Morgan Holen & Associates, LLC
Consulting Arborists and Urban Forest Management
971.409.9354
3 Monroe Parkway, Suite P 220
Lake Oswego, Oregon 97035
morgan.holen@comcast.net

October 3, 2013

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

Re: Arborist Report and Tree Preservation Plan for the Harper's Terrace Subdivision Project
West Linn, Oregon
Project No. MHA1311 Rosemont Ph2

Please find enclosed the Arborist Report and Tree Preservation Plan for the Harper's Terrace Subdivision project located at 4997 Summit Street in West Linn, Oregon. Please contact us if you have questions or need any additional information.

Respectfully,
Morgan Holen & Associates, LLC

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

Morgan Holen & Associates LLC
Consulting Arborists and Urban Forest Management
971.409.9354
3 Monroe Parkway, Suite P 220
Lake Oswego, Oregon 97035
morgan.holen@comcast.net

Arborist Report and Tree Preservation Plan

Harper's Terrace Subdivision
West Linn, Oregon

October 3, 2013

971.409.9354
3 Monroe Parkway, Suite P 220
Lake Oswego, Oregon 97035
morgan.holen@comcast.net

Table of Contents

Morgan Holen & Associates LLC
Consulting Arborists and Urban Forest Management
971.409.9354
3 Monroe Parkway, Suite P 220
Lake Oswego, Oregon 97035
morgan.holen@comcast.net

Harper's Terrace Subdivision – West Linn, Oregon
Arborist Report and Tree Preservation Plan
October 3, 2013

MHA1311

Purpose

This Arborist Report and Tree Preservation Plan for the Harper's Terrace 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 and Qualified Tree Risk Assessor Morgan Holen (PN-6145A) during a site visit conducted on June 20, 2013.

Scope of Work and Limitations

Morgan Holen & Associates, LLC, was contracted by J.T. Smith Company 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 four building lots and a private access street. A preliminary site plan was provided by 3J Consulting, Inc. 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 site plan demonstrate that all trees on site were physically identified. VTA is the standard process developed by the ISA 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, Inc. to discuss treatment 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 Harper's Terrace subdivision project site is located at 4997 Summit Street in West Linn, Oregon. The site is sloping and any pre-existing structures have been demolished. The existing trees are scattered across the site, but are generally located near property boundaries and not in the interior of the site. The location of individual trees is shown on site plan drawings and tree numbers correspond with the enclosed inventory data.

Tree Inventory

In all, 41 existing trees were inventoried, including one tree located near the northeast corner on the adjacent property. The remaining 40 trees are located on the project site and include 14 different tree species. Table 1 provides a summary of the number of on-site trees by species. The enclosed tree inventory data provides a complete description of the individual trees.

Table 1. Number of On Site Trees by Species – Harper's Terrace Subdivision Project.

Common Name	Species Name	Quantity	Percent
apple	*Malus* spp.	4	10.0%
bigleaf maple	*Acer macrophyllum*	3	7.5%
black cottonwood	*Populus trichocarpa*	1	2.5%
Douglas-fir	*Pseudotsuga menziesii*	8	20.0%
European white birch	*Betula pendula*	3	7.5%
grand fir	*Abies grandis*	3	7.5%
lodgepole pine	*Pinus contorta*	1	2.5%
noble fir	*Abies nobilis*	1	2.5%
plum	*Prunus* spp.	1	2.5%
Port-Orford-cedar	*Chamaecyparis lawsoniana*	4	10.0%
princess tree	*Paulownia tomentosa*	1	2.5%
red alder	*Alnus rubra*	7	17.5%
spruce	*Picea* spp.	1	2.5%
sweet cherry	*Prunus avium*	2	5.0%
Total		**40**	**100%**

European white birch (Betula pendula), princess tree (*Paulownia tomentosa*), and sweet cherry (*Prunus avium*) are widely accepted as being invasive tree species in our region and account for approximately 15-percent of the inventoried trees located on site. Invasive species are broadly defined as species that were introduced by humans to locations outside of their native range that spread and persist over large areas, outcompeting native species. Invasive species negatively impact natural ecosystems by displacing native species, reducing biological diversity and interfering with natural succession.

Red alder (*Alnus rubra*) accounts for 17.5-percent of the inventoried trees. These trees are located in a row near the southeast corner of the site and are mature trees with structural defects and some decay. As a species, red alders have inherent limitations because they are short-lived, fast-growing species with brittle wood that tends to break apart with maturity.

Other deciduous trees scattered across the site appear in moderate to poor condition, including: one large black cottonwood (*Populus trichocarpa*) with an old broken top, multiple attachments, and suspected basal decay; two of three bigleaf maples (*Acer macrophyllum*) that are over-grown with English ivy (*Hedera helix*); and five fruit trees that are relatively unmaintained and with advanced decay including four apples (*Malus* spp.) and one plum (*Malus* spp.).

