Tree Risk Assessment Report

Client: Town of Weston, CT Attn: Bill Loomis, Tree Warden

Inspection Date: August 9, 2016

Inspectors: Neil Hendrickson, PhD; Doug Williams, Manager and Arborist representative, Bartlett Tree Experts, Stamford, CT; and Dan Urcioli, Arborist representative, Bartlett Tree Experts, Stamford, CT

Time Frame: 3 years

Tree:

Species: Red oak (*Quercus rubra)* DBH: 4 trunks of approximately 40" each Est. Ht. Approx. 80'

Tree Location: edge of Northfield Rd

Assignment:

1. Perform a *Level 2 Advanced assessment* (as defined in the *International Society of Arboriculture's (ISA's) Best Management Practices (BMP) for Tree Risk Assessment* and the *ANSI A300 Part 9 Standard for Tree Risk Assessment*). A mallet was used to assess decay in the lower stem and major flare roots.
2. Make recommendations to reduce risk where appropriate.
3. Provide a written report that documents the level of risk based on tree and site conditions observed at the time of the inspection.
4. Only high value targets were included in potential risk ratings. These targets were people/cars and wires/road. Tree failure could damage other targets including adjacent vegetation, and possibly other small structures near the tree (the stone wall, for example). Additional targets can be assessed in risk ratings upon request.

Target Description

Target	Description	Within Dripline	Within 1X height	Within 1.5 x Height	Occupancy/ Frequency of site use
1	People/cars (no unoccupied cars likely)	X			Occasional
2	Utility wires	X			Constant
3	Road	X			Constant

Site Factors

History of Site/Tree Failures: Appears to have lost limbs/leader to either storm damage or pruning

Topography: generally flat

Site Changes: None evident since building of nearby retaining wall; tree appears to have always been open-grown

Soil Conditions: road and driveway covers more than half the root zone, grass covers the other half.

Common Climate Conditions: Thunderstorms with high winds can routinely occur in growing season. Snow and ice accumulation in winter.

Tree

Tree Health/Vitality; Tree is in good condition considering age and location.

Species Failure Profile: Red oak is a fairly failure-resistant species. Branch and stem failures are uncommon. Root disease in old age is primary concern. Root rot can lead to soil and root failures.

Defects and Conditions the Affecting Likelihood of Failure

Crown

The crown is normal for the size of the tree, and fairly balanced symmetry. Other large trees nearby partially buffer wind loads, except on the side opposite the road, which is more open. There is some tip dieback and dead branches in different areas of the crown. There are large dead branches, most of which are over the road. The likelihood of dead branch failure in the three-year time frame is ***probable***.

Stems/Trunks

There are four main trunks/leaders, also known as codominant stems. The main concern of codominant stems is the main crotch, where all meet. This is a typically weak attachment.

One leader extending over the road shows separation from the other stems at the point of attachment. A cable which apparently helped support this stem has pulled out and is hanging in the tree.

Another leader over the road has sustained bark damage from apparent vehicle scraping of the bark. Decay appears to still be mostly superficial, and woundwood has formed around the edges. Nevertheless, it seems likely that vehicles, particularly tall ones, will continue to occasionally strike the tree, causing more injury and decay. This leader is also supported by at least one cable.

The cables in the tree appear to be old, in that ones that are visible from the ground are too low to be effective, or, as noted above, have pulled out. Cables need to be regularly inspected and maintained or replaced for them to continue to be effective.

Sounding the lower stem, from the main crotch to the root flares, with a mallet gave no indication of internal decay. There were no other obvious defects.

The likelihood of failure for three of the leaders in the next three years is ***improbable*** based on our inspection. We estimated the likelihood of failure of the remaining leader, towards the road that has separated from the main crotch, as ***possible.***

Roots

The root zone is restricted, with the road and driveway covering more than 50 percent of the root system. The side opposite the road, or tension-root side, is under grass.

The root collar is visible: the flare is pronounced on all sides. There is no indication of soil heaving or decay fruiting structures on flare roots. Sounding with a mallet gave no indication of decay in the root flares. The Likelihood of Failure in the next three years is ***improbable***.

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Risk Rating Summary								
Tree Part	**Condition of Concern**	**Part Size**	**Target**	**Failure**	**Likelihood of impact**	**Failure & Impact**	**Consequence**	**Risk Rating**
Crown	Dead branches	Up to 10"	People/cars	Probable	Low	Unlikely	Severe	Low
Crown	Dead branches	Up to 10"	Wires	Probable	Low	Unlikely	Minor	Low
Crown	Dead branches	Up to 10"	Road	Probable	High	Likely	Negligible	Low
Leader over road	Separation at crotch, failed cable	Entire leader	People/cars	Possible	Low	Unlikely	Severe	Low
Leader over road	Separation at crotch, failed cable	Entire leader	Wires	Possible	High	Somewhat likely	Minor	Low
Leader over road	Separation at crotch, failed cable	Entire leader	Road	Possible	High	Somewhat likely	Minor	Low

Notes on Likelihood of Failure: Our assessment was from the ground (Level 2). We could not judge the quality of the cable installation, or their ability to adequately support the leaders. As noted above, they appear old, and might not conform to current industry standards. Had we done an aerial (climber or bucket truck) inspection, our rating categories might be higher.

