

Preliminary Arborist Report

To: LCM – Washington State Department of Enterprise Services c/o Amy Kim

Site: Capitol Campus - Newhouse Building and Surrounding Area
Olympia, WA 98504

Re: Development Preparation Tree Assessment and Sonic Tomography

Date: November 24, 2021

Project Arborist: Tyler Bunton
ISA Certified Arborist #PN-8715A
ISA Qualified Tree Risk Assessor

George White
ISA Certified Arborist #PN-8098A
ISA Qualified Tree Risk Assessor

Reviewed By: Joseph Sutton-Holcomb
ISA Certified Arborist #PN-8397AM
Municipal Specialist, Qualified Tree Risk Assessor

Referenced Documents: Large Tree Layer Plan (Mithun, 6/15/2009)

Attached: Table of Trees
Tree Site Map

Summary

On November 16, 2021 Tree Solutions Inc. visited the above referenced site to assess the condition of 20 trees in preparation for the replacement of the Newhouse Building. We also tested one tree for internal decay with sonic tomography.

We have provided retention values based on tree condition and surrounding site conditions, which should be used to make planning and retention decisions.

Assignment and Scope of Work

This report outlines the site inspection by Tyler Bunton and George White, of Tree Solutions Inc, on November 16, 2021. We were asked to visit the site and assess twenty trees on-site for health and structural condition. We were asked to produce an arborist report documenting my findings and management recommendations. Amy Kim of the Washington State Department of Enterprise Services (DES) requested these services for development planning purposes.

Observations & Discussion

Site

The site is located on the State Capitol Campus in Olympia. The area proposed for development currently consists of two blocks bordered by Sid Snyder Ave SW to the north, 15th Ave SW to the south, Water St SW to the west, and Capitol Way S to the east. There are currently two houses which appear to be residential or storage, the existing Newhouse Building, paved parking lots, and a closed visitor center on-site. Most of the streets surrounding and through the site are approximately 3- to 4-feet below the elevations of the adjacent properties.

I have attached an annotated Large Tree Layer Plan (Mithun, 6/15/2009) to serve as the site map and a table of trees that has detailed information about each tree, including retention values.

Trees

We were asked to assess 20 trees on the site to determine their retention value based on their health and structural condition. Brent Chapman, the horticulturist and grounds manager for DES, selected the trees based on their size and species. Mr. Chapman also tagged each of the trees assessed with plastic tags attached to the tree trunks prior to our assessment.

Tree tags are labeled with plot number and tree number (Plot #-Tree #). The tags on the trees were mislabeled as plot 34 and are instead referenced with the correct plot number of 13 in this report.

Several trees were also tagged with different tree numbers than indicated on the provided Large Tree Layer Plan (Mithun, 6/15/2009). We have identified trees in this report with the plot and tree identifiers from the Large Tree Layer Plan and have indicated the tag numbers in the attached table of trees.

The tree protection zones (TPZ) referred to below are defined as eight times trunk diameter and are based on ISA's Best Management Practices.

Tree 13-1

Tree 13-1 is a Douglas-fir (*Pseudotsuga menziesii*) tree in the northeast corner of the site growing in a lawn. This tree has surface roots indicating shallow compacted soils. There is also a narrow codominant union at approximately 10 feet with included bark.

We have rated the retention value of this tree as moderate due to the narrow codominant union, which will likely require monitoring and possible management such as installation of a cable between the trunks as the tree matures.

Trees 13-6 & 13-7

Trees 13-6 and 13-7 are tagged in the field as 34-102 and 34-103 respectively. These trees are both Sawara cypress (*Chamaecyparis pisifera* 'Filifera') trees growing at the top of rock retaining walls at the corner of Columbia St SW and Sid Snyder Ave SW. There is also a concrete stairway between the two trees.

We have rated the retention value of these trees as high due to their good health and good structural condition as well as their large single-stem equivalent diameters for the cultivar.

If these trees are retained the rock retaining walls within the recommended limits of disturbance must be left in place. The stairs between the trees should also either remain in place, or be removed carefully

taking care not to disturb the surrounding soils. Additionally, no grading may occur within the recommended limits of disturbance. If the grade will be lowered around the trees a retaining wall should be considered at the edge of the TPZ to maintain the current elevation within the TPZ.

When designing and locating any new retaining walls around the trees any over excavation necessary for forms and drainage must be accounted for in the plans.

Tree 13-15

Tree 13-15 is a Douglas-fir tree growing in a lawn to the west of the existing Newhouse Building. This tree has a DSH of 57.6-inches and is in good health and structural condition. There is a codominant union at approximately 100-feet above the base. One of the codominant stems has been reduced to approximately 3 feet above the codominant union leaving one live branch on the stem. The canopy of this tree was raised to above the existing Newhouse Building roof in the past and any pruning wounds were not visible at the time of our assessment.

We were asked to perform sonic tomography on this tree to determine if there is any internal decay. The sonic tomography was performed at 45-inches above the base and indicated sound wood throughout (Figure 1).

Due to the size and prominence of tree 13-15 we have rated the retention value as high. Care should be taken when demolishing the existing Newhouse Building to ensure debris does not enter the tree protection zone. Any new structure built to the east of this tree should remain within the existing building footprint to minimize disturbance to the soils around the tree.

