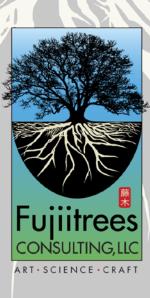
# Menlo Park City School District

# **Lower Laurel School**

# Tree Risk Assessment Report

April 25, 2017



### TREE RISK ASSESSMENT REPORT

Lower Laurel School Atherton, California

Submitted to:

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Completed by:

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### April 25, 2017

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## Menlo Park City School District

Lower Laurel School

Consulting Arborist Narrative



### **Executive Summary**

Tree 29 (formerly identified as Tree 13) Prior to considering Tree 29 for preservation, a root collar examination (RCX) should be completed. A cabled limb extending over the classroom building presents a moderate to high risk that requires mitigation pruning.

The RCX should be completed prior to performing any maintenance work on Tree 29. A temporary barrier should be placed around Tree 29 until a determination is made on the status of its buttress roots.

Tree 16 was determined to lack sufficient sound wood. Under current, normal weather conditions Tree 16 presents a moderate to high risk to human activity in close proximity to its dripline. Risk will increaser during severe weather conditions.

Tree 16 should be removed at the earliest possible date. A temporary barrier should be placed around Tree 16 until it is safely removed.

### Introduction

### <u>Assignment</u>

Fujiitrees Consulting, LLC was assigned to complete the following tasks:

- 1. Complete a Level 3 Advanced Tree Risk Assessment Report. An Advanced Tree Risk Assessment is performed to provide detailed information about specific tree parts, defects, targets or site conditions.
- 2. According to the Arborist Tree Assessment Report dated March 6, 2017, internal decay was possibly present within the trunks of subject trees 29 (formerly13) and 16.
- 3. A Resistance Recording Drill (RRD) will be employed to approximately discern the presence of decayed wood in suspected areas within each trunk. As the drill penetrates the trunk, relative wood resistance is recorded onto a wax chart. Proper interpretation of the charts is necessary to be provide meaningful information.
- 4. The subject trees will be photographed as part of the assessment.
- 5. Collected tree data, photos, findings and recommendations will be included in a letter report submitted by email to the Client in an electronic format.

### Survey Methods

A visual assessment of the trees was made from the ground. No samples were collected for laboratory analysis, the trees were not entered and root collar examinations were not completed as none of these tasks were part of the assignment. Trees assessed in this report were limited to trees specified by the Menlo Park City School District.



Trunk diameters of the trees were measured with a diameter tape at the height of 4.5 feet above grade. This method of trunk measurement is an accepted standard in the arboricultural industry.

A TruPulse® laser range finder was used to approximate tree height and crown spread (edge of canopy to trunk).

### Assumptions and Limitations

This report provides information about the subject tree at the time of the inspection. Trees and conditions change over time. This report is only valid for subject trees numbered 16 and 29 (formerly 13) with the conditions present at the time of the inspection.

Please refer to the attached Certificate of Performance and Terms and Conditions at the end of this report for additional Assumptions and Limitations.

### Level Three Advanced Tree Risk Assessment

This is a Level 3 Advanced Tree Risk Assessment Report that complies with the protocols presented in the American Standards Institute (ANSI) A300 (Part 9) Tree Risk Assessment and the Best Management Practices for Tree Risk Assessment published by the International Society of Arboriculture (ISA) for a Level 3 Advanced Tree Risk Assessment. Walter Fujii of Fujiitrees Consulting, LLC successfully completed the ISA Tree Risk Assessment Qualification course (TRAQ, June 2014).

The three levels of Tree Risk Assessment are:

- A Level 1 Limited Visual Assessment involves a limited inspection of one or more sides of the subject tree to determine whether an additional inspection is necessary.
- A Level 2 Basic Assessment involves a 360 degree inspection of the subject tree. Measurements and observations are recorded. Binoculars, a plastic mallet and tile probe may be used to assess features of concern.
- A Level 3 Advanced Tree Risk Assessment is performed to provide detailed information about specific tree parts, defects, targets or site conditions. Specialized equipment and analysis is usually required to conduct an Advanced Tree Risk Assessment. (Best Management Practices, ISA 2011)

A Tree Risk Assessment is one of many tools employed by Arborists who are responsible for managing possible conflicts between trees and human activities. The two primary goals of tree risk assessment are to; 1) ensure the safety of people and property and 2) promote tree health and work towards reducing future tree conflicts by practicing better tree care. (Dunster 2009)



The term "tree risk" is the likelihood *and* consequences of failure of a tree or tree parts that results in injury or property damage. Usually one of four levels of risk is assigned to the tree or tree part that presents consequences in the event of a failure.

The four levels of risk are:

Low risk – No action required apart from customary maintenance practices.

Moderate risk – Monitor the tree or tree part identified to present a risk; mitigation action may or may not be required.

High risk – Action should be taken in the near future to alleviate the risk.

Extreme risk – Failure of the tree or a tree part is imminent and the consequences are severe. Immediate action to mitigate the risk is required.

To live near or pass by a sizable tree in the urban environment presents some level of risk to human activity. One may then conclude that in order to remove all risk from trees, all trees must be removed.

