



Greenforest Incorporated



Consulting Arborist

TO: William Altman

REFERENCE: Tree Inventory

PARCEL NUMBER: 3024059001

DATE: June 19, 2019

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

Introduction

You contracted my services to prepare an inventory of the trees on the referenced parcel. I received a topographic survey from George Steirer of Plan to Permit, LLC. I visited the site 6/10/2019 and inspected the trees. This inventory represents all regulated trees on the parcel, and includes offsite trees on abutting parcels, and within the right-of-way.

Summary

The subject parcel is vacant and undeveloped. The subject trees include both deciduous and evergreen native species.

	Onsite	Offsite	
Small	8		
Significant	27		
Hazard	0		
Exceptional	12		
Outside Disturbance Area	20		
ROW/Offsite		20	
TOTAL TREES THIS INVENTORY	67	20	87

Of the 87 onsite and offsite trees summarized above, 53 are of *grove size*, though *grove* designation has not yet been established.

This inventory establishes the condition of the regulated trees on site, and provides a *significant tree inventory* as per MI code §19.10.090.c.2.a, including:

- i. A numbering system of all existing large trees on the subject property (with corresponding tags on trees); the inventory shall also include large trees on adjacent property with driplines or critical root zones extending into the development proposal site;
- ii. Size (diameter);
- iii. Proposed tree status (retained or removed), is yet to be determined.
- iv. Tree type or species;
- v. Brief general health or condition rating of these trees (i.e., poor, fair, good, etc.).

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

Each tree was marked with white surveyor's tape and identified by 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

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



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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.

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:

Outside of Disturbance Area – identifies trees whose driplines are outside of the proposed disturbed area.

ROW and Offsite Trees – indicates if tree is off of the subject parcel and/or within the street right-of-way.

Proposed Action – Project is still in the design phase and you or your designer will provide status for each tree.

Regulated Tree Category – indicates if tree is small, large (significant) or exceptional as defined by Municipal code.

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

Grove size tree – grove trees include 8 or more trees, 10” DBH or larger that comprise a contiguous canopy. The attached inventory identifies trees 10” DBH or larger, but as of yet makes no distinction whether or not they are grove trees. This will occur once accurate driplines are added to the survey.

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

Tree number as shown on tape 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 common name is listed in the attached inventory. All of the surveyed trees are of a species that are regulated by the municipality. Trees listed as Maple or Fir are either native Bigleaf maples, or Douglas-firs. These trees were not assessed as they are smaller than 10” DBH, and are not regulated. Since they have not yet been removed from the survey, they remain in this inventory and are identified as *small* trees to avoid confusion.

Latin binomials are as follows:

Bigleaf maple	<i>Acer macrophyllum</i>
Douglas-fir	<i>Pseudotsuga menzeisii</i>
Pacific dogwood	<i>Cornus nuttallii</i>
Pacific yew	<i>Taxus brevifolia</i>
Red alder	<i>Alnus rubra</i>
Western hemlock	<i>Tsuga heterophylla</i>
Western red-cedar	<i>Thuja plicata</i>

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:

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.

Bow in trunk - a trunk lean characterized by the top of the tree leaning over.

(Common with edge trees)

Canker - disease cankers are established on trunk/branches.

Chlorosis - yellowing or off-color foliage.

Crack - separation of wood fibers and predisposed to failure.

Dead - tree is dead.

Deadwood - large and/or multiple dead branches throughout canopy.

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

Diseased - foliage and trunk/stems are diseased.

Dogleg in trunk - trunk with a bow or defective bend (90°) in trunk often half way of further up the trunk.

Double leader - the tree has multiple stem attachments, which may require maintenance or monitoring over time.

Foliar disease - foliage is diseased with manageable fungus.

Gummosis - oozing resin from *Prunus sp.*, indicating stress/decline.

Heart rot - fungal infection with interior of tree decayed.

Included bark - an inclusion of bark at the attachment of multiple leaders that prevents a wood-to-wood attachment

Insect Injury - active insect injury affecting tree health.

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

Kretzschmaria – a wood-decaying fungi that causes the trunk to become brittle.

LCR - live crown ratio: the ratio of crown length to total tree height. Stand-alone trees with a LCR of 30 and lower are at increased risk of failure.

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.

OHPL – overhead power lines.

Previous failure - tree trunk previously broken and defective.

