

Gilles Consulting

— Brian K. Gilles —

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Evaluation of Trees AT

1932 Market Street
Kirkland, WA

August 26, 2015

PREPARED FOR:

Highland Builders/BDR Construction
Greg Heiser
7683 SE 27th Street
353
Mercer Island, WA 98040

PREPARED BY:

GILLES CONSULTING

Brian K. Gilles, Consulting Arborist

ISA Certified Arborist # PN-0260A

ASCA Registered Consulting Arborist # RCA-418

ISA TRAQ Qualified

ISA TRAQ Certified Instructor



fax: 425-822-6314

email: bkgilles@comcast.net

P.O. Box 2366 Kirkland, WA 98083

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EXECUTIVE SUMMARY

A total of 19 trees were shown on the survey. Two trees, numbers 937 and 940 are no longer present. The remaining trees can be summarized as follows:

PROPERTY SUMMARY		
# of Trees	Property	% of Total
7	Off Property	41.2%
0	Right-of-Way	0.0%
10	Subject Property	58.8%
17	Total # of Trees	100.0%

SIGNIFICANCE SUMMARY		
# of Trees	Status	% of Total
2	Non-Significant	11.8%
15	Significant	88.2%
17	Total # of Trees	100.0%

VIABILITY SUMMARY		
# of Trees	Viability	% of Total
4	Non-Viable	23.5%
13	Viable	76.5%
17	Total # of Trees	100.0%

RECOMMENDATION SUMMARY		
# of Trees	Recommendation	% of Total
4	Remove for Safety	23.5%
13	Potential to Retain w/ Tree Protection Measures	76.5%
17	Total # of Trees	100.0%

ASSIGNMENT

Greg Heiser, of the Highland Builders Group, contracted with Gilles Consulting to evaluate the trees at 1932 Market Street in Kirkland, Washington. The property is being re-developed and the City of Kirkland requires an extensive 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 30+ 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 Assessment (VA) 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.

Tree Tags

The trees were tagged and numbered 936 through 954. 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 that were not included on the survey. They were labeled with the next number in the sequence and then their approximate location was indicated on the included site plan. These trees may need to be surveyed to determine their exact location in relation to the proposed site improvements and their retainability.

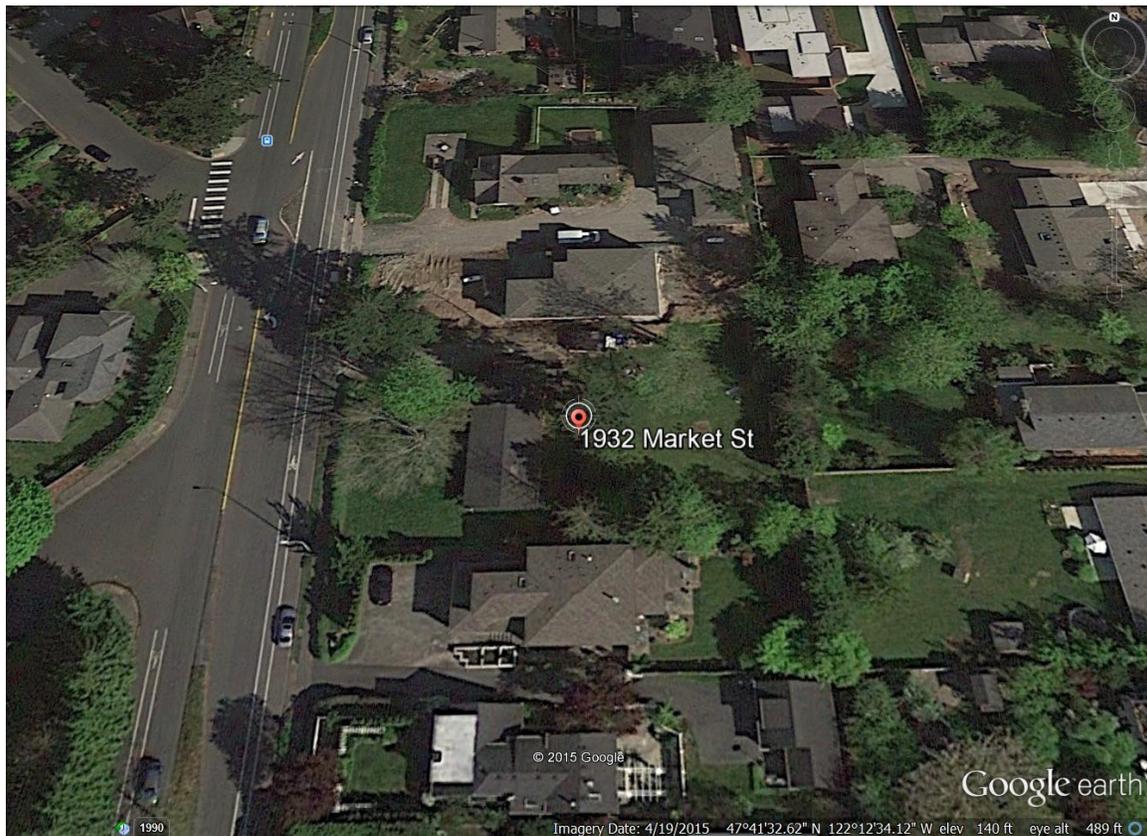
OBSERVATIONS

The subject property is located in the Market Neighborhood of west Kirkland right on Market Street. The property is currently improved with a wood structure single-family home, driveway, walkways, patio, planter beds, and lawns. The property has a gentle slope up from the sidewalk at the northwest property corner to the southeast property corner of approximately 22 feet. The existing trees are scattered randomly about the property.