The Tree Risk Assessment Qualified (TRAQ) protocol is not meant as a means to simply remove trees.



### Lower Laurel School

### **TREE 29**

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Consulting Arborist Narrative



#### Subject Tree 29 (formerly 13) Observations and Discussion

Identification: valley oak (*Quercus lobata*) Trunk Diameter: 56.3 inches at 4.5 feet above the existing grade. Approximate Height: 83 feet Approximate Crown: North: 47 feet, South: 39 feet, East: 46 feet and West: 48 feet

The subject tree is a mature valley oak located on the campus of Lower Laurel School in the town of Atherton, California. This tree was identified as having tag number 13. The maintenance supervisor and I were able to locate only one tree tag inscribed with number 29. From this point on this tree will be identified as Tree 29.

A classroom structure was built on two sides of Tree 29 within its dripline. To the east is a soft path and to the north is a service roadway; both are within the dripline of the tree. The top of one buttress root was just visible above the soil line.

According to the Maintenance supervisor, construction operations took place near Tree 29 in 2012. Remains of two recently removed trees were visible on the opposite side of the path. Irrigation emitters were observed in the area where the trees were removed. The Maintenance supervisor confirmed that these emitters were functional.

Tree 29 displayed a sparse canopy with occasional branch dieback. Two cables extended from the central leader to opposite elongated limbs. One elongated limb was over the classroom structure and appeared to be in significant decline. The other limb was over the service roadway and was in fair condition. (Photos 1 and 2) Both limbs exhibited poor diameter taper.

The trunk exhibited three active cankers. These cankers emitted an odorless dark viscous fluid that stained the bark. (Photos 2 and 7)

Tussock moth larva (*Orgyia vetusta*) were observed on the trunk and on buildings. (Photo 6) In early spring larva feed on foliage and later pupate in hairy brown cocoons.

### Analysis

Approximately two to three inches of soil was removed from around the lower trunk by the Consultant. This cursory inspection revealed a patch of decay extending behind the layer of bark. (Photos 5 and 6) The actual root collar (base of tree) was not exposed.

The Consultant struck the trunk with a plastic head hammer as a means to locate possible hollows or cavities. Detecting hollows is the first step before proceeding with a Resistance Recording Drill. No significant hollows were sounded by the hammer.



To provide a visual record of the extent of sound wood the Consultant employed a Resistance Recording Drill (RRD) formerly known as a Resistograph<sup>®</sup>.

The RRD is a finely machined drilling device that was developed specifically to determine wood density through recording resistance encountered by the drill as it enters the trunk or limb of a tree. As the drill penetrates the wood, resistance is recorded on a chart.

Three sites were selected for sampling with the RRD:

- 1. East facing buttress root. (Photo 3)
- 2. South side of the trunk just above the observed site of decay. (Photo 4)
- 3. West side of the trunk approximately three feet above grade. This was at the perimeter of a smooth patch of bark. (Photo 4)

Appendix 2.1 – Resistance Recording Drill Sampling Sites is a diagram of the trunk with locations of the drill sites sampled.

Sample site 1 was taken at top of buttress root and downward at approximately 45 degrees. After three and a half inches of sound wood, decayed wood or soil was encountered. Sample site 2 was taken just above an observed site of decay just below the soil line. An inch and a half of decayed wood followed by five inches of sound wood was encountered. Possible incipient decayed wood or transitional wood was then encountered.

Sample site 3 was taken on the west side. Approximately three inches of transitional wood was encountered followed by very dense sound wood that resulted in a broken drill shaft.

A copy of the charts are in Appendix 3.1 – Resistance Recording Drill charts.

#### Conclusions

Site conditions provided two major concerns; construction operations within the dripline of Tree 29 and irrigation in the immediate vicinity of the oak. Construction impacts and summer irrigation are known to contribute to the decline of native oaks like the valley. (Costello et al, 2011)

Results from RRD samples 1 and 2 indicate decay issues at the soil line and probable root damage. Sample 1 of the buttress root with three and a half inches of sound wood suggests the presence of decay beneath the buttress root.

Result from RRD sample 3 indicates the upper trunk is likely sound. The dense wood resulting from the wind sail effect on its upper canopy.



The active trunk cankers described earlier are generally symptomatic of a root disease such as root rot (*Phytophthora spp.*) or oak root fungus (*Armillaria mellea*). Bacterial wetwood, a more benign infection, will emit a foul odor which these cankers do not emit.

In addition, the overall sparse canopy of Tree 29 suggests root damage has occurred. Such damage could result from excessive soil moisture, mechanical means and/or fungal pathogens.

A root collar excavation (RCX) would allow inspection of the buried buttress roots. Doing so would determine whether preservation of Tree 29 is a prudent course of action.

The limb extending over the classroom is in significant decline. Its poor taper and end weight compromises its strength. Decay is present from an old wound that has not closed. (Photos 8, 9 and 10)

The chance of limb failure increases during severe weather events. Under normal weather conditions and considering the frequency of human activity, this limb presents a moderate to high risk to the building, students, staff and visitors within the target area.

