

Tree # 1



**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 36-inch Oregon white oak (*Quercus garryana*), northeast of Mt. Pleasant Elementary School, 1232 Linn Ave., Oregon City, OR.

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### Summary

This report provides the risk assessment for a 36-inch diameter Oregon white oak (*Quercus garryana*) in the street parking area at the northeast property corner of Mt. Pleasant Elementary School, 1232 Linn Ave. in Oregon City. This tree is one of two Oregon white oaks assessed; each tree is addressed in separate reports. A risk rating is assigned to this 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 of the 36-inch Oregon white oak 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 east of Mt. Pleasant Apartments. At approximately 1:30am on Tuesday September 19<sup>th</sup>, a larger Oregon white oak approximately 25-feet to the south 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.

### Assignments

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 my 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 at 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 and fungus sampling 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 4<sup>th</sup>, 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 to the north. The weather on both dates was sunny and calm.

## Observations

The assessed tree is a 36-inch diameter Oregon white oak (*Quercus garryana*), approximately 55-feet in height (see Figure 1). It is in a parking strip between the sidewalk and bike lane. Asphalt is paved to within 15-inches of the trunk on all sides. A fire hydrant is located on the tree's north side which assumes the supply line for the hydrant runs along the west edge of the right of way, possibly cutting off the roots on the west side of the tree when installed. The oak visually appears to be in fair health and is of fair 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 fair as the crown has two codominant leaders with a wide angle of attachment. The east leader is near vertical; the west leader, approximately 30-inches in diameter, has a 22-degree lean to the west toward the neighboring apartment building. At the north side of the two-leader union is a decayed scaffold branch stub which may indicate the presence of decay in the union, possibly destabilizing the two codominant leaders. In the northeast crown quadrant is a larger, approximately 12-foot long and 8-inch diameter dead scaffold branch with a nesting hole near the top. When viewed from the east, the top of the crown is heavier to the south, possibly due to the absence of the above-mentioned branches.

On the tree's northwest side, there are fungal fruiting bodies at the base of a depression in the trunk near soil level. Several layers of white hard fruiting bodies of varied ages span approximately two vertical feet. In the

lawn west of the tree across the sidewalk is a second dark brown dry fruiting body likely associated with tree roots that had been crushed, leaving powdery spores and slimy black material.

Every 20-inches around the tree adjacent to 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 of locations, the probe penetrated about 18-inches, which may indicate structural root decay. The probe location near the fungal fruiting body on the trunk penetrated approximately 30-inches which strongly indicates the possibility of decayed structural roots.

## 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 the west codominant branch; 2. Failure of the dead 12-foot scaffold branch; and 3. Whole tree failure. Each of these failure modes are discussed in detail below. The targets of concern are the apartments to the northwest, the school to the southwest, parking areas to the north and south, vehicular and pedestrian traffic on Linn Avenue and sidewalk, and possibly power lines above the east side of the street.

### West Codominant Branch Failure

The likelihood of the west codominant branch failure over a one-year period is **possible** due to the possibility of decay at the branch union and its 22-degree lean to the west. The target of this branch failure is the apartments to the west where the likelihood of impact is **high**. The consequence of failure is **severe** as the west codominant branch would cause extensive damage to the apartments and possibly the inhabitants within. Therefore, the risk rating of the failure of the west codominant branch is **moderate**.

To assess the need to mitigate the moderate risk associated with the potential of the west codominant failure, I recommend a climbing arborist inspect the codominant union to determine the presence and extent of decay. Depending on the results of this inspection, pruning and cabling may be options to mitigate the weakness of the leader if it is to be retained. If the codominant is to remain, reduce its weight by appropriate pruning. To eliminate the risk associated with this codominant leader, remove it entirely. However, I do not recommend this as it would create a large wound which may become a pathogen entry point.

### 12-foot Dead Scaffold Branch Failure

The likelihood of dead wood failure over a one-year period is **probable**. The target of this failure is southbound traffic. The likelihood of impact is **somewhat likely** based on traffic frequency. The consequences of failure are **significant**. The risk rating for the 12-foot dead scaffold branch failure on the northeast side of 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.

## 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 the brunt of south/southwest winds.

The laboratory confirmed the presence of *Ganoderma applanatum*, which is a common root and buttress rot fungus. This fungus was found approximately 25-feet to the west of the tree in the lawn outside the elementary school and therefore may have been associated with either the assessed tree or the failed tree to the south. The presence of this fungus does not conclusively indicate extensive decay in tree roots as it may have been locally associated with a root wound caused by a lawn mower shaving off the top of the root. However, with the presence of the conk on the northwest side of the tree's trunk in addition to the above-mentioned conk in the lawn, the possibility that there is extensive root, buttress and trunk decay associated with this fungus cannot be ruled out.

