



August 16, 2022

Project: Pre-construction assessment for lot re-development at 6950 SE Maker Street, Mercer Island, WA. Parcel number 9350900620.

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Objectives: Evaluate health of existing trees and establish criteria for the preservation of those to be retained.

Description: The existing house on the subject property was built in 1952 and was part of the White Brothers 1st to East Seattle development which included the surrounding properties. The previous owners owned the home for at least twenty years and made few changes to the home or over tenure. Just prior to selling the property they removed one small tree on the west side of their yard and arranged to have the neighbor's large tree pruned back from over their roof.

None of the surrounding properties have made significant changes to their yards since the early 1990s. Several have large trees present which have grown up in place.

The current owners purchased the subject property in Spring of 2021 and began working with RKK Construction on a plan to tear down the existing house and replace it with another as shown in Figures 1 and 2. They didn't make a tree preservation plan initially as they had no trees on their parcel. The City of Mercer Island requested a tree protection plan because of large trees on the neighboring properties. Superior NW Enterprises contacted and requested to assess the tree situation.

No trees were found on the subject lot during the August 5, 2022 site visit. Large shrubbery runs around the SW corner of the 6950 lot but none of the plants reached the dimensions of being a significant tree. Five significant trees were noted on the neighboring west, north, and east properties that stood close enough to the lot lines that could potentially be affected by the proposed project. The following itemized tree list begins with the trees on the west side parcel, runs clockwise, and the numerical designations are reflected in Figure 3. Diameters were estimated at the standard height of 54" above grade (DSH) conservatively to the tree's favor. Heights were also estimated.

1. Likely a Teddy Bear Magnolia (*Magnolia grandiflora* 'Teddy Bear') about 8" DSH, 22' tall with a 6' radial spread. The tree stands 10' W of the west property line and close to 40 N of the SE corner (Figure 4). Fair condition with average new growth and color.
2. Paper Bark maple (*Acer griseum*) 10" DSH, 24' tall with an 8' radial spread. Tree stands close to 15' W of the west line and 25' N of the #1 magnolia. Good condition.
3. Southern Magnolia (*Magnolia grandiflora*) about 10" DSH, 28' tall with a 12' radial spread. The tree stands 12' W of the west line and about 20' S of the NW corner. Tree is in fair condition.
4. Douglas fir (*Pseudotsuga menziesii*) 36" DSH (may be less as it appears to have heavy bark), reaches in the neighborhood of 75' tall. It appears to have been topped multiple times and regrown (Figure 5). Exhibits good new growth and color with a full radial canopy down below the halfway point. Base of the tree is 9.5' N of the northwest corner of the subject property. There is a significant drop off in this area of the yard. The plan sheet indicates a negative 12' grade change.
5. Red oak (*Quercus rubra*) easily 40" DSH, 50' tall in the highest reaches, spreads as much as 45' north and south, around 35' east, but was cut back quite hard on the west and extends no more than 18' to that side (Figure 6). The base of the tree is 25' S of the NE corner and 10' on center east of the east line. It sits on top of a large stone retaining wall that is near 5' tall and fully on the neighbor's lot (Figure 7). The stone wall sits above a Keystone block retaining wall that is 5.5' tall and runs along the whole east side of the existing house and 5' E of it (Figure 8). The roots from the oak have interwoven with the stones and likely have entered the soil beneath but primarily they have to have spread toward the east side neighbor's house. There are no indications that the oak's roots have disrupted the Keystone blocks. The oak appears to be fair condition overall but is exhibiting signs of stress in the upper canopy. Heavy epicormic response growth is present in the lower canopy.

Methods: Tree assessment is both an art and a science. To properly perform, an arborist must have an extensive background in biology, tree mechanics, and tree structure that is equal parts academic and field knowledge. It takes years of study to recognize and correctly diagnose the subtle signs trees exhibit before their failure, whether it be partial or total. The process begins with a visual inspection (visual tree assessment, VTA) which is followed up as necessary with soundings, core testing, and/or other detection means. Each tree is examined and evaluated according to several factors including species type, size, vigor, injuries present, root and grade disturbance, deadwood, location and extent of decay, stem taper, exposure, and targets in range.

