Gilles Consulting
Brian K. Gilles
425-822-4994

January 24, 2008

Sound Quality Homes
Jeordy Rostad
233 10th Avenue
Kirkland, WA 98033

Subject: Tree Evaluation Report

Dear Mr. Rostad:

As you requested, enclosed are three signed original Tree Evaluation Reports for your property at 90xx 126th Avenue NE in Kirkland, Washington and an invoice for our services. One copy of the report is for the City to file with your permit work. One copy is for your designer, planner, or engineer to use in development of the Tree Plan required by the City.

You will need to have the information in this report converted to a tree retention and preservation plan with the required tree protection measures. You will need this to apply for your permit with the city. Please be aware that you will need this permit before cutting down any trees on the property.

Currently there are 100 tree credits on the lot. Several of these will need to be lost due to the construction of the new home and other improvements. You will need to discuss with the engineer and architect how you can retain enough tree credits on the property. (This is explained in the report.) If you cannot retain enough trees to meet the required minimum you will have to explain why to the City in a cover letter with your permit application materials. It is as straight forward as showing that a tree will be inside a building or too close to a utility or what ever the issue is. If this is the case, you will be required to plant new trees that bring the tree credits up to the minimum.

Thank you for calling Gilles Consulting for your arboricultural needs.

Sincerely,

Brian K. Gilles, Consulting Arborist
ISA Certified Arborist # PN-0260
ASCA Registered Consulting Arborist # RCA-418A
PNW-ISA Certified Tree Risk Assessor #148

MEMBER

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P.O. Box 2366 Kirkland, WA 98083

Gilles Consulting
Brian K. Gilles
425-822-4994

EVALUATION OF TREES AT THE ROSE HILL HOUSE

90XX 126TH AVENUE NE KIRKLAND, WA 98033

January 24, 2008

PREPARED FOR:
Sound Quality Homes
Jeordy Rostad
233 10th Avenue
Kirkland, WA 98033

PREPARED BY:
GILLES CONSULTING
Brian K. Gilles, Consulting Arborist
ISA Certified Arborist # PN-0260
ASCA Registered Consulting Arborist # RCA-418A
PNW-ISA Certified Tree Risk Assessor #148

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CONTENTS

EXECUTIVE SUMMARY

36 Trees were evaluated:

- **Off Property Trees:**
  - There are no trees from adjacent properties with canopies reaching over the subject property:

- **Subject Property Trees:**
  - of the 36 trees evaluated on the subject property:
  - **Significance:**
    - 2 trees, **#'s 480 & 490, are less than 6-inches in diameter and are, therefore, *Non-Significant.***
    - The remaining 34 trees were found to be greater than 6 inches in diameter and rated as *Significant*.
  - **Viability:**
    - 3 trees, **#'s 495, 498, & 971 were found to be in poor health, poor structure, or lack wind firmness. They are rated as *Non-Viable*.**
    - 33 trees have the health, structure, and wind firmness to rate *Viable*.
      - The 33 trees total 100 Tree Credits.

- **Tree Retention requirements:**
  - The **City of Kirkland** requires 30 Tree Credits per acre be retained:
    - In this case, the property is approximately 14,154.15 square feet / 43560 * 30 = 9.75 or **a minimum of 10 Tree Credits are required.**
    - It is always my general recommendation to retain as many trees as possible to allow for unforeseen contingencies. However, in this case, large Cottonwood trees can be a challenge with the typical loss of large limbs.

ASSIGNMENT

Jeordy Rostad, of Sound Quality Homes, contracted with Gilles Consulting to evaluate the trees at 90xx 126th Avenue NE, Kirkland, Washington. The property is being considered for development and the City of Kirkland requires an analysis of the trees as part of the permit process. This report provides the analysis. The information in this report can be utilized to create a Tree Plan as required by Chapter 95 of the Kirkland Code.

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 Visual Tree Assessment (VTA) 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 470 through 500 and 971 through 975. The tags are made of shiny aluminum approximately one inch by three inches in size and are attached to the tree with staples and a one foot strip of brightly colored survey tape. The tags were placed as high as possible to minimize their removal and were generally placed on the backsides of the trees as inconspicuously as possible. Please refer to *Attachment 1, Site Plan* for an orientation to the site and the approximate location of the trees.

