



**Tina Cohen, Certified Arborist**

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June 20, 2017

To: Andrea Cummins, Urban Environmental Specialist, City of Tukwila  
6300 Southcenter Blvd., Suite 100  
Tukwila, WA 98188

Cc: Moira Bradshaw, Senior Planner, City of Tukwila  
Chris Petersen, LA Studio

From: Tina Cohen, Certified Arborist

Site: Tukwila Village, International Blvd at S. 144<sup>th</sup> Street, Tukwila, WA  
Site visit: June 1, 2017

**Arborist Services: Coast Redwood Damage & Recommendations**

Dear Ms. Cummins:

On June 1st we met to discuss the damage to a Coast redwood, *Sequoia sempervirens* due to the development of Tukwila Village Phase I. The purpose was to determine if the tree can be retained through Phase III and what can be done to improve its health. I received several conflicting grading plans, but relied on the most recent plan dated 6/19/2017 from Chris Petersen of LA Studio. Please see the attached annotated plan.

**Scope of Work**

I will determine the current condition and viability of the 40-inch Redwood, tree #32 on the original survey. This report lists the damage during construction, and recommendations for the future. Other trees were not included.

**Executive Summary**

The post construction prognosis is fair. Retain the tree and be vigilant about not further impacting the roots. The Tree Protection Zone (fence location) is shown on the attached plan. There can be no incursion into this area. I recommend omitting the proposed deck.

The Coast redwood appears healthy but the canopy is thin as a result of root stress. The tree was not fully fenced and was not adequately protected from disturbance as specified in the 2015 arborist report. However this species is tolerant of disturbance and flooding, and might still survive.

The primary problem is root loss due to suffocation where the grade has been raised. Recommendations include filling the existing swale with a porous mix including drain-rock and round sand and avoiding additional grade changes.



**Health & Damage from Construction Activities**

The tree is healthy but not vigorous. The canopy appears thin, although not significantly different compared with photos from 2015. However compared with the 2011 photo from the original inventory the canopy is more sparse and stressed looking. This is likely the response to root loss and/or summer drought.

As a rule of thumb with conifers, the roots extend double the radius of the dripline. Much of the surrounding area has been filled so most of the rootzone is now below the original grade. The roots are restricted by significant amount of added compacted soil, an estimated 5 feet or more above the original grade. The fill has not impacted the trunk.

During the winter 2017 the area adjacent to the trunk to the south, west, and east was flooded. There was standing water February through April until it was pumped out. I sent my concerns to California forester and pathologist Dr. Bruce Hagen, who responded redwoods are very tolerant of flooding. "Redwoods growing in valley bottoms, drainages, along creeks, etc., are regularly flooded in the winter for weeks. They also tolerate coarse fill soil over their roots deposited by flooding events. Heavy soils added during construction may result in low soil aeration that could be an issue. Buried redwoods resprout from the trunk and ultimately form another higher root system."

Therefore I feel there's hope the tree will survive assuming a permeable fill is used in the swale and if further disturbance is avoided.

**Recap of Problems**

- The contractor either disregarded or did not receive the tree protection specifications listed in my 2015 report. The site plans that I reviewed did not show the Tree Protection Zone.
- In the field, the tree protection fence was located significantly closer than specified.
- The City inspector failed to include tree protection in the approval process.
- The grade change was much more excessive than indicated to me in 2015.
- The north portion of the existing drainage swale has already been filled and compacted.

**Details of Findings 2017**

Please see the photos at the end of the report.

Tree # per the original report and species	Trunk diameter inches at 4.5 ft updated 6/1/17	Current health	Canopy RADIUS in feet, measured from center of trunk	2017 Measured distances from trunk to grade change or other disturbance.  Proposed distances (Tree Protection Zone), per 6/19/2017 plan
32. Coast redwood, <i>Sequoia sempervirons</i>	43.5 inches	Fair. Canopy appears thin indicating root stress.	22 ft.	<p><b>The distances to the existing grade change as of 6/1/2017:</b>                      4 feet to the east (the swale)                      9.5 feet to the north (compacted soil)                      21.5 feet to the south                      18.5 feet to the west</p> <p><b>PROPOSED distances to disturbance per 6/19/17 plan:</b>                      10 feet to the east (past the swale)                      9 feet to the north (to a retaining wall)                      21.5 feet to the south (omit or modify the deck)                      22 feet to the west (to a retaining wall - however this measurement is inconsistent with field conditions)</p>



