

Pre-Construction Tree Inventory & Tree Protection Plan

Inventoried July 2021

Plan Proposed March 2022



Prepared For:

Community Partners for Affordable Housing
Plambeck Gardens Multifamily Housing Project
Site Address: 23500 SW Boones Ferry Road
Tualatin, OR 97062

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Summary

On July 9 & 13, 2021, Ruth Williams, an International Society of Arboriculture (ISA) Board Certified Master Arborist (#WE-7317-BM) completed an assessment and inventory of the trees at 23500 SW Boones Ferry Road Tualatin, Oregon. The assessment was contracted by Community Partners for Affordable Housing, in anticipation of upcoming development of the site. The arborist performed a visual assessment of all trees greater than 8" DBH on the property and along the property line which could be potentially impacted by development, and some smaller vegetation by client request. The arborist evaluated the current condition, health, and size of each tree and photo documented the site. The results were used to determine the Tree Protection Zone and Structural Root Zone of the trees (RPZ and SRZ). Prior to the assessment, land clearing mechanically with mulchers, mowers or similar light equipment had been conducted that created a path, facilitating site access.

Observations

- The site includes two residential properties and a lightly maintained area that historically was a plant nursery. Topography is variable. Irrigation was not apparent.
- One hundred and four (104) trees were assessed including 15 unique species. The most common species were Scotch pine, (*Pinus sylvestris*, 60 trees) and Leyland cypress (*Cupressus x leylandii*, 15 trees).
- The trees are primarily in good (40) to fair (56) condition. Six (6) are in poor condition and two (2) are dead. Tree #34 meets the conditions of TDC 33.110 (5)(a)(ii)(B); the tree is hazardous and parts are in danger of falling.
- Diameters at breast height (DBHs) ranged from 7-30", heights ranged from 8-66'.
- Arborist-assigned preservation priorities were rated high, moderate, low, and one tree is hazardous to preserve. Fifteen (15) trees on adjacent property are required to be preserved unless alternative agreements are made with adjacent property owners. Six (6) adjacent property trees (#13-17) are no longer adjacent to the proposed construction because the parcel is no longer in consideration for development or construction site access.

Recommendations

- Preserve tree #29 following the detailed recommendations for fencing and monitoring provided in this plan. Arborist monitoring of construction is required whenever work is within the Tree Protection Zones.
- Remove eighty nine (89) trees early in the construction process. These trees would be directly impacted by site grading within the structural root zones, and therefore meet approval criteria TDC 33.110 (5)(a)(iii).
- Provide tree protection fencing for 15 trees on adjacent property and schedule arborist supervision of any excavation within 12' of adjacent property trees.
- The trees should be monitored by a Certified Arborist at the end of construction, and if any foliar browning, seasonally unusual loss, or lean.

This report focuses on recommendations for tree preservation, and provides the TPZs and SRZs of these trees for permitting purposes. This Tree Protection Plan is based on the proposed grading and drainage plans submitted March 4, 2022 for Architectural Review. The trees should be monitored by a Certified Arborist at the end of construction, and if any foliar browning, seasonally unusual loss, or lean.

Introduction

Purpose

This Pre-construction Tree Inventory and Tree Protection Plan can be submitted for permitting. This report details the health, size, and location of the trees and discusses tree protection and retention measures based on the proposed design.

Limits of the Assignment

Many factors can limit specific and accurate data when performing evaluations of trees, their conditions, and values. The determinations and recommendations presented here are based on current data and conditions that existed at the time of the evaluation and cannot be a predictor of the ultimate outcomes for the trees. A visual inspection was used to develop the findings, conclusions, and recommendations found in this report. No physical inspection of any canopy, sounding, root crown excavation, and resistograph or other technologies were used in the evaluation of the trees. Where vines or brambles prohibited access, DBH was estimated. Nineteen trees were not assessed in the original scope of work, but were later added to the data set at client request. These trees are not tagged, and tree data was estimated remotely on July 14. If greater accuracy is required, an additional arborist site visit should be arranged.