Missing Trees

There were a few trees inventoried on the site that were not included in the site plan. They were labeled with the next number in the sequence and then their approximate location was indicated on the included site plan. However, these trees may need to be surveyed to determine their exact location in relation to site improvements and their retainability.

OBSERVATIONS

The site is currently an undeveloped site with a dense stand of native hardwood trees--predominately Black Cottonwoods. The ground cover is a combination of naturally occurring native plants and invasive species that have grown. The trees are randomly scattered across the front 10,000 square feet of the property.

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.

Additional Testing
There were no trees that presented signs or symptoms that warranted additional testing. Therefore, no additional testing was done at this time.

DISCUSSION AND CONCLUSIONS

Trees on Adjacent Properties
Due to the spacing of the trees and the growth angles, predominately relating to phototropic growth, there are no trees on adjacent properties with canopies that overhang the subject property.

Trees on the Subject Property
There are 36 trees on the property. Two are less than 6 inches in diameter and are rated as *Non-Significant.* (They are #'s 480 and 490.) There are 3 trees, #'s 495, 498, and 971, that are in poor health, poor structure, or lack wind firmness. They have been rated as *Non-Viable.* The remaining 33 trees are rated *Viable.* They all have the potential to be retained if the development requirements allow.

Minimum Tree Density Calculations
The City of Kirkland's Tree Code now requires that each lot have a minimum density of at least 30 tree credits per acre. The density may consist of existing trees, supplemental trees, or a combination of existing and supplemental trees. The tree credits are calculated, as indicated below, by dividing the size of the individual lot by the square footage in an acre and multiplying by 30: lot area in square feet / 43,560 square feet x 30 (rounded to the nearest whole #) = the number of tree credits required for each lot.

In this case, the property is approximately 14,154.15 square feet:

> 14,154.15 / 43,560 * 30 = 9.75 or **a minimum of 10 tree credits required for the property.**

Please refer to Chapter 95, Tree Management and Required Landscaping, Section 95.35.5 and Table 95.35.1 of the Kirkland Municipal Code to see how tree credits are assigned and for more information. Please be aware that the City can require the retention of additional trees above the minimum. This applies especially trees in excellent or very good condition located in the building set backs.

Tree Protection Measures
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 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.

The minimum Tree Protection Measures in *Attachment 5, Tree Protection Measures* are on three separate sheets that 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.

