CITY OF KIRKLAND
PLANNING & COMMUNITY DEVELOPMENT
123 5th Avenue, Kirkland, WA 98033 425.587.3225
www.ci.kirkland.wa.us

*****Notice to Our Customers*****

New Tree Regulations – Short Plats & Subdivisions

Effective January 1, 2006

Purpose of the new tree regulations

Trees and other vegetation are important elements of the physical environment which protect public health, safety and general welfare in a variety of ways. These regulations establish a process and standards to provide for the protection, preservation, replacement, proper maintenance and use of significant trees, associated vegetation and woodlands located in the City of Kirkland. **For Short Plats and Subdivisions, the regulations require retention of viable trees within the required setbacks and in potential preserved groves. The site is required to meet a minimum density of tree coverage on the subject property following construction of the project. These requirements are discussed in Section 95.35.2.B.3 of the Kirkland Zoning Code (KZC) and are summarized below.**

Helpful definitions to complete the tree plans described below:

1. **Significant Tree**: A tree that is at least 6" in diameter at breast height (DBH) (The diameter or thickness of a tree trunk measured at 4.5 feet from the ground).
2. **Dripline**: The distance from the tree trunk that is equal to the furthest extent of the tree's crown.
3. **Impact**: A condition or activity that affects a part of a tree, including the trunk, branches, and critical root zone.
4. **Qualified Professional**: An individual that possesses and demonstrates the ability to perform tree risk assessments and prescribe appropriate measures necessary for the preservation of trees during development; must at a minimum be certified by the International Society of Arboriculture (ISA).
5. A **Type 1 Tree** is a viable tree that meets at least one of the following criteria:
   i. Landmark tree (pre-designated);
   ii. Specimen tree (very good to excellent condition and free of major defects);
   iii. Tree groves and associated vegetation to be set aside as preserved groves;
   iv. Trees on slopes of at least 10%; or
   v. Trees that are a part of a grove that extends into adjacent property.

Permit Submittal Requirements – Short Plats and Subdivisions

The following information is required for all permits in order for the application to be deemed complete. Incomplete applications will not be accepted.

Tree Plan III shall be submitted with short plat and preliminary subdivision permit applications and subsequent Land Surface Modification permit applications. *The approved Tree Plan III will later be used to comply with the Tree Plan I requirement for the single-family building permit application of each lot.*

A. The following information must be incorporated on the site plan:
   1. Surveyed location of all significant trees;
   2. A tree inventory prepared by a qualified professional including a numbering system of existing significant trees (with corresponding tags on trees), measured driplines, size (DBH), species and tree status (removed or retained) based on health, risk of failure and suitability of species (see criteria in KZC 95.35.2.C) for all significant trees; and
   3. Approximate trunk location and dripline of significant trees that are on adjacent property with driplines extending over the subject property line.

B. Tree Plan III shall include a report from a qualified professional detailing:
   1. An indication and discussion, for each tree, of whether it is proposed to be retaine of failure and suitability of species;

ATTACHMENT 6
Spec cccc1

2. Limits of disturbance around viable trees; and
3. Special instruction for work within the critical root zone of viable trees;
4. Location and type of protection measures for viable trees.

C. Utilizing the information from the tree survey, inventory and report, the applicant must submit a site plan showing:
1. The proposed development activity – including location of lot lines, easements and roads
2. Location and limits of disturbance of viable trees to be retained according to the tree inventory, report, and City's determination of tree types
3. Trees being removed for proposed development or trees being removed that are not viable
4. Tree density calculations of retained trees compared to the minimum tree density for the site; The required minimum tree density is 30 tree credits per acre. Use the following formula to determine the required tree density:
(Project size in square feet*/43,560) X 30 = Required minimum tree density
   * excluding existing public right-of-way, areas to be dedicated as public right-of-way and access easements or tracts not counted in lot area

For example, the minimum tree density for a 15,000 square foot parcel is 10 tree credits and for 30,000 square feet, it is 21 tree credits.

Use the following chart to calculate the tree density for existing trees that are going to be retained.

Tree Density for Existing Significant Trees (Credits per minimum diameter - DBH)					
DBH	Tree Credits	DBH	Tree Credits	DBH	Tree Credits
3–5"	0.5				
6-10"	1	24"	8	38"	15
12"	2	26"	9	40"	16
14"	3	28"	10	42"	17
16"	4	30"	11	44"	18
18"	5	32"	12	46"	19
20"	6	34"	13	48"	20
22"	7	36"	14	50"	21

5. If the calculated tree density is below the minimum, indicate the type, size and location of the supplemental trees needed to meet the density requirement. Supplemental trees must be at least 6 feet tall if they are conifers or 2-inch caliper if they are deciduous or broad-leaf evergreens. They are worth one tree credit each. Larger supplemental trees may be awarded additional credits.

D. Additional Requirements:
1. The applicant shall pursue applicable variations to development as outlined in KZC 95.35.4.A.2 and 3 for the retention of Type 1 trees in required yards.
2. Prior to permit approval, the applicant shall provide a final plan showing tree density calculations, retained trees, trees to be removed, and any required supplemental trees to meet the minimum tree density. The plan must describe the details of site preparation, the installation of new trees, and the maintenance measures necessary for the long-term survival and health of all trees on site pursuant to KZC 95.45 and KZC 95.50.
3. A description and location of tree protection measures during construction for trees to be retained must be shown on demolition and grading plans, and protections measures must be in accordance with KZC 95.35.6.
4. Prior to plat recording, the applicant shall submit a five year preservation and maintenance agreement pursuant to KZC 95.50.

Note: This is an overview of tree requirements, for more details and information visit our website at http://www.ci.kirkland.wa.us/depart/planning/trees.htm or request a copy of Ordinance 4010.