Analysis: No primary impact will occur as no trees stand within 10' of the proposed construction changes. The secondary impact zone includes any trees which have root systems potentially extending within the construction impact zone. This region, the Critical Root Zone (CRZ), is a radial area extending out from the tree a distance equal to one foot per inch of diameter. For example, the #5 oak, with a 40" DSH, has a theoretical 40' radial CRZ.

Based on the proposed plans only the #4 and #5 trees are large enough to potentially have roots in the secondary impact zone.

Discussion: The demolition of the existing home theoretically, based on the linear distances, has the potential to create root disturbance in the CRZ of the #5 oak. The Keystone block wall is to be retained though. As a rule of thumb it is rare to find roots from trees more than 4' below their bases in areas of sudden grade change. Roots have to have aerated soils to function properly. While oak trees are known to be rock breakers and large ones like the subject tree have the power to crack concrete and affect other types of hardscaping there are no indications that this tree has any roots on the 6950 property.

The oak tree is deemed to be under little to no risk of disturbance from the proposed construction project.

The plan does not show that there will be significant changes in grade levels (backfill) occurring in the area of the NW corner of the yard. There is already a stone retaining wall along the west side of the 6950 parcel and a secondary block wall parallel to it on the west side neighbor's property. Both wall ends close to the NW corner of the subject property.

The existing deck, wooden steps leading down to it, and brick patio will be removed from the corner area. If anything this will result in better water and nutritional access for the big fir.

If grade changes due to landscaping are proposed later in the project they should be analyzed for potential impact prior to implementation.

According to the plan set the nearest construction impact to the fir will come from trenching for the drain lines. This will occur 40-45' out from the tree at the closest, well outside its potential rooting space.

The fir tree is also deemed to be under little to no risk of disturbance from the proposed construction project.

Ideally the protection fencing will be set up prior to the demolition. Along the east side it can just follow the top of the Keystone wall as there are no roots west of it. Technically a fence could be erected along the top of the west retaining wall but the trees to that side are not large enough to have penetrated into the subject property. Out of an abundance of caution a section of fence could be set between the north and west property lines at a radial distance of 25' out from the base of the #4 tree. This should ensure that no accidental impact will occur within the potential root zone of the Douglas fir.

Waiver of Liability Because the science of tree assessment is constantly broadening its understanding, it cannot be said to be an exact science. Every tree is different and performing tree risk assessment is a continual learning process. Many variables beyond the control, or immediate knowledge, of the arborist involved may adversely affect a tree and cause its premature failure. Internal cracks and faults, undetectable root rot, unexposed construction damage, interior decay, and even nutrient deficiencies can be debilitating factors. Changes in circumstance and condition can also lead to a tree's rapid deterioration and resulting instability. All trees have a risk of failure. As they increase in stature and mass their risk of breakdown also increases, eventual failure is inevitable.

While every effort has been taken to provide the most thorough and accurate snapshot of the trees' health, it is just that, a snapshot, a frozen moment in time. These findings do not guarantee future safety nor are they predictions of imminent events. It is the responsibility of the property owner to adequately care for the tree(s) in question by utilizing the proper professionals and to schedule future assessments in a timely fashion.

