



Greenforest Incorporated



Consulting Arborist

TO: Ryan Yuan
3611 W Mercer Way
Mercer Island WA 98040

REFERENCE: *Arborist Report*

SITE ADDRESS: 3611 W Mercer Way, Mercer Island

DATE: September 5, 2019

PREPARED BY: Favero Greenforest, ISA Certified Arborist # PN -0143A
ISA Tree Risk Assessment Qualified
ASCA Registered Consulting Arborist® #379

INTRODUCTION

You previously contracted my services to prepare a *Tree Inventory* for the referenced site. That '*Inventory*' was submitted 2/13/19, and provided attributes and a condition assessment of the regulated trees. In preparation for this *Arborist Report*, I reviewed Drainage/Civil Plan (C2.0), dated 6/19/2019 and a Site Plan dated 7/18/2019 (Sheet A100).

SUMMARY

The site is waterfront property with a single-family residence. The subject trees include both native and ornamental deciduous species. Data is included for 2 offsite trees on an abutting parcel to the north.

	<i>Significant</i>	<i>Grove</i>	<i>Exceptional</i>	Not Regulated
Onsite Trees	2	15	2	6
Offsite Trees			2	

This report establishes the condition of the regulated trees on site, and provides information required per MI code §19.10.090.c.2.b.

LIMITATIONS AND USE OF THIS REPORT

This document provides required tree attributes for a *tree inventory*: required data for an *arborist report* (as per MI code §19.10.090.c.2.b) shall be provided under separate cover and scope. This inventory shall be used in the building permit process for the subject parcel, and as an aid in tree retention with City planners.

This tree report establishes, via the most practical means available, the existing conditions of the trees on the subject property. Ratings for health and structure, as well as any recommendations are valid only through the development and construction process. This report is based solely on what is readily visible and observable, without any invasive means.

There are several conditions that can affect a tree's condition that may be pre-existing and unable to be ascertained with a visual-only analysis. No attempt was made to determine the presence of hidden or concealed conditions which may contribute to the risk or failure potential of trees on the site. These conditions include root and stem (trunk) rot, internal cracks, structural defects or construction damage to roots, which may be hidden beneath the soil. Additionally, construction and post-construction circumstances can cause a relatively rapid deterioration of a tree's condition.

TREE INSPECTION

I marked each onsite tree with 1" x 3.5" aluminum tag indicating tree number.

I visually inspected each tree from the ground. I performed a Level 1 risk assessment.¹ This is the standard assessment for populations of trees near specified targets, conducted in order to identify obvious defects or specified conditions such as a pre-development inventory. This is a limited visual assessment focuses on identifying trees with imminent and/or probable likelihood of failure, and/or other visible conditions that will affect tree retention.

I recorded tree species and size (DBH). I estimated the average dripline of each tree. I rated the condition of each tree, both health and structure/form. A tree's structure/form is distinct from its health. This inspection identifies what is visible with both.

High-risk trees can appear healthy in that they can have a dense, green canopy. This may occur when there is sufficient sapwood or adventitious roots present to maintain tree health, but inadequate strength for structural support.

¹ Companion publication to the ANSI A300 Part 9: Tree Shrub and Other woody Plant Management – Standard Practices, Tree Risk Assessment. 2011. ISA.

Ryan Yuan

RE: *Arborist Report*, 3611 W Mercer Way, Mercer Island

September 5, 2019

Page 3 of 13

Conversely, trees in poor health may or may not be structurally stable. For example, tree decline due to root disease is likely to cause the tree to be structurally unstable, while decline due to drought or insect attack may not.

One way that tree health and structure/form are linked is that healthy trees are more capable of compensating for structural defects. A healthy tree can develop adaptive growth that adds strength to parts weakened by decay, cracks, and wounds.

