

Tree #2



TERAGAN
& ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

DATE: October 23, 2017

TO: Wes Wilson, Utility Maintenance Specialist III. Public Works Operations Center, City of Oregon City

FROM: Suzie Spencer, *ISA Certified Arborist, PN-6544A, ISA Qualified Tree Risk Assessor*

RE: Tree Risk Assessment of 37-inch Oregon white oak (*Quercus garryana*) east of Mt. Pleasant Apartments, 1208 Linn Avenue, Oregon City 97045.

Summary

This report provides a risk assessment, and options for addressing the issues for a 37-inch diameter Oregon white oak (*Quercus garryana*) in the street parking area east of Mt. Pleasant Apartments, north of Mt. Pleasant School in Oregon City. This tree is one of two Oregon white oaks assessed; each tree addressed in separate reports. A risk rating is assigned to the tree with options for mitigating the observed risks. For the three possible modes of failure detailed below, the greatest risk is associated with whole tree failure. The risk rating for whole tree failure is **high**. My recommendation is to remove this tree.

Background

The City of Oregon City Public Works division requested our firm complete a Tree Risk Assessment to determine the risk associated with two Oregon white oaks on Linn Avenue northeast of Mt. Pleasant Elementary School and Mt. Pleasant Apartments. At approximately 1:30am on Tuesday September 19th, a larger Oregon white oak approximately 25-feet to the south of the oak northeast of Mt. Pleasant Elementary School in the same parking area failed across Linn Avenue. This failure stemmed the concern regarding the stability of the remaining two oaks of similar size, age, and growing environments to the north.

Assignment

The assignment requested of our firm is as follows:

1. Complete a Basic Risk Assessment of two Oregon white oaks on Linn Avenue near Mt. Pleasant Elementary School and Mt. Pleasant Apartments.
2. Prepare two separate arborist reports for each tree summarizing the findings of the Tree Risk Assessments.

Limitations

The following are limitations of our assessment:

- Tree Risk Assessment considers only known targets and visible or detectable tree conditions.
- Tree Risk Assessments represent the condition of the tree and site at the time of the assessment on October 2, 2017 and October 4, 2017.
- Any tree, whether it has visible weakness or not, will fail if the forces applied exceed the strength of the tree or its parts. The risk assessment only considers normal weather conditions that might occur during a one-year period; it does not consider unusual or extreme weather.
- The risk level determined during a risk assessment is not a guarantee of tree stability or instability.

Assessment

On October 2, 2017 I visited the site on Linn Street with Wes Wilson and his colleague from Oregon City Public Works to assess the risk associated with a 36-inch and 37-inch Oregon white oak in the street parking area off the northeast corner of Mt. Pleasant Elementary School and east of Mt. Pleasant Apartments. A basic visual assessment from the ground (Level 2) was conducted where the tree was evaluated from all sides from varying distances. The visual assessment was done by walking around the tree, inspecting the ground around it, the base of the tree, and observing the trunk and crown for outward signs of defects or conditions of concern. Soil probing was also performed. Advanced (Level 3) assessment techniques were not performed such as climbing the tree or completing a root crown excavation to examine roots. The City had retained the root wad of the recently failed Oregon white oak on a separate property that we also visited on this date. On October 4th, I returned to the Linn Street site to collect samples for pathogen laboratory analysis from the 36-inch Oregon white oak to the south and gather soil probing data on the 37-inch Oregon white oak. The weather on both dates was sunny and calm.

