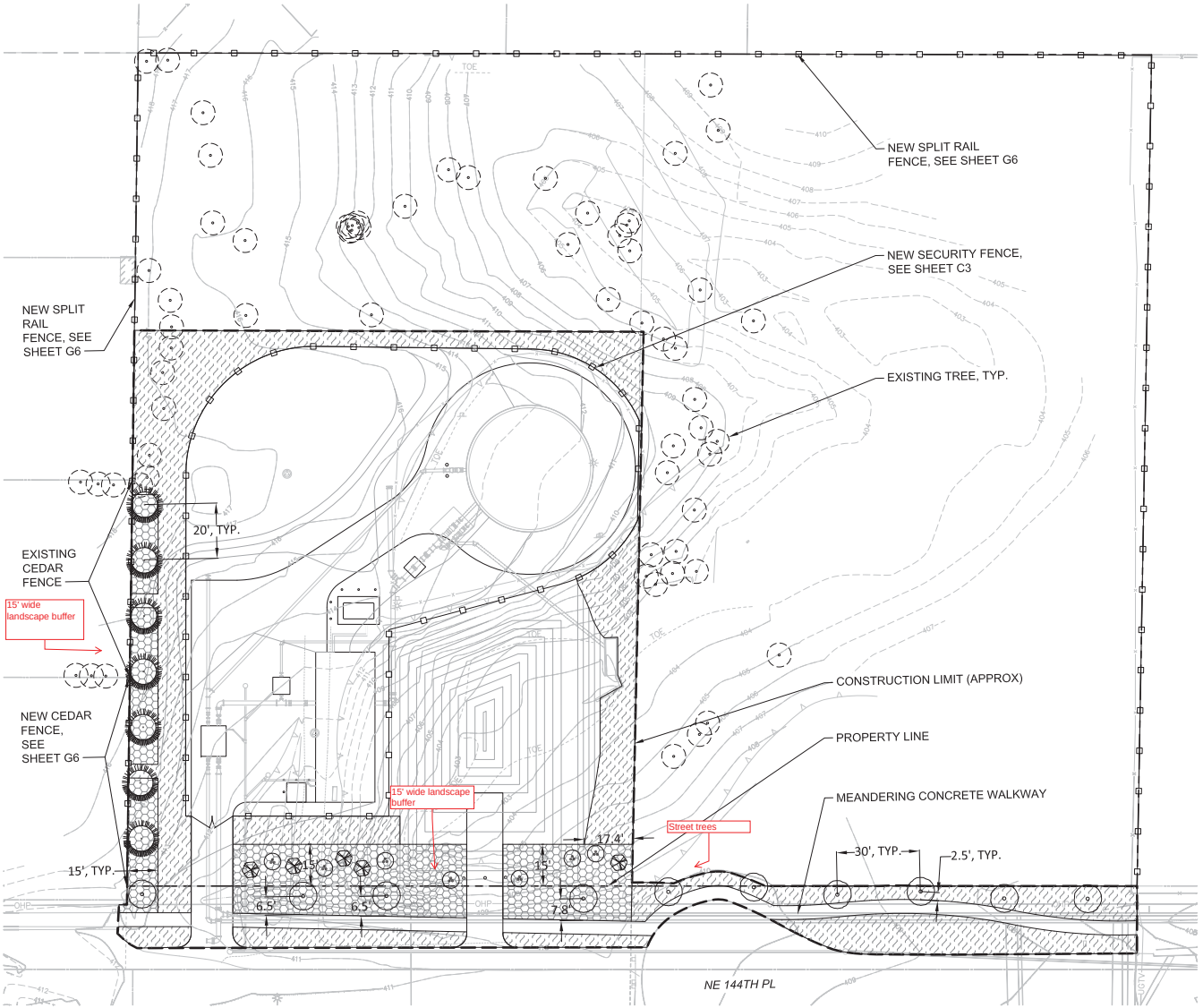


PLANT SCHEDULE

SYMBOL	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
TREES				
	PINUS CONTORTA 'CONTORTA'	SHORE PINE	8' HEIGHT	AS SHOWN
	STEWARTIA PSEUDOCAMELLIA	JAPANESE STEWARTIA	2 1/2" CALIPER	AS SHOWN
	ACER CIRCINATUM	VINE MAPLE	2 1/2" CALIPER	AS SHOWN
SHRUBS				
	AMELANCHIER ALNIFOLIA	SERVICEBERRY	5 GAL	AS SHOWN
SHRUBS/GROUNDCOVER				
	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL	18" OC
	BERBERIS NERVOSA	LOW OREGON GRAPE	1 GAL	18" OC
	GAULTHERIA SHALLON	SALAL	1 GAL	18" OC
NATIVE GRASS & FORB SEED MIX				
	ACHILLEA MILLEFOLIUM	YARROW		
	ANAPHALIS MARGARITACEA	PEARLY EVERLASTING		
	BROMUS CARINATUS	CALIFORNIA BROME		
	ELYMUS GLAUCUS	BLUE WILDRYE		
	FESTUCA RUBRA VAR RUBRA	NATIVE RED FESCUE		
	FESTUCA OCCIDENTALIS	WESTERN FESCUE		
	LUPINUS ALBICAULIS	SICKLE KEELED LUPINE		

NOTES:

PRIOR TO PLANTING:

1. PROTECT EXISTING TREES TO REMAIN.
2. HAND REMOVE ALL NONNATIVE, INVASIVE VEGETATION.
3. FIELD VERIFY, AND RECEIVE APPROVAL FROM THE PROJECT REPRESENTATIVE, THE LOCATION OF ALL PROPOSED TREE PLANTINGS. TREES SHALL BE PLANTED A MINIMUM OF 5' FROM THE CENTERLINE OF ALL UNDERGROUND UTILITIES.

DURING PLANTING:

4. TREES AND SHRUBS SHALL BE INSTALLED PER CITY OF KIRKLAND STANDARDS.

AFTER PLANTING:

5. APPLY A 3" LAYER OF WOOD CHIP MULCH THROUGHOUT PLANTING AREAS, MULCH SHALL BE KEPT 6" FROM SHRUB AND TREE STEMS.

N

0 10' 20' 40'

LAST SAVED BY: dpierce

REV	DATE	BY	DESCRIPTION

NOT FOR CONSTRUCTION

DESIGNED
DRAWN
CHECKED
DATE AUG 2012
PROJECT ENGINEER

WWD SHEET NO.
WOODINVILLE WATER DISTRICT
APPROVED BY MANAGER FOR PUBLIC WATER AND SEWER SYSTEMS ONLY
DATE

ESA
5309 Shilshole Ave, NW
Seattle, WA 98107
P: (206) 789-9658
F: (206) 789-9684

WOODINVILLE WATER DISTRICT

WOODINVILLE WATER DISTRICT
KINGSGATE BOOSTER PUMP STATION AND PIPELINE
LANDSCAPE
PLANTING PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 7763A.10
DRAWING NO. L-2
SHEET NO. OF XX

PROJECT NO. 7763A10 FILE NAME: 7763A10-L-001.dwg

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

DEVELOPMENT STANDARDS LIST
File: ZON12-00311

PLANNING DEPARTMENT CONDITIONS

ZONING CODE STANDARDS

18.08 and 18.10.070 Public Utility Use Zone Chart

150.22.2 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 issuance of a grading or building permit:

95.30(4) 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.

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 6 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.

95.50 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.

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

105.77 Parking Area Curbing. All parking areas and driveways, for uses other than detached dwelling units must be surrounded by a 6" high vertical concrete curb.

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.

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.

115.40 Fence Location. Fences over 6 feet in height may not be located in a required setback yard.

115.45 Garbage and Recycling Placement and Screening. For uses other than detached dwelling units, duplexes, moorage facilities, parks, and construction sites, all garbage receptacles and dumpsters must be setback from property lines, located outside landscape buffers, and screened from view from the street, adjacent properties and pedestrian walkways or parks by a solid sight-obscuring enclosure.

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.

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.

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.

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.

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.

115.115.d Driveway Setbacks. Parking areas and driveways for uses other than detached dwelling units, attached and stacked dwelling units in residential zones, or schools and day-cares with more than 12 students, may be located within required setback yards, but, except for the portion of any driveway which connects with an adjacent street, not closer than 5 feet to any property line.

115.120 Rooftop Appurtenance Screening. New or replacement appurtenances on existing buildings shall be surrounded by a solid screening enclosure equal in height to the appurtenance. New construction shall screen rooftop appurtenances by incorporating them in to the roof form.

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.

Prior to occupancy:

95.51.2.a Required Landscaping. All required landscaping shall be maintained throughout the life of the development. The applicant shall submit an agreement to the city to be recorded with King County which will perpetually maintain required landscaping. Prior to issuance of a certificate of occupancy, the proponent shall provide a final as-built landscape plan and an agreement to maintain and replace all landscaping that is required by the City

110.60.5 Landscape Maintenance Agreement. The owner of the subject property shall sign a landscape maintenance agreement, in a form acceptable to the City Attorney, to run with the subject property to maintain landscaping within the landscape strip and landscape island portions of the right-of-way (see Attachment @). It is a violation to pave or cover the landscape strip with impervious material or to park motor vehicles on this strip.

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.

PUBLIC WORKS CONDITIONS

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 at www.ci.kirkland.wa.us.

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 fees can also be review the City of Kirkland web site at www.ci.kirkland.wa.us. The applicant should anticipate the following fees:
    - Right-of-way Fee
    - Review and Inspection Fee (for utilities and street improvements).
    - Traffic Impact Fee (paid with the issuance of Building Permit). For additional information, see notes below.

3. Prior to submittal of a Building or Zoning Permit, the applicant must apply for a Concurrency Test Notice. Contact Thang Nguyen, Transportation Engineer, at 425-587-3869 for more information.

4. Building Permits associated with this proposed project may be subject to the traffic, impact fees per Chapter 27 of the Kirkland Municipal Code. The impact fees shall be paid prior to issuance of the Building Permit(s).

5. 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 titled ENGINEERING PLAN

REQUIREMENTS. This policy is contained in the Public Works Pre-Approved Plans and Policies manual.

6. 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.

7. 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).

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

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

Surface Water Conditions:

1. Provide temporary and permanent storm water control per the 2009 King County Surface Water Design Manual and the Kirkland Addendum. 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.

    - <u>Full Drainage Review</u>
    - A full drainage review is required for any proposed project, new or redevelopment, that will:
        - ✓ Add or replaces 5,000ft^2 or more of new impervious surface area,
        - ✓ Propose 7,000ft^2 or more of land disturbing activity, or,
        - ✓ Be a redevelopment project on a single or multiple parcel site in which the total of new plus replaced impervious surface area is 5,000ft^2 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. 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.

3. If this project is creating or replacing more than 5000 square feet of new impervious area that will be used by vehicles (PGIS - pollution generating impervious surface), then provide storm water quality treatment per the 2009 King County Surface Water Design Manual. The enhanced treatment level is encouraged when feasible for multi-family residential, commercial, and industrial projects.

4. Storm detention calculations for the entire site are required.

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

6. It doesn't appear that 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.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage_NWPs

   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. 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.

8. 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.

Street and Pedestrian Improvement Conditions:

1. The subject property abuts NE 144th Place. This street is a Neighborhood Access 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 along their west parcel that is being developed would typically be improved with the following:

   A. Widen the street to match the curb to the west.
   B. Install storm drainage, curb and gutter, a 4.5 ft. planter strip with street trees 30 ft. on-center, and a 5 ft. wide sidewalk.
   C. However, in this case, the Water District has proposed a modification to the street improvements and in-lieu of installing the above described improvements, they are

proposing to install a 5 ft. wide meandering sidewalk that will be installed from the west property line of their western lot to their east property line of their eastern lot which is not directly affected by this project; the eastern parcel serves as passive open space for the neighborhood and is maintained by the Kirkland Parks Department. Public Works recommends approval of the modification because it will construct sidewalk all the way across both lot frontages and will link to a subdivision that is installing sidewalk direct to the east all the way to 132nd Ave. NE. Street trees 30 ft on-center should be installed along the new sidewalk. The street does not need to be widened to match the existing street to the west, but it shall be widened to a minimum width of 20 ft. from the west property line east to the existing barricade (it appears that the existing asphalt is approximately 15 ft. wide). Install drainage collection and conveyance as needed for the new pavement as well as the new asphalt driveways serving the property and the detention pond.

2. A 2-inch asphalt street overlay will be required where three or more utility trench crossings occur within 150 lineal ft. of street length or where utility trenches parallel the street centerline. Grinding of the existing asphalt to blend in the overlay will be required along all match lines.

3. 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.

4. 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.

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

6. 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 NE 144th Pl 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.

7. 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.

BLDG. DEPT. CONDITIONS

1. Prior to issuance of Building, Demolition or Land surface Modification permit applicant must submit a proposed rat baiting program for review and approval. Kirkland Municipal Ordinance 9.04.040
2. Building permits must comply with the 2009 editions of the International Building, Residential and Mechanical Codes and the Uniform Plumbing Code as adopted and amended by the State of Washington and the City of Kirkland.
3. Structure must comply with the 2009 Washington State Energy Code.
4. Structures to be designed for seismic design category D, wind speed of 85 miles per hour and exposure C.
5. Plumbing meter and service line shall be sized in accordance with the current UPC.
6. Demolition permit required for removal of existing structures, if applicable.
7. A geotechnical report is required to address this development activity. The report must be prepared by a Washington State licensed Professional Engineer. Recommendations contained within the report shall be incorporated into the design of the subsequent structures.

