

**Arborist Report**

TO: Lowe Enterprises, Inc.  
SITE: NE 74<sup>th</sup> St & 168<sup>th</sup> Ave NE, Redmond, WA 98052  
RE: Tree Inventory & Assessment  
DATE: December 7, 2015  
PROJECT ARBORIST: Katie Hogan, ISA Certified Arborist PN-8078A  
ASSISTED BY: Haley Galbraith, ISA Certified Arborist PN-7512A  
ISA Qualified Tree Risk Assessor

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**Summary**

Forty-four (44) significant trees were assessed at the above-addressed site. None of the trees assessed meet the City definition of a Landmark tree or present a high level of risk to surrounding targets.

Thirty-eight (38) trees will likely require removal to accommodate proposed site development. Six (6) trees are planned for retention according to the information provided to us.

Eight (8) of the trees proposed for removal were in poor to fair health and structural condition.

The city of Redmond requires that 35-percent of site trees be retained throughout development. Of the forty-four significant trees located within the property boundary, sixteen (16) trees would need to be retained to meet City requirements.

The city of Redmond requires an exception request be submitted and approved for the removal or impact of more than 35-percent of the significant trees on site. Significant trees removed are to be replaced at a 1:1 ratio, except for those that are removed beyond the 35-percent retention minimum, which shall be replaced at a 3:1 ratio.

Retained trees should have protection measures applied before the commencement of site work. Tree protection areas should include groups of trees wherever possible in order to maximize protection of the critical root zones.

Detailed site plans have not yet been provided to us, therefore, this report does not discuss the proposed level of impact to trees to be retained on site. We can provide further recommendations as more detailed plans become available.

*Obtain the necessary tree removal permission from the City of Redmond before beginning site development.*

## Assignment & Scope of Report

This report outlines the site inspection by Katie Hogan and Haley Galbraith, of Tree Solutions, Inc., made on November 18, 2015. We were asked to evaluate the significant trees on site and to review the Redmond Zoning Code (RZC) requirements as they pertain to the project. We were asked to produce an Arborist Report including tree identifier, species, size, health, and designation of each tree as it relates to the RZC. Lowe Enterprises, Inc. requested these services to acquire information for project planning purposes.

Specifics for each tree can be found in the attached [Table of Trees](#). A preliminary description of the number and percentages of each tree scheduled to be removed, impacted, or retained can be found in [Figure 1: Tree Inventory - Proposed Actions](#). A marked-up site survey showing tree locations and corresponding identifiers is attached. Photographs, Glossary, and References are included below. Limits of Assignment can be found in [Appendix A](#). Methods can be found in [Appendix B](#). Additional Assumptions and Limiting Conditions can be found in [Appendix C](#).

## Observations

### The Site

This approximately 116,305 square-foot property is located in Downtown Redmond and is currently used as a parking lot for the Redmond Town Center. There are no critical areas on site; the topography is flat. The extent of the site can be seen on the attached marked-up survey.

### The Trees

Forty-four (44) trees were tagged and assessed for health and structural condition. One (1) tree was found to be in poor structural condition. This tree does not present a high level of risk to surrounding targets.

Significant tree species included predominantly red maple (*Acer rubrum*), with some hedge maple (*Acer campestre*) and zelkova (*Zelkova* sp.) trees along the site periphery. All of the trees appear to have been planted when the parking lot was constructed. Many of the trees had roots which were causing infrastructure damage to the surrounding parking lot pavement and sidewalks. One tree that was shown on the survey had failed and pulled up the surrounding landscaping. The fallen tree had been cut to a stump prior to our inspection.

None of the trees had severe structural defects, but most of them had a multi-stem form that branched above standard height. The trees all had a history of pruning, including crown raising for parking and roadway clearance. Much of the past pruning we observed appeared to have been carried out improperly, as indicated by large flush cut wounds. Some pruning wounds were fully occluded with new growth, while others did not have adequate response growth and decay had begun forming.

Several trees had what appeared to be vertical freeze-thaw cracks along the basal trunks. These cracks did not seem to be negatively impacting the health or stability of the trees.

The hedge maple trees along NE 74<sup>th</sup> street have been repeatedly topped to achieve a pollarded aesthetic. As a result, the branches had re-sprouted with multiple weakly attached shoots. The trees also appeared to be declining in health, as indicated by areas of foliar dieback.

**Discussion**

Retained, Impacted, & Removed Trees

The Redmond Zoning Code (RZC) states that the tree protection area shall be a minimum of the drip line plus five additional radial feet added to the furthest extent of the drip line. Trees that are proposed to be retained, removed, or may be impacted, should be shown on a Tree Preservation Plan.

