Symbiosis Tree Care

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Seth Davis
4917 East Mercer Way
Mercer Island, WA 98040

July 8, 2019

Dear Mr. Davis,

Property located at 4825 East Mercer Way on Mercer Island Washington (King County Parcel #2162000070) is directly north of your property. Plans call for construction of a new house on the property.

Several adjacent property owners have expressed concerns related to new home construction since a wetland is present and tree failures to the west and upslope have impacted surrounding properties.

On June 29, 2019 Kurt Fickeisen from Symbiosis Tree Care came to the 4825-Property to inspected and evaluated trees.

This report provides information on several 4825-Property trees and evaluates prior assessments by arborists on the property. Recommendations based on observations and findings are provided. Please see Assumptions and Limitations for this report (Assumptions and Limitations).

Summary

Installation of a new home on property located at 4825 East Mercer Way on Mercer Island Washington is planned. Due to existing mature trees on the property, exploration to discover the extent of root growth within a potential driveway location was conducted.

While exploration exposed few roots at 2-feet below grade or deeper in some locations, **unexposed root growth is likely to be present within the area where a new driveway is planned**.

Additional root exploration to deeper depths is recommended prior to project approval.

Observations

The 4825-Property contains a parcel of undeveloped land adjacent to several single-family homes. Mature trees on the property include a big leaf maple *(Acer macrophyllum)*, a western hemlock *(Tsuga heterophylla)*, and two Douglas firs *(Pseudotsuga menziesii)* numbered 916 and 917 (Photo-1).

The Douglas firs have the following diameter measurements at 54-inches above grade

- #916: 76-inches
- #917: 42-inches

The big leaf maple and both Douglas show signs of good structural condition and the western hemlock shows signs of fair to poor structural condition.

Radial canopy spread of both Douglas firs range between 20 and 23-feet

- Each fir requires a minimum of 1,256 to 1,661 square feet for root growth based on canopy spread measurements

Based on potential interests in construction on the 4825-Property trees were inspected by two Arborists

- 2008: Scott Baker of Tree Solutions Inc.
- 2019: Brian Gilles of Gilles Consulting

While assigned different names or numbers, the Douglas firs mentioned above were inspected and are identified by number assigned by Gilles Consulting (Figure-2).

Potential Root Growth Conflicts

While tree trunks and canopies represent potential obstacles to construction, root growth is a potential conflict and not visible without additional below grade exploration. Both Gilles Consulting and Tree Solutions Inc. explored soil for root growth between the two Douglas firs and the line marked as the, "Approximate location of the air spaded trench" (Figure-2).

Gilles Consulting: East Mercer Highlands Drive Root Exploration

The Gilles Consulting report documents finding clay soil 2 to 3-feet below grade and states, "blue impenetrable soil was encountered at deeper depths." In at least one case solid clay was encountered when a depth of 40 to 46-inches was reached (Figure-3).

Gilles Consulting: Additional Root Exploration

Upslope and west of excavation described above, Gilles Consulting's root exploration exposed several large diameter roots (Figure-4, Figure-5)

- Expose roots measure between 2.9 and 4.6-inches

Exploration performed by Gilles Consulting encountered clay soils or solid clay at greater depths.

Tree Solutions Root Exploration

Tree Solutions Inc. explored the area to determine root growth patterns.

While their exploration exposed silty clay soil, **sandy loam soil was also encountered** (Figure-6).

Discussion

A Critical Area Report produced by Talasae Consultants Inc. for the Hou Property (KC Parcel #2162000070) classifies large areas of Category 3 wetlands.

Douglas fir trees prefer well drained soil and do not perform well in excessively wet soil as found near creeks or wetlands.

Douglas fir root masses require areas equivalent to or greater than the canopy spread of each tree. Given radial canopy spreads of between 20 and 23-feet, **each fir requires at least 1,256 to 1,661 square feet for root growth based on canopy spread measurements**.

Given the species preference for soil free of excessively damp areas, most fir roots grow south and west of trunks. This area is within the area marked as “Approximate location of the air spaded trench,” in Figure-2

While clay soils to hard layers of clay were encountered, sandy and or root permeable soil may be present at deeper depths or near exposed clay soils.

Excavation Depth

Soil exploration reached a depth of 2-feet in many locations and deeper depths in isolated locations.

While tree roots typically grow in the upper 2-feet of soil, **roots may reach greater depths if permeable soil is present, and or if layers of clay soil reside above sandy textured soil (Figure-7)**.

Placement of a new driveway is likely to require excavation below the upper 2-feet of soil. Tree roots may be present at these depths

Conclusion

While significant tree roots were encountered at depths of 2-feet or less in locations where air spaded trenching took place, significant tree roots are likely present at greater depths and in soil where the new driveway is planned or preferred.