Gilles Consulting
Brian K. Gilles
425-822-4994

RECEIVED
JAN 20 2006
AM PM
PLANNING DEPARTMENT
BY

EVALUATION OF SELECTED TREES AT

DAWSON SHORT PLAT
10827 NE 108TH STREET
KIRKLAND, WA 98033

January 18, 2006

PREPARED FOR:
Kit Klinker, President
Klinker Corporation
PO Box 2668
Kirkland, WA 98083

PREPARED BY:
GILLES CONSULTING
Brian K. Gilles, Consulting Arborist
ISA Certified Arborist # PN-0260
ASCA Registered Consulting Arborist # RCA-418

PACIFIC NORTHWEST CHAPTER ISA CERTIFIED ARBORIST
INTERNATIONAL SOCIETY OF ARBORICULTURE MEMBER
ASCA REGISTERED CONSULTING ARBORIST
Printed on recycled paper

Fax: 425-822-
E-mail: bkgill
P.O. Box 2366

ATTACHMENT 7
SP06-00001

CONTENTS

ASSIGNMENT 3

EXECUTIVE SUMMARY 3

METHODOLOGY 3

Tree Tags 3

Missing Trees 4

OBSERVATIONS 4

DISCUSSION 4

CONCLUSIONS AND RECOMMENDATIONS 5

TREE PROTECTION MEASURES: 5

WAIVER OF LIABILITY 6

ATTACHMENTS: 7

ASSIGNMENT

Mr. Kit Klinker of the Klinker Corporation contracted with Gilles Consulting to evaluate the trees on the Dawson Short Plat at 10827 NE 108th Street, Kirkland, WA 98033. The property is currently occupied by a single-family home and a detached building. The plan is to divide the property into smaller individual single-family lots, and build new homes. Mr. Klinker requested that Gilles Consulting evaluate the trees on the property as required under the new City of Kirkland Tree Retention Code and deliver a report to him.

EXECUTIVE SUMMARY

- 15 trees on the property were evaluated:
  - 8 were found to be *Non-Significant* due to poor health, poor structure, or both.
    - These 8 trees will not withstand the stress of construction and will not survive long-term.
  - 7 trees were found to be in Fair, Good, or Excellent condition.
    - They have the potential to be retained if they are protected during construction and if they are not in the way of required site improvements.

METHODOLOGY

To evaluate the trees and to prepare the report, I drew upon my 25+ years of experience in the field of arboriculture and my formal education in natural resources management, dendrology, forest ecology, plant identification, and plant physiology. I also followed the protocol of the International Society of Arboriculture (ISA) for Hazard Tree Assessment that includes looking at the overall health of the trees as well as the site conditions. This is a scientifically based process to look at the entire site, surrounding land and soil, as well as a complete look at the trees themselves.

In examining each tree, I looked at such factors as: size, vigor, canopy and foliage condition, density of needles, injury, insect activity, root damage and root collar health, crown health, evidence of disease-causing bacteria, fungi or virus, dead wood and hanging limbs. While no one can predict with absolute certainty which trees will or will not fail, we can, by using this scientific process, assess which trees are most likely to fail and take appropriate action to minimize injury and damage.

Tree Tags

The trees were tagged and numbered 173 through 187. The tags are made of shiny aluminum approximately one inch by three inches in size and are attached to the tree with staples. The tags were generally placed on the north sides of the trunks at six feet high to minimize their removal. Please refer to *Attachment 1, Dawson Short Plat, Sheet No. 2 of 2 by Greene Land Surveying dated 1/12/06* for an orientation to the site and the location of the trees.

Missing Trees

There were a few trees not included on the survey. I tagged them, evaluated them, and included them in this report. I also indicated their approximate location on *Attachment 1, Dawson Short Plat, Sheet No. 2 of 2 by Greene Land Surveying dated 1/12/06*. However, if these trees are considered for retention they may need to be surveyed to determine their exact location in relation to site improvements and their retainability.

OBSERVATIONS

In an effort to present the information and conclusions for each tree in a manner that is clear and easy to understand, I have included a detailed spreadsheet, *Attachment 2, Tree Inventory/Condition Spreadsheet*. The descriptions on the spreadsheet were left brief in order to include as much pertinent information as possible and to make the report manageable. A detailed description of the terms used in the spreadsheet and in this report can be found in *Attachment 3, Glossary*. A brief review of these terms and descriptions will enable the reader to rapidly move through the spreadsheet and better understand the information.

DISCUSSION

The property is currently occupied by a single family home with a hot tub, a deck, an out building, a dog kennel, lawns, and a small landscape nursery/garden area. The property is relatively flat. The trees are primarily located around the house except for the large Black Cottonwood trees which are closer to the southeast corner of the property.

The evaluation went as follows:

- 15 trees on the property were evaluated:
  - 8 were found to be *Non-Significant* due to poor health, poor structure, or both.
    - These 8 trees will not withstand the stress of construction and will not survive long-term. These are trees # 173, 174, 178, 181, 183, 185, 186, and 187:
      - Tree 173 (Eastern White Birch) is in marginal condition. However, the poor crown and moderate health of this species lead me to judge that the tree will not survive long-term. The tree is nearing its terminal age and its decline will be accelerated by the construction.
      - Trees 174 (Lodgepole Pine) and 181 (Thundercloud Plum) are nearly dead and not worthy of retention.
      - Tree 178 (Douglas Fir) is nearly dead. There is excessive sap flow at the base that is consistent with tree suffering from Armillaria Root Rot. The tree is nearly dead.
      - Trees 183, 185, 186, and 187 have center rot, base rot, carpenter ant infestation, and rot pockets and cracks in

scaffold branches. They are hazards that should be removed.

- 7 trees were found to be in Fair, Good, or Excellent condition.
  - They have the potential to be retained if they are protected during construction and if they are not in the way of required site improvements.
  - They are #'s 175, 176, 177, 179, 180, 182, and 184.

CONCLUSIONS AND RECOMMENDATIONS

Please note that of the 7 trees that appear to have adequate structure, and adequate health and vigor to withstand the stresses of construction, they may not be able to be retained due to the many, and often conflicting requirements of development. Such factors as topography, placement of utilities, building foot-prints, retaining walls, and many more may require the removal of one or more of these trees. The developer will need to work with the engineers and the City to adjust development plans in a way that is consistent with the goals of the development and the goals of the City that include tree preservation.