### Recommendations

The following recommendations are just that, recommendations. The Client must decide whether or not to make use of this information. The question for the Client is, "How much risk can be tolerated?" Answering that question will guide the Client through the recommendations.

Recommendations are presented to allow the Client to make an informed decision.

- 1. A temporary barrier should be placed around the tree until a determination is made on the status of its buttress roots.
- 2. A root collar examination (RCX) should be completed at the earliest possible date. Exposing the root collar and inspection of the buttress roots will determine whether efforts to preserve Tree 29 are warranted. The RCX should be conducted by an Arborist certified by the International Society of Arboriculture (ISA) and is a member of the American Society of Consulting Arborists (ASCA).
- 3. Should results from an RCX indicate a healthy root system with the minimal presence of decay then mitigation pruning should take place to remove dead branches and excessive end weight from branches and limbs as was recommended by the district's Arborist in his March 2017 report.



- 4. If Tree 29 is to be preserved, the stressed limb over the class room should be reduced by half or be removed at its attachment. Mitigation work should be completed at the earliest possible date.
- 5. Should results from the RCX determine that the buttress roots are severely compromised, Tree 29 should be removed at the earliest possible date.



### Lower Laurel School

### **TREE 16**

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Consulting Arborist Narrative



### Subject Tree 16 Observations and Discussion

Identification: valley oak (*Quercus lobata*) Trunk Diameter: 41 inches at 4.5 feet above the existing grade. Approximate Height: 60 feet Approximate Crown: North: 34 feet, South: 38 feet, East: 35 feet and West: 36 feet

This valley oak is located west of Tree 29 where a soft path and service roadway intersect. Bare soil extended out approximately 15 feet from the trunk to where the turf play area begins. (Photo 11)

Canopy of Tree 16 is moderately dense and extends further over the play area than the service roadway. Overall structure is well composed although past pruning has directed growth out to the ends of branches.

The trunk begins vertical and then shifts to provide a counter lever profile. An old wound was observed at the site where the stem deviated to the east. This wound was filled with concrete. In the early days of Arboriculture, filling cavities with concrete was practiced as a means to strengthen and preserve a tree. (Photos 15 and 16)

Old trunk wounds were present and closed or nearly covered. Tussock moth larva were moving on the ground and the trunk.

At the time of the Consultant's site visit, students were playing around the tree and having lunch under its canopy. (Photo 11)

### Analysis

Approximately two to three inches of soil was removed from around the lower trunk by the Consultant. This cursory inspection revealed a site of decay extending beyond the layer of bark. (Photos 13 and 14) The actual root collar (base of tree) was not exposed. (Photo 14)

The Consultant struck the trunk with a plastic head hammer as a means to locate possible hollows or cavities. Soundings were distinctly hollow and occurred consistently around the trunk. To provide a visual record of the extent of sound wood the Consultant employed a Resistance Recording Drill (RRD). (Photos 12 and 13)

After the sounding, the Consultant was concerned with encountering concrete during the RRD sampling process. Fortunately no concrete was encountered at 13 inches in depth.



Four sample sites were selected for sampling with the RRD:

- 1. South side, approximately four feet above grade.
- 2. East side, approximately four feet above grade.
- 3. West side, approximately four feet above grade.
- 4. North side, approximately four feet above grade.

Appendix 2.2 – Resistance Recording Drill Sampling Sites is a diagram of the trunk with locations of the drill sites sampled.

Sample site 1, approximately two and a half inches of transitional wood was encountered after which a continuous hollow was recorded.

Sample site 2, approximately one inch of sound wood and two inches of transitional wood was encountered after which a continuous hollow was recorded.

Sample site 3, approximately one and a half inches of sound wood and approximately two and a half of transitional wood was encountered after which a continuous hollow was recorded.

Sample site 4, approximately one and three quarters inches of sound wood and two inches of transitional wood was encountered after which a continuous hollow was recorded.

A copy of the charts are in Appendix 3.2 – Resistance Recording Drill charts.

#### Conclusions

Results from the RRD sampling describe a fairly well centered column of decay within the tree. The recorded amount of sound wood encountered by the RRD is less than the 35 percent threshold considered sufficient for structural stability. (C. Mattheck, 1993)

Based on results of the sounding and RRD sampling, Tree 16 is at possible risk for failing under normal weather conditions and at probable risk for failing during a severe weather event within the next two years. Student activity within the vicinity of Tree 16 is sporadic however it is somewhat likely that a student can be injured in the event of a tree failure. Therefore Tree 16 presents a moderate to high risk to the students, staff and visitors.

#### Recommendations

- 1. Remove Tree 16 at the earliest possible date.
- 2. A temporary barrier should be placed around the tree until the tree is safely removed.

This report completes the Consultant's assignment.