The trees along 168<sup>th</sup> Ave NE were in fair to good health and structural condition. These trees are unlikely to be compromised during site development if careful construction practices are implemented that do not over-excavate or encroach into the critical root zones of these trees. Depending on the extent of disturbance for the proposed structure, it is possible that trees planned for retention may be considered impacted per RZC.

The hedge maple trees along NE 74<sup>th</sup> St were declining in health and structural condition. The trees were pruned in a way that will require regular pruning maintenance. While they do not present high risk to surrounding targets, it may better suit the long-term vision of this right-of-way to remove and replace these trees with healthy trees. We recommend taking this opportunity to amend the soil conditions prior to planting new trees along this strip.

The RZC states that a minimum of 35-percent of all significant trees on site shall be retained on any new development site, along with all Landmark trees, unless an exception has been applied for and granted. If the 35-percent retention level for significant trees is not achieved, each significant tree removed beyond 35-percent must be replaced at a 3:1 ratio. If these replacement ratios cannot be met due to development constraints, there may be alternatives for satisfying the site requirements at the discretion of the City Planner.

Figure 1 provides a description of the number and percentages of each tree scheduled to be removed, impacted, or retained, based on tree classification and site development schematics.

*Figure 1: Tree Inventory -- Proposed Action & Brief Definition*

	<b>Removal</b>	<b>Impacted</b>	<b>Retained</b>	<b>Total</b>
<b>Landmark (&gt;30")</b>	0 = 0%	0 = 0%	0 = 0%	0 = 0%
<b>Significant (6"- 30")</b>	38 = 86%	0 = 0%	6 = 14%	44 = 100%
<b>Totals</b>	38 = 86%	0 = 0%	6 = 14%	44 = 100%
<b>Replacement Trees</b>	58	0	0	0

*Numbers are generated based on site conditions, proposed development, and City requirements. Significant trees are to be replaced at a 1:1 ratio; Landmark trees at a 3:1 ratio. Each significant tree removed beyond 35-percent retention must be replaced at a 3:1 ratio. The total number of replacement trees is to be determined to include proposed trees as the site design develops.*

### Replacement Tree Calculations

Landmark trees to be replaced at 3:1 = 0 x 0 = **0 replacement trees.**

Significant trees removed beyond the 35-percent minimum threshold to be replaced at 3:1 = 10 x 3 = **30 replacement trees.**

Significant trees removed to be replaced at 1:1, minus those to replaced at 3:1 = 38 - 10 = 28 x 1 = **28 replacement trees.**

A total of **58 replacement trees** will be required to mitigate trees removed on site.

As more detailed site plans become available, these numbers may change if more trees are determined to be impacted by construction activities.

### Replacement Trees

The Redmond Zoning Code states the following:

Replacement trees are to be a minimum of:

- Two-and-one-half-inch caliper at breast height for deciduous trees
- Six feet in height for evergreen trees
- The Administrator may consider smaller-sized replacement trees if the applicant can demonstrate that smaller trees are more suited to the species, the site conditions, and the purposes of this section, and that such trees will be planted in sufficient quantities to meet the intent of this section.
- Replacement trees shall be primarily native species in order to restore and enhance the site as nearly as practicable to its pre-development character.
- The condition of replacement trees shall meet or exceed current American Nursery and Landscape Association or equivalent organization's standards for nursery stock.
- Installation of required replacement trees shall be in accordance with best management practices for landscaping which ensure the tree's long-term health and survival.
- All required tree replacement and other required mitigation shall be bonded or completed prior to issuance of a building permit.

### **Recommendations**

- Provide the City with a written exception request for the removal of any trees greater than the 35-percent minimum threshold for significant trees.
- Obtain the necessary tree removal permission from the City before developing the site.

## Photographs



**Photo 1:** Trees along 168<sup>th</sup> Ave NE proposed for retention (on left). Trees in relatively good health and structure and are good long-term trees for this site.



**Photo 2:** Trees along NE 74<sup>th</sup> St that have been repeatedly topped (on left). Trees are not ideal long-term trees for this site.



**Photo 3:** Large pruning cut wounds and what appeared to be freeze-thaw cracking (red arrow).

## Glossary

**co-dominant stems:** stems or branches of nearly equal diameter, often weakly attached (Matheny *et al.* 1998)

**crown/canopy:** the aboveground portions of a tree (Lilly 2001)

**DSH:** diameter at standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Matheny *et al.* 1998)

**ISA:** International Society of Arboriculture

**included bark:** bark that becomes embedded in a crotch between branch and trunk or between co-dominant stems and causes a weak structure (Lilly 2001)

**Landmark tree:** A healthy tree with a DSH greater than 30-inches. (RZC)

**significant size:** a tree measuring 6 inches DSH or greater (RZC)

**structural defects:** flaws, decay, or other faults in the trunk, branches, or root collar of a tree, which may lead to failure (Lilly 2001)

## References

ANSI A300 (Part 1) – 2008 American National Standards Institute. American National Standard for Tree Care Operations: Tree, Shrub, and Other Woody Plant Maintenance: Standard Practices (Pruning). New York: Tree Care Industry Association, 2008.

