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Pages to follow: ~~0~~ 12
Subject: Hazard Tree Removal at McLoughlin House

Comments:

Please call if you have any other needs / questions

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Heidi

* Please toss 1st fax - missing even # pages - this fax is complete

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11814 SE Jennifer Street, Clackamas, Oregon 97015

April 24, 2009

McLoughlin House
Tree Health and Risk Assessment

Prepared for:

Gary Bickford
612 E Reserve Street
Vancouver, WA 98661

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Introduction

Background

Gary Bickford contacted me concerning the large maple located in the front of the National Historic site McLoughlin House in Oregon City, Oregon. The tree and its root system are located above a waterline for a fire suppression system along with other utilities for the site. According to Mr. Bickford, the fire suppression system needs below ground repairs which have the potential to damage the maple tree's root system. There are concerns to the tree's health and hazard risk as to whether the tree can be preserved or if a high enough risk exists that its removal would be more appropriate.

Assignment

On April 01, 2009, Mr. Gary Bickford hired me, Lyle J. Feilmeier, a Consulting Arborist employed by Collier Arbor Care to perform the following:

1. Visual tree assessment for health and risk potential on a sycamore maple on the front side of the McLoughlin House.
2. Assign tree with a numerical risk rating based on the methodology found in Evaluation of Hazard Trees in Urban Areas second edition by Matheny and Cark.
3. Provide a written report summarizing the findings.
4. Provide recommendations based on my findings

Limits of the Assignment

- No other trees where evaluated on the property.
- The health and risk assessment was performed from the ground for visual conditions. I did not make any observations below ground within the maple's root zone.
- I have very limited knowledge of any prior care or history of this tree other than the knowledge of past excavating performed when the initial fire suppression system was installed five to ten years prior.

Observations

Property Observations

The McLoughlin House is a National Historic site located at 713 Center Street, Oregon City, OR 97045. The landscape is mature with many large species of trees including American elm, European beech, horse chestnut, and sycamore maple to name a few. The McLoughlin House is located on the east edge of the property along Center Street. I also observed electrical primary power lines along Center Street.

Tree Observations

I made a site visit on March 31, 2009 to meet with Gary Bickford and a staff member to discuss and make observations concerning the health and potential risk of a mature sycamore maple (*Acer pseudoplatanus*). The maple is located near the front entry between the house and power lines (Appendix I -- Photos -- photo 1). The maple is approximately eight feet from the house's

foundation and the sidewalk. I measured the diameter of the trunk at four feet six inches above ground level to be 32 inches, and the height to be approximately 75 feet tall.

I observed the trunk to be vertical with good taper from the root zone to the canopy. The first branches of the canopy start approximately 15 feet above the ground. I observed several pruning wounds below the first branches with epicormic (sucker) growth.

The canopy of the maple consists of co-dominant trunks with included bark (two or more trunks of approximately the same size, with narrow angles of attachment without connective tissue between them. As tree size increases, a weaker trunk may split off). At the connection of the two co-dominant trunks I observed a large woody growth (Appendix I – Photos – photo 2). I can not identify this growth without further more detailed assessment and testing.

I observed most of the canopy lateral limbs over the house on the west side and over the primary electrical lines on the east side to have been removed with past pruning (Appendix I- Photos – photo 3). I identified several large dead branches within the canopy; however the canopy is in dormancy. I cannot confirm to what extent of deadwood exists until spring bud break. Overall I observed the canopy to have average annual growth of six to 12 inches at the branch tips over the entire canopy.

The root zone of the maple is located in close proximity to utility boxes including a large fire suppression system on the east side. On the south side of the root system I observed a sidewalk to the entry and on the west side the foundation of the McLoughlin House. I observed inadequate space for proper root growth and development (Appendix I – Photos – photo 4).

Analysis and Testing

Tree Hazard Risk

In order to assess the risk of the maple tree, I employed the methodology found in Evaluation of Hazard Trees in Urban Areas second edition by Matheny and Clark. This method assigns a numerical risk rating. The assessment information about the tree is divided into three components: failure potential, size of defective part, and target rating. The overall hazard rating is obtained by assigning a value (1, 2, 3 or 4) for each of the three components.

A "hazard tree" is any tree with a combination of structural defect and/or disease, which make it a high risk for failure, and a proximity to people or property, which makes it an imminent threat.