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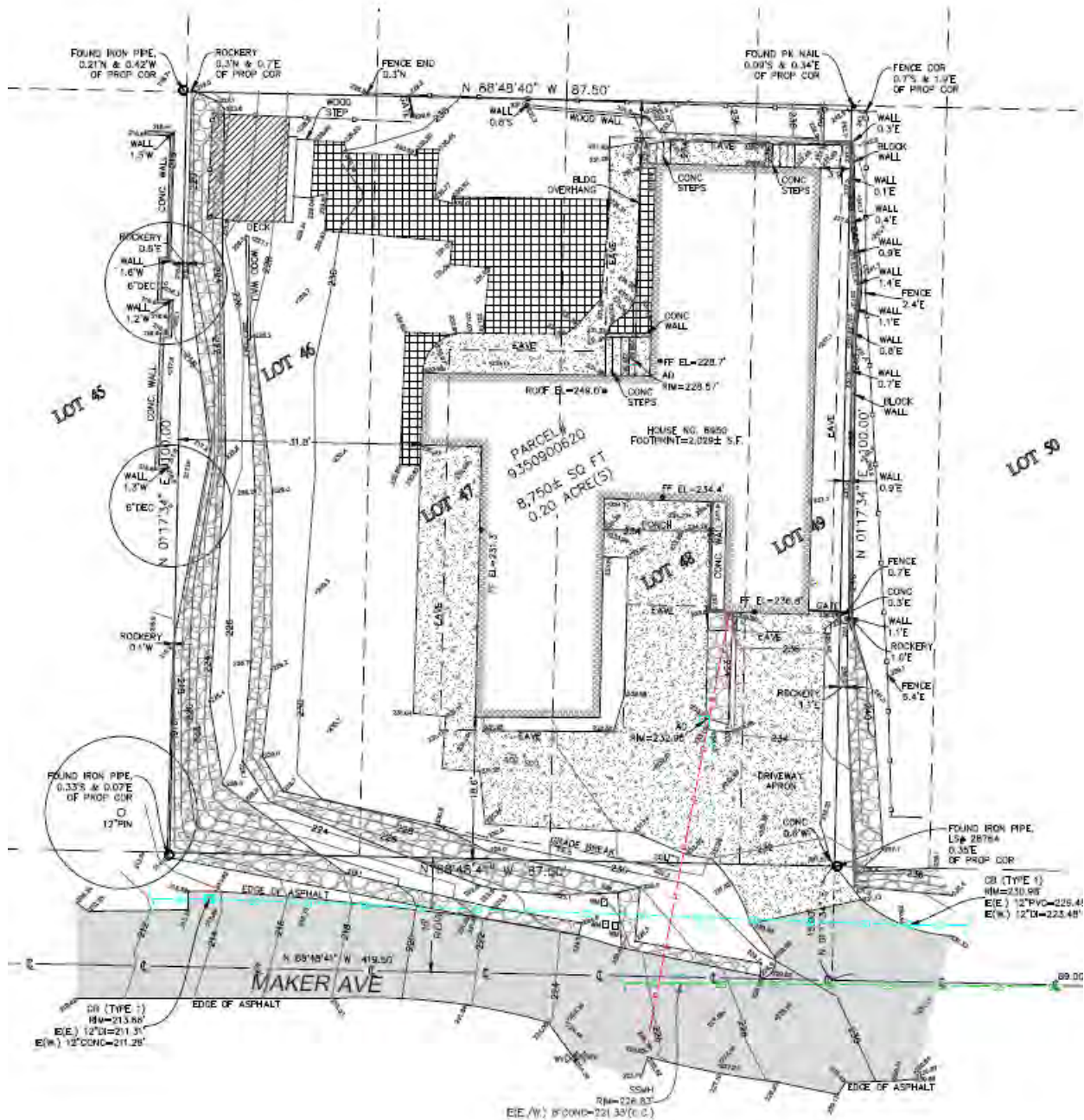


Figure 1. Excerpt from the plan set showing the current layout of the property.