To further minimize disturbance the existing Newhouse Building foundation should remain in place to the east of the tree with the new structures foundation installed immediately east of the old foundation. By retaining the old foundation soil disturbance will be minimized.

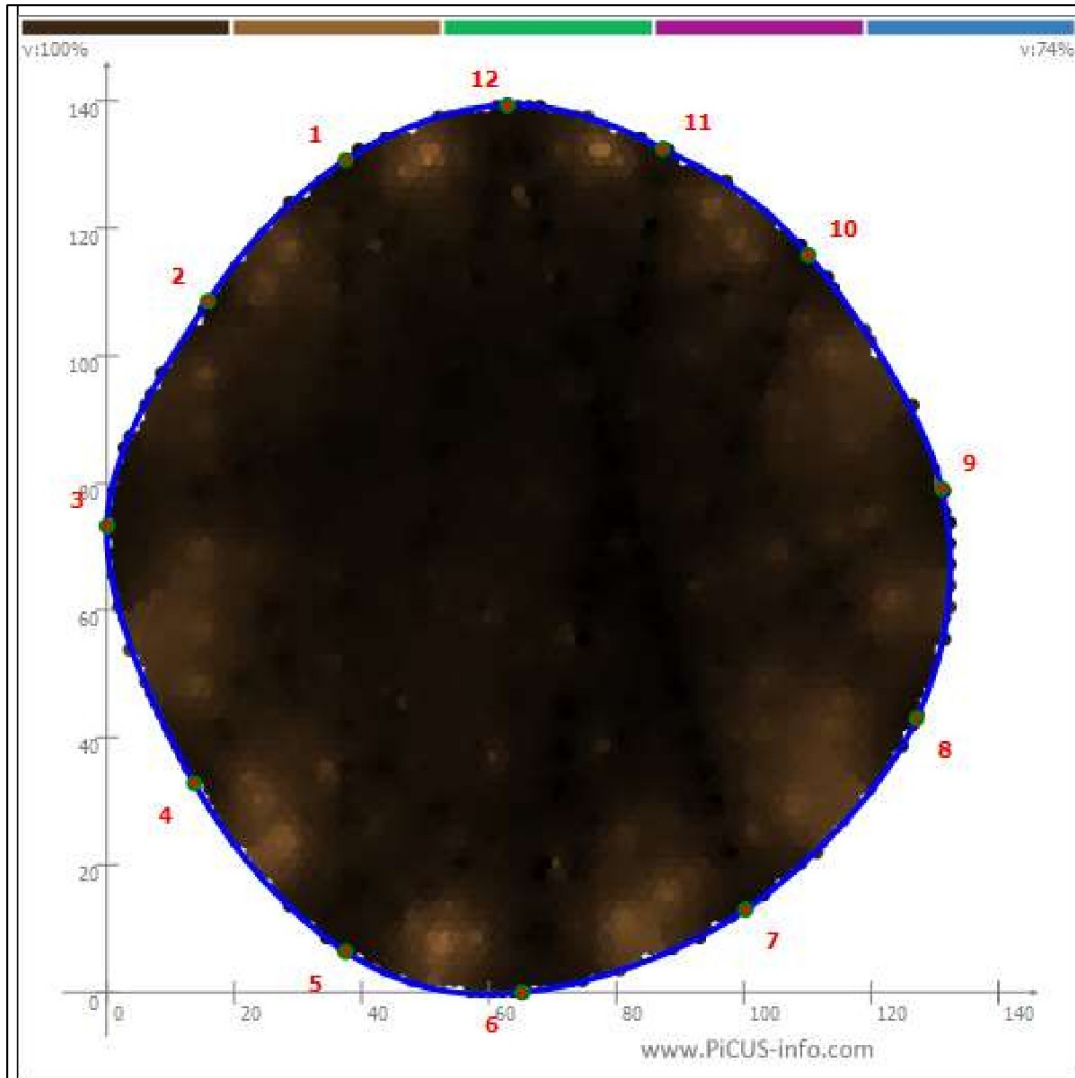


Figure 1. Sonic tomogram showing sound wood, the brown area, throughout the trunk at 45-inches above the base.

Tree 13-22

Tree 13-22 is a European beech (*Fagus sylvatica*) tree growing adjacent to the parking lot on the east half of the site. This tree is in good health and structural condition and has a high retention value.

If this tree is retained the existing hardscape within the TPZ must be demolished carefully, working away from the tree to make sure that no machinery traverses exposed soils. There is also a small Douglas-fir tree to the northwest of tree 13-22 which could also be retained as part of the TPZ of this tree.

Tree 13-23

Tree 13-23 is a Douglas-fir tree with a DSH of 29.8-inches located approximately 5-feet to the east of the closed visitor center on the east side of the site. This tree is in good health and good structural condition with a very mildly swept base.

Tree 13-23 has a high retention value, and if retained care must be taken when demolishing the adjacent building to prevent damage to the tree and disturbance to the soils within the TPZ.

Trees 13-25, 13-26, & 13-27

These three trees are all Douglas-fir trees located south of the pedestrian bridge and approximately 5-feet north of the parking lot. All three are in good health and excellent structural condition with straight trunks and good branch spacing. An electric vehicle charging station was recently installed approximately 4-feet to the south of tree 13-25 and may have caused root damage.