In an effort to present the information and conclusions for each tree in a manner that is clear and easy to understand, as well as to save paper, I have included a detailed spreadsheet, Attachment 2, Tree Inventory/Condition Spreadsheet. All the same

information from the ISA Tree Hazard Form is included in this spreadsheet and the attached glossary. The descriptions on the spreadsheet were left brief in order to include as much pertinent information as possible and to make the report manageable. The attached glossary provides a detailed description of the terms used in the spreadsheet and in this report. It 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.

Photo # 1: A Google Earth image of the subject property and surrounding neighborhood dated 4/19/15.



DISCUSSION AND CONCLUSIONS

The project is to remove the existing improvements, short plat the property into two lots, and build two new homes.

Right-of-Way Trees

There are no right-of-way trees impacted by this project.

Trees on Adjacent Properties

There are seven trees on adjacent properties with canopies that extend over the subject property.

- Trees # 946 and 947 are just east of the east property line.
 - Their canopies overhang the subject property by two to three feet.
 - They can be adequately protected by the minimum “limits of disturbance” fencing on the yard setback.

Photo # 2: Looking north east at the back yard. Trees # 946 & 947 on the adjacent property are located here. These two trees can be adequately protected with a fence 5 feet west of the east property line.



- Trees 950 through 954 are a row of 5 Douglas Fir trees north of the north property line near the northwest property corner.
 - Their bases are very close to the property line.
 - Their canopies overhang the subject property for a significant portion of their driplines.
 - The critical root zones have been impacted by the re-development of the adjacent property at 1936 Market Street.
 - The trees have adapted well to the gravel drive over their critical roots on the south side—that is the driveway for the subject property.
 - They can be adequately protected with a tree protection fence at the edge of the existing gravel driveway.

Photo # 3: Looking from the sidewalk northeast at the row of Douglas Fir trees on the adjacent property to the north. The trees appear to have adapted well to the existing driveway on the subject property. The redevelopment of the adjacent property, specifically the construction of a new house north of the row of trees may have negative consequences for the row of trees.



Trees on the Subject Property

There are 10 trees on the subject property now.

- Viability:
 - Four of the 10 are in Poor Condition. They are *Non-Viable*.
 - They are trees # 936, 938, 942, & 948.
 - They should be removed for safety.
 - The remaining 6 trees are *Viable* with Current Health Ratings of Fair, Good, Very Good, or Excellent.
 - They all have the potential to be retained if design, construction methodologies, topography, and permit requirements allow.
- Significance:
 - There are two trees that are *Non-Significant*, that is; they are less than 6.0 inches in diameter measured at the standard 4.5 feet above the average ground level.
 - Tree # 939 is a Fruiting Cherry that is in Good Condition.
 - However, given its location, near the center of the back yard, I doubt it can be retained.

- Tree # 945 is an Italian Plum that is in Fair Condition.
 - Given its location, near the southeast property corner, it has the potential to be retained.

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 lot is 100 feet wide by 180.06 feet long. So the calculation is as follows:

$$18,006 / 43,560 \times 30 = 12.4 \text{ or } 12 \text{ minimum tree credits}$$

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 setbacks or trees in a grove—even a grove that extend across property lines.

The information from this report will need to be transferred to a *Tree Plan* as required in Kirkland Code section *95.35.2.B Tree Plan Requirements*.

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 4, 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-0260A
ASCA Registered Consulting Arborist # RCA-418
ISA TRAQ Qualified
ISA TRAQ Certified Instructor



ATTACHMENTS

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ATTACHMENT 2 - TREE INVENTORY/CONDITIONS SPREADSHEET

ABBREVIATED LEGEND--SEE GLOSSARY IN REPORT ATTACHMENTS FOR GREATER DETAIL	
#1 Property: Where the tree is: on or off the Subject Property, or a Right-of-Way tree.	#8 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.
#2 Tree Location: Relative placement of the tree on the Subject Property.	#9 LCR: Live Crown Ratio - the amount of live canopy expressed as a % of the entire tree height
#3 Tree #: The unique tag number of each tree.	#10 Symmetry: General shape of canopy and weight distribution of the tree around the trunk.
#4 Species:	#11 Foliage: General description of foliage density that indicates tree health and vigor.
BLW/Am <i>Big Leaf Maple, Acer macrophyllum</i>	#12 Crown Condition: The most important external indication of tree health and vigor.
CBS/Pp <i>Colorado Blue Spruce, Picea pungens</i>	#13 Trunk: Description of trunk condition or abnormalities if any.
DF/Pm <i>Douglas Fir, Pseudotsuga menziesii</i>	#14 Root Collar: The base of the tree where the trunk flares into the roots--defects are noted here.
FrCh/Psp <i>Fruiting Cherry, Prunus sp.</i>	#15 Roots: Root problems are noted here.
IP/Psp <i>Italian Plum, Prunus sp.</i>	#16 Comments: Additional observations about the tree's condition.
OAV/Fl <i>Oregon Ash, Fraxinus latifolia</i>	#17 Significance: A "Significant" tree is at least 6" in diameter measured at DBH.
SM/As <i>Silver Maple, Acer saccharinum</i>	#18 Current Health Rating: A ranging from dead, dying, poor, fair, good, very good, to excellent.
WRC/Tp <i>Western Red Cedar, Thuja plicata</i>	#19 Viability: A significant tree 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
#5 DBH: Trunk diameter @ 4.5' above average ground level.	#20 Recommendation: Whether or not the tree is of sufficient health, vigor, and structure to consider retaining.
#6 Tree Credit: This is based upon Table 95.35.1, P 12, Chapter 95 of the KMC.	
#7 Drip Line: The radius, the distance from the trunk to the furthest branch tips.	

