

ufm urban forest manual City of Tacoma



CITY OF TACOMA
URBAN FOREST MANUAL
VOLUME 3: REQUIRED LANDSCAPING THROUGH DEVELOPMENT

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INTRODUCTION

This volume of the Urban Forest Manual (UFM) is a technical guide created to facilitate the planning, design, installation and maintenance of landscaping that is required for new development and redevelopment per the City of Tacoma's (City) Tacoma Municipal Code (TMC) 13.06.090B Landscaping and Buffering Standards. It is intended to be used concurrently with TMC 13.06.090B to ensure the requirements and standards are executed properly. Before finalizing development plans, contact Planning and Development Services (PDS) at (253) 591-5030, or visit them at 747 Market Street on the third floor, to verify that all other applicable City codes and manuals have been met. This manual can also be used as a guide for the planning, design, installation and maintenance for any landscaping project.

INTENT

The City's landscaping requirements are intended to contribute to the aesthetic environment of the city, enhance livability and foster economic development. Effective landscaping can provide for an attractive urban setting; support the urban citywide tree canopy and wildlife, such as birds; buffer visual impacts of development; help reduce stormwater runoff; and contribute to the planting, maintenance, and preservation of a stable and sustainable urban forest.

TMC 13.06.090B helps to support this intent by requiring landscaping (trees, shrubs and groundcover) be installed when significant development activities take place. In crafting TMC 13.06.090B, the City sought to achieve these objectives in a flexible manner that does not overly burden development activities. Landscaping requirements generally apply to new construction and substantial alterations of structures, parking areas, streets and sidewalks. Minor alterations, and one, two and three-family development are exempt from landscaping requirements, except for street tree requirements triggered by off-site improvements as specified in Section 4.2.3 Street Trees. The code also contains a range of options intended to provide flexibility while still meeting the intent, as well as incentives for inclusion of desired features like larger tree species, native plants, and Low Impact Development stormwater facilities.

When required, landscaping must comply with the code standards for plant selection, installation and maintenance. These code standards are intended to better ensure that plants survive and thrive, to minimize conflicts with infrastructure, and in some cases to provide a substantial visual buffer. Generally, landscaping plans, and management plans detailing how landscaping will be maintained, must be prepared by a professional. TMC 13.06.090B also references the UFM as a source of additional guidance on the technical aspects of landscaping. However, please note that the TMC 13.06.090B is the source of regulatory authority and is the final say on landscaping requirements.

In certain instances other City codes may require or pertain to landscaping. For additional landscaping requirements, erosion control and other stormwater related measures refer to the City's Stormwater Management Manual available online at cityoftacoma.org/stormwatermanual. For street tree planting and pruning not associated with development activities, refer to TMC Title 9.

DETERMINING LANDSCAPING REQUIREMENTS

The UFM is organized to guide users in determining if and how landscaping is required in association with development activities. The following steps are recommended:

1. Determine if your development will trigger landscaping requirements, and which ones apply.

***Chapter 1** of the UFM provides an overview of the City's landscaping requirements and an indication of when they typically apply. It is intended to be used in conjunction with TMC 13.06.090B .*

2. If landscaping is required, determine how much and what type is required.

***Chapter 2** of the UFM includes a landscaping requirements table, for use in determining how much landscaping will be required, based on the location, scope and type of development activities.*

*In addition, UFM **Chapter 3** provides guidance on determining whether landscaping features eligible for incentives or bonuses under the landscaping code may reduce the amount of required landscaping or provide flexibility on planting location.*

3. Determine requirements intended to ensure that landscaping survives and thrives.

***Chapter 4** of the UFM provides guidance on planting and installation.*

4. Based on the landscaping that is required and how it should be selected and cared for, prepare your application for submittal with your building or site development permit. To enable staff to determine that your proposed landscaping meets the code, the following items are required for submittal:

- *Landscaping Requirements Table – (discussed in **Chapter 2** and provided as 0)*
- *Landscape Plan – (refer to **Chapter 5** and 0)*
- *Landscape Management Plan – (refer to **Chapter 6** and 0)*
- *Tree Protection Plan and Arborist Report (if retaining vegetation) – (refer to **Chapter 7** and 0)*

5. After submittal, City staff will guide you through the review and approval process.

Once construction permits are issued, landscaping is required to be installed (or bonded for) in accordance with the approved plans and pertinent code requirements. Ongoing maintenance and replacement of required landscaping is the responsibility of the property owner.

