Morgan Holen
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Consulting Arborists and Urban Forest Management
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October 4, 2015

Planning and Building
City of West Linn
22500 Salamo Road #1000
West Linn, Oregon 97068

Re: Arborist Report and Tree Preservation Plan for Savanna Heights Subdivision
West Linn, Oregon
Project No. MHA14116 Savanna Heights

Please find enclosed the Arborist Report and Tree Preservation Plan for the Savanna Heights Subdivision project located at 23128 Bland Circle in West Linn, Oregon. Please contact us if you have questions or need any additional information.

Respectfully,
Morgan Holen & Associates, LLC

Morgan E. Holen

Morgan E. Holen, Owner
ISA Certified Arborist, PN-6145A
ISA Tree Risk Assessment Qualified
Forest Biologist

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Arborist Report and Tree Preservation Plan

Savanna Heights Subdivision
West Linn, Oregon

October 4, 2015

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Savanna Heights Subdivision – West Linn, Oregon
Arborist Report and Tree Preservation Plan
October 4, 2015

MHA14116

Purpose

This Arborist Report and Tree Preservation Plan for the Savanna Heights Subdivision project in West Linn, Oregon, is provided pursuant to City of West Linn Community Development Code Chapter 55, Municipal Code Sections 8.500 and 8.600, and the West Linn Tree Technical Manual. This report describes the existing trees located on the project site, as well as recommendations for tree removal, retention and protection. This report is based on observations made by International Society of Arboriculture (ISA) Certified Arborist (PN-6145A) and Qualified Tree Risk Assessor Morgan Holen during a site visit conducted on July 29, 2015, a subsequent site meeting with the City Arborist Mike Perkins on September 2, 2015, and site plan coordination with 3J Consulting.

Scope of Work and Limitations

Morgan Holen & Associates, LLC, was contracted by Bland Circle Estates, LLC, to collect tree inventory data for individual trees measuring six inches and larger in diameter and to develop an arborist report and tree preservation plan for the project. The site is planned for residential development with new streets, six building lots, and a water quality facility. Site plans were provided by 3J Consulting illustrating the location of existing trees and potential construction impacts.

Visual Tree Assessment (VTA) was performed on individual trees located across the site. The enclosed tree inventory data and sheet C1.2 in the Land Use Plan Set demonstrate that all trees on the site were physically identified. VTA is the standard process whereby the inspector visually assesses the tree from a distance and up close, looking for defect symptoms and evaluating overall condition and vitality of individual trees. Trees were evaluated in terms of general condition and potential construction impacts. Following the inventory fieldwork, we coordinated with 3J Consulting to discuss tree protection recommendations.

The client may choose to accept or disregard the recommendations contained herein, or seek additional advice. Neither this author nor Morgan Holen & Associates, LLC, have assumed any responsibility for liability associated with the trees on or adjacent to this site.

General Description

The Savanna Heights Subdivision project site is located at 23128 Bland Circle in West Linn, Oregon. The site is sloping to the south and includes one existing single family residential home which is planned to remain on proposed lot 1. The site is heavily treed and includes a mix of species in variable condition. The location of individual trees is shown on site plan drawings and tree numbers correspond with the enclosed tree data.

Tree Inventory

In all, 61 existing trees were inventoried, including 14 different species. Table 1 provides a summary of the number of inventoried trees by species. The enclosed tree data provides a complete description of the individual trees.

Table 1. Number of Trees by Species – Savanna Heights Subdivision.

Common Name	Species Name	Quantity	Percent
apple	*Malus* spp.	1	1.6%
Austrian pine	*Pinus nigra*	3	5%
bigleaf maple	*Acer macrophyllum*	14	23%
Douglas-fir	*Pseudotsuga menziesii*	17	28%
incense cedar	*Calocedrus decurrens*	4	7%
madrone	*Arbutus menziesii*	1	1.6%
palm	*Arecaceae* spp.	1	1.6%
ponderosa pine	*Pinus ponderosa*	1	1.6%
Port-Orford-cedar	*Chamaecyparis lawsoniana*	1	1.6%
scots pine	*Pinus sylvestris*	1	1.6%
Scouler's willow	*Salix scouleriana*	5	8%
spruce	*Picea* spp.	6	9.8%
western redcedar	*Thuja plicata*	5	8%
white pine	*Pinus monticola*	1	1.6%
Total		**61**	**100%**

Douglas-fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*) account for more than half of the inventoried trees and they are scattered across the site. The Douglas-firs are the largest and most prominent trees on the site measuring 12- to 44-inches in diameter. Most of the Douglas-firs are in generally good condition and with no major defects. A few have minor defects including twig dieback, reduced vigor, codominant stems, and some history of lateral branch failure. One Douglas-fir (#3697) appeared in severe and progressive decline. The bigleaf maples are relatively smaller—measuring six to 22-inches in diameter—and less prominent trees and most appeared in fair condition with poor to moderate structure.

