

February 21, 2024

### LNL Builds

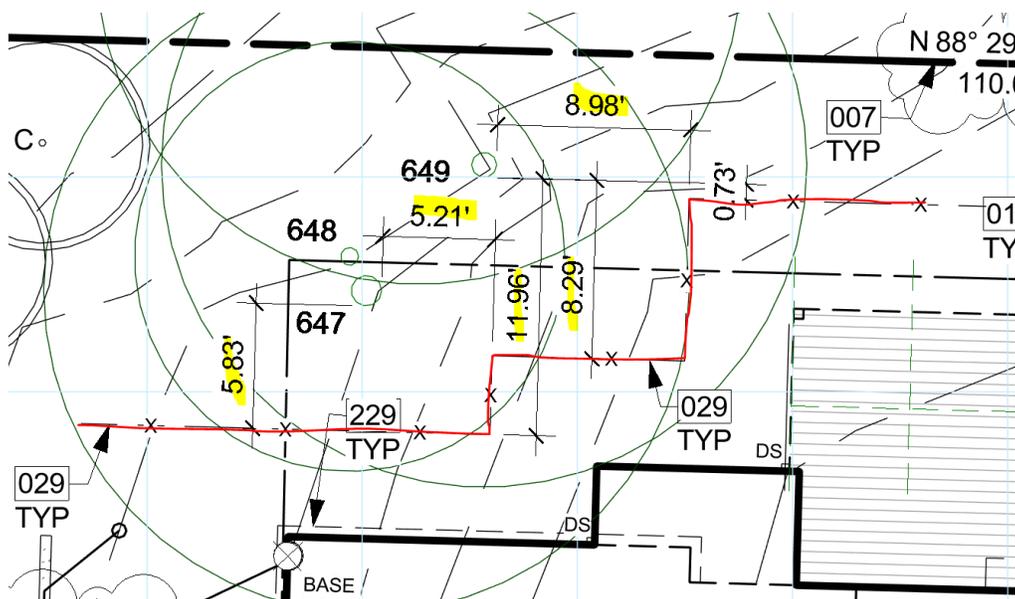
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Davey Resource Group, Inc. (DRG) was contracted to respond to the adjusted tree protection fencing for TREE ID#s 647 & 649 near development activities on the site at 74th Avenue SE (PIN: 5315100-458 in Mercer Island, WA). Excavation is expected to encroach into the required tree protection zone (TPZ) which is defined as the average dripline radius. Reduction of the TPZ may be permitted by the city arborist to allow construction related activity if:

- Such activity or work will not threaten the long-term health of the retained tree(s) and;
- Such activity or work complies with the protective methods and best building practices established by the International Society of Arboriculture.

The site arborist from DRG reviewed the site plans and reduction of the TPZ to ascertain the viability of two (2) trees on the site. **TREE ID# 647** is a bigleaf maple (*Acer macrophyllum*) that had a diameter at standard height (DSH) of 17 inches. The tree was in fair condition. The average canopy radius was 15 feet. **TREE ID# 649** was also a bigleaf maple that measured 14" DSH and had an average dripline radius of 15". This tree was in fair condition.

The TPZ of these two (2) trees will be reduced to facilitate excavation for the new structure. Excavation is proposed at 5.83 feet south to 5.21 ft. east of **TREE ID# 647** and 11.96' south to 8.98' east of **TREE ID# 649**. The average dripline radius for these trees is 15'. The structural root zone radius of these trees is 8' and 6' respectively.



There are two considerations when evaluating tree root disturbance during construction; the removal of absorption roots and anchoring roots. Removal (or compaction in the area) of the feeder roots can cause immediate water stress and a significant decline in tree health. The ability of a tree to survive root removal is dependent on its tolerance of drought, tree health, and the ability to form new roots quickly. Removal of the larger anchoring roots can lead to structural instability. Trees that suffer substantial root loss or damage are seldom good candidates for preservation.

The trunk diameter (DSH) of the trees was used to determine the potential structural root zone (SRZ) using a commonly accepted method established by Dr. Kim Coder in *Construction Damage Assessments: Trees and Sites*<sup>1</sup>. In this method, the root plate size (i.e. pedestal roots, zone of rapid taper area, and roots under compression) and limit of disturbance (LOD) based upon tree DSH is considered as a minimum distance that any disruption should occur during construction. A significant risk of catastrophic tree failure exists if structural roots within this given radius are destroyed or severely damaged. Any work within the SRZ of a tree that will be preserved at the site will require special considerations.

Each tree species, and each unique individual, will respond to the stress and strain of site development activities in different ways. Some species vary widely in their response to mechanical injury, pest attack, soil modifications, and microclimatic changes associated with construction. As more tree tissues, physical space, and essential resources are disrupted, the more a tree must effectively react to these changes to ensure survival. The variability of general tree reactions to construction damage represents a range of tolerances. Some trees tolerate damage well while others tolerate damage poorly. This assumption represents only broad expectations of tree reactions and cannot anticipate reactions to specific site changes and circumstances.

Both of the impacted trees are young and healthy. Furthermore, bigleaf maple trees are able to tolerate heavy pruning and soil limitations. It is expected that these trees will not be significantly impacted by the reduced TPZ and excavation within the TPZ if the following actions are followed:

- Prior to any soil disturbance at the site the LOD for excavation are marked in the field.
- The soil can then be removed with a pneumatic air-tool ~6 inches outside the LOD for the new building. The trench will be ~6" wide and 12" deep or greater.
- Once exposed, the roots of the trees will be pruned by a certified arborist. The pruning cuts will be made as close to the LOD as feasible.
- The trench will then be filled with native soil or amended soil, as needed.
- A 4" layer of mulch or wood chips will be applied just outside the filled trench and throughout the entire remaining TPZ's.
- Tree protection fencing will then be installed just outside the backfilled trench.

Root pruning, instead of tearing and ripping roots with large excavation equipment, reduces the potential future vectors of decay. Clean cuts made using sharp tools allow the tree to undergo its natural process of compartmentalizing wounds, preventing the spread of decay. It is recommended that the arborist performing the work make note of the size and quantity of pruned roots. If many large anchoring roots require removal the tree may become structurally unstable. In this instance, the whole tree may need to be removed to reduce tree risk at the site.

Please contact DRG with any questions or concerns. Thank you.

Respectfully,



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<sup>1</sup> Dr. Kim Coder, University of Georgia June 1996