Dunster & Associates Environmental Consultants Ltd. Assessing Trees in Urban Areas and the Urban-Rural Interface, US Release 1.0. Silverton: Pacific Northwest Chapter ISA, 2006.

Lilly, Sharon. Arborists' Certification Study Guide. Champaign, IL: The International Society of Arboriculture, 2001.

Matheny, Nelda and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Champaign, IL: International Society of Arboriculture, 1998.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 1994.

Redmond Zoning Code. <http://www.codepublishing.com/WA/redmond.html>

## **Appendix A - Limits of Assignment**

Unless stated otherwise: 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, climbing, or coring unless explicitly specified. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Tree Solutions did not review any reports or perform any tests related to the soils located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the soils on site should be obtained by a qualified professional if additional understanding of site characteristics is needed to make an informed decision.

## **Appendix B - Methods**

I evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which trees produce in reaction to weak spots or areas of mechanical stress. Trees react to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts (Mattheck & Breloer 1994). Understanding uniform stress allows us to make informed judgments about the condition of a tree.

We measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH).

When a tree had multiple stems, we measured each stem individually at standard height and calculated a single-stem equivalent diameter by taking the average of the stem diameters, per Redmond Zoning Code.

## Appendix C - Assumptions & Limiting Conditions

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.
2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.
3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in the Consulting Arborist Agreement.
5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.
6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.
7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
8. All photographs included in this report were taken by Tree Solutions Inc. during the documented site visit, unless otherwise noted.
9. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
10. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of the those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.
11. Loss or alteration of any part of this Agreement invalidates the entire report.

**Table of Trees**  
NE 74th St and 168th Ave NE  
Redmond, WA

Date of Inventory: November 18, 2015  
Table Prepared: November 20, 2015

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	North	East	South	West	Landmark Status (y/n)	Proposed Action	Notes
107	Acer rubrum	Red maple	7.8	Good	Fair	9.0	10.0	8.5	10.5	NO	Remove	surface roots, girdling roots, no foliage (seasonal)
108	Acer rubrum	Red maple	10.8	Good	Fair	11.5	12.5	11.5	14.0	NO	Remove	stem girdling roots, sapsucker activity, surface root damage, no foliage (seasonal)
109	Acer rubrum	Red maple	11.4	Good	Fair	11.0	9.5	11.0	11.5	NO	Remove	codominant stems with narrow angles of attachment, surface roots circling base, poor past pruning for lot clearance (flush cuts)
110	Acer rubrum	Red maple	7.9	Good	Fair	6.0	8.5	87.0	9.5	NO	Remove	poor past pruning, codominant stems with narrow attachments
111	Acer rubrum	Red maple	13.0	Good	Fair	13.0	11.5	13.0	11.0	NO	Remove	codominant stems with narrow attachments, girdling roots
112	Acer rubrum	Red maple	10.2	Good	Fair	12.0	10.5	11.5	12.0	NO	Remove	root infrastructure damage, large flush cut on north side of trunk with some sprouting response
113	Acer rubrum	Red maple	8.9	Good	Fair	6.0	11.5	7.5	11.0	NO	Remove	large past flush cuts to trunk almost fully occluded, compacted soil
114	Acer rubrum	Red maple	10.7	Fair	Fair	12.5	10.0	9.5	13.0	NO	Remove	root infrastructure damage, surface roots damaged, past flush cut to trunk - decaying with fungal fruiting body on dead wood
115	Acer rubrum	Red maple	11.5	Fair	Fair	7.5	12.5	10.0	13.0	NO	Remove	stem girdling roots - damaged, poor past pruning (flush cuts) all around trunk for lot clearance