Trees highlighted in red in are **Non-Viable trees.**

1	2	3	4	5	6	7	8 -- LIMITS OF DISTURBANCE				9	10	11	12	13	14	15	16	17	18	19	20
PROPERTY	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
Subject property	Front yard	936	SM/As	39.0"	0 0	30	NA	NA	NA	NA	90 %	Maj. Asym	Sparse	Weak	Forked at 3.5'	Base rot	Rot, surface	Trunk diameters are 21.9, 17.3 and 27.2 inches which equals a single trunk of 39.0 inches. There is mower damage and decay in the surface roots. Fungal fruiting bodies, rot pockets in branch collar wounds and dead branches in the canopy.	Significant	Poor	Non-viable	Remove for safety
Subject property	Front yard	937	Tree No longer present																			
Subject property	Front yard	938	CBS/Pp	7.5"	0 0	12	NA	NA	NA	NA	40 %	Min. Asym	Sparse	Weak	Straight	NAD	Restricted	Growing in the corner at the steps and retaining wall. Bark beetle infestation.	Significant	Poor	Non-viable	Remove for safety

1	2	3	4	5	6	7	8 -- LIMITS OF DISTURBANCE				9	10	11	12	13	14	15	16	17	18	19	20
PROPERTY	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
Subject property	Back yard	939	FrCh/Psp	5.4"	0.5	13'	13'	13'	13'	13'	65%	Min. Asym.	Average	Average	Serpentine	Bowed	NAD		Not Significant	Good	Viable	Potential to retain with Tree Protection Measures
Subject property	Back yard	940				Tree No longer present																
Subject property	Back yard	941	OA/Fl	10.6"	1.0	20'	20'	20'	20'	20'	85%	Gen. sym.	Average	Healthy	Serpentine	NAD	Restricted	The new house is approximately 12 feet to the south. Some foliar blight. English ivy up 36 feet.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
Subject property	Back yard	942	BLM/Am	30.9"	0.0	26'	26'	26'	26'	26'	90%	Maj. Asym.	Average	Average	Forked at 21'. Center rot	Base rot	Probable root rot	Trunk diameters are 24.3 and 19.1 inches which equal a single trunk of 30.9 inches. Hypoxylon. Rot pockets in branch collar wounds. Dead branches in canopy.	Significant	Poor	Non-viable	Remove for safety
Subject property	Back yard	943	WRC/Tp	30.6"	1.1	24'	24'	24'	24'	To west property line fence	99%	Gen. sym.	Dense	Healthy	Straight	NAD	NAD	Tag is tied to a twig on the south side at approximately 6 feet high.	Significant	Excellent	Viable	Potential to retain with Tree Protection Measures
Subject property	Back yard	944	IP/Psp	8.5"	1.0	16'	16'	To south property line fence	To east property line fence	16'	55%	Gen. sym.	Dense	Healthy	Forked at base, serpentine	NAD	NAD	Trunk diameters are 7.2 and 4.5 inches which equal a single trunk of 8.5 inches.	Significant	Good	Viable	Potential to retain with Tree Protection Measures
Subject property	Back yard	945	IP/Psp	5.7"	0.5	12'	12'	To south property line fence	To east property line fence	12'	40%	Maj. Asym.	Dense	Average	Serpentine	NAD	NAD		Not Significant	Fair	Viable	Potential to retain with Tree Protection Measures

1	2	3	4	5	6	7	8 -- LIMITS OF DISTURBANCE				9	10	11	12	13	14	15	16	17	18	19	20
PROPERTY	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
Off property	East of property	946	DF/Pm	12.2"	0.0	14'	14'	14'	14'	14'	75%	Gen. sym.	Dense	Average	Serpentine	NAD	NAD		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
Off property	East of property	947	DF/Pm	8.8"	0.0	12'	12'	12'	12'	12'	75%	Gen. sym.	Dense	Healthy	Serpentine	NAD	NAD		Significant	Very good	Viable	Potential to retain with Tree Protection Measures
Subject property	Back yard	948	BLM/Am	10.7"	0.0	14'	NA	NA	NA	NA	25%	Maj. Asym.	Thin	Weak	Center rot	Base rot	Probable root rot	Rot pockets in branch collar wounds. Hypoxylon.	Significant	Dying	Non-viable	Remove for safety
Subject property	Back yard	949	BLM/Am	11.8"	1.0	16'	To the north property line	16'	To east property line fence	16'	60%	Maj. Asym.	Average	Average	Kinked at 5', leans north east	Exposed	NAD		Significant	Fair	Viable	Potential to retain with Tree Protection Measures
Off property	North of property	950	DF/Pm	13.4"	0.0	8'	To the north property line	To the gravel driveway	8'	8'	35%	Maj. Asym.	Average	Broken Out	Straight	NAD	NAD	The base is approximately 2-4 feet north of the north property line fence. The tag is tied to the north property line chain link fence. Tree is also tagged 25.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
Off property	North of property	951	DF/Pm	13.5"	0.0	12'	To the north property line	To the gravel driveway	12'	12'	65%	Maj. Asym.	Average	Broken Out	Slight lean north	Exposed	NAD	The base is approximately 2-4 feet north of the north property line fence. The tag is tied to the north property line chain link fence. Tree is also tagged 26.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures

1	2	3	4	5	6	7	8 -- LIMITS OF DISTURBANCE				9	10	11	12	13	14	15	16	17	18	19	20
PROPERTY	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
Off property	North of property	952	DF/Pm	17.3"	0.0	16'	To the north property line	To the gravel driveway	16'	16'	70%	Min. Asym.	Average	Average	Slight bow	Exposed	NAD	The base is approximately 2-4 feet north of the north property line fence. The tag is tied to the north property line chain link fence. Tree is also tagged 27.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
Off property	North of property	953	DF/Pm	15.3"	0.0	12'	To the north property line	To the gravel driveway	12'	12'	60%	Maj. Asym.	Average	Average	Straight	NAD	NAD	The base is approximately 2-4 feet north of the north property line fence. The tag is tied to the north property line chain link fence. Tree is also tagged 28.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
Off property	North of property	954	DF/Pm	26.1"	0.0	20'	To the north property line	To the gravel driveway	20'	To road shoulder	85%	Maj. Asym.	Dense	Healthy	Forked at 26'	NAD	Surface	The base is approximately 2-4 feet north of the north property line fence. The tag is tied to the north property line chain link fence. Tree is also tagged 29.	Significant	Fair	Viable	Potential to retain with Tree Protection Measures
					15.0	Total tree credits on the property at this time.																

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 in a spreadsheet format. This spreadsheet was developed by Gilles Consulting based upon the *Tree Risk Assessment in Urban Areas and the Urban/Rural Interface* course manual and the *Tree Risk Assessment Form*, both sponsored by the Pacific Northwest Chapter of the International Society of Arboriculture, and the *Hazard Tree Evaluation Form* from the book, *The Evaluation of Hazard Trees in Urban Areas*, by Matheny 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 avoid boring the reader with infinite levels of detail. However, a review of these terms and descriptions will allow the reader to rapidly move through the report and understand the information.

- 1) **PROPERTY**—Whether the tree is on or off the Subject Property, or a Right-of-Way tree.
- 2) **TREE LOCATION**—Relative placement of the tree.
- 3) **TREE #**—the unique tag number of each tree.
- 4) **SPECIES**—this describes the species of each tree with both most readily accepted common name and the officially accepted scientific name.
- 5) **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, e.g. '28.4" at 36"'.
 - (1) Every effort is made to distinguish between a single tree with multiple stems and several trees growing close together at the bases.
 - 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.
- 6) **TREE CREDIT**—Tree Credit based on Trunk Diameter
- 7) **DRIP LINE**— the radius, the distance from the trunk to the furthest branch tips.
- 8) **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. Distances from the center of the trunk were derived on a case by case basis looking at the unique circumstances of each property and each tree on that property.

- 9) **% 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.
- 10) **SYMMETRY**—is the description of the form of the canopy, i.e., the balance or overall shape of the canopy and crown. This is the place I list any major defects in the canopy shape, e.g. 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, or root defects.
- 11) **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 deciduous 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.
- 12) **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, and are prone to insect attack as well as bacterial and fungal infections.

- 13) **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.
- 14) **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, or fungal or bacterial infection are noted. **NAD** stands for **No Apparent Defects**.
- 15) **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.

- 16) **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.
- 17) **SIGNIFICANCE**—a “significant” tree is at least 6” in diameter measured at 4.5’ above the average ground level.
- 18) **CURRENT HEALTH RATING**— a description of general health ranging from dead, dying, poor, senescent, suppressed, fair, good, very good, to excellent.
- 19) **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.
- 20) **RECOMMENDATION**— this is an estimate of whether or not the tree is of sufficient health, vigor, and structure that it is worth retaining. Specific recommendations for each tree are included in this column. They may include anything from pruning dead wood, mulching, aerating, injecting tree-based fertilizer into the root system, shortening into a habitat tree or wildlife snag, or to completely removing the tree.
- i) **Monitor:** “Monitor” is a specific recommendation that the tree be re-evaluated on a routine basis to determine if there are any significant changes in health or structural stability. “Monitor annually” (or bi-annually, tri-annually, etc.)” means the tree should be looked at once every year (or every 2 or 3 years, etc.) This yearly monitoring can be a quick look at the trees to see if there are any significant changes. Significant changes such as storm damage, loss of crown, partial failure of one or more roots, etc. require that a full evaluation be done of the tree at that time.
- ii) **Potential to retain with tree protection measures:** means that the tree appears to have the internal resources, the health and vigor, structural stability, and the wind firmness to be able to withstand the stresses of construction if development requirements and construction requirements allow.
- iii) **Habitat or Remove:** means that the tree has a high potential to fail and cause either personal injury or property damage—in other words the tree has been declared a hazard tree and should be dealt with prior to the next large storm. If it is at all possible the recommendation is to leave some of the trunk standing for wildlife habitat and some of the trunk on the ground as a nurse log. The height of the standing habitat tree depends upon the size of the tree, the condition of the tree, and the distance to a probable target. It should be short enough so that when it does fail years in the future it will not cause personal injury or property damage. Nurse logs can be laid horizontally across the slope to aid with erosion control and to provide microenvironments for

new plantings. The nurse logs meaning to be steak to prevent their movement and potential harm to people. If for some reason this is not possible that should be removed for safety.