The remaining 49% of the inventoried trees include a mix of species:

- The apple (*Malus* spp.) tree growing along the north side of Bland Circle has poor structure and is not well-maintained; it likely sprouted from natural regeneration.
- The Austrian pines (*Pinus nigra*), spruces (*Picea* spp.), and one scots pine (*Pinus sylvestris*) generally border the eastern and southern property boundaries and are small trees in fair condition with structural defects.
- One palm tree (*Arecaceae* spp.), three of the four incense cedars (*Calocedrus decurrens*) and three of the five western redcedars (*Thuja plicata*) are relatively young landscape trees planted north of the existing home. The other incense cedar and two western redcedars are located along the north side of Bland Circle—this incense cedar (#4818) is 32-inches in diameter and in generally good condition, while the two western redcedars are much smaller and in fair to poor condition with notable defects.
- The madrone (*Arbutus menziesii*) is dead.
- The Scouler's willows (*Salix scouleriana*) mostly appear in poor condition with dieback and decay.
- The ponderosa pine (*Pinus ponderosa*) is infected with western gall rust which is caused by the fungus *Endocronartium harknessii*.

- The Port-Orford-cedar (*Chamaecyparis lawsoniana*) is a small, young tree growing into the property line fence along the western boundary.
- The white pine (*Pinus monticola*) is a small landscape tree with lower trunk decay.

Significant trees will be determined by the City Arborist. Based on our evaluation of the size, type, location, health, and long term survivability of the individual trees, 19 (31%) trees were identified as potentially being significant.

Tree Preservation Plan

We coordinated with the project team to discuss trees suitable for preservation in terms of potential construction impacts. Table 2 provides a summary of the number of non-significant and potentially significant trees by treatment recommendation.

Table 2. Number of On Site Trees by Treatment Recommendation and Significance.

Treatment	Remove	Retain	Total
Non-Significant Trees	35	7	**42**
Potentially Significant Trees	11	8	**19**
Total	**46**	**15**	**61**

Of the 61 on site trees, 46 are recommended for removal either for construction or because of condition, including 11 potentially significant trees. Ten of these 11 trees are located on proposed lots 4 and 5 and in the vicinity of grading for the water quality facility; adequate protection is not possible for these trees. The eleventh tree is a 44-inch diameter Douglas-fir (#4830) located on lot 1 in a landscape island surrounded by the existing driveway. This tree is in fair condition with some twig dieback and resin flow. It will not be impacted by the proposed construction, but is planned for removal because of declining condition. However, this tree could be retained with monitoring. If this tree is retained, we recommend conducting a soil analysis and performing a root invigoration treatment to reduce soil compaction and add organic matter and nutrients if needed (based on the results of the soil analysis) to improve growing space.

The remaining 15 trees are recommended for retention, including 8 potentially significant trees. Minor pruning to remove dead and defective branches for safety is recommended for trees to be retained and pruning should be performed by a Qualified Tree Service. Trees to be retained should be protected with tree protection fencing established at the dripline at a minimum for non-significant trees and at the dripline plus 10-feet for significant trees.

In some cases, the proposed development will encroach within the tree protection area and special protection measures will be needed.

- At proposed lot 2, future home construction should require a building layout that is compatible with tree protection. The future home should allow for protection of trees #3988, #3989 and #4746 located in the rear of the lot at the dripline plus 10-feet. However, it will not be possible to provide protection for tree #3991 at the dripline plus 10-feet and a modified foundation design will be needed. Tree #3991 is located on the east side of the lot within the allowable building footprint. The future home should be designed to sit as far west from tree #3991 as

possible and a pier and beam foundation is recommended to avoid foundation excavation in the tree protection zone.

- The private access drive ends directly south of trees #3991 and #3992. The street should stop as far south of these trees as possible, yet it will not be possible to avoid encroachment within the dripline plus 10-feet. Therefore, we recommend using a modified profile for street construction within the tree protection zone. As provided in the figure below, this profile allows removal of only the uppermost organic matter from the ground surface, with no excavation. A layer of permeable geotextile fabric is placed on the ground surface beneath the dripline area and topped with clean crushed rock to the desired depth. The rock is then topped with surfacing, such as asphalt or concrete.

