Urban Forestry Manual

March 2013
City of Tigard
URBAN FORESTRY MANUAL

Introduction

The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

The city manager or designee has the authority to amend the Urban Forestry Manual pursuant with the provisions in Chapter 2.04 of the Tigard Municipal Code. The city manager or designee is authorized to administer the Urban Forestry Manual.
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Section 1 - Hazard Tree Evaluation and Abatement Procedure

Part 1. Informal Reconciliation:
If interpersonal communication is not feasible or is unsuccessful, the claimant shall contact the respondent by concurrently sending a regular and certified letter that explains the reasons they believe there is a hazard tree on the respondent's property, demonstrates how the claimant's life, limb or property has the potential to be impacted by said tree, and offers to negotiate a solution that is in compliance with all applicable rules and regulations either directly or through a third party mediator. The claimant is encouraged to support their claim with documentation by a tree risk assessor. The respondent shall have seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the postmarked date of the regular letter (whichever is sooner) to respond to the claimant's proposal in writing by concurrent regular and certified mail. In order to become eligible for formal reconciliation, the claimant’s letter shall cite Tigard Municipal Code sections 8.06.020 and 8.06.030, explain the respondent's written response deadlines and include all of the other required elements listed above.

Part 2. Formal Reconciliation:
If the results of informal reconciliation are not acceptable to the claimant or there has been no response for 21 calendar days or more since the claimant sent the concurrent regular and certified letters, the claimant may seek resolution through formal reconciliation by completing a hazard tree dispute resolution application, paying a deposit for all applicable hazard tree dispute resolution fees and providing the city all documentation of informal reconciliation including but not limited to any letters to and from the respondent, proof of certified mail delivery and proof of certified mail receipt (if available).

The city shall use all readily available tools and technology when assigning the hazard tree owner or responsible party as defined in Tigard Municipal Code Chapter 8.02. If the city determines that the claimant’s previous correspondence was with the incorrect respondent, then the claimant shall be required to complete the previous steps of the hazard tree evaluation and abatement procedure with the correct respondent before proceeding with formal reconciliation. If the claimant or respondent disagrees with the city’s assignment of the hazard tree owner or responsible party, the city shall be presented a land survey by a professional land surveyor that demonstrates the location of the tree in question in relation to property lines within all listed deadlines in order for the city to consider a reassignment of the hazard tree owner or responsible party.
Within seven calendar days of receipt of all the required application materials, the city shall gain access to the respondent’s property either voluntarily or with a warrant pursuant to Chapter 1.16 of the Tigard Municipal Code, conduct a tree risk assessment by a tree risk assessor using the tree risk assessment methodology in Appendix 1 of the Urban Forestry Manual, determine if the definition of hazard tree in Tigard Municipal Code Chapter 8.02 has been met and, if necessary, prescribe hazard tree abatement as defined in Tigard Municipal Code Chapter 8.02.

If the city determines the definition of hazard tree has been met, the city shall send a concurrent regular and certified letter to the respondent, explain that the definition of hazard tree has been met, explain the required hazard tree abatement procedures and require that hazard tree abatement be completed in seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the mailing date of the regular letter (whichever is less). The city shall also bill the respondent for all applicable hazard tree dispute resolution fees, and refund the claimant previously deposited hazard tree dispute resolution fees.

If the respondent fails to complete the hazard tree abatement within the required timeframe, the city shall gain access to the property either voluntarily or with a warrant, abate the hazard, bill the respondent for the cost of abatement including administrative costs or place a lien on the property for the cost of abatement including administrative costs pursuant to Chapter 1.16 of the Tigard Municipal Code.

If the city determines the definition of hazard tree has not been met, the city shall send a concurrent regular and certified letter to both the claimant and respondent explaining that the definition of hazard tree has not been met and close the case.
Part 1. **Street Tree Planting Standards:**

A. Street trees shall be planted in a manner consistent with tree care industry standards.

B. Street trees shall have a minimum caliper of 1 1/2 inches at the time of planting.

C. Street tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.

D. Street tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
   1. Consistency with previously approved street tree plans given space constraints for roots and branches at maturity;
   2. Compatibility with space constraints for roots and branches at maturity;
   3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
   4. Consideration of the objectives of the current street tree planting proposal.

E. Street trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
   1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
   2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
   3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years; and
   4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a street tree.

F. Street trees shall be placed according to the following standards:

See Appendix 2 for Street Tree List
Notes:

1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
5. Not closer than 2 feet on center from any underground utility;
6. Not closer than 10 feet on center from a street light standard;
7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
8. Where there are overhead utility lines, the street tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.

G. Root barriers shall be installed according to the manufacturer’s specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.

H. Street trees planted prior to the adoption of the most current version of the street tree planting standards shall be exempt from the most current version of the street tree planting standards. However, the most current version of the street tree maintenance standards and the most current version of the street tree removal standards shall apply.

I. If street tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a street tree per the standards in Section 2, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 2, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the street tree planting requirement.
Part 2. Street Tree Maintenance Standards:

A. Street trees shall be maintained in a manner consistent with tree care industry standards.

B. Street trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
   1. 8 feet of clearance above public sidewalks;
   2. 13 feet of clearance above public local and neighborhood streets;
   3. 15 feet of clearance above public collector streets; and
   4. 18 feet of clearance above public arterial streets.

C. Street trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.
Section 3 - Street Tree Removal Standards

Part 1. Street Tree Removal Standards:

A. Street trees shall be removed in a manner consistent with tree care industry standards.

B. The city manager or designee shall approve the removal of a street tree if any one of the following criteria are met:

1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.

2. The tree is dead.

3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.

4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.

5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.

6. The tree is listed on the nuisance tree list.

7. The tree location is such that it would not meet all of the street tree planting standards in Section 2, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.

8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.

9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.

10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.

11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for Nuisance Tree List
12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of a street tree upon the planting of a replacement tree in accordance with the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 2, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.

D. If the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual preclude replanting within the same right of way abutting on, fronting on or adjacent to the property as the tree was removed or on private property within 6 feet of the same right of way as the tree that was removed, the applicant shall be exempt from planting a replacement tree.
Part 1. Median Tree Planting Standards:

A. Median trees shall be planted in a manner consistent with tree care industry standards.
B. Median trees shall have a minimum caliper of 1 ½ inches at the time of planting.
C. Median tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.
D. Median tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
   1. Consistency with previously approved median tree plans given space constraints for roots and branches at maturity;
   2. Compatibility with space constraints for roots and branches at maturity;
   3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
   4. Consideration of the objectives of the current median tree planting proposal.
E. Median trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
   1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
   2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
   3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years; and
   4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a median tree.

Notes:

See Appendix 2 for Street Tree List
F. Median trees shall be placed according to the following standards:
1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2½ feet from any hard surface paving;
3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
5. Not closer than 2 feet on center from any underground utility;
6. Not closer than 10 feet on center from a street light standard;
7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
8. Where there are overhead utility lines, the median tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.

G. Root barriers shall be installed according to the manufacturer's specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.

H. Median trees planted prior to the adoption of the most current version of the Median Tree Planting Standards shall be exempt from the most current version of the Median Tree Planting Standards. However, the most current version of the Median Tree Maintenance Standards and the most current version of the Median Tree Removal Standards shall apply.

I. If median tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a median tree per the standards in Section 4, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 4, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the median tree planting requirement.
Part 2. Median Tree Maintenance Standards:
A. Median trees shall be maintained in a manner consistent with tree care industry standards.
B. Median trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
1. 8 feet of clearance above public sidewalks;
2. 13 feet of clearance above public local and neighborhood streets;
3. 15 feet of clearance above public collector streets; and
4. 18 feet of clearance above public arterial streets.
C. Median trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.
Section 5 - Median Tree Removal Standards

Part 1. Median Tree Removal Standards:

A. Median trees shall be removed in a manner consistent with tree care industry standards.

B. The city manager or designee shall approve the removal of a median tree if any one of the following criteria are met:
   1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
   2. The tree is dead.
   3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
   4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
   5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
   6. The tree is listed on the nuisance tree list.
   7. The tree location is such that it would not meet all of the median tree planting standards in Section 4, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.
   8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
   9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for Nuisance Tree List
12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of a median tree upon the planting of a replacement tree within the same median as the tree was removed in accordance with the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 4, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.

D. If the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual preclude replanting within the same median as the tree was removed, the applicant shall be exempt from planting a replacement tree.
Part 1. Sensitive Lands Tree Removal Standards:
A. Native trees in sensitive lands shall be removed in a manner consistent with tree care industry standards.
B. The city manager or designee shall approve the removal of a native tree in sensitive lands if any one of the following criteria are met:
1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
2. The tree is dead.
3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline, or cause other trees to die or enter an advanced state of decline.
5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.10 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
6. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
7. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
8. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
9. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
10. A certified arborist or certified forester determines that thinning of interior trees within a stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
C. Unless removed for thinning purposes (part 1.B.10 above) the city manager or designee shall condition the removal of each tree in sensitive lands upon the planting of a replacement tree in accordance with the Sensitive Lands Tree Replacement Standards in Section 6, part 2 of the Urban Forestry Manual.

D. If the Sensitive Lands Tree Replacement Standards in Section 6, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

Part 2. Sensitive Lands Tree Replacement Standards:

A. Replacement trees shall be planted in a manner consistent with tree care industry standards.

B. The minimum size of a replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size.

C. Replacement trees shall be selected from the native tree list in the Urban Forestry Manual.

D. The city manager or designee may consider native trees that are less than 6 inches DBH as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted by the Tigard Municipal Code.

E. The location of replacement trees shall be as follows:
   1. As close as practicable to the location of the tree that was removed provided the location complies with the other standards in this section;
   2. No closer than 10 feet on center from newly planted or existing trees;
   3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
   4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
   5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
   6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving; Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree in sensitive lands per the standards in this Section and maintain a tree in sensitive lands per the standards in Section 8.10.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the sensitive lands tree replacement requirement.
Part 1. Development Tree Removal Standards:

A. Trees subject to the requirements of Chapter 8.12 shall be removed in a manner consistent with tree care industry standards.

B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.12 if any one of the following criteria are met:

1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.

2. The tree is dead.

3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.

4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.

5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.12 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.

6. The tree is listed in the nuisance tree list.

7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.

8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.

9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation, or utility or infrastructure repair.

10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
Section 7 – Development Tree Removal and Replacement Standards

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C. Unless removed for thinning purposes (Part 1B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Development Tree Replacement Standards in Section 7, part 2 of the Urban Forestry Manual.

D. If the Development Tree Replacement Standards in Section 7, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

Part 2. Development Tree Replacement Standards:

A. Replacement trees shall be planted in a manner consistent with tree care industry standards.

B. The replacement tree shall be located so as to replace the function of the tree that was removed. For example, trees removed from parking lots shall be replaced in parking lots and trees removed from landscape buffers shall be replaced in landscape buffers. If planting in the same location would not comply with the other standards in this section, the replacement tree shall be planted as close as practicable to the tree that was removed in compliance with the other standards in this section.

C. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.

D. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:

1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;

2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and

3. The replacement tree shall be located as follows:
   a. No closer than 10 feet on center from newly planted or existing trees;
   b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
   c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;

See Appendices 2-5 for Approved Tree Lists

See Appendix 5 for Native Tree List
d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;

e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;

g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and

h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

E. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:

1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;

2. The minimum size of the replacement tree shall be 1½ inch caliper for deciduous or 6 feet in height for evergreen; and

3. The replacement tree shall be located as follows:

   a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;

   b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;

   c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List
d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;

e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 1/2 feet from any hard surface paving;

g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and

h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

F. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this Section and were not already required to be planted or preserved by the Tigard Municipal Code.

G. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this Section and maintain a tree per the standards in section 8.12.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the development tree replacement requirement.
Section 8 - Urban Forestry Fund Tree Removal and Replacement Standards

Part 1. Urban Forestry Fund Tree Removal Standards:
A. Trees subject to the requirements of Chapter 8.14 shall be removed in a manner consistent with tree care industry standards.
B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.14 if any one of the following criteria are met:

1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
2. The tree is dead.
3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.14 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
6. The tree is listed in the nuisance tree list.
7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

See Appendix 6 for Nuisance Tree List
C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 of the Urban Forestry Manual.

D. If the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

Part 2. Urban Forestry Fund Tree Replacement Standards:

A. Replacement trees shall be planted in a manner consistent with tree care industry standards.

B. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.

C. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:

1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;

2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and

3. The replacement tree shall be located as follows:
   a. No closer than 10 feet on center from newly planted or existing trees;
   b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
   c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
   d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
   e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;

g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and

h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

D. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:

1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;

2. The minimum size of the replacement tree shall be 1 ½ inch caliper for deciduous or 6 feet in height for evergreen; and

3. The replacement tree shall be located as follows:
   a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
   b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;
   c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;
   d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
   e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

Notes:

See Appendices 2-5 for Approved Tree Lists
See Appendix 6 for Nuisance Tree List
f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 1/2 feet from any hard surface paving;

g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and

h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

E. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted or preserved by the Tigard Municipal Code.

F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this section and maintain a tree per the standards in section 8.14.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the urban forestry fund tree replacement requirement.
Part 1. Heritage Tree Designation Removal Standards:

A. Heritage trees subject to the requirements of Chapter 8.16 shall be removed in a manner consistent with tree care industry standards.

B. The city manager or designee shall approve the removal of heritage tree designation if any one of the following criteria are met for a designated heritage tree:

1. The heritage tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.

2. The heritage tree is dead.

3. The heritage tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.

4. The heritage tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.16 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.

5. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

6. The heritage tree is part of a stand of heritage trees, and a certified arborist or certified forester determines that thinning of interior heritage trees within the stand of heritage trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native heritage trees is maximized prior to thinning of native heritage trees.

C. Replacement of heritage trees is not required unless a heritage tree is also subject to other provisions of the Tigard Municipal Code that require replacement.
Part 1. Urban Forestry Plan – Tree Preservation and Removal Site Plan Requirements:

A. The plan shall be standard size D (24" x 36"), a reduced ledger size (11" x 17") and a PDF, and include all items in part 1.B-O below. When required for clarity, the development impact area information in part 1.I may be detailed separately on multiple plan sheets provided that all of the remaining items in part 1 are included for reference. Alternate sheet sizes may be allowed if approved by the city manager or designee.

B. Date of drawing or last revision.

C. North arrow.

D. Bar scale as follows (unless otherwise approved by the city manager or designee):
   1. Less than 1.0 acres: 1" = 10'
   2. 1.0 - 5.0 acres: 1" = 20'
   3. 5.0 – 20.0 acres: 1" = 50'
   4. Over 20.0 acres: 1" = 100'.

E. Site address or assessor’s parcel number.

F. The location of existing and proposed property lines.

G. The location of existing and proposed topographic lines at 1-foot contours unless otherwise approved.

H. The location and type of sensitive lands areas.

I. Proposed activities within the development impact area, including but not limited to:
   1. Construction of structures and walls;
   2. Paving and graveling;
   3. Utility and irrigation installation;
   4. Construction parking and construction equipment storage;
   5. Landscaping;
   6. Grading and filling;
   7. Stockpiling;
   8. Demolition and tree removal;
   9. Trenching and boring; and
   10. Any other activities that require excavation or soil disturbance.

J. The trunk locations, driplines, assigned numbers and “X” marks when applicable (indicating trees proposed for removal) for the following trees within the development impact area and within 25 feet of the development impact area:
   1. Trees greater than or equal to 6 inch DBH; and
   2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.

K. The trunk locations, driplines and assigned numbers for the following trees that are not within the development impact area:
   1. Open grown trees greater than or equal to 6 inch DBH; and

Notes:
See Appendix 7 for Example Tree Preservation and Removal Site Plan
2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.

L. The driplines of stand grown trees greater than or equal to 6 inch DBH that form a contiguous tree canopy. The driplines may be delineated at the outer edge of the stand. Each stand shall be assigned a number.

M. The location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.

N. Any supplemental tree preservation specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.

O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual.

Part 2. Urban Forestry Plan – Tree Canopy Site Plan Requirements:

A. The plan shall be standard size D (24” x 36”), a reduced ledger size (11” x 17”) and PDF format, and include all items in part 2.B-O below. Alternate sheet sizes may be allowed if approved by the city manager or designee.

B. Date of drawing or last revision.

C. North arrow.

D. Bar scale as follows (unless otherwise approved by the city manager or designee):
   1. less than 1.0 acres: 1" = 10'
   2. 1.0 - 5.0 acres: 1" = 20'
   3. 5.0 – 20.0 acres: 1" = 50'
   4. Over 20.0 acres: 1" = 100'.

E. Site address or assessor's parcel number.

F. The location of proposed property lines.

G. The location of proposed building footprints, utilities and irrigation, streets and other paved areas.

H. The trunk locations, driplines and assigned numbers for trees to be preserved in parts 1.J and 1.K. Each tree on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.

I. The dripline locations of stand grown trees proposed for preservation greater than or equal to 6 inch DBH that form a contiguous tree canopy. The dripline may be delineated at the outer edge of the stand. Each stand shall be assigned a number. Each stand on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
J. The location of existing or potential areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors.

K. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those locations.

L. The location, species, caliper (in inches for deciduous) or height (in feet for evergreen), assigned numbers and depiction of the mature tree canopy (in feet as identified on any of the tree lists in the Urban Forestry Manual or by the city manager or designee) for all trees to be planted and maintained as open grown trees. The minimum size for all trees planted and maintained as open grown trees is 1 ½ inch caliper for deciduous or 6 feet in height for evergreen. Open grown trees shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of open grown trees shall result in a reasonable amount of diversity for the site. Open grown trees shall be located as follows:

1. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

2. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

3. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
4. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

5. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

6. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;

7. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;

8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and

9. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to site constraints.

M. The location, species, size (in height or container size), assigned number and depiction of the mature tree canopy dripline as identified in the native tree list in the Urban Forestry Manual (delineated at the outer edge of the stand) for all trees to be planted and maintained as stand grown trees. The species of trees planted and maintained as stand grown trees shall be selected from the native tree list in the Urban Forestry Manual. The depiction of the mature tree canopy dripline shall be consistent with dimensions in the native tree list. The minimum size of stand grown trees shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of stand grown trees shall result in a reasonable amount of diversity for the site. Stand grown trees shall be located as follows:

1. No closer than an average of 10 feet on center from newly planted or existing trees;

2. No further than an average of 20 feet on center from newly planted or existing trees;
3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings. The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 1/2 feet from any hard surface paving;

8. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;

9. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and

10. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to space constraints.

N. Any supplemental specifications that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.

O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual.
Part 3. Urban Forestry Plan – Supplemental Report Requirements:
A. The supplemental report shall be provided by the project arborist or landscape architect in paper and PDF format, and include all items in part 3.B-P below.
B. Date of the report.
C. The name, address, telephone number, email address and ISA certified arborist number of the project arborist or stamp and registration number of the project landscape architect.
D. The following inventory data in table or other such organized format corresponding to each tree in parts 1.J and 1.K in the tree preservation and removal site plan:
   1. The assigned tree number;
   2. The genus, species and common name;
   3. DBH (in inches);
   4. Average tree canopy area (in square feet), calculated as follows:
      a. Average tree canopy area = \( \frac{\text{average tree canopy spread}}{2} \times \pi \);
   5. Open grown tree or stand grown tree;
   6. Heritage tree? (Y or N);
   7. Numerical condition rating (0-3) as follows:

<table>
<thead>
<tr>
<th>Condition rating</th>
<th>Overall vigor</th>
<th>Tree canopy density</th>
<th>Amount of deadwood</th>
<th>History of failure</th>
<th>Pests</th>
<th>Extent of decay</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Dead to severe decline</td>
<td>&lt;30%</td>
<td>Large; major scaffold branches</td>
<td>More than one scaffold</td>
<td>Infested</td>
<td>Major; conks and cavities</td>
</tr>
<tr>
<td>1</td>
<td>Declining</td>
<td>30-60%</td>
<td>Twig and branch dieback</td>
<td>Scaffold branches</td>
<td>Infested</td>
<td>One to a few conks; small cavities</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>60-90%</td>
<td>Small twigs</td>
<td>Small branches</td>
<td>Minor</td>
<td>Present only at pruning wounds</td>
</tr>
<tr>
<td>3</td>
<td>Good to excellent</td>
<td>90-100%</td>
<td>Little or none</td>
<td>None</td>
<td>Minor to Insignificant</td>
<td>Absent to present only at pruning wounds</td>
</tr>
</tbody>
</table>
8. Numerical suitability for preservation rating (0-3) as follows:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The tree is a “hazard tree” as defined in Chapter 18.120 of the Tigard Development Code and “hazard tree abatement” as defined in Chapter 18.120 in the Tigard Development Code cannot be completed in a manner that results in tree retention consistent with tree care industry standards.</td>
</tr>
<tr>
<td>1</td>
<td>The tree is dead, in severe decline or declining but may be retained if desirable for wildlife or other benefits because it is not considered a “hazard tree” or “hazard tree abatement” could be performed.</td>
</tr>
<tr>
<td>2</td>
<td>The tree has average health and/or structural stability that could be alleviated with treatment; the tree will be less resilient to development impacts and will require more frequent management and monitoring after development than a tree rated as a “3”.</td>
</tr>
<tr>
<td>3</td>
<td>The tree has good to excellent health and structural stability; the tree will be more resilient to development impacts, and will require less frequent management and monitoring after development than a tree rated as a “2”.</td>
</tr>
</tbody>
</table>

9. Proposed for preservation? (Y or N); and
10. Additional comments.

E. The following inventory data in table or other such organized format corresponding to each existing stand in the tree preservation and removal site plan:
   1. The assigned stand number;
   2. The genus, species and common name of the tree species estimated to be dominant in the stand;
   3. The genus, species and common name of the tree species estimated to be the second and third most common in the stand;
   4. The estimated average DBH (in inches) of the dominant tree species in the stand;
   5. The estimated average DBH (in inches) of both the second and third most common tree species in the stand;
   6. The estimated average condition rating (per part 3.D.7) of the dominant tree species in the stand;
   7. The estimated average condition rating (per part 3.D.7) of both the second and third most common tree species in the stand;
   8. The total on site tree canopy area (in square feet) of the stand;
   9. Numerical suitability for preservation rating of the stand (0-3) as follows:
### Rating Considerations

<table>
<thead>
<tr>
<th>Rating</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nuisance trees are the dominant species in the stand and/or continued viability of the stand is unlikely due to pests, diseases, competition from nuisance tree or plant species, hydrologic changes or other factors.</td>
</tr>
<tr>
<td>1</td>
<td>The stand requires a currently cost prohibitive level of investment and management of pests, diseases, nuisance tree or plant species, hydrology or other factors to become viable.</td>
</tr>
<tr>
<td>2</td>
<td>The stand is viable but requires more frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a “3”.</td>
</tr>
<tr>
<td>3</td>
<td>The stand is viable and requires less frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a “2”.</td>
</tr>
</tbody>
</table>

10. The total on site tree canopy area (in square feet) of the stand proposed for preservation; and

11. Additional comments.

F. Supplemental specifications regarding the location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.

G. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.

H. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of stands identified for preservation.

I. A general accounting of soil characteristics on site. Areas of existing or potential tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors shall be clearly identified. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas shall be specifically addressed.