The retention value of these trees is high due to their location near the pedestrian foot bridge, good health and excellent structural condition. If these trees are to be retained the existing hardscape and infrastructure must be carefully demolished to minimally disturb the soils within the TPZ.

Tree 13-32

Tree 13-32 is an eastern dogwood (*Cornus florida*) tree growing in a small planting space in a parking lot. This tree is in fair health and structural condition with little shoot extension and a codominant union at the base.

Based on the fair health and structure of this tree and its location in the parking lot we have rated the retention value of this tree as moderate. If this tree is retained we recommend careful removal of the asphalt and curb around the tree to minimize disturbance to soils within the TPZ. The planting area surrounding the tree should also be expanded in the final plans to allow for improved access to water and nutrients.

Tree 13-35

Tree 13-35 is a wild cherry (*Prunus avium*) growing in a planting space between Columbia Way SW and a parking lot to the east. This tree is in good health and fair structural condition with a codominant union at approximately 6-feet and a tear out on the south stem at approximately 15 feet. Due to the fair structural condition we rated the retention value of this tree as moderate.

Tree 13-36

Tree 13-36 is a Chinese photinia (*Photinia serratifolia*) tree growing in the same planting area as tree 13-35. This tree has a DSH of 14.9-inches and has good health and structural condition. Based on the size and condition of this tree we rated the retention value as high.

Tree 13-41

Tree 13-41 is an elm (*Ulmus* sp.) tree with a DSH of 36.5-inches and in good health and good structural condition. This tree is located at the top corner of a rock retaining wall above a sidewalk along Columbia Way SW and a driveway to the adjacent building. At this time Dutch elm disease (*Ophiostoma ulmi*) is not prevalent in the area, but is currently spreading in our region. Due to the condition of the tree and its location at the top of the rock retaining wall we rated the retention value as moderate. In determining the retention status of this tree the presence of Dutch elm disease in the region should be considered.

Trees 13-44, 13-45, & 13-46

These trees are all European white birch (*Betula pendula*) trees growing north of 15th Ave SW west of Columbia Way SW. These trees are in good health and good structural condition and have diameters at standard height from 17.7-inches to 29-inches. At this time bronze birch borer (*Agrilus anxius*) is not prevalent in the area, but is currently spreading in our region. We rated the retention value of these

trees as high due to their good condition and location at the edge of the site. In determining the retention status of these trees the presence of bronze birch borer in the region should be considered.

Tree 13-47

Tree 13-47 is a monkey puzzle (*Araucaria araucana*) tree growing to the west of the row of trees 13-44 to 13-46. This tree is in good health and structural condition and is located at the edge of the site. Due to the location and condition we rated the retention value of this tree as high. Hardscape removal and replacement within the TPZ of this tree must be performed to minimize disturbance to soils.

Tree 13-100

Tree 13-100 is a Sawara cypress tree located to the north of tree 13-36 in a small planting area between a parking lot, rock retaining wall, and a set of concrete stairs. The canopy of this tree is slightly sparse, and the trunk has a narrow codominant union at approximately 4-feet with included bark. We rated the retention value of this tree as moderate based on the tree's condition and the amount of hardscape surrounding the tree which will likely require demolition.

Tree 13-104

Tree 13-104 is a Sawara cypress tree growing at the top of a rock wall south of Sid Snyder Ave SW. This tree has a single-stem equivalent diameter of 41.6-inches and is in good health and fair structural condition. The trunk is codominant at the base, and the canopy is slightly sparse in locations. Based on the trees location at the top of a rock wall and the condition we have rated the retention value of this tree as moderate.

Tree 13-105

Tree 13-105 is a Sawara cypress tree growing immediately adjacent to tree 13-104 at the top of a rock wall. This tree has a single-stem equivalent diameter of 39.8-inches and is in fair health and fair structural condition. The canopy is slightly sparse, and the eastern trunk likely has a decay cavity from the base to approximately 3-feet in height originating from a large wound at the base on the southwest side. Based on the tree's location and the likely decay we rated the retention value of this tree as low.

Discussion—Construction Impacts

This report is preliminary as we have not reviewed design or construction plans for this area. However, tree protection specifications, which must be followed throughout the project, are included in Appendix F.

Recommendations

- Consult Tree Solutions Inc. on any work planned within the TPZ of retained trees.
- Provide Tree Solutions Inc. with civil, underground utility, and tree protection plans for review when available.
- All pruning should be conducted by an ISA certified arborist following current ANSI A300 specifications.