CHAPTER 18 – SINGLE-FAMILY RESIDENTIAL A (RSA) ZONES

18.05 User Guide.

The charts in KZC 18.10 contain the basic zoning regulations that apply in each RSA 1, RSA 4, RSA 6 and RSA 8 zones of the City. Use these charts by reading down the left hand column entitled Use. Once you locate the use in which you are interested, read across to find the regulations that apply to that use.

Section 18.08

Section 18.08 – GENERAL REGULATIONS

The following regulations apply to all uses in this zone unless otherwise noted:

1. Refer to Chapter 1 KZC to determine what other provisions of this code may apply to the subject property.

2. If any portion of a structure is adjoining a detached dwelling unit in a low density zone, then either:
   a. The height of that portion of the structure shall not exceed 15 feet above average building elevation; or
   b. The maximum horizontal facade shall not exceed 50 feet.

   See KZC 115.30, Distance Between Structures/Adjacency to Institutional Use, for further details.
   (Does not apply to Detached Dwelling Unit and Mini-School or Mini-Day-Care Center uses).

3. All subdivisions and short subdivisions in the RSA-1 zone shall be clustered such that development is located away from critical areas. The open space resulting from such clustering shall be placed in a separate tract that includes at least 50 percent of the subject property. Open space tracts shall be permanent and shall be dedicated to a homeowner's association or other suitable organization for purposes of maintenance. Passive recreation, with no development of recreational facilities, and natural-surface pedestrian and equestrian trails are acceptable uses within the open space tract. If access to the open space is provided, the access shall be located in a separate tract. A greenbelt protection or open space easement shall be dedicated to the City to protect the designated open space tract resulting from lot clustering.

4. For properties within the Holmes Point (HP) Overlay Zone, see Chapter 70 KZC for additional regulations.

5. May not use lands waterward of the ordinary high water mark to determine lot size or to calculate allowable density.

6. For properties within the jurisdiction of the Shoreline Management Act, see Chapter 83 KZC for permitted uses, shoreline setback regulations and other additional regulations.

7. A hazardous liquid pipeline extends through or near the RSA 1, 4, 6 and 8 zones in the vicinity of 136th Avenue NE. Refer to Chapter 118 KZC for regulations pertaining to properties near hazardous liquid pipelines.

link to Section 18.10 table

Section 18.10 USE ⇩ REGULATIONS ⇨		DIRECTIONS: FIRST, read down to find use...THEN, across for REGULATIONS										
			MINIMUMS				MAXIMUMS					
		Required Review Process	Lot Size	REQUIRED YARDS (See Ch. 115)			Lot Coverage	Height of Structure	Landscape Category (See Ch. 95)	Sign Category (See Ch. 100)	Required Parking Spaces (See Ch. 105)	Special Regulations (See also General Regulations)
				Front	Side	Rear						
.070	Public Utility	See Spec. Reg. 1.	None	20'	20' on each side	20'	70%, except 30% for RSA 1 zone. See Gen. Reg. 3. See Gen. Reg. 4 for Holmes Point overlay zone.	30' above average building elevation.	A See Gen. Regs. 3 and 4.	B	See KZC 105.25.	1. The required review process is as follows: a. If the subject property, including all contiguous property owned by the applicant and held by others for future use by the applicant, is less than five acres, the required review process is Process IIA, Chapter 150 KZC. b. If the subject property, including all contiguous property owned by the applicant and held by others for future use by the applicant, is five or more acres, a Master Plan, approved through Process IIB, Chapter 152 KZC, is required. The Master Plan must show building placement, building dimensions, roadways, utility locations, land uses within the Master Plan area, parking location, buffering, and landscaping. 2. Site design must minimize adverse impacts on surrounding residential neighborhoods. 3. Landscape Category A or B may be required depending on the type of use on the subject property and the impacts associated with the use on the nearby uses. 4. One pedestal sign with a readerboard having electronic programming is allowed at a fire station only if: a. It is a pedestal sign (see Plate 12) having a maximum of 40 square feet of sign area per sign face; b. The electronic readerboard is no more than 50 percent of the sign area; c. Moving graphics and text or video are not part of the sign; d. The electronic readerboard does not change text and/or images at a rate less than one every seven seconds and shall be readily legible given the text size and the speed limit of the adjacent right-of-way; e. The electronic readerboard displays messages regarding public service announcements or City events only; f. The intensity of the display shall not produce glare that extends to adjacent properties and the signs shall be equipped with a device which automatically dims the intensity of the lights during hours of darkness; g. The electronic readerboard is turned off between 10:00 p.m. and 6:00 a.m. except during emergencies; h. It is located to have the least impact on surrounding residential properties. If it is determined that the electronic readerboard constitutes a traffic hazard for any reason, the Planning Director may impose additional conditions.
.080	Government Facility Community Facility				10' on each side	10'			C See Spec. Reg. 3.			
				See Gen. Reg. 6.								
.090	Public Park	Development standards will be determined on a case-by-case basis. See Chapter 49 KZC for required review process.										1. For properties within the jurisdiction of the Shoreline Management Act, this use may include a public access pier or boardwalk. See Chapter 83 KZC.

Arborist Report

Woodinville Water District Kingsgate Reservoir Project

Prepared for: Environmental Science Associates
5309 Shilshole Avenue NW, Suite 200
Seattle, WA 98107
206.789.9658

Prepared by: Back To Nature Design LLC
121 NW 79th Street
Seattle WA 98117
206.664.1688

July 2012
Revised II

Background

Environmental Science Associates (ESA) retained Back To Nature Design (BTND) of Seattle, Washington to prepare an Arborist Report, providing ESA necessary data and other information needed to develop a final Tree Protection Plan that meets Kirkland Zoning Code (KZC) 95.30.4(c) requirements as it relates to the Woodinville Water District (WWD) Kingsgate Reservoir project located at 13006 NE 144th PL, in Kirkland, Washington (Parcel # 2126059131).

The report is broken up into a series of sections related to existing tree health and anticipated site changes during and following construction. Included in this report are the following: a description of methods used to collect data and develop this report, results from a significant tree inventory previously conducted by BTND, a significant tree impact assessment, a discussion about anticipated tree removals, recommended tree protection measures, a discussion about supplemental planting and a draft maintenance plan.

According to the requirements of KZC 95.34, this report at a minimum includes:

- A description of tree health, condition and viability,
- A description of methods used to determine the Limit of Disturbance (LOD),
- Specific tree protection needs within the LOD during construction,
- Reasons for tree removal,
- Discussion of impacts of removal activities on other trees,
- Suggestions for timing and installation of tree protection measures and
- Suggestions for location and species of supplemental trees to be used when required (includes planting and maintenance specifications).

Site Description

The WWD Kingsgate reservoir site is located north of two dead-end streets, which meet at 130th AVE and NE 144th Place, in Kirkland, Washington. Kingsgate developed heavily in the 1980's and well into the 1990's. The canopy surrounding the project site can generally be described as second or third growth semi-mature native forest. This forest provides moderately continuous conifer habitat for wildlife species. The most common tree in the area is the notorious and culturally significant, Douglas fir tree (*Pseudotsuga menzeiseii*). Other common native trees include big-leaf maple (*Acer macrophyllum*) and western red cedar (*Thuja plicata*). Some native understory plants persist in the area; however, the majority of green spaces are landscaped in the iconic northwest style. Big-leaf maple, Douglas fir, western red cedar and black cottonwood dominate the reservoir site. Common understory vegetation includes sword fern (*Polystichum munitum*), salmonberry (*Rubus spectabilis*) and Himalayan blackberry (*Rubus armeniacus*).

Technical Guidelines and Criteria

In order to complete this Arborist Report, BTND ISA Certified Arborist, Brooke Sullivan (#PN-6439A and TRACE #484) prepared a tree inventory and a tree impact assessment for significant trees located at 13006 NE 144th PL, in Kirkland, Washington (Parcel # 2126059131). An adjoining property, Parcel # 2126059136, was not included in this study. As a result of proposed development at the site, a detailed arborist report meeting the requirements of Kirkland Zoning Code (KZC) 95.30.4(a) and Task 2 of the Scope of Work and Cost Estimate for Arborist Services – Revised June 1, 2011 was developed.

Tree Inventory

All *significant trees* on the parcel measuring six inches or greater in diameter at 4.5 feet above ground (dbh) were inventoried in the field over the course of two days by an ISA Certified Arborist. The arborist was equipped with a Spencer Original Logger's Tape, field data sheets, a compass, tree hammer, nails, tree tags and a camera. The original inventory was completed prior to any site plan review. This allowed for an unbiased assessment of the general health, location and condition of each tree. Each tree was measured, assessed, tagged and recorded. The final tree inventory is included in Appendix A.

Survey

All significant trees onsite were surveyed by ESA using a Trimble Global Positioning Systems (GPS) unit on October 3, 2011. Some tree locations were adjusted manually to better reflect conditions onsite. The final GPS tree survey was eventually converted to AutoCAD and included in ESA's tree removal and protection site plans (Appendix B).

LOD

Following completion of the inventory, the Limit Of Disturbance (LOD) for each significant tree was determined. Initial limits were estimated to be equal to 1-foot for protection of every inch of tree caliper. A list of the LOD for significant trees in the tree inventory is included in Appendix C.

Impact Assessment

Sheet L-1, was created by ESA (November 2011) using the site plan developed by Carollo Engineers (Appendix B). Using this plan sheet, a fair estimate for the extent of construction encroachment into the LOD could be established for each tree. Using estimates of encroachment and the intensity of proposed impacts, a description of the nature of anticipated tree impacts could be developed. The four levels of impact established on this site describe the intensity of anticipated disturbances for each tree. The four categories are Extreme, High, Medium and Low Impact. The Extreme Impact category includes all trees whose trunks are within Limit of Construction (LOC) for the proposed reservoir project. Trees whose drip-line or structural

branches fall within the LOC were given a High Impact rating. In the Medium Impact category the LOC is in conflict with the tree's LOD. Low Impact was assigned to trees whose LOD, drip-line and trunk are not within the LOC. A summary of tree impact categories can be found in Appendix C.

Tree Protection

These projected impact categories were further broken down into three zones, which correspond to a level of intensity in protection efforts and require variable protection methods. The three zones are: Remove (Zone 1), Protect (Zone 2) and Conserve (Zone 3). For each zone, applicable tree protection measures were established to provide the best chance for long-term health and vitality of all significant trees in that zone during and after construction activities. A summary of tree protection zones can be found in the *Recommended Tree Protection Measures* section later into this report. Recommended supplemental tree protection measures can be found in Appendix D.

Supplemental Planting and Maintenance

Supplemental planting recommendations are provided to assist ESA in the development of tree protection and replacement plans. Six common species of native trees are recommended for use as replacement tree plantings. Criteria for landscape placement are also provided in this report.

Summary

The preparation of this document has been accomplished through review of City of Kirkland Zoning Code (KZC) Chapter 95.30.4(c) and a process of data collection, plan review and site analysis. Every attempt was made to use unbiased data collection and plan review methods. Included in the investigations and reporting herein are a completed tree inventory, a tree impact assessment and recommendations for tree protection measures, supplemental planting and maintenance planning.

Tree Inventory

Identification, Measurement and Recording

BTND arborist Brooke Sullivan visited the Woodinville Water District Kingsgate Reservoir project site on September 13, 2011 to conduct an initial field inventory of significant trees. The inventory work included data collection and tree tagging. The first survey revealed a total of 66 trees, measuring six inches or greater in diameter at 4.5 feet above ground (dbh), were numbered with blue aluminum tags on the northwest side of the tree. During field mapping of trees, 21 additional trees were inventoried. In all, 87 trees were identified for inclusion in the tree inventory. Five tree species were identified during the course of investigations, including *Pseudotsuga menziesii* (Douglas fir), *Alnus rubra* (red alder), *Acer macrophyllum* (big leaf maple), *Populus balsamifera* (black cottonwood) and *Thuja plicata* (western red cedar). Imperial dbh measurements were obtained and recorded onto field data sheets.

The species, size, condition and a preliminary health status for each tree was also recorded in the field. A field sketch was created at each site visit to organize trees for analysis in the office. Health status was recorded at the time of review as Excellent, Good, Fair or Poor depending on current vigor and condition. Young trees and trees with exceptional rates of annual growth were rated as Excellent. Trees who were not young or growing exceptionally well, but still maintained vigor and sound structure were rated as Good. Trees with some structural defects that retained normal vigor were rated as Fair. Trees with well-defined issues that affected vigor were rated as Poor. No dead trees were inventoried during the course of these surveys.

A number of wildlife species were noted in the area during data collection, including American crow, American robin, black-capped chickadee, winter wren, Eastern gray squirrel, and domestic dog. Evidence of pileated woodpecker activity was also present in a standing snag to the east of the property.

Field Mapping

BTND arborist Brooke Sullivan and ESA staff scientist Alex Wallace visited the Woodinville Water District Kingsgate Reservoir project site (Parcel # 2126059131) on October 3, 2011 to locate eighty-seven tree specimens for inclusion in the significant tree inventory and entered into ESA's GPS survey. All 87 significant trees were mapped in the field by ESA staff using measuring tapes, a compass and a Trimble GPS unit. Instances in which a sufficient number of satellites could not be established, GPS data points were inferred through taking a compass degree reading and marking the known distance to the trunk. These measurements were then added into the final tree location map provided by ESA. The accuracy of these field measurements cannot be verified at this time. Many of the original blue aluminum tree tags were missing from significant trees tagged in the original survey and could

not be relocated on-site. Due to previous tagging failures, no additional tagging was completed during the second site visit. BTND has included field sketches from the two site visits to assist in locating each tree correctly in the future (Appendix E). During the supplemental survey and mapping, 21 additional significant trees were added to the inventory and four additional species of trees were recorded including, black locust (*Robinia pseudoacacia*), blue spruce (*Picea pungens*), lodge pole pine (*Pinus contorta* ssp*. latifolia)* and red maple (*Acer rubrum)*.