American National Standard Institute. <u>Tree Care Operations</u> ANSI A300 (Part 9) – 2011 Tree Risk Assessment; Londonderry, NH: Tree Care Industry, Inc. c.2011

Costello, L.R., Hagen, B.W., Jones, K.S. <u>Oaks in the Urban Landscape</u>; Selection, Care and Preservation. Richmond, CA: ANR Communication Services c.2011

Dreistadt, S.H. and Kelly, J.K. <u>Pests of Landscape Trees and Shrubs.</u> 2<sup>nd</sup> ed. Oakland, CA: UC/ANR Publications (Publication 3359) c.2004

Dunster, J.A., Smiley, E.T., Matheny, N., Lilly, S. <u>Tree Risk Assessment Manual</u>: A course manual. Champaign, IL: ISA Publications c. 2013

Dunster, J.A. <u>Tree Risk Assessment in Urban Areas and the Urban / Rural Interface:</u> Course Manual. Silverton, Oregon: Pacific Northwest Chapter, International Society of Arboriculture c.2009

Mattheck, C., Bethge, K. and Erb, D. "Failure Criteria for Trees." <u>Arboricultural Journal</u> 1993: 201-209 printed in Great Britain

Matheny, N. and Clark, J. <u>Evaluation of Hazard Trees in Urban Areas.</u> Champaign, IL: Wadley Graphix Corp. c.1994

Smiley, E.T., Matheny, N., Lilly, S. <u>Tree Risk Assessment</u> – Best Management Practices, Champaign, ILL: International Society of Arboriculture c. 2011

Swiecki, Tedmund J. and Bernhardt, Elizabeth A. 2006. <u>A field guide to insects of</u> <u>California oaks.</u> Gen. Tech Rep. PSW-GTR—197. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 151p.

### Training

International Society of Arboriculture, Tree Risk Assessment Qualification (TRAQ) a two and half day course; Oakland, CA (2014)

Pacific Northwest Chapter (PNW/ISA) Tree Risk Assessment and Course Examination (TRACE) two and half day course; Palo Alto, CA (2011)

Instrument Mechanic Labor, Inc. (IML) Resistograph Certification Seminar conducted by Oliver Hein; San Francisco, CA (2006)



## Appendix 1

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Photograph Exhibit



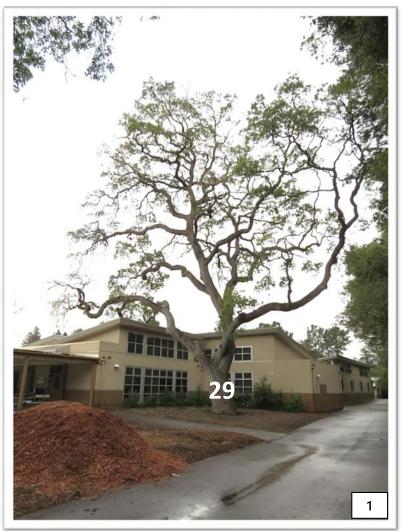


Photo 1. Tree 29 (formerly 13) a valley oak, is located between the classroom and roadway. Photo taken of east side of tree.

Photo 2. A closer view of tree 29 and its proximity to classrooms. An arrow points to an active canker exuding a dark fluid. (Refer to photo 7.)





Photo 3. Circled is the orange flag marking RRD sample 1. This was the top of a buttress root.

Photo 4. Circled are orange flags marking RRD sample sites 2 and 3. Note soil was removed to partially expose the root collar (base of tree).

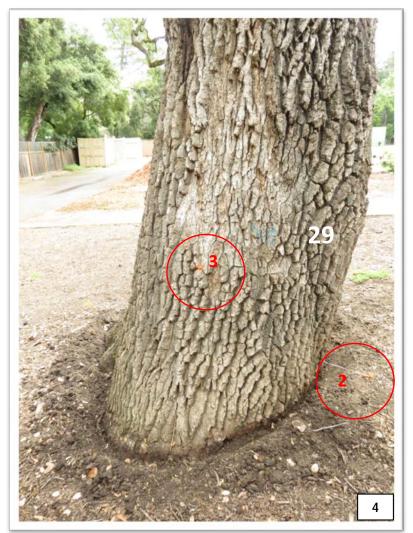






Photo 5. Arrows point to approximately two to three inches of soil that the consultant removed from around the lower trunk. Photo 6. Pencil is placed near a site of decayed wood just below the surface of the soil. A Tussock moth is circled in yellow.



Photo 7. Circled is an active canker exuding a dark, odorless viscous fluid. Symptom suggests internal and/or root pathogen infection. A bacterial infection is generally accompanied by an unpleasant odor.



Photo 8. This lower limb is partially supported by one metal cable. A closer view of the end of the limb is pictured in photo 9.