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, i.e., “early necrosis” versus “advanced necrosis” for instance. Another example is “center rot” or “base rot”. In a Western Red Cedar tree, the presence of low or even moderate rot is not significant and does not diminish the strength of the tree. However, low levels of rot in the base of a Douglas Fir tree, in an area known to have virulent pathogens present, is highly significant and predisposes that tree to windthrow.

ATTACHMENT 4 - 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.

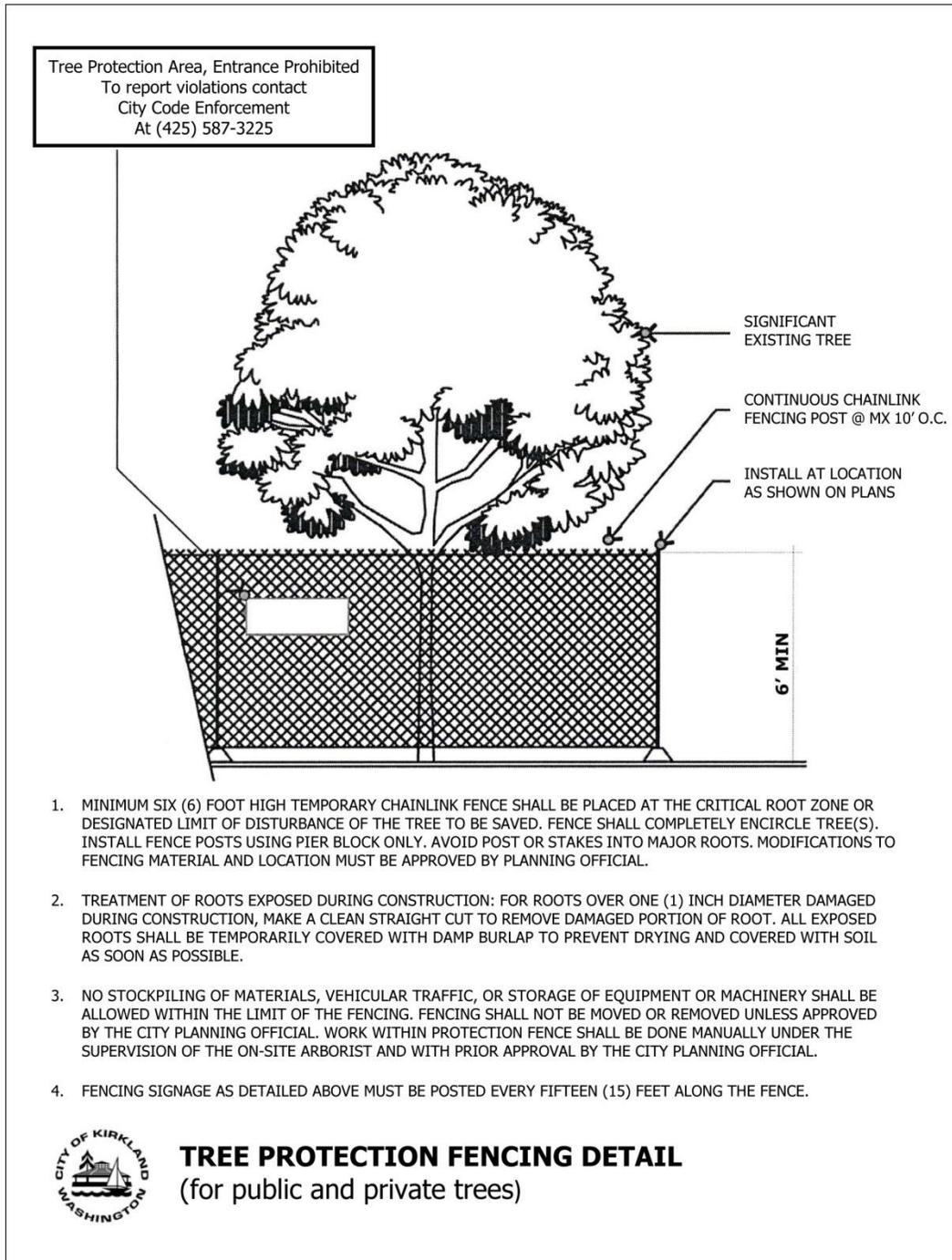
- i. The Certified Arborist should then instruct the equipment operator to continue.

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 composted 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.