This report identifies unhealthy trees based on existing health conditions and tree structure, and specifies which trees are most suitable for preservation.² No invasive procedures were performed on any trees. The results of this inspection are based on what was visible at the time of the inspection. The attached inventory summarizes my inspection results and provides the following information for each tree:

Tree Status: Remove or Retain – indicates if tree is proposed for removal or retention.

Regulated Tree Category – indicates if tree is significant or exceptional as defined by Municipal code.

Grove tree – indicates 8 or more trees, 10" DBH or larger that comprise a contiguous canopy.

> 24" – indicates trees with DBH equal to or greater than 24".

Tree number as shown on tag in the field, and on attached exhibit.

DBH Stem diameter in inches measured 4.5 feet from the ground. Multiple-stemmed trees are reported as a single integer, using quadratic mean.

QMD - Multiple-stemmed trees are reported as a single integer, using quadratic mean.

Tree Species Latin and common name.

Dripline average branch extension from the trunk as radius in feet.

Health and Structure/Form ratings '1' indicates good to excellent condition; no visible health-related problems or structural defects, '2' indicates fair condition; minor visible problems or defects that may require attention if the tree is retained, and '3' indicates poor condition; significant visible problems or defects and tree removal is recommended.

Comments on Condition obvious structural defects or diseases visible at time of inspection, which includes:

² Companion publication to the *ANSI A300 Part 5: Tree Shrub and Other woody Plant Maintenance – Standard Practices, Managing Trees During Construction*. 2008. ISA.

Ryan Yuan

RE: *Arborist Report*, 3611 W Mercer Way, Mercer Island

September 5, 2019

Page 4 of 13

Asymmetric canopy - the tree has an asymmetric canopy from space and light competition from adjacent trees.

Branch dieback - mature branches in canopy are dying/dead.

Decay - process of wood degradation by microorganisms resulting in weak and defective structure.

Diseased - foliage and trunk/stems are diseased.

Ivy - dense ivy prevents a thorough inspection, and other defects may be present.

Lean - angle of the trunk from vertical.

Multiple leaders - the tree has multiple stem attachments, which may lead to tree failure and require maintenance or monitoring over time.

Stumpsprout- tree previously cut at grade with multiple stems and potentially weak attachments.

Tree leans - trunk has significant lean from vertical.

Trunk decay - wood decay is visible in the trunk.

Wound/decay base of trunk - open wound with visible decay in trunk.

Tree type – indicates if tree is coniferous, deciduous or broadleaf evergreen.

Viability - a determination by the arborist whether the tree is viable for retention, regardless of municipal requirements.

Onsite trees include 2 *significant* ornamental species growing near the residence. One, a flowering cherry, is in very poor condition and nearly dead. Two maple trees are *exceptional* based on trunk size: a Vine maple and a Japanese maple, both also near the house.

Portugal laurel flank the south parcel boundary, and the downhill side of the driveway. This species is not regulated though is still shown on the submittal documents.

Uphill from the driveway stand 15 native alders and maples. These trees qualify as *grove* trees based on municipal code. Ten of these 15 grove trees are in very poor condition, and in my opinion, are not viable for retention.

Two offsite trees stand near the NE corner of your parcel, both of *exceptional* size.

TREE STATUS: REMOVE OR RETAIN

Trees 2, 11, 12, 23, 24 & 25 are to be removed because of proposed improvements.

All other regulated trees are proposed for retention.

Nine trees, #14-22 were established as non-viable trees based on my initial site inspection. These trees all stand uphill to the east of the existing driveway, and are within striking distance of the proposed garage. (Establishing a tree as non-viable is strictly my opinion to aid in tree retention selection, and is not a municipally regulated tree category.)

These 9 trees are exceptional based on the definition of a grove: A group of 8 or more trees each 10 inches or more in diameter that form a continuous canopy. Trees that are part of a grove shall also be considered exceptional trees, unless they also meet the definition of a hazardous tree. In this case, all are proposed for retention.

In communication with your municipal arborist, I prescribe removal of the ivy in order to 1) reduce load to the trunks (from wind and gravity), and 2) to ascertain if any defects were obstructed from view.