Specifically, the City's goal as stated in the new tree regulations, Ordinance 4010, is that the City wants a canopy density of 30 tree credits per acre. The 22 trees on the site that have the potential for retention amount to a total of 114 Tree Credits. Some of these trees may need to be removed in the short plat process and some will likely be removed in the construction of the homes on each lot. You will need to do the required calculation for the required tree retention as follows:

(Lot size in square feet) / 43,560 X 30 = Required Minimum Tree Density.

TREE PROTECTION MEASURES:

There are several trees that are good candidates for retention due to their size and health as well as their location. Once the specific trees for retention have been delineated, and the determination as to whether the property will adequately meet the required minimum tree density, the trees marked for retention will need to be protected during the construction process.

In order for trees to survive the stresses placed upon them in the construction process, tree protection must be planned in advance of equipment arrival on site. If tree protection is not planned integral with the design and layout of the project, the trees will suffer needlessly and will possibly die. With proper preparation, often costing little, or nothing extra to the project budget, trees can survive and thrive after construction. This is critical for tree survival because damage prevention is the single most effective treatment for trees on construction sites. Once trees are damaged, the treatment options available are limited.

Attachment 5, Tree Protection Measures are a minimum description of needed protection efforts. They are included on three separate sheets so that they can be copied and introduced into all relevant documents such as site plans, permit applications and conditions of approval, and bid documents so that everyone involved is aware of the requirements. These Tree Protection Measures are intended to be generic in nature. They will need to be adjusted to the specific circumstances of your site that takes into account the location of improvements and the locations of the trees.

WAIVER OF LIABILITY

There are many conditions affecting a tree's health and stability which may be present and cannot be ascertained, such as, root rot, previous or unexposed construction damage, internal cracks, stem rot and more which may be hidden. Changes in circumstances and conditions can also cause a rapid deterioration of a tree's health and stability. Adverse weather conditions can dramatically affect the health and safety of a tree in a very short amount of time. While I have used every reasonable means to examine these trees, this evaluation represents my opinion of the tree health at this point in time. These findings do not guarantee future safety nor are they predictions of future events.

The tree evaluation consists of an external visual inspection of an individual tree's root flare, trunk, and canopy from the ground only unless otherwise specified. The inspection may also consist of taking trunk or root soundings for sound comparisons to aid the evaluator in determining the possible extent of decay within a tree. Soundings are only an aid to the evaluation process and do not replace the use of other more sophisticated diagnostic tools for determining the extent of decay within a tree.

As conditions change, it is the responsibility of the property owners to schedule additional site visits by the necessary professionals to ensure that the long-term success of the project is ensured. It is the responsibility of the property owner to obtain all required permits from city, county, state, or federal agencies. It is the responsibility of the property owner to comply with all applicable laws, regulations, and permit conditions. If there is a homeowners association, it is the responsibility of the property owner to comply with all Codes, Covenants, and Restrictions (CC&R's) that apply to tree pruning and tree removal.

This tree evaluation is to be used to inform and guide the client in the management of their trees. This in no way implies that the evaluator is responsible for performing recommended actions or using other methods or tools to further determine the extent of internal tree problems without written authorization from the client. Furthermore, the evaluator in no way holds that the opinions and recommendations are the only actions required to insure that the tree will not fail. A second opinion is recommended. The client shall hold the evaluator harmless for any and all injuries or damages incurred if the evaluator's recommendations are not followed or for acts of nature beyond the

evaluator's reasonable expectations, such as severe winds, excessive rains, heavy snow loads, etc.

This report and all attachments, enclosures, and references, are confidential and are for the use of the client concerned. They may not be reproduced, used in any way, or disseminated in any form without the prior consent of the client concerned and Gilles Consulting.

Thank you for calling Gilles Consulting for your arboricultural needs. Please call me if I can provide more information or be of further service.

Sincerely,

Brian K. Gilles, Consulting Arborist
International Society of Arboriculture Certified Arborist – PN-0260
American Society of Consulting Arborists, Registered Consulting Arborist – RCA—418

ATTACHMENTS:

ATTACHMENT 1 - SITE PLAN

ATTACHMENT 2 - TREE INVENTORY/CONDITIONS SPREADSHEET

ATTACHMENT 3 - GLOSSARY

ATTACHMENT 4 - SITE PHOTOS

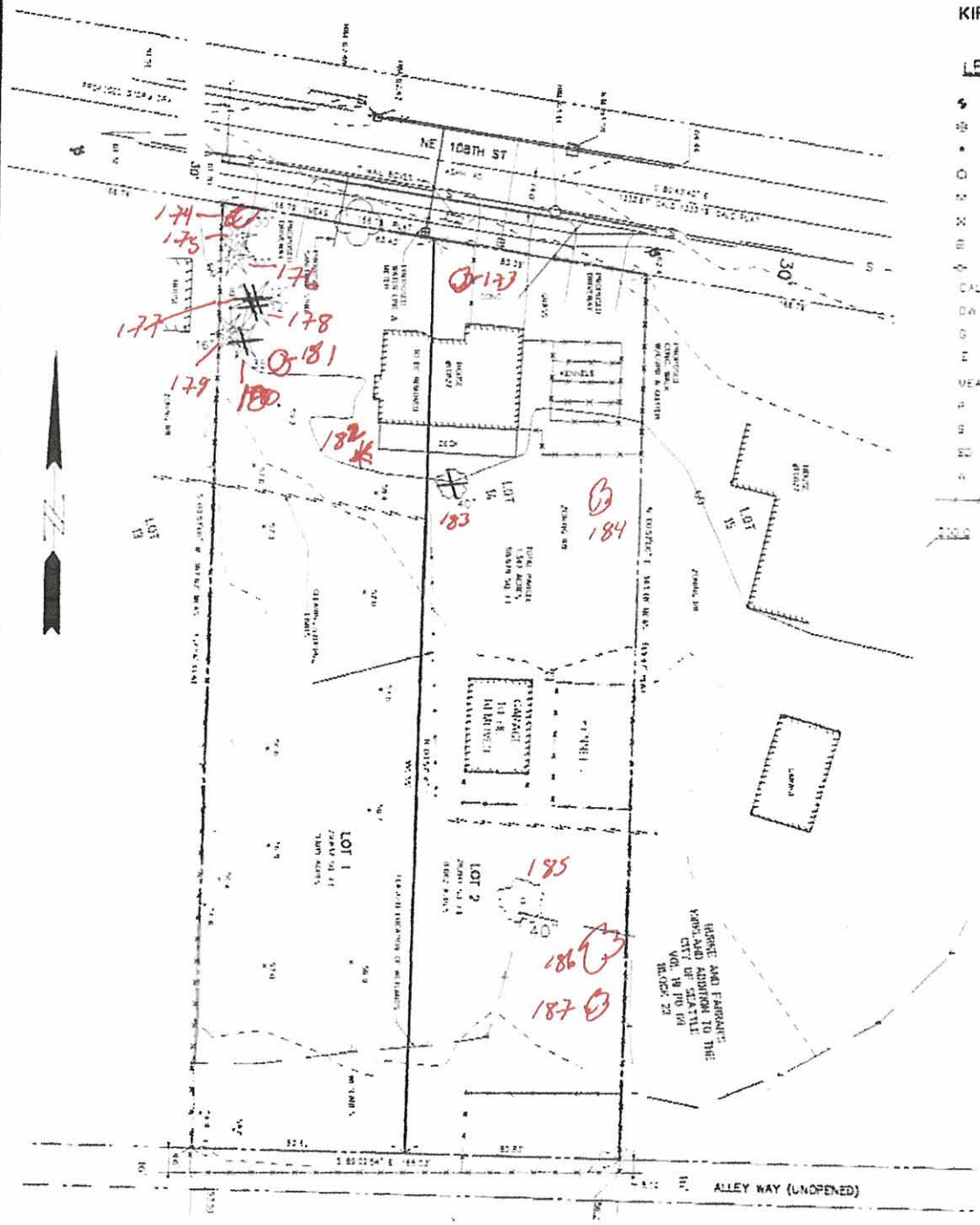
ATTACHMENT 5 - TREE PROTECTION MEASURES

ATTACHMENT 6 - REFERENCES

DAWSON SHORT PLAT

PTN: S.W. 1/4, N.E. 1/4, & N.W. 1/4, S.E. 1/4, SEC. 32, T 26 N, R 5 E, W.M.

KIRKLAND, WASHINGTON



LEGEND

	MONUMENT IN CASE
	FOUND CONCRETE MONUMENT
	SET 1/2" X 24" REBAR WITH CAP LS 29539
	GAS VALVE
	MAIL BOX
	WATER VALVE
	WATER METER
	UTILITY POLE
CALC	CALCULATED
DW	DRIVE WAY
G	GAS
E	INVERT ELEVATION
MEAS	MEASURED
P	PLAT OF
S	SEWER
SD	STORM DRAIN
W	WATER
	WOODFENCE
200.0	SPOT ELEVATION IS LOCATED AT THE DECIMAL POINT OF ELEVATION (200.0) UNLESS AS NOTED WITH LEADER OR X

TREE RETENTION

EXISTING SIGNIFICANT TREES 9

TREES FOR REMOVAL 5

GRAPHIC SCALE

(IN FEET)
1 INCH = 30 FT

PTN: S.W. 1/4, N.E. 1/4, & N.W. 1/4, S.E. 1/4, SEC. 32, T 26 N, R 5 E, W.M.

PREPARED BY

GREENE LAND SURVEYING

20515 82ND AVE SW EDMONDS, WASHINGTON

PHONE (425) 697-6606 FAX (425) 697-6604

DATE	DRAWN BY	DRAWING	SCALE	JOB NUMBER
1/12/06	RG	205P	1" = 30'	2006.20

CITY OF KIRKLAND FILE NO.

ROBERT GUY GREENE
STATE OF WASHINGTON
29539
REGISTERED
PROFESSIONAL LAND SURVEYOR
EXPIRES 11/29/2007

SHORT PLAT
OF
10827 108TH ST
FOR
KLINKER CORPORATION

SHEET NO. 2 OF 2

 # 1 *Tree #:* Individual tree number.
 # 2 *Species*:

	BCh/Pe	Bitter Cherry, *Prunus emarginata*
	BL/Rp	Black Locust, *Robinia pseudoacacia*
	CF/Cl	Chinese Fir, *Cunninghamia lanceolata*
	DF/Pm	Douglas Fir, *Pseudotsuga menziezii*
	EWB/Bpa	Eastern White Birch, *Betula papyrifera*
	LpP/Pc	Lodgepole Pine, (Shore Pine), *Pinus contorta*
	TcP/Pc	Thundercloud Plum, *Prunus cerasifera*

 # 3 *DBH*: Trunk diameter @ 4.5' above average ground level.
 # 4 *Drip Line:* The diameter from the furthest branch tips across the tree canopy.