The laboratory was unable to confirm the identity of the conk found on the tree's north trunk near the base due to the age of the sample (which was the youngest on the tree), and the appearance that the original fungus had been parasitized by a secondary fungus. The presence of several years' worth of conks, the depression on the north trunk above the fungi, and that all conks appear to have been parasitized indicate the original fungus, possibly a species of *Ganoderma*, has colonized the tree for many years. The potential damage associated with the presence of wood-decaying fungi is compounded by the likely root suffocation and therefore death of roots when the parking area was created, and by the installation of the fire hydrant which may have severed up to forty percent of the tree's roots, including structural roots. The likelihood the tree has significant advanced decay in its major roots is supported by the minimal sidewalk and road damage caused by the recent oak's failure that was growing in similar conditions; the root wad of the failed tree shows highly decayed structural roots.

The likelihood of whole tree failure in one year is **probable**. The possible targets of failure are the apartments, Mt. Pleasant Elementary School, parking, and two lanes of traffic possibly including power lines. The likelihood of impact is **high** as targets of concern surround this tree. The likely extent of root decay makes predicting failure patterns difficult. The weight and angle of the west codominant leader increases the possibility of failure toward the apartments. The presence of root decay fungi and decayed roots found by probing on the northwest side of the tree could also cause the tree to fail to the south/southeast across Linn Avenue. The consequences of whole tree failure could be **severe**. The risk rating of whole tree failure of the 36-inch Oregon white oak is considered **high**.

If it is desired to retain this tree, further analysis which may include a root crown excavation will 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 19<sup>th</sup>, 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 speed wind gusts are not typically associated with whole tree failure which occurs when forces applied to a tree exceed the strength of the tree.

The presence of a *Ganoderma sp.* conk in the lawn west of the 36-inch Oregon white oak indicates the presence of this aggressive pathogen, and has possibly infected the assessed tree. The presence of several conks on the lower northwest trunk indicates a pathogenetic infection that could cause the same or similar weakness in this tree as was present in the tree that failed.

**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 36-inch diameter Oregon white oak in the street parking area northeast of Mt. Pleasant Elementary School carries a **high** risk of whole tree failure due to possible root damage by paving, pathogen infection, and utility installation. 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