CHAPTER 1 LANDSCAPING APPLICABILITY AND TYPES

Use this chapter, along with TMC 13.06.090B, to determine if your development triggers landscaping requirements, and to determine which ones apply. For developments within Downtown Tacoma, see TMC 13.06.050 Downtown Tacoma. Most landscaping requirements consist of a mix of trees, shrubs and groundcover, as specified in the code. Consult a PDS Planner to discuss any questions or concerns.

1. Does the landscaping code apply to what I am doing?

Landscaping is required for new development and substantial alterations as laid out in the code. Street trees, specifically, are required for construction of new roadways and sidewalks. See TMC 13.06.010.A Applicability.

2. Is my development exempt from landscaping?

The on-site portions of the following are exempt from on-site landscaping requirements outright, except for street tree requirements triggered by off-site improvements as specified in Section 4.2.3 Street Trees:

- *Single, two and three-family developments*
- *Passive open space areas*
- *Park and recreation uses*

See TMC 13.06.020, 13.06.030, 13.06.060, and 13.06.040 Landscaping requirements applicable to Residential, Commercial, Industrial and Mixed-Use Districts.

3. If landscaping is required, then review TMC 13.06.090B to determine which of the following applies:

- *Overall Site Landscaping*
- *Site Perimeter Landscaping*
- *Landscaping Buffers*
- *Street Trees*
- *Parking Lot Landscaping*
- *X District Front Yard and Foundation Landscaping*

CHAPTER 2 LANDSCAPING REQUIREMENTS

Use this chapter, in association with the landscaping requirements table in TMC 13.06.090B, to determine how much landscaping will be required, based on the location, scope and type of development activities.

2.1 LANDSCAPING REQUIREMENTS WORKSHEETS

The following worksheets are intended as an aid in calculating the total number of trees required under each applicable landscaping type. The tables included in Sections 2.2 – 2.7 are for use in aiding the applicant to determine their requirements and are not required for permit submittal. The summary table included as Appendix 1 is to be filled out and submitted as part of the permit application submittal.

Guidance to Help Meet Code Requirements:

- The code contains both numerical and distribution requirements. Each project must provide landscaping to satisfy the most stringent of the numerical or distribution requirements.
- In some cases, landscaping may count towards fulfillment of more than one requirement. For example, Overall Site Landscaping is often met by other requirements, such as Site Perimeter, Parking Lot distribution and Buffer landscaping.
- Credits and Flexibility, described in Chapter 3, can reduce the total number of trees required and/or allow flexibility in landscaping distribution requirements. Review the credits and flexibility options to determine if any apply.
- Tree requirements are determined based on tree species Canopy Factor (mature height, crown spread and growth rate). For each landscaping type that requires trees, the number required is a sliding scale with the most required when small tree species are planted, and least when large tree species are planted. Small, medium and large tree species may be used in combination. See Appendix 7 for a list of tree species' Canopy Factors.
- Unique circumstances such as wetlands, steep slopes, habitat corridors or an area specific landscape plan may affect landscaping requirements. To find out additional information on constraints or to see if an area specific landscape plan exists, contact a Planner at (253) 591-5030 to discuss further.

2.2 OVERALL SITE LANDSCAPING

STEP 1: Determine site area not covered by structures			
Total site area	Percentage covered by structures	Area not covered by structures	
_____ sf -	_____ sf =	_____ sf	
STEP 2: Determine total Overall Site Landscaping area required			Total Overall Site Area landscaping required
Residential	5% x	_____ sf =	_____ sf
Commercial	10% x	_____ sf =	_____ sf
Industrial	5% (of parking lots over 20,000 sf) x	_____ sf =	_____ sf
X Districts (single-purpose residential)	15% x	_____ sf =	_____ sf
STEP 3: Determine required number of Small, Medium and/or Large Tree Species			
Total Overall Site Area Trees required			
_____ sf –	_____ Small Trees x 200 sf	_____ Medium Trees x 300 sf	_____ Large Trees x 400 sf
NOTES: <ul style="list-style-type: none"> • If other required landscaping is equal to or greater than this amount, then no further landscaping is required. • See Code for X District Exceptions. • Shrubs and groundcover to fully cover area within 3 years. 			