 # 5 *LCR*: *Live Crown Ratio* - the amount of live canopy expressed as a % of the entire tree height
 # 6 *Symmetry*: General shape of canopy and weight distribution of the tree around the trunk.
 # 7 *Foliage:* General description of foliage density that indicates tree health and vigor.
ABS/ASE are descriptors for
 # 8 *Crown Condition:* The most important external indication of tree health and vigor.
 # 9 *Trunk:* Description of trunk condition or abnormalities if any.
 # 10 *Root Collar*: The base of the tree where the trunk flares into the roots--deformities or problems are noted here.
 # 11 *Roots:* Root problems are noted here.
 # 12 *Comments*: Additional observations about the tree's condition.
 # 13 *Current Health Rating:* *A general indication of health on a scale from dead to dying to poor to fair to good to excellent.*
 # 14 *Recomm.*: *Recommendation* -- the best course of action based on the evaluation of the tree.
Potential Keeper means that the tree will likely survive if adequate tree protection measures are followed.
Non-Significant means that the tree will not likely survive the stresses of construction and site changes.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
TREE #	SPECIES	DBH	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATIONS
173	EWB/Bp	25.3"	36'	70%	Gen. Sym.	ABS/ASE	Regenerating - Healthy	slight bow at base	Partially Exposed	Restricted	base of tree is 3' west of driveway, broken and hanging limb in canopy, weak attachments of large branches where tree was topped decades ago	Poor	Non-significant
174	LpP/Pc	9.6"	12'	60%	Maj. Asym.	Thin	Regenerating - Poor	leans NW	NAD	-		Poor	Non-significant
175	DF/Pm	32.3"	20'	85%	Maj. Asym.	Thin	Healthy	Straight	NAD	-	Hanging limb	Fair	Potential Keeper
176	DF/Pm	29.3"	22'	90%	Min. Asym.	Dense	Healthy	slightly serpentine	NAD	-		Good	Potential Keeper
177	CF/Cl	Clump of 5	28'	85%	Min. Asym.	Dense	Healthy	fork at base	Internal Structural Weakness	-	trunk diameters are: 12.8, 12.8, 9.0, 8.2, and 10.9 inches	Good	Potential Keeper
178	DF/Pm	18.1"	14'	40%	Maj. Asym.	Sparse	Dead	leans west	excessive sap flow	Probable Root Rot	Possible Armillaria Root Rot, callused wound on east side from 2 feet to 3.5 feet, sounds like a rot pocket behind the wound	Poor	Non-significant
179	DF/Pm	36.1"	44'	85%	Min. Asym.	Dense	Healthy	Straight	NAD	-		Good	Potential Keeper
180	DF/Pm	26.0"	26'	85%	Maj. Asym.	Average	Average	bowed south	NAD	-		Fair	Potential Keeper
181	TcP/Pc	6.5"	10'	80%	Maj. Asym.	None	Dead	serpentine	Base Rot	-		Dead	Non-significant
182	DF/Pm	14.1"	30'	85%	Gen. Sym.	Dense	Healthy	Straight	NAD	-	near southwest corner of the house	Excellent	Potential Keeper
183	BL/Rp	50.0"	64'	80%	Gen. Sym.	PBS/PSE	Average	fork @ 5.5', Included bark to base	Base Rot	Restricted	next to hot tub and back deck, rot pockets and stress fractures in scaffold branches, rot in main trunks, fork at 5.5 feet and at 12 feet with significant included bark extending down 6 feet, center rot,	Poor	Non-significant
184	EWB/Bp	17.7"	30'	70%	Min. Asym.	ABS/ASE	Average	leans East	NAD	-	circular brick planter at base with bamboo planted	Fair	Potential Keeper
185	BCw/Pt	35.9"	28'	65%	Maj. Asym.	ABS/ASE	Average	leans west	Base Rot	-	center rot, rotten trunk stub at 6 feet--rot extends into base of tree	Poor	Non-significant
186	BCw/Pt	74.4"	68'	85%	Min. Asym.	ABS/ASE	Average	fork @ 9', Included Bark to Base	Base Rot	-	Center Rot, rot pockets in trunk and scaffold branches, dead branches in canopy	Poor	Non-significant
187	BCw/Pt	38.4"	48'	80%	Maj. Asym.	ABS/ASE	Average	Leans SE	Base Rot	-	Center Rot, Carpenter Ant Infestation	Poor	Non-significant

SITE: DAWSON Short Plat
10827 NE 108th Street, Kirkland, WA 98033

Date of Inspection: January 18, 2006

1	2	3	4	5	6	7	8	9	10	11	12	13	14
TREE #	SPECIES	DBH	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATIONS

SUMMARY:

-15 Trees on the property were evaluated

- 8 were found to be *Non-Significant* due to poor health, poor structure, or both.
- 7 trees were found to be of good health and structure that may be able to survive the stress of constru
  - the 7 trees total 55 Tree Credits
    - They are trees # 175, 176, 177, 179, 180, 182, and 184.

ATTACHMENT 3 - GLOSSARY
Terms Used in This Report, on the Tree Condition / Inventory Spreadsheet, and Their Significance

In an effort to clearly present the information for each tree in a manner that facilitates the reader's ability to understand the conclusions I have drawn for each tree, I have collected the information onto a spreadsheet format. This spreadsheet was developed by Gilles Consulting based upon the *Hazard Tree Evaluation Form* from the book, *The Evaluation of Hazard Trees in Urban Areas*, by Matheney and Clarke. The descriptions were left brief on the spreadsheet in an effort to include as much pertinent information as possible, to make the report manageable, and, to not bore the reader with infinite levels of detail. A review of these terms and descriptions will allow the reader to rapidly move through the report and understand the information.

1) **TREE #**--The individual number of each tree.
2) **SPECIES**—This describes the species of each tree with both most readily accepted common name and the officially accepted scientific name.
3) **DBH**—Diameter Breast Height. This is the standard measurement of trees taken at 4.5 feet above the average ground level of the tree base.
    i) Occasionally it is not practical to measure a tree at 4.5 feet above the ground. The most representative area of the trunk near 4.5 feet is then measured and noted on the spreadsheet. For instance, a tree that forks at 4.5 feet can have an unusually large swelling at that point. The measurement is taken below the swelling and noted as, '28.4" at 36"'.
    ii) Trees with multiple stems are listed as a "clump of x," with x being the number of trunks in the clump. Measurements may be given as an average of all the trunks, or individual measurements for each trunk may be listed.
        (1) Every effort is made to distinguish between a single tree with multiple stems and several trees growing close together at the bases.
4) **Drip Line:** The diameter from the furthest branch tips across the tree canopy.
5) **% LCR**—Percentage of Live Crown Ratio. The relative proportion of green crown to overall tree height. This is an important indication of a tree's health. If a tree has a high percentage of Live Crown Ratio, it is likely producing enough photosynthetic activity to support the tree. If a tree has less than 30 to 40% LCR it can create a shortage of needed energy and can indicate poor health and vigor.
6) **SYMMETRY**—*is the description of the form of the canopy. That is, the balance or* overall shape of the canopy and crown. This is the place I list any major defects in the tree shape—does the tree have all its foliage on one side or in one unusual area. Symmetry can be important if there are additional defects in the tree such as rot pockets, cracks, loose roots, weak crown etc. Symmetry is generally categorized as Generally Symmetrical, Minor Asymmetry or Major Asymmetry:
    i) Gen. Sym.—Generally Symmetrical. The canopy/foliage is generally even on all sides with spacing of scaffold branches typical for the species, both vertically and radially.