Summary

In total, the tree inventory includes 87 significant trees, including nine species, both deciduous and coniferous. All significant trees are recorded in the final significant tree inventory for the parcel. Trees ranged in health from poor to excellent. Deciduous trees range in size from six inches to 53 inches dbh, and coniferous trees range in size from eight inches to 39 inches dbh. Appendix A includes the final significant tree inventory, which was updated on October 3, 2011.

Impact Assessment

Following development of the tree inventory, the Limit of Disturbance (LOD) from each tree trunk was estimated to be equal to one-foot for each inch of dbh measured and recorded in the field. Upon field verification, these limits appeared sufficient in all cases. Final LOD distances are provided in Appendix C. The Tree Removal and Protection Plan Sheet L-1, developed by ESA for use in the tree impact assessment can be found in Appendix B. The plan depicts proposed site disturbances, Limit of Construction (LOC) and existing significant tree locations.

Proposed Construction Activities

Construction activities at the Kingsgate Reservoir site are expected to include clearing, grading, excavating, trenching, pipeline construction, paving, fence building and landscaping. The limits of clearing, provided by Carollo Engineers on October 19, 2011, shows that all proposed impacts to the site would occur in the southern half of the parcel. As a result of these construction activities a number of trees will need to be removed.

Impacts to Significant Trees

When construction activities are planned within the branching or root zones of existing trees, impacts occur. Impacts to surrounding soils and water processes may also impact tree health. The intensity of these impacts can vary project-to-project, tree-to-tree and season-to-season. Often, impacts from construction do not materialize in trees for three to five years following construction.

Impact Rating

All trees from the final tree inventory were rated during the field visit based upon the likelihood that impacts would encroach into their respective LOD and drip-line. An assessment of the intensity of cumulative impacts from proposed construction activities on the significant trees was performed by BTND on October 21, 2011. Brooke Sullivan, ISA Certified Arborist #PN-6439A visited the project site with plan sheet L-1 and walked the site to assess likely impacts of the reservoir project to the health and condition of significant trees.

Four different impact categories were developed to describe the nature of expected tree impacts. The four levels of impact are Extreme, High, Medium and Low Impact.

All trees whose trunks are in direct conflict with LOC are assigned to the Extreme Impact category. Tree protection in these areas is not feasible. Removal is required. An exception to these criteria is Tree 66, which is located entirely within the LOC, however planned construction activities are limited to fence construction within the

outer edge of the drip-line. Tree 66 is a larger specimen tree that could be retained through the use of standard tree protection measures.

Trees whose drip-lines and outermost branches are most likely to be affected by construction activities were given a High Impact rating. Trees in this category will require detailed protection efforts. These trees may be saved if proactive tree protection and care measures are taken to prevent excessive physical and physiological damage.

Trees in the Medium Impact category are likely to incur encroachment within the LOD during construction; however, these impacts are minimal and protection measures are likely to mitigate any losses.

Low Impact was assigned to trees whose LOD, drip-line, and trunk are not within the LOC shown on Figure 1. Final recommendations and specifications for removal, protection and conservation are based upon the likelihood construction activities will intrude into the LOD and drip-line during the course of construction. Trees whose trunks are in the path of construction and must be removed are in Zone 1. Trees whose branches and/or roots are likely to be affected and require detailed tree protection measures are in Zone 2. Trees unlikely to endure changes following construction are in Zone 3.

Tree impact categories and associated protection zones are summarized in Figure 1 below.

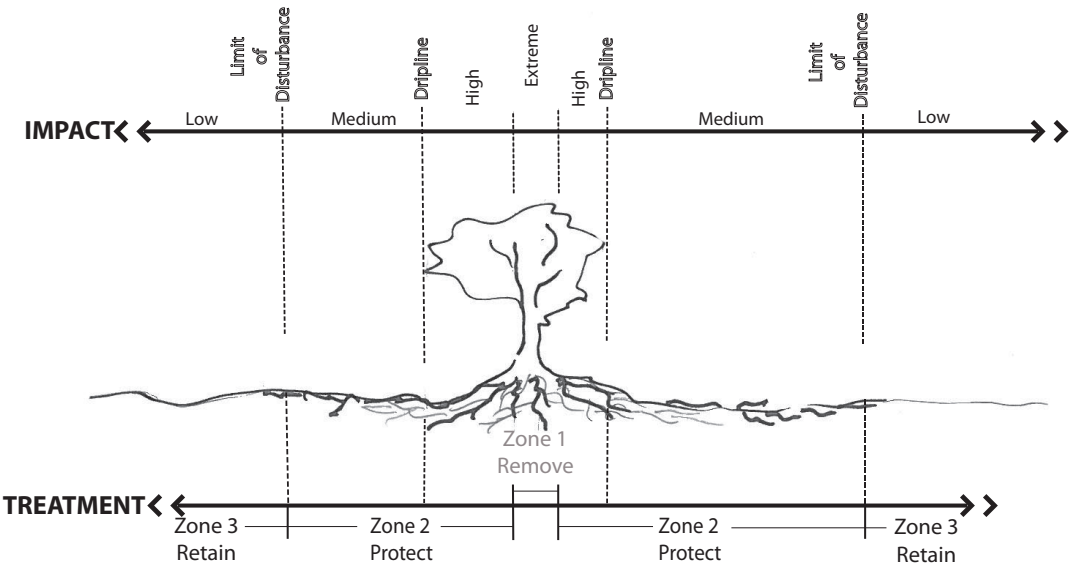


Figure 1: Conceptual diagram of tree impact and protection zones. Impact categories include Extreme, High, Medium and Low depending upon the extent of disturbance into roots and drip-lines.

Summary

In total, 87 significant trees were assessed for the intensity of potential impacts from construction activities. Impact categories include extreme (trunk removal), high (disturbance in the drip-line), medium (disturbance in LOD) and low (no impacts expected). Through this rating of anticipated impact intensity, 28 trees would likely require removal based upon projected construction impacts. Additionally, Tree #66, a Douglas fir in fair health will be removed. Tree removal efforts during construction are anticipated to include a total of 29 trees. Trees located within the High and Medium Impact tree categories (except Tree #66) should be carefully protected during construction activities. All Low Impact trees should be retained and preserved indefinitely on the site. A total of 26 Low Impact trees will be retained on-site.

Table 1 below provides a summary of anticipated tree impacts as a result of proposed Kingsgate Reservoir Project construction activities.

Table 1: Tree Impact Summary

Impact Category	Extreme Impact	High impact (Drip-line)	Medium impact (LOD only)	Low impact
Treatment	*Remove*	*Protect*		*Retain*
Proposed Impacts	Trunk Buttress Compaction over 1.8 g/cm^2	Structural roots Crown Scaffolds Compaction 1.3 – 1.7g/cm^2	Shallow roots Branches Twigs	No disturbance
Tree Protection Recommendation	No protection recommended	Detailed Protection recommended		Basic protection recommended
Total Trees	28 (+ one high impact)	13	19	26
Final Summary	29 Removed	58 Protected		

Recommended Tree Protection Measures

Trees and vegetation can be impacted during construction in many ways and often times the damage is not seen for several months or even years after the construction is completed. Proper tree protection can benefit not only the tree by reducing stress during construction but also can benefit the developer and the property owners by reducing long-term maintenance costs. The cost of removing a tree that was damaged during construction and died after construction was completed is usually greater than the cost of simply protecting the tree throughout construction. Not all damage occurs to trees and vegetation during the actual construction of buildings or structures. Trees are often damaged during the landscaping phase, after all the heavy equipment and workers have left. Installing irrigation, applying topsoil and turf installation can also cause damage to trees. Proper installation of tree protection measures will minimize minor and unexpected impacts occurring as a result of construction activities. There are three phases of tree loss prevention for any project site, including pre-construction, construction and post-construction protection.

BTND has collated KZC, standard industry procedures and practices, and site specific needs into this arborist report. This section focuses on providing information about the City of Kirkland's minimum requirements and BTND's standard recommended tree protection measures for achieving maximum success in providing tree protection during construction activities.

Preparation of a tree protection plan (TPP) and the installation of tree protection measures prior to construction are known to reduce tree loss throughout the life of the project. Installation of tree protection measures should occur prior to project staging activities, and may occur simultaneously with erosion and sediment control installations. During construction, protection measures should be monitored and maintained for effectiveness in reducing stress and damage to tree roots, trunks, branches and crowns. Following completion of all groundwork including grading, landscaping, site stabilization and irrigation, tree protection measures can be removed. Detailed recommendations for tree protection during construction, recommended measures for tree protection during active construction, and steps to be taken by contractor in trees emergencies are included in Appendix C of this report.

Minimum Tree Protection During Development Activity

The City of Kirkland has developed code requirements for tree protection during construction activities (KZC 95.34). The code provides for tree protection measures to be installed before construction begins, and methods for avoiding and mitigating unintended tree damages during construction. Further, they provide

guidance on tree installations (KZC 95.50), as well as maintenance and care for trees following construction (KZC 95.51).

At a minimum, trees should be protected pursuant to the following standards:

1) Use Directional Felling Techniques When Removing Trees

- Directional felling of trees shall be used to avoid damage to trees designated for retention.

2) Establish a tree protection area

- No person may conduct *any activity* within the protected area of *any tree designated to remain*, including, but not limited to, operating or parking equipment, placing solvents, storing building material or soil deposits, or dumping concrete washout or other chemicals.
- During construction, no person shall attach any object to any tree designated for protection.
- Erect and maintain readily visible temporary protective tree fencing along the limits of disturbance (LOD), which completely surrounds the protected area of all retained trees or groups of trees. Fences shall be constructed of chain link and be at least six (6) feet high, unless other type of fencing is authorized by the Planning Official.
- Install highly visible signs spaced no further than 15 feet along the entirety of the protective tree fence. Said sign must be approved by the Planning Official and shall state at a minimum "Tree Protection Area, Entrance Prohibited" and provide the City phone number for code enforcement to report violations.
- Prohibit excavation or compaction of earth or other potentially damaging activities within the barriers; provided, that the Planning Official may allow such activities approved by a qualified professional and under the supervision of a qualified professional retained and paid for by the applicant.
- Maintain the protective barriers in place for the duration of the project until the Planning Official authorizes their removal.
- Ensure that any approved landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or preferably, hand labor.

3) Stabilize Grade and Prevent Compaction

- The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the Planning Official's authorization based on recommendations from a qualified professional. The Planning Official may allow coverage of up to one-half (1/2) of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

- If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.
- The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the Planning Official. The Planning Official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root-induced damage to the impervious surface.
- To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The Planning Official may require that utilities be tunneled under the roots of trees to be retained if the Planning Official determines that trenching would significantly reduce the chances of the tree's survival.
- Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, it is encouraged that shrubs, ground cover and stumps be maintained on the individual lots, where feasible.

Please note that the Planning Official may require additional tree protection measures that are consistent with accepted urban forestry industry practices, which may include:

- If equipment is authorized to operate within the critical root zone, cover the areas adjoining the critical root zone of a tree with mulch to a depth of at least six (6) inches or with plywood or similar material in order to protect roots from damage caused by heavy equipment.
- Minimize root damage by excavating a 2-foot-deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.
- Corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.
- Maintenance of trees throughout construction period by watering and fertilizing.

BTND recommends additional protection measures be included in tree protection construction plans in order to maintain a minimum level of tree impacts on-site. Other recommended tree protection measures are included in the following section, *Tree Zones* and in the additional Recommended Tree Protection Measures found in Appendix C.

Tree Zones

For ease in developing and implementing tree protection measures for this construction project, anticipated tree impacts were used to reduce all significant trees into to three separate treatment zones. Zone 1 includes 29 trees that are

expected to require removal due to proposed construction activities. Trees in this area will not be protected or conserved through construction phases due to direct conflict with site developments plans. Zone 2 includes all trees whose LOD and/or drip-line will likely be disturbed to some extent through the course of construction; however, damages may be reduced through intentional tree care and preservation practices. Maintenance of tree health in Zone 2 following construction is anticipated to be feasible through implementation of appropriate tree protection measures prior to and during site disturbance and development activities. Zone 3 includes remaining significant trees whose LOD is not expected to be disturbed at any point during planned construction activities. These trees may be protected through relatively minimal effort compared to trees in Zone 2. The initial tree inventory rated the general health and condition of trees based upon their existing status. In all, 69 trees were originally determined to have some retention value. At least one tree (#35) is likely a hazard tree; however, since it is located in an area of low disturbance, it is recommended the tree be retained for habitat value. Of the 87 significant trees in the inventory, 26 are anticipated to remain vigorous following site development and an additional 32 are expected to survive any impacts from construction activities. A summary of criteria used for rating various tree protection zones (TPZ) is provided in Table 2 below.

Table 2: Tree Protection Zone Summary

Protection Zone	*Zone 1*	*Zone 2*		*Zone 3*
Impact Category	Extreme Impact	High impact	Medium impact	Low impact
Protection Recommendation	Removal recommended	Detailed Protection recommended		Basic protection recommended
Total Trees	29	32		26

Figure 2 below shows how the LOD, drip-line and trunk locations were used to develop three main protection zones.