In general the existing conifers, including one grand fir (*Abies grandis*), one lodgepole pine (*Pinus contorta*), one noble fir (*Abies nobilis*), four Port-Orford-cedars (*Chamaecyparis lawsoniana*), one spruce (*Picea* spp.), and six of eight Douglas-firs (*Pseudotsuga menziesii*), all appear in moderate to poor condition with structural defects such as lean, old topping cuts, poor crown structure, and some decay. These trees are not suitable for preservation with development.

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 located on site, 3 (8%) trees were identified as potentially being significant, including trees 3052 and 3053, two Douglas-firs, and tree 3064, a bigleaf maple.

Tree Preservation Plan

We coordinated with the project team to discuss trees suitable for preservation in terms of proposed 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	Likely to be Removed	Retain	Total	Percent
Non-Significant Trees	37	0	0	**37**	92.5%
Potentially Significant Trees	1	1	1	**3**	7.5%
Total	**38**	**1**	**1**	**40**	100%
Percent	95%	2.5%	2.5%		

Of the 40 on site trees, 38 (95%) are recommended for removal either for construction or because of poor or hazardous condition, including one potentially significant Douglas-fir (3053) which must be removed to accommodate the minimum lot area per City zoning requirements. Of the two remaining trees, one (2.5%) potentially significant Douglas-fir (3052) is recommended for retention and one (2.5%) potentially significant bigleaf (3064) is classified as "likely to be removed".

Tree 3052 is suitable for preservation with the proposed construction and recommendations for tree protection are provided in the next section.

Tree 3064 is the potentially significant bigleaf maple that is "likely to be removed". This tree is growing in close proximity to the row of red alders that are not suitable for retention with development because of condition, inherent species limitations, and necessary grading. Tree 3064 is potentially significant because of species and size, but this tree has a one-sided crown and an approximate 8-degree lean to the south, in the direction of the crown weight and towards the neighboring house, which is the primary target if this tree were to fail. In addition, decay is suspected at the base of the tree. Removal of the alders is likely to result in negative impacts to the maple since these trees have grown up competing with and adapting to one another; removing the alders will expose the maple and is likely to increase the probability of large branch or whole tree failure. However, until the alders are removed, it is difficult to determine whether or not this maple will be suitable for preservation on its own. We recommend re-evaluating tree 3064 during site clearing to assess the risk potential of this tree following removal of the adjacent trees. This tree may be protected during construction if it is determined to be safe and suitable for retention with development following the re-evaluation. Otherwise, the project arborist should document the hazardous condition of the tree and request authorization from the City to proceed with its removal. Classifying tree 3064 as "likely to be removed" allows flexibility to make a more informed decision during construction. For the purposes of the development application, we recommended that this tree be planned for retention with protection measures, but accounted for as removed for the purposes of determining mitigation requirements. If tree 3064 is retained and protected throughout construction, the mitigation would be reduced accordingly.

The Tree Plan drawing illustrates the location of trees to be removed and preserved, and the approximate location of tree protection measures.

Tree Protection Standards

Trees to be protected will need special consideration to assure their protection during construction. Tree protection measures include:

Before Construction

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 (retaining walls, 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.

During Construction

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.

Summary

The enclosed tree inventory provides complete data for individual trees at the Harper's Terrace Subdivision project site in West Linn. The location of inventoried trees and tree protection measures shall be shown on site plan drawings. Of the 40 inventoried trees, 37 non-significant trees are recommended for removal because of condition or for the purposes of construction and of the three potentially significant trees, one is recommended for removal for the purposes of construction, one is likely to be removed because it is likely that this tree will not be safe to retain following the removal of adjacent trees, and one tree is recommended for retention with protection during construction. It is the Client's responsibility to implement this plan and to monitor the construction process. The project arborist will be available during construction to help with tree related issues.