**PREVIOUS Findings & Recommendations from 2015**

Tree # per the original report and species	2015 Trunk diameter inches at 4.5 ft	2015 health rating	Canopy RADIUS in feet, measured from center of trunk	ORIGINAL SPECIFICATIONS 2015: Protection dimensions (the Tree Protection Zone) measured from center of trunk.  Prognosis if protected.
32. Coast redwood, <i>Sequoia sempervirens</i>	42.5 in. (40 in 2011)	Healthy. No apparent defects.	21 ft.	<p>The fenced protection area should be: 12 feet to the east (near Bldg B), 27 feet to the north (near walkway &amp; utilities), 33 feet to the south (near walkway), 24 feet to the west (near walkway).</p> <p>Do NOT prune the canopy until starting the new building. Avoid removing lower limbs as much as possible.</p> <p>The tree will be more tolerant of disturbance if it receives water.</p> <p>Prognosis is GOOD assuming the grading is omitted and the utility vaults are moved outside of the dripline.</p>

**Recommendations to Improve the Outcome**

**Use permeable fill in the existing swale:** The project engineer and landscape architect shall specify a draining, permeable fill such as a mix of soil, and drain rock mixed with round sand. The fill must drain. Compacted fill will further damage the roots.

**Omit or greatly reduce the south deck:** The goal is to reduce the disturbance. The installation of posts and coverage of the roots contributes to root damage.

**Channel run-off away from the trunk:** Place yard drains and catch basins OUTSIDE of the tree protection zone. I understand yard drain 5 has already been installed within the tree protection zone.

**Wait to prune the canopy:** Wait until the start of construction of future Building B before doing any canopy pruning. The canopy will accept proper pruning for clearance including 'selective heading' cuts so branches can be shortened, not totally removed.

**Specify root barriers:** The roots will eventually grow and impact the new foundation. Therefore a root barrier system should be installed adjacent or near to the side of the foundation. Further research is needed to determine the design and best brand of barrier for this situation.

**Add Tree Protection Specifications to the construction documents:** The goal is to prevent root loss and/or irreversible damage caused by soil compaction or added soil.

'Tree Protection' requires the placement of a temporary fence around the tree at a specified distance throughout the project. The fence and explanation should be shown on all construction plans: There can be NO grading, excavation, storage of materials or any trespass within the Tree Protection Zone



(TPZ). If needed, temporary incursions must be first approved by the project arborist. Please the attached site plan.

**Landscaping must be consistent with tree protection goals:**

- Remove weeds and grass by placing equipment outside of the TPZ and reaching in, using shallow excavation.
- Mulch the TPZ with arborist woodchips (not bark) 3 inches in depth, but do not place the woodchips against the trunk. Woodchips are preferable because as they decompose they improve the soil.
- During landscaping retain the mulch within the dripline of the tree and don't add new plants. Beyond it add only 2 inches of new soil.
- Install new plants using small material to limit digging.
- Use woodchip mulch over all open soil after landscaping.

**Conclusion**

The City needs to require plan modifications and enforce the Tree Protection Zone for the best outcome. The Coast redwood is still a good candidate for retention if further disturbance can be avoided. However if the fenced protection zone is reduced, the City will have to reconsider saving this excellent tree.

**Limits**

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 further dissection, excavation, probing, or coring.

Loss or alteration of any part of a report invalidates the entire report.

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

The report and conclusions expressed herein represent the opinion of Tina Cohen d/b/a Northwest Arborvitae. Our fee is no way contingent upon any specified value, a result or occurrence of a subsequent event, or upon any finding to be reported.

Respectfully submitted,



Tina Cohen, I.S.A. Certified Arborist #PN0245  
American Society of Consulting Arborists, Registered Consulting Arborist #473  
I.S.A. Tree Risk Assessor Qualification #194



**Attachments:** Photos  
Annotated site plan from LA Studio 6/19/2017





Above: Photo from 9/13/2011 shows #32 Coast redwood in a flat, wet grassy area. The photo was taken standing northwest of the tree.



Above: The redwood on 4/28/2015 from the same angle.