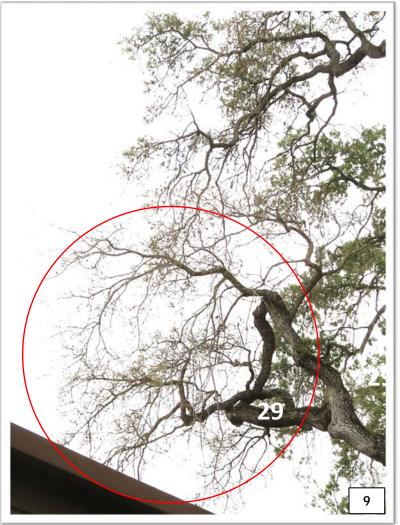
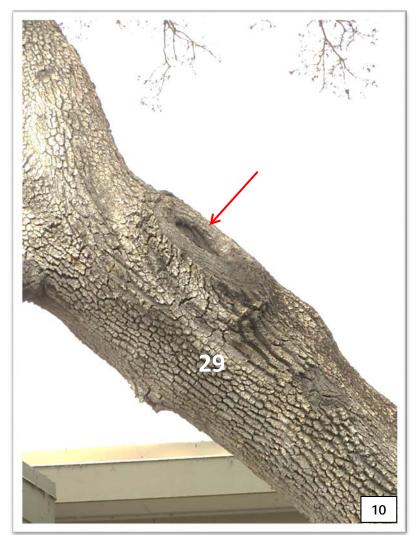


Photo 9. A closer view of the end of the lower limb pictured in photo 8 is shown. Note the lack of foliage.

Photo 10. An arrow points to an old wound that has not fully closed. The concave bark suggests internal decay.



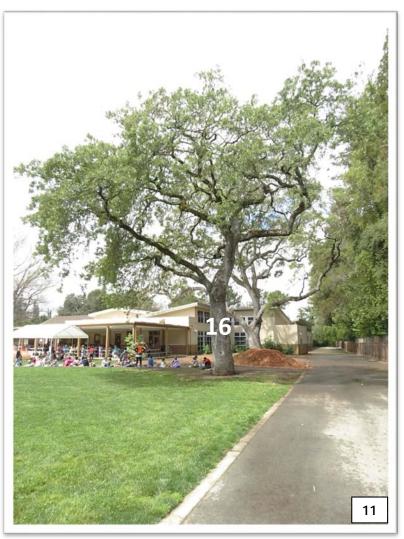


Photo 11. Tree 16, a valley oak, is shown when viewed from the east. Students are having lunch on the path that is partially beneath the canopy of tree 16.

Photo 12. Circled are orange flags indicating the RRD sampling sites, 1, 2 and 3.





Photo 13. Circled are orange flags indicating the RRD sampling sites, 4, 3 and 2. Note that the Consultant only partially exposed the lower trunk.

Photo 14. Two to three inches of soil was removed to provide a cursory look at the covered root collar. Decayed wood, circled in red, was clearly visible at one site.



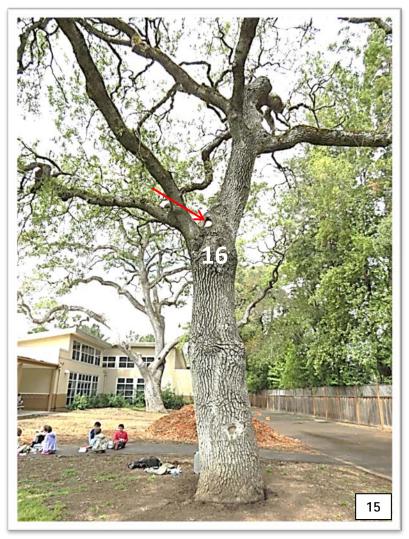


Photo 15. The very straight trunk is typical of the valley oak. A red arrow points to an old wound that was filled with concrete as a means of preservation.

Photo 16. A closer view of the concrete reveals the inscribed lines on the surface of the fill. This was once state of the art in tree work.