LIMITS OF DISTURBANCE & TREE PROTECTION FENCING

Limits of Disturbance are calculated for all the retained significant trees. They are listed below as radii in feet from the trunk for the side of the tree to be impacted most by construction. They are determined using rootplate³ and trunk diameter,^{4,5} and ISA Best Management Practices.⁶ These are the minimum distances from the trees for any soil disturbance.

The recommended distance for tree protection fencing is also provided, and unless work is required inside this distance, fencing should be placed and maintained at this distance throughout construction.

The following table lists the dripline (DL), tree protection fencing (TPF) and limit of disturbance (LOD) each as radius in feet from center of tree for each retained tree, and for 2 offsite trees.

³ Coder, Kim D. 2005. *Tree Biomechanics Series*. University of Georgia School of Forest Resources.

⁴ Smiley, E. Thomas, Ph. D. *Assessing the Failure Potential of Tree Roots, Shade Tree Technical Report*. Bartlett Tree Research Laboratories.

⁵ Fite, Kelby and E. Thomas Smiley. 2009. *Managing Trees During construction; Part Two*. Arborist News. ISA.

⁶ Companion publication to the ANSI A300 Series, Part 5: *Managing Trees During Construction*. 2008. ISA.

Dripline, Protection Fencing and Disturbance Limits.

Tree No.	DBH	Species	Dripline	TPF	LOD
1	10.1"	Vine maple	6'	DL	6'
3	10.8"	Flowering cherry	11'	DL	6'
4	12.7"	Birch	15'	DL	6'
5	11"	Portugal laurel	10'	N/R	6'
6	10"	Portugal laurel	10'	N/R	6'
7	10.9"	Portugal laurel	8'	N/R	6'
8	12.8"	Portugal laurel	8'	N/R	6'
9	11"	Portugal laurel	8'	N/R	6'
10	11"	Portugal laurel	10'	N/R	6'
13	24"	Red alder	18'	12'	12'
14	17.5"	Bigleaf maple	10'	DL	DL
15	16.5"	Bigleaf maple	12'	8'	DL
16	17"	Red alder	15'	10'	DL
17	18"	Red alder	12'	10'	DL
18	18"	Red alder	12'	10'	DL
19	16"	Red alder	16'	8'	DL
20	21"	Red alder	18'	10'	DL
21	19"	Red alder	16'	10'	DL
22	16"	Red alder	14'	8'	8'
101	32"	Bigleaf maple	20'	DL	14'
102	30"	Western red-cedar	16'	DL	15'

(DL = dripline, NR = non-regulated tree, protection not required)

SPECIAL INSTRUCTIONS FOR WORK WITHIN CRITICAL ROOT ZONE.

Demolition of existing house and asphalt driveway are required around exceptional tree #1. Temporary fencing shall be installed prior to site clearing around this tree at the tree's dripline as much as is feasible. Care shall be taken during demolition to avoid injury to branches and roots, and once completed, TPF shall be permanently installed at a uniform radius around the tree of at least 6 feet.

IMPACT OF NECESSARY TREE REMOVAL TO THE REMAINING TREES

Tree 2 is a short stand-alone tree currently buffered by the existing house. It currently provides no wind protection to other onsite features or trees.

At the north side of the parcel, trees 11, 12, 23, 24 & 25 stand as a group at the base of the slope. They offer little to no wind protection for other onsite trees, particularly those on

Ryan Yuan

RE: *Arborist Report*, 3611 W Mercer Way, Mercer Island

September 5, 2019

Page 7 of 13

the slope to the east. No trees stand immediately north of these that would otherwise be subjected to sudden changes in wind loads.

TREE PROTECTION MEASURES AROUND RETAINED TREES

Prior to site clearing, minimum six (6) foot temporary chain-link fence shall be installed at the driplines of all retained trees or at the limits of disturbance (as established above) when construction or access is required within the dripline. Fence shall completely encircle the retained trees. Install fence posts using pier block only. A City planner must approve any modifications to the fencing material and location.