Notes on Likelihood of Impact: The likelihood of impact to people and cars is rated as low because although the tree is located adjacent to a road, we judged that the road has occasional occupancy. Occupancy might be frequent during parts of the day, but not around the clock.

Impact to the utility lines and road is rated as high because they are a constantly occupied target and the leader with the separation would strike both if it should fail. However, consequences are rated negligible or minor because power is often re-connected and trees fallen in roads cleaned up within hours. The likelihood of failure of the dead branches is rated as probable, but the likelihood of impact to either people/cars or wires is rated as low, due to the occasional occupancy of the road. Dead branches in the road can be easily cleaned up.

The question of vehicles hitting the tree is not a part of tree risk assessment. The concern in this report is limited to the likelihood of failure of some part of the tree, the likelihood that a part of the tree could strike a particular target, and the consequences of that impact.

Summary and Recommendations:

Tree Risk Rating: Low

Mitigation Recommendations:

1. If a low risk is not acceptable, remove this red oak and replant with another tree. The risk of failure cannot be reduced to zero unless the tree is removed and the stump ground.

2. If a low risk is acceptable and the tree is not removed, re-cabling should be a high priority. Proper cabling, with proper follow-up inspections, should greatly reduce the risk of leader failure for many years.

3. Pruning to remove dead branches is a high priority, and would reduce their likelihood of failure to improbable.

4. Pruning to reduce some of the longest limbs is recommended to reduce loads, and the likelihood of their failure. As with cabling, reduction pruning would not alter the risk rating.

Mitigation Priority: Pruning of dead branches is recommended as soon as possible, to reduce the likelihood of branch failure. Cabling can be done at the same time, as costs are far lower when pruning and cabling are done during the same visit.

Residual Risk: **None** if tree is removed; low for branch failure if tree is pruned; low for the whole tree even if pruning and cabling is performed.

Re-inspection Interval: Visual assessments are recommended annually and after major storms if tree is not removed. Cables should be inspected approximately annually.

Submitted by:

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Appendix:

Limitations of Tree Risk Assessments

It is important for the tree owner or manager to know and understand that all trees pose some degree of risk from failure or other conditions. The information and recommendations within this report have been derived from the level of tree risk assessment identified in this report, using the information and practices outlined in the *International Society of Arboriculture's Best Management Practices for Tree Risk Assessment*, as well as the information available at the time of the inspection. However, the overall risk rating, the mitigation recommendations, or any other conclusions do not preclude the possibility of failure from undetected conditions, weather events, or other acts of man or nature. Trees can unpredictably fail even if no defects or other conditions are present. It is the responsibility of the tree owner or manager to schedule repeat or advanced assessments, determine actions, and implement follow up recommendations, monitoring and/or mitigation. Bartlett Tree Experts can make no warranty or guarantee whatsoever regarding the safety of any tree, trees, or parts of trees, regardless of the level of tree risk assessment provided, the risk rating, or the residual risk rating after mitigation. This information is solely for the use of the tree owner and manager to assist in the decision making process regarding the management of their tree or trees. Tree risk assessments are simply tools which should be used in conjunction with the owner or tree manager's knowledge, other information and observations related to the specific tree or trees discussed, and sound decision making.

Glossary

Tree risk assessment has a unique set of terms with specific meanings. Definitions of all specific terms may be found in the International Society of Arboriculture's *Best Management Practice for Tree Risk Assessment*. Definitions of some of these terms used in this report are as follows:

The *likelihood of failure* may be categorized as imminent meaning that failure has started orcould occur at any time; probable meaning that failure may be expected under normal weather conditions within the next 3 years; possible meaning that failure could occur, but is unlikely under normal weather conditions during that time frame; and improbable meaning that failure is not likely under normal weather conditions, and may not occur in severe weather conditions during that time frame.

The *likelihood of the failed tree part impacting a target* may be categorized as high meaning that a failed tree or tree part will most likely impact a target; medium meaning that a failed tree or tree part may or may not impact a target with equal

likelihood; low meaning that the failed tree or tree part is not likely to impact a target; and very low meaning that the chance of a failed tree or tree part impacting the target is remote.

