

Bill Owen  
Arborwell  
ISA Board Certified Master Arborist  
WE-7113-B  
10/25/2011



## Congregational Church of San Mateo

### Summary

Arborwell was hired to provide a construction impact report and on-going consulting services throughout the construction of a memorial garden and columbarium at the Congregational Church of San Mateo. Portions of the project are within the root zone of two mature coast live oaks (*Quercus agrifolia*). I performed my initial site inspection on June 9<sup>th</sup> 2010. I had a follow up site meeting with the Head of the garden Committee and the landscape architect on July 7<sup>th</sup>. Tree one was found to have oozing cankers on the lower portion of the trunk. Lab analysis of infected material taken from tree one did not positively identify the pathogen associated with the cankers. Tree two was found to be in good health. External observations of growth rate, leaf size, and canopy density suggest that both trees are in good health and are worthy of retention.

The conceptual plan I reviewed indicates that construction of the memorial garden can be executed in a manner that will minimize root damage and allow for water and oxygen penetration into the root zone through the use of permeable pavers and gravel. Both the head of the garden committee and the landscape architect were agreeable to design elements that would minimize compaction and root damage in the root zone of the trees.

### Background and History

Arborwell was contacted by John Cahalan, Landscape Architect to provide consulting services throughout the duration of the project. John Fyfe is a member of the church's garden committee and is responsible for oversight of the Memorial Garden project. As part of the bid package I received a conceptual plan of the proposed construction prepared by John Cahalan, and a geotechnical report prepared by PGSoils INC. I also received a copy of the preliminary grading plan and a demolition plan for my analysis.

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## Assignment

Based on the Request for Proposal that Arborwell received from John Cahalan, my assignment was to;

- Prepare a construction impact report detailing the condition and health of the two oak trees and summarize preservation methods and anticipated impacts of memorial garden construction.
- Provide onsite consulting services throughout the construction project to insure proper tree protection implementation
- Oversee all explorative air spading to determine optimal placement of foundation piers

## Limits of Assignment

This assignment includes periodic site visits during design and construction to facilitate adequate tree protection.

The exact of impact to the root zone cannot be determined until exploratory air spading is performed and a final grading plan is prepared. Based on the preliminary design and site meetings I have concluded that root disturbance will be within an acceptable range of less than 25% root disturbance.

## Observations

I inspected the site on June 9<sup>th</sup>, and July 7<sup>th</sup> 2010. The site address is 225 Tilton Ave in San Mateo. While I was onsite I met with John Fyfe and Jim Ingwersen from the Congregational Church of San Mateo. John Cahalan, the Landscape architect was at the site meeting on July 7<sup>th</sup>. I inspected the site as it is now, prior to construction. The site consists of an open area beneath the two oaks and an existing masonry wall that will be demolished to facilitate construction. The wall runs along the edge of the trunk of tree #2(photo 1). The proposed construction will encompass portions of the root zones of the two oaks and extend in to the open asphalt area to the east of tree #2(photo 2).

The existing landscape under the two oaks is bare compacted soil with some adjacent landscape plants next to a small lawn area along the sidewalk for San Mateo Blvd (photo 3).

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Aerial site image; Location of the two oaks



## Subject Tree Observations

### Tree # 1

Tree 1 is a coast live oak that measures approximately 40 feet tall, has a crown spread of 50 feet and has a diameter at breast height of 53 ½ inches. Leaf size is normal for the species. Annual twig extension is normal. Canopy density is medium. There are no obvious signs of decay throughout the crown. There are oozing cankers along the lower trunk of tree 1. On July 7<sup>th</sup>, I photographed the cankers and cut into the cambium to determine the pathogen. Based on a visual assessment the pathogen appeared to be some type of *Phytophthora*. The cankers on the lower trunk had a black shiny liquid oozing from various points. The cankers cover approximately 15% of the circumference of the trunk just below the first branch union. I cut into the cambium layer to investigate. (See photos 4 and 5). Tissue samples from the trunk were submitted to Soil and plant labs for analysis. The tissue sample did not isolate a specific pathogen associated with the cankers (see appendix 1).

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## Tree # 2

Tree 2 is a coast live oak that measures approximately 40 feet tall, has a crown spread of 50 feet and has a diameter at breast height of 29 ½ inches. The tree is in good health. Leaf size is normal for the species. Annual twig extension is normal. Canopy density is medium.

There are no obvious signs of decay throughout the crown. The wall adjacent to tree 2 is shaped to accommodate the root flare and there appears to be no damage to the bark near the root flare.

Tree 2 was pruned for building clearance on the day of my June 9<sup>th</sup> inspection. Pruning was performed to reduce the crown spread encroaching on the apartment complex to the north of the site.