ii) Min. Asym.—Minor Asymmetry. The canopy/foliage has a slightly irregular shape with more weight on one side but appears to be no problem for the tree.

iii) Maj. Asym.—Major Asymmetry. The canopy/foliage has a highly irregular shape for the species with the majority of the weight on one side of the tree. This can have a significant impact on the tree's stability, health and hazard potential—especially if other defects are noted such as cracks, rot, root defects.

7) **FOLIAGE/BRANCH**—Describes the foliage of the tree in relation to a perfect specimen of that particular species. First the branch growth and foliage density is described, and then any signs or symptoms of stress and/or disease are noted. The condition of the foliage, or the branches and buds for deciduous trees in the dormant season, are important indications of a tree's health and vigor.

i) For Deciduous trees in the dormant season:

(1) The structure of the tree is visible,

(2) The quantity and quality of buds indicates health, and is described as good bud set, average bud set, or poor bud set. These are abbreviated in the spreadsheet as: gbs, abs, or pbs.

(3) The amount of annual shoot elongation is visible and is another major indication of tree health and vigor. This is described as:

a) Excellent, Good, Average, or Short Shoot Elongation. These are abbreviated in the spreadsheet as ESE, GSE, ASE, OR SSE.

ii) For evergreen trees year round and deciduous trees in leaf, the color and density of the foliage indicates if the tree is healthy or stressed, or if an insect infestation, a bacterial, fungal, or viral infection is present. Foliage is categorized on a scale from:

(1) Dense—extremely thick foliage, an indication of healthy vigorous growth,

(2) Good—thick foliage, thicker than average for the species,

(3) Normal/Average—thick foliage, average for the species, an indication of healthy growth,

(4) Thin or Thinning—needles and leaves becoming less dense so that sunlight readily passes through; an indication that the tree is under serious stress that could impact the long-term survivability and safety of the tree,

(5) Sparse—few leaves or needles on the twigs, an indication that the tree is under extreme stress and could indicate the future death of the tree

(6) Necrosis—the presence of dead twigs and branchlets. This is another significant indication of tree health. A few dead twigs and branches are reasonably typical in most trees of size. However, if there are dead twigs and branchlets all over a certain portion of the tree, or all over the tree, these are indications of stress or attack that can have an impact on the tree's long-term health.

(7) Hangers—A term to describe a large branch or limb that has broken off but is still hanging up in the tree. These can be particularly dangerous in adverse weather conditions.

8) **CROWN CONDITION**—The crown is uppermost portion of the tree, generally considered the top 10 to 20% of the canopy or that part of the canopy above the main trunk in deciduous trees and above the secondary bark in evergreen trees.
   i) The condition of the tree's crown is a reflection of the overall health and vigor of the entire tree. The crown is one of the first places a tree will demonstrate stress and pathogenic attack such as root rot.
   ii) If the **Crown Condition** is healthy and strong, this is a good sign. If the crown condition is weak, broken out, or shows other signs of decline, it is an indication that the tree is under stress. It is such an important indication of health and vigor that this is the first place a trained forester or arborist looks to begin the evaluation of a tree. Current research reveals that, by the time trees with root rot show significant signs of decline in the crown, fully 50% or more of the roots have already rotted away. **Crown Condition** can be described as:
      (1) Healthy Crown—exceptional growth for the species.
      (2) Average Crown—typical for the species.
      (3) Weak Crown—thin spindly growth with thin or sparse needles.
      (4) Flagging Crown—describes a tree crown that is weak and unable to grow straight up.
      (5) Dying Crown—describes obvious decline that is nearing death.
      (6) Dead Crown—the crown has died due to pathological or physical injury. The tree is considered to have significant stress and/or weakness if the crown is dead.
      (7) Broken out—a formerly weak crown condition that has been broken off by adverse weather conditions or other mechanical means.
      (8) Regenerated or Regenerating—formerly broken out crowns that are now growing back, Regenerating crowns may appear healthy, average, or weak and indicate current health of the tree.
      (9) Suppressed—a term used to describe poor condition of an entire tree or just the crown. Suppressed crowns are those that are entirely below the general level of the canopy of surrounding trees which receive no direct sunlight. They are generally in poor health and vigor. Suppressed trees are generally trees that are smaller and growing in the shade of larger trees around them. They generally have thin or sparse needles, weak or missing crowns, are prone to insect attack as well as bacterial and fungal infections.

9) **TRUNK**—this is the area to note any defects that can have an impact on the tree's stability or hazard potential. Typical things noted are:
   i) FORKED—bifurcation of branches or trunks that often occur at a narrow angle.
   ii) INCLUDED BARK—a pattern of development at branch or trunk junctions where bark is turned inward rather than pushed out. This can be a serious

structural defect in a tree that can and often does lead to failure of one or more of the branches or trunks especially during severe adverse weather conditions.

iii) EPICORMIC GROWTH—this is generally seen as dense thick growth near the trunk of a tree. Although this looks like a healthy condition, it is in fact the opposite. Trees with Epicormic Growth have used their reserve stores of energy in a last ditch effort to produce enough additional photosynthetic surface area to produce more sugars, starches and carbohydrates to support the continued growth of the tree. Generally speaking, when conifers in the Pacific Northwest exhibit heavy amounts of Epicormic Growth, they are not producing enough food to support their current mass and are already in serious decline.

iv) INTERNAL STRUCTURAL WEAKNESS—a physical characteristic of the tree trunk, such as a **kink, crack, rot pocket, or rot column** that predisposes the tree trunk to failure at the point of greatest weakness.

v) BOWED—a gradual curve of the trunk. This can indicate an Internal Structural Weakness or an overall weak tree. It can also indicate slow movement of soils or historic damage of the tree that has been corrected by the curved growth.

vi) KINKED—a sharp angle in the tree trunk that indicates that the normal growth pattern is disrupted. Generally this means that the internal fibers and annual rings are weaker than straight trunks and prone to failure, especially in adverse weather conditions.

vii) GROUND FLOWER—an area of deformed bark near the base of a tree trunk that indicates long-term root rot.