J. The following inventory data in table or other such organized format corresponding to each open grown tree proposed for planting in the tree canopy site plan:

1. The assigned tree number;
2. The genus, species and common name;
3. The caliper (in inches for deciduous) or height (in feet for evergreen);
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4. The average mature tree canopy spread (in feet) as identified on any of the tree lists in the Urban Forestry Manual. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;

5. The average mature tree canopy area (in square feet) calculated as follows:
   a. Average mature tree canopy area = \left(\frac{\text{average mature tree canopy spread}}{2}\right)^2 \times \pi;

6. The proposed available soil volume (in cubic feet) for each tree according to the methodology in Section 12, part 2 of the Urban Forestry Manual. If the available soil volume is greater than 1000 cubic feet, then it is OK to note soil volume as simply “over 1000 cubic feet”; and

7. Additional comments.

K. The following inventory data in table or other such organized format corresponding to each stand proposed for planting in the tree canopy site plan:
   1. The assigned stand number;
   2. The genus, species and common name of trees proposed for planting in the stand;
   3. The average spacing (in feet) and total number of each tree species proposed for planting in the stand;
   4. The height (in feet) or container size (in gallons) of each species proposed for planting in the stand;
   5. The mature tree canopy dripline area of the stand (in square feet) delineated at the outer edge of the stand; and
   6. Additional comments

L. Any supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.

M. A summary in table or other such organized format clearly demonstrating the effective tree canopy cover that will be provided for the overall development site (excluding streets) and for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (excluding streets) as follows:
   1. The area (in square feet) of the overall development site and each lot or tract; and
   2. The effective tree canopy area that will be provided for the overall development site and each lot or tract which shall be considered the sum of the following:
Notes:

a. Double the canopy area (in square feet) of all open grown trees in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only trees with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The overall development site and each lot or tract (or associated right of way) with the largest percentage of the trunk immediately above the trunk flare or root buttresses shall be assigned the effective tree canopy cover area for the corresponding tree;

b. Double the canopy area (in square feet) of all stands in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only stands with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The eligible tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way). The canopy area of any stand grown tree with the largest percentage of the trunk immediately above the trunk flare or root buttresses outside of the overall development site and each lot or tract (or associated right of way) shall not be eligible for credit towards the effective tree canopy cover requirement for that development site or lot or tract;

c. The mature canopy area (in square feet) of all open grown trees in the tree canopy site plan, except for those from the native tree list in the Urban Forestry Manual, to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);

d. 1.25 times the mature canopy area (in square feet) of all open grown trees from the native tree list in the Urban Forestry Manual in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);
e. 1.25 times the mature canopy area (in square feet) of each stand in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees). The eligible mature tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way); and

f. Divide the tree canopy area (calculated per part 3.M.2.a-e above) for the overall development site and each lot or tract by the total area of the overall development site and each lot or tract respectively to determine the effective tree canopy cover for the overall development site and each lot or tract.

N. The standard percentage of effective tree canopy cover for the overall development site shall be at least:
1. 40 percent for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(J));
2. 33 percent for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(J)); and
3. 25 percent for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(J)) in all districts.

O. If the percent of effective tree canopy cover is less than the applicable standard percent in item n above for the overall development or less than 15 percent for any lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover in item n), calculate the tree canopy fee required to meet the applicable standard percent effective tree canopy cover in item n above for the overall development site or 15 percent effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (only if the overall development site meets or exceeds the standard percent effective tree canopy cover in item n but individual lots or tracts in the R-1, R-2, R-3.5, R-4.5 and R-7 districts do provide 15 percent effective tree canopy cover) according to the methodology in Section 10, part 4 of the Urban Forestry Manual.

P. A signature of approval and statement from the project arborist or landscape architect, attesting that:
1. The tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual;
2. The canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual; and
3. The supplemental report meets all of the requirements in Section 10, part 3 of the Urban Forestry Manual.

Part 4. Urban Forestry Plan – Tree Canopy Fee Calculation Requirements:
A. The tree canopy fee shall be calculated as follows:
1. If the percentage of effective tree canopy cover is less than the applicable standard percentage in part 3, item n above for the overall development site find the difference (in square feet) between the proposed effective tree canopy cover and the applicable standard effective tree canopy cover for the overall development site and multiply the difference (in square feet) by:
   a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.

2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than 15 percent for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts, find the difference (in square feet) between the proposed effective tree canopy cover and 15 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:
   a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.

Part 5. Urban Forestry Plan – Significant Tree Grove Preservation Considerations:
A. Connects with and does not become isolated from the remaining portion of the significant tree grove on or off the site;
B. Preserves the most dominant, resilient and healthiest native trees;
C. Preserves a diversity of species, ages and sizes of native trees;
D. Preserves native understory and supports natural succession;
E. Preserves and minimizes disturbance to native soils and tree roots;
F. Does not preserve hazard trees or trees likely to soon become hazard trees particularly those subject to windthrow (low live crown ratio, high height to diameter ratio, suppressed root development) and exacerbated by newly created edges and/or removal of adjacent trees; and
G. Does not preserve trees currently or likely to soon be severely impacted by large scale weed, pest or disease outbreaks and/or changing site conditions (hydrology, light, temperature, wind).
Part 1. Urban Forestry Plan Implementation Standards – Inspection Requirements:

A. After tree protection measures are installed and prior to any ground disturbance other than what is necessary for the installation of tree protection measures and erosion, sediment and pollutant controls measures, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection.

B. Following the completion of item a above, the project arborist or landscape architect shall perform semimonthly (twice monthly) site inspections for tree protection measures during periods of active site development and construction, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection. The frequency of site inspections may be decreased if approved by the city manager or designee.

C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in Section 10, part 2.B-N of the Urban Forestry Manual consistent with the approved urban forestry plan. Prior to issuance of any building permits for each resulting lot or tract, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval with the building permit submittal documents.

D. When the land use review type will result in the division of land into multiple lots or tracts, the project arborist or landscape architect shall perform a site inspection for tree protection measures for all lots or tracts that are not proposed to be associated with a building permit, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee prior to the issuance of the first building permit resulting from the land use review type.

E. Prior to final building inspection for any lot or tract with an urban forestry plan that is still in effect, the project arborist or landscape architect shall perform a site inspection, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee.

Notes:

See Appendix 10 for Example Tree Canopy Site Plan (Section 10, Part 2) for an Individual Lot.
Part 2. Urban Forestry Plan Implementation Standards – Tree Establishment Requirements:

A. Prior to any ground disturbance work, the applicant shall provide a tree establishment bond for all trees to be planted per the approved urban forestry plan. The total bond amount:
   1. For subdivisions and minor land partitions shall be equivalent to the city’s average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of two years after planting multiplied by the total number of trees to be planted and maintained; and
   2. For all other land use review types shall be equivalent to the city’s average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of one year after planting multiplied by the total number of trees to be planted and maintained.

B. Following final building inspection or upon acceptance by the city manager or designee when there is no final building inspection, the tree establishment period shall immediately begin and continue:
   1. In subdivisions and partitions, for a period of two years or until such time as each lot is sold; and
   2. In all other land use review types, for a period of one year.

C. When the land use review type will result in the division of land into multiple lots or tracts, there shall be a separate tree establishment period for each resulting lot or tract where trees are shown to be planted in the approved urban forestry plan.

D. Following the applicable tree establishment period for each lot or tract, the bond shall be correspondingly reduced based on tree survival following a site inspection, documentation of successful tree establishment and/or replacement according to items E and F below, and receipt by the city manager or designee of written verification of findings and a signature of approval by the project arborist or landscape architect.

E. For planted open grown trees, successful establishment shall be considered 80 percent survival of the open grown trees planted on the lot or tract, and replacement of 100 percent of the remaining open grown trees planted on the lot or tract that did not survive.

F. For planted stand grown trees, successful establishment shall be considered survival of at least 80 percent of the original stand grown trees planted on the lot or tract.

G. If successful establishment for open grown trees is less than 80 percent for any lot or tract, the applicable tree establishment period shall reset for that lot or tract and the establishment process for open grown trees described in part 2.B-F above shall be repeated until the successful establishment requirement for open grown trees is met.
H. If successful establishment for stand grown trees is less than 80 percent for any lot or tract, the applicable tree establishment period shall reset for that lot or tract and the establishment process for stand grown trees described in Part 2.B-F above shall be repeated until the successful establishment requirement for stand grown trees is met.

Part 3. Urban Forestry Plan Implementation Standards – Urban Forest Inventory Requirements:
A. Following documentation of compliance with the urban forestry plan by the project arborist or landscape architect for each lot or tract, the city shall collect spatial and species specific data for each open grown tree and area of stand grown trees for inclusion in a publicly accessible inventory of trees.
B. Prior to any ground disturbance work, the applicant shall provide a fee to cover the city’s cost of collecting and processing the inventory data for the entire urban forestry plan.

Notes:
See Master Fees and Charges Schedule for current fees
Section 12 - Street Tree Soil Volume Standards

Part 1. Street Tree Soil Volume Standards – Soil Volume Requirements:
A. Street trees required to be planted by chapter 18.745 shall be provided the following minimum soil volumes based on the width of the proposed right of way measured from the edge of the street (excluding curb) towards the subject site:

<table>
<thead>
<tr>
<th>Right of Way Width (feet)</th>
<th>Minimum Soil Volume Requirement (cubic feet per tree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10</td>
<td>400</td>
</tr>
<tr>
<td>Over 10 up to 12</td>
<td>500</td>
</tr>
<tr>
<td>Over 12 up to 14</td>
<td>600</td>
</tr>
<tr>
<td>Over 14 up to 16</td>
<td>700</td>
</tr>
<tr>
<td>Over 16 up to 18</td>
<td>800</td>
</tr>
<tr>
<td>Over 18 up to 20</td>
<td>900</td>
</tr>
<tr>
<td>Over 20</td>
<td>1000</td>
</tr>
</tbody>
</table>

Part 2. Street Tree Soil Volume Standards – Soil Volume Calculation Requirements:
A. For open soil volumes, soil depth is assumed to be 3 feet if the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) demonstrate that the tree will not be planted in an area of tree growth limiting soil or the area of tree growth limiting soil will be adequately amended to a depth of 3 feet in the specified planting area.
B. Areas of tree growth limiting soils that have not been adequately amended shall not be eligible for credit towards the minimum soil volume requirements in part 1 of this section.
C. For covered soil volumes, the soil depth is equal to the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
D. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
E. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
F. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.C above) to the available covered soil volume (per part 2.D above) within a 50 foot radius of the tree.
Section 12 – Street Tree Soil Volume Standards

G. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width.

H. In addition, covered soil volumes are considered “available” to a tree only when demonstrated as available by the soil volume plan in part 3 of this section.

I. All soil volumes calculated per this section shall be displayed for each corresponding tree in the required supplemental report.

Part 3. Street Tree Soil Volume Standards – Soil Volume Plan Requirements:

A. A soil volume plan shall be required for any street tree required to be planted by chapter 18.745 if a covered soil volume is proposed to be used to meet any portion of the minimum soil volume requirements in part 1 of this section. The soil volume plan shall include all items in part 3.B-E below.

   1. Date of drawing or last revision;
   2. North arrow;
   3. Bar scale;
   4. Site address or assessor’s parcel number;
   5. The name, address, telephone number, email address and license number of the project landscape architect;
   6. The location of property lines or proposed property lines if different from existing;
   7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
   8. The assigned numbers (consistent with the tree canopy site plan and supplemental report of a concurrent urban forestry plan) of all trees;
   9. The location of each open soil volume area and each covered soil volume area considered “available” for each tree; and
   10. The City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.

B. A standard size D (24" x 36"), a reduced ledger size (11" x 17") and a PDF soil volume plan by a registered landscape architect (the project landscape architect) that includes all of the following elements (alternate sheet sizes may be allowed if approved by the city manager or designee):

   1. Date of drawing or last revision;
   2. North arrow;
   3. Bar scale;
   4. Site address or assessor’s parcel number;
   5. The name, address, telephone number, email address and license number of the project landscape architect;
   6. The location of property lines or proposed property lines if different from existing;
   7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
   8. The assigned numbers (consistent with the tree canopy site plan and supplemental report of a concurrent urban forestry plan) of all trees;
   9. The location of each open soil volume area and each covered soil volume area considered “available” for each tree; and
   10. The City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.