Failure Potential

Failure potential identifies the most likely failure and rates the likelihood that the structural defect(s) will result in failure within an inspection period. Criteria used for the ratings are:

1. **Low**: defects are minor (e.g. minor twig dieback, small wounds with good wound-wood development, thinning canopy, poor annual growth).
2. **Medium**: defects are present and obvious (e.g. cavity encompassing 10-25% of trunk circumference, co-dominant stems without included bark, moderate lean).

3. **High:** numerous and/or significant defects present (e.g. cavity encompassing 26-50% of trunk circumference, co-dominant stems with included bark, severe lean, visible conks on the trunk).
4. **Imminent:** defects are very severe, dead standing tree, soil is heaving on back side of lean, included bark is separating, cavity encompassing more than 50% of trunk circumference (e.g. the tree or part of the tree will fail at any time without a weather event)

I rated this maple "3" for the two co-dominate trunks with included bark at 15 feet above the ground. The woody growth at the branch connection, although I have not identified, also elevates my rating for failure potential.

Size of Defective Part

Size of defective part rates the size of the part most likely to fail. The larger the potential tree part to fail, the greater the potential for damage. Therefore the size of the failure affects the hazard potential.

1. The size of part most likely to fail is less than **6 inches** in diameter.
2. The size of part most likely to fail is **6-18 inches** in diameter.
3. The size of part most likely to fail is **18-30 inches** in diameter.
4. The size of part most likely to fail is greater than **30 inches** in diameter.

I rated this maple "3". The most likely part of the tree to fail would be a split between the co-dominate stems. Each stem has an approximate diameter of 20 inches.

Target Rating

Target rating rates the use and occupancy of the area that would be struck by the defective tree part. The following are examples used in rating the target:

1. **Occasional use:** (seldom used area or trail).
2. **Intermittent use:** (seasonal use, less than daily use).
3. **Frequent use, Secondary Structures:** (daily use for several hours, trail used daily).
4. **Constant use, Structures:** (Year-round use for a number of hours daily, parking lots, buildings).

I rated this maple "4". The area has structures within reach almost 360 degrees around the tree.

Hazard Rating

The overall hazard rating is obtained by assigning a value for each of the three components: failure potential, size of part, and target. Each component has a maximum rating of 4 points.

Hazard rating = Failure Potential + Size of Part + Target Rating.

The points in each of the three categories are added to obtain the overall hazard rating, with 12 being the maximum value. Ratings have only a relative meaning, i.e., a tree rated an 11 has a greater hazard potential than a 5. By definition a tree rated a 12 represents a significant hazard.

The hazard rating for the sycamore maple in the front of the McLoughlin House is "10" indicating a high risk potential.

Discussion

Hazard Tree Rating

Trees are considered hazardous when one or more of their parts have the potential to fail and cause property damage or personal injury. All trees have some potential to fail, but only a relative few actually do. Identifying and managing tree risk is a subjective process. Since the nature of tree failures are not well known, our ability to predict which trees will fail, when they will fail, and how they will fail is limited.

A tree hazard evaluation involves examining a tree for structural defects, associating those defects with a known pattern of failure then rating the degree of risk. A tree hazard assessment involves three components:

- A tree with the potential to fail;
- An environment that may contribute to failure;
- A person or object that would be injured or damaged (the target).

A hazard situation, by definition, requires the presence of a defective tree; a target and some event (ex. weather). Unless a target is present, a tree is not considered hazardous. Hazard ratings do not define "danger". Certainly, trees with ratings of 12 may be considered more dangerous than those with a rating of 5. However, a tree does not become dangerous at a given rating. Hazard ratings cannot strictly be defined as a numerical line for action. Some degree of risk will always be present when people live among trees. The hazard rating is only valid at the time of evaluation. Hazard ratings may change with time due to changing conditions and a living organism.

Root Damage Affects on Tree Health

Most tree root systems are located within the top thirty-six inches of soil. When excavating around roots damage may occur, affecting the health and anchorage of a tree's root system. Cutting excessive roots may result in the loss of the trees ability to absorb water and nutrients. Substantial root loss decreases the potential for a trees' long-term survival and eventually may cause death.

Conclusions

In conclusion, the sycamore maple located near the entry of the McLoughlin House has average annual growth. The maple's branch structure with the co-dominate trunks and included bark create a hazard rating of 10 out of a possible 12 points. This is high for potential risk; however, in order for this tree to fail a weather event would need to take place. A wind gust from the east or west could produce a limb failure of the included bark on the weaker of the two stems.