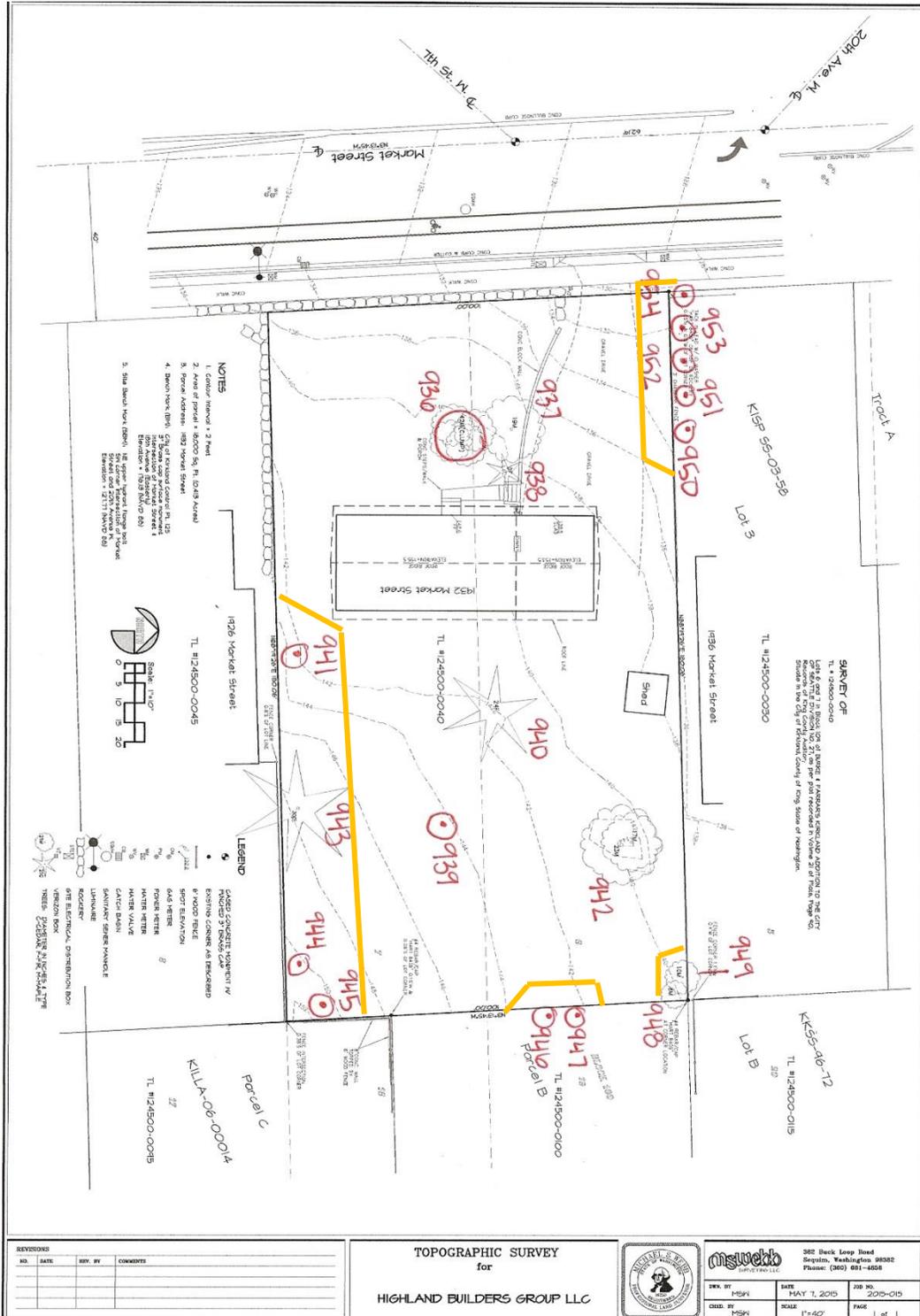
TREE PROTECTION AREA

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To report violations contact

City Code Enforcement

At (425) 587-3225

— = Tree Protection Fence Locations if these trees are retained.



ATTACHMENT 5 - REFERENCES

1. Dirr, Michael A. *Manual of Woody Landscape Plants, Their Identification, Ornamental Characteristics, Culture, Propagation, and Uses*. Champaign: Stipes Publishing Company, 1990.
2. Eric Allen, et al. *Common Tree Diseases of British Columbia*. Victoria: Canadian Forest Service, 1996.
3. Harris, Richard W. et al. *Arboriculture, Integrated Management of Landscape Trees, Shrubs, and Vines*. 4th ed. Upper Saddle River: Prentice Hall, 2004.
4. Matheny, Nelda P. and Clark, James R. *Evaluation of Hazard Trees*. 2nd ed. Savoy: The International Society of Arboriculture Press, 1994.
5. Matheny, Nelda P. and Clark, James R. *Trees & Development, A Technical Guide to Preservation of Trees During Land Development*. Savoy: The International Society of Arboriculture Press, 1998.
6. Mathews, Daniel. *Cascade -- Olympic Natural History*. Portland, Oregon: Raven Editions with the Portland Audubon Society, 1992.
7. Mattheck, Claus and Breloer, Helge. *The Body Language of Trees, A Handbook for Failure Analysis*. London: HMSO, 1994.
8. Pacific Northwest Chapter-ISA. *Tree Risk Assessment in Urban Areas and the Urban/Rural Interface*. Course Manual. Release 1.5. PNW-ISA: Silverton, Oregon, 2011.
9. Sinclair, Wayne A., Lyon, Howard H., and Johnson, Warren T. *Diseases of Trees and Shrubs*. Ithaca, New York: Cornell University Press, 1987.
10. Watson, Gary W., and Neely, Dan, eds. *Trees & Building Sites*. Savoy: The International Society of Arboriculture Press, 1995.

Gilles Consulting

— Brian K. Gilles —

4 2 5 - 8 2 2 - 4 9 9 4

September 2, 2015

Highland Builders/BDR Construction

Attn: Greg Heiser

7683 SE 27th Street

353

Mercer Island, WA 98040

Subject: Review of Proposed Tree Protection Fencing at 1932 Market Street, Kirkland, WA

Dear Mr. Heiser:

As you requested, I have reviewed the proposed *Tree Protection Fencing* diagram/site plan that you sent to me on Friday, August 28, 2015. You requested that I review the placement of the fencing to determine whether or not it meets the requirements of the Kirkland Code and will in fact the location of the fencing likely result in the preservation of the trees. (Please refer to *Attachment 1, Tree Protection Fencing Plan* for an orientation to the site and the location of the fences in relation to the trees.)