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## Discussion

Based on my review of the conceptual plan, the geotechnical report, and my site visits I have concluded that root disturbance will be kept to a minimum during construction. By my estimate, no more than 25% of the root zone will be affected throughout the construction project. The design calls for the use of permeable pavers in a large portion of the root zone. Permeable pavers allow for the percolation of water into the root zone. They also allow oxygen to penetrate into the root zone. An 8 foot by 10 foot area of gravel will be installed by the base of each tree which will also allow for adequate penetration of water and oxygen. The geotechnical report specifies compaction of the soil to 90% of maximum dry density in areas where concrete slabs and pavers will be installed. From a tree health perspective this is not recommended. Soil compaction negatively affects soil water percolation, oxygen exchange, and fine root development. It was agreed that compaction would be avoided in the construction process to facilitate tree health. There is a slight compromise in the integrity of the paver installation and shifting is a possible consequence of avoiding compaction during site preparation.

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A sidewalk will be installed adjacent to tree two approximately eight feet from the base leading up to the fountain. The original design called for a four inch thick slab over four inches base rock. It was agreed by the landscape architect and the garden committee head that the design could easily be modified to use permeable pavers instead of concrete to minimize root disturbance. The profile of the installation could be reduced by 2-4 inches. With this simple design modification root disturbance can be kept to a minimum.

The wall that will be constructed for the project will consist of a columbarium, a water feature, and plaster wall. The foundation for the wall is a pier type footing. As currently specified the piers measure 16 inches in diameter drilled to a depth of eight feet. Grade beam connections between piers are specified to be embedded 12 inches below grade. In my opinion this depth should be reduced as much as possible to minimize root damage. Root damage can be minimized if excavation is only required for a small portion of the root zone. Air spading will be performed to determine optimal placement of the pier footings. Both the landscape architect and garden committee head agreed that the design could be altered to have grade beams set at grade level to minimize root disturbance.

Both trees fall within the designation of a heritage tree according to the city of San Mateo Heritage Tree Ordinance. Section 13.52.025(2) "Prohibit(s) excavation, grading, soil deposit, drainage and leveling within the drip line unless approved by the City Arborist". Portions of the memorial garden construction project take place within the drip line of the two trees.

Based on the lab results yielded from the tissue sample from tree one, cause of the cankers has not been determined. It is possible the cankers are caused by a non-lethal pathogen such as bacterial wet wood. Such an infection would not be a cause for concern, and would necessitate no special considerations beyond normal preservation.

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## Conclusion

Upon review of the conceptual plan, the geotechnical report, the demolition plan, and my two site visits the following preservation methods are recommended.

General guidelines for tree protection consist of the following;

- Root cutting should be kept to a minimum throughout the project. Design elements should incorporate only the minimum amount of excavation, root cutting, and soil compaction necessary to achieve desired results.
- Excavation, root cutting, and soil compaction shall be done as directed and under the direct supervision of a qualified arborist.
- Roots greater than 1 ½ inches in diameter shall not be cut unless directed and approved by the project arborist.
- Demolition of the existing masonry wall shall be performed in a manner that minimizes the possibility of trunk damage to tree two. The trunk can be protected with a combination of 2x4 studs and construction fencing wrapped around the trunk to a height of 6 feet above grade.
- No braches of any size shall be cut unless directed and supervised by the project arborist.

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## Appendix 1

Copied text from lab report regarding tissue sample submitted on 8-24-2010

Anaheim Office  
Lab No. 10-238-0351  
Path No. 843  
September 1, 2010  
Arborwell  
2337 American Avenue  
Hayward, CA 94545  
Attn: Bill Owen

**PATHOLOGY RESULTS: QUERCUS AGRIFOLIA – CONG CHURCH, SAN MATEO**

Examination and culturing of the plant specimen(s) delivered to our laboratory on 8/24/10 identified

the following microorganisms.

Tissues examined and cultured: trunk tissue taken from bleeding lesions

No culturable plant pathogens were isolated from the received trunk patch samples.

**Comments**

As requested, we screened the sample for *Phytophthora ramorum* by culturing the tissues onto a *Phytophthora* selective medium. This pathogen, however, was not recovered from the received trunk

tissue samples. It is quite possible that the bleeding lesions may either be due to some physiological

disorder. It is also possible that the lesions may be due bacterial wet wood, a common non-lethal disorder that affect many trees.

Paul F. Santos, M.S.  
Plant Pathologist

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Photo 1



Photo one was taken during my site visit on June 9<sup>th</sup> and shows tree two and the existing wall that will be demolished as part of the project.

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## Photo 2



Photo two was taken during my site visit on June 9<sup>th</sup> and shows the east side of tree two and the existing wall that will be demolished as part of the project behind the shed

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### Photo 3



Photo three was taken on my site visit June 9<sup>th</sup> and shows the project site as seen from San Mateo Blvd north of Tilton Street.

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## Photo 4



Photo 4 shows a close up of the trunk of tree1 (taken7-7-2010).

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## Photo 5



The above photo shows the cambium layer of tree one after cutting through the oozing canker (taken 7-7-2010).

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