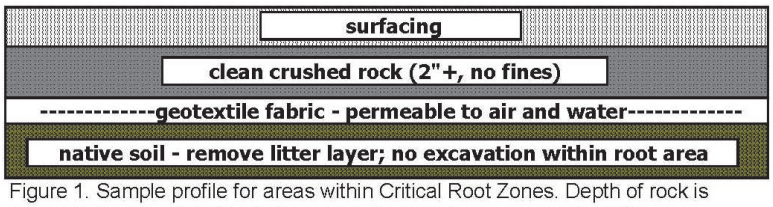


Figure 1. Sample profile for areas within Critical Root Zones. Depth of rock is dependent on grading. Technique based on best management practices.

- Future home construction at proposed lot 4 should also require a building layout that is compatible with tree protection. Tree #4772 is located within the allowable building footprint on the west side of the lot and near the center. It will not be possible to provide protection for tree #4772 at the dripline plus 10-feet and a modified foundation design will likely be needed to avoid excavation within the tree protection zone.

Work beneath the dripline of protected trees should be supervised by the project arborist in coordination with the City's arborist. Additional recommendations for special protection of these trees may be provided once the site is staked and prepared for construction. Standard tree protection specifications are provided in the next section and should be translated onto construction drawings.

Tree Protection Standards

Trees to be protected will need special consideration to assure their protection during construction. Any work that is necessary within the standard tree protection zone should be performed under the guidance of a qualified arborist. It is the Client's responsibility to implement this plan and to monitor the construction process. Tree protection measures include:

<u>Before Construction</u>

1. **Tree Protection Zone.** The project arborist shall designate the Tree Protection Zone (TPZ) for each tree to be protected. Where feasible, the size of the TPZ shall be established at the dripline of the tree plus 10-feet. Alternatively, the TPZ shall be established at the dripline of protected trees. Where infrastructure (driveways, buildings, and utilities) must be installed closer to the tree(s), the TPZ may be established within the dripline area if the project arborist, in coordination with the City Arborist, determines that the tree(s) will not be unduly damaged. The location of TPZs shall be shown on construction drawings.

2. **Protection Fencing.** Protection fencing shall serve as the tree protection zone and shall be erected before demolition, grubbing, grading, or construction begins. All trees to be retained shall be protected by six-foot-high chain link fences installed at the edge of the TPZ. Protection fencing shall be secured to two-inch diameter galvanized iron posts, driven to a depth of a least two feet, placed no further than 10-feet apart. If fencing is located on pavement, posts may be supported by an appropriate grade level concrete base. Protection fencing shall remain in place until final inspection of the project permit, or in consultation with the project arborist.
3. **Signage.** An 8.5x11 –inch sign stating, "WARNING: Tree Protection Zone," shall be displayed on each protection fence at all times.
4. **Designation of Cut Trees.** Trees to be removed shall be clearly marked with construction flagging, tree-marking paint, or other methods approved in advanced by the project arborist. Trees shall be carefully removed so as to avoid either above or below ground damage to those trees to be preserved. Roots of stumps that are adjacent to retained trees shall be carefully severed prior to stump extraction.
5. **Preconstruction Conference.** The project arborist shall be on site to discuss methods of tree removal and tree protection prior to any construction.
6. **Verification of Tree Protection Measures.** Prior to commencement of construction, the project arborist shall verify in writing to the City Arborist that tree protection fencing has been satisfactorily installed.

<u>During Construction</u>

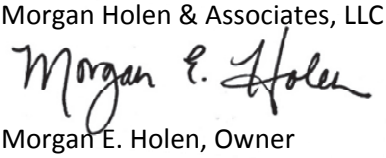
7. **Tree Protection Zone Maintenance.** The protection fencing shall not be moved, removed, or entered by equipment except under direction of the project arborist, in coordination with the City Arborist.
8. **Storage of Material or Equipment.** The contractor shall not store materials or equipment within the TPZ.
9. **Excavation within the TPZ.** Excavation with the TPZ shall be avoided if alternatives are available. If excavation within the TPZ is unavoidable, the project arborist shall evaluate the proposed excavation to determine methods to minimize impacts to trees. This can include tunneling, hand digging or other approaches. All construction within the TPZ shall be under the on-site technical supervision of the project arborist, in coordination with the City Arborist.
10. **Tree Protection Zone.** The project arborist shall monitor construction activities and progress, and provide written reports to the developer and the City at regular intervals. Tree protection inspections shall occur monthly or more frequently if needed.
11. **Quality Assurance.** The project arborist shall supervise proper execution of this plan during construction activities that could encroach on retained trees. Tree protection site inspection monitoring reports shall be provided to the Client and City on a regular basis throughout construction.