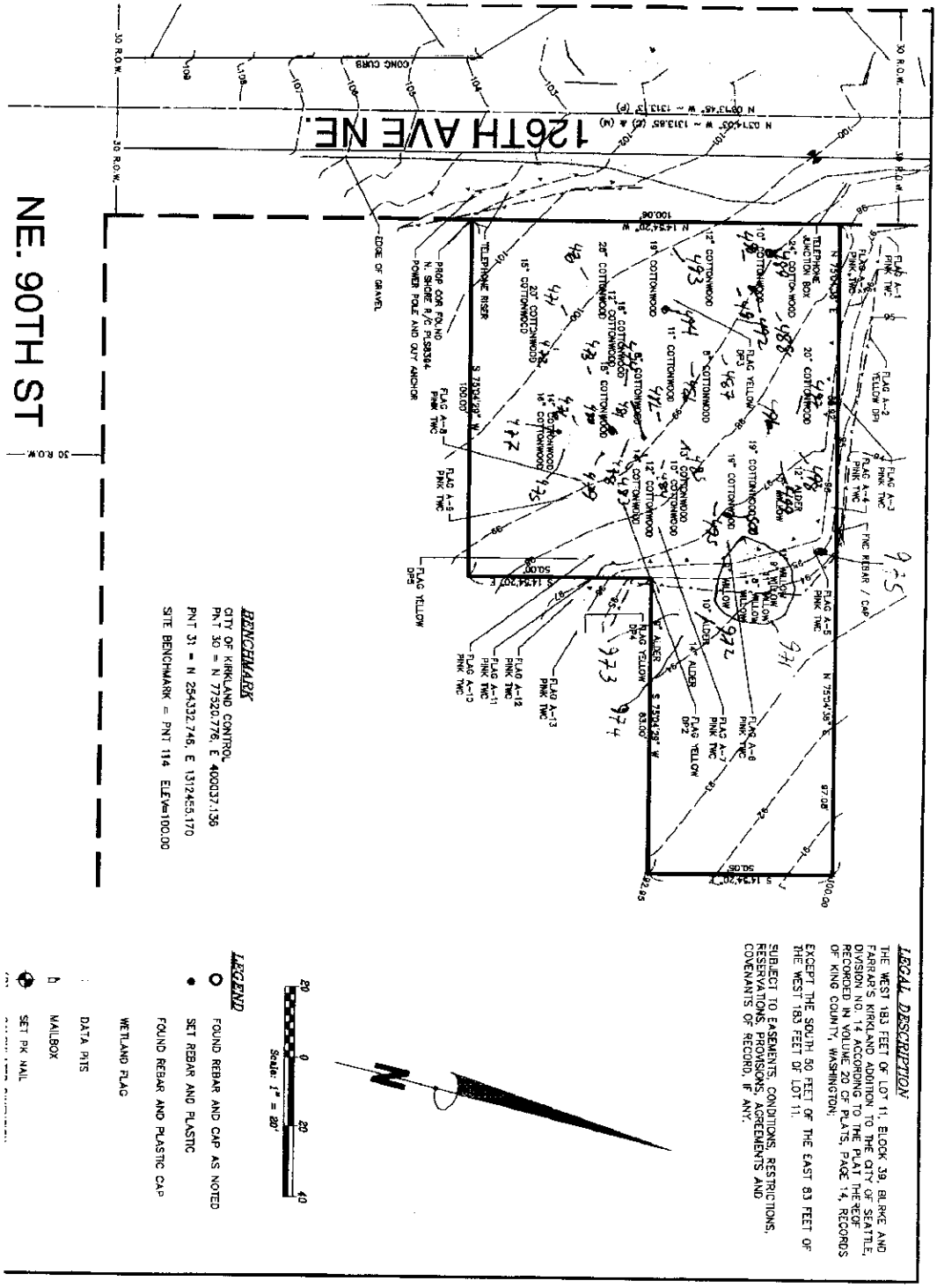
Thank you for calling Gilles Consulting for your arboricultural needs.

Sincerely,

Brian K. Gilles, Consulting Arborist
ISA Certified Arborist # PN-0260
ASCA Registered Consulting Arborist # RCA-418A
PNW-ISA Certified Tree Risk Assessor #148

ATTACHMENTS

ATTACHMENT 1 - SITE PLAN



#1 ***Tree Location:*** General location of tree on site, or whether tree is Off Project property.
#2 ***Tree #:*** Individual tree number.
#3 ***Species:***

BCw/Pt	= Black Cottonwood, *Populus trichocarpa*
BLM/Am	= Big Leaf Maple, *Acer macrophyllum*
RA/Ar	= Red Alder, *Alnus rubra*
PW/Sl	= Pacific Willow, *Salix lasiandra*
SW/Ss	= Scuter's Willow, *Salix scouleriana*

#4 ***DBH:*** Trunk diameter @ 4.5' above average ground level.
#5 ***Tree Credit:*** This is based upon Table 95.35.1, Page 12, Chapter 95 of the Kirkland Municipal Code.
#6 ***Drip Line:*** The radius, the distance from the trunk to the furthest branch tips.
#7 ***Limits of Disturbance:*** The boundary between the area of minimum protection around a tree and the allowable site disturbance as determined by a qualified professional.
#8 ***LCR:*** *Live Crown Ratio* - the amount of live canopy expressed as a % of the entire tree height.
#9 ***Symmetry:*** General shape of canopy and weight distribution of the tree around the trunk.
#10 ***Foliage:*** General description of foliage density that indicates tree health and vigor.
#11 ***Crown Condition:*** The most important external indication of tree health and vigor.
#12 ***Trunk:*** Description of trunk condition or abnormalities if any.
#13 ***Root Collar:*** The base of the tree where the trunk flares into the roots--deformities or problems are noted here.
#14 ***Roots:*** Root problems are noted here.
#15 ***Comments:*** Additional observations about the tree's condition.
#16 ***Significance:*** A "significant" tree is at least 6" in diameter measured at 4.5' above the average ground level.
#17 ***Current Health Rating:*** A description of general health ranging from dead, dying, hazard, poor, suppressed, fair, good, very good, to excellent.
#18 ***Viability:*** A significant tree that is in good health with a low risk of failure due to structural defects, is relatively wind firm if isolated or remains as part of a grove, and is a species that is suitable for its location.
#19 ***Recommendation:*** This is an estimate of whether or not the tree is of sufficient health, vigor, and structure to consider retaining.