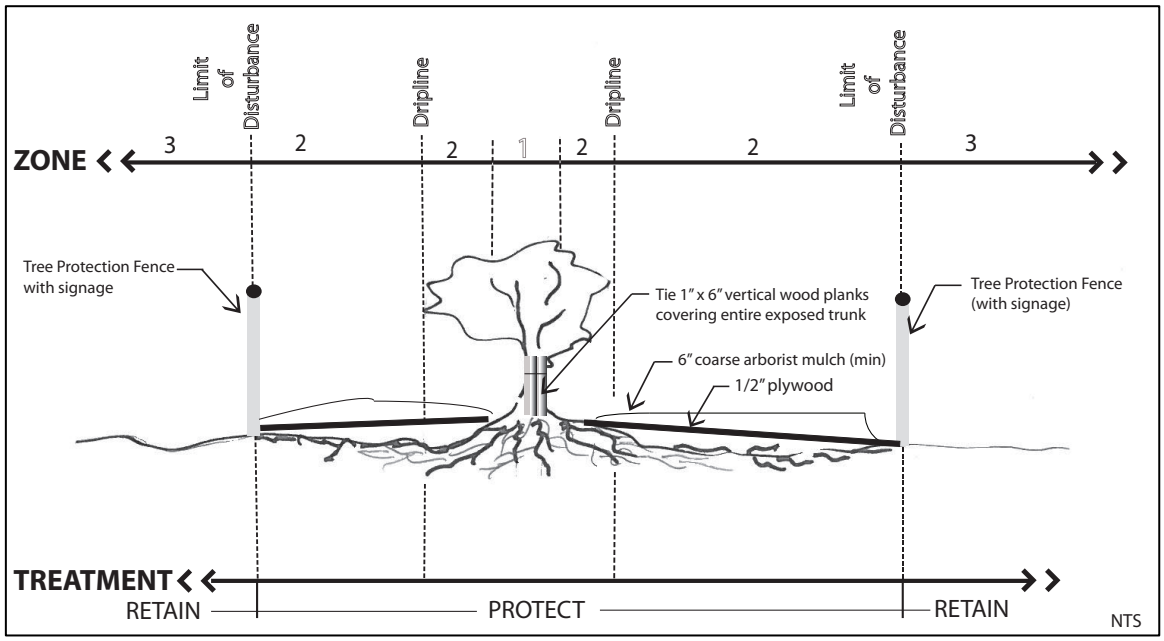


Figure 2: Draft impact zone and tree protection treatment diagram

ZONE 1 – REMOVE

All 28 trees located in the Extreme Impact category will require removal because the trunk or buttress of the tree is in the way of planned construction activities. Additionally, tree number 66 will be removed, so that a total of 29 trees will be removed as part of the Kingsgate Reservoir Project. Most of the tree removals occur on the southeastern part of the project parcel and will be removed to create a detention pond through the course of construction. A total of sixteen (16) tree removals will occur in the area planned for a new detention pond. These specimen collectively provide shade, annual nutrient contributions, stormwater run-off reduction, wildlife habitat, visual screening for the water tower and wind protection for other trees on-site. One (1) large Douglas fir and two (2) larger and two (2) smaller maple trees on the western side of the property will likely be lost as a result of various construction activities. Two (2) larger maples near the northern edge of the limits of construction are likely to require removal during fence building activities. Additionally, trees #82-#85 are located along the roadway and removal of all four trees is anticipated to be required for construction of the pipeline and a concrete meandering path (Appendix I). Finally, one semi-mature big-leaf maple tree on the eastern side of the water tower will need to be removed for installation of new fencing during construction.

The larger trees onsite have established wider crowns and stronger taper than most other specimen on-site. Preservation of the larger trees would be of value and detailed plans for preservation may be prepared once the final limits of construction are complete. Heavy sod growing beneath the trees has limited the availability of water and root development, however all of these trees are generally in good health.

Trees in Zone 1 should be removed according to the following standards:

- Directional felling of trees shall be used to avoid damage to trees designated for retention.
- Ensure removal does not compact soil in the LOD of trees to remain.
- Consider leaving some trunks of removed trees onsite as habitat in the form of tree snags or downed logs.

A list of all anticipated removal trees is provided in Table 3 below.

Table 3: Anticipated Tree Removals

Tree #	LOD (Feet)	Impacts
1	32	Extreme
2	8.5	Extreme
3	36	Extreme
4	28	Extreme
5	45	Extreme
6	26	Extreme
7	20.5	Extreme
11	31	Extreme
12	25	Extreme
13	24	Extreme
14	26	Extreme
15	36	Extreme
16	27	Extreme
17	16.5	Extreme
18	18	Extreme
19	17	Extreme
20	29.5	Extreme
21	30	Extreme
26	18.5	Extreme

53	22	Extreme
54	51	Extreme
66	36	High
79	6	Extreme
80	11	Extreme
81	39	Extreme
82	51	Extreme
83	11	Extreme
84	8	Extreme
85	8	Extreme

Remaining Trees

A total of fifty-eight (58) trees will be protected and retained on-site. BTND has prepared recommendations for tree protection measures aimed at protecting and retaining each of the remaining trees. Two protection zones will utilize various methods for protection that are applicable to each type of impact anticipated from construction. Through careful application of tree protection measures, these trees may be protected for a longer term on the site.

ZONE 2 – PROTECT

Protection of high and medium impact trees should be a priority of contractors during construction. Preservation of these trees will be largely dependent upon the ability of the Contractor, Project Arborist and the Woodinville Water District to maintain strict preservation policies during the course of construction.
Trees in Zone 2 should be protected by the following standards:

- No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, operating or parking equipment, placing solvents, storing building material or soil stockpiles, or dumping concrete washout or other chemicals.
- Prior to commencement of construction staging, locate the LOC and install 6-foot high chain-link fence around LOC and LOD perimeters.
- Install protection signage every 15 feet along barrier fences (Appendix F).
- Mark all LODs in the field with paint or other method approved by Project representative.
- Install additional high-visibility fencing in all areas of high impact.

- Install 6" of course arborist mulch within the LOD of all trees in Zone 2. If the LOD is located within the LOC, use plywood to cover the impact area within the LOC to the maximum extent feasible for the duration of construction activities.
- During construction, no person shall attach any unauthorized object to any tree designated for protection.
- Trees and other vegetation to be retained shall be protected from erosion and sedimentation.
- Additionally, all tree rated in the High Impact category should be additionally protected with 1" x 6" wood planks tied together vertically around the trunk of the tree to reduce risk of physical damage to tree trunks.

A list of tree to be protected in Zone 2 can be found in Table 4 below.

Table 4: Tree to be protected

Tree #	LOD (Feet)	Impacts
8	25.5	High
9	20	High
10	20.5	High
22	28.5	High
22.5	8	High
23	21	Medium
23.5	17.5	Medium
24	34.5	High
25	23	Medium
27	11	Medium
28	36	High
31	15	High
32	24	Medium
33	14.5	Medium
34	21	Medium
39	37	Medium
55	11	Medium
56	8	Medium
57	8	Medium
58	10.5	Medium
59	53	Medium
60	22.5	Medium
61	20.5	Medium
70	27.5	Medium
71	7	Medium
72	16	Medium
73	8.5	Medium

74	11.5	High
75	19	High
76	13	High
77	10	High
78	11	High

ZONE 3 – RETAIN

Trees in Zone 3 are unlikely to be impacted during construction; however, some protection is recommended to ensure there are no unanticipated losses in these areas.

Trees in Zone 3 should be protected to the following standards:

- No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, operating or parking equipment, placing solvents, storing building material or soil stockpiles, or dumping concrete washout or other chemicals.
- Install high visibility fencing (min. 4 feet high) outside of the LOD of all significant trees to remain.
- Trees and other vegetation to be retained shall be protected from erosion and sedimentation.

A list of trees to be retained can be found in Table 5 below.

Table 5: Low impact trees to be retained

Tree #	LOD (Feet)	Impacts
29	10	Low
30	16.5	Low
35	20	Low
36	19	Low
37	13	Low
38	11	Low
40	17	Low
41	16	Low
42	18	Low
43	23.5	Low
44	12	Low
45	18	Low
46	22.5	Low
47	24.5	Low
48	14	Low
49	24.5	Low
50	18	Low
51	25	Low
52	31	Low
62	25	Low
63	6	Low
64	8.5	Low
65	9	Low
67	32	Low
68	8.5	Low
69	11	Low

A tree treatment summary map was developed to show the limit of construction and proposed tree protection zones based upon field inventory (Appendix A), existing production maps (Appendix B) and tree impact assessment data (Appendix C).

Supplemental Planting

Planned tree removals may lead the City of Kirkland to require additional tree planting following completion of construction activities. New trees should be planted in such a way as to promote long-term health and viability of both existing and newly planted trees. The most important concept for tree planting success is known as "right plant, right place". Selecting the most appropriate tree for existing conditions allows for the greatest possible chance for survival over the long-term. Replacement trees should be selected with care to ensure long-term health and add beauty to the surrounding environment.

Site Conditions

The reservoir property contains both coniferous and deciduous trees, which form a forest on the eastern side and a largely open field spotted with a few native specimen on the west side. On-site conditions vary with regard to key environmental factors, including: hydrology, shade, aspect, nutrients and soil compaction. Generally the site can be broken up into five areas: 1) northwest (NW), northeast (NE), southwest (SW), southeast (SE) and center (C). The NW and SW areas are more open and flat, with higher levels of compaction and less nitrogen. The northwest will not be impacted during construction. The NE and SE are shadier with three distinct canopy levels, including a marginal wetland, downed wood, a variety of mushroom species and an understory of native plants. For more information on the project site see *Site Description* section at the beginning of the report. The NE will not be impacted by construction activities.

Recommended Replacement Trees

Table 6 below contains a list of tree species appropriate for planting within typical environmental conditions found on the Kingsgate Reservoir project site. Final species selection and placement should occur following final establishment of the LOC.

Table 6: Recommended replacement tree species by site conditions

Species	Site Conditions	Planting Area
Western red cedar	Wetter, shady, flat, rich soil	NE, SE
Big leaf maple	Drier, shady, sloped, loose sediment	NW, NE, SE, C
Douglas fir	Drier, sunny, flat	NW, SW, C
Shore pine	Dry, sunny, slope, poor soil	NE, SE, C
Black cottonwood	Wetter, sunny, flat	NW, SW
Red alder	Sunny, sloped/flat, poor soil, exposed	NW, NE, SW

In no case should replacement trees be planted over underground utilities. All replacement trees should be flagged in the field for ease in subsequent monitoring and maintenance activities. Detailed code requirements for replacement tree planting can be found in KZC 95.41 and 95.50.

Maintenance

Following construction, supplemental plantings must be maintained to meet City of Kirkland land use codes. Detailed recommendations and requirements for maintaining required plantings can be found in KZC 95.51 and in the supplemental tree protection recommendations found in Appendix C.

In order to ensure the greatest success of newly installed and retained trees, BTND recommends the following measures be taken following substantial completion of work by the selected contractor:

- The post-construction landscape contractor will prepare a Tree Maintenance and Monitoring Plan (TMMP), including a projected schedule, to be approved by the Project Representative and Project Arborist that outlines the monitoring and maintenance goals and objectives for the 3-5 year monitoring period and detailed methods for achieving those objectives.

Supplemental maintenance specifications on this site will depend on the replacement planting requirements determined by the City of Kirkland, development plans, and any unanticipated impacts that result in damage to live trees. BTND recommends all tree maintenance needs be included in any and all final maintenance plans developed for the site.

Limitations

Within the limitations of schedule, budget, and scope-of-work, this Arborist Report was prepared in accordance with generally accepted arboricultural practices, including the technical guidelines and criteria in effect at the time this report was prepared, as outlined in the methods section. The results and conclusions of this report represent the authors' best professional judgment, based upon information provided by the project proponent in addition to that obtained during the course of the study. No other warranties are expressed or implied.