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116	Acer rubrum	Red maple	7.9	Good	Good	5.5	9.0	7.5	6.5	NO	Remove	erosion and minor root infrastructure damage
117	Acer rubrum	Red maple	6.0	Good	Good	2.5	6.0	3.5	6.0	NO	Remove	
118	Acer rubrum	Red maple	5.7	Fair	Fair	3.0	5.0	1.0	2.5	NO	Retain	major stem girdling roots, basal wound
119	Acer rubrum	Red maple	10.8	Good	Good	10.0	11.0	9.5	12.0	NO	Remove	surface roots damaged, large past pruning wounds on trunk
120	Acer rubrum	Red maple	9.1	Fair	Fair	9.5	7.0	5.0	5.0	NO	Retain	holding on to yellow leaves still, stem girdling roots
121	Acer rubrum	Red maple	10.2	Good	Fair	12.0	11.0	10.5	11.0	NO	Remove	good structural root flare
122	Acer rubrum	Red maple	10.6	Good	Good	11.5	11.5	12.0	9.5	NO	Retain	sufficient root space available
123	Acer rubrum	Red maple	8.2	Good	Good	6.5	10.5	9.5	8.5	NO	Remove	large flush cut on west side, surface roots damaged
124	Acer rubrum	Red maple	8.7	Good	Good	11.0	10.0	9.5	10.5	NO	Remove	major stem girdling roots, surface roots damaged, rocky soils
125	Acer campestre	hedge maple	7.1	Fair	Fair	10.5	10.5	6.5	7.5	NO	Retain	large trunk wound on west side, root flare buried, heavy seed crop still intact
126	Acer rubrum	Red maple	9.7	Good	Good	9.5	9.5	6.5	7.0	NO	Remove	surface roots damaged, erosion
127	Acer rubrum	Red maple	10.0	Good	Good	10.5	9.0	9.0	10.0	NO	Retain	crowded co-dominant union, surface roots damaged
128	Acer rubrum	Red maple	10.5	Good	Good	9.0	9.5	11.0	9.5	NO	Remove	minor stem girdling roots, surface roots
129	Acer rubrum	Red maple	10.0	Fair	Fair	10.0	10.0	11.5	8.5	NO	Retain	large stem girdling root, root wounds
130	Zelkova sp.	Zelkova	8.3 (at narrowest point)	Fair	Poor	8.0	8.0	8.0	7.5	NO	Remove	previously topped for pollarded form, root flare completely buried

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Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	North	East	South	West	Landmark Status (y/n)	Proposed Action	Notes
131	Acer campestre	hedge maple	6.0	Fair	Fair	5.5	7.5	7.0	7.0	NO	Remove	previously topped for pollarded form, unusual foliage on new shoots growing above topping cuts
132	Acer rubrum	Red maple	10.0	Good	Good	10.0	12.5	10.5	10.0	NO	Remove	
133	Acer campestre	hedge maple	6.0	Good	Fair	6.0	7.0	7.5	7.5	NO	Remove	previously topped - pollarded
134	Acer rubrum	Red maple	9.7	Good	Good	10.0	11.0	9.0	10.0	NO	Remove	erosion, surface roots
135	Acer campestre	hedge maple	6.4	Fair	Fair	5.5	6.5	6.5	6.5	NO	Remove	previously topped - pollarded
136	Acer rubrum	Red maple	10.3	Good	Good	12.0	10.0	11.0	9.5	NO	Remove	
137	Acer campestre	hedge maple	7.0	Fair	Fair	6.5	7.5	7.0	7.5	NO	Remove	previously topped - pollarded
138	Acer rubrum	Red maple	10.7	Good	Good	12.5	12.0	10.0	11.5	NO	Remove	
139	Acer campestre	hedge maple	6.8	Fair	Fair	6.5	9.5	7.0	9.0	NO	Remove	previously topped - pollarded
140	Acer rubrum	Red maple	11.5	Good	Good	13.5	13.0	11.5	11.0	NO	Remove	
141	Acer campestre	hedge maple	6.3	Fair	Fair	6.5	7.0	7.5	7.0	NO	Remove	previously topped - pollarded
142	Acer rubrum	Red maple	10.7	Good	Good	11.0	11.0	10.0	10.5	NO	Remove	
143	Acer rubrum	Red maple	8.5	Good	Good	9.5	9.5	8.0	8.5	NO	Remove	
144	Acer campestre	hedge maple	7.0	Fair	Fair	6.0	6.0	5.5	5.0	NO	Remove	
145	Acer rubrum	Red maple	6.1	Good	Fair	6.5	7.5	3.0	5.0	NO	Remove	root flare buried, erosion
146	Acer rubrum	Red maple	7.3	Good	Good	6.5	7.0	7.0	6.5	NO	Remove	
147	Acer rubrum	Red maple	8.8	Good	Good	11.0	7.0	9.0	6.5	NO	Remove	large trunk wound with decay
148	Acer rubrum	Red maple	6.7	Good	Good	4.5	9.5	5.0	8.5	NO	Remove	
149	Acer rubrum	Red maple	7.3	Good	Good	4.0	5.0	5.5	5.0	NO	Remove	
150	Acer rubrum	Red maple	8.2	Good	Good	5.0	8.5	6.0	7.5	NO	Remove	

Additional notes:

DSH (Diameter at Standard Height) is measured 4.5 feet above grade.

Multi-stem trees are noted, and a single stem equivalent is calculated using the method defined in the Redmond Zoning Code 21.72.  
Drip line is measured from the center of the tree to the outermost extent of the canopy