Respectfully submitted,



Tyler Bunton,
Consulting Arborist

Appendix A Glossary

advanced assessment: an assessment performed to provide detailed information about specific tree parts, defects, targets, or site conditions. Specialized equipment, data collection and analysis, and/or expertise are usually required (ISA 2013)

ANSI A300: American National Standards Institute (ANSI) standards for tree care

basic assessment: detailed visual inspection of a tree and surrounding site that may include the use of simple tools. It requires that a tree risk assessor walk completely around the tree trunk looking at the site, aboveground roots, trunk, and branches (ISA 2013)

cabling: installation of hardware in a tree to help support weak branches or crotches (Lilly 2001)

codominant stems: stems or branches of nearly equal diameter, often weakly attached (Matheny *et al.* 1998)

DBH or DSH: diameter at breast or standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Council of Tree and Landscape Appraisers 2019)

deciduous: tree or other plant that loses its leaves sometime during the year and stays leafless generally during the cold season (Lilly 2001)

evergreen: tree or plant that keeps its needles or leaves year round; this means for more than one growing season (Lilly 2001)

ISA: International Society of Arboriculture

included bark: bark that becomes embedded in a crotch between branch and trunk or between codominant stems and causes a weak structure (Lilly 2001)

minimum limits of disturbance: Area surrounding a tree equal to a radius measured as 5 times DSH

recommended limits of disturbance: Area surrounding a tree equal to a radius measured as 8 times DSH

structural defects: flaws, decay, or other faults in the trunk, branches, or root collar of a tree, which may lead to failure (Lilly 2001)

tomography: a technique for obtaining 2-D cross sections or 3-D pictures of the interior of an object by passing sound waves through the object and measuring the travel times of the acoustic signals as the object absorbs or scatters them on ray paths between source and receiver.

tree protection zone (TPZ): see “recommended limits of disturbance”

Visual Tree Assessment (VTA): method of evaluating structural defects and stability in trees by noting the pattern of growth (Mattheck & Breloer 1994)

Appendix B References

Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Council of Tree and Landscape Appraisers, Guide for Plant Appraisal, 10th Edition Second Printing. Atlanta, GA: The International Society of Arboriculture (ISA), 2019.

Dunster & Associates Environmental Consultants Ltd. Assessing Trees in Urban Areas and the Urban-Rural Interface, US Release 1.0. Silverton: Pacific Northwest Chapter ISA, 2006.

Dunster, Julian A., E. Thomas Smiley, Nelda Matheny, and Sharon Lilly. Tree Risk Assessment Manual. Champaign, Illinois: International Society of Arboriculture, 2013.

E. Smiley, N. Matheny, S. Lilly. Best Management Practices: TREE RISK ASSESSMENT. ISA 2011.

Lilly, Sharon. Arborists' Certification Study Guide. Champaign, IL: The International Society of Arboriculture, 2001.

Matheny, Nelda and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Champaign, IL: International Society of Arboriculture, 1998.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 1994.

Appendix C Photographs



Photo 1. Trees 13-25, 13-26, and 13-27 from left to right, indicated by red arrows, in relation to existing infrastructure.



Photo 2. Tree 13-23 with the slightly swept base in relation to the closed visitor center building.



Photo 3. Narrow codominant union with included bark of tree 13-1.



Photo 4. The hardscape surrounding tree 13-22.



Photo 5. Tree 13-32 located in a small planter in the parking lot.



Photo 6. Tree 13-100 in a small planting area with a codominant trunk.



Photo 7. Tree 13-41 growing at the top corner of a rock retaining wall along Columbia Way SW.



Photo 8. Trees 13-6 (left) and 13-7 (right) growing above rock retaining walls and with concrete steps between.



Photo 9. Wound with decay at the base of tree 13-105.



Photo 10. Canopies of trees 13-104 (roughly left half of circled canopy) and 13-105 (roughly right half of circled canopy), and surrounding area.



Photo 11. From left to right trees 13-44, 16-45, 13-46, and 13-47, and surrounding area.



Photo 12. Tree 13-15 in relation to the existing Newhouse Building.

Appendix D Assumptions & Limiting Conditions

- 1 Consultant assumes that the site and its use do not violate, and is in compliance with, all applicable codes, ordinances, statutes or regulations.
- 2 The consultant may provide a report or recommendation based on published municipal regulations. The consultant assumes that the municipal regulations published on the date of the report are current municipal regulations and assumes no obligation related to unpublished city regulation information.
- 3 Any report by the consultant and any values expressed therein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event, or upon any finding to be reported.
- 4 All photographs included in this report were taken by Tree Solutions, Inc. during the documented site visit, unless otherwise noted. Sketches, drawings and photographs (included in, and attached to, this report) are intended as visual aids and are not necessarily to scale. They should not be construed as engineering drawings, architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.
- 5 Unless otherwise agreed, (1) information contained in any report by consultant covers only the items 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 dissection, excavation, probing, climbing, or coring.
- 6 These findings are based on the observations and opinions of the authoring arborist, and do not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described and assessed.
- 7 Measurements are subject to typical margins of error, considering the oval or asymmetrical cross-section of most trunks and canopies.
- 8 Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the site's soil should be obtained by a qualified professional if an additional understanding of the site's characteristics is needed to make an informed decision.
- 9 Our assessments are made in conformity with acceptable evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.

Appendix E Methods

Measuring

We measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH). If a tree had multiple stems, I measured each stem individually at standard height and determined a single-stem equivalent diameter by using the method outlined in the Guide for Plant Appraisal, 10th Edition Second Printing published by the Council of Tree and Landscape Appraisers.

Tagging

Each tree was tagged with a plastic tag prior to our inventory. The inventory numbers were written in a plot-tree ID format. The plot number on the tags was written as 34, but is actually 13. All trees are identified in this report as plot 13.

Evaluating

We evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. An understanding of the uniform stress allows the arborist to make informed judgments about the condition of a tree.