No stockpiling of materials, vehicular or pedestrian traffic, material storage or use of equipment or machinery shall be allowed within the protective fencing. Fencing shall not be moved or removed unless approved by a City planner. Any work, activity or soil disturbance within the protection fencing, or critical root zone, shall be reviewed, approved and monitored by the project arborist.

Attachments:

1. Assumptions and Limiting Conditions
2. Certification of Performance
3. Regulated Tree Inventory
4. Tree Number Exhibit

Attachment No. 1 - Assumptions & Limiting Conditions

1. A field examination of the site was made 11/29/2018. My observations and conclusions are as of that date.
2. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/arborist can neither guarantee nor be responsible for the accuracy of information provided by others.
3. I am not a qualified land surveyor. Reasonable care was used to match the trees indicated on the sheets with those growing in the field.
4. Construction activities can significantly affect the condition of retained trees. All retained trees should be inspected after construction is completed, and then inspected regularly as part of routine maintenance.
5. Unless stated other wise: 1) information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) the inspection is limited to visual examination of the subject trees without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied that problems or deficiencies of the subject tree may not arise in the future.
6. All trees possess the risk of failure. Trees can fail at any time, with or without obvious defects, and with or without applied stress. A complete evaluation of the potential for this (a) tree to fail requires excavation and examination of the base of the subject tree. Permission of the current property owner must be obtained before this work can be undertaken and the hazard evaluation completed.
7. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made.

Attachment No. 2 - Certification of Performance

I, Favero Greenforest, certify that:

- I have personally inspected the trees and the property referred to in this report and have stated my findings accurately.
- I have no current or prospective interest in the vegetation or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved.
- The analysis, opinion, and conclusions stated herein are my own and are based on current scientific procedures and facts.
- My analysis, opinion, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices.
- No one provided significant professional assistance to me, except as indicated within the report.
- My compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client of any other party nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am a member in good standing of International Society of Arboriculture (ISA), and the ISA PNW Chapter, I am an ISA Certified Arborist (#PN-0143A) and am Tree Risk Assessment Qualified, and am a Registered Consulting Arborist® (#379) with American Society of Consulting Arborists. I have worked as an independent consulting arborist since 1989.

Signed:



GREENFOREST, Inc.

By Favero Greenforest, M. S.

Date: September 5, 2019

Ryan Yuan

RE: Arborist Report, 3611 W Mercer Way, Mercer Island

September 5, 2019

Page 10 of 13

Attachment No. 3 – Tree Inventory

Retain	Remove	Threshold (in.)	Significant	Exceptional (Grove)	Exceptional (Size)	> 24" DBH	Tree No.	DBH (in.)	QMD*	Species	Dripline radius (Ft.)	Health	Structure		Viabile Tree	Tree Type
X		8"			X		1	3.5,3.3, 4.8,2.9, 3.7"	10.1"	Vine maple, <i>Acer circinatum</i>	6'	1	2	Stumpsprout, multiple stems	Yes	D
	X	12"			X		2	14.5"		Japanese maple, <i>Acer palmatum</i>	13'	1	2	Growth obstruction, roots are soil surface	Yes	D
	X	23"	X				3	10.8"		Kwanzan flowering ch. <i>P. serrulata</i> 'Kwanzan'	11'	3	3	Diseased, decay, decline	NO	D
X		24"	X				4	12.7"		European white birch, <i>Betula pendula</i>	15'	1	2	Ivy	Yes	D
NOT A REGULATED SPECIES							5	11"		Portugal laurel, <i>Prunus lusitanica</i>	10'	1	2	Sheared as hedge	Yes	BE
							6	10"			10'	1	2		Yes	BE
							7	4.5,6,8"	10.9"		8'	1	2		Yes	BE
							8	6,7,9"	12.8"		8'	1	2		Yes	BE
							9	11"			8'	1	2		Yes	BE
							10	11"			10'	1	2		Yes	BE
	Imp.	30"		X			11	18"		Bigleaf maple, <i>Acer macrophyllum</i>	20'	1	3	Asymmetric canopy, sweep,	NO	D