Appendices

A - Tree Inventory

B - ESA Tree Survey and Site Plan Overlay

C - Tree Impact Summary

D – Tree Protection Measures

E – Field Sketches

F - Typical Tree Protection Sign

G – City of Kirkland Zoning Code

H – Combined Tree Data

I- Final Treatment Summary Map

Appendix A

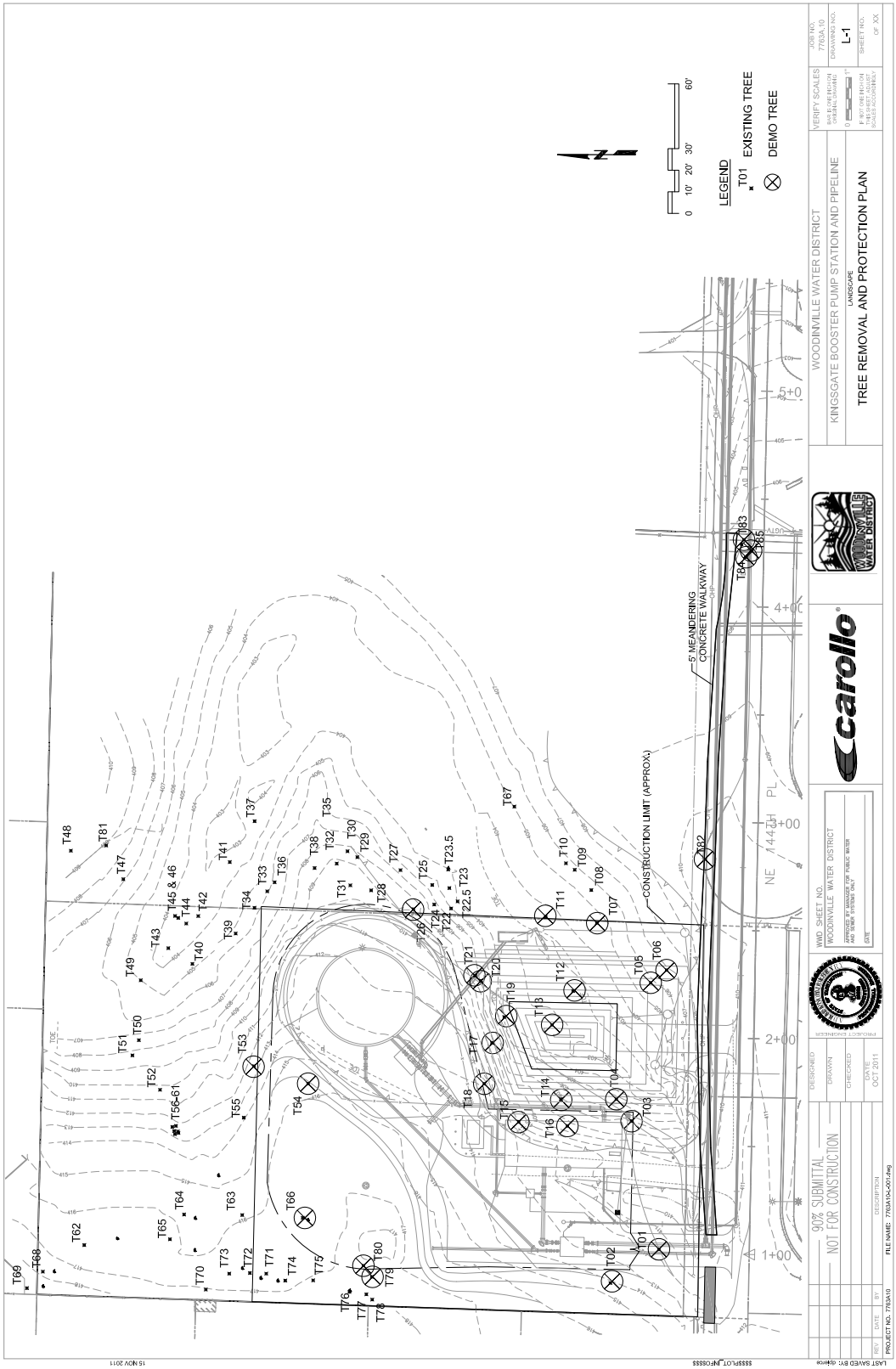
Final Tree Inventory

Tree #	Species	Dbh (inches)	Health	Retention Value
1	Douglas fir	32	Fair	Yes
2	red alder	8.5	Poor	Yes
3	big leaf maple	36	Good	Yes
4	big leaf maple	28	Good	Yes
5	big leaf maple	45	Good	Yes
6	big leaf maple	26	Good	Yes
7	big leaf maple	20.5	Good	Yes
8	big leaf maple	25.5	Fair	Yes
9	big leaf maple	20	Fair	Yes
10	big leaf maple	20.5	Poor	No
11	black cottonwood	31	Fair	Yes
12	black cottonwood	25	Good	Yes
13	black cottonwood	24	Fair	Yes
14	Douglas fir	26	Fair	Yes
15	Douglas fir	36	Fair	Yes
16	Douglas fir	27	Fair	Yes
17	Douglas fir	16.5	Poor	No
18	Douglas fir	18	Good	Yes
19	Douglas fir	17	Poor	No
20	western red cedar	29.5	Fair	Yes
21	Douglas fir	30	Fair	Yes
22	western red cedar	28.5	Fair	Yes
22.5	western red cedar	8	Fair	Yes
23	Douglas fir	21	Fair	Yes
23.5	western red cedar	17.5	Fair	Yes
24	Douglas fir	34.5	Poor	No
25	western red cedar	23	Fair	Yes
26	big leaf maple	18.5	Good	Yes
27	western red cedar	11	Fair	Yes
28	Douglas fir	36	Fair	Yes
29	western red cedar	10	Fair	Yes
30	Douglas fir	16.5	Poor	No
31	Douglas fir	15	Poor	No
32	Douglas fir	24	Poor	No
33	big leaf maple	14.5	Fair	Yes
34	Douglas fir	21	Fair	Yes
35	Red alder	20	Poor	No
36	western red cedar	19	Fair	Yes
37	western red cedar	13	Fair	Yes
38	western red cedar	11	Fair	Yes
39	big leaf maple	37	Fair	Yes
40	big leaf maple	17	Fair	Yes
41	western red cedar	16	Fair	Yes
42	western red cedar	18	Fair	Yes
43	western red cedar	23.5	Good	Yes
44	western red cedar	12	Good	Yes

Tree #	Species	Dbh (inches)	Health	Retention Value
45	big leaf maple	18	Fair	Yes
46	big leaf maple	22.5	Good	Yes
47	big leaf maple	24.5	Good	Yes
48	Douglas fir	14	Fair	Yes
49	western red cedar	24.5	Fair	Yes
50	big leaf maple	18	Fair	Yes
51	Douglas fir	25	Poor	No
52	big leaf maple	31	Fair	Yes
53	big leaf maple	22	Fair	Yes
54	big leaf maple	51	Good	Yes
55	red alder	11	Fair	Yes
56	big leaf maple	8	Fair	Yes
57	big leaf maple	8	Poor	No
58	big leaf maple	10.5	Fair	Yes
59	big leaf maple	53	Good	Yes
60	big leaf maple	22.5	Good	Yes
61	big leaf maple	20.5	Good	Yes
62	Douglas fir	25	Fair	Yes
63	black cottonwood	6	Fair	Yes
64	big leaf maple	8.5	Excellent	Yes
65	big leaf maple	9	Excellent	Yes
66	Douglas fir	36	Fair	Yes
67	Douglas fir	32	Fair	Yes
68	blue spruce	8.5	Fair	Yes
69	blue spruce	11	Fair	Yes
70	Douglas fir	27.5	Fair	Yes
71	Douglas fir	7	Poor	No
72	Douglas fir	16	Poor	No
73	Douglas fir	8.5	Poor	No
74	black locust	11.5	Poor	No
75	Douglas fir	19	Poor	No
76	Douglas fir	13	Poor	No
77	Douglas fir	10	Poor	No
78	red maple	11	Good	Yes
79	western red cedar	6	Fair	Yes
80	black cottonwood	11	Good	Yes
81	Douglas fir	39	Good	Yes
82	shore pine	8	Fair	Yes
83	black cottonwood	17	Good	Yes
84	black cottonwood	8.5	Good	Yes
85	black cottonwood	13	Good	Yes

Appendix B

ESA Tree Removal and Protection Plan Sheet (L-1), July, 2012.


LEGEND
T01 EXISTING TREE
DEMO TREE
0 10' 20' 30' 60'
5' MEANDERING CONCRETE WALKWAY
CONSTRUCTION LIMIT (APPROX.)
90% SUBMITTAL NOT FOR CONSTRUCTION
WOODINVILLE WATER DISTRICT
KINGSGATE BOOSTER PUMP STATION AND PIPELINE
LANDSCAPE
TREE REMOVAL AND PROTECTION PLAN
carollo

Appendix C

Tree Impact Summary

Tree #	Zone	LOD	Impacts	Treatment
1	1	32	Extreme	Remove
2	1	8.5	Extreme	Remove
3	1	36	Extreme	Remove
4	1	28	Extreme	Remove
5	1	45	Extreme	Remove
6	1	26	Extreme	Remove
7	1	20.5	Extreme	Remove
8	2	25.5	high	Protect
9	2	20	high	Protect
10	2	20.5	high	Protect
11	1	31	Extreme	Remove
12	1	25	Extreme	Remove
13	1	24	Extreme	Remove
14	1	26	Extreme	Remove
15	1	36	Extreme	Remove
16	1	27	Extreme	Remove
17	1	16.5	Extreme	Remove
18	1	18	Extreme	Remove
19	1	17	Extreme	Remove
20	1	29.5	Extreme	Remove
21	1	30	Extreme	Remove
22	2	28.5	high	Protect
22.5	2	8	high	Protect
23	2	21	medium	Protect
23.5	2	17.5	medium	Protect
24	2	34.5	high	Protect
25	2	23	medium	Protect
26	1	18.5	Extreme	Remove
27	2	11	medium	Protect
28	2	36	high	Protect
29	3	10	low	Retain
30	3	16.5	low	Retain
31	2	15	high	Protect
32	2	24	medium	Protect
33	2	14.5	medium	Protect
34	2	21	medium	Protect

35	3	20	low	Retain
36	3	19	low	Retain
37	3	13	low	Retain
38	3	11	low	Retain
39	2	37	medium	Protect
40	3	17	low	Retain
41	3	16	low	Retain
42	3	18	low	Retain
43	3	23.5	low	Retain
44	3	12	low	Retain
45	3	18	low	Retain
46	3	22.5	low	Retain
47	3	24.5	low	Retain
48	3	14	low	Retain
49	3	24.5	low	Retain
50	3	18	low	Retain
51	3	25	low	Retain
52	3	31	low	Retain
53	1	22	extreme	Remove
54	1	51	extreme	Remove
55	2	11	medium	Protect
56	2	8	medium	Protect
57	2	8	medium	Protect
58	2	10.5	medium	Protect
59	2	53	medium	Protect
60	2	22.5	medium	Protect
61	2	20.5	medium	Protect
62	3	25	low	Retain
63	3	6	low	Retain
64	3	8.5	low	Retain
65	3	9	low	Retain
66	1	36	high	Remove
67	3	32	low	Retain
68	3	8.5	low	Retain
69	3	11	low	Retain
70	2	27.5	medium	Protect
71	2	7	medium	Protect
72	2	16	medium	Protect
73	2	8.5	medium	Protect
74	2	11.5	high	Protect
75	2	19	high	Protect

76	2	13	high	Protect
77	2	10	high	Protect
78	2	11	high	Protect
79	1	6	extreme	Remove
80	1	11	extreme	Remove
81	2	39	low	Protect
82	2	8	extreme	Remove
83	2	17	extreme	Remove
84	2	8.5	extreme	Remove
85	2	13	extreme	Remove

Appendix D

Proposed Tree Protection Standards

1. Avoid common types of tree injuries that occur during construction including:
    - Mechanical injury to roots, trunk and branches;
    - Compaction of soil by storing of materials or equipment, which degrades the functioning of roots, inhibits the development of new roots and restricts drainage;
    - Changes in existing grade, which can cut or suffocate roots;
    - Alteration of the water table-either raising or lowering;
    - Changes in drainage patterns that promotes erosion or excessive accumulation of run-off;
    - Sterile soil conditions associated with stripping of topsoil;
    - Damage to roots from dumping of liquids or rinsing of construction equipment.

Specifications for tree protection measures are broken down in three categories for ease of reference during various construction phases.

Pre-construction

1. Determine the LOD for all trees retained onsite. The LOD is defined as the closest point to the tree trunk construction activities are permitted. LOD is the outer edge of the Tree Protection Zone (TPZ).

2. Stage equipment away from trees and vegetation to be retained so that existing plants and their roots are protected.

3. Stake and/or flag clearing limits and LOD, which will be verified and approved by a Project Representative prior to installation of barrier fencing and commencement of construction activities.

4. Install protective 6-foot high chain-link fencing along the Limit of Construction so that protected trees are completely surrounded and cannot be accessed.

5. Install highly visible signs along all protective fencing no farther than every 15 feet along fencing that say “Tree Protection Area, Entrance Prohibited” with the City number for code enforcement and to report violations (See Appendix F).

6. Removal and pruning of existing trees will be performed by an ISA Certified Arborist, prior to commencement of construction activities and according to the tree treatment table.

7. Report any tree damage to Project Arborist within 4 hours of incident or at the close of daily construction activities .

Construction

1. No Construction activities are permitted within the drip-line of significant trees.
2. Ensure the Project Arborist is notified as soon as possible of damage to tree branches, trunks and roots.
3. All excavations and trenching performed with the drip-line of each tree will be performed by hand, through tunneling or an air spade.

4. In order to avoid injury to tree roots, when a trenching or excavation machine is being used outside of the LOD and roots are encountered smaller than 1" diameter, the wall of the trench adjacent to the trees will be hand trimmed, making clear, clean cuts through the roots. All damaged, torn and cut roots will be given a clean cut to remove ragged edges, which promote decay. Trenches should be filled within 24 hours; however, when this is not possible, the side of the trench adjacent to the trees will be kept shaded with four layers of dampened, untreated burlap, wetted as frequently as necessary to keep the burlap wet.

5. Whenever possible keep construction activities outside of the LOD to avoid conflict with tree roots. If landscaping must be done in LOD, all work will be completed with light machinery or hand-tools to minimize effects on protected trees. All work required in the drip-line of any tree will be performed with hand-tools only.

6. During construction activities that occur inside of the TPZ, if any tree roots greater than 1" diameter are encountered, the project arborist will be notified immediately of any damage, and no later than 1-hour after the roots are encountered. The Project Arborist will determine if the affected roots can be pruned, or if other mitigation measures are needed to ensure critical roots of the significant trees are adequately protected.

7. Pruning of impacted limbs and roots will be performed only by a Certified Arborist, and under direct supervision of the Project Arborist.

8. Any damage due to construction activities will be reported to the Project Arborist and Project Representative within four hours of an event so that remedial action can be taken.

9. Replace all removed significant trees in place and in-kind with locally grown trees and according to KZC 95.50.

10. Prior to the end of construction activities, the post-construction tree care contractor will arrange with the Project Arborist for the long-term care and monitoring of preserved trees.