1	2	3	4	5	6	7 -- LIMITS OF DISTURBANCE				8	9	10	11	12	13	14	15	16	17	18	19
TREE LOCATION	TREE #	SPECIES	DBH	TREE CREDIT	DRIP LINE	North	South	East	West	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	SIGNIFICANCE	CURRENT HEALTH RATING	VIABILITY	RECOMMENDATION
-	470	BCw/Pt	26.0"	5.0	16'	16'	to prop. line	16'	16'	90%	Gen. sym.	abs/ase	Healthy	Straight	Partially exposed	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	471	BCw/Pt	16.1"	4.0	12'	16'	16'	16'	16'	80%	Min. Asym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	472	BCw/Pt	20.7"	5.0	16'	16'	16'	16'	16'	80%	Min. Asym.	abs/ase	Healthy	fork at base	NAD	-	Trunk diameters are 20.3 & 4.3 inches = single trunk tree of 20.7 inches	Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	473	BCw/Pt	12.7"	2.0	10'	10'	10'	10'	10'	65%	Gen. sym.	abs/ase	Average	Typical	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	474	BCw/Pt	15.3"	3.0	12'	12'	12'	12'	12'	40%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	475	BCw/Pt	17.0"	4.0	12'	16'	to prop. line	16'	16'	60%	Maj. Asym.	abs/ase	Average	leans SE	NAD	Surface		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	476	BCw/Pt	14.3"	3.0	12'	16'	to prop. line	16'	16'	75%	Maj. Asym.	abs/ase	Average	leans South	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	477	BCw/Pt	6.3"	1.0	8'	8'	8'	8'	8'	65%	Maj. Asym.	pbs/pse	Suppressed	leans SE	NAD	-		Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	478	BCw/Pt	27.0"	6.0	14'	14'	14'	14'	14'	65%	Gen. sym.	abs/ase	Healthy	fork at 3' w/included bark to base	Internal structural weakness	-	Trunk diameters are 19.9 and 18.3 inches = single trunk of 27.0 inches	Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	479	BCw/Pt	18.6"	5.0	14'	14'	14'	14'	14'	60%	Gen. sym.	abs/ase	Healthy	bowed NE	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	480	BCw/Pt	5.3"	0.5	5'	5'	5'	5'	5'	40%	Min. Asym.	abs/ase	Weak	leans west	NAD	-		Not Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	481	BCw/Pt	7.5"	1.0	8'	8'	8'	8'	8'	40%	Min. Asym.	abs/ase	Suppressed	leans NW	NAD	-		Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	482	BCw/Pt	15.5"	3.0	12'	12'	12'	12'	12'	50%	Gen. sym.	abs/ese	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	483	BCw/Pt	13.1"	2.0	10'	10'	10'	10'	10'	50%	Maj. Asym.	abs/ase	Healthy	leans NE	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures

1	2	3	4	5	6	7 -- LIMITS OF DISTURBANCE				8	9	10	11	12	13	14	15	16	17	18	19
TREE LOCATION	TREE #	SPECIES	DBH	TREE CREDIT	DRIP LINE	North	South	East	West	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	SIGNIFICANCE	CURRENT HEALTH RATING	VIABILITY	RECOMMENDATION
-	484	BCw/Pt	10.0"	1.0	9'	9'	9'	9'	9'	50%	Maj. Asym.	abs/ase	Average	leans NE	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	485	BCw/Pt	13.5"	2.0	12'	12'	12'	12'	12'	50%	Min. Asym.	abs/ase	Average	Typical	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	486	BCw/Pt	11.4"	1.0	12'	12'	12'	12'	12'	40%	Gen. sym.	abs/ase	Average	Typical	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	487	BCw/Pt	8.1"	1.0	6'	6'	6'	6'	6'	40%	Gen. sym.	abs/ase	Average	Typical	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	488	BCw/Pt	20.6"	6.0	22'	22	22	22	22	85%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	489	BCw/Pt	5.5"	0.0	5'	5	5	5	5	20%	Maj. Asym.	PBS/PSE	Suppressed	leans NW	NAD	-		Not Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	490	BCw/Pt	9.1"	1.0	12'	12	12	12	12	60%	Min. Asym.	abs/ase	Healthy	leans NW	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	491	BCw/Pt	10.9"	1.0	12'	12	12	12	12	70%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	492	BCw/Pt	6.3"	1.0	5'	5	5	5	5	30%	Maj. Asym.	PBS/PSE	Suppressed	leans NW	NAD	-		Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	493	BCw/Pt	19.5"	5.0	16'	16'	16'	to prop. line	16'	70%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree
-	494	BCw/Pt	15.6"	3.0	16'	16'	16'	16'	16'	60%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	495	BCw/Pt	13.8"	0.0	0'	n/a	n/a	n/a	n/a	0%	none	None	Dead	-	-	-	tree blew over in storm	Significant	Dead	Non-viable	Potential to retain with Tree Protection Measures
-	496	BCw/Pt	20.7"	6.0	16'	16'	16'	16'	16'	60%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-	two small branches broken and hanging in canopy	Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	497	BCw/Pt	20.6"	6.0	22'	to prop. line	22'	22'	22'	45%	Min. Asym.	abs/ase	Healthy	leans north	NAD	-		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
-	498	RA/Ar	12.6"	0.0	n/a	n/a	n/a	n/a	n/a	30%	Maj. Asym.	PBS/PSE	Broken Out	fork at 1' w/included bark	NAD	-	Trunk diameters are 11.3 & 5.5 inches = single trunk of 12.6 inches. Dead branches and broken and hanging branches in canopy.	Significant	Dying	Non-viable	Remove
-	499	PW/Sl	7.7"	1.0	12'	12'	12'	12'	12'	25%	Maj. Asym.	PBS/PSE	Weak	leans east	NAD	-	Lots of epicormic growth on the lower trunk.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
-	500	BCw/Pt	19.9"	5.0	16'	16'	16'	16'	16'	65%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	971	SW/Ss	Clump of 10	0.0	14'	14'	14'	14'	14'	20%	Gen. sym.	PBS/PSE	Weak	Center rot	Base rot	-	Dead branches in canopy. Trunk diameters range from 7.0 to 11.6. Rot in multiple trunks extends up 6 to 8 feet and down into the base of the trunks. Advanced Carpenter Ant infestation.	Significant	Poor	Non-viable	Potential to retain with Tree Protection Measures
-	972	PW/Sl	9.8"	1.0	10'	10'	10'	10'	10'	65%	Gen. sym.	abs/ase	Healthy	Typical	NAD	-	base is against 973	Significant	Good	Viable	Potential to retain with Tree Protection Measures

1	2	3	4	5	6	7 -- LIMITS OF DISTURBANCE				8	9	10	11	12	13	14	15	16	17	18	19
TREE LOCATION	TREE #	SPECIES	DBH	TREE CREDIT	DRIP LINE	North	South	East	West	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	SIGNIFICANCE	CURRENT HEALTH RATING	VIABILITY	RECOMMENDATION
-	973	PW/SI	9.3"	10	10'	10'	10'	10'	10'	70%	Min. Asym.	abs/ase	Healthy	Typical	NAD	-	Base is against 972	Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	974	BLM/Am	16.4"	30	18'	18'	18'	18'	18'	60%	Gen. sym.	abs/ase	Healthy	leans east	NAD	-		Significant	Good	Viable	Potential to retain with Tree Protection Measures
-	975	PW/SI	10.5"	10	8'	to prop. line	8'	8'	8'	65%	Maj. Asym.	PBS/PSE	Weak	leans north	NAD	-	Harp tree--northern trunk is horizontal o the ground for 5 feet then turns vertical. Trunk diameters are 6.3 and	Significant	Fair	Viable	Potential to retain with Tree
				100	Total number of Tree Credits currently existing on the site.																