C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in –part 3.B.1-10 of this section consistent with the approved soil volume plan and a signature of approval from the project landscape architect.
D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved soil volume plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection for all lots, parcels, or tracts associated with each particular tree. When the land use review type will result in the division of land into multiple lots or tracts, the project landscape architect shall provide the documentation/verification described above for all lots or tracts that are not proposed to be associated with a building permit prior to the issuance of the first building permit resulting from the land use review type. When the land use review type does not involve a building permit, the project landscape architect shall provide the documentation/verification described above prior to final acceptance by the city manager or designee.

E. If any subsequent modifications to an approved soil volume plan is required to meet the minimum soil volume requirements in part 1 of this section, a revised soil volume plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.
Section 13 - Parking Lot Tree Canopy Standards

Part 1. Parking Lot Tree Canopy Standards – Parking Lot Tree Requirements:
A. Parking lot trees shall be planted in a manner consistent with tree care industry standards.
B. Parking lot trees shall have a minimum caliper of 1 ½ inches (for deciduous) or height of a 6 feet (for evergreen) at the time of planting.
C. Parking lot tree species shall be from the parking lot tree list, unless otherwise approved by the city manager or designee.
D. Parking lot trees shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving, including curbs.
E. Parking lot trees shall be evenly distributed within the parking area, and no greater than 6 feet from the parking area.
F. Parking lot trees shall be provided a minimum of 1000 cubic feet of soil volume per tree.

Part 2. Parking Lot Tree Canopy Standards – Soil Volume Calculation Requirements:
A. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
B. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the parking lot tree canopy plan in part 3 of this section.
C. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.A above) to the available covered soil volume (per part 2.B above) within a 50 foot radius of the tree.
D. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width, and demonstrated as available by the parking lot tree canopy plan in part 3 of this section.
E. All soil volumes calculated per this section shall be displayed for each corresponding tree in the supplemental report (per 18.790.030.A.4) when an urban forestry plan is concurrently required.

Part 3. Parking Lot Tree Canopy Standards – Parking Lot Tree Canopy Plan Requirements:
A. A parking lot tree canopy plan shall be required unless the city manager or designee determines the requirements of a concurrent urban forestry plan per chapter 18.790 will meet the equivalent standards in part 3 of this section. The parking lot tree canopy plan shall include all items in part 3.B-E below.

Notes:
See Appendix 3 for Parking Lot Tree List
See Appendix 15 for three Example Soil Volume Calculations for Parking Lot Trees
See Appendix 16 for Example Parking Lot Tree Canopy Plan
B. A standard size D (24" x 36"), a reduced ledger size (11" x 17") and a PDF parking lot tree canopy plan by a registered landscape architect (the project landscape architect) that includes all of the following elements (alternate sheet sizes may be allowed if approved by the city manager or designee):

1. Date of drawing or last revision;
2. North arrow;
3. Bar scale;
4. Site address or assessor's parcel number;
5. The name, address, telephone number, email address and license number of the project landscape architect;
6. The location of property lines or proposed property lines if different from existing;
7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
8. The location of areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors;
9. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas. If required for clarity, this information may be detailed on a separate plan sheet;
10. The location of all parking lot striping and the location of the limits of the parking area, which includes all parking spaces, all landscape islands and all parking aisles;
11. Assigned numbers (consistent with the tree canopy site plan per 18.790.030.A.3 and supplemental report per 18.790.030.A.4 of a concurrent urban forestry plan) of all parking lot trees;
12. The location, species and caliper (in inches for deciduous) or height (in feet for evergreen) of all parking lot trees;
13. Depiction of the average mature tree canopy spread (in feet as identified on any of the tree lists in the Urban Forestry Manual) for each parking lot tree. If a parking lot tree is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;
14. The location of each open soil volume area and each covered soil volume area considered “available” for each tree; and
15. If covered soil volumes are proposed to meet any portion of the soil volume requirement in part 1.F of this section, the City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.

C. A summary in table or other such organized format clearly demonstrating the proposed percent tree canopy cover at maturity directly over the parking area as follows:

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Notes:

See Appendix 17 for two alternative Example Covered Soil Volume Plan Drawings and an Example Covered Soil Specification for Parking Lot Trees

See Appendix 18 for Example Parking Lot that Meets the 30% Minimum Canopy Cover Requirement per Code Section 18.745.050.E.1.a.4
1. The area (in square feet) of the parking area as shown in the parking lot tree canopy plan;
2. The average mature tree canopy area for each parking lot tree as follows:
   a. Average mature tree canopy area = (average mature tree canopy spread/2)² x \pi;
3. The total combined mature tree canopy area (in square feet) of all parking lot trees less the percentage not directly over the parking area; and
4. The total combined mature tree canopy area directly over the parking area (in square feet) divided by the parking area.

D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved parking lot tree canopy plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection or prior to final acceptance when there is no final building inspection.

E. If any subsequent modifications to an approved parking lot tree canopy plan is required, a revised parking lot tree canopy plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.
City of Tigard
Tree Risk Assessment Form

Recommended Hazard Tree Abatement Procedures:

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Property Address:__________________________________________________________

Location: □ Public □ Private □ Right-of-Way

Protected Tree: □ Yes □ No

Tree Species:________________________________________

Diameter at Breast Height (DBH):__________________________

Tree Height:________________________________________

Crown Spread:________________________________________

Tree Part Subject of Evaluation:________________________________________

Diameter of Subject Tree Part:________________________________________

Distance to Target of Subject Tree Part:________________________________________

Length of Subject Tree Part:________________________________________

Target:________________________________________

Occupancy of Target: □ Occasional Use □ Intermittent Use □ Frequent Use □ Constant Use

Date of Evaluation:

Tree Risk Assessor:

ISA Number:

Tree Risk Assessor Signature:________________________________________

*Fill out this and supplemental rating form completely and attach: 1) photos of the tree; 2) an aerial photo showing the location of the tree on the subject property; and 3) a supplemental tree risk assessment report more fully describing whether the definition of hazard tree has been met and, if necessary, recommended hazard tree abatement procedures.
<table>
<thead>
<tr>
<th>Probability of Failure (1 - 5 points)</th>
<th>(✓) One</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong> 1 point</td>
<td></td>
</tr>
<tr>
<td>Defect is not likely to lead to imminent failure, and no further action is required. In many cases, defects might not be recorded.</td>
<td>Minor branch or crown dieback, small wounds, minor defects.</td>
</tr>
<tr>
<td><strong>Moderate</strong> 2 points</td>
<td></td>
</tr>
</tbody>
</table>
| One or more defects areas well-established but typically do not lead to failure for several years. Corrective action might be useful to prevent future problems but only if time and money are available. Not the highest priority for action, these are retain and monitor situations used to inform budget and work schedules for subsequent years. | Several defects present.  
- Shell wall exceeds minimum requirement  
- Cracks initiated but no extensive decay  
- Cavity opening or other stem damage less than 30% of circumference  
- Crown damage or breakage less than 50% of canopy (30% in pines)  
- Dead crown limbs with fine twigs attached and bark intact  
- Weak branch union such as major branch or codominant stem with included bark  
- Stem girdling roots with less than 40% of circumference compressed  
- Root damage or root decay affects less than 33% of roots within the critical zone  
- Standing dead tree that is recently dead (still has fine twigs) and no other significant defects |
| **Moderately High** 3 points         |         |
| One or more defects areas well-established, but not yet deemed to be a high priority issue. Additional testing may be required or, the assessor may feel the problems are not serious enough to warrant immediate action, but do warrant placing the tree on a list of trees to be inspected more regularly. These are Retain and Monitor trees. | Areas of decay that may be expanding; trees that have developed a recent but not yet critical lean; cracks noted but may be stable; edge trees that may adapt and become more stable. |
| **High** 4 points                    |         |
| The defect is serious and imminent failure is likely and corrective action is required immediately. These cases require treatment within the next few days or weeks. | One or more major defects present.  
- Insufficient shell wall thickness  
- Large cracks, possibly associated with other defects  
- Cavity opening greater than 30% of circumference  
- Crown damage or breakage more than 50% of canopy (> 30% in pines)  
- Dead crown limbs with no fine twigs and bark peeling away. May be some saprophytic fungal evidence  
- Weak branch union has crack(s) or decay  
- Stem girdling root affects 40% or more of trunk circumference  
- More than 33% of roots are damaged within the critical zone  
- Tree is leaning. Recent root breakage, or soil mounding, or cracks, or extensive decay evident  
- Standing dead tree, has very few fine twigs, and no other significant defects |
| **Extreme** 5 points                 |         |
| The tree or component part is already failing. An emergency situation where treatment is required today. | Multiple high or extreme risk defects present.  
- Shell wall is already cracked and failing  
- Major cracks already open, such as hazard beams or split trunks  
- More than 30% of circumference defective and cracks or decay obvious  
- Dead crown limbs, no fine twigs, no bark, decay present  
- Weak branch union has crack(s) and decay  
- Leaning tree with recent root failure, soil mounding, and cracks or extensive decay  
- Dead branches hung up or partly failed  
- Visual obstruction of traffic signs/lights at intersections  
- Any partly failed component or whole tree  
- Standing dead trees that have been dead for more than one season with multiple defects such as cracks, decay, damaged roots, shedding bark |
The Target Area (1 - 4 points)

| Low 1 point | Sites rated at one point are very rarely used for any long period of time, and people passing through the area (regardless of how they travel) do not spend a lot of time within the striking range of the tree. There are no valuable buildings or other facilities within striking range. Examples are seldom used back country roads or trails, seldom used overflow or long-term parking, industrial areas where workers drive machines (trucks, forklifts, tractors) with substantial cab protection; natural or wilderness areas; transition areas with limited access; remote areas of yards, parks, or private lands open for public use within set hours. All of these sites have relatively low occupancy within any one day. |
| Moderate 2 points | Valuable buildings are at the edge off the striking distance, so they would not be seriously damaged even if the tree did fall down. The site has people within striking range occasionally, meaning less than 50% of the time span in any one day, week, or month, and do not stay within striking range very long. Examples include areas that are used seasonally; more remote areas of camping areas or parks; minor rural roads; picnic areas; low to moderate use trails; most park and school playgrounds. ** Moderate to low use parks, parking lots with daily use; secondary roads and intersections, dispersed camping sites, moderate to high use trails, works and/or storage yards. |
| Moderately High 3 points | The site has valuable buildings within striking range. People are within striking range more than 50% of the time span in any one day, week, or month, and their exposure time can be more than just passing by. Examples include secondary roads, trails, and access points; less commonly used parking areas and trails within parks; trails alongside fairways, bus stops. |
| High 4 points | The highest rated targets have a) a building within striking range frequently accessed by people, often for longer periods of time, or high volumes of people coming and going within striking range. Valuable buildings or other structures within striking range that would suffer major structural damage in the event of tree failure or; b) people within striking distance of the tree, or both, seven days a week, all year long, and at all times of the day. Examples include main roads, the busiest streets or highways; high volume intersections power lines;* paths through busy open space areas and parks; short-term parking constantly in use; institutional buildings such as police stations, hospitals, fire stations; shopping areas; highly used walking trails; pick up and drop off points for commuters; golf tees and greens; emergency access routes and/or marshalling areas; handicap access areas; high use camping areas, visitor centers or shelters; residential buildings; industrial areas where workers take outside breaks; development sites where work activity within striking range lasts more than a few hours at a time. |

*There are very specific safe work practices required when working close to Power Lines. These vary depending on location, but all employ similar principles.