Post-Construction

1. Coordinate tree care with Project Arborist.

2. Monitoring and maintenance activities will commence following substantial completion of project.

3. The post-construction landscape contractor will prepare a Tree Maintenance and Monitoring Plan (TMMP), including a projected schedule, to be approved by the Project Arborist outlining the monitoring and maintenance goals and objectives for the 5-year monitoring period. The contractor's TMMP will comply with KZC and meet the following conditions:

    - Complete post-construction tree maintenance, including pruning, mulching, fertilization, irrigation and soil aeration where necessary;
    - Remove by hand all tree protection measures, such as fencing, arborist mulch and plywood;
    - Provide for remediation of compacted soil as needed by methods such as aeration and vertical mulching;
    - New trees will be fitted with a Treegator® Original Slow Release Watering Bag, or equal as approved by Project Arborist, in order to irrigate with 15 gallons of water per week for the first year. Following year 1, irrigate with 5 gallons of water per week, supplemented as needed, for the second and third years. Any dead material that is replaced during the monitoring period will begin with year-1 irrigation requirements;
    - Fertilize trees with slow-release phosphorus, potassium, calcium, magnesium, and other macro- and micro-nutrients as indicated by a soil test, but wait at least one year to apply nitrogen;
    - Fertilize lightly with slow-release nitrogen after 1 year and then make lighter annual nitrogen application for the next 3-5 years;
    - Remove trees that are badly damaged, or are in irreversible decline as determined by the Project Arborist and Project Representative;
    - Continue to protect not only the large, established trees on the site, but also those newly planted in the landscape.

Proposed Arborist Schedule of Work

Pre-construction

Pre-construction (Begins prior to scheduled start of construction date)

1. The Project Arborist will attend a pre-construction meeting prior to commencement of mobilization and construction to discuss implementation of the Tree Protection Plan (TPP). This meeting will be set up by the prime Contractor. At a minimum the Owner or Owner's representative, Project Arborist, tree sub-contractors, and the prime contractor must be attendance.

2. Project Arborist will observe and verify the following tree protection measures are in place and comply with the approved TPP prior to commencement of construction activities:

    - A 6" layer of coarse arborist mulch is to be placed beneath the Tree Protection Zone (TPZ) of all protected trees. Mulch is to be kept 12" from the trunk.

    - Trees that have been identified in the site inventory as posing a health or safety risk may be removed, or pruned by no more than one quarter, subject to approval of the required permit by the City of Kirkland. Pruning of existing limbs and roots will occur under the direct supervision of the Project Arborist.

    - Tree protection chain link fencing of 6' in height will be installed around the TPZ of protected trees. The fencing can be moved to locations within the TPZ if authorized by the City and the Project Arborist but not closer than 5' from the trunk of any tree. Fence posts will be 2" in diameter and are to be driven 2' into the ground. The distance between posts will not be more than 10'.

    - Tree protection fencing will have a warning sign prominently installed on each fence at 15-foot intervals (Appendix F).

    - Movable barriers of chain link fencing secured to cement blocks may be substituted for 'fixed' chain link fencing if the Project Arborist and the City's clearing and grading inspector agree that the fencing will have to be moved to accommodate certain phases of construction. The contractor(s) may not move the fence without authorization from the Project Arborist and the City's clearing and grading inspector.
    - All protected existing significant trees in Zone 2 will receive 5 gallons of water per week following trenching and excavation activities

during the dry season (Apr-Sept). Natural rainfall will be supplemented as needed during the wet season (Oct-Mar) to ensure trees receive 5 gallons of water per week by a watering trunk or approved drip irrigation system. All irrigation methods are to be approved by the Project Arborist. Sprinkler systems will not be allowed. The Project Arborist may require additional watering for trees whose roots (1" diameter or greater) are damaged or severed during construction activities.

- Should temporary access into the TPZ be approved, an additional 3" layer of mulch and ¾" plywood will be placed over the entire TPZ prior to commencement of approved activities in that zone.

- Monitor installation of tree protection measures and related erosion and sediment controls. All tree protection measures should be implemented prior to commencement of construction activities and as required in the approved final TPP and should remain functional throughout the course of construction.

Construction

At a minimum during construction, the Project Arborist should:

1. Attend all weekly progress meetings and other project meetings as requested by City of Kirkland;

2. Ensure the TPP is being followed and report any conflicts or deviations to the City of Kirkland;

3. Approve and monitor construction activities that require encroachment within the TPZ;

4. Assess and monitor the effectiveness of the TPP and provide any recommendations for additional care or treatment needed, at least once a week during construction phase;

5. Supervise all grade changes located adjacent to any TPZ of a significant tree. Cuts or fills of soil that are adjacent to the TPZ will have a retaining wall system designed in consultation with the Project Arborist and approved in writing by City staff;

6. Be responsible for the retention and protection of designated significant trees. Should the builder fail to follow the tree protection specifications, it will be the responsibility of the Project Arborist to report the matter to City staff as an issue of non-compliance;

7. Approve any additional required pruning of tree limbs and roots, which will only be performed by an ISA Certified Arborist;

8. Keep a written record of activities throughout the life of the project, including all monitoring, maintenance and mitigation efforts; and

9. During the final landscaping phase of construction, verify all removed trees have been successfully replaced according to KZC 95.34.

Post-Construction

(Begins following the end of the construction contract)

1. Inspect trees annually for at least 5 years or greater as needed following end of construction to look for changes in condition;

2. Coordinate with tree care contractors as needed to ensure the TPP is being followed;

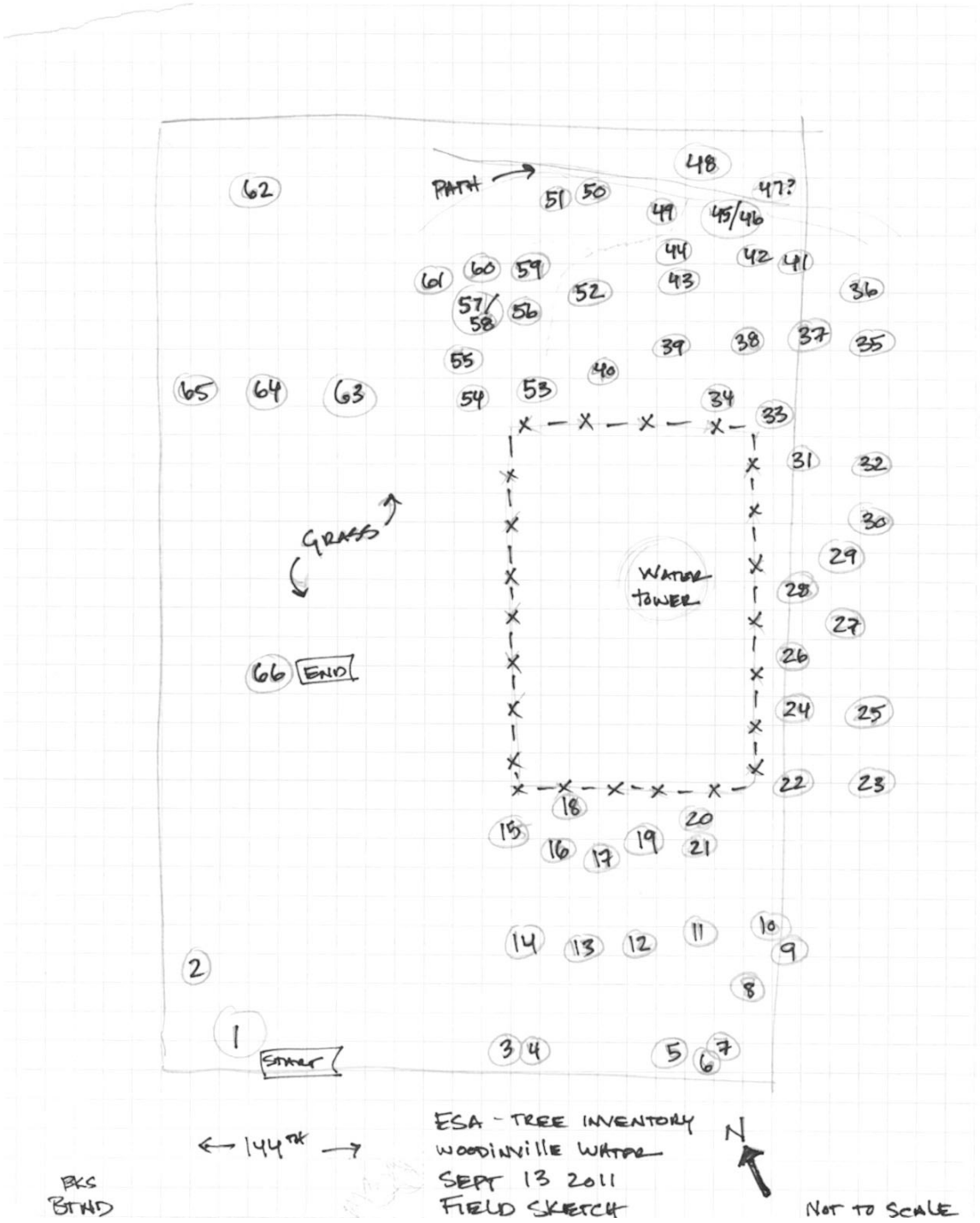
3. Notify Woodinville Water District of any additional monitoring and maintenance requirements discovered after annual monitoring event; and

4. Notify the Woodinville Water District immediately when any deviations from tree protection plans or failure of the site to meet applicable tree protection obligations KZC Chapter 95.

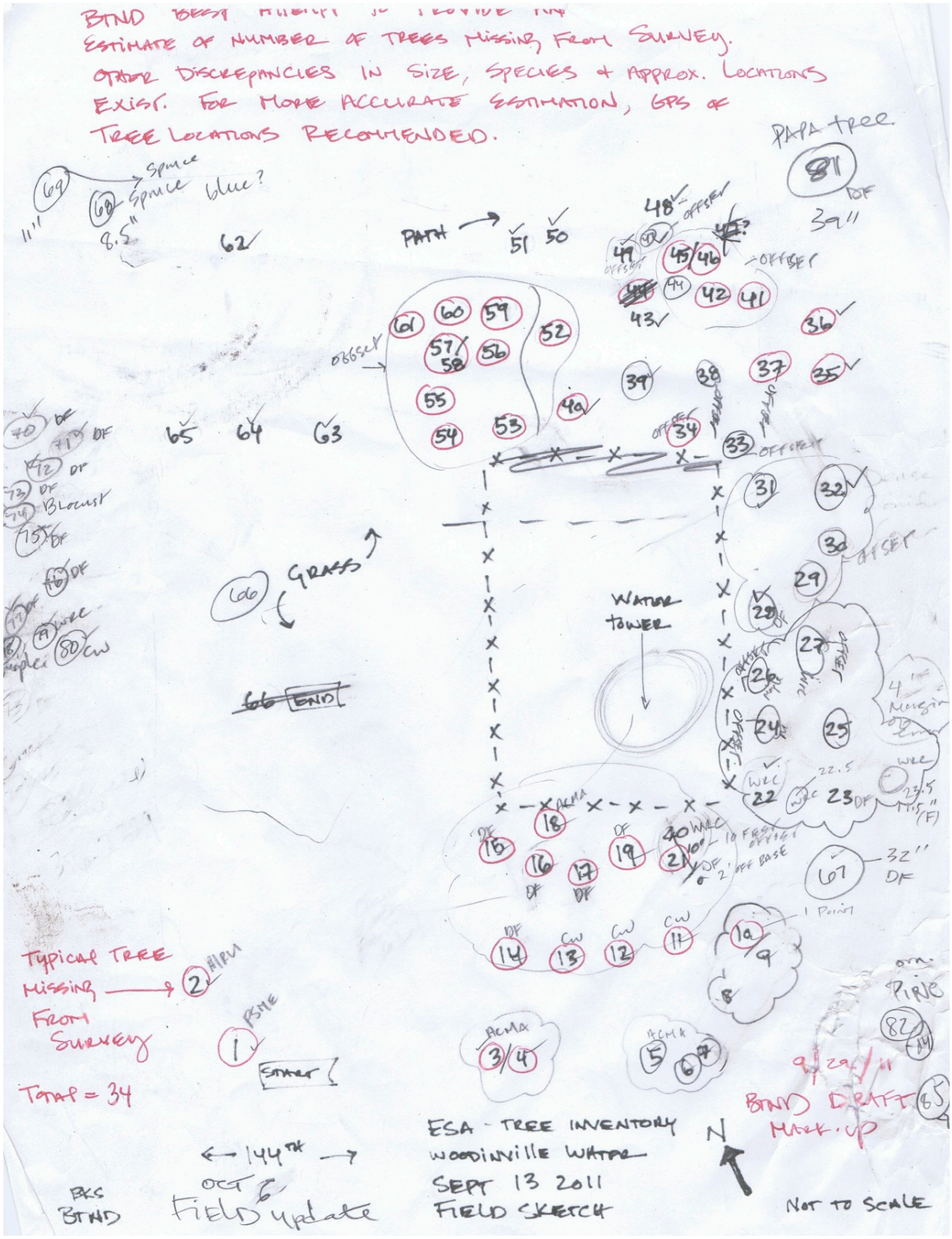
Appendix E

Field Sketches

September 13, 2011



October 3, 2011



Appendix F


8.5” MIN
11” MIN
WARNING
Tree Protection Area
ENTRANCE PROHIBITED
Report violations
City of Kirland (425) 587-3290
ADVERTENCIA
Zona de Protección de Arbol
La ENTRADA PROHIBIO
Reportee infracciones
la Ciudad de Kirland (425) 587-3290

Appendix G

Relevant City of Kirkland Zoning Code

95.30.4 – Tree Retention Plan Components. The tree retention plan shall contain the following information as specified in the chart in subsection (5) of this section, unless waived by the Planning Official:

(a) A tree inventory containing the following:

1. A numbering system of all existing significant trees on the subject property (with corresponding tags on trees); the inventory must also include significant trees on adjacent property with driplines extending over the subject property line;
2. Limits of disturbance (LOD) of all existing significant trees (including approximate LOD of off-site trees with overhanging driplines);
3. Size (DBH);
4. Proposed tree status (trees to be removed or retained);
5. Brief general health or condition rating of these trees (i.e.: poor, fair, good, excellent, etc.);
6. Tree type or species.