Observations

The assessed tree is a 37-inch diameter Oregon white oak (*Quercus garryana*), approximately 40-feet in height (see Figure 1). It is in a parking strip between the sidewalk and bike lane. Asphalt is paved on all sides of the trunk at varying distances; 15-inches on the east side, between 8 and 26-inches on the south side, 10 to 16-inches on the west, and 12 to 16-inches on the north side. The oak visually appears to be in fair health and is of poor structural condition. The tree's health is rated fair as the tree's crown is exhibiting signs of stress such as smaller off-colored leaves and short internodal growth, however there is limited die-back. The tree's structure is rated as poor as the crown appears to have been topped at least two times many years ago, with topping cuts appearing to be large, 6-inches in diameter and greater (see Figure 2). The resulting crown has many large diameter dead stubs, many crowded branches originating from the same point, and upright growing branches (water sprouts) that are likely to be poorly attached. When viewed from the east, the crown is balanced, only slightly heavier to the south. The north portion of the crown is taller to the east, but appears to be weight balanced to the east and west.

Every 20-inches around the tree adjacent to the tree's buttress roots, at 4 to 8-inches from the trunk, I probed the soil with a 3-foot long metal probe. This is a low-invasive technique to determine the integrity of structural roots. In most locations, the probe penetrated about 12-inches, which may indicate structural root decay. On the northeast side, the probe penetrated 27-inches at the location of a buttress root, which strongly indicates the presence of decay on that structural root. On the tree's east side along Linn Avenue, the buttress is significantly decayed at the soil level; the 3-foot probe passed under the tree easily at this location (see Figure 3). Above this decay is a 6-inch diameter wound with decay and wound wood. Approximately 10-feet high on the east side, there is the remnant of a metal t-post where the trunk has grown around it (see Figure 4). On the south side, there is another large wound with decay and wound wood. Below this wound is a 10-inch decay pocket and a lack of buttress flare. On the west side, there is another decay pocket where I could not penetrate with the 3-foot probe entirely (see Figure 5).

Discussion and Recommendations

The Oregon white oak likelihood of failure for the whole tree or parts of the tree was assessed in the context of a one-year time frame. Each failure mode is assessed to determine an overall risk rating on a scale of Low, Moderate, High, and Extreme. The possible failure modes for the assessed Oregon white oak are: 1. Failure of one of the poorly attached branches at topping points; 2. Failure of any of the dead large-diameter stubs; and 3. Whole tree failure. Each of these failure modes are discussed in detail below. The targets of concern are the apartments to the west, parking areas to the north and south, vehicular and pedestrian traffic on Linn Avenue and sidewalk.

1. Poorly Attached Branch Failure

The likelihood of failure of any of the multiple possibly poorly attached branches resulting from the at least two prior topping events over a one-year period is **possible** due to the suspected decay commonly associated with topping at the branch unions that may have penetrated the trunk wood and the branch's weak attachment points. All the targets mentioned above are of concern, with the likelihood of impact being **high**. The consequence of failure is **severe** as topping occurred many years ago, resulting in considerable upright growth and therefore weight that would likely strike the targets of concern. The risk rating of the failure of any of the branches post-topping is **moderate**.

To assess the need to mitigate the moderate risk associated with this type of branch failure, I recommend a climbing arborist inspect the topping points to determine the presence and extent of decay. Depending on the results of this inspection, pruning and cabling may be options to utilize in addressing the strength of branch attachment.

2. Large Dead Stub Failure

The likelihood of dead wood failure over a one-year period is **probable**. All targets are of concern as there is significant deadwood throughout the crown, especially at topping points. The likelihood of impact is **medium** based on the target occupancy rates. The consequences of failure are **significant**. The risk rating for large dead stubs throughout the tree is **moderate**.

Mitigating the risk associated with this dead wood is to crown clean prune the tree by removing any dead, damaged or diseased wood greater than 2-inches in diameter.

3. Whole Tree Failure

Winds most likely to cause failure in this area are infrequent and come from the south/southwest. With the recent loss of the largest of the three trees to the south, the wind pattern forces have changed, exposing the tree to south/southwest winds buffered by the one 36-inch Oregon white oak to the south.