In my professional opinion, if excavation is to take place along the north side of the trunk for the repair of the fire suppression system, substantial root damage will occur. The maple's root zone has limited root space and the loss of the roots may have a negative affect on the trees short and long term health and stability may greatly reduce stability.

Recommendations

I recommend removal of the sycamore maple. The excavating will increase risk with the associated root loss for the repair of the fire suppression system. The limited space for proper growth and the near-by structures and primary power lines will continue the need for pruning to provide clearance.

I recommend hiring a professional TCIA Accredited tree care company and ISA Certified Arborist that follows the American National Standards Institution (ANSI) Z133.1 safety standards to remove this sycamore maple.

Appendix I – Photos

Photo 1

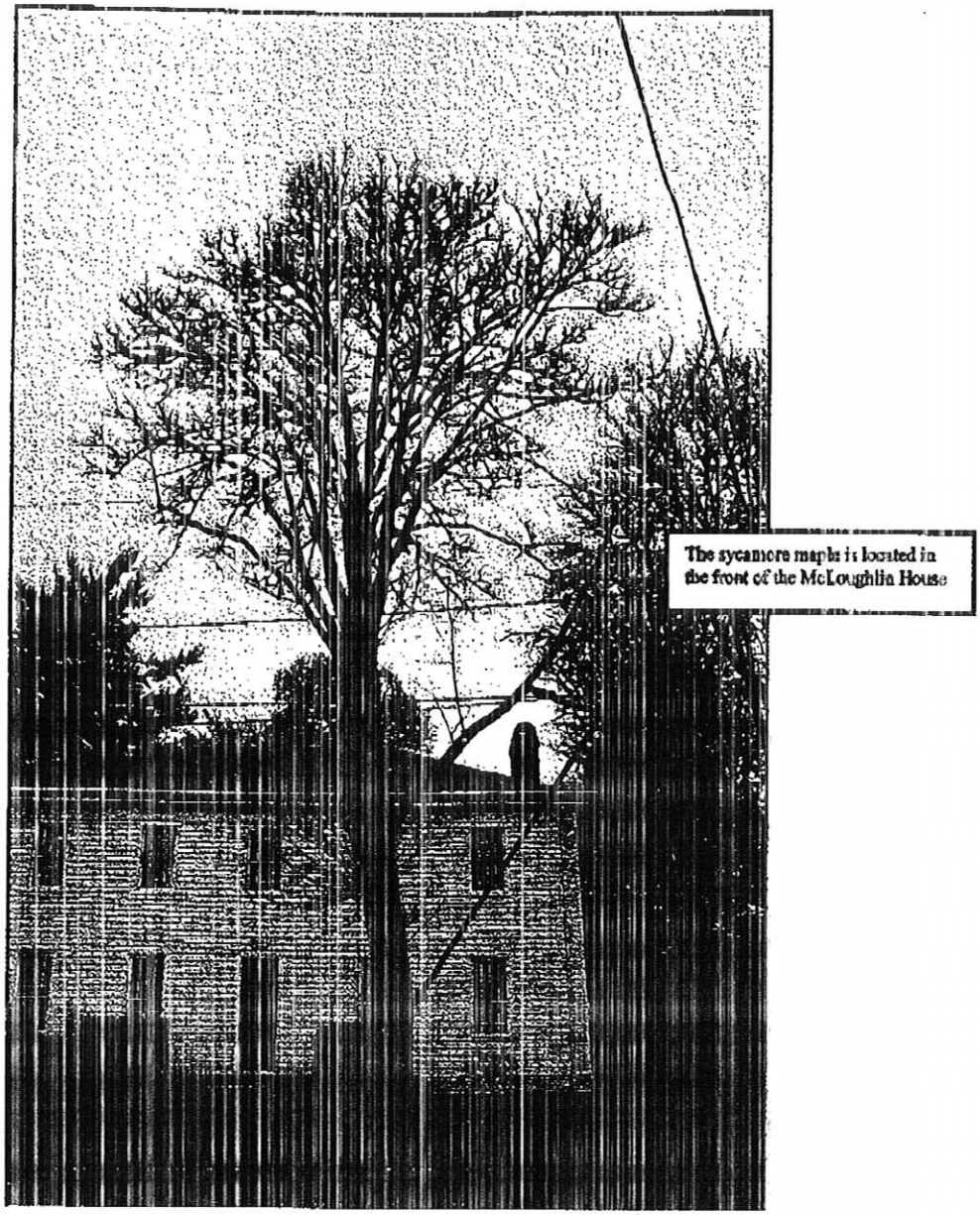


Photo 1 – Taken March 31, 2009 looking west from the east side of Center Street.