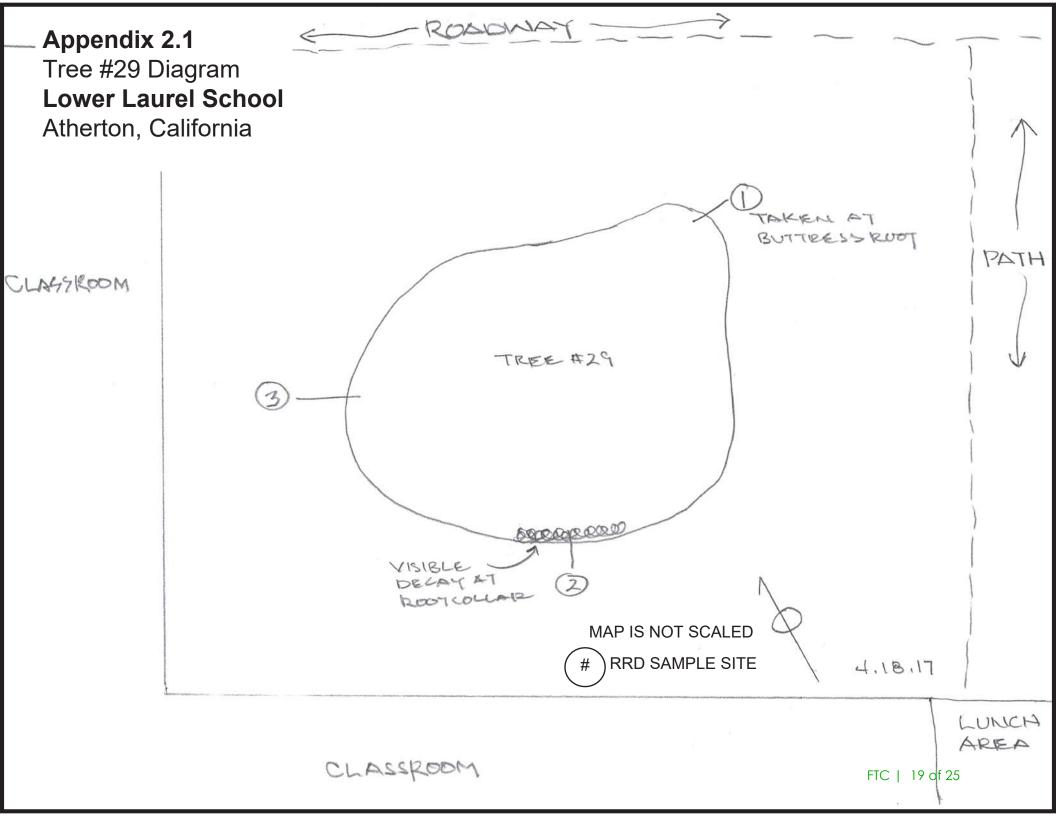
Appendix 2.1

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Tree 29

Diagram



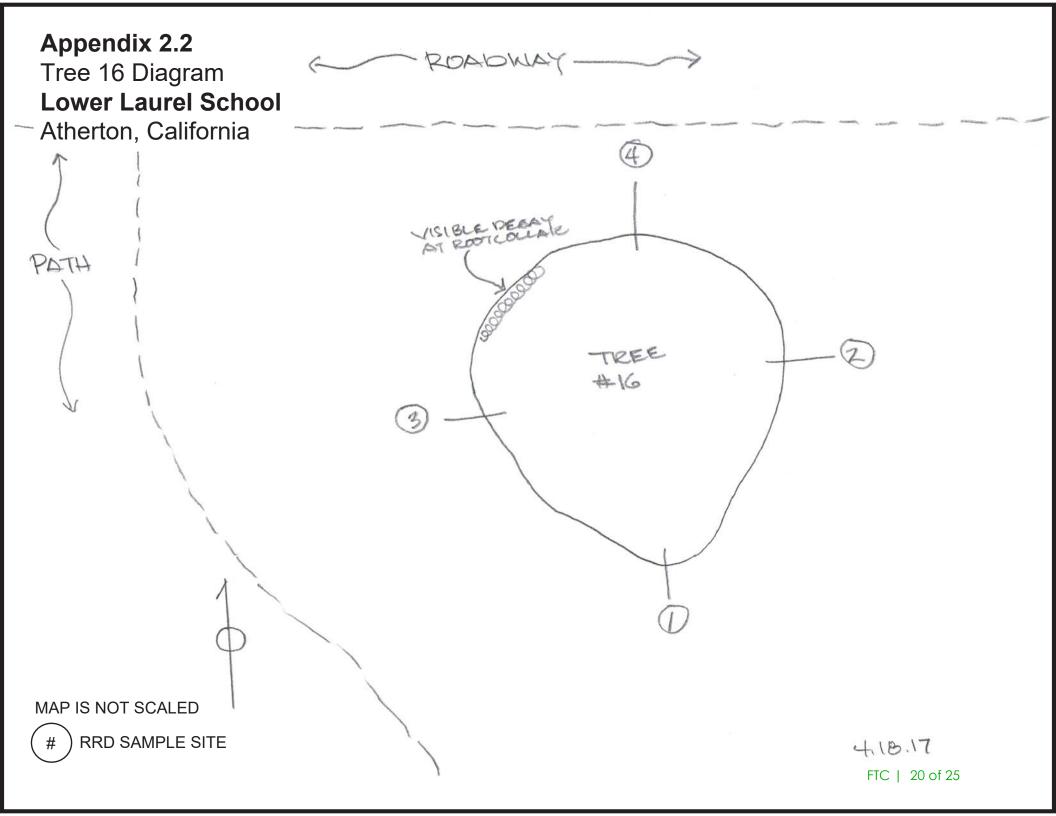


Appendix 2.2

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Tree 16 Diagram





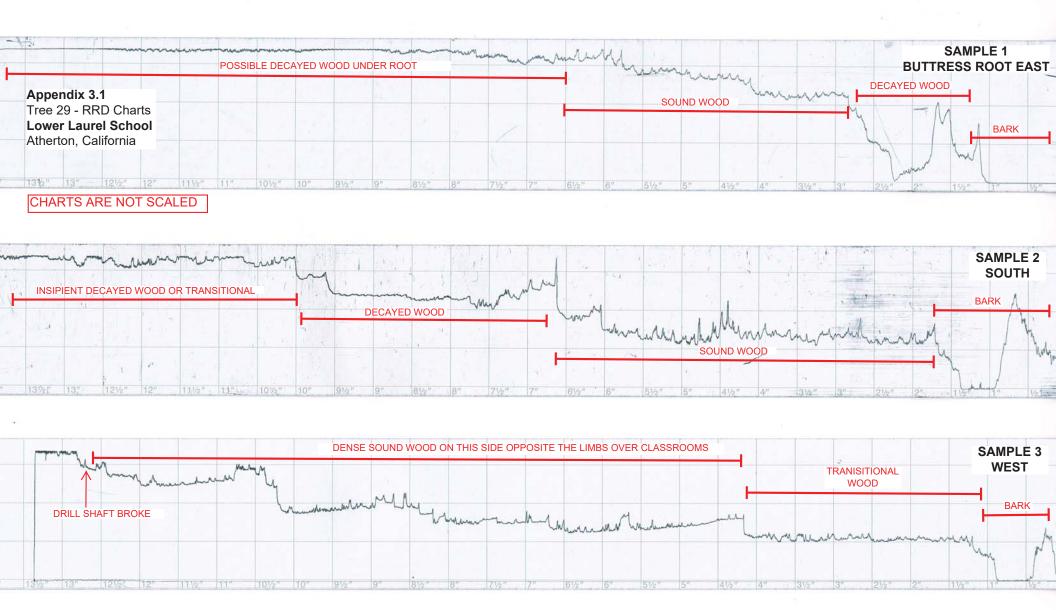