Methods

Data was collected by an ISA Board Certified Master Arborist (Ruth Williams #WE-7317 BM). A visual inspection was used to develop the findings, conclusions, and recommendations found in this report. Using a digital tablet to record information, the arborist visually assessed the trees and recorded information July 13, 2021. Following data collection, the tree's protection zone and structural root zones (TPZs and SRZs) were calculated.

The following attributes were collected:

Tree Tag: Each tree over 8" DBH was tagged with a metal identifier, and the number was recorded except for trees that obviously fell outside the property boundaries.

Species: Tree genus and species were identified.

Diameter at Breast Height (DBH): Trunk diameter was recorded to the nearest inch at 4.5 feet (breast height) above grade except where noted. When limbs or deformities occurred at breast height, measurement was taken below 4.5 ft. For multi-stemmed trees, the diameter was determined by measuring the six largest stems, and calculating the root of the sum of stems squared, or by taking a basal measurement.

Height: Tree height was measured with a laser range finder with a variance not to exceed +/- 10'.

Crown Spread: Approximate crown diameter was visually estimated with a variance not to exceed +/- 10'.

Condition: The arborist evaluated the structure and health of the tree compared to other trees in urban landscapes. Excellent, good, fair, poor, or dead were used to describe condition.

Geolocation: Approximate locations were determined by adding points to geolocated aerial tiles. Locations provided by the land surveyor are more accurate, and should be used for design purposes.

Notes: Additional observations, comments, or other points of consideration.

Observations

Site Observations

The site includes two residential properties and a lightly maintained area that was historically a plant nursery. Topography is variable. Irrigation was not apparent. Vegetation not inventoried included cryptomeria and arborvitae, as these perform as shrubs, not trees. Significant blackberry growth was present.



Map 1. North Site Overview



Map 2. South Site Overview

*Note: Trees 13-18 are not included in the project area as work and access are not anticipated within 30’.

Tree Observations

One hundred and four (104) trees were assessed including 15 unique species. The most common species were Scotch pine, (*Pinus sylvestris*, 60 trees) and Leyland cypress (*Cupressus x leylandii*, 15 trees). The trees are in good (40) to fair (56) condition. Six (6) are in poor condition and two (2) are dead. Diameters at breast height (DBHs) ranged from 7-30", heights ranged from 8-66'. Five (5) adjacent property trees (#13-17) are no longer adjacent to the proposed construction or access because the parcel is no longer in consideration for development.

Many of the Scotch pines had prior pruning resulting in co-dominant stems, and have been grown on 5' centers, creating uneven crowns, with low live crown ratios or self-pruning/dieback of most of the lower branches due to competition. Subsequently, many have had branches broken or ripped off, rather than pruned. They meet the conditions of TDC 33.110 (5)(b)(i)(B); evergreens which are unbalanced and lacking a full crown.

Analysis

Tree Benefits



Total Tree Value and Savings

Total Monetary Benefit: \$10,616

Benefits are only calculated for trees with defined species, DBH, and land use based on I-Tree research. Totals are annual amounts.



Stormwater Monetary Benefit
\$1,885 ⓘ
Runoff Prevention (Gallons)
85,642 ⓘ



Property Value Total
\$8,009 ⓘ



Energy Savings
\$241 ⓘ
Energy Saved (kWh)
4,247 ⓘ
Natural Gas Savings
\$219 ⓘ
Heat Prevention (Therms)
231 ⓘ



Air Quality Monetary Benefit
\$160 ⓘ
Pollutants removed (lb)
130 ⓘ



Carbon Monetary Benefit
\$103 ⓘ
Carbon Stored (lb)
21,380 ⓘ
Carbon Sequestered (lb)
13,961 ⓘ
Carbon Avoided (lb)
8,923 ⓘ

Root Calculations

This analysis considers two types of roots.