**It is recognized that there is a tendency to rate playgrounds higher simply because children are involved. Most playgrounds are occupied for short periods of time in daylight hours. Overall, their use is infrequent when compared to other locations such as busy streets.

Size of Defective Part (1 - 3 points)

| 1 point | Branches or stems up to 10 centimeters (4 inches) in diameter |
| 2 points | Branches or stems between 10 to 50 centimeters (4 to 20 inches) in diameter. |
| 3 points | Branches or stems greater than 50 centimeters (20 inches) in diameter. |

*In some cases, there may be large areas of sloughing back bark, dwarf mistletoe brooms, branch stubs, or large bird nests in cavities that pose a risk. The assessor must use his or her judgment to assign a number to these components. In general, the lowest rating (1 point) is reserved for component parts that would not create much impact on a person or property if it were to fail. The highest rating is used for parts that have the potential to kill people or seriously damage property.

Appendix 1
## Overall Risk Rating and Action Thresholds

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Risk Category</th>
<th>Interpretation and Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Low 1</td>
<td>Insignificant – no concern at all.</td>
</tr>
<tr>
<td>4</td>
<td>Low 2</td>
<td>Insignificant – very minor issues.</td>
</tr>
<tr>
<td>5</td>
<td>Low 3</td>
<td>Insignificant – minor issues not of concern for many years yet.</td>
</tr>
<tr>
<td>6</td>
<td>Moderate 1</td>
<td>Some issues but nothing that is likely to cause any problems for another 10 years or more.</td>
</tr>
<tr>
<td>7</td>
<td>Moderate 2</td>
<td>Well defined issues – retain and monitor. Not expected to be a problem for at least another 5-10 years.</td>
</tr>
<tr>
<td>8</td>
<td>Moderate 3</td>
<td>Well defined issues – retain and monitor. Not expected to be a problem for at least another 1-5 years.</td>
</tr>
<tr>
<td>9</td>
<td>High 1</td>
<td>The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage, it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.</td>
</tr>
<tr>
<td>10</td>
<td>High 2</td>
<td>The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.</td>
</tr>
<tr>
<td>11</td>
<td>High 3</td>
<td>The tree, or a part of it has reached a stage where it could fail at any time. <strong>Action to mitigate the risk is required within weeks rather than months.</strong> By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.</td>
</tr>
<tr>
<td>12</td>
<td>Extreme</td>
<td>This tree, or part of it, is in the process of failing. <strong>Immediate action is required.</strong> All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordon off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.</td>
</tr>
</tbody>
</table>

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

Notes:

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Appendix 1
# Street Tree List - Small Stature Trees
*(up to 25' in height at maturity)*

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area (sq. ft.)</th>
<th>Soil Type</th>
<th>Suitable for Under Powerlines</th>
<th>Special Features/Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paperbark Maple</td>
<td>Acer griseum</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes*</td>
<td>peeling bark, tolerates some shade</td>
</tr>
<tr>
<td>Tatarian Maple</td>
<td>Acer tataricum</td>
<td>20'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Trident Maple</td>
<td>Acer buergeranum</td>
<td>25'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Serviceberry</td>
<td>Amelanchier × grandiflora</td>
<td>25'</td>
<td>15'</td>
<td>177</td>
<td>all</td>
<td>Yes</td>
<td>white flowers, edible fruit</td>
</tr>
<tr>
<td>Western Serviceberry</td>
<td>Amelanchier alnifolia</td>
<td>20'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>native to Portland metropolitan region</td>
</tr>
<tr>
<td>American Hornbeam</td>
<td>Carpinus caroliniana</td>
<td>25'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>No</td>
<td>needs ample water</td>
</tr>
<tr>
<td>Eastern Redbud</td>
<td>Cornus canadensis</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes</td>
<td>pink flowers in spring before leaves emerge</td>
</tr>
<tr>
<td>Glorybower Tree</td>
<td>Clerodendrum trichotomum</td>
<td>20'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>colorful flowers in summer, blue berries in fall</td>
</tr>
<tr>
<td>Kousa Dogwood</td>
<td>Cornus kousa</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes</td>
<td>shade tolerant</td>
</tr>
<tr>
<td>Flowering Dogwood</td>
<td>Cornus florida</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes</td>
<td>large number of varieties available</td>
</tr>
<tr>
<td>Lavalle Hawthorne</td>
<td>Crataegus × lavallei</td>
<td>25'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>white flowers in May, orange-red fruit persist into Winter</td>
</tr>
<tr>
<td>Black Hawthorne</td>
<td>Crataegus douglasii</td>
<td>25'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>native to Portland metropolitan region, has thorns</td>
</tr>
<tr>
<td>Golden Desert Ash</td>
<td>Fraxinus excelsior 'Golden Desert'</td>
<td>20'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>golden twigs</td>
</tr>
<tr>
<td>Flowering Ash</td>
<td>Fraxinus ornus</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes</td>
<td>fragrant flowers</td>
</tr>
<tr>
<td>Merrill Magnolia</td>
<td>Magnolia x hubner 'Merrill'</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>No</td>
<td>fragrant white flowers</td>
</tr>
<tr>
<td>Southern Magnolia</td>
<td>Magnolia grandiflora 'Victoria' or 'Little Gem'</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>No</td>
<td>broadleaf evergreen, large fragrant white flowers</td>
</tr>
<tr>
<td>Prairie Fire Crabapple</td>
<td>Malus spp. 'Prairiefire'</td>
<td>20'</td>
<td>20'</td>
<td>314</td>
<td>all</td>
<td>Yes</td>
<td>disease resistant</td>
</tr>
<tr>
<td>Japanese Stewartia</td>
<td>Stewartia pseudocamellia</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>loam</td>
<td>No</td>
<td>needs ample water</td>
</tr>
<tr>
<td>Japanese Snowbell</td>
<td>Stryax japonica</td>
<td>25'</td>
<td>25'</td>
<td>491</td>
<td>all</td>
<td>Yes</td>
<td>white flowers hang down from branches</td>
</tr>
<tr>
<td>Japanese Tree Lilac</td>
<td>Syringa reticulata</td>
<td>20'</td>
<td>15'</td>
<td>177</td>
<td>all</td>
<td>Yes</td>
<td>showy, creamy white flowers</td>
</tr>
</tbody>
</table>

*These trees have been approved by Portland General Electric (PGE) for planting beneath overhead powerlines*
## Street Tree List - Medium Stature Trees
(between 25' and 40' in height at maturity)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area</th>
<th>Soil Type</th>
<th>Suitable for Under Powerlines</th>
<th>Special Features/Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedge Maple</td>
<td><em>Acer campestre</em></td>
<td>35'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Sunset Maple</td>
<td><em>Acer truncatum</em> x <em>Acer platanoides</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>many varieties available</td>
</tr>
<tr>
<td>Strawberry Tree</td>
<td><em>Arbutus 'Marina'</em></td>
<td>30'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>broadleaf evergreen</td>
</tr>
<tr>
<td>European Hornbeam</td>
<td><em>Carpinus betulus</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>dense crown</td>
</tr>
<tr>
<td>Katsura</td>
<td><em>Cercidiphyllum japonium</em></td>
<td>40'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>requires moist soils</td>
</tr>
<tr>
<td>Strawberry Tree</td>
<td><em>Arbutus 'Marina'</em></td>
<td>30'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>broadleaf evergreen</td>
</tr>
<tr>
<td>European Hornbeam</td>
<td><em>Carpinus betulus</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>dense crown</td>
</tr>
<tr>
<td>Katsura</td>
<td><em>Cercidiphyllum japonium</em></td>
<td>40'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>requires moist soils</td>
</tr>
<tr>
<td>Yellowwood</td>
<td><em>Cladrastis kentuckia</em></td>
<td>35'</td>
<td>35'</td>
<td>962 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>fragrant, white, pendulous flowers</td>
</tr>
<tr>
<td>June Snow Dogwood</td>
<td><em>Cornus controversa 'June Snow'</em></td>
<td>30'</td>
<td>35'</td>
<td>962 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>wide spreading, flowers in May/June</td>
</tr>
<tr>
<td>Pacific Dogwood</td>
<td><em>Cornus nutallii</em></td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>loam</td>
<td>No</td>
<td>native to Portland metropolitan region, requires moist soil and some shade</td>
</tr>
<tr>
<td>Dove Tree</td>
<td><em>Davidia involucrata</em></td>
<td>35'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>dove-like flowers</td>
</tr>
<tr>
<td>Raywood Ash</td>
<td><em>Freccimus ocyaceta 'Raywood'</em></td>
<td>35'</td>
<td>35'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>smog tolerant</td>
</tr>
<tr>
<td>Goldenrain Tree</td>
<td><em>Koelreuteria paniculata</em></td>
<td>35'</td>
<td>35'</td>
<td>962 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Yulan Magnolia</td>
<td><em>Magnolia denudata</em></td>
<td>35'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>white, fragrant flowers</td>
</tr>
<tr>
<td>Southern Magnolia</td>
<td><em>Magnolia grandiflora 'Edith Bogue'</em></td>
<td>35'</td>
<td>20'</td>
<td>314 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>broadleaf evergreen, many other varieties available</td>
</tr>
<tr>
<td>Sourwood</td>
<td><em>Oxydendrum arboreum</em></td>
<td>30'</td>
<td>20'</td>
<td>314 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>white, midsummer flowers</td>
</tr>
<tr>
<td>American Hophornbeam</td>
<td><em>Ostrya virginiana</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>exfoliating bark texture is attractive</td>
</tr>
<tr>
<td>Persian Parrotia</td>
<td><em>Parrotia persica</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>beautiful bark and fall color</td>
</tr>
<tr>
<td>Amur Corktree</td>
<td><em>Pseudotsuga amurnensis</em></td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>fragrant leaves and fruit</td>
</tr>
<tr>
<td>Callery Pear</td>
<td><em>Pyrus calleryana</em></td>
<td>40'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>many varieties available</td>
</tr>
<tr>
<td>Cascara</td>
<td><em>Rhus aromatica</em></td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>native to Portland metropolitan region</td>
</tr>
<tr>
<td>Frontier Elm</td>
<td>*Ulmus 'Frontier'</td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>all</td>
<td>No</td>
<td>pest and disease resistant, substitute for American Elm</td>
</tr>
</tbody>
</table>
# Street Tree List - Large Stature Trees