Appendix 3.1

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Tree 29

## Resistance Recording Drill Charts



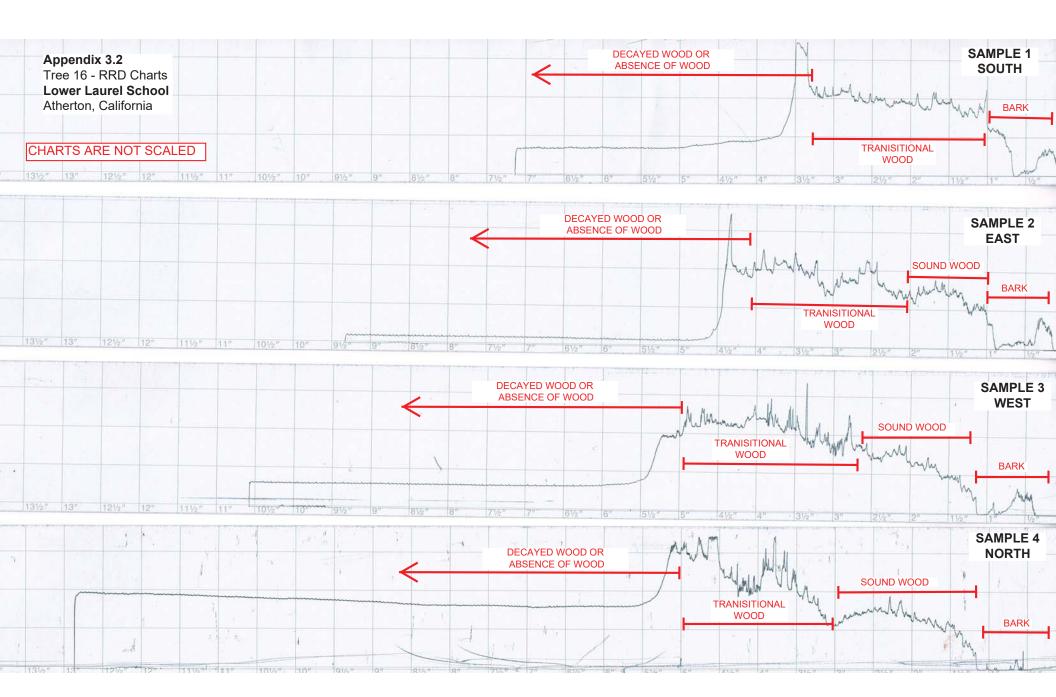


Appendix 3.2

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Tree 16 Resistance Recording Drill Charts