SUMMARY:

36 Trees were evaluated:

- **Off Property Trees:**
  - There are no trees from adjacent properties with canopies reaching over the subject property:
- **Subject Property Trees:**
  - of the 36 trees evaluated on the subject property:
  - **Significance:**
    - 2 trees, #'s 480 & 490, are less than 6-inches in diameter and are, therefore, *Non-Significant*.
    - The remaining 34 trees were found to be greater than 6 inches in diameter and rated as *Significant*.
  - **Viability:**
    - 3 trees, #'s 495, 498, & 971 were found to be in poor health, poor structure or lack wind firmness. They are rated as *Non-Viable*.
    - 33 trees have the health, structure, and wind firmness to rate *Viable*.
      - The 33 trees total 100 Tree Credits.
- **Tree Retention requirements:**
  - The City of Kirkland requires 30 Tree Credits per acre be retained:
    - In this case, the property is approximately 14,154.15 square feet / 43560 * 30 = 9.75 or a minimum of 10 Tree Credits are required.
    - It is always my general recommendation to retained as many trees as possible to allow for unforeseen contingencies. However, in this case, large Cottonwood trees can be a challenge with the typical loss of large

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 LOCATION**--indicates what general area of the site the tree is on, or whether the tree is Off the Project property.
2) **TREE #**—the individual number of each tree.
3) **SPECIES**—this describes the species of each tree with both most readily accepted common name and the officially accepted scientific name.
4) **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.
5) **TREE CREDIT**—Tree Credit based on Trunk Diameter
6) **DRIP LINE**— the radius, the distance from the trunk to the furthest branch tips.
7) **LIMITS OF DISTURBANCE**— the boundary between the area of minimum protection around a tree and the allowable site disturbance as determined by a qualified professional.
8) **% 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.

9) **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.
10) **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.

11) **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

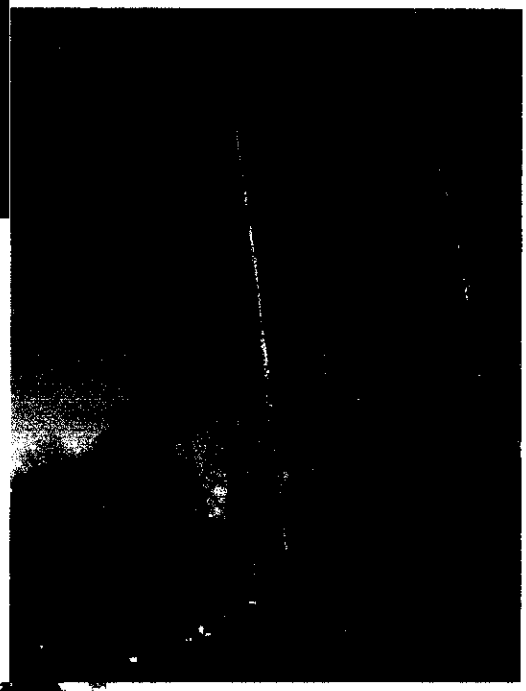
shade of larger trees around them. They generally have thin or sparse needles, weak or missing crowns, are prone to insect attack as well as bacterial and fungal infections.

12) **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.
13) **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.
14) **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.
15) **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.

16) **SIGNIFICANCE**—a "significant" tree is at least 6" in diameter measured at 4.5' above the average ground level.
17) **CURRENT HEALTH RATING**— a description of general health ranging from dead, dying, poor, senescent, suppressed, fair, good, very good, to excellent.
18) **VIABILITY**— a significant tree that is in good health with a low risk of failure due to structural defects, is relatively wind firm if isolated or remains as part of a grove, and is a species that is suitable for its location.
    (1) Please note that many trees may be listed as "Non-Viable" due to poor health, poor structure, or the tree may be below the size threshold for a "Viable Tree." However, it is worth examining the Non-Viable Trees to determine if any or all of them can be left on the property. They can add significant benefit to the landscape and contribute to wildlife habitat.
19) **RECOMMENDATION**—this is an estimate of whether or not the tree is of sufficient health, vigor, and structure to consider retaining.