1. Structural roots near the trunk that should not be damaged or cut - Removal of these large anchoring roots can lead to structural instability or failure.
2. Absorptive and feeder roots - These may be impacted with arborist supervision and monitoring. Removal (or compaction in the area) of the feeder roots can cause immediate water stress, limit a trees' ability to combat decay pathogens, and cause significant declines in condition. The ability of a tree to survive root loss is dependent on its tolerance of drought, tree health, and the ability to form new roots quickly. This area is called the Root Protection Zone.

The trunk diameter (DBH) of each assessed tree was used to determine the Root Protection Zone (RPZ). The RPZ is considered the ideal preservation area of a tree. It is equal to 1 foot of radius for every inch of trunk diameter measured at 4.5 feet from grade. The RPZ represents the typical rooting area required for tree health and survival. Construction activities should be limited near or in the RPZ of any tree to be retained. This includes but is not limited to the storage of materials, parking of vehicles, contaminating soil by washing out equipment, (concrete, paint, etc.), or changing soil grade.

Like the RPZ, the Structural Root Zone (SRZ) was also calculated using a commonly accepted method established by Dr. Kim Coder in *Conserving Trees During Site Development: A training manual*.¹ In this method, the root plate size (i.e. pedestal roots, zone of rapid taper area, and roots under compression) and limit of disruption based upon tree DBH is calculated. The SRZ is the trunk radius at breast height multiplied by 10.8. Significant risk of catastrophic tree failure exists if structural roots within the SRZ are cut, destroyed or severely damaged. The SRZ is the area where no disturbance should occur unless supervised by a Certified Arborist with Tree Risk Assessment training.

Design Constraints

Due to extensive site grading, shown in the Architectural Review submitted drawings March 4, 2022, eighty nine (89) trees have grading impacts in the structural root zone and cannot be preserved. Tree #29 is close to the proposed grade and a minor grade adjustment is possible, according to the civil engineer.

Recommendations

1. Fifteen (15) trees on adjacent property are required to be preserved unless alternative agreements are made with adjacent property owners. Provide tree protection fencing for any trees on adjacent property and schedule arborist supervision of any excavation within 12' of adjacent property trees.
2. Eighty nine (89) trees are identified for removal. These trees would be directly impacted by site grading within the structural root zones, and therefore meet approval criteria TDC 33.110 (5)(a)(iii).
3. Slightly modify grading plan to preserve tree #29 and provide tree protection fencing at the furthest possible extent to facilitate grading, but no closer than 12' from the tree trunk. The fence must be a

¹ Dr. Kim D. Coder. University of Georgia. 2018.

minimum of 6' cyclone fence attached to metal posts driven into the ground to a depth of 2' at intervals of 10' minimum. The fence may have one gate or bolted panel on fence stands to allow maintenance access, but the area may not be accessed without arborist supervision. The fence must be in place prior to any construction activity on site, and remain through the duration of the project. Signage must be affixed to the fence that states "Tree Protection Area. Do Not Enter without Arborist Supervision." in multiple languages, if applicable.

4. Prior to plan finalization, consider ivy removal and an aerial inspection of tree #29 to determine maintenance recommendations such as pruning or cabling. Hidden defects are possible in its current ivy-covered state.
5. Due to the sensitive nature of working within the RPZ of trees to be retained, any demolition, excavation or grading within the RPZ of the trees must be performed with hand or pneumatic excavation tools and supervised by a Certified Arborist to monitor and document any tree impacts. Any significant roots (roots 2 inches in diameter or larger) encountered should be cut cleanly and photo documented under the supervision of the project arborist. If severed roots increase failure risk beyond the property owner's tolerance, the Arborist may recommend tree removal.
6. The Landscape Architect should provide a detailed planting plan for any area in the RPZ to the arborist for review prior to beginning work. Landscaping within the RPZ must be supervised by the Arborist and field adjusted if significant roots are found. Plant spacing, sizing and count may require adjustment to preserve tree roots.
7. No material shall be stored, nor concrete basins, painting equipment washed, or any chemical materials stored within the RPZ of the tree, and no construction chemicals or paint should be released into landscaped areas, as these can be toxic to the tree and contaminate soil.
8. Efforts to reduce soil compaction and disturbance throughout the site should be considered. These may include mulch, fencing, and if needed, plywood or metal plates to distribute weight across a broader area. Soil that is preserved uncompacted provides an ideal substrate for tree planting and establishment.
9. A Certified Arborist should inspect the trees on construction completion, and immediately if any changes in tree health, condition or structural stability develop. If the trees decline, they should be monitored monthly or more frequently. Please call 503-804-7868 or 503-880-3818 to schedule monitoring site visits.
10. After construction is complete, the trees recommended by the designer should be planted November - February, and should receive mulch and irrigation for a minimum 3 year establishment period May - October.