Seam - visible anomaly vertically along the trunk that can indicate an internal self-propagating crack along the wood fibers.

Slender - tree lacks adequate trunk taper to stand lone.

Stem Canker - disease canker on trunk/branches.

Sweep in trunk - characterized by a leaning lower trunk and a more upright top.

Stilts - tree grew atop a stump or nurselog, and has an elevated rootcrown.

Thinning foliage - low foliage density may indicate stress, or early infection/declining health.

Self-corrected lean - self-corrected leans and sweeps are characterized by a leaning lower trunk and a top that is more upright.

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

Suppressed - tree crowded by larger adjacent trees, with defective structure and/or low vigor. Retain tree only as a grove tree, not stand-alone.

Sweep - tree leans away from adjacent trees. Characterized by a leaning lower trunk and a top that is more upright.

Taper - change in diameter over the length of trunks, branches and roots.

Topped – the tree is previously topped and has poor structure and/or stem decay.

Tree leans - trunk has significant lean from vertical.

Trunk decay - wood decay is visible in the trunk.

Twist in trunk - trunk fibers are twisted and subject to cracking in high winds.

Undermined rootplate – soil under a portion of the rootplate has eroded and has put the tree at risk of failure.

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

Tree type – indicates if tree is coniferous (C), deciduous (D) or broadleaf evergreen (BE).

Viability - a determination by the arborist whether the tree is viable for retention.

This project is currently in the design phase. The following information will be provided later under separate cover of an *arborist report*:

- i. A complete description of each tree's diameter, species, critical root zone, limits of allowable disturbance, health, condition, and viability;
- ii. A description of the method(s) used to determine the limits of allowable disturbance (i.e., critical root zone, root plate diameter, or a case-by-case basis description for individual trees);
- iii. Any special instructions specifically outlining any work proposed within the limits of the disturbance protection area (i.e., hand-digging, air spade,

- tunneling, root pruning, any grade changes, clearing, monitoring, and aftercare);
- iv. For trees not viable for retention, a description of the reason(s) for removal based on poor health, high risk of failure due to structure, defects, unavoidable isolation (windfirmness), or unsuitability of species, etc., and for which no reasonable alternative action is possible must be given (pruning, cabling, etc.);
 - v. Describe the impact of necessary tree removal to the remaining trees, including those in a grove or on adjacent properties;
 - vi. For development applications, a discussion of timing and installation of tree protection measures. Such measures must include fencing and be in accordance with the tree protection standards as outlined in this chapter; and
 - vii. The suggested location and species of supplemental trees to be used when required. The report shall include planting and maintenance specifications to ensure long-term survival.

LIMITS OF DISTURBANCE

Limits of Disturbance (LOD) are calculated for all the significant trees (and for trees on adjoining parcels with overhanging driplines). They are provided in the attached inventory as radii in feet from the trunk for the side of the tree to be impacted 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, and represent the area to be protected during construction.

These LOD are malleable and may be adjusted during the design and construction process. The adjustment may be larger or smaller depending on the extent of the proposed disturbance.

Attachments:

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

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.

Attachment No. 1 - Assumptions & Limiting Conditions

1. A field examination of the site was made 6/10/2019. 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. 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.
7. The consultant does not assume any liability for the subject tree and does not represent the transfer of such for any risks associated with the tree from the landowner to the consultant. **Risk management is solely the responsibility of the landowner.**

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: June 19, 2019

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Limits of Allowable Disturbance

Attachment No. 3 – Significant Tree Inventory

Tree Outside Of Disturbed Area	Offsite/Row	Proposed Action	Regulated Category	Grove Size	Tree > 24" DBH	Tree #	DBH (QMD) (in.)	Tree Species (Common Name)	Exceptional Threshold (in.)	Drip-line Radius (Ft.)	Health	Structure	Comments on Condition	Tree Type	Viable Tree?	LOD Radius (Ft.)
	Sig			X		1	12	Western hemlock	24"	16	2	2	Suppressed, ivy	C	Y	6
			Sig	X		2	23	Western red-cedar	30"	16	1	3	Decay, ivy	C	N	12
X						2870										
X						2872										
X						2927										
X						2929										
X						2930										
X						2931										
X						2932										
X						2933										
X						2936										
X						2937										
X						2939										
			Exec	X	X	2940	23, 29 (37)	Bigleaf maple	30"	40	1	2	Asymmetric, double leader	D	Y	18
			Sig	X		2941	13	Bigleaf maple	30"	16	1	3	Topped, asymmetric, ivy	D	N	7
			Sig	X		2942	15	Bigleaf maple	30"	18	2	3	Decline, decay, sweep, perched on embankment	D	N	8
			Sig	X		2943	10, 12 (15)	Bigleaf maple	30"	18	2	3	Decline, decay, sweep, perched on embankment	D	N	7
			Sig	X	X	2945	25.5	Bigleaf maple	30"	20	3	3	Decline, double leader, perched on embankment	D	N	13