Ryan Yuan

RE: Arborist Report, 3611 W Mercer Way, Mercer Island

September 5, 2019

Page 11 of 13

Retain	Remove	Threshold (in.)	Significant	Exceptional (Grove)	Exceptional (Size)	> 24" DBH	Tree No.	DBH (in.)	QMD*	Species	Drip line radius (Ft.)	Health	Structure		Viable Tree	Tree Type
														rootplate failure		
	X	30"		X		Yes	12	10,18, 18"	27.3"	Bigleaf maple, Acer macrophyllum	25'	1	2	Multiple leaders, ivy, perched on retaining wall	Yes	D
X		36"		X		Yes	13	24"		Red alder, Alnus rubra	18'	2	2	Branch decline, lean, ivy	Yes	D
X		30"		X			14	8,10, 12"	17.5"	Bigleaf maple, Acer macrophyllum	10'	1	3	Stumpsprout, diseased, decay, decline, ivy	NO	D
X		30"		X			15	16.5"		Bigleaf maple, Acer macrophyllum	12'	2	3	Stumpsprout, ivy	NO	D
X		36"		X			16	17"		Red alder, Alnus rubra	15'	2	3	Branch dieback, asymmetric, very dense ivy covering nearly the entire tree	NO	D
X		36"		X		17	18"		12'		2	3	NO		D	
X		36"		X		18	18"		12'		2	3	NO		D	
X		36"		X		19	16"		16'		2	3	NO		D	
X		36"		X		20	21"		18'		2	3	NO		D	
X		36"		X		21	19"		16'		3	3	NO		D	
X		36"		X		22	16"		14'		3	3	NO		D	
	X	30"		X			23	20"		Bigleaf maple,	20'	2	2	Lean, asymmetric,	Yes	D