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 - PHOTOS



Views from 126th Avenue NE looking east, north east, and east--taken 1-24-08

ATTACHMENT 5 - TREE PROTECTION MEASURES

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.

The following minimum Tree Protection Measures 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.

TREE PROTECTION MEASURES:

1. Tree Protection Fences will need to be placed around each tree or group of trees to be retained.
    a. Tree Protection Fences are to be placed according to the attached drawing and as noted in the attached Tree Inventory/Conditions Spreadsheet, Column 6 - Limits of Disturbance.
    b. Tree Protection Fences must be inspected prior to the beginning of any construction work/activities.
    c. Nothing must be parked or stored within the Tree Protection Fences—no equipment, vehicles, soil, debris, or construction supplies of any sorts.

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

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

TREE PROTECTION AREA, ENTRANCE PROHIBITED
To report violations contact
City Code Enforcement
at 425-587-3225

4. 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.

5. When excavation occurs near trees that are scheduled for retention, the following procedure must be followed to protect the long term survivability of the tree:
    a. An International Society of Arboriculture, (ISA) Certified Arborist must be working with all equipment operators.
        i. 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).
    b. The hoe must be placed to "comb" the material directly away from the trunk as opposed to cutting across the roots.
        i. Combing is the gradual excavation of the ground cover plants and soil in depths that only extend as deep as the tines of the hoe.
    c. 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.

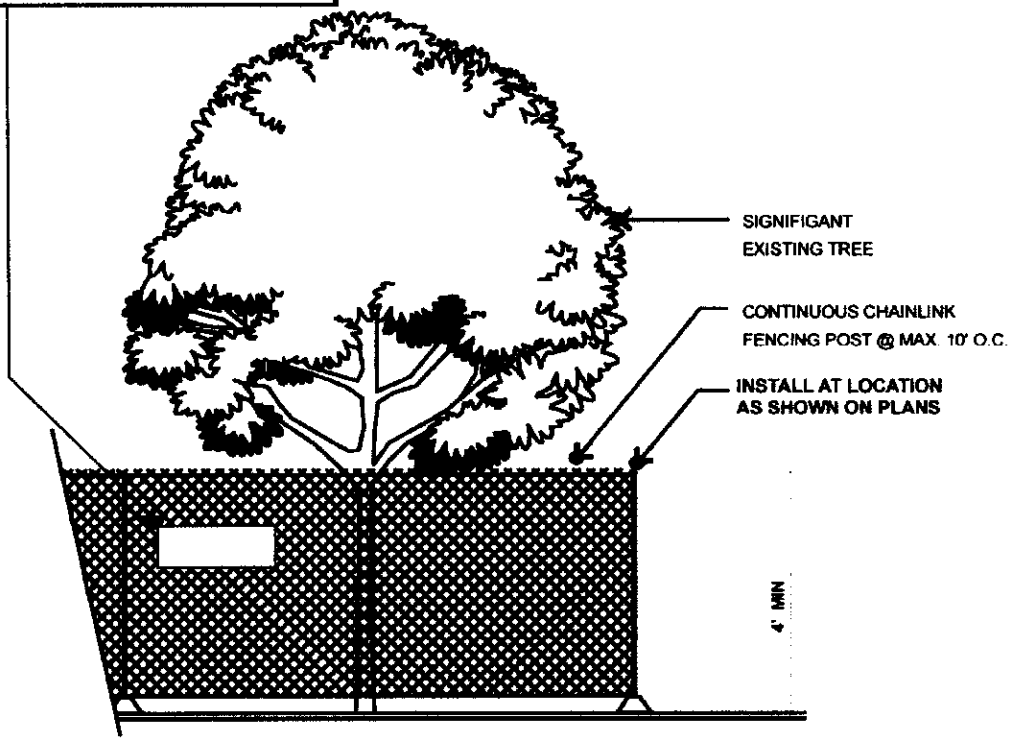
d. The Certified Arborist should then excavate around the tree root by hand/shovel and cleanly cut the tree root.
    i. The Certified Arborist should then instruct the equipment operator to continue.

6. Putting Utilities Under the Root Zone:
    a. 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.
    b. 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.
    c. 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.