ROOT COLLAR—This is the area where the trunk enters the soil and the buttress roots flare out away from the trunk into the soil. It is here that signs of rot, decay, insect infestation, fungal or bacterial infection are noted. **NAD** stands for **N**o **A**pparent **D**efects.

10) **ROOTS**—Any abnormalities such as girdling roots, roots that wrap around the tree itself that strangle the cambium layer and kill the tree, are noted here.

11) **COMMENTS**—This is the area to note any additional information that would not fit in the previous boxes or attributes about the tree that have bearing on the health and structure of the tree.

12) **CURRENT HEALTH ASSESSMENT**—A description of the tree's general health rating from dead, poor, suppressed, fair, good, to excellent.

13) **STATUS/RECOMMENDATION**—This is an estimate of whether or not the tree is off sufficient health, vigor, and structure that it is worth consideration of retention.

NOTE: TREES WITH THE SAME DESCRIPTION AND DIFFERENT RATINGS: Two trees may have the same descriptions in the matrix boxes, one may be marked "Significant," while another may be marked "Non-Significant." The difference is in the degree of the description; early "necrosis" versus advanced "necrosis" for instance. Again, these descriptions were left brief in an effort to include as much pertinent information as possible, to make the report manageable, and, not to bore the reader with infinite levels of detail.

ATTACHMENT 4 - SITE PHOTOS

Photo # 1: Front yard Birch by Drive and front door.

PHOTO # 2: Tree # 173, Birch Showing Large Hanger.

Photo # 3: Front yard from near the front door showing stand of 8 trees in the northwest corner of the property.

Photo # 4: Side yard with tree # 182.

Photo # 5: Showing the back yard looking south.

Photo # 6: Back yard dominated by tree # 183.

Photo # 7: showing the base of tree # 183 with weak structure—included bark extending to the ground below the fork at 5.5 feet.

Photo # 8: Large scaffold branch on tree # 183 with stress fractures and internal rot.

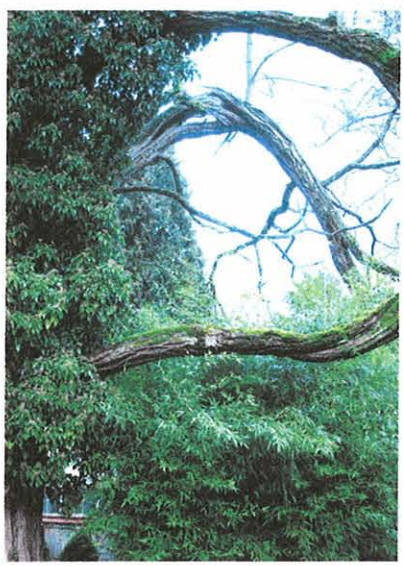


Photo # 9: Three of the main scaffold branches on tree # 183 with stress fractures and internal rot.

ATTACHMENT - 5 TREE PROTECTION MEASURES

- Tree Protection Fences will need to be placed around each tree or group of trees to be retained.
    - Tree Protection Fences are to be placed according to the attached drawing at a distance of not less than 5 feet outside the dripline of the tree or group of trees to be saved.
    - Tree Protection Fences must be inspected prior to the beginning of any construction work/activities.
    - Nothing must be parked or stored within the Tree Protection Fences—no equipment, vehicles, soil, debris, or construction supplies of any sorts.

- Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the Tree Protection Fences.

- The Tree Protection Fences need to be clearly marked with the following or similar text in four inch or larger letters:

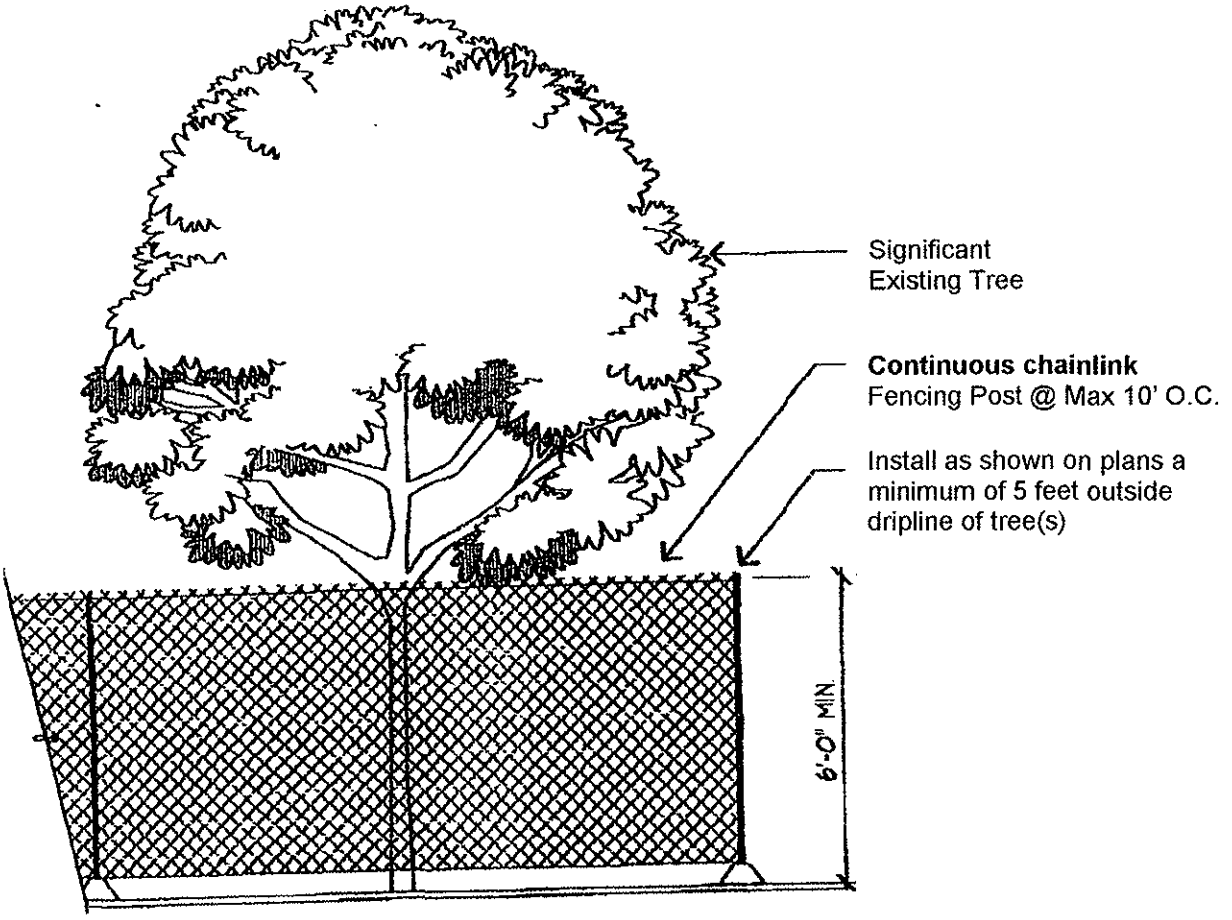
  "TREE PROTECTION FENCE
  DO NOT ENTER THIS AREA
  DO NOT PARK OR STORE MATERIALS
  WITHIN THE PROTECTION AREA

  Any questions, call Brian K. Gilles at Gilles Consulting
  @ 425-417-0850"

- The area within the Tree Protection Fencing must be covered with wood chips, hog fuel, or similar materials to a depth of 8 to 10 inches. The materials should be placed prior to beginning construction and remain until the Tree Protection Fencing is taken down.

- When excavation occurs within the driplines of the trees that are scheduled for retention, the following procedure *must* be followed to protect the long term survivability of the tree:
    - An International Society of Arboriculture, (ISA) Certified Arborist must be working with all equipment operators.
        - The Certified Arborist should be outfitted with a shovel, hand pruners, a pair of loppers, a handsaw, and a power saw (a "sawsall" is recommended).

- When any roots of one inch diameter or greater, of the tree to be retained, is struck by the equipment, the Certified Arborist should stop the equipment operator:
    - The Certified Arborist should then excavate around the tree root by hand/shovel and cleanly cut the tree root.
    - The Certified Arborist should then instruct the equipment operator to continue.
- Boring under the root systems of trees (and other vegetation) shall be done under the supervision of an ISA Certified Arborist. This is to be accomplished by excavating a limited trench or pit on each side of the critical root zone of the tree and then hand digging or pushing the pipe through the soil under the tree. The closest pit walls shall be a minimum of 7 feet from the center of the tree and shall be sufficient depth to lay the pipe at the grade as shown on the plan and profile.
- Tunneling under the roots of trees shall be done under the supervision of an ISA Certified Arborist in an open trench by carefully excavating and hand digging around areas where large roots are exposed. No roots 1 inch in diameter or larger shall be cut.
- The contractor shall verify the vertical and horizontal location of existing utilities to avoid conflicts and maintain minimum clearances; adjustment shall be made to the grade of the new utility as required.



1. Six-foot high temporary chainlink fence shall be placed as shown on plans. Fence shall completely encircle tree(s). Install fence posts using pier blocks only. Avoid driving posts or stakes into major roots.

2. Make a clean straight cut to remove damaged portion of root for all roots over 1" in diameter damaged during construction. ***All*** exposed roots shall be temporarily covered with damp burlap and covered with soils the same day, if possible, to prevent drying. If not possible, burlap must be kept moist at all times.

3. Work with the protection fencing shall be done manually. No stockpiling of materials, soil, debris, vehicle traffic, or storage of equipment or machinery shall be allowed within the limit of the fencing.

4. Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the Tree Protection Fences.

5. The area within the Tree Protection Fencing must be covered with wood chips, hog fuel, or similar materials to a depth of 8 to 10 inches. The materials should be placed prior to beginning construction and remain until the Tree Protection Fencing is taken down.

ATTACHMENT 6 - REFERENCES

1. Eric Allen, et al. *Common Tree Diseases of British Columbia,* Canadian forest Service, Pacific Forestry Centre, Victoria, BC, and Canada. 1996.

2. Harris, Richard W. et al, *Arboriculture, Integrated Management of Landscape Trees, Shrubs, and Vines, Fourth Edition,* Prentice Hall, Upper Saddle River, New Jersey. 2004.

3. Matheney, Nelda P. & Clark James R., *Evaluation of Hazard Trees, Second Edition,* The International Society of Arboriculture Press, Savoy, Illinois. 1994

4. Matheney, Nelda P. & Clark James R., *Trees & Development, A Technical Guide to Preservation of Trees During Land Development,* The International Society of Arboriculture Press, Savoy, Illinois. 1998.

5. Mattheck, Claus Prof., and Ass. Jur Mrs. Helge Breloer, *The Body Language of Trees, A Handbook for Failure Analysis,* HMSO, London, England. 1994.

6. Scharpf, Robert F. *Diseases of Pacific Coast Conifers,* USDA Forest Service, Agriculture Handbook 521, revised June 1993

7. Sinclair et al, *Diseases of Trees and Shrubs,* Cornell University Press, Ithaca, NY, 1987.

8. Watson, Dr. Gary W., & Dr. Dan Neely Editors, *Trees & Building Sites,* The International Society of Arboriculture Press, Savoy, IL. 1995.