(over 40' in height at maturity)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area (sq. ft.)</th>
<th>Soil Type</th>
<th>Suitable for Under Powerlines</th>
<th>Special Features/Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Maple</td>
<td>Acer rubrum</td>
<td>50'</td>
<td>40'</td>
<td>1256</td>
<td>any</td>
<td>No</td>
<td>many large stature varieties available</td>
</tr>
<tr>
<td>Hackberry</td>
<td>Celtis occidentalis</td>
<td>45'</td>
<td>35'</td>
<td>962</td>
<td>any</td>
<td>No</td>
<td>tolerant of urban stresses, deep rooted</td>
</tr>
<tr>
<td>European Beech</td>
<td>Fagus sylvatica</td>
<td>50'</td>
<td>40'</td>
<td>1256</td>
<td>well drained</td>
<td>No</td>
<td>beautiful bark</td>
</tr>
<tr>
<td>White Ash</td>
<td>Fraxinus americana</td>
<td>60'</td>
<td>45'</td>
<td>1590</td>
<td>any</td>
<td>No</td>
<td>plant seedless varieties</td>
</tr>
<tr>
<td>Oregon Ash</td>
<td>Fraxinus latifolia</td>
<td>60'</td>
<td>30'</td>
<td>707</td>
<td>any</td>
<td>No</td>
<td>native to Portland metropolitan region</td>
</tr>
<tr>
<td>Green Ash</td>
<td>Fraxinus pennsylvatica</td>
<td>50'</td>
<td>40'</td>
<td>1256</td>
<td>any</td>
<td>No</td>
<td>plant seedless varieties</td>
</tr>
<tr>
<td>Maidenhair Tree</td>
<td>Ginkgo biloba</td>
<td>60'</td>
<td>45'</td>
<td>1590</td>
<td>any</td>
<td>No</td>
<td>many large stature varieties available, plant males only</td>
</tr>
<tr>
<td>Honeylocust</td>
<td>Gleditsia triacanthos var. inermis</td>
<td>45'</td>
<td>35'</td>
<td>962</td>
<td>any</td>
<td>No</td>
<td>thornless, tolerant of urban stresses</td>
</tr>
<tr>
<td>Kentucky Coffeetree</td>
<td>Gymnocladus dioicus</td>
<td>65'</td>
<td>50'</td>
<td>1963</td>
<td>any</td>
<td>No</td>
<td>fragrant flowers</td>
</tr>
<tr>
<td>Tulip Tree</td>
<td>Liriodendron tulipifera</td>
<td>60'</td>
<td>30'</td>
<td>707</td>
<td>any</td>
<td>No</td>
<td>beautiful fall color</td>
</tr>
<tr>
<td>Southern Magnolia</td>
<td>Magnolia grandiflora</td>
<td>70'</td>
<td>60'</td>
<td>1963</td>
<td>any</td>
<td>No</td>
<td>broadleaf evergreen, large fragrant white flowers</td>
</tr>
<tr>
<td>Blackgum</td>
<td>Nyssa sylvatica</td>
<td>45'</td>
<td>25'</td>
<td>491</td>
<td>sq. ft.</td>
<td>No</td>
<td>beautiful fall color</td>
</tr>
<tr>
<td>London Planetree</td>
<td>Platanus x acerifolia 'Bloodgood'</td>
<td>50'</td>
<td>40'</td>
<td>1256</td>
<td>sq. ft.</td>
<td>No</td>
<td>disease resistant, pollution tolerant</td>
</tr>
<tr>
<td>Scotch Pine</td>
<td>Pinus sylvestris</td>
<td>50'</td>
<td>40'</td>
<td>1256</td>
<td>sq. ft.</td>
<td>No</td>
<td>evergreen conifer, striking orange bark</td>
</tr>
<tr>
<td>Oregon White Oak</td>
<td>Quercus garryana</td>
<td>65'</td>
<td>50'</td>
<td>1963</td>
<td>sq. ft.</td>
<td>No</td>
<td>native to Portland metropolitan region</td>
</tr>
<tr>
<td>Willow Oak</td>
<td>Quercus phellos</td>
<td>60'</td>
<td>45'</td>
<td>1590</td>
<td>sq. ft.</td>
<td>No</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Red Oak</td>
<td>Quercus rubra</td>
<td>60'</td>
<td>45'</td>
<td>1590</td>
<td>sq. ft.</td>
<td>No</td>
<td>beautiful fall color</td>
</tr>
<tr>
<td>American Linden</td>
<td>Tilia americana</td>
<td>60'</td>
<td>30'</td>
<td>707</td>
<td>sq. ft.</td>
<td>No</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Sterling Silver Linden</td>
<td>Tilia tomentosa 'Sterling Silver'</td>
<td>45'</td>
<td>30'</td>
<td>707</td>
<td>sq. ft.</td>
<td>No</td>
<td>dark green leaves with silver undersides</td>
</tr>
<tr>
<td>Zelkova</td>
<td>Zelkova serrata</td>
<td>65'</td>
<td>50'</td>
<td>1963</td>
<td>sq. ft.</td>
<td>No</td>
<td>attractive shade tree</td>
</tr>
</tbody>
</table>
## Parking Lot Trees
### (recommended for parking lots, large stature)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area</th>
<th>Soil Type</th>
<th>Suitable for Under Powerlines</th>
<th>Special Features/Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigleaf Maple</td>
<td><em>Acer macrophyllum</em></td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>native to Portland metropolitan region</td>
</tr>
<tr>
<td>Red Maple</td>
<td><em>Acer rubrum</em></td>
<td>50'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>brilliant red fall color</td>
</tr>
<tr>
<td>European Beech</td>
<td><em>Fagus sylvatica</em></td>
<td>50'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>beautiful bark</td>
</tr>
<tr>
<td>White Ash</td>
<td><em>Fraxinus americana</em></td>
<td>60'</td>
<td>45'</td>
<td>1590 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>plant seedless varieties</td>
</tr>
<tr>
<td>Green Ash</td>
<td><em>Fraxinus pennsylvania</em></td>
<td>50'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>plant seedless varieties</td>
</tr>
<tr>
<td>Maidenhair Tree</td>
<td><em>Ginkgo biloba</em></td>
<td>60'</td>
<td>45'</td>
<td>1590 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>many large stature varieties available, plant males only</td>
</tr>
<tr>
<td>Kentucky Coffeetree</td>
<td><em>Gymnocladus dioicus</em></td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>fragrant flowers</td>
</tr>
<tr>
<td>Southern Magnolia</td>
<td><em>Magnolia grandiflora</em></td>
<td>70'</td>
<td>60'</td>
<td>2826 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>broadleaf evergreen, large fragrant white flowers</td>
</tr>
<tr>
<td>Austrian Pine</td>
<td><em>Pinus nigra</em></td>
<td>55'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>evergreen conifer</td>
</tr>
<tr>
<td>Eastern White Pine</td>
<td><em>Pinus strobus</em></td>
<td>70'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>evergreen conifer</td>
</tr>
<tr>
<td>Scotch Pine</td>
<td><em>Pinus sylvestris</em></td>
<td>50'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>evergreen conifer, striking orange bark</td>
</tr>
<tr>
<td>London Planetree</td>
<td><em>Platanus x acerifolia 'Bloodgood'</em></td>
<td>50'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>disease resistant, pollution tolerant native to Portland metropolitan region</td>
</tr>
<tr>
<td>Oregon White Oak</td>
<td><em>Quercus garryana</em></td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>tolerant of urban stresses</td>
</tr>
<tr>
<td>Willow Oak</td>
<td><em>Quercus phellos</em></td>
<td>60'</td>
<td>45'</td>
<td>1590 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>beautiful fall color</td>
</tr>
<tr>
<td>Red Oak</td>
<td><em>Quercus rubra</em></td>
<td>60'</td>
<td>45'</td>
<td>1590 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>graceful vase shaped tree, disease resistant substitute for American dm</td>
</tr>
<tr>
<td>Accolade Elm</td>
<td><em>Ulmus 'Morton'</em></td>
<td>70'</td>
<td>60'</td>
<td>2826 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>interesting mottled bark</td>
</tr>
<tr>
<td>Lacebark Elm</td>
<td><em>Ulmus parvifolia</em></td>
<td>60'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>rounded spreading crown, disease resistant substitute for American dm</td>
</tr>
<tr>
<td>Pioneer Elm</td>
<td><em>Ulmus 'Pioneer'</em></td>
<td>50'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>broadleaf evergreen</td>
</tr>
<tr>
<td>Oregon Myrtle</td>
<td><em>Umbellularia californica</em></td>
<td>70'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>attractively shaped tree</td>
</tr>
<tr>
<td>Zelkova</td>
<td><em>Zelkova serrata</em></td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>attractively shaped tree</td>
</tr>
</tbody>
</table>
## Columnar Trees
*(canopy spread of less than 20 feet at maturity, small stature)*

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area</th>
<th>Soil Type</th>
<th>Suitable for Under Powerlines</th>
<th>Special Features/Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong Maple</td>
<td><em>Acer rubrum</em> 'Armstrong'</td>
<td>45'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>orange-red fall color</td>
</tr>
<tr>
<td>Bowhall Maple</td>
<td><em>Acer rubrum</em> 'Bowhall'</td>
<td>40'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>bright red fall color</td>
</tr>
<tr>
<td>Frans Fontaine</td>
<td><em>Carpinus betulus</em> 'Frans Fontaine'</td>
<td>35'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>narrowest of the <em>Carpinus b.</em> cultivars</td>
</tr>
<tr>
<td>Dawyck Purple Beech</td>
<td><em>Fagus sylvatica</em> 'Dawyck Purple'</td>
<td>40'</td>
<td>12'</td>
<td>113 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>purple leaves for entire growing season</td>
</tr>
<tr>
<td>Princeton Sentry Ginkgo</td>
<td><em>Ginkgo biloba</em> 'Princeton Sentry'</td>
<td>40'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>seedless, bright yellow fall color</td>
</tr>
<tr>
<td>Arnold Tulip Tree</td>
<td><em>Liriodendron tulipifera</em> 'Arnold'</td>
<td>40'</td>
<td>10'</td>
<td>79 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>fast grower</td>
</tr>
<tr>
<td>Edith Bogue Magnolia</td>
<td><em>Magnolia grandiflora</em> 'Edith Bogue'</td>
<td>30'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>broadleaf evergreen</td>
</tr>
<tr>
<td>Galaxy Magnolia</td>
<td><em>Magnolia x</em> 'Galaxy'</td>
<td>30'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>showy pink flowers</td>
</tr>
<tr>
<td>Tschonoskii Crabapple</td>
<td><em>Malus tschonoskii</em></td>
<td>30'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>good fall color</td>
</tr>
<tr>
<td>Princeton Sentry Austrian</td>
<td><em>Pinus nigra</em> ‘Arnold Sentinel'</td>
<td>35'</td>
<td>10'</td>
<td>79 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>evergreen conifer</td>
</tr>
<tr>
<td>Fastigiate White Pine</td>
<td><em>Pinus strobus</em> 'Fastigiata'</td>
<td>30'</td>
<td>10'</td>
<td>79 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>evergreen conifer</td>
</tr>
<tr>
<td>Quaking Aspen</td>
<td><em>Populus tremuloides</em></td>
<td>30'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>native to the Portland Metro region</td>
</tr>
<tr>
<td>Capital Pear</td>
<td><em>Pyrus calleryana</em> 'Capital'</td>
<td>35'</td>
<td>12'</td>
<td>113 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>glossy summer foliage</td>
</tr>
<tr>
<td>Chanticleer Pear</td>
<td><em>Pyrus calleryana</em> 'Chanticleer'</td>
<td>40'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>resistant to fireblight</td>
</tr>
<tr>
<td>Columnar Sargent Cherry</td>
<td><em>Praunus sargentii</em> 'Columnaris'</td>
<td>35'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>pink flowers and reddish bark</td>
</tr>
<tr>
<td>Skyrocket Oak</td>
<td><em>Quercus robur</em> 'Fastigiata'</td>
<td>45'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>may hold brown leaves into winter</td>
</tr>
<tr>
<td>Crimson Spire Oak</td>
<td><em>Crumschmidt</em> 'Crumschmidt'</td>
<td>45'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>well drained</td>
<td>No</td>
<td>red fall color</td>
</tr>
<tr>
<td>Giant Arborvitae</td>
<td>&quot;Virescens&quot;</td>
<td>25'</td>
<td>12'</td>
<td>113 sq. ft.</td>
<td>moist</td>
<td>No</td>
<td>evergreen conifer, species native to the Portland Metro Region</td>
</tr>
<tr>
<td>Corinthia Linden</td>
<td><em>Tilia cordata</em> 'Corzam'</td>
<td>45'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>narrowest of the linden cultivars</td>
</tr>
<tr>
<td>Columnar Zelkova</td>
<td><em>Zelkova serrata</em> 'Musashino'</td>
<td>45'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>any</td>
<td>No</td>
<td>fine textured leaves</td>
</tr>
</tbody>
</table>
## Native Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Height (feet)</th>
<th>Spread (feet)</th>
<th>Canopy Area</th>
<th>Stature</th>
<th>Suitable for Under Powerlines</th>
<th>Primary Habitat Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Fir</td>
<td>Abies grandis</td>
<td>150'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Wetland, Riparian, Upland</td>
</tr>
<tr>
<td>Big-leaf Maple</td>
<td>Acer macrophyllum</td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Red Alder</td>
<td>Alnus rubra</td>
<td>100'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Riparian, Upland</td>
</tr>
<tr>
<td>Madrone</td>
<td>Arbutus menziesii</td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Pacific Dogwood</td>
<td>Cornus nuttallii</td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Black Hawthorn</td>
<td>Cytisus douglasii</td>
<td>25'</td>
<td>20'</td>
<td>314 sq. ft.</td>
<td>Small</td>
<td>Yes</td>
<td>Wetland, Riparian, Upland</td>
</tr>
<tr>
<td>Oregon Ash</td>
<td>Fraxinus latifolius</td>
<td>60'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Wetland, Riparian</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>Pinus ponderosa</td>
<td>200'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Black Cottonwood</td>
<td>Populus balsamifera ssp. trichocarpa</td>
<td>175'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Wetland, Riparian</td>
</tr>
<tr>
<td>Quaking Aspen</td>
<td>Populus tremuloides</td>
<td>30'</td>
<td>15'</td>
<td>177 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Wetland, Riparian</td>
</tr>
<tr>
<td>Bitter Cherry</td>
<td>Prunus emarginata</td>
<td>30'</td>
<td>20'</td>
<td>314 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Riparian, Upland</td>
</tr>
<tr>
<td>Douglas Fir</td>
<td>Pseudotsuga menziesii</td>
<td>180'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Oregon White Oak</td>
<td>Quercus garryana</td>
<td>65'</td>
<td>50'</td>
<td>1963 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Upland</td>
</tr>
<tr>
<td>Cascara</td>
<td>Rhamnus purshiana</td>
<td>35'</td>
<td>25'</td>
<td>491 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Riparian, Upland</td>
</tr>
<tr>
<td>Pacific Willow</td>
<td>Salix lucida ssp. lasiandra</td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Wetland, Riparian</td>
</tr>
<tr>
<td>Rigid Willow</td>
<td>Salix rigida var. macrogygma</td>
<td>30'</td>
<td>20'</td>
<td>314 sq. ft.</td>
<td>Small</td>
<td>No</td>
<td>Wetland, Riparian</td>
</tr>
<tr>
<td>Scouler Willow</td>
<td>Salix scouleri</td>
<td>40'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Wetland, Riparian, Upland</td>
</tr>
<tr>
<td>Pacific Yew</td>
<td>Taxus brevifolia</td>
<td>40'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Medium</td>
<td>No</td>
<td>Riparian, Upland</td>
</tr>
<tr>
<td>Western Red Cedar</td>
<td>Thuja plicata</td>
<td>100'</td>
<td>30'</td>
<td>707 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Wetland, Riparian, Upland</td>
</tr>
<tr>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>150'</td>
<td>40'</td>
<td>1256 sq. ft.</td>
<td>Large</td>
<td>No</td>
<td>Riparian, Upland</td>
</tr>
</tbody>
</table>
# Nuisance Tree List