Rating

When rating tree health, I took into consideration crown indicators such as foliar density, size, color, stem and shoot extensions. When rating tree structure, we evaluated the tree for form and structural defects, including past damage and decay. Tree Solutions has adapted our ratings based on the Purdue University Extension formula values for health condition (*Purdue University Extension bulletin FNR-473-W - Tree Appraisal*). These values are a general representation used to assist arborists in assigning ratings.

Health

Excellent - Perfect specimen with excellent form and vigor, well-balanced crown. Normal to exceeding shoot length on new growth. Leaf size and color normal. Trunk is sound and solid. Root zone undisturbed. No apparent pest problems. Long safe useful life expectancy for the species.

Good - Imperfect canopy density in few parts of the tree, up to 10% of the canopy. Normal to less than ¾ typical growth rate of shoots and minor deficiency in typical leaf development. Few pest issues or damage, and if they exist they are controllable or tree is reacting appropriately. Normal branch and stem development with healthy growth. Safe useful life expectancy typical for the species.

Fair - Crown decline and dieback up to 30% of the canopy. Leaf color is somewhat chlorotic/necrotic with smaller leaves and “off” coloration. Shoot extensions indicate some stunting and stressed growing conditions. Stress cone crop clearly visible. Obvious signs of pest problems contributing to lesser condition, control might be possible. Some decay areas found in main stem and branches. Below average safe useful life expectancy

Poor - Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting of shoots is obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe and uncontrollable. Extensive decay or hollows in branches and trunk. Short safe useful life expectancy.

Structure

Excellent - Root plate undisturbed and clear of any obstructions. Trunk flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.

Good - Root plate appears normal, with only minor damage. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure and less than 25% of bark section missing. Good branch habit; minor dieback with some signs of previous pruning. Codominant stem formation may be present, requiring minor corrections.

Fair - Root plate reveals previous damage or disturbance. Dysfunctional roots may be visible around the main stem. Evidence of trunk damage or cavities, with decay or defects present and less than 30% of bark sections missing on trunk. Co-dominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.

Poor - Root plate disturbance and defects indicate major damage, with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important branches dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective action required.

Advanced Testing

We used a PICUS sonic tomograph to test for internal decay and other defects. This instrument is a non-destructive evaluation tool that works by using sound velocity measurements between several sensors placed around the trunk. Because sound velocity decreases in decayed areas, internal defects can be detected and the stability of the tree can be estimated. The data from the instrument is recorded and results display the cross section of the trunk along the plane where the sensors were placed.

Appendix F Tree Protection Specifications

The following is a list of protection measures that must be employed before, during and after construction to ensure the long-term viability of retained trees.

1. **Project Arborist:** The project arborists shall at minimum have an International Society of Arboriculture (ISA) Certification and ISA Tree Risk Assessment Qualification.
2. **Tree Protection Zone (TPZ):** The TPZ is the area surrounding the tree with a radius equal to 8 times diameter at standard height (DSH). With approval of the project arborist work may occur within the TPZ up to 5 times DSH. No work may occur within 5 times DSH. In some cases, the TPZ may extend outside tree protection fencing. Work within the TPZ must be approved and monitored by the project arborist.
3. **Tree Protection Fencing:** Tree protection shall consist of 6-foot chain-link fencing installed at the TPZ as approved by the project arborist. Fence posts shall be anchored into the ground or bolted to existing hardscape surfaces.
 - a. Where trees are being retained as a group the fencing shall encompass the entire area including all landscape beds or lawn areas associated with the group.
 - b. Per arborist approval, TPZ fencing may be placed at the edge of existing hardscape within the TPZ to allow for staging and traffic.
 - c. Where work is planned within the TPZ, install fencing at edge of TPZ and move to limits of disturbance at the time that the work within the TPZ is planned to occur. This ensures that work within the TPZ is completed to specification.
 - d. Where trees are protected at the edge of the project boundary, construction limits fencing shall be incorporated as the boundary of tree protection fencing.
4. **Access Beyond Tree Protection Fencing:** The project manager or project arborist shall be present when tree protection areas are accessed.
5. **Tree Protection Signage:** Tree protection signage shall be affixed to fencing every 20 feet. Signage shall be fluorescent, at least 2' x 2' in size. Signage will note: "Tree Protection Area – Do Not Enter: Entry into the tree protection area is prohibited unless authorized by the project manager." Signage shall include the contact information for the project manager and instructions for gaining access to the area.
6. **Filter / Silt Fencing:** Filter / silt fencing within, or at the edge of, the TPZ of retained trees shall be installed in a manner that does not sever roots. Install so that filter / silt fencing sits on the ground and is weighed in place by sandbags or gravel. Do not trench to insert filter / silt fencing into the ground.
7. **Monitoring:** The project arborist shall monitor all ground disturbance within the TPZ, including where the TPZ extends beyond the tree protection fencing.
8. **Soil Protection:** No parking, foot traffic, materials storage, or dumping (including excavated soils) are allowed within the TPZ. Heavy machinery shall remain outside of the TPZ. Access to the tree protection area will be granted under the supervision of the project arborist or project manager. If project arborist allows, heavy machinery can enter the area if soils are protected from the load. Acceptable methods of soil protection include applying 3/4-inch plywood over 4 to 6 inches of wood chip mulch or use of AlturnaMats® (or equivalent product approved by the project arborist). Retain existing paved surfaces within or at the edge of the TPZ for as long as possible.
9. **Soil Remediation:** Soil compacted within the TPZ of retained trees shall be remediated using pneumatic air excavation according to a specification produced by the project arborist.
10. **Canopy Protection:** Where fencing is installed at the limits of disturbance within the TPZ, canopy management (pruning or tying back) shall be conducted to ensure that vehicular traffic does not

damage canopy parts. Exhaust from machinery shall be located five feet outside the dripline of retained trees. No exhaust shall come in contact with foliage for prolonged periods of time.