(c) An arborist report containing the following:

1. A complete description of each tree's health, condition, and viability;
2. A description of the method(s) used to determine the limits of disturbance (i.e., critical root zone, root plate diameter, or a case-by-case basis description for individual trees);
3. Any special instructions specifically outlining any work proposed within the limits of the disturbance protection area (i.e., hand-digging, tunneling, root pruning, any grade changes, clearing, monitoring, and aftercare);
4. For trees not viable for retention, a description of the reason(s) for removal based on poor health, high risk of failure due to structure, defects, unavoidable isolation (wind firmness), or unsuitability of species, etc., and for which no reasonable alternative action is possible must be given (pruning, cabling, etc.);
5. Describe the impact of necessary tree removal to the remaining trees, including those in a grove or on adjacent properties;
    a. For development applications, a discussion of timing and installation of tree protection measures that must include fencing and be in accordance with the tree protection standards as outlined in KZC 95.34; and
    b. The suggested location and species of supplemental trees to be used when required. The report shall include planting and maintenance specifications pursuant to KZC 95.50 and 95.51.

95.34 - Tree Protection during Development Activity

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 pursuant to the following standards:

1. Placing Materials near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, operating or parking equipment, placing solvents, storing building material or soil deposits, or dumping concrete washout or other chemicals. During construction, no person shall attach any object to any tree designated for protection.

2. Protective Barrier. Before development, land clearing, filling or any land alteration, the applicant shall:

   a. Erect and maintain readily visible temporary protective tree fencing along the limits of disturbance which completely surrounds the protected area of all retained trees or groups of trees. Fences shall be constructed of chain link and be at least six (6) feet high, unless other type of fencing is authorized by the Planning Official.
   b. Install highly visible signs spaced no further than 15 feet along the entirety of the protective tree fence. Said sign must be approved by the Planning Official and shall state at a minimum "Tree Protection Area, Entrance Prohibited" and provide the City phone number for code enforcement to report violations.
   c. Prohibit excavation or compaction of earth or other potentially damaging activities within the barriers; provided, that the Planning Official may allow such activities approved by a qualified professional and under the supervision of a qualified professional retained and paid for by the applicant.
   d. Maintain the protective barriers in place for the duration of the project until the Planning Official authorizes their removal.
   e. Ensure that any approved landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor.
   f. In addition to the above, the Planning Official may require the following:
      1) If equipment is authorized to operate within the critical root zone, cover the areas adjoining the critical root zone of a tree with mulch to a depth of at least six (6) inches or with plywood or similar material in order to protect

roots from damage caused by heavy equipment.

2) Minimize root damage by excavating a 2-foot-deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

3) Corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

4) Maintenance of trees throughout construction period by watering and fertilizing.

3. Grade.

   a. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the Planning Official's authorization based on recommendations from a qualified professional. The Planning Official may allow coverage of up to one-half (1/2) of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

   b. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

   c. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the Planning Official. The Planning Official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root-induced damage to the impervious surface.

   d. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The Planning Official may require that utilities be tunneled under the roots of trees to be retained if the Planning Official determines that trenching would significantly reduce the chances of the tree's survival.

   e. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, it is encouraged that shrubs, ground cover and stumps be maintained on the individual lots, where feasible.

4. Directional Felling. Directional felling of trees shall be used to avoid damage to trees designated for retention.

5. Additional Requirements. The Planning Official may require additional tree protection measures that are consistent with

accepted urban forestry industry practices.

95.41 - Supplemental Plantings

1. General. The applicant shall provide the supplemental landscaping specified in subsection (2) of this section in any area of the subject property that:

   a. Is not covered with a building, vehicle circulation area or other improvement; and
   b. Is not a critical area, critical area buffer, or in an area to be planted with required landscaping; and
   c. Is not committed to and being used for some specific purpose.

2. Standards. The applicant shall provide the following at a minimum:

   a. Living plant material, which will cover 80 percent of the area to be landscaped within two (2) years. If the material to be used does not spread over time, the applicant shall re-plant the entire area involved immediately. Any area that will not be covered with living plant material must be covered with nonliving groundcover.
   b. One (1) tree for each 1,000 square feet of area to be landscaped. At the time of planting, deciduous trees must be at least two (2) inches in caliper and coniferous trees must be at least five (5) feet in height.
   c. If a development requires approval through Process I, IIA or IIB as described in Chapters 145, 150 and 152 KZC, respectively, the City may require additional vegetation to be planted along a building facade if:
      1) The building facade is more than 25 feet high or more than 50 feet long; or
      2) Additional landscaping is necessary to provide a visual break in the facade.
   d. In RHBD varieties of rose shrubs or ground cover along with other plant materials shall be included in the on-site landscaping.

e. If development is subject to Design Review as described in Chapter 142 KZC, the City will review plant choice and specific plant location as part of the Design Review approval. The City may also require or permit modification to the required plant size as part of Design Review approval.

95.50 - Installation Standards for Required Plantings

All required trees and landscaping should be installed according to sound horticultural practices in a manner designed to encourage quick establishment and healthy plant growth. All required landscaping should be installed in the ground and not in aboveground containers, except for landscaping required on the top floor of a structure.

When an applicant proposes to locate a subterranean structure under required landscaping that appears to be at grade, the applicant will: (1) provide site-specific documentation prepared by a qualified expert to establish that the design will adequately support the long-term viability of the required landscaping; and (2) enter into an agreement with the City, in a form acceptable to the City Attorney, indemnifying the City from any damage resulting from development activity on the subject property which is related to the physical condition of the property. The applicant shall record this agreement with the King County Department of Elections and Records.

1. Compliance. It is the applicant's responsibility to show that the proposed landscaping complies with the regulations of this chapter.

2. Timing. All landscaping shall be installed prior to the issuance of a certificate of occupancy, except that the installation of any required tree or landscaping may be deferred during the summer months to the next planting season, but never for more than six (6) months. Deferred installation shall be secured with a performance bond pursuant to Chapter 175 KZC prior to the issuance of a certificate of occupancy.

3. Grading. Berms shall not exceed a slope of two (2) horizontal feet to one (1) vertical foot (2:1).

4. Soil Specifications. Soils in planting areas shall have adequate porosity to allow root growth. Soils which have been compacted to a density greater than one and three-tenths (1.3) grams per cubic centimeters shall be loosened to increase aeration to a minimum depth of 24 inches or to the depth of the largest plant root ball, whichever is greater. Imported topsoils shall be tilled into existing soils to prevent a distinct soil interface from forming. After soil preparation is completed, motorized vehicles shall be kept off to prevent excessive compaction and underground pipe damage. The organic content of soils in any landscape area shall be as necessary to provide adequate nutrient and moisture-retention levels for the establishment of plantings. See subsection (9) of this section for mulch requirements.

5. Plant Selection.

    a. Plant selection shall be consistent with the Kirkland Plant List, which is produced by the City's Natural Resource Management Team and available in the Department of Planning and Community Development.

b. Plants shall be selected and sited to produce a hardy and drought-resistant landscape area. Selection shall consider soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, and compatibility with existing native vegetation preserved on the site. Preservation of existing vegetation is strongly encouraged.

c. Prohibited Materials. Plants listed as prohibited in the Kirkland Plant List are prohibited in required landscape areas. Additionally, there are other plants that may not be used if identified in the Kirkland Plant List as potentially damaging to sidewalks, roads, underground utilities, drainage improvements, foundations, or when not provided with enough growing space.

d. All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock" manual.

e. Plants shall meet the minimum size standards established in other sections of the KZC.

f. Multiple-stemmed trees may be permitted as an option to single-stemmed trees for required landscaping provided that such multiple-stemmed trees are at least 10 feet in height and that they are approved by the Planning Official prior to installation.

6. Fertilization. All fertilizer applications to turf or trees and shrubs shall follow Washington State University, National Arborist Association or other accepted agronomic or horticultural standards.

7. Irrigation. The intent of this standard is to ensure that plants will survive the critical establishment period when they are most vulnerable due to lack of watering. All required plantings must provide an irrigation system, using either Option 1, 2, or 3 or a combination of those options. For each option irrigation shall be designed to conserve water by using the best practical management techniques available. These techniques may include, but not be limited to: drip irrigation to minimize evaporation loss, moisture sensors to prevent irrigation during rainy periods, automatic controllers to insure proper duration of watering, sprinkler head selection and spacing designed to minimize overspray, and separate zones for turf and shrubs and for full sun exposure and shady areas to meet watering needs of different sections of the landscape.

   Exceptions, as approved by the Planning Official, to the irrigation requirement may be approved xeriscape (i.e., low water usage

plantings), plantings approved for low impact development techniques, established indigenous plant material, or landscapes where natural appearance is acceptable or desirable to the City. However, those exceptions will require temporary irrigation (Option 2 and/or 3) until established.

a. Option 1. A permanent built-in irrigation system with an automatic controller designed and certified by a licensed landscape architect as part of the landscape plan.
b. Option 2. An irrigation system designed and certified by a licensed landscape architect as part of the landscape plan, which provides sufficient water to ensure that the plants will become established. The system does not have to be permanent if the plants chosen can survive adequately on their own, once established.
c. Option 3. Irrigation by hand. If the applicant chooses this option, an inspection will be required one (1) year after final inspection to ensure that the landscaping has become established.

8. Drainage. All landscapes shall have adequate drainage, either through natural percolation or through an installed drainage system. A percolation rate of one-half (1/2) inch of water per hour is acceptable.

9. Mulch.

a. Required plantings, except turf or areas of established ground cover, shall be covered with two (2) inches or more of organic mulch to minimize evaporation and runoff. Mulch shall consist of materials such as yard waste, sawdust, and/or manure that are fully composted.
b. All mulches used in planter beds shall be kept at least six (6) inches away from the trunks of shrubs and trees.

10. Protection. All required landscaped areas, particularly trees and shrubs, must be protected from potential damage by adjacent uses and development, including parking and storage areas. Protective devices such as bollards, wheel stops, trunk guards, root guards, etc., may be required in some situations.

11. Mitigation and Restoration Plantings in Critical Areas and Critical Area Buffers. Plants intended to mitigate for the loss of natural resource values are subject to the following requirements in addition to the other landscaping requirements found in KZC 95.40 through 95.45. Where these requirements conflict with other requirements of this chapter, these requirements take precedence. Refer to Chapters 85 and 90 KZC for additional

requirements for these areas.

a. Plant Source. Plant materials must be native and selected from the Kirkland Plant List. Seed source must be as local as possible, and plants must be nursery propagated unless transplanted from on-site areas approved for disturbance. These requirements must be included in the Mitigation Plan specifications.
b. Installation. Plant materials must be supported only when necessary due to extreme winds at the planting site. Where support is necessary, stakes, guy wires, or other measures must be removed as soon as the plant can support itself, usually after the first growing season. All fertilizer applications to turf or trees and shrubs shall follow Washington State University, National Arborist Association or other accepted agronomic or horticultural standards.
c. Fertilizer Applications. Fertilizers shall be applied in such a manner as to prevent its entry into waterways and wetlands and minimize its entry into storm drains. No applications shall be made within 50 feet of a waterway or wetland, or a required buffer as established by the City codes (such as Chapter 90 KZC) or Kirkland Shoreline Master Program (SMP, KMC Title 24), whichever is greater, unless specifically authorized in an approved mitigation plan or otherwise authorized in writing by the Planning Official.

95.51 - Tree and Landscape Maintenance Requirements

The following maintenance requirements apply to all trees, including street trees, and other vegetation required to be planted or preserved by the City:

1. Responsibility for Regular Maintenance. Required trees and vegetation, fences, walls, and other landscape elements shall be considered as elements of the project in the same manner as parking, building materials, and other site details. The applicant, landowner, or successors in interest shall be responsible for the regular maintenance of required landscaping elements. Plants that die must be replaced in kind. It is also the responsibility of the property owner to maintain street trees abutting their property pursuant to KZC 95.21.

2. Maintenance Duration. Maintenance shall be ensured in the following manner except as set forth in subsections (3) and (4) of this section:

a. All required landscaping shall be maintained throughout the

life of the development. Prior to issuance of a certificate of occupancy, the proponent shall provide a final as-built landscape plan and an agreement to maintain and replace all landscaping that is required by the City.

b. Any existing tree or other existing vegetation designated for preservation in a Tree Retention Plan shall be maintained for a period of five (5) years following issuance of the certificate of occupancy for the individual lot or development. After five (5) years, all trees on the property are subject to KZC 95.23 unless:
   1) The tree and associated vegetation are in a grove that is protected pursuant to subsection (3) of this section; or
   2) The tree or vegetation is considered to be a public benefit related to approval of a planned unit development; or
   3) The tree or vegetation was retained to partially or fully meet requirements of KZC 95.40 through 95.45, Required Landscaping.

3. Maintenance of Preserved Grove. Any applicant who has a grove of trees identified for preservation on an approved Tree Retention Plan pursuant to KZC 95.30(2) shall provide prior to occupancy the legal instrument acceptable to the City to ensure preservation of the grove and associated vegetation in perpetuity, except that the agreement may be extinguished if the Planning Official determines that preservation is no longer appropriate.

4. Maintenance of Critical Area and Critical Area Buffers. In critical areas and their buffers, native vegetation is not to be removed without City approval pursuant to KZC 95.23(5)(d). However, it is the responsibility of the property owner to maintain critical areas and their buffers by removing non-native, invasive, and noxious plants in a manner that will not harm critical areas or their buffers. See also subsection (6) of this section and Chapters 85 and 90 KZC for additional requirements for trees and other vegetation within critical areas and critical area buffers.