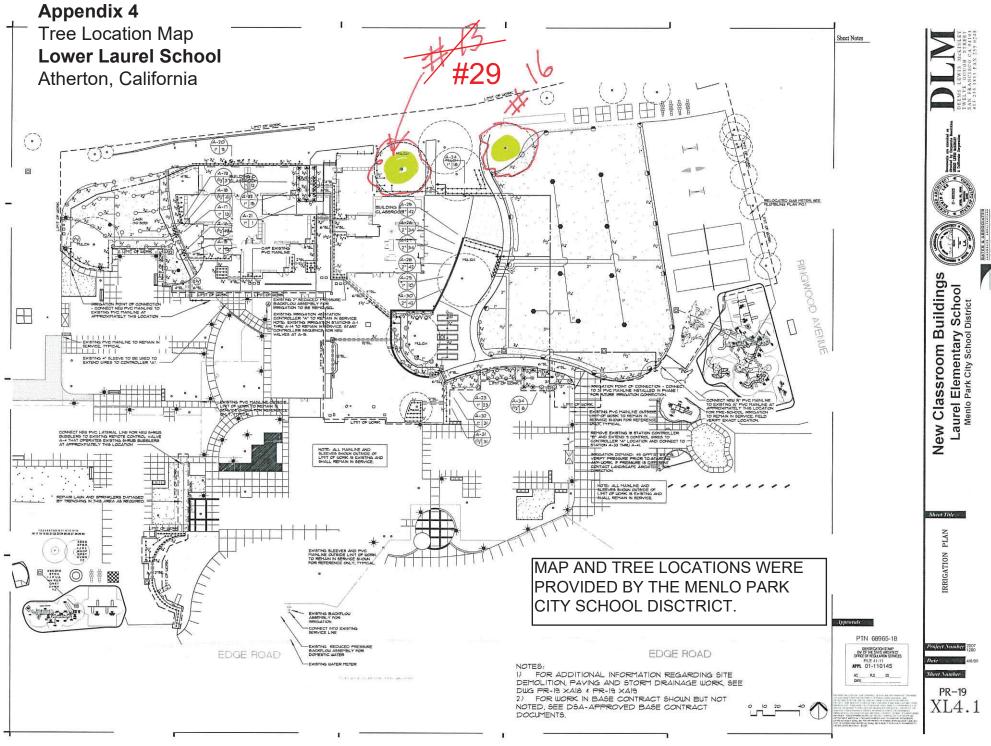


Appendix 4

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Tree Location Map





## Attachments

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Certificate of Performance

Terms and Conditions



#### **Certification of Performance**

That I have personally inspected the tree(s) and /or property referred to in this report and have stated my findings accurately. The extent of the evaluation and appraisal is stated in the attached report and the Terms and Conditions;

That I have no current or prospective interest in the vegetation or the property that is the subject of this report and I have no personal interest or bias with respect to the parties involved;

That the analysis opinions and conclusions stated herein are my own and are based on current scientific procedures and facts;

That my compensation is not contingent upon the reporting of a predetermined conclusion that favors 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;

That my analysis opinions and conclusion were developed and this report has been prepared according to commonly accepted Arboricultural practices;

I further certify that I am a Registered Consulting Arborist® by the American Society of Consulting Arborists (ASCA) and a Certified Arborist by the International Society of Arboriculture (ISA).

#### **Disclosure Statement**

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees and recommend measures to enhance the beauty and health of trees and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Certain conditions are often hidden within trees or below the ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances or for a specific period of time. Likewise remedial treatments cannot be guaranteed.

Trees can be managed but they cannot be controlled. To live near trees is to accept some degree of risk.

FUJIITREES CONSULTING, LLC

Walter Fujii, RCA® Manager and Consulting Arborist

Date: May 22, 2017



# Fujiitrees Consulting, LLC TERMS AND CONDITIONS

The following terms and conditions apply to all oral and written reports and correspondence pertaining to the consultations, inspections and activities of Fujiitrees Consulting hereinafter referred to as "Consultant".

1. Any legal description provided to the Consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as to the quality of any title.

2. It is assumed that any property referred to in any report or in conjunction with any services performed by the Consultant, is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations, and that any titles and ownership to any property are assumed to be good and marketable. Any existing liens and encumbrances have been disregarded.

3. Possession of this report or a copy thereof does not imply any right of publication or use for any purpose, without the express permission of the Consultant and the Client to whom the report was issued. Loss, removal or alteration of any part of a report invalidates the entire appraisal/evaluation.

4. The scope of any report or other correspondence is limited to the trees and conditions specifically mentioned in those reports and correspondence. The Consultant assumes no liability for the failure of trees or parts of trees, either inspected or otherwise. The Consultant assumes no responsibility to report on the condition of any tree or landscape feature not specifically requested by the named client.

5. No tree described in this report was climbed, unless otherwise stated. The Consultant cannot take responsibility for any defects, which could only have been discovered by climbing. A full root crown examination (RCX), consisting of excavating the soil around the tree to uncover the root crown and major buttress roots was not performed unless otherwise stated. We cannot take responsibility for any root defects, which could only have been discovered by such an inspection.

6. The Consultant shall not be required to provide further documentation, give testimony, be deposed, or attend court by reason of this appraisal/report unless subsequent contractual arrangements are made, including payment of additional fees for such services as described by the consultant or in the fee schedules or contract.

7. The Consultant offers no guarantees or warrantees, either expressed or implied, as to the suitability of the information contained in the reports for any purpose. It remains the responsibility of the client to determine applicability to his/her particular case.

8. Any report and the values, observations, and recommendations expressed therein represent the professional opinion of the Consultant, and the fee for services is in no manner contingent upon the reporting of a specified value nor upon any particular finding to be reported.

9. Any photographs, diagrams, graphs, sketches, or other graphic material included in any report, being intended solely as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys, unless otherwise noted in the report. Any reproductions of graphs material or the work produce of any other persons is intended solely for the purpose of clarification and ease of reference. Inclusion of said information does not constitute a representation by the Consultant as to the sufficiency or accuracy of that information.

10. Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

11. Payment terms are net payable upon receipt of invoice unless other arrangements have been mutually agreed upon. All balances due beyond 30 days of invoice date will be charged a service fee of 1.5 percent per month (18.0% APR). All checks returned for insufficient funds or any other reason will be subject to a \$25.00 service fee. Advance payment of fees may be required in some cases.