The visible presence of decay on the north, east, south and west sides of the buttress coupled with the ability of the metal probe to penetrate where structural roots were likely located and the basal trunk depressions (see Figure 6) on the north, east and south sides, indicates extensive decay in critical structural components. This is compounded by the likely root suffocation and therefore death of roots when the parking area was created. This likelihood is supported by the minimal sidewalk and road damage caused by the oak that recently failed to the south that was growing in similar conditions. The failed oak's root wad revealed highly decayed structural roots.

The likelihood of whole tree failure in one year is **probable**. The possible targets of failure are the apartments, parking, and two lanes of traffic possibly including power lines. The presence of basal decay on many sides of the tree makes predicting failure patterns difficult. The likelihood of impact is **high** as winds from the south/southwest could cause the tree to fall to the north where the occupancy rate of the apartments is more stable than traffic and pedestrian usage. The consequences of whole tree failure would be **severe**. The risk rating of whole tree failure due to possible root damage and decay of the 37-inch Oregon white oak is **high**.

If it is desired to retain this tree, further analysis which may include a root crown excavation would be required to rule out advanced root decay before any recommendation would be made to retain this tree. Removing the tree will eliminate all its associated risks.

The largest of the three oaks failed near 1:30am on September 19th, 2017. The previous day, 0.45-inches of rain fell. Just before the reporting of tree failure, there was a 9mph wind gust that came from the south/southwest, with wind gusts not exceeding 15mph during the hour prior. These low wind gusts are not typically associated with tree failure which occurs when forces applied to a tree exceed its strength.

Recommendation: Given the **high** risk of whole tree failure, this tree should be removed.

No tree should be planted in the same location as this tree exists. The growing conditions will make it extremely difficult for a tree to grow and thrive, compromising its survival.

Conclusion

The assessed 37-inch diameter Oregon white oak in the street parking area east of Mt. Pleasant Apartment carries a **high** risk of whole tree failure due to possible root damage and decay by paving. I recommend the removal of this high-risk tree.

Please contact me if you have any questions or concerns regarding this report.

Sincerely,



Suzanne E. Spencer
ISA Certified Arborist, #PN-6544A
ISA Tree Risk Assessment Qualified

Enclosures:

- APPENDIX 1: Certification of Performance
- APPENDIX 2: Assumptions and Limiting Conditions
- APPENDIX 3: Tree Images
- APPENDIX 4: Site Map

APPENDIX 1 CERTIFICATION OF PERFORMANCE

I, Suzanne E. Spencer, certify:

- That a representative of Teragan & Associates, Inc., has inspected the tree(s) and/or the property referred to in this report. The extent of the evaluation is stated in the attached report.
- That Teragan & Associates, Inc. has no current or prospective interest in the vegetation of the property that is the subject of this report, and Teragan & Associates, Inc. has no personal interest or bias with respect to the parties involved.
- That Teragan & Associates, Inc.'s compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party, or upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.
- That the analysis, opinions, and conclusions that were developed as part of this report have been prepared per commonly accepted arboricultural practices.
- That a Board-Certified Master Arborist, Terrence P. Flanagan-BCMA # 0120BMTL, has overseen the gathering of data.

APPENDIX 2 ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant is assumed to be correct.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultants' role is only to make recommendations, inaction on the part of those receiving the report is the responsibility of the owner and their agents.

APPENDIX 3
TREE IMAGES



Figure 1. View from the north.

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Figure 2. Crown view of topping points.



Figures 3 and 4. Image above (3) is decay pocket opening on east side. Image below (4) is ground-level image of same decay pocket beneath tree.

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Figure 4. T-post at 10-feet on east side.



Figure 5. Decay pocket on west side; extensive decay visible in pocket. Handle is of 3-foot metal probe.