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Also need 2948,
2949

Tree Outside Of Disturbed Area	Offsite/Row	Proposed Action	Regulated Category	Grove Size	Tree ≥ 24" DBH	Tree #	DBH (QMD) (In.)	Tree Species (Common Name)	Exceptional Threshold (In.)	Dripline Radius (Ft.)	Health	Structure	Comments on Condition	Tree Type	Viable Tree?	LOD Radius (Ft.)
			Sig	X		2946	22.5	Western hemlock	24"	20	1	1		C	Y	11
X						3108										
			Sig	X		3135	22	Bigleaf maple	30"	18	2	3	Deadwood, asymmetric, lean, tree is tagged 3125	D	N	11
			Sml			3137		Maple or Fir								6
			Exec	X	X	3138	(5) 14-16 (34)	Bigleaf maple	30"	25	2	3	Decline, stumpsprout	D	N	17
			Sig	X		3140	23	Douglas-fir	30"	18	1	2	Slender, ivy	C	Y	12
			Exec	X	X	3141	12, 12, 18, 18 (31)	Bigleaf maple	30"	16	3	3	Decline, slender, stumpsprout	D	N	15
			Exec	X	X	3142	43	Bigleaf maple	30"	35	2	2	Decline, deadwood	D	Y	21
			Sig	X		3143	16	Bigleaf maple	30"	18	2	3	Decline, asymmetric, ivy	D	N	8
						3145				0	3	3	Dead, excluded from totals			
			Sig	X		3147	10	Douglas-fir	30"	8	1	3	Top failure	C	N	6
			Sig	X		3150	15	Western hemlock	24"	16	1	1		C	Y	8
			Exec	X	X	3151	49	Bigleaf maple	30"	35	3	3	Decline, deadwood, decay	D	N	24
						3152				0	3	3	Dead, excluded from totals			
			Sig	X		3153	18	Bigleaf maple	30"	12	3	3	Suppressed, decay	D	N	17
			Exec	X	X	3154	41	Bigleaf maple	30"	35	1	2	Double leader, ivy	D	Y	20
			Sig	X		3157	10	Western hemlock	24"	8	2	2	Suppressed, ivy	C	Y	6
			Sig	X		3159	10	Western hemlock	24"	6	2	2	Suppressed, LCR. Mistagged--should be 3158	C	Y	6



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Also need: 3175

Limit of (Allowable) Disturbance

Tree Outside Of Disturbed Area	Offsite/Row	Proposed Action	Regulated Category	Grove Size	Tree ≥ 24" DBH	Tree #	DBH (QMD) (In.)	Tree Species (Common Name)	Exceptional Threshold (In.)	Dripline Radius (Ft.)	Health	Structure	Comments on Condition	Tree Type	Viable Tree?	LOD Radius (Ft.)
			Sml			3162		Maple or Fir								6
			Sml			3163		Maple or Fir								6
			Sig	X		3164	15	Bigleaf maple	30"	16	3	3	Decline, slender	D	N	8
			Sig	X		3165	13	Douglas-fir	30"	14	2	2	Suppressed, ivy	C	Y	7
			Exec	X	X	3166	13, 16, 25 (32)	Bigleaf maple	30"	30	1	2	Multiple leader	D	Y	16
			Sig	X		3168	22	Bigleaf maple	30"	25	1	2	Stumpsprout, double leader	D	Y	11
			Sml			3169		Maple or Fir								6
			Sml			3170		Maple or Fir								6
			Sml			3171	9	Douglas-fir	30"	14	1	2	Asymmetric	C	Y	6
	Sig			X		3172	11	Western red-cedar	30"	12	1	1		C	Y	6
	Sig			X		3173	12.8	Bigleaf maple	30"	16	3	3	Decline, asymmetric, ivy	D	N	6
	Sig			X		3174	20.8	Bigleaf maple	30"	20	1	3	Topped, ivy	D	N	11
			Sml			3176	8	Douglas-fir	30"	14	1	1		C	Y	6
	Sig			X		3177	11	Douglas-fir	30"	15	1	1		C	Y	6
			Exec	X	X	3231	36	Western red-cedar	30"	22	1	1		C	Y	18
			Sig	X	X	3239	29	Western red-cedar	30"	18	1	2	Sweep, previous failure	C	Y	14
			Sig	X		3241	15	Western red-cedar	30"	14	1	1		C	Y	8
			Sml			3249		Maple or Fir								6
X						3260										
X						3261										
X						3263										