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Photos</th>
<th>Photos2</th>
<th>Photos3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway maple</td>
<td><em>Acer platanoides</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Sycamore maple</td>
<td><em>Acer pseudoplatanus</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Tree-of-heaven</td>
<td><em>Ailanthus altissima</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>European white birch</td>
<td><em>Betula pendula</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>English hawthorn</td>
<td><em>Crataegus monogyna</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>English holly</td>
<td><em>Ilex aquifolium</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Princess tree</td>
<td><em>Paulownia tomentosa</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>White poplar</td>
<td><em>Populus alba</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Sweet cherry</td>
<td><em>Prunus avium</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Black locust</td>
<td><em>Robinia pseudoacacia</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>European mountain ash</td>
<td><em>Sorbus aucuparia</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
<tr>
<td>Siberian elm</td>
<td><em>Ulmus pumila</em></td>
<td>leaf detail</td>
<td>fruit detail</td>
<td>flower detail</td>
</tr>
</tbody>
</table>
Urban Forestry Plan –Supplemental Report Example Template

**General Information**

Date:
Project Name:
Project Arborist or Landscape Architect Name:
Project Arborist or Landscape Architect Address:
Project Arborist or Landscape Architect Telephone Number:
Project Arborist or Landscape Architect Email Address:
ISA Certified Arborist No.:
Landscape Architect Stamp:

**Project Summary**

**Specifications**

Tree Protection Fencing Specifications:

Tree Preservation Specifications:

Stand Preservation Specifications:

Soil Characteristics and Specifications for Improvement:

Tree Planting Specifications:

Stand Planting Specifications:
Urban Forestry Plan – Supplemental Report Example Template

**Existing Tree Inventory**

<table>
<thead>
<tr>
<th>Tree #</th>
<th>Genus sp./Common</th>
<th>DBH</th>
<th>Canopy (ft²)</th>
<th>Open or Stand Grown</th>
<th>Heritage Tree?</th>
<th>Cond. Rating</th>
<th>Pres. Rating</th>
<th>Preserve?</th>
<th>Comments</th>
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</tbody>
</table>

**Existing Stand Inventory**

<table>
<thead>
<tr>
<th>Stand #</th>
<th>Genus sp./Common of Dominant</th>
<th>Avg. DBH 1</th>
<th>Avg. Cond. Rating 1</th>
<th>Overall Stand Pres. Rating</th>
<th>Total Canopy (ft²)</th>
<th>Canopy Preserved (ft²)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Genus sp./Common of 2nd</td>
<td>Avg. DBH 2</td>
<td>Avg. Cond. Rating 2</td>
<td></td>
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<tr>
<td></td>
<td>Genus sp./Common of 3rd</td>
<td>Avg. DBH 3</td>
<td>Avg. Cond. Rating 3</td>
<td></td>
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</tbody>
</table>

|         |                  |     |              |                     |               |              |              |           |          |
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|         |                  |     |              |                     |               |              |              |           |          |
|         |                  |     |              |                     |               |              |              |           |          |
## Urban Forestry Plan – Supplemental Report Example Template

### Planted Tree Inventory

<table>
<thead>
<tr>
<th>Tree #</th>
<th>Genus sp./ Common</th>
<th>Caliper (Decid.) or Height (Evergreen)</th>
<th>Mature Canopy Spread (ft)</th>
<th>Mature Canopy Area (ft²)</th>
<th>Available Soil Volume (ft³)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

### Planted Stand Inventory

<table>
<thead>
<tr>
<th>Stand #</th>
<th>Genus sp./Common 1</th>
<th>Hgt. or Container size</th>
<th>No. of Trees</th>
<th>Avg. Spacing (ft)</th>
<th>Total Mature Canopy Area (ft²) Delineated at the Outer Edge of the Stand</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Genus sp./Common 2</td>
<td>Hgt. or Container size</td>
<td>No. of Trees</td>
<td>Avg. Spacing (ft)</td>
<td>Delineated at the Outer Edge of the Stand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genus sp./Common 3</td>
<td>Hgt. or Container size</td>
<td>No. of Trees</td>
<td>Avg. Spacing (ft)</td>
<td>Delineated at the Outer Edge of the Stand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genus sp./Common 4</td>
<td>Hgt. or Container size</td>
<td>No. of Trees</td>
<td>Avg. Spacing (ft)</td>
<td>Delineated at the Outer Edge of the Stand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genus sp./Common 5</td>
<td>Hgt. or Container size</td>
<td>No. of Trees</td>
<td>Avg. Spacing (ft)</td>
<td>Delineated at the Outer Edge of the Stand</td>
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</tbody>
</table>
Effective Tree Canopy Cover Summary

<table>
<thead>
<tr>
<th>*Lot or Tract # (exclude streets)</th>
<th>Lot or Tract Area (ft²)</th>
<th>2x Canopy Area (ft²) of Preserved Trees (w/ cond. and pres.≥2)</th>
<th>2x Canopy Area (ft²) of Preserved Stands (w/ cond. and pres.≥2)</th>
<th>1.25x Mature Canopy Area (ft²) of Native Planted Trees</th>
<th>Mature Canopy Area (ft²) of Non-Native Planted Trees</th>
<th>1.25x Mature Canopy Area (ft²) of Planted Stands</th>
<th>Total Canopy Area (ft²) per lot or tract</th>
<th>Effective % Canopy (Canopy Area / Lot or Tract Area)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

*Note: effective tree canopy cover is required to be calculated on a lot/tract by lot/tract basis only in the R-1, R-2, R-3.5, R-4.5 and R-7 districts.

The standard percentage of effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts shall be at least 15 percent.

The standard percentage of effective tree canopy cover for the overall development site shall be at least:

i. 40% for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(j));

ii. 33% for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(j)); and

iii. 25% for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(j)) in all districts.
Urban Forestry Plan –Supplemental Report Example Template

Tree Canopy Fee Calculation (if applicable)

If the percentage of effective tree canopy cover is less than the applicable standard percentage for the overall development:

1. Find the required ft² of tree canopy:
   (overall development site area) x (standard required % (40%, 33%, or 25%)).
2. Find the ft² of tree canopy the development is short:
   (required ft² of tree canopy from 1 above) - (proposed ft² of tree canopy).
3. Find the $ value of tree canopy:
   (PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:
   (amount of ft² of tree canopy from 2 above) x (the $ value of tree canopy from 3 above).

If the overall development meets the applicable standard percentage, but the percentage of effective tree canopy cover is less than 15% for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts:

1. Find the required ft² of tree canopy for the deficient lot or tract:
   (lot or tract area) x 15%.
2. Find the ft² of tree canopy the lot or tract is short:
   (required ft² of tree canopy from 1 above) - (proposed ft² of tree canopy).
3. Find the $ value of tree canopy:
   (PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:
   (amount of ft² of tree canopy from 2 above) x (the $ value of tree canopy from 3 above).

Signature of Approval

I hereby attest that:

1. The Tree Preservation and Removal site plan meets all of the requirements in Section 10, Part 1 of the Urban Forestry Manual;
2. The Tree Canopy site plan meets all of the requirements in Section 10, Part 2 of the Urban Forestry Manual; and

______________________________________________

Appendix 9
TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':

OPEN SOIL VOLUME = 100' x 5' x 3' = 1,500 C.F.
COVERED SOIL VOLUME = 0 C.F.

TOTAL SOIL VOLUME = 1,500 C.F.

1,500 C.F. is GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (600 C.F.), THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.
TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':

OPEN SOIL VOLUME = 4' x 4' x 3' = 48 C.F.
COVERED SOIL VOLUME = 20' x 10' x 3' = 600 C.F.
TOTAL SOIL VOLUME = 840 C.F.

840 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (600 C.F.). THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.
OPEN SOIL VOLUME = (PLANTER STRIP AREA + FRONT YARD AREA CONNECTED BY THE COVERED CONTINUOUS ROOT PATH) x SOIL DEPTH

PLANTER STRIP AREA = 6 FEET X 22 FEET = 132 S.F.

AREA CONNECTED BY CONTINUOUS ROOT PATH = 4,000 S.F.

OPEN SOIL VOLUME = (132 S.F + 4,000 S.F.) x 3 = 12,396 C.F.

COVERED SOIL VOLUME = (SIDEWALK WIDTH) x (SIDEWALK LENGTH) x (STRUCTURAL SOIL DEPTH)

COVERED SOIL VOLUME = (6') x (3') x (3') = 54 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 12,396 C.F. + 54 C.F. = 12,450 C.F.