In addition, placement of a new driveway, and construction of a new house on the 4825-Property will increase runoff and may impact health and stability of significant trees on property to the south (4917 East Mercer Way).

Recommendations

Prior to approving placement of a new driveway in the desired location, additional root exploration is recommended due to likely chances of encountering significant roots.

In addition, an assessment of impacts on tree stability on the 4917 East Mercer Way property is advised along with impacts associated with new runoff onto the 4825-Property

If you have questions about the contents of this report contact Symbiosis Tree Care.

Sincerely

Kurt Fickeisen

International Society of Arboriculture™ (ISA) Certified Arborist # RM-451A
ISA Tree Risk Assessment Qualified
American Society of Consulting Arborists Registered Consulting Arborists© # 472

Figure-1

King County iMAP 2017 Aerial Image

Figure-2

Proposed Site Plan:

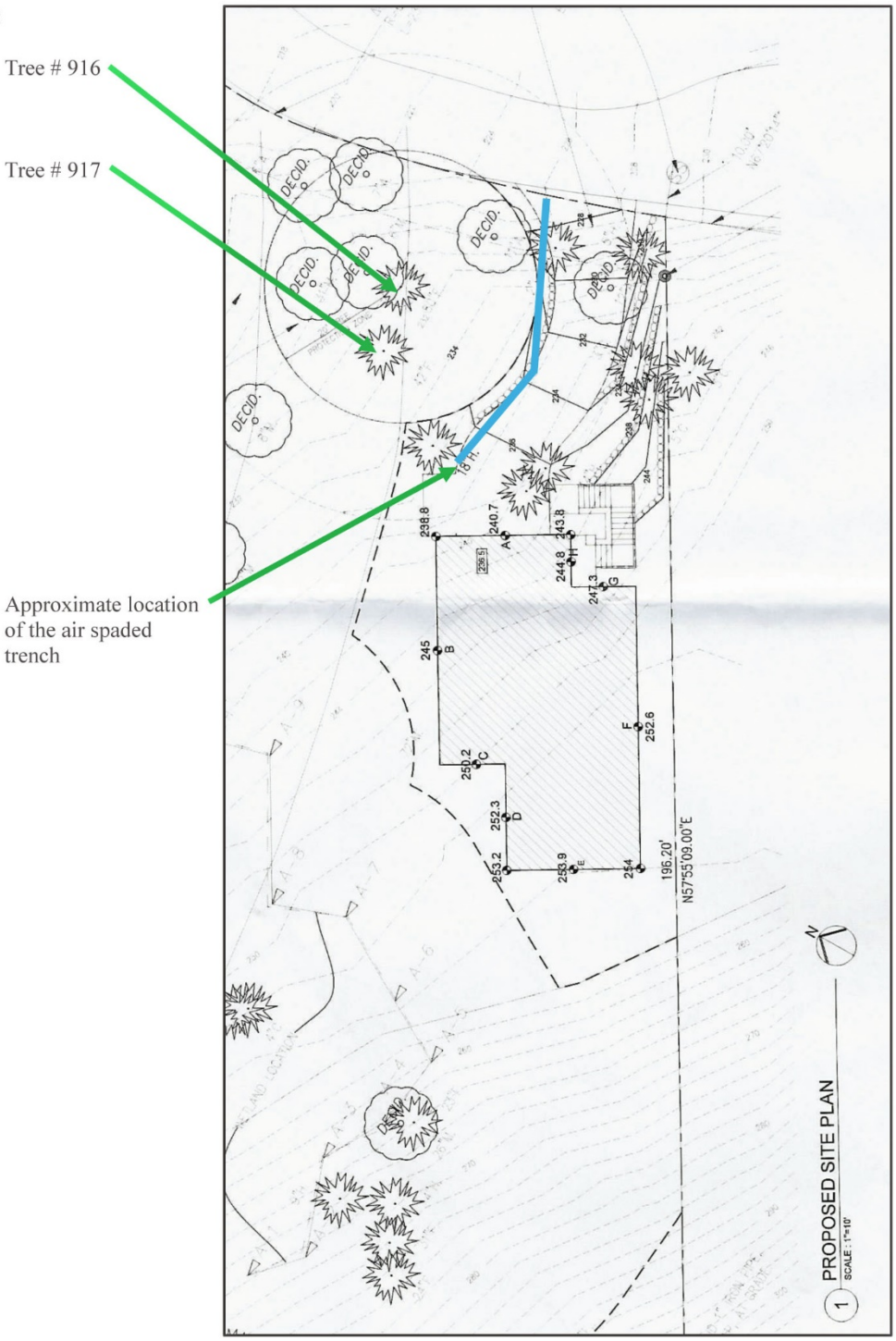

Figure-3

Photo # 2: Looking west from the road at the trench being blown and shoveled. Note the tarp under the soil in the roadside ditch to capture the soil as it moved down. This soil was then put back up into the trench. The roots observed appear to be from the adjacent shrubs.