2.3 SITE PERIMETER LANDSCAPING

STEP 1: Determine if Site Perimeter Landscaping is required			
Not required in Industrial or X Districts.			
<ul style="list-style-type: none"> • 7 feet wide for sites without abutting street trees • 5 feet wide for sites with street trees or less than 150 feet in depth 			
STEP 2: Determine total area of Site Perimeter Landscaping			
Length of site frontage x 7 or 5 feet width (– areas not planted) = _____			
STEP 3: Determine required number of Small, Medium and/or Large Tree Species			
Total Site Perimeter Trees required			
_____ sf –	_____ Small Trees x 200 sf	_____ Medium Trees x 300 sf	_____ Large Trees x 400 sf
NOTES: <ul style="list-style-type: none"> • Shrubs and groundcover to fully cover area within 3 years. 			

2.4 LANDSCAPING BUFFERS

STEP 1: Determine if Buffers are required			
More intensive district abutting an R-District:			
<ul style="list-style-type: none"> • 15 foot wide buffer • 10-foot wide buffer for sites less than 150 feet deep 			
More intensive district across street or alley from R District:			
<ul style="list-style-type: none"> • 7 foot wide buffer • May be reduced to 4-feet with vegetated fence or wall. 			
Determine if exceptions apply			
STEP 2: Determine total area of Buffer planting			
Length of required buffer x width (15, 10, 7 or 4 feet) = _____			
STEP 3: Determine required planting			
Planting when abutting R-District:			
<ul style="list-style-type: none"> • See code tree number and spacing requirements. 			
Plantings across street or alley from R-District:			
<ul style="list-style-type: none"> • Total Buffer Trees required: 			
_____ sf –	_____ Small Trees x 200 sf	_____ Medium Trees x 300 sf	_____ Large Trees x 400 sf
NOTES: <ul style="list-style-type: none"> • Mobile home/trailer court exceptions • See code for species and spacing requirements • Shrubs and groundcover as specified in TMC 13.06.090B . 			

2.5 STREET TREES

STEP 1: Determine if street trees are required			
Street trees required in all districts except for certain streets in the PMI District.			
STEP 2: Determine required number of Small, Medium and/or Large Tree Species			
Total Site Frontage: _____ (linear feet)			
Site Frontage: _____ lf –	_____ Small Trees x 25 lf	_____ Medium Trees x 33.3 lf	_____ Large Trees x 50 lf
TOTALS: Site Frontage: _____ (total linear feet) Small Trees: _____ Medium Trees: _____ Large Trees: _____			

2.6 PARKING LOT LANDSCAPING

STEP 1: Determine if Parking Lot Landscaping is required			
Required for all parking areas with more than 5 stalls.			
STEP 2: Determine Parking Area tree minimum – Overall			
Total area of parking lot: _____			
Total area of parking lot: _____ sf –	_____ Small Trees x 700 lf	_____ Medium Trees x 1,000 sf	_____ Large Trees x 1,400 sf
NOTE: <ul style="list-style-type: none"> If other required parking lot landscaping is equal to or greater than this amount, then no further landscaping is required. 			
STEP 3: Determine Parking Lot – Interior Planting requirements			
Tree Distribution requirements: <ul style="list-style-type: none"> No stalls further than 50 feet from tree trunk No more than 8 stalls in a row Planting at aisle ends Trees an average of 40-foot intervals along walkways (30-foot intervals in X Districts) 			
TOTAL TREES REQUIRED: _____			
Tree Distribution flexibility: Maximum distance between trees increase by 10 ft AND maximum row length by 1 stall for each of the following provided: <ul style="list-style-type: none"> Tree retention (at least 50% of tree requirements met through retaining trees greater than 20 inches DBH) Evergreen trees (greater than 2/3 of required trees) LID as primary stormwater technique 			
Once total number of trees is determined, utilize Minimum unpaved planting area requirement to determine total interior parking lot landscaped area: <ul style="list-style-type: none"> 24 sf per Small Tree planted 40 sf per Medium Tree planted 60 sf per Large Tree planted = _____ sf total Parking Lot Interior Planting Requirements			
Determine Small, Medium and Large Trees required:			
Interior Parking Lot Area: _____ sf –	_____ Small Trees x 200 sf	_____ Medium Trees x 300 sf	_____ Large Trees x 400 sf
NOTE: <ul style="list-style-type: none"> Shrubs and groundcover to fully cover area within 3 years. 			
STEP 4: Parking Lot – Perimeter Planting requirements			