Appendix I -- Photos cont.

Photo 2

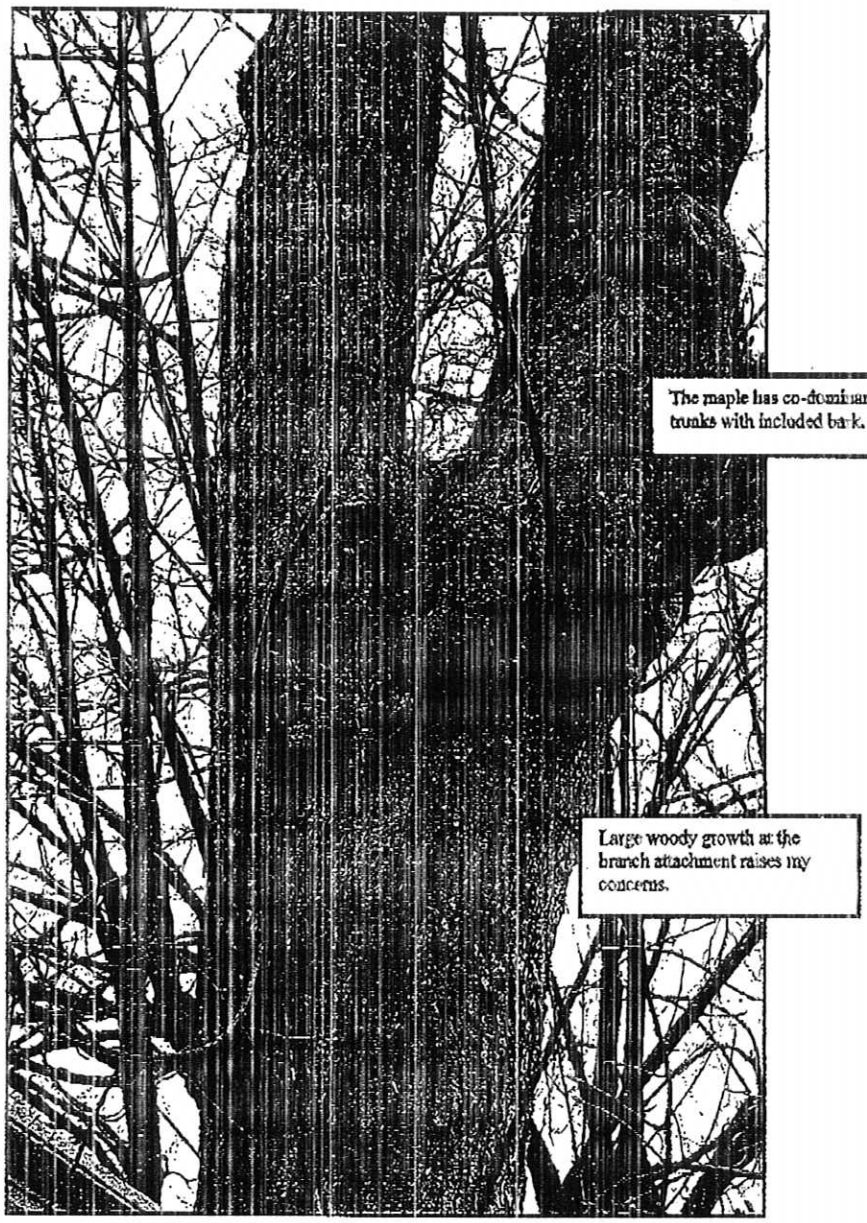


Photo 2 – Taken March 31, 2009 looking north upward toward the canopy.

Appendix I – Photos cont.