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Tree Outside Of Disturbed Area	Offsite/Row	Proposed Action	Regulated Category	Grove Size	Tree \geq 24" DBH	Tree #	DBH (QMD) (In.)	Tree Species (Common Name)	Exceptional Threshold (In.)	DripLine Radius (Ft.)	Health	Structure	Comments on Condition	Tree Type	Viable Tree?	LOD Radius (Ft.)
X						3266										
X						3267										
X						3268										
			Sig	X		3272	13	Western hemlock	24"	16	1	3	Previous failure, decay	C	N	7
X						3274										
			Sig	X		3275	18	Western hemlock	24"	17	1	1		C	Y	17
			Exec			3278	9	Pacific yew	6"	10	2	2	Decline, ivy	C	Y	6
			Sig	X		3282	20	Bigleaf maple	30"	18	2	3	Decline, previous failure, dogleg	D	N	10
			Sig	X		3283	20	Western hemlock	24"	18	1	2	Ivy	C	Y	10
			Exec			3284	7.2	Pacific dogwood	6"	12	1	2	Slender	D	Y	6
			Sig	X		3286	19.5	Western red-cedar	30"	16	1	2	Ivy	C	Y	10
			Exec	X	X	3288	32.5	Bigleaf maple	30"	18	3	3	Decline, previous failure, Kretzschmaria	D	N	16
	Sig			X		3364	22	Bigleaf maple	30"	20	3	3	Decline, topped, ivy	D	N	11
			Sig	X		3366	10	Western red-cedar	30"	14	1	1		C	Y	6
X						3367										
	Sig			X		3376	23	Bigleaf maple	30"	25	1	2	Topped, ivy	D	Y	12
	Sml					3377		Maple or Fir								6
	Sig			X		3378	10	Douglas-fir	30"	14	1	2	Pruned for OHPL, ivy	C	Y	6
	Sig			X		3379	21.5	Bigleaf maple	30"	25	1	2	Asymmetric, ivy	D	Y	11
	Sig			X	X	3380	27.5	Bigleaf maple	30"	30	2	2	Decline, ivy, asymmetric	D	Y	14



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Tree Outside Of Disturbed Area	Offsite/Row	Proposed Action	Regulated Category	Grove Size	Tree \geq 24" DBH	Tree #	DBH (QMD) (In.)	Tree Species (Common Name)	Exceptional Threshold (In.)	Drip line Radius (Ft.)	Health	Structure	Comments on Condition	Tree Type	Viable Tree?	LOD Radius (Ft.)
	Sig			X		3381	13	Bigleaf maple	30"	18	2	3	Decline, asymmetric, ivy	D	N	7
			Exec	X	X	3382	39	Western red-cedar	30"	18	2	2	LCR, ivy	C	Y	20
	Sml					3383		Maple or Fir								6
	Sig			X		3384	6, 9 (11)	Bigleaf maple	30"	14	3	3	Topped, stumpsprout	D	N	6
	Sml					3386		Maple or Fir								6
			Sig	X		3390	10, 13 (16)	Bigleaf maple	30"	16	3	3	Decline, ivy, stumpsprout	D	N	8
	Sig			X		3404	11.8	Douglas-fir	30"	15	1	1		C	Y	6
	Sig			X		3405	13.5	Western hemlock	24"	16	1	2	Pruned for OHPL	C	Y	7
	Sig			X		3408	11	Western red-cedar	30"	15	1	1		C	Y	6
	Sig			X		3410	15	Western red-cedar	30"	16	1	1		C	Y	8
	Sml					3412		Maple or Fir								6
			Sig	X		3715	11	Western hemlock	24"	14	1	2	Asymmetric, ivy	C	Y	6



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Attachment No. 4 – Tree Number Exhibit