Post Construction

12. **Final Report.** After the project has been completed, the project arborist shall provide a final report to the developer and the City. The final report shall include concerns about any trees negatively impacted during construction, and describe the measures needed to maintain and protect the remaining trees for a minimum of two years after project completion.

Please contact us if you have questions or need any additional information. Thank you for choosing Morgan Holen & Associates, LLC, to provide consulting arborist services for the Savanna Heights Subdivision project.

Thank you,
Morgan Holen & Associates, LLC



Morgan E. Holen, Owner
ISA Certified Arborist, PN-6145A
ISA Tree Risk Assessment Qualified
Forest Biologist

Enclosures: MHA14116 Savanna Heights – Tree Data 7-29-15

No.	Common Name	Species Name	DBH*	C-Rad^	Cond#	Comments	Sig?	Treatment
3682	spruce	*Picea* spp.	10	10	F	old broken top, moderate structure	No	Remove
3683	spruce	*Picea* spp.	10	10	F	off-site, forked leaders	No	Remove
3684	scots pine	*Pinus sylvestris*	10	10	F	strong but self-correcting lean	No	Remove
3685	spruce	*Picea* spp.	10	8	F	codominant stems, forked leaders, trunk damage	No	Remove
3686	spruce	*Picea* spp.	8	8	F	codominant stems, trunk damage	No	Remove
3687	spruce	*Picea* spp.	8	8	F	moderate structure, twig dieback	No	Remove
3688	spruce	*Picea* spp.	8	10	F	moderate structure, some twig dieback	No	Remove
3689	bigleaf maple	*Acer macrophyllum*	8	14	F	poor structure, chlorotic foliage	No	Remove
3692	Austrian pine	*Pinus nigra*	10	10	F	poor structure, old broken top, off-center leader	No	Remove
3693	Austrian pine	*Pinus nigra*	10	10	F	trunk damage	No	Remove
3694	Douglas-fir	*Pseudotsuga menziesii*	32	22	F	codominant leaders with V-shaped crotch, thin crown, few dead branches	No	Remove
3695	Douglas-fir	*Pseudotsuga menziesii*	40	26	G	no major defects	Yes	Remove
3696	Douglas-fir	*Pseudotsuga menziesii*	21	18	G	below dominant canopy	Yes	Remove
3697	Douglas-fir	*Pseudotsuga menziesii*	39	22	P	twig and branch dieback, poor vigor	No	Remove
3698	Douglas-fir	*Pseudotsuga menziesii*	21	16	G	below dominant canopy	Yes	Remove
3699	Douglas-fir	*Pseudotsuga menziesii*	34	18	G	some resin flow at lower trunk	Yes	Remove
3700	Douglas-fir	*Pseudotsuga menziesii*	38	30	G	no major defects	Yes	Remove
3701	white pine	*Pinus monticola*	8	8	F	lower trunk decay	No	Remove
3702	madrone	*Arbutus menziesii*	16	0	D	diseased, decay, few live epicormics, not viable	No	Remove
3843	incense cedar	*Calocedrus decurrens*	8	6	G	crown asymmetry, flagging in lower branches	No	Retain
3844	incense cedar	*Calocedrus decurrens*	7	5	P	dieback	No	Retain
3845	incense cedar	*Calocedrus decurrens*	6	6	G	minor crown asymmetry	No	Retain
3934	western redcedar	*Thuja plicata*	6	6	G	multiple leaders	No	Retain
3935	western redcedar	*Thuja plicata*	6	6	G	multiple leaders	No	Retain