Photo 3

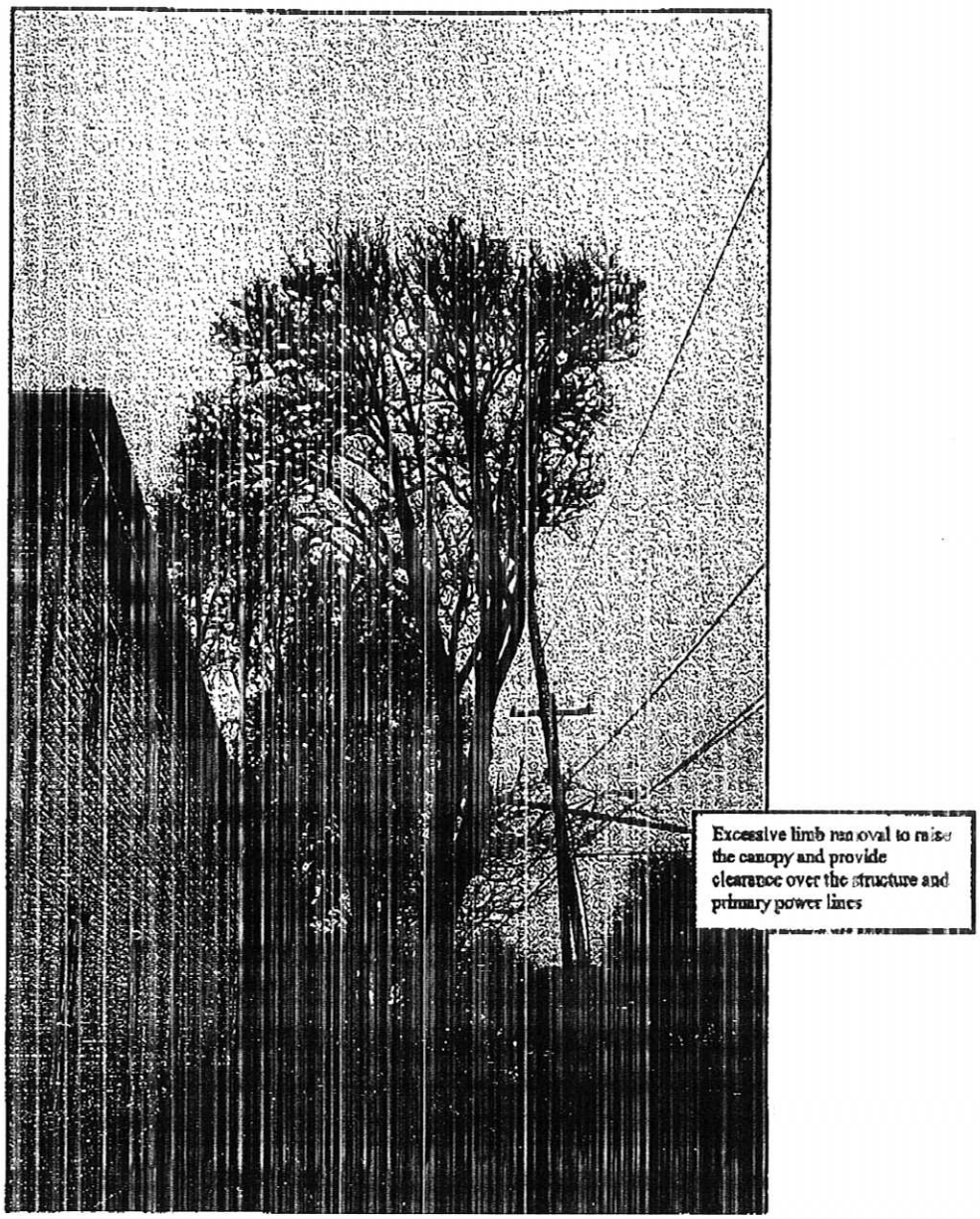
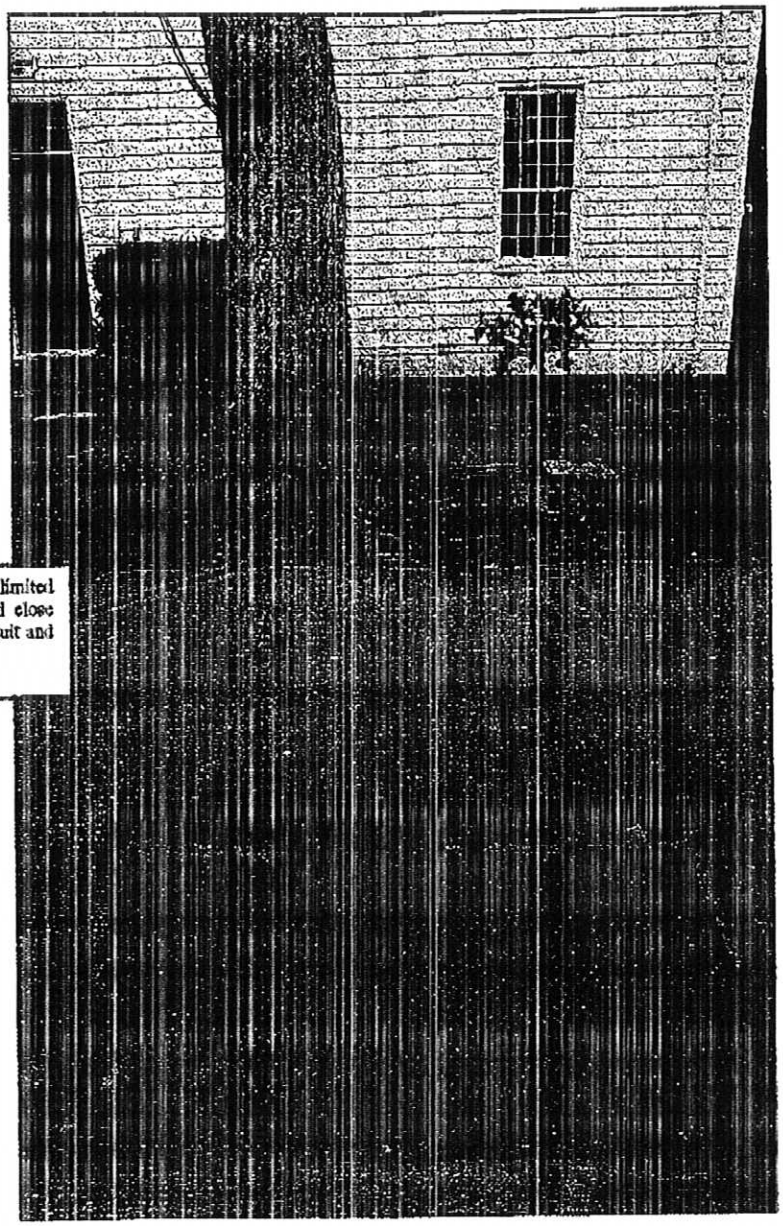