11. **Duff/Mulch:** Apply 6 inches of arborist wood chip mulch or hog fuel over bare soil within the TPZ to prevent compaction and evaporation. TPZ shall be free of invasive weeds to facilitate mulch application. Keep mulch 1 foot away from the base of trees and 6 inches from retained understory vegetation. Retain and protect as much of the existing duff and understory vegetation as possible.
12. **Excavation:** Excavation done within the TPZ shall use alternative methods such as pneumatic air excavation or hand digging. If heavy machinery is used, use flat front buckets with the project arborist spotting for roots. When roots are encountered, stop excavation and cleanly sever roots. The project arborist shall monitor all excavation done within the TPZ.
13. **Fill:** Limit fill to 1 foot of uncompacted well-draining soil, within the TPZ of retained trees. In areas where additional fill is required, consult with the project arborist. Fill must be kept at least 1 foot from the trunks of trees.
14. **Root Pruning:** Limit root pruning to the extent possible. All roots shall be pruned with a sharp saw making clean cuts. Do not fracture or break roots with excavation equipment.
15. **Root Moisture:** Root cuts and exposed roots shall be immediately covered with soil, mulch, or clear polyethylene sheeting and kept moist. Water to maintain moist condition until the area is back filled. Do not allow exposed roots to dry out before replacing permanent back fill.
16. **Hardscape Removal:** Retain hardscape surfaces for as long as practical. Remove hardscape in a manner that does not require machinery to traverse newly exposed soil within the TPZ. Where equipment must traverse the newly exposed soil, apply soil protection as described in section 8. Replace fencing at edge of TPZ if soil exposed by hardscape removal will remain for any period of time.
17. **Tree Removal:** All trees to be removed that are located within the TPZ of retained trees shall not be ripped, pulled, or pushed over. The tree should be cut to the base and the stump either left or ground out. A flat front bucket can also be used to sever roots around all sides of the stump, or the roots can be exposed using hydro or air excavation and then cut before removing the stump.
18. **Irrigation:** Retained trees with soil disturbance within the TPZ will require supplemental water from June through September. Acceptable methods of irrigation include drip, sprinkler, or watering truck. Trees shall be watered three times per month during this time.
19. **Pruning:** Pruning required for construction and safety clearance shall be done with a pruning specification provided by the project arborist in accordance with American National Standards Institute ANSI-A300 2017 Standard Practices for Pruning. Pruning shall be conducted or monitored by an arborist with an ISA Certification.
20. **Plan Updates:** All plan updates or field modification that result in impacts within the TPZ or change the retained status of trees shall be reviewed by the senior project manager and project arborist prior to conducting the work.
21. **Materials:** Contractor shall have the following materials onsite and available for use during work in the TPZ:
 - **Sharp and clean bypass hand pruners**
 - **Sharp and clean bypass loppers**
 - **Sharp hand-held root saw**
 - **Reciprocating saw with new blades**
 - **Shovels**
 - **Trowels**
 - **Clear polyethylene sheeting**
 - **Burlap**
 - **Water**

DSH (Diameter at Standard Height) is measured 4.5 feet above grade, or as specified in the Guide for Plant Appraisal, 10th Edition, published by the Council of Tree and Landscape Appraisers.

DSH for multi-stem trees are noted as a single-stem equivalent, which is calculated using the method defined in the Guide for Plant Appraisal, 10th Edition.

Letters are used to identify trees on neighboring property with overhanging canopies.

All trees are tagged with plastic tags with written plot-tree # (34-##). Trees listed in the table are identified with the correct plot number as 13-##.

Recommended limits of disturbance (LOD) / Tree protection zone (TPZ) are defined as 8 times DSH.

Minimum LOD are defined as 5 times DSH.

Retention values are based solely on tree condition and existing surroundings.

Dripline is measured from the center of the tree to the outermost extent of the canopy.

