property line
52	685													neighboring - dripline does not cross property line
53	686													neighboring - dripline does not cross property line
54	687		big leaf maple	native	18, 19, 27	120			20 / 18	27 / 18	22 / 18	good	viable	forks at 2'
55	688		red alder	native	10	42			11 / 5			fair	viable	
56	689													dead
57	209	691	bitter cherry	native	19	90						poor	non-viable	45 deg lean, root plate lifting, high risk
58	695													neighboring - dripline does not cross property line
59	695													neighboring - dripline does not cross property line
60	696													neighboring - dripline does not cross property line
61	700		red alder	native	17	69	4	22	13	9	17	fair	viable	
62	706		red alder	native	14	72	3	7	12	6	13	fair	viable	
63	707		red alder	native	8	52	1	0	13	3	6	fair	viable	severe lean
64	708		red alder	native	13	72	2	6	14	9	11	fair	viable	
65	711													dead
66	216	712	bitter cherry	native	7	68		7	5	2	3	poor	non-viable	20% lcr, severe dieback
67	713													dead
68	205	770	big leaf maple	native	16, 21	105	10	32	2	34	18	fair	viable	

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City of Kirkland

American Forest Management, Inc
Date: 5/9/2016
Inspector: Wilkinson

Tree #	Tag #	Old Tree #	Species	Native/ Planted/ Volunteer	DBH (inches)	Height (feet)	Tree Credit	Drip-Line/Limits of Disturbance (feet) N	S	E	W	Condition	Viability	Comments
69	206	771	big leaf maple	native	21	110	6	8	9	29	15	fair	viable	
70	772		big leaf maple	native	25	116		12			38	good	viable	
71	773		big leaf maple	native	18, 19	108		16				good	viable	neighboring
72	774		big leaf maple	native	22	114		15		46		good	viable	neighboring
73	777		western hemloc	native	34	114	13	16	18	15	14	good	viable	
74	778		red alder	native	7	66						poor	non-viable	10% lcr
75	779		red alder	native	6	65		6	5	7	6	fair	viable	
76	217	780	Pacific dogwoo	native	7	50	1	7	6	7	8	fair	viable	
77	783		red alder	native	10, 4, 6	74	2.5	15	14	12	19	fair	viable	
78	784		red alder	native	7	70	1	9	12	13	10	fair	viable	
79	787		red alder	native	7	67	1	3	11	8	4	fair	viable	
80	788		red alder	native	5, 4	62	1	5	13	10	12	fair	viable	
81	789		red alder	native	9, 9	71	2	13	15	9	10	fair	viable	
82	223	793	red alder	native	10	75	1	14	10	12	13	fair	viable	
83	222	794	red alder	native	8, 14	77	4	9	13	10	12	fair	viable	
84	224	795	red alder	native	12	62	2	16	10	6	12	fair	viable	
85	802													unknown - based on field Tree 85 is #867/T122
86	809													neighboring - dripline does not cross property line
87	810													neighboring - dripline does not cross property line
88	811		big leaf maple	native	18, 12	98		24	17	19	21	fair	viable	neighboring
89	227	815	big leaf maple	native	34	78	13	27	13	12	16	fair	viable	
90	816		big leaf maple	native	25, 42	82	25	29	31	17	16	fair	viable	lower trunk decay
91	817		big leaf maple	native	37	95	14	28	11	12	18	fair	viable	
92	229	869	big leaf maple	native	35	92	13	19	16	10	16	fair	viable	large stem failure
93	829		red alder	native	14	87	3	8	14	18	15	good	viable	
94	830		red alder	native	16, 5, 8	95	5.5	17	16	12	14	fair	viable	
95	831		red alder	native	17	92	4	4	18	12	19	fair	viable	
96	832		red alder	native	9	76	1	5	14	3	18	fair	viable	
97	833		red alder	native	7	77	1	8	4	5	15	fair	viable	
98	834		red alder	native	9	75	1	6	5	8	12	fair	viable	
99	835		red alder	native	17, 5	86	4.5	16	6	16	17	fair	viable	
100	838		red alder	native	18	87	5	16	12	17	17	good	viable	
101	839		red alder	native	16, 17	92	8	12	18	17	15	fair	viable	
102	840		red alder	native	16	89	4	11	9	7	12	fair	viable	

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City of Kirkland

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Tree #	Tag #	Old Tree #	Species	Native/ Planted/ Volunteer	DBH (inches)	Height (feet)	Tree Credit	Drip-Line/Limits of Disturbance (feet) N	S	E	W	Condition	Viability	Comments
103	841		red alder	native	3, 14	67	3.5	16	8	7	9	fair	viable	dieback
104	843													dead
105	847													neighboring - dripline does not cross property line
106	848													neighboring - dripline does not cross property line
107	225	795	red alder	native	28	92	10	8	22	6	18	fair	viable	3 codominant stems
108	226	850	red alder	native	19	86	5	10	18	11	8	fair	viable	
109	851		red alder	native	10	76			12			fair	viable	
110	852													neighboring - dripline does not cross property line
111	853		western hemloc	native	10	65	1	6	10	7	8	good	viable	
112	221	854	red alder	native	7	65		6	12	7	6	fair	viable	
113	857													neighboring - dripline does not cross property line
114	858													neighboring - dripline does not cross property line
115	859													neighboring - dripline does not cross property line
116	860													neighboring - dripline does not cross property line
117	861													neighboring - dripline does not cross property line
118	862													neighboring - dripline does not cross property line
119	863													neighboring - dripline does not cross property line
120	865		red alder	native	9, 5	74		6	5	4	15	fair	viable	neighboring
121	866		red alder	native	6, 7, 8, 8, 9	62	5	8	7	9	5	fair	viable	
122	867		big leaf maple	native	6, 8, 28	115	12	22		9	20	good	viable	location - tree #85 on the map
123	228	828	big leaf maple	native	28	88		17	10	8	12	fair	viable	neighboring
124	870													neighboring - dripline does not cross property line
125	871													neighboring - dripline does not cross property line
	201		bitter cherry	native	8	28		9	0	14	0	fair	viable	leans E, ivy on the trunk
	202		Douglas-fir	native	6	31		6	8	4	6	fair	viable	
	203		bitter cherry	native	8	46		4	8	12	9	fair	viable	
	212		bitter cherry	native	8	65						poor	non-viable	ivy covering trunk, 20% lcr
	213		bitter cherry	native	6, 7	42						poor	non-viable	30% lcr, ivy covering trunk
	214		bitter cherry	native	11	63	1	6	8	3	8	fair	viable	dieback
	218		red alder	native	8	65	1	12	9	10	16	fair	viable	
	219		red alder	native	6	62	1	6	6	11	10	fair	viable	
	220		red alder	native	8, 7	67	2	6	10	13	14	fair	viable	
	836		red alder	native	16	92	4	17	5	7	18	fair	viable	no tree #