Photo # 3: Looking down into the trench. At approximately 26 to 34 inches below the surface solid blue clay was encountered. In a few random places the operators forced their way into the clay to a depth of 44 to 46 inches. They encountered solid clay at those depths also.

The small roots present are from the invasive English Ivy and ground cover shrubs.

Tip of shovel.

Blue, impenetrable clay layer 26 to 34 inches below the surface.

Figure-4

Photo # 4: Looking down at the only Douglas Fir tree roots encountered from the two subject trees. A fourth root was encountered at the bottom of the trench at approximately 30 inches of depth. They measured 2.9", 4.6", 3.7", & an estimated 2.5".

Photo # 5: The last several feet of the trench showing roots of shrubs and the Hemlock in poor condition, but no Fir Roots.

Figure-5

Photo # 6: The crew finishing the day with a bale of straw covering the open soil to minimize erosion.

The Four Douglas Fir Tree Roots

City Staff requested that we clearly mark the location of the only four roots that were encountered from trees # 916 & 917. Therefore, on May 30, a small length of the trench was left open where these four root are. I returned on June 4, 2019 and put in four pieces of lath with the roots numbered. Then I refilled the trench.

Photos # 7 & 8: The open portion of the trench on June 2, 2019 before and after the trench was filled and the root locations marked with lath.

Figure-6

The soil exposed by the excavation was sandy loam. A small lens of silt clay was also encountered. I was able to insert my probe another 36" from the bottom of the excavation without much force, indicating that the sandy well drained soils continue in this area. Given the soil conditions on the site it would not surprise me to find more roots of significant size growing at a greater depth than was exposed during this investigation.

After photographs were taken by various people on the site, Mr. See filled the trench having sprinkled some fertilizer and unidentified fungal (mycorrhizae) inoculants into the hole. I do not think that this was necessary but it is unlikely to cause any problems.

Figure-7

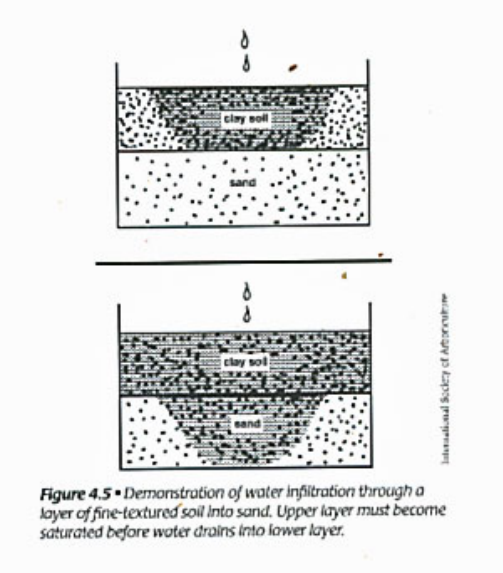

Figure 4.5 • *Demonstration of water infiltration through a layer of fine-textured soil into sand. Upper layer must become saturated before water drains into lower layer.*

(International Society of Arboriculture 1997)

Photo-1

#916 & #917 are Douglas fir

Works Cited

International Society of Arboriculture. 1997. *Plant Health Care for Woody Ornamentals.* Champaign, IL: International Society of Arboriculture.

Assumptions and Limitations

ASSUMPTIONS AND LIMITING CONDITIONS

Kurt Fickeisen
International Society of Arboriculture (ISA) Certified Arborist #RM 451A
ISA Tree Risk Assessment Qualification
American Society of Consulting Arborists Registered Consulting Arborist #472
Owner Symbiosis Tree Care LLC

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character.
2. All existing liens, encumbrances, and assessments, if any, have been disregarded (unless otherwise noted), and the trees are evaluated as though free and clear, under responsible ownership and competent management. It is assumed that no violations of applicable governmental regulations have occurred.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible, however, Symbiosis Tree Care can neither guarantee nor be responsible for the accuracy of information.
4. Symbiosis Tree Care shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in our fee schedule and contract of engagement.
5. Loss or alteration of any part of this report invalidates the entire report.
6. This report shall be used for its intended purpose only and by the parties to whom it is addressed. Possession of this report does not include the right of publication.
7. Neither all or any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales, or other media, without the prior expressed written or verbal consent of Symbiosis Tree Care.
8. This report and any values expressed herein represent the opinion of Symbiosis Tree Care. Our fee is in no way contingent upon any specified value, a result or occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs, 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.
10. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection, and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring.
11. There is no warranty or guarantee, expressed or implied that problems or deficiencies of the tree or other plant or property in question may not arise in the future.
12. The right is reserved to adjust tree valuations, if additional relevant information is made available.