Ryan Yuan

RE: Arborist Report, 3611 W Mercer Way, Mercer Island

September 5, 2019

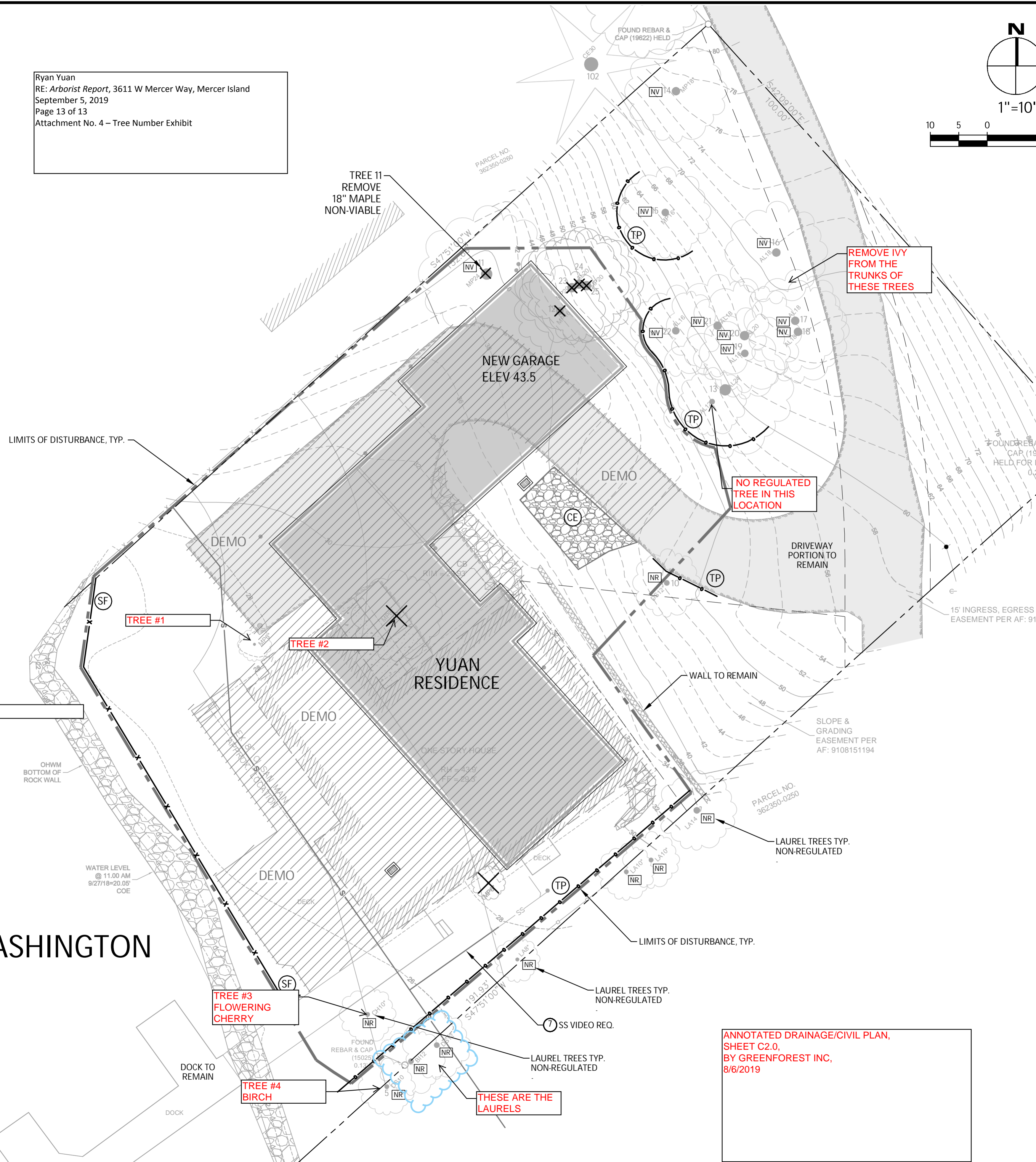
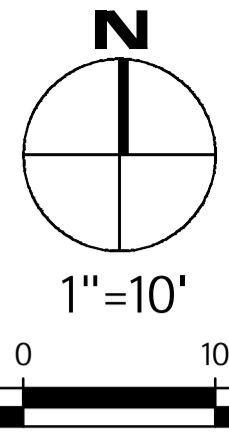
Page 12 of 13

Retain	Remove	Threshold (in.)	Significant	Exceptional (Grove)	Exceptional (Size)	> 24" DBH	Tree No.	DBH (in.)	QMD*	Species	Dripline radius (Ft.)	Health	Structure		Viable Tree	Tree Type
										Acer macrophyllum				ivy, perched on retaining wall		
	X	36"		X			24	21"		Red alder, Alnus rubra	25'	2	2	Lean, asymmetric, ivy, perched on retaining wall	Yes	D
	X	30"		X		Yes	25	19,22"	29"	Bigleaf maple, Acer macrophyllum	30'	2	2	Multiple leaders, ivy, perched on retaining wall	Yes	D
OFFSITE TREES																
		30"			X	Yes	101	(6) 6-18"	32"	Bigleaf maple, Acer macrophyllum	20'			Offsite		D
		30"			X	Yes	102	30"		Western red-cedar, Thuja plicata	16'			Offsite		C

QMD - quadratic mean diameter in inches.



Ryan Yuan
 RE: *Arborist Report, 3611 W Mercer Way, Mercer Island*
 September 5, 2019
 Page 13 of 13
 Attachment No. 4 – Tree Number Exhibit



ANNOTATED DRAINAGE/CIVIL PLAN,
 SHEET C2.0,
 BY GREENFOREST INC,
 8/6/2019