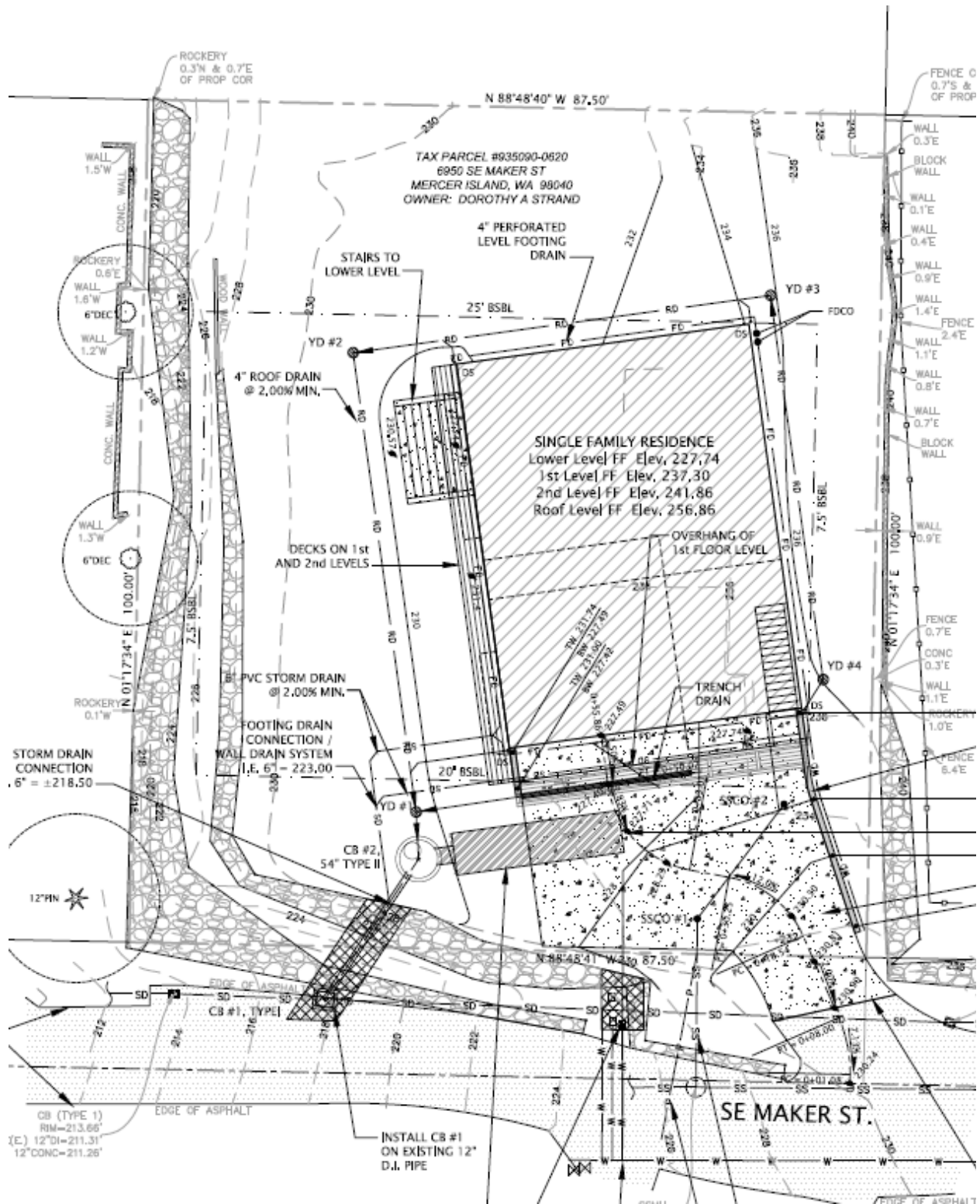


Figure 2. Excerpt from the proposed plan set showing the new layout



Figure 3. Aerial photo circa 2019 showing the approximate locations of the trees noted in the study (teal numerals). The yellow circles just help spot the numbers. The 'np' stands for 'not present' as this plant was not present at the time of the August 2022 site visit. It is presumed to have been removed by the previous owners in anticipation of selling the home.



Figure 4. Looking NW at the #1-4 trees.



Figure 5. Looking NNW at the #4 fir and showing its conformation.



Figure 6. Looking up and north at the west side of the #5 oak's canopy. It was pruned back as to not extend over the roofline of the existing house. This was likely done in anticipation of selling the home.



Figure 7. Looking up and east at the base of the #5 oak. The concrete blocks at the bottom of the photo are the top or the Keystone wall shown in Figure 8.



Figure 8. Looking SSE down the length of the Keystone block retaining wall running along the east side of the existing house. Note the base of the #5 oak at top center of the photo, The edge of the existing roof is visible in the top right corner of the image.