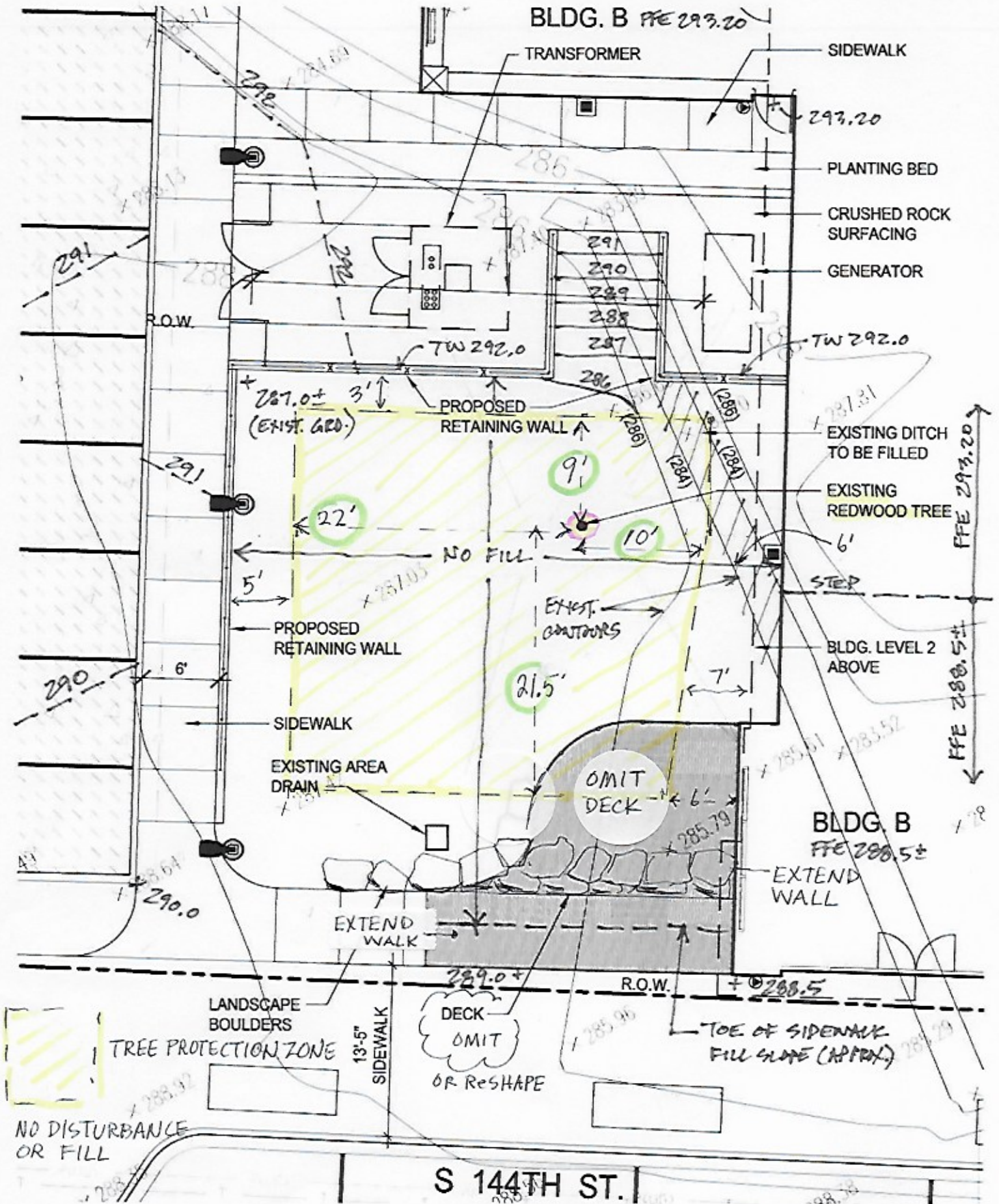


Above: The same tree 6/1/2017. The grade has been raised on all sides. Other trees were removed.



Above: 6/1/2017. The existing drainage swale can be seen to the left, east of the trunk. Note the orange protection fence adjacent to the swale. The portion of the swale to the north has already been filled.





By: The LA Studio, LLC  
 Date: June 19, 2017

NOTES ADDED  
 BY TINA COHEN  
 6-20-2017



1" = 10' 85