The *Likelihood of Failure and Impact* is defined by Table 1, the Likelihood Matrix:

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probably	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

The *consequences* of a known target being struck may be categorized as severe meaning that impact could involve serious personal injury or death, damage to high value property, or disruption to important activities; significant meaning that the impact may involve personal injury, property damage of moderate to high value, or considerable disruption; minor meaning that impact could cause low to moderate property damage, small disruptions to traffic or a communication utility, or minor injury; and negligible meaning that impact may involve low value property damage, disruption that can be replaced or repaired, and do not involve personal injury.

Targets are people, property, or activities that could be injured, damaged or disrupted by a tree failure

Levels of assessment 1) *Limited visual assessments* are conducted to identify obvious defects. 2) *Basic assessments* are visual inspections done by walking around the tree looking at the site, buttress roots, trunk and branches. It may include the use of simple tools to gain information about the tree or defects. 3) *Advanced assessments* are performed to provide detailed information about specific tree parts, defects, targets of site conditions. Drilling to detect decay is an advanced assessment technique.

Tree Risk Ratings are terms used to communicate the level of risk rating. They are defined in Table 2, the Risk Matrix, as a combination of Likelihood and Consequences:

Likelihood of Failure & Impact	Consequences of Tree Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Overall tree risk rating is the highest individual risk identified for the tree. The *residual risk* is the level of risk the tree should pose after the recommended mitigation. *Mitigation priority 1* is defined as mitigation activities that should be scheduled prior to the next growing season. *Mitigation Priority 2* can be scheduled on the next routine maintenance cycle.

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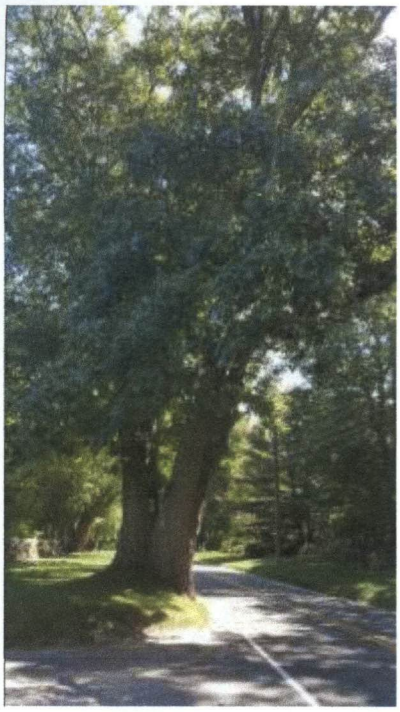
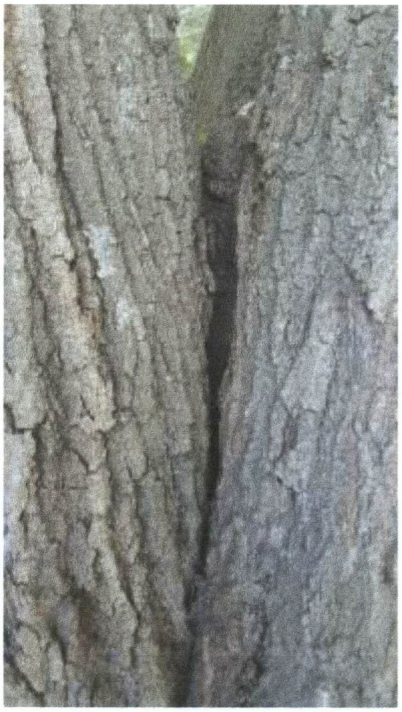
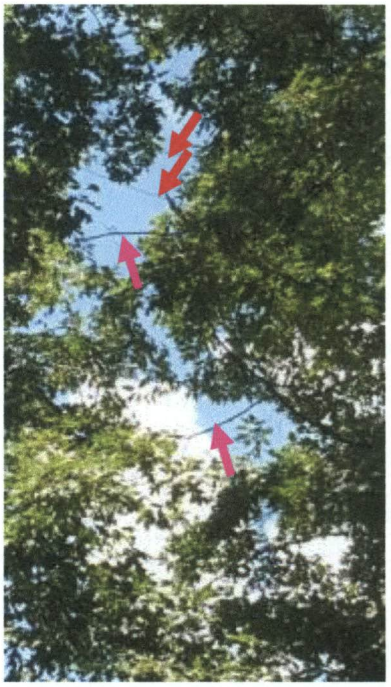


Red oak showing codominant stems and root zone restricted by road and driveway



Separation between leaders at main crotch

Dead branch and wires



Two visible cables (red arrows) and small dead branches (purple)

Base of the tree showing no obvious defects except grass up to the base.

Leader immediately adjacent to road, damaged by vehicle impacts