After reviewing the Fencing Plan, it is my judgment that the plan does in fact meet the needs of the Code and will support long-term tree survival.

It should be noted that there are a few encroachments into the driplines of the trees but I judge them to be negligible and manageable. They are:

- The dripline of tree # 941 is 20 feet.
 - The *Tree Protection Fence* as shown will slightly encroach into the dripline for the southeast corner of the patio. This will be an encroachment of approximately 3 to 5 feet totaling less than a 5% dripline encroachment.
 - The tree will easily tolerate this encroachment as long as the excavation techniques outlined in the main tree report are followed.
 - I have included those *Tree Protection Measures* below as *Attachment 2* for convenience.
- The dripline of tree # 944 is 16 feet.
 - The *Tree Protection Fence* as shown will slightly encroach into the dripline for the southeast corner of the patio. This will be an encroachment of approximately 4 feet along the north side of the dripline totaling approximately 10% of the dripline.



fax: 425-822-6314

email: bkgilles@comcast.net

P.O. Box 2366 Kirkland, WA 98083

- The tree will easily tolerate this encroachment as long as the excavation techniques outlined in the main tree report are followed.
- I have included those *Tree Protection Measures* below as *Attachment 2* for convenience.
- The driplines of trees 950 – 954 range from 8 to 20 feet.
 - The *Tree Protection Fence* as shown will significantly encroach into the driplines of this row of Douglas Fir trees for the construction of the driveway. This will be an encroachment of approximately 0 to 10 feet.
 - Given that the trees have adapted to the existing driveway in the same place, I judge that the trees will easily tolerate this encroachment as long as the excavation techniques outlined in the main tree report are followed.
 - I have included those *Tree Protection Measures* below as *Attachment 2* for convenience.

SUMMARY STATEMENT: *After reviewing the proposed Fencing Plan, it is my judgment that the plan is consistent with the information in my tree report and is consistent with the meetings we had on site to discuss the conflicting demands required to build. It is my judgment that this proposed Tree Protection Fence Plan does in fact meet the needs of the Code and will support long-term tree survival.*

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

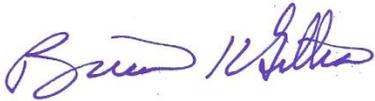
conditions. If there is a homeowners association, it is the responsibility of the property owner to comply with all Codes, Covenants, and Restrictions (CC&R's) that apply to tree pruning and tree removal.

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. 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.