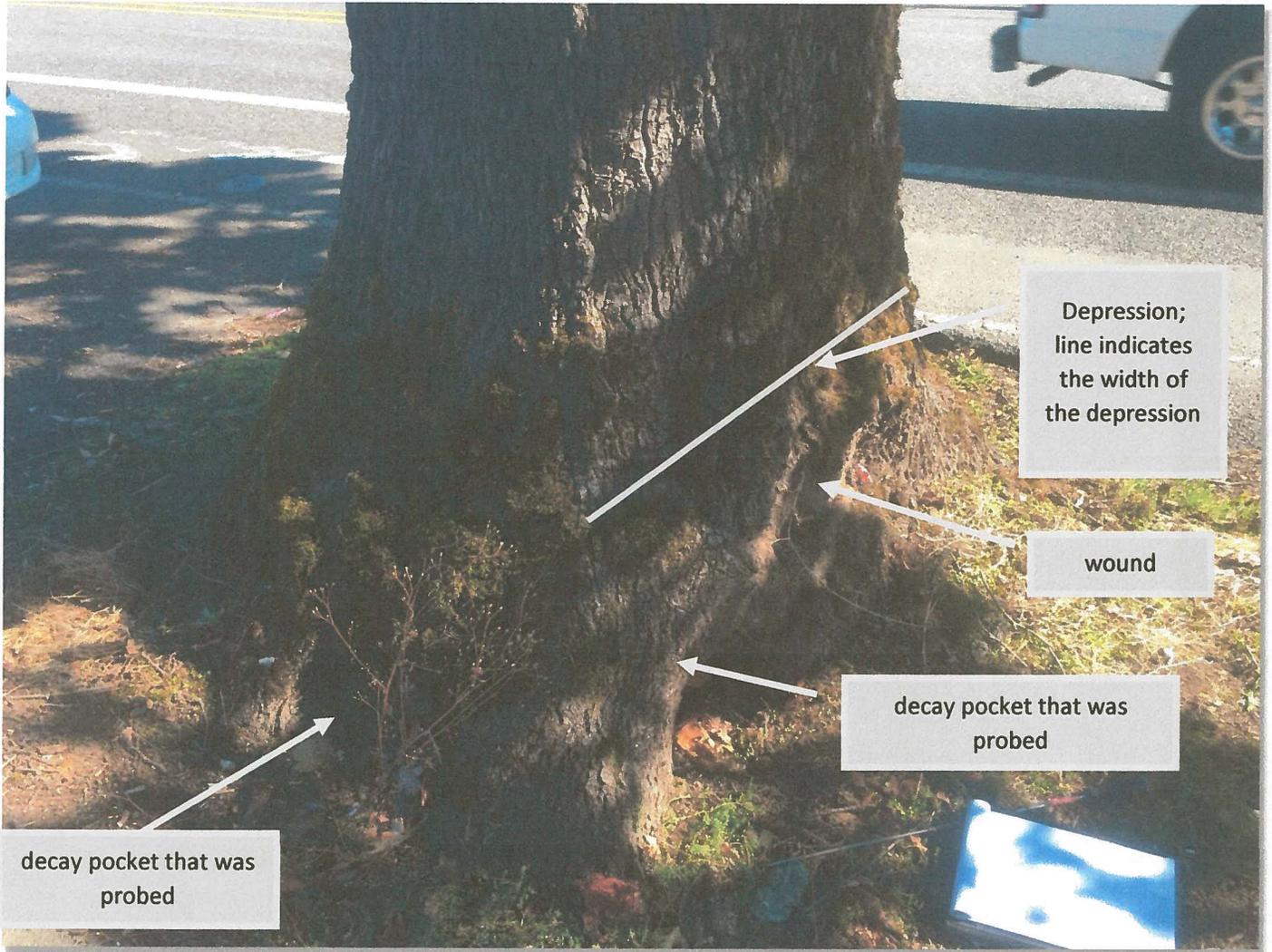


Figure 6. Trunk buttress. Depression at base of entire south side.



Figure 7. Failed root wad; extensive decay of structural roots.

APPENDIX 4
SITE MAP