Photo 3 – Taken March 31, 2009 looking north toward the maple.

Appendix I – Photos cont.

Photo 4



The sycamore maple has limited available root space and close proximity to utility conduit and boxes

Photo 4 – Taken March 31, 2009 looking west toward the root zone and utility boxes.

Appendix III – Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownership to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is evaluated as though free and clear, under responsible ownership and competent management.

2. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

3. The consultant shall not be required to give testimony or 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 the fee schedule and contract of engagement.

4. Loss or alteration of any part of this report invalidates the entire report.

5. Possession of this report or a copy thereof does not imply right of publication of use for any purpose by any other than the persons to whom it is addressed, without the prior expressed written or verbal consent of the consultant.

6. Neither all nor 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 the consultant particularly as to value conclusions, identity of the consultant, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant as stated in his qualification.

7. This report and values expressed herein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

8. Illustrations, 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.

9. 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. There is no warranty or guarantee, expressed or implied, that problems of deficiencies of the plans or property in question may not arise in the future.

Appendix IV – Certificate of Performance

I, Lyle J. Feilmeier, certify that:

- I have personally assessed the sycamore maple tree referred to in this report and have stated my findings accurately. The extent of the health and risk assessment is stated in the attached report and the Terms of the Assignment;
- I have not current or prospective interest in the maple tree that is the subject of this report and have not personal interest or bias with respect to the parties involved;
- The analysis, opinions and conclusions stated herein are my own and are based on current scientific procedures and facts;
- My analysis, opinions and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;
- No one provided significant professional assistance to me, except as indicated within this report;
- My compensation is not contingent upon the reporting of a predetermined conclusion that factors the cause of the client or any other party nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am an International Society of Arboriculture Board Certified Master Arborist MW-0173. I am a member in good standing of the International Society of Arboriculture and the American Society of Consulting Arborists. I have been involved in the field of Arboriculture in a fulltime capacity for a period of twenty plus years.

Signed: Lyle J. Feilmeier

Date: 4-23-09