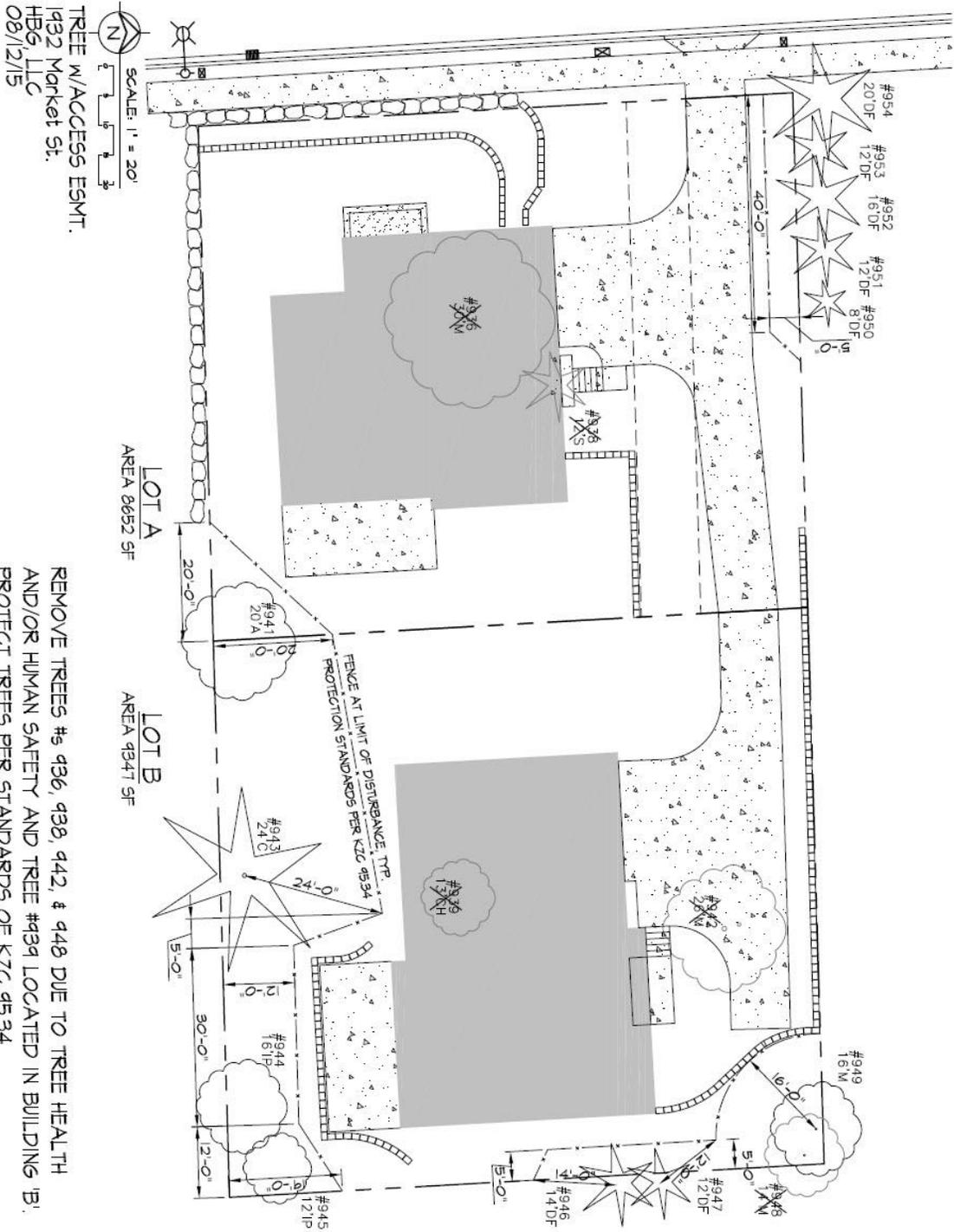
Sincerely,



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



ATTACHMENT 1, PROPOSED TREE PROTECTION FENCE EXHIBIT



REMOVE TREES #936, 938, 942, & 948 DUE TO TREE HEALTH AND/OR HUMAN SAFETY AND TREE #934 LOCATED IN BUILDING 'B'. PROTECT TREES PER STANDARDS OF KZC 95.34

TREE W/ACCESS ESMT.
 1932 Market St.
 HBG, LLC
 08/12/15

ATTACHMENT 1 - TREE PROTECTION MEASURES

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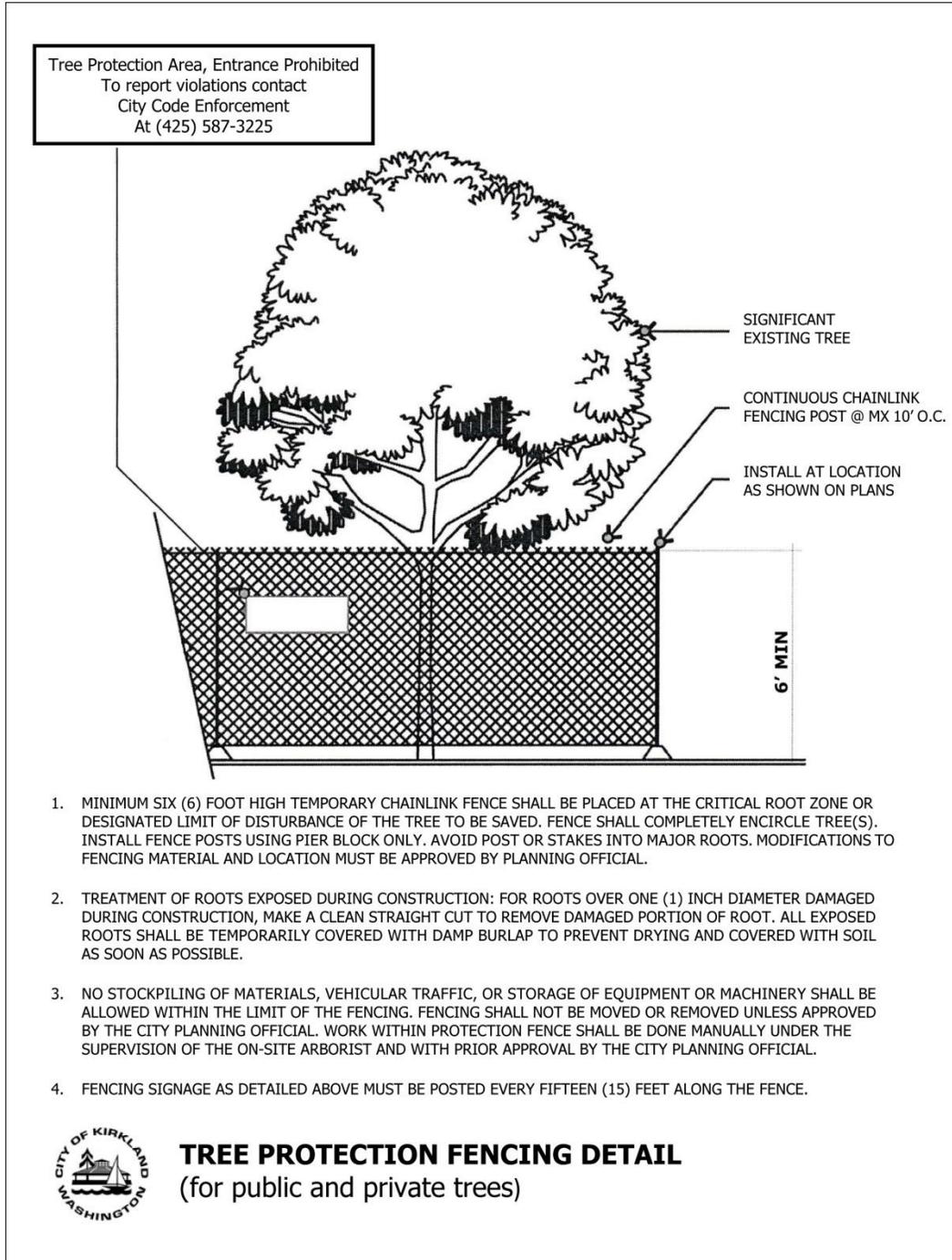
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