<p>Determine Parking Lot – Perimeter Planting is requirements: All lots greater than 20 stalls:</p> <ul style="list-style-type: none"> • 10 foot perimeter required • 5 foot perimeter width if less than 150 foot deep site 			
<p>EXCEPTIONS:</p> <ul style="list-style-type: none"> • Not required in M-2 or PMI Districts. • Exceptions for parking lots less than 15 and behind buildings adjacent to alleys. 			
<p>Determine total area of Parking Lot Perimeter:</p> <p>Parking lot circumference x perimeter width (5 or 10 feet) = _____ sf</p>			
<p>Determine Small, Medium and Large Trees required:</p>			
<p>Parking Lot – Perimeter Area:</p> <p>_____ sf –</p>	<p>_____ Small Trees x 200 sf</p>	<p>_____ Medium Trees x 300 sf</p>	<p>_____ Large Trees x 400 sf</p>
<p>NOTE:</p> <ul style="list-style-type: none"> • Shrubs and groundcover to fully cover area within 3 years. 			

2.7 X DISTRICT FRONT YARD AND FOUNDATION LANDSCAPING

<p>STEP 1: Determine if required</p> <ul style="list-style-type: none"> • X Districts only • When buildings are set back from sidewalk
<p>STEP 2: Determine shrubs and groundcover required</p> <ul style="list-style-type: none"> • Cover exposed foundations • One shrub per three lineal feet of foundation • Groundcover plants to cover remainder of landscaped area.

CHAPTER 3 CREDITS AND FLEXIBILITY

The Landscaping Code allows for reductions in the amount of trees planted and the distribution of landscaping within parking areas, in exchange for the inclusion of desired features. Use this chapter to determine whether credits and flexibility may apply.

3.1 TREE RETENTION

If protected properly, trees retained through development offer more immediate benefits to the urban forest than newly transplanted trees. Therefore, retained trees are a priority when feasible. An incentivized credit is offered for retained trees to reflect this priority. To receive the credit, trees must be healthy and have minimal serious defects. Proper pruning to mitigate minor defects may be indicated on the Arborist Report and Tree Protection Plan as necessary.

An Arborist's Report (Appendix 4), Tree Protection Plan (TPP) and subsequent tree protection measures consistent with Chapter 7 of this Volume are required for each tree proposed to be retained if tree retention credits are desired.

Credit for qualifying retained trees will be given according to their species as small, medium or large trees (refer to Tree Size definition) in the following manner:

1. Each retained tree of at least equal size to that required gives a credit of one tree;
2. Each retained tree that is 8 inches to 20 inches in DBH gives a credit of two trees;
3. Each retained tree that is 20 inches to 32 inches in DBH gives a credit of three trees;
4. Each retained tree over 32 inches in DBH gives a credit of four trees.

For example: If a development is required to install 8 trees and they elect to retain an on-site tree of 20 inches to 32 inches in DBH, they will only have to install 5 trees on their site.

NOTE: Species considered invasive or ecosystem nuisances including, but not limited to, the following are not eligible for the retained tree credit:

- Any previously topped trees
- *Ailanthus altissima* (tree of heaven)
- *Ilex aquifolium* (English holly)
- *Acer platanoides* (Norway maple)
- *Robinia pseudoacacia* (black locust)
- *Prunus laurocerasus* / *lusitanica* (cherry / Portuguese laurel)
- Additional trees may be added to this list as necessary by the City's Urban Forester

3.2 EVERGREEN TREES

Scientific research shows that evergreen trees provide more consistent stormwater benefit to the urban environment than deciduous trees, due in part to their persistent foliage year round. Therefore, transplanting evergreens is preferred over deciduous trees in appropriate situations. A credit is offered to incentivize transplanting evergreens above and beyond the minimum requirements for evergreens (refer to Section 4.2.1 Tree Selection and Species Diversity of this Manual) to reflect this benefit.

Credit for transplanting evergreen trees will be given in the following manner:

1. Each evergreen tree planted that is above the minimum amount of required evergreen trees as defined in Section 4.2 gives a credit of 1.1 trees.
2. For sites planted with evergreens which account for more than 2/3 of the required trees, additional Parking Lot Distribution Flexibility is available; refer to TMC 13.06.090B .