5. Non-Native Invasive and Noxious Plants. It is the responsibility of the property owner to remove non-native invasive plants and noxious plants from the vicinity of any tree or other vegetation that the City has required to be planted or protected. Removal must be performed in a manner that will not harm the tree or other vegetation that the City has required to be planted or protected.

6. Pesticides, Herbicides, and Fertilizer. The use of plant material requiring excessive pesticide or herbicide applications to be kept healthy and attractive is discouraged. Pesticide, herbicide, and

fertilizer applications shall be made in a manner that will prevent their unintended entry into waterways, wetlands, and storm drains. No application shall be made within 50 feet of a waterway or wetland or a required buffer as established by City codes, whichever is greater, unless done so by a state certified applicator with approval of the Planning Official, and is specifically authorized in an approved mitigation plan or otherwise authorized in writing by the Planning Official.

7. Landscape Plans and Utility Plans. Landscape plans and utility plans shall be coordinated. In general, the placement of trees and large shrubs should adjust to the location of required utility routes both above and below ground. Location of plants shall be based on the plant's mature size both above and below ground. See the Kirkland Plant List for additional standards.

Appendix H

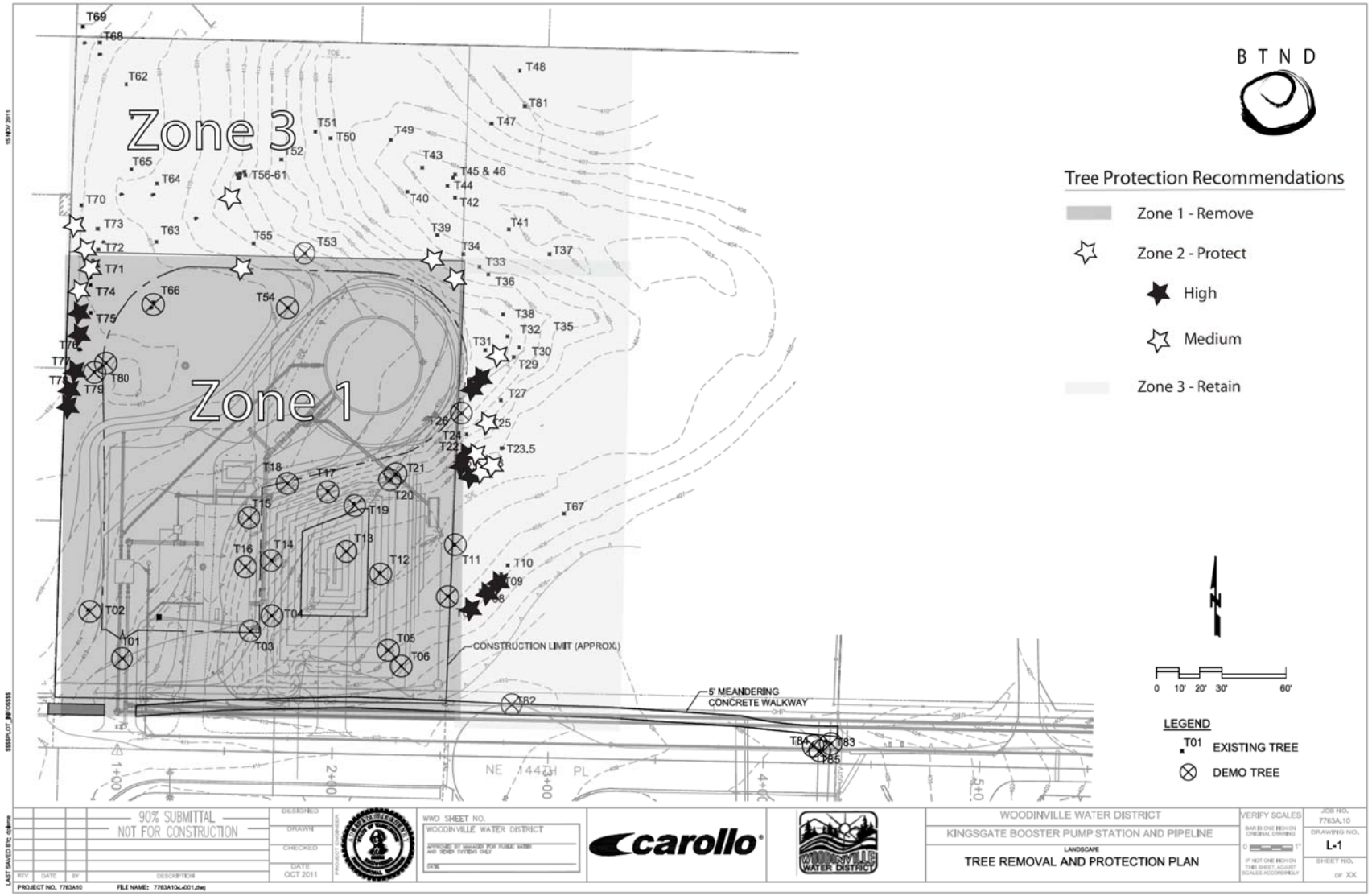
Combined Tree Data

Tree #	Species	Dbh (inches)	Health	Retention Value	Zone	LOD (Feet)	Impacts	Treatment
1	Douglas fir	32	Fair	Yes	1	32	Extreme	Remove
2	red alder	8.5	Poor	Yes	1	8.5	Extreme	Remove
3	big leaf maple	36	Good	Yes	1	36	Extreme	Remove
4	big leaf maple	28	Good	Yes	1	28	Extreme	Remove
5	big leaf maple	45	Good	Yes	1	45	Extreme	Remove
6	big leaf maple	26	Good	Yes	1	26	Extreme	Remove
7	big leaf maple	20.5	Good	Yes	1	20.5	Extreme	Remove
8	big leaf maple	25.5	Fair	Yes	2	25.5	high	Protect
9	big leaf maple	20	Fair	Yes	2	20	high	Protect
10	big leaf maple	20.5	Poor	No	2	20.5	high	Protect
11	black cottonwood	31	Fair	Yes	1	31	Extreme	Remove
12	black cottonwood	25	Good	Yes	1	25	Extreme	Remove
13	black cottonwood	24	Fair	Yes	1	24	Extreme	Remove
14	Douglas fir	26	Fair	Yes	1	26	Extreme	Remove
15	Douglas fir	36	Fair	Yes	1	36	Extreme	Remove
16	Douglas fir	27	Fair	Yes	1	27	Extreme	Remove
17	Douglas fir	16.5	Poor	No	1	16.5	Extreme	Remove
18	Douglas fir	18	Good	Yes	1	18	Extreme	Remove
19	Douglas fir	17	Poor	No	1	17	Extreme	Remove
20	western red cedar	29.5	Fair	Yes	1	29.5	Extreme	Remove
21	Douglas fir	30	Fair	Yes	1	30	Extreme	Remove
22	western red cedar	28.5	Fair	Yes	2	28.5	high	Protect
22.5	western red cedar	8	Fair	Yes	2	8	high	Protect
23	Douglas fir	21	Fair	Yes	2	21	medium	Protect
23.5	western red cedar	17.5	Fair	Yes	2	17.5	medium	Protect
24	Douglas fir	34.5	Poor	No	2	34.5	high	Protect
25	western red cedar	23	Fair	Yes	2	23	medium	Protect
26	big leaf maple	18.5	Good	Yes	1	18.5	Extreme	Remove
27	western red cedar	11	Fair	Yes	2	11	medium	Protect
28	Douglas fir	36	Fair	Yes	2	36	high	Protect
29	western red cedar	10	Fair	Yes	3	10	low	Retain
30	Douglas fir	16.5	Poor	No	3	16.5	low	Retain
31	Douglas fir	15	Poor	No	2	15	high	Protect
32	Douglas fir	24	Poor	No	2	24	medium	Protect
33	big leaf maple	14.5	Fair	Yes	2	14.5	medium	Protect
34	Douglas fir	21	Fair	Yes	2	21	medium	Protect
35	Red alder	20	Poor	No	3	20	low	Retain
36	western red cedar	19	Fair	Yes	3	19	low	Retain
37	western red cedar	13	Fair	Yes	3	13	low	Retain
38	western red cedar	11	Fair	Yes	3	11	low	Retain
39	big leaf maple	37	Fair	Yes	2	37	medium	Protect
40	big leaf maple	17	Fair	Yes	3	17	low	Retain
41	western red cedar	16	Fair	Yes	3	16	low	Retain
42	western red cedar	18	Fair	Yes	3	18	low	Retain
43	western red cedar	23.5	Good	Yes	3	23.5	low	Retain
44	western red cedar	12	Good	Yes	3	12	low	Retain
45	big leaf maple	18	Fair	Yes	3	18	low	Retain
46	big leaf maple	22.5	Good	Yes	3	22.5	low	Retain
47	big leaf maple	24.5	Good	Yes	3	24.5	low	Retain
48	Douglas fir	14	Fair	Yes	3	14	low	Retain
49	western red cedar	24.5	Fair	Yes	3	24.5	low	Retain
50	big leaf maple	18	Fair	Yes	3	18	low	Retain
51	Douglas fir	25	Poor	No	3	25	low	Retain
52	big leaf maple	31	Fair	Yes	3	31	low	Retain
53	big leaf maple	22	Fair	Yes	1	22	extreme	Remove
54	big leaf maple	51	Good	Yes	1	51	extreme	Remove
55	red alder	11	Fair	Yes	2	11	medium	Protect
56	big leaf maple	8	Fair	Yes	2	8	medium	Protect

Tree #	Species	Dbh (inches)	Health	Retention Value	Zone	LOD (Feet)	Impacts	Treatment
57	big leaf maple	8	Poor	No	2	8	medium	Protect
58	big leaf maple	10.5	Fair	Yes	2	10.5	medium	Protect
59	big leaf maple	53	Good	Yes	2	53	medium	Protect
60	big leaf maple	22.5	Good	Yes	2	22.5	medium	Protect
61	big leaf maple	20.5	Good	Yes	3	24.5	low	Retain
62	Douglas fir	25	Fair	Yes	3	14	low	Retain
63	black cottonwood	6	Fair	Yes	3	24.5	low	Retain
64	big leaf maple	8.5	Excellent	Yes	3	18	low	Retain
65	big leaf maple	9	Excellent	Yes	3	25	low	Retain
66	Douglas fir	36	Fair	Yes	3	31	high	Remove
67	Douglas fir	32	Fair	Yes	1	22	extreme	Remove
68	blue spruce	8.5	Fair	Yes	1	51	extreme	Remove
69	blue spruce	11	Fair	Yes	2	11	medium	Protect
70	Douglas fir	27.5	Fair	Yes	2	8	medium	Protect
71	Douglas fir	7	Poor	No	2	8	medium	Protect
72	Douglas fir	16	Poor	No	2	10.5	medium	Protect
73	Douglas fir	8.5	Poor	No	2	53	medium	Protect
74	black locust	11.5	Poor	No	2	22.5	medium	Protect
75	Douglas fir	19	Poor	No	3	24.5	low	Retain
76	Douglas fir	13	Poor	No	3	14	low	Retain
77	Douglas fir	10	Poor	No	3	24.5	low	Retain
78	red maple	11	Good	Yes	3	18	low	Retain
79	western red cedar	6	Fair	Yes	3	25	low	Retain
80	black cottonwood	11	Good	Yes	3	31	low	Retain
81	Douglas fir	39	Good	Yes	1	22	extreme	Remove
82	shore pine	8	Fair	Yes	1	51	extreme	Remove
83	black cottonwood	17	Good	Yes	2	11	extreme	Remove
84	black cottonwood	8.5	Good	Yes	2	8	extreme	Remove
85	black cottonwood	13	Good	Yes	2	8	extreme	Remove

Appendix I

BTND Tree Protection Summary Map



90% SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED
DRAWN
CHECKED
DATE OCT 2011

WWD SHEET NO.
WOODINVILLE WATER DISTRICT

carollo

WOODINVILLE WATER DISTRICT
KINGSGATE BOOSTER PUMP STATION AND PIPELINE
LANDSCAPE
TREE REMOVAL AND PROTECTION PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

JOB NO. 7763A.10
DRAWING NO. L-1
SHEET NO. OF XX

PROJECT NO. 7763A10
FILE NAME: 7763A10L-001.dwg

Russ1 Cole

From: Russ1 Cole
Sent: Friday, July 20, 2012 3:57 PM
To: 'jcoogan@kiklandwa.gov'
Cc: Rosalie Cole
Subject: Case No. ZON12-00311 Woodinville Water District Pump Station
Attachments: photo 2.JPG; photo 3.JPG; photo 4.JPG

My husband and I have attended several Water District Commissioner meetings because our property - 13117 NE 145th Place, Kirkland - abuts the water district property, the site of the Kingsgate pump station improvement project.
We are somewhat resigned to the fact that the Water District will be installing a fence to mark the property boundary. We remain hopeful that this fence will be rustic in design, fitting the fact that the Water District property has for many years been a de facto "greenbelt". Because our home is situated so close to the property line and because we have over the past 16 years "encouraged" a natural vegetative screen that provides a very pleasant buffer, we want to appeal to the District Commissioners that when the fence is installed that the absolute minimum of clearing be done. I can't begin to tell you how much we enjoy the green "sanctuary" that this vegetative screen creates. We enjoy the birds and wildlife, even the raccoons that often climb up on our deck to also enjoy the view. We especially enjoy the hummingbirds that use the salmon berry and holly shrubs as habitat.

To help you visualize what we presently enjoy, I have attached some photos that depict what I am trying to express.
Respectfully Submitted
Rosalie A. Cole

rosalie.cole@coleprop.com