

# JOSEPH McNEIL, CONSULTING ARBORIST

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August 25, 2012

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*ASCA* AMERICAN SOCIETY of  
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**SUBJECT:** Storm drain bores at the Oakland Zoo associated with the relocated  
Veterinary Hospital Bio-retention planter.

A shallow bio-retention planter will be created between several trees, native and exotic at this site. Runoff will be brought to this planter at least partly by an eight inch PVC line that passes about ten feet from a scarlet oak, *Quercus coccinea* of 18.8 inch trunk diameter. Treated water will leave the basin through a PVC pipe of similar size directly under a 38 inch<sup>1</sup> coast live oak, *Quercus agrifolia*.

You have requested that I comment on any impact resulting to either tree from installation of these storm drains. I inspected the site and trees earlier today, August 25, and have reviewed Aliquot drawings Stormwater Control Plan, Drainage Area, Sheet C6.01 dated August 3, 2012, and Stormwater Control Plan, Planter Grading Plan, Sheet C6.02, dated August 3, 2012. I expect no adverse effect to either tree from the storm drains as proposed.

## SCARLET OAK #190

Both storm drain segments will be installed using the technique of horizontal directional drilling rather than by open trench. The inflow pipe passes about ten feet south of scarlet oak #190. This tree is in good health, with annual shoot growth of about six inches. Separately from and not affecting tree health is a decay of the heartwood (center of the tree) by a *Ganoderma* species, the fruiting body or conk of which is visible at the base of the trunk on the south side.

This organism does not appear to be affecting the vascular portion of the tree trunk cross section. In early stages of infection it may not have much effect on tree stability, although over time it may. I did not conduct a structural evaluation of the tree beyond a simple visual assessment<sup>2</sup>. Sounding with a mallet was not revealing of the extent of decay, suggesting it is minimal at ground level. No excavation nor examination of roots was performed.

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<sup>1</sup> Measured at about 15 inches above grade, the height most representing the tree.

<sup>2</sup> Defined as Level 2 by American National Standards Institute A300 (part 9)-2011 Tree Risk Assessment ¶93.4.2.2

The proposed use of the site does not justify extensive further examination of this decay, such as by Resistograph<sup>3</sup> or Sonic Tomography<sup>4</sup>. If use of the site were changed to include frequent human occupation or a fragile structure I would suggest such assessment.

The proposed storm drain will pass ten feet south of this tree at closest approach, where the top of the bore to accommodate it will be more than 18 inches below grade. I expect most roots of this tree to be 18 to 24 inches below grade.<sup>5</sup> Even in the worst-case event that a few peripheral roots are encountered by the bore I expect no adverse effect on the tree.

#### **COAST LIVE OAK #184**

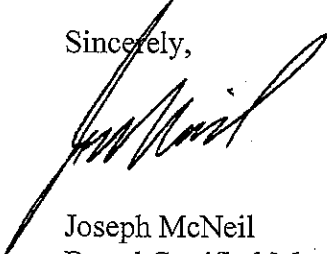
This is a more imposing and impressive tree, at 38 inch diameter, than tree #190, and its placement near the road makes it much more visible. I found it to be exceptionally vigorous throughout. Annual shoot growth increments are eight inches or more overall and the trunk and limb expansion, the annual radial growth is rapid on all sides of the large woody parts of the tree.

The tree generally appears to have excellent structural form, that is, structure that will be resistant to mechanical failure over the years. Two stems that diverge at about ten feet are codominant<sup>6</sup> but relatively upright and do not present elevated potential to fail, in my opinion.

The proposed outflow storm drain line will pass directly under the trunk but the upper side of the bore will be at minimum 28 inches below grade at that point, probably slightly more. It is likely that no significant roots will be encountered at that depth. In the event roots are encountered they will be relatively minor, and for a tree of this exceptional vigor I expect that even in the worst case there will be no observable adverse health effects by the horizontal directional drilling of the proposed storm drain.

Please contact me if you have further questions.

Sincerely,



Joseph McNeil  
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Registered Consulting Arborist #299, ASCA  
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<sup>3</sup> A Resistograph inserts a 3 mm diameter probe to a 15 inch depth into the tree. It measures wood toughness along that track and converts the measurement into a graph that can be used to infer decay, cavities, internal knots, or other features.

<sup>4</sup> For further information go to <http://www.oakperson.com/tree-risk-assessment-pleasant-hill-ca.html>

<sup>5</sup> Tree roots grow where conditions are favorable, where there is good gas exchange, adequate moisture, and sufficient mineral content. In soils such as at this site roots spread wide but do not extend far down. This is primarily limited by oxygen availability.

<sup>6</sup> Trunks of similar size on the same tree compete for dominance and are said to be codominant. As the trees grow larger these trunk attachments are increasingly prone to mechanical failure if they cantilever horizontally.