No.	Common Name	Species Name	DBH*	C-Rad^	Cond#	Comments	Sig?	Treatment
3936	western redcedar	*Thuja plicata*	6	6	G	multiple leaders	No	Retain
3937	Douglas-fir	*Pseudotsuga menziesii*	30	16	F	moderate vigor, history of lateral branch failure, prune to reduce/remove high risk branches	Yes	Retain
3938	Douglas-fir	*Pseudotsuga menziesii*	24	16	F	old wound NE trunk, crook in main stem, below dominant canopy	Yes	Retain
3939	palm	*Arecaceae* spp.	6	5	G	small ornamental	No	Retain
3988	Douglas-fir	*Pseudotsuga menziesii*	26	14	G	codominant crown class with 3989	Yes	Retain
3989	Douglas-fir	*Pseudotsuga menziesii*	42	14	G	codominant crown class with 3988	Yes	Retain
3990	Douglas-fir	*Pseudotsuga menziesii*	12	14	G	basal wound, old broken top	No	Remove
3991	Douglas-fir	*Pseudotsuga menziesii*	38	28	G	some crown asymmetry	Yes	Retain
3992	Douglas-fir	*Pseudotsuga menziesii*	18	14	G	codominant with 3991	Yes	Retain
4743	Port-Orford-cedar	*Chamaecyparis lawsoniana*	9	8	G	young tree already growing into fence	No	Remove
4744	bigleaf maple	*Acer macrophyllum*	8	12	F	poor structure, broken top	No	Remove
4745	bigleaf maple	*Acer macrophyllum*	8	12	F	poor structure, broken top	No	Remove
4746	Douglas-fir	*Pseudotsuga menziesii*	44	24	G	no major defects, safety pruning recommended	Yes	Retain
4766	bigleaf maple	*Acer macrophyllum*	6	12	F	codominant leaders, one-sided crown	No	Remove
4767	Scouler's willow	*Salix scouleriana*	10	10	F	basal decay, poor structure, multiple leaders with included bark	No	Remove
4768	bigleaf maple	*Acer macrophyllum*	10	8	F	trunk decay, poor structure, multiple upright leaders	No	Remove
4769	Scouler's willow	*Salix scouleriana*	10	16	F	moderate structure, one-sided crown with lean away from 4768	No	Remove
4770	bigleaf maple	*Acer macrophyllum*	10	12	F	codominant leaders	No	Remove
4771	bigleaf maple	*Acer macrophyllum*	14	20	F	topped at over head lines, poor structure, decay	No	Remove
4772	bigleaf maple	*Acer macrophyllum*	18	16	G	codominant leaders, no major defects	Yes	Retain
4773	bigleaf maple	*Acer macrophyllum*	3x10	16	F	very poor structure	No	Remove

No.	Common Name	Species Name	DBH*	C-Rad^	Cond#	Comments	Sig?	Treatment
4774	bigleaf maple	*Acer macrophyllum*	12	6	P	advanced basal and trunk decay, dieback	No	Remove
4775	Douglas-fir	*Pseudotsuga menziesii*	38	30	G	no major defects, remove ivy	Yes	Remove
4776	bigleaf maple	*Acer macrophyllum*	2x16	22	G	codominant stems, okay in group with 4777 & 4817	Yes	Remove
4777	bigleaf maple	*Acer macrophyllum*	14	20	G	one-sided crown, okay in group with 4776 & 4817	Yes	Remove
4778	Scouler's willow	*Salix scouleriana*	14	10	P	advanced decay, dieback	No	Remove
4779	Scouler's willow	*Salix scouleriana*	12	8	P	advanced decay, dieback	No	Remove
4780	Scouler's willow	*Salix scouleriana*	9	0	D	dead	No	Remove
4816	ponderosa pine	*Pinus ponderosa*	18	18	F	spur leader, western gall rust infection	No	Remove
4817	bigleaf maple	*Acer macrophyllum*	15	20	G	moderate structure, okay in group with 4776 & 4777	Yes	Remove
4818	incense cedar	*Calocedrus decurrens*	32	12	G	no major defects, prune lower branches	Yes	Remove
4825	western redcedar	*Thuja plicata*	10	10	F	lower trunk wound, forked leaders	No	Remove
4826	Austrian pine	*Pinus nigra*	10	12	F	trunk damage	No	Remove
4827	apple	*Malus* spp.	10	12	F	poor structure, not maintained	No	Remove
4828	bigleaf maple	*Acer macrophyllum*	8	10	F	codominant leaders, upright crown	No	Remove
4829	western redcedar	*Thuja plicata*	12	12	P	trunk decay, poor structure	No	Remove
4830	Douglas-fir	*Pseudotsuga menziesii*	44	20	F	minor twig dieback, some resin flow	Yes	Remove

***DBH** is tree diameter measured at breast height, 4.5-feet above the ground level (inches); codominant trunks splitting below DBH are measured individually and separated by a comma, except for codominant stems of equal size are noted as quantity x size.

^C-Rad is the average crown radius measured in feet.

#**Cond** is an arborist assigned rating to generally describe the condition of individual trees as follows- **D**ead; **P**oor; **F**air; or **G**ood condition.

Sig? asks whether or not individual trees are considered potentially significant, either Yes (likely significant) or No (not considered significant).

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