3.3 LOW IMPACT DEVELOPMENT TECHNIQUES

For sites utilizing Low Impact Development techniques as defined in the City of Tacoma Stormwater Management Manual as their primary stormwater management approach, additional flexibility is available on Parking Lot Distribution requirements; refer to TMC 13.06.090B .

3.4 IN-LIEU FEES

In limited instances when specific site characteristics do not support the preservation or planting of trees, in-lieu fees may be paid into the City Urban Forestry Fund instead of installing trees per the requirements. Applicants must demonstrate to the satisfaction of the PDS Director that specific site constraints make the tree installation problematic to the reasonable use of the site. Landscaping buffer requirements, including required trees in the landscaping buffer, may not be modified through this provision. Trees and landscaping must still be installed to the maximum extent practicable. Funds collected will be used by the City Urban Forestry Program to plant trees on other public or private property within the City.

If a project is allowed to pay In-Lieu Fees instead of installing trees, the fees will be in the following amounts:

Price per tree
\$750.00

In-Lieu Fee is based on 1.5 times the current market cost for the City to purchase, plant and maintain a 2-2 ½ inch caliper tree through the establishment period (the first three years). These fees may be adjusted to keep up with current market cost.

CHAPTER 4 GENERAL LANDSCAPING STANDARDS

This chapter describes plant material minimum standards that apply to landscaping both on private property (on-site) and within the public right-of-way (off-site). The following standards shall apply to all vegetation used to satisfy landscaping requirements.

4.1 ALL PLANT STOCK

Plants shall meet the standards of the most current edition of American Standard for Nursery Stock (ANSI Z60.1) and as further specified in this Manual. Where ANZI 60.1 Standards and this Manual conflict, this Manual shall apply. Plant material should be obtained from established commercial licensed nursery growers and installed by qualified landscape professionals.

All plant material shall be:

- balled and burlapped (B&B), containerized, bare root and/or grown in root control bags;
- well watered prior to shipping and checked for adequate moisture at arrival;
- maintained under shade and irrigated regularly if not planted within 24 hours of delivery. B&B or bare-root plant material must be healed-in while being stored prior to planting;
- planted immediately once removed from the packaging, such as the container, burlap or root control bag; and,
- protected from extreme temperatures, wind and theft, during transport and storage on-site.

It is intended that all plants installed in the required landscaped areas will reach their full mature size. Pruning that adversely affects the healthy living condition of the plant, significantly damages the natural growing form of the plant, eliminates or significantly reduces the plant function (i.e. canopy, stormwater absorption/benefit) will be considered removal, and is subject to provisions in TMC 13.06.090B and 13.05.150 enforcement including, but not limited to, fines and required plant replacement.

4.2 TREES

In accordance with City of Tacoma policies to establish a healthy and diverse urban forest, as defined in the Urban Forest Policy Element adopted in 2010 as part of the City's Comprehensive Plan, the following standards apply to all trees required by TMC 13.06.090B .

4.2.1 Tree Selection and Species Diversity

Diversification lessens the impact and likelihood of disease and pest infestation, and provides diverse habitat to better meet the needs of wildlife within a healthy urban forest. To ensure tree species diversity, the following standards shall apply.

For projects involving the planting of:

- 4 to 10 trees, a minimum of 2 different genera shall be used.
- 10 to 25 trees, a minimum of 3 different genera and a mixture of tree types (evergreen and deciduous) shall be used.

- greater than 25 trees, one genera shall not exceed 25 percent and a minimum of 20 percent of the total number of trees shall be evergreen.

Fruit producing (edible) trees may be planted to satisfy tree planting requirements on-site, including in on-site parking areas/lots. Fruit trees are not permitted in the public right-of-way (ROW). Be advised that some fruit tree pruning practices might be considered “excessive pruning” under TMC 13.06.090B and as such, pruning that adversely affects the healthy living condition of the plant, significantly damages the natural growing form of the plant, eliminates or significantly reduces the plant function (i.e. canopy, stormwater absorption/benefit) will be considered removal, and is subject to provisions in TMC 13.06.090B and 13.05.150 enforcement including, but not limited to, fines and required plant replacement.

4.2.2 Tree Stock

At the time of planting all trees shall:

- Have natural shape (no sheared or semi-sheared trees);
- Have a single, strong, central leader;
- Have branches