Conclusion

This report is the first step in preserving the health, function, and value of the tree during and after construction. Trees and green spaces provide benefits and add value to residential properties. Tree preservation starts with a basic understanding of the health and structure of the tree, and the design intent of the project. With proper care and protection, this tree can continue to thrive. Tree protection guidelines and strategies should be shared with contractors and employers prior to any disturbance at the site. Successful tree preservation requires a team effort between the property owner, arborist, and project contractors. Using the findings of this report as a foundation, the design team and construction personnel are equipped to preserve one tree on site and 15 on adjacent property.

Appendix A. Tree Photos



Photo 1. Typical Scotch pine with low live crown ratio, poor pruning, meets the conditions of TDC 33.110 (5)(b)(i)(B); evergreens which are unbalanced and lacking a full crown.



Photo 2. Tree #34 is a mountain ash that is hazardous to preserve due to previous failure, crack, and weakly attached epicormic shoots. It meets the conditions of TDC 33.110 (5)(a)(ii)(B); substantial portions of the tree are in danger of falling.

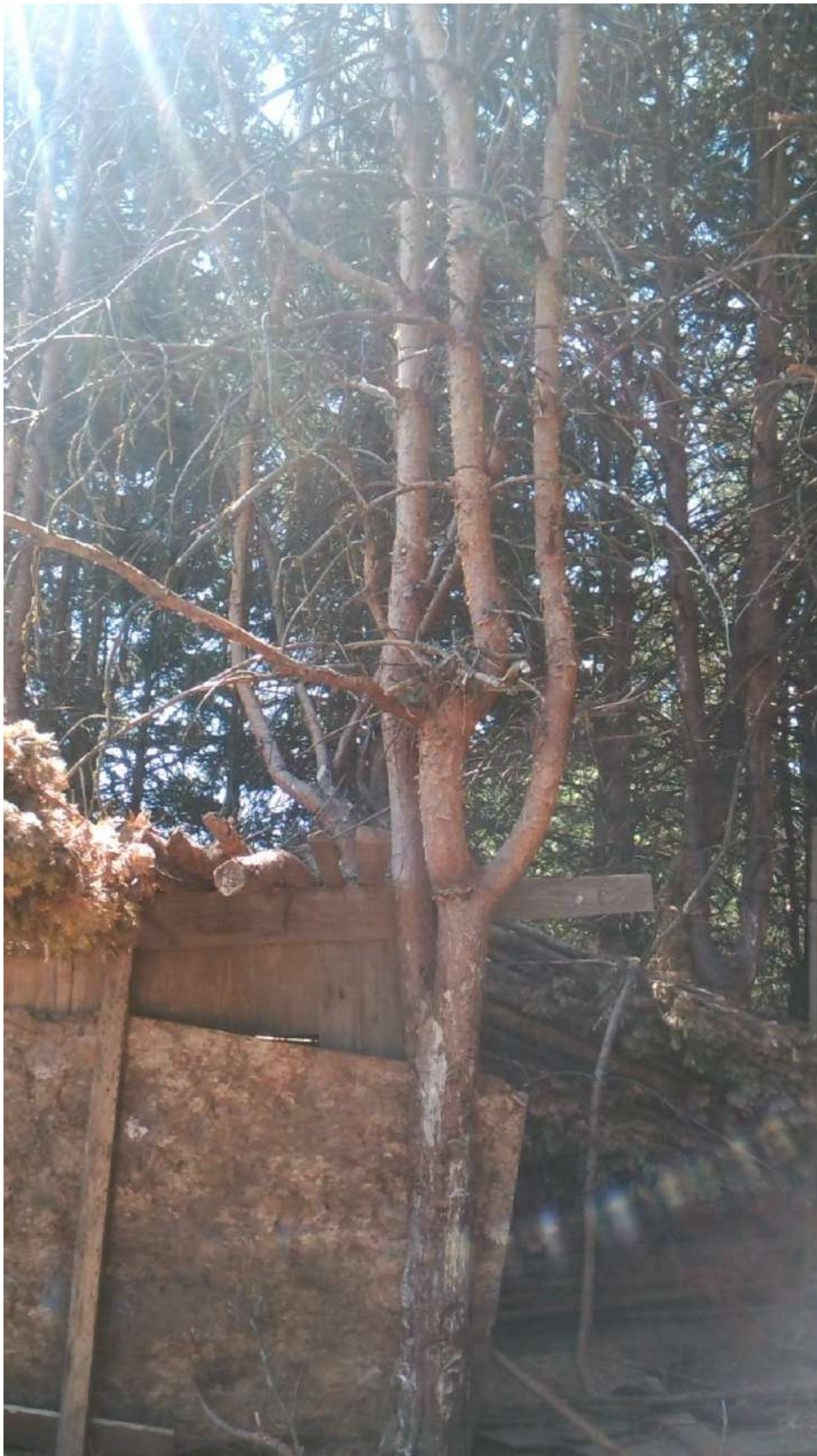


Photo 3. Tree #59 is a dead Scotch pine with multiple leaders. It meets the conditions of TDC 33.110 (5)(b)(i)(B); evergreens which are unbalanced and lacking a full crown.



Photo 4. Tree #79 is a fair condition apple tree with a broken limb.



Photo 5. Trees 39-42 and several untagged smaller DBH trees in a row are good condition Leyland cypress.



Photo 6. Nine untagged scotch pine on adjacent property near trees #80-82 should be fenced and protected in construction.



Photo 7. Tree #19 (left) and #20 (Right)



Photo 8. Tree #21 is an open-grown spruce



Photo 9. Tree #29 is a co-dominant pine in fair condition.