7. Watering:
    a. The trees will require significant watering throughout the summer and early fall in order to survive long-term. An easy and economical watering can be done using soaker hoses placed three feet from the trunk of the tree and spiraled around the tree. One 75-foot soaker hose per tree is adequate. It is best to place the soakers using landscape staples, (available from HD Fowler in Bellevue for pennies apiece) then cover the area with two to three inches composed materials. The composted material will act as a mulch to minimize evaporation and will also stimulate the microbial activity of the soil which is another benefit to the health of the tree.
    b. Water the tree to a depth of 18 to 20 inches. I recommended leaving the water on the soaker hoses for six to eight hours and then digging down to determine how deep your water is penetrating. Then adjust accordingly. It may take a good two days of watering to reach the proper depth.
    c. Once the water reaches the proper depth, turn off the hoses for four weeks and then water again. Water more often when temperatures increase—every three weeks when temperatures exceed 80 degrees and every two weeks when temperatures exceed 90 degrees. This drying out of the soil in between watering is important to prevent soil pathogens from attacking the trees.

FENCING SIGN DETAIL

Tree Protection Area, Entrance Prohibited
To report violations contact
City Code Enforcement
at (425)587-3225



1. MINIMUM FOUR (4) FOOT HIGH TEMPORARY CHAINLINK FENCE SHALL BE PLACED AT THE CRITICAL ROOT ZONE OR DESIGNATED LIMIT OF DISTURBANCE OF THE TREE TO BE SAVED. FENCE SHALL COMPLETELY ENCIRCLE TREE (S). INSTALL FENCE POSTS USING PIER BLOCK ONLY. AVOID POST OR STAKES INTO MAJOR ROOTS. MODIFICATIONS TO FENCING MATERIAL AND LOCATION MUST BE APPROVED BY PLANNING OFFICIAL.

2. TREATMENT OF ROOTS EXPOSED DURING CONSTRUCTION: FOR ROOTS OVER ONE (1) INCH DIAMETER DAMAGED DURING CONSTRUCTION, MAKE A CLEAN STRAIGHT CUT TO REMOVE DAMAGED PORTION OF ROOT. ALL EXPOSED ROOTS SHALL BE TEMPORARILY COVERED WITH DAMP BURLAP TO PREVENT DRYING, AND COVERED WITH SOIL AS SOON AS POSSIBLE.

3. NO STOCKPILING OF MATERIALS, VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIMIT OF THE FENCING. FENCING SHALL NOT BE MOVED OR REMOVED UNLESS APPROVED BY THE CITY PLANNING OFFICIAL. WORK WITHIN PROTECTION FENCE SHALL BE DONE MANUALLY UNDER THE SUPERVISION OF THE ON-SITE ARBORIST AND WITH PRIOR APPROVAL BY THE CITY PLANNING OFFICIAL.

4. FENCING SIGNAGE AS DETAILED ABOVE MUST BE POSTED EVERY FIFTEEN (15) FEET ALONG THE FENCE.

TREE PROTECTION FENCING DETAIL

ATTACHMENT 6 - ABOUT BLACK COTTONWOOD TREES

Black Cottonwood trees are one of the trees known as "primary cultivators" by forest ecologists. These trees fill the ecological niche of colonizing an area after disturbance such as forest fire, logging, or construction. The Black Cottonwood's natural history is to grow fast and large, reproduce profusely; then to die rapidly. They have a short lifespan compared to other trees—sixty to eighty years is considered an average lifespan for Black Cottonwood trees.

Also, because so much energy is placed into rapid growth and reproduction, these trees tend to be more brittle and have inadequate immune response systems. This results in Black Cottonwood trees being prone to failure in adverse weather conditions, being susceptible to several kinds of root disease, and even losing large limbs on hot summer days when little or no wind is present. Once disturbed, Black Cottonwood trees are highly susceptible to root disease and insect infestations. It is common for Black Cottonwood trees to rapidly become hazards after construction activity.

It may be worth considering replacing the Cottonwood trees on the site with more desirable species that are adapted to the wet soils such as Swamp Gum (Black Tupelo), *Nyssa sylvatica* or Dawn Redwood, *Metasequoia glyptostroboides.*