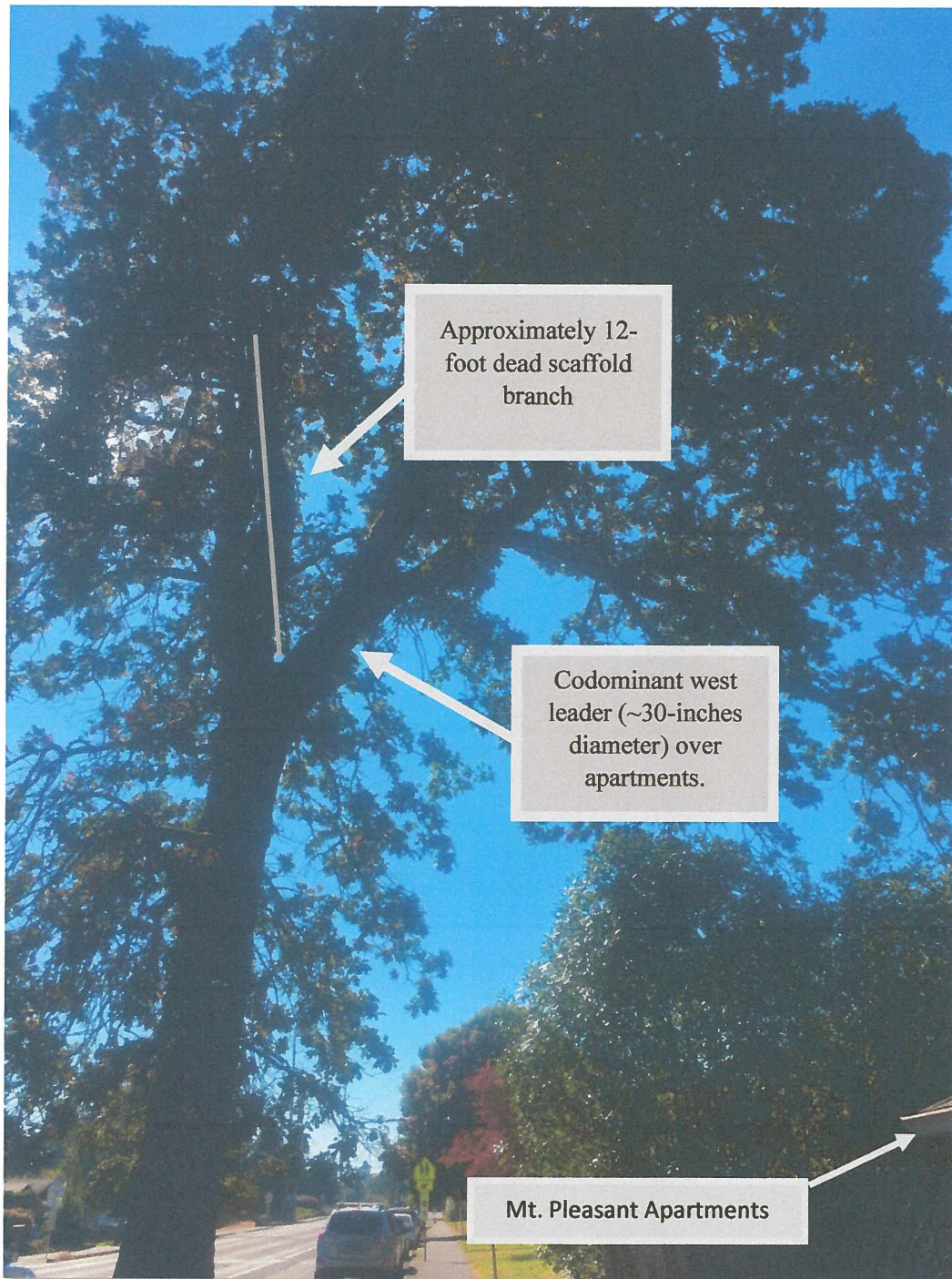


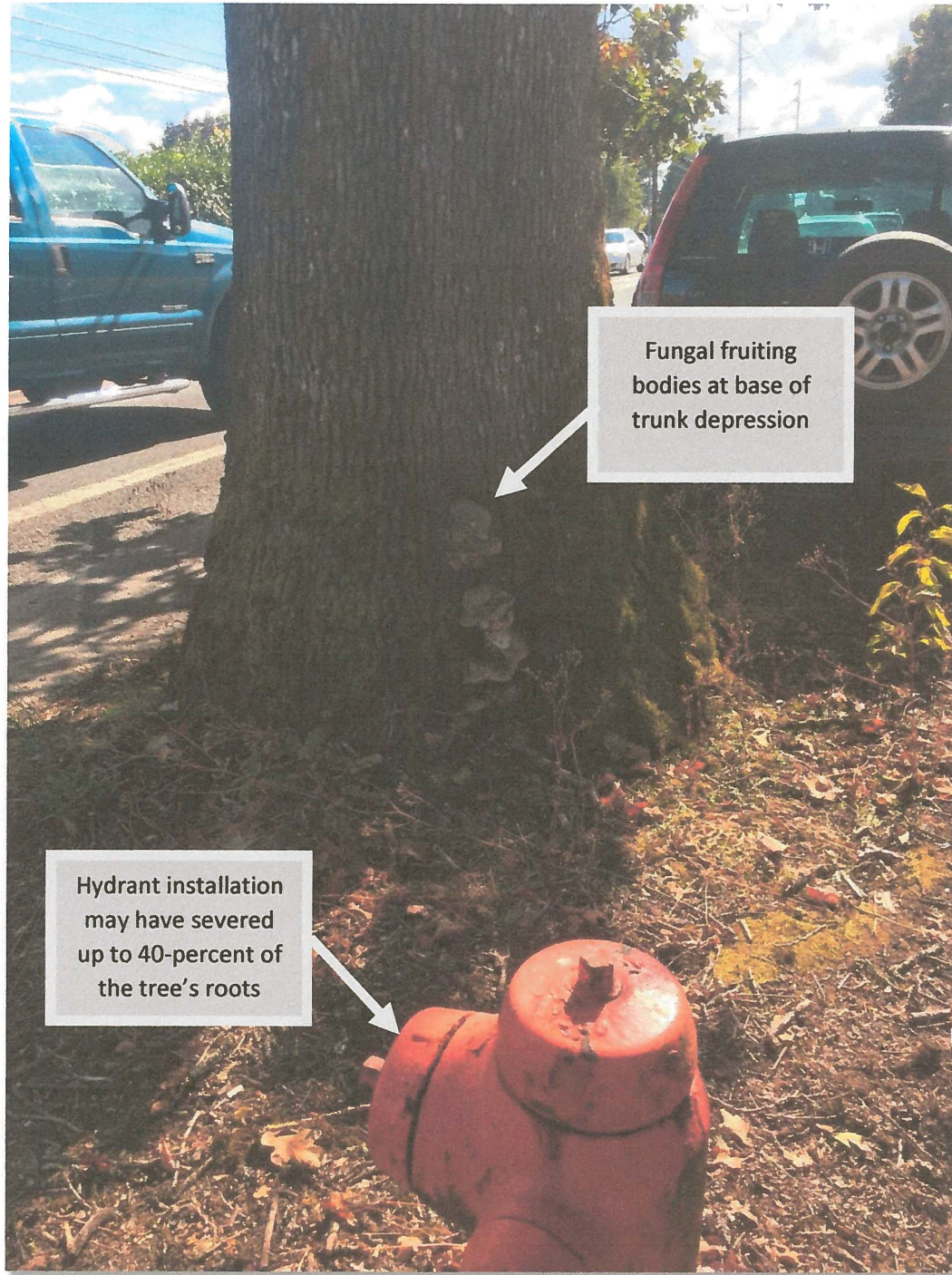
Figure 1. View from north





*Figure 2. View from east.*





*Figure 3. Fungal fruiting bodies; hydrant proximity.*





*Figure 4. Probe penetration at structural root location near fungal fruiting bodies.*





*Figure 5. Failed root wad; extensive decay of structural roots.*



APPENDIX 4  
SITE MAP