12,450 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN A 12' RIGHT OF WAY (600 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.
EXAMPLE COVERED SOIL VOLUME
PLAN DRAWING - UNDER SIDEWALK
OPTION FOR STREET TREE
Example Covered Soil Volume Specifications

Part 1. Covered Soil Materials

A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
   1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
   2. Loam/Organic Topsoil;
   3. Soil binder such as “Stabilizer”; and

Part 2. Proportions of Covered Soil Materials

A. The proportions of covered soil materials shall be as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Amount for 1 CY of Covered Soil</th>
<th>Amount for 4.6 CY of Covered Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushed Rock</td>
<td>23.2 cubic feet</td>
<td>4 cubic yards</td>
</tr>
<tr>
<td>Topsoil</td>
<td>5.9 cubic feet</td>
<td>1 cubic yard</td>
</tr>
<tr>
<td>Soil Binder</td>
<td>13.7 ounces</td>
<td>4 pounds</td>
</tr>
<tr>
<td>Water</td>
<td>1.6 gallon</td>
<td>46 gallons</td>
</tr>
</tbody>
</table>

B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

Part 3. Covered Soil Mixing Procedures

A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.
B. Start with half of the crushed rock material.
C. Add all of the topsoil material.
D. Add the soil binder.
E. Add half of the estimated water.
F. Add the other half of the crushed rock material.
G. Mix the material together.
H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock
shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

**Part 4. Placement of Covered Soil**

A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.

B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.

C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.

D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to the required percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.

E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.
TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':

OPEN SOIL VOLUME = (ISLAND AREA) X (SOIL DEPTH) = 336 S.F. x 3' = 1,008 C.F.

COVERED SOIL VOLUME = 0 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 1,008 C.F. + 0 C.F. = 1,008 C.F.

1,008 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY REQUIREMENTS.
TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':

OPEN SOIL VOLUME = (PLANTER AREA) X (SOIL DEPTH) = 196 S.F. x 3' = 588 C.F.

COVERED SOIL VOLUME = 259 S.F. X 3' = 777 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 588 C.F. + 777 C.F. = 1,365 C.F.

1,365 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY REQUIREMENTS.
TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':
OPEN SOIL VOLUME = 36 S.F. (TREE CUTOUT AREA) + 36 S.F (CONNECTED TREE CUTOUT AREA) x 3' (SOIL DEPTH) = 216 C.F.
COVERED SOIL VOLUME = 330 S.F. (COVERED SOIL AREA) x 3' (COVERED SOIL DEPTH) = 990 C.F.
TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 216 C.F. + 990 C.F. = 1,206 C.F.

1,206 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A PARKING LOT TREE (1000 C.F.) SO THIS MEETS THE CITY REQUIREMENTS.
<table>
<thead>
<tr>
<th>Tree ID</th>
<th>Species</th>
<th>Open Soil Volume</th>
<th>Covered Soil Volume</th>
<th>Total Soil Volume</th>
<th>Ave. Mature Canopy</th>
<th>% of Canopy Over Parking Lot</th>
<th>Area Over Parking Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Zelkova</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>5,466 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>39%</td>
<td>757 s.f.</td>
</tr>
<tr>
<td>002</td>
<td>Red Oak</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,539 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>40%</td>
<td>640 s.f.</td>
</tr>
<tr>
<td>003</td>
<td>Zelkova</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>3,192 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>92%</td>
<td>1,812 s.f.</td>
</tr>
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<td>004</td>
<td>Zelkova</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>3,069 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>89%</td>
<td>1,749 s.f.</td>
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<td>005</td>
<td>Zelkova</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>1,818 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>53%</td>
<td>1,040 s.f.</td>
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<td>006</td>
<td>Zelkova</td>
<td>303 c.f.</td>
<td>2,160 c.f.</td>
<td>2,463 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>50%</td>
<td>984 s.f.</td>
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<tr>
<td>007</td>
<td>Zelkova</td>
<td>348 c.f.</td>
<td>2,160 c.f.</td>
<td>2,508 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>80%</td>
<td>1,575 s.f.</td>
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<td>008</td>
<td>Zelkova</td>
<td>576 c.f.</td>
<td>2,166 c.f.</td>
<td>2,742 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>85%</td>
<td>1,668 s.f.</td>
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<td>009</td>
<td>Zelkova</td>
<td>3,681 c.f.</td>
<td>0 c.f.</td>
<td>3,681 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>76%</td>
<td>1,498 s.f.</td>
</tr>
<tr>
<td>010</td>
<td>Red Oak</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,200 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>35%</td>
<td>559 s.f.</td>
</tr>
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<td>011</td>
<td>Zelkova</td>
<td>708 c.f.</td>
<td>2,076 c.f.</td>
<td>2,784 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>82%</td>
<td>1,613 s.f.</td>
</tr>
<tr>
<td>012</td>
<td>Zelkova</td>
<td>3,651 c.f.</td>
<td>0 c.f.</td>
<td>3,651 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>79%</td>
<td>1,550 s.f.</td>
</tr>
<tr>
<td>013</td>
<td>Zelkova</td>
<td>1,101 c.f.</td>
<td>0 c.f.</td>
<td>1,101 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>014</td>
<td>Zelkova</td>
<td>1,101 c.f.</td>
<td>0 c.f.</td>
<td>1,101 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>015</td>
<td>Red Oak</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,155 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>36%</td>
<td>566 s.f.</td>
</tr>
<tr>
<td>016</td>
<td>Zelkova</td>
<td>4,176 c.f.</td>
<td>0 c.f.</td>
<td>4,176 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>017</td>
<td>Zelkova</td>
<td>4,233 c.f.</td>
<td>0 c.f.</td>
<td>4,233 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>018</td>
<td>Zelkova</td>
<td>4,233 c.f.</td>
<td>0 c.f.</td>
<td>4,233 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>019</td>
<td>Zelkova</td>
<td>3,630 c.f.</td>
<td>0 c.f.</td>
<td>3,630 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>79%</td>
<td>1,547 s.f.</td>
</tr>
<tr>
<td>020</td>
<td>Red Oak</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,506 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>41%</td>
<td>644 s.f.</td>
</tr>
<tr>
<td>021</td>
<td>Zelkova</td>
<td>417 c.f.</td>
<td>870 c.f.</td>
<td>1,287 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>022</td>
<td>Zelkova</td>
<td>444 c.f.</td>
<td>870 c.f.</td>
<td>1,314 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>023</td>
<td>Zelkova</td>
<td>4,293 c.f.</td>
<td>870 c.f.</td>
<td>5,163 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>024</td>
<td>Zelkova</td>
<td>4,284 c.f.</td>
<td>870 c.f.</td>
<td>5,154 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>025</td>
<td>Zelkova</td>
<td>4,284 c.f.</td>
<td>870 c.f.</td>
<td>5,154 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>026</td>
<td>Zelkova</td>
<td>5,946 c.f.</td>
<td>0 c.f.</td>
<td>5,946 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>48%</td>
<td>936 s.f.</td>
</tr>
<tr>
<td>027</td>
<td>Red Oak</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>3,702 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>37%</td>
<td>581 s.f.</td>
</tr>
<tr>
<td>028</td>
<td>Zelkova</td>
<td>2,430 c.f.</td>
<td>0 c.f.</td>
<td>2,430 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>79%</td>
<td>1,558 s.f.</td>
</tr>
<tr>
<td>029</td>
<td>Zelkova</td>
<td>1,077 c.f.</td>
<td>0 c.f.</td>
<td>1,077 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>030</td>
<td>Zelkova</td>
<td>1,077 c.f.</td>
<td>0 c.f.</td>
<td>1,077 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>100%</td>
<td>1,963 s.f.</td>
</tr>
<tr>
<td>031</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,191 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>40%</td>
<td>642 s.f.</td>
</tr>
<tr>
<td>032</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>4,392 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>38%</td>
<td>602 s.f.</td>
</tr>
<tr>
<td>033</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>2,562 c.f.</td>
<td>45' spread (1,590 s.f.)</td>
<td>100%</td>
<td>1,256 s.f.</td>
</tr>
<tr>
<td>034</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>2,529 c.f.</td>
<td>40' spread (1,256 s.f.)</td>
<td>73%</td>
<td>915 s.f.</td>
</tr>
<tr>
<td>035</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>1,533 c.f.</td>
<td>40' spread (1,256 s.f.)</td>
<td>58%</td>
<td>726 s.f.</td>
</tr>
<tr>
<td>036</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>516 c.f.</td>
<td>40' spread (1,256 s.f.)</td>
<td>81%</td>
<td>1,021 s.f.</td>
</tr>
<tr>
<td>037</td>
<td>Red Maple</td>
<td>0 c.f.</td>
<td>0 c.f.</td>
<td>516 c.f.</td>
<td>40' spread (1,256 s.f.)</td>
<td>80%</td>
<td>1,007 s.f.</td>
</tr>
<tr>
<td>038</td>
<td>Zelkova</td>
<td>837 c.f.</td>
<td>441 c.f.</td>
<td>1,278 c.f.</td>
<td>50' spread (1,963 s.f.)</td>
<td>92%</td>
<td>1,804 s.f.</td>
</tr>
</tbody>
</table>

Total Qualifying Mature Tree Canopy Area: 57,763 s.f. (Sum of canopy area over parking lot)
EXAMPLE COVERED SOIL VOLUME
PLAN DRAWING – UNDER
PARKING LOT OPTION FOR
PARKING LOT TREE
COVERED SOIL VOLUME
ROOT PATH (3' MINIMUM)

CONNECTED TREE CUTOUT

VARIES

CURB

6'X6' MINIMUM TREE CUTOUT
(OPEN SOIL VOLUME)

PLAN

6'X6' MINIMUM TREE CUTOUT
(OPEN SOIL VOLUME)

CURB

PARKING LOT SURFACING

CONNECTED TREE CUTOUT
(OPEN SOIL VOLUME)

COMPACTED SUBGRADE
DRAINAGE

COVERED SOIL VOLUME (ROOT PATH)
PER CITY SPECIFICATIONS

PROFILE

EXAMPLE COVERED SOIL VOLUME DRAWING— ROOT PATH OPTION FOR PARKING LOT TREE

NO SCALE

APPENDIX 17
Example Covered Soil Volume Specifications

Part 1. Covered Soil Materials

A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
   1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
   2. Loam/Organic Topsoil;
   3. Soil binder such as “Stabilizer”; and

Part 2. Proportions of Covered Soil Materials

A. The proportions of covered soil materials shall be as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Amount for 1 CY of Covered Soil</th>
<th>Amount for 4.6 CY of Covered Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushed Rock</td>
<td>23.2 cubic feet</td>
<td>4 cubic yards</td>
</tr>
<tr>
<td>Topsoil</td>
<td>5.9 cubic feet</td>
<td>1 cubic yard</td>
</tr>
<tr>
<td>Soil Binder</td>
<td>13.7 ounces</td>
<td>4 pounds</td>
</tr>
<tr>
<td>Water</td>
<td>1.6 gallon</td>
<td>46 gallons</td>
</tr>
</tbody>
</table>

B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

Part 3. Covered Soil Mixing Procedures

A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.

B. Start with half of the crushed rock material.
C. Add all of the topsoil material.
D. Add the soil binder.
E. Add half of the estimated water.
F. Add the other half of the crushed rock material.
G. Mix the material together.
H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock
shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

Part 4. Placement of Covered Soil

A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.

B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.

C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.

D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to at least 85 percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.

E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.
TOTAL CANOPY AREA OF PARKING LOT TREES* = 11,388 S.F.

TOTAL QUALIFYING MATURE CANOPY COVER = CANOPY COVER DIRECTLY OVER THE PARKING AREA IN SQUARE FEET, INCLUDING PLANTING ISLANDS AND AREAS SURROUNDED BY CURB OR HARD SURFACE PAVING ON AT LEAST THREE SIDES.

TOTAL QUALIFYING MATURE CANOPY COVER = 8,057 S.F.

PARKING LOT AREA = 13,590 S.F.

PERCENT ACTUAL CANOPY COVER = (8,057 S.F.) / (13,590 S.F.) = 59%

59% IS GREATER THAN THE MINIMUM OF 30% TOTAL QUALIFYING MATURE CANOPY COVER THEREFORE CITY REQUIREMENTS ARE MET.

*CANOPY AREA PER TREE IS DETERMINED FROM THE VALUE GIVEN IN THE CITY OF TIGARD PARKING LOT TREE LIST FOR A MATURE TREE OF THAT SPECIES.