Photo 10. Tree #32 is a good condition Japanese maple



Photo 11. Tree #33 is a good condition Purple beech.



Photo 12. Tree #35 is a fastigiata beech.

Appendix B. Background Analysis

The following information was provided to the design team before grading plans were finalized. Diligent study of the preservation options within the context of the site's soil, land use rules, and required site elements was performed by the design team. Ultimately, due to extensive site grading, it was determined preservation is possible for one onsite tree, (#29). Preservation is required for adjacent property trees unless arrangements are made with the adjacent property owner.

Arborist-Assigned Preservation Priorities

- Preservation priorities were rated high, moderate (Table 1) or low (46), and one tree, #34 meets the conditions of TDC 33.110 (5)(a)(ii)(B); the tree is hazardous and parts are in danger of falling.
- If preservation is desired for spruces #22-27, they are best preserved as a group for aesthetic reasons. Removal of end trees will likely result in unsightly gaps for at least a few years.
- Several of the trees near existing building footprints (30, 31, 33, 35, 36, 37, 38) would be challenging to preserve. Demolition would need to be conducted with great care and in some cases the prior foundation would need to be abandoned to avoid destabilizing the tree. Ultimately depending on foundation quality preservation may not be possible regardless of the nature of the proposed design.
- Many of the scotch pines and spruces meet the conditions of TDC 33.110 (5)(b)(i)(B); evergreens which are unbalanced and lacking a full crown.
- Fifteen (15) trees on adjacent property are required to be preserved unless alternative agreements are made with adjacent property owners. Due to design changes, Five (5) adjacent property trees (#13-17) are no longer adjacent to the proposed construction because the parcel is no longer being developed or identified for site access.