Tree ID	Tag Number	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Dripline Radius (ft)	Recommended LOD / TPZ (ft)	Minimum LOD (ft)	Retention Value (High, Moderate, Low)	Notes
13-1	34-1	<i>Pseudotsuga menziesii</i>	Douglas-fir	29.5		Good	Fair	20.2	20	12	Moderate	Codominant at ten feet with included bark, surface roots
13-6	34-102	<i>Chamaecyparis pisifera</i>	Sawara cypress	27.5	19, 13.1, 14.9	Good	Good	16.6	18	11	High	Tagged 34-102 - identified as 13-6 on provided map, Filifera cultivar
13-7	34-103	<i>Chamaecyparis pisifera</i>	Sawara cypress	26.2	11.3, 8.9, 13.1, 9.2, 15	Good	Good	15.6	17	11	High	tagged 34-103 - identified as 13-7 on provided map, Filifera cultivar, stairs between 13-6 & 13-7
13-15	34-15	<i>Pseudotsuga menziesii</i>	Douglas-fir	57.6		Good	Good	30.4	38	24	High	Reduced codominant stem near top, some canopy reduction on north side, canopy raised above existing Newhouse building, pruning wounds on trunk not visible, 120 feet tall
13-22	34-22	<i>Fagus sylvatica</i>	European Beech	31.0		Good	Good	25.3	21	13	High	Adjacent small Douglas-fir may be able to be retained within tree protection
13-23	34-23	<i>Pseudotsuga menziesii</i>	Douglas-fir	29.8		Good	Good	21.2	20	12	High	Slightly swept base
13-25	34-25	<i>Pseudotsuga menziesii</i>	Douglas-fir	24.5		Good	Excellent	19.0	16	10	High	Possible root disturbance from installation of electric vehicle charging stations 4 feet south
13-26	34-26	<i>Pseudotsuga menziesii</i>	Douglas-fir	25.1		Good	Excellent	23.0	17	10	High	
13-27	34-27	<i>Pseudotsuga menziesii</i>	Douglas-fir	24.9		Good	Excellent	18.0	17	10	High	
13-32	34-101	<i>Cornus florida</i>	Eastern Dogwood	15.3	10.7, 7.2, 8.3	Fair	Fair	13.6	10	6	Moderate	Tagged 34-101 - identified as 13-32 on provided map, parking lot tree, little shoot extension, codominant at base
13-35	34-37	<i>Prunus avium</i>	Wild cherry	13.5		Good	Fair	15.6	9	6	Moderate	Tagged 34-37 - identified as 13-35 on provided map, codominant at 6 feet with included bark, tear out on south stem at 15 feet with good response and no decay
13-36	34-39	<i>Photinia serratifolia</i>	Chinese photinia	14.9		Good	Good	15.6	10	6	High	Tagged 34-39 - identified as 13-36 on provided map
13-41	34-41	<i>Ulmus sp.</i>	Elm	36.5		Good	Good	38.5	24	15	Moderate	Pruning wounds with good response
13-44	34-44	<i>Betula pendula</i>	European White Birch	25.5		Good	Good	22.1	17	11	High	
13-45	34-45	<i>Betula pendula</i>	European White Birch	17.6		Good	Good	17.7	12	7	High	
13-46	34-46	<i>Betula pendula</i>	European White Birch	23.7		Good	Good	29.0	16	10	High	Dead wood in canopy up to 3 inches diameter
13-47	34-47	<i>Araucaria Araucana</i>	Monkey puzzle tree	41.3		Good	Good	18.7	28	17	High	



Table of Trees

Capitol Campus - Newhouse, Olympia, WA 98504

Arborist: TB / GW

Date of Inventory: 11/16/2021

Table Prepared: 11/24/2021

Tree ID	Tag Number	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Dripline Radius (ft)	Recommended LOD / TPZ (ft)	Minimum LOD (ft)	Retention Value (High, Moderate, Low)	Notes
13-100	34-100	<i>Chamaecyparis pisifera</i>	Sawara cypress	17.0		Fair	Fair	13.7	11	7	Moderate	Filifera cultivar, ivy to 10 feet, codominant at 4 feet with included bark, measured at narrowest point below union, sparse canopy, growing at top of rock wall
13-104	34-104	<i>Chamaecyparis pisifera</i>	Sawara cypress	41.6	23.5, 25.8, 22.7	Good	Fair	15.7	28	17	Moderate	Codominant at base, slightly sparse canopy
13-105	34-105	<i>Chamaecyparis pisifera</i>	Sawara cypress	39.8	21.1, 33.7	Fair	Fair	16.7	27	17	Low	East trunk likely internal decay, wound at base on southwest side with decay

IN COLLABORATION WITH:



PROJECT:
West Capitol Campus
Historic Landscape
Preservation Plan

LOCATION:
Olympia, WA

PREPARED FOR:
The Washington State
Department of General
Administration



SYMBOL KEY: See also Large Tree Layer Planting Key

- Existing tree with inventory number
- Proposed tree with lettered abbreviation
- dashed circle indicates a tree recommendation subsequent to a parking re-location, alongside an existing tree loss and replenishment, or associated with other future alteration

NOTE:
Replenish existing native trees in-kind, whenever possible. If disease prevents replenishment of Douglas firs, possible substitutions (abbreviations) include: Th pl, Pi s, Pi co, Ts he, Sa se. Substitutions for other species are listed on the Large Tree Layer Planting Key.