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 Harper's Terrace 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: MHA1311 Harper's Terrace Subdivision – Tree Data 6-20-13

No.	Common Name	Species Name	DBH*	C-Rad^	Defects and Comments	Sig?	Recommendation
2715	European white birch	*Betula pendula*	14	15	invasive species, poor structure, decay	no	remove
2716	European white birch	*Betula pendula*	14	15	invasive species, poor structure, decay	no	remove
2717	European white birch	*Betula pendula*	12	12	invasive species, poor structure, decay	no	remove
3049	lodgepole pine	*Pinus contorta*	17	20	mechanical damage, sweep, 10-degree lean west	no	remove
3050	princess tree	*Paulownia tomentosa*	41	35	invasive species	no	remove
3051	black cottonwood	*Populus trichocarpa*	40	40	old broken top, multiple attachments; inherent species limitations; suspect basal decay on northwest side	no	remove
3052	Douglas-fir	*Pseudotsuga menziesii*	24	12	no major defects	yes	retain
3053	Douglas-fir	*Pseudotsuga menziesii*	36	18	no major defects, but removal is necessary for construction	yes	remove
3054	spruce	*Picea* spp.	16	15	12-degree lean north, poor stem structure	no	remove
3055	red alder	*Alnus rubra*	27	35	forked top, branch decay; mature, inherent species limitations	no	remove
3056	grand fir	*Abies grandis*	13	15	broken top, dead branches, small live crown	no	remove
3057	grand fir	*Abies grandis*	10	10	dead branches, poor crown development	no	remove
3058	red alder	*Alnus rubra*	24	35	old broken top, multiple new tops; mature, inherent species limitations	no	remove
3059	red alder	*Alnus rubra*	18	20	12-degree lean southeast; mature, inherent species limitations	no	remove
3060	red alder	*Alnus rubra*	18	20	basal and stem decay; mature, inherent species limitations	no	remove
3061	red alder	*Alnus rubra*	18	30	basal and stem decay; mature, inherent species limitations	no	remove
3062	red alder	*Alnus rubra*	14	20	mechanical damage, decay; mature, inherent species limitations	no	remove
3063	red alder	*Alnus rubra*	18	25	over-grown with ivy, poor condition; mature, inherent species limitations	no	remove
3064	bigleaf maple	*Acer macrophyllum*	23	32 S 12 N	8-degree lean, suspected basal decay, and one-sided crown to southeast; potentially hazardous with adjacent tree removal; re-eval suitability for preservation with clearing	yes	likely to be removed
3065	Douglas-fir	*Pseudotsuga menziesii*	6	6	over-topped, suppressed, not viable	no	remove
3095	grand fir	*Abies grandis*	10	8	dead branches, small live crown, stem decay	no	remove
3096	bigleaf maple	*Acer macrophyllum*	8	15	over-grown with ivy, poor condition	no	remove

No.	Common Name	Species Name	DBH*	C-Rad^	Defects and Comments	Sig?	Recommendation
3097	bigleaf maple	*Acer macrophyllum*	11	25	over-grown with ivy, poor condition	no	remove
3357	noble fir	*Abies nobilis*	18	15	dead branches, 10% live crown ratio; suspect adelgid infestation	no	remove
3358	Port-Orford-cedar	*Chamaecyparis lawsoniana*	14	12	very poor structure; susceptible to root disease	no	remove
3359	Port-Orford-cedar	*Chamaecyparis lawsoniana*	14	12	very poor structure; susceptible to root disease	no	remove
3360	Port-Orford-cedar	*Chamaecyparis lawsoniana*	26	12	very poor structure; susceptible to root disease	no	remove
3361	Port-Orford-cedar	*Chamaecyparis lawsoniana*	20	12	very poor structure; susceptible to root disease	no	remove
3362	plum	*Prunus* spp.	20	20	multiple attachments at 3ft, decay in juncture; not maintained	no	remove
3415	Douglas-fir	*Pseudotsuga menziesii*	23	25	topped in past; planted 10ft on center; poor structure	no	remove
3416	Douglas-fir	*Pseudotsuga menziesii*	20	25	topped in past; planted 10ft on center; poor structure	no	remove
3417	Douglas-fir	*Pseudotsuga menziesii*	28	30	topped in past; planted 1ft on center; poor structure	no	remove
3418	Douglas-fir	*Pseudotsuga menziesii*	17	20	codom stems at 14ft, history of branch failure	no	remove
3419	Douglas-fir	*Pseudotsuga menziesii*	22	25	broken top, multiple upright leaders, decay in juncture	no	remove
3501	sweet cherry	*Prunus avium*	10	20	invasive species	no	remove
3513	sweet cherry	*Prunus avium*	10,12	14	invasive species	no	remove
3671	apple	*Malus* spp.	8	6	decay	no	remove
3672	apple	*Malus* spp.	8	6	decay	no	remove
3673	apple	*Malus* spp.	8	6	decay	no	remove
3674	apple	*Malus* spp.	8	6	decay	no	remove
3710	plum	*Prunus* spp.	2*10	n/a	protection fencing recommended at property line	no	protect adjacent tree

*DBH is tree diameter measured at breast height, 4.5-feet above the ground level (inches)

^C-RAD is the average crown radius measured in feet

Sig? asks whether or not the tree is considered potentially significant, either Yes (likely significant) or No (non-significant)