Table 1. Root Protection Zones for Required, High, and Moderate Preservation Priority Trees

Tree Tag	Scientific Name	Condition	DBH (In.)	Tree Height	RPZ (Ft.)	SRZ (Ft.)	Arborist Assigned Preservation Priority	Basis for Preservation Priority
8	Pinus sylvestris	Fair	9	22	9	4.1	required	Adjacent property
9	Pinus sylvestris	Fair	9	20	9	4.1	required	Adjacent property
10	Pinus sylvestris	Poor	10	15	10	4.5	required	Adjacent property
20	Pseudotsuga menziesii	Good	28	63	28	12.6	high	Open grown, native
21	Picea spp.	Fair	16	33	16	7.2	moderate	Meets TDC 33.110 (5)(b)(i)(B)
22	Picea spp.	Fair	13	39	13	5.9	moderate	Meets TDC 33.110 (5)(b)(i)(B)
23	Picea spp.	Fair	15	45	15	6.8	moderate	Meets TDC 33.110 (5)(b)(i)(B)
24	Picea spp.	Fair	10	45	10	4.5	moderate	Meets TDC 33.110 (5)(b)(i)(B)
25	Picea spp.	Fair	12	45	12	5.4	moderate	Meets TDC 33.110 (5)(b)(i)(B)
26	Picea spp.	Fair	14	45	14	6.3	moderate	Meets TDC 33.110 (5)(b)(i)(B)
27	Picea spp.	Fair	14	45	14	6.3	moderate	Meets TDC 33.110 (5)(b)(i)(B)
29	Pinus spp.	Fair	30	66	30	13.5	high	Open grown ornamental

Tree Tag	Scientific Name	Condition	DBH (In.)	Tree Height	RPZ (Ft.)	SRZ (Ft.)	Arborist Assigned Preservation Priority	Basis for Preservation Priority
32	Acer palmatum	Good	14	19	14	6.3	moderate	Small size
33	Fagus sylvatica	Good	23	61	23	10.4	moderate	Close to existing building footprint
35	Fagus sylvatica	Good	16	44	16	7.2	moderate	Close to existing building footprint
36	Picea spp.	Fair	27	48	27	12.2	moderate	Close to existing building footprint
37	Picea spp.	Fair	19	45	19	8.6	moderate	Close to existing building footprint
38	Sequoiadendron giganteum	Good	10	30	10	4.5	moderate	Close to existing building footprint
39	Cupressus x leylandii	Good	8	27	8	3.6	high	Nice ornamental tolerates construction impacts, young and vigorous.
40	Cupressus x leylandii	Good	9	27	9	4.3	high	Nice ornamental tolerates construction impacts, young and vigorous.
41	Cupressus x leylandii	Good	8	23	8	3.6	high	Nice ornamental tolerates construction impacts, young and vigorous.
42	Cupressus x leylandii	Good	9	23	9	4.0	high	Nice ornamental tolerates construction impacts, young and vigorous.
71	Pseudotsuga menziesii	Good	8	37	8	3.6	high	Native tolerates construction impacts, young and vigorous.
73	Pseudotsuga menziesii	Good	9	37	9	4.1	high	Native tolerates construction impacts, young and vigorous.
74	Pseudotsuga menziesii	Good	9	25	9	4.1	high	Native tolerates construction impacts, young and vigorous.
75	Malus domestica	Good	17	21	17	7.7	high	Historic food-producing tree
76	Prunus domestica	Fair	20	47	20	9.0	high	Historic food-producing tree
77	Malus domestica	Good	16	26	16	7.2	high	Historic food-producing tree
78	Malus domestica	Good	21	29	21	9.5	high	Historic food-producing tree
81	Pinus sylvestris	Good	12	34	12	5.4	required	Adjacent property
82	Pinus sylvestris	Good	9	34	9	4.1	required	Adjacent property
	Pinus sylvestris	Good	12	34	12	5.4	required	9 trees, Adjacent property