PRIMARY SOURCES:
Table of Trees, Ch. 10: VMP, last section

2001 Regeneration Study (Artifacts Consulting & Susan Black Associates)

5350_88-pt1 and 5350_88-tc1: General Planting Plan, Olmsted Brothers, 1929

5350_66: General Plan, Olmsted Brothers, 1928

5350_85: Tree Moving Plan, Olmsted Brothers, 1929

LARGE TREE LAYER PLAN

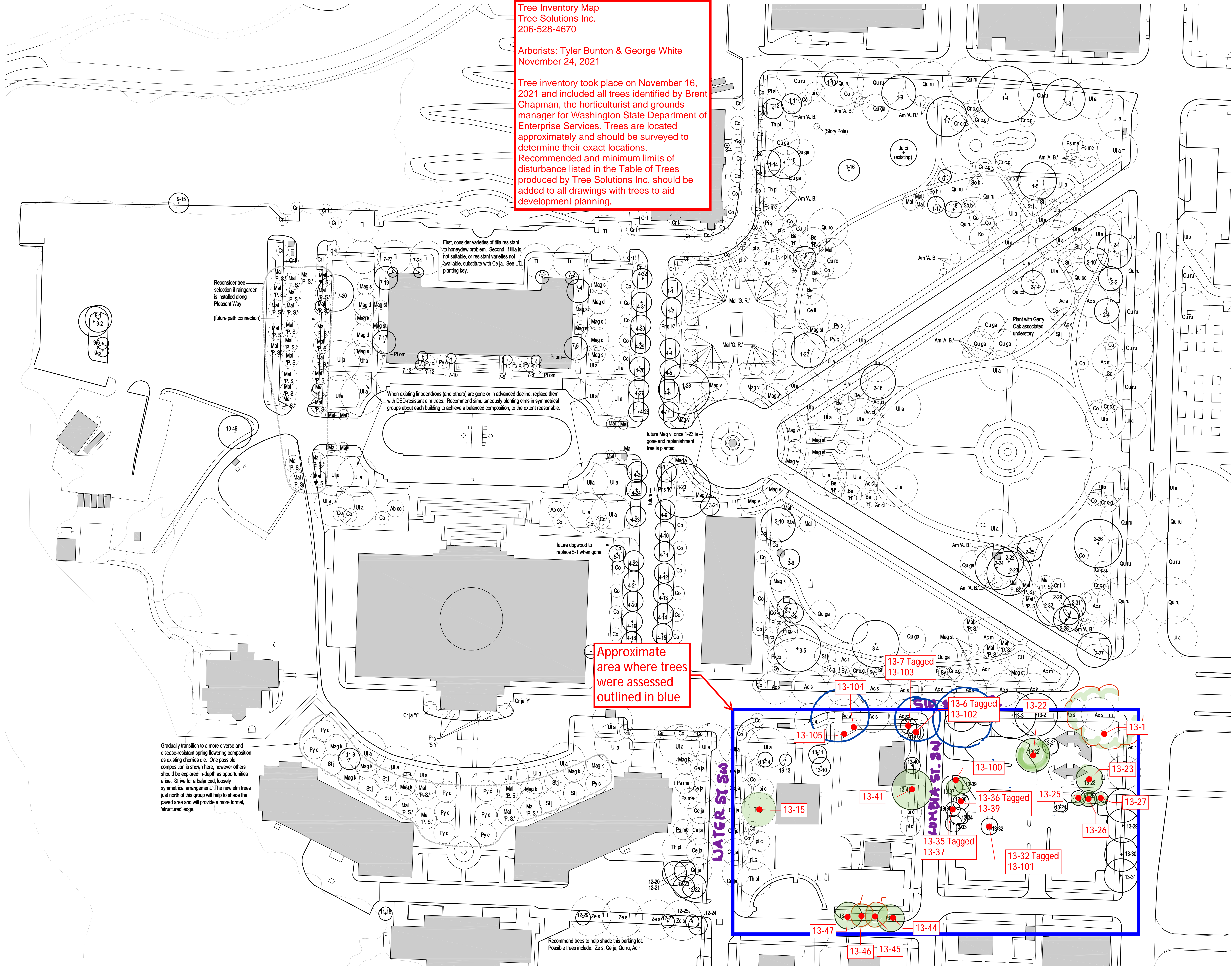
PROJECT NO:
0833600

DATE:
JUNE 15, 2009

Tree Inventory Map
Tree Solutions Inc.
206-528-4670

Arborists: Tyler Bunton & George White
November 24, 2021

Tree inventory took place on November 16, 2021 and included all trees identified by Brent Chapman, the horticulturist and grounds manager for Washington State Department of Enterprise Services. Trees are located approximately and should be surveyed to determine their exact locations. Recommended and minimum limits of disturbance listed in the Table of Trees produced by Tree Solutions Inc. should be added to all drawings with trees to aid development planning.



Reconsider tree selection if raingarden is installed along Pleasant Way.
(future path connection)

First, consider varieties of lilia resistant to honeydew problem. Second, if lilia is not suitable, or resistant varieties not available, substitute with Ce ja. See LTL planting key.

When existing lindendrons (and others) are gone or in advanced decline, replace them with DED-resistant elm trees. Recommend simultaneously planting elms in symmetrical groups about each building to achieve a balanced composition, to the extent reasonable.

future Mag v, once 1-23 is gone and replenishment tree is planted

future dogwood to replace 5-1 when gone

Approximate area where trees were assessed outlined in blue

Gradually transition to a more diverse and disease-resistant spring flowering composition as existing cherries die. One possible composition is shown here, however others should be explored in-depth as opportunities arise. Strive for a balanced, loosely symmetrical arrangement. The new elm trees just north of this group will help to shade the paved area and will provide a more formal, 'structured' edge.

Recommend trees to help shade this parking lot. Possible trees include: Ze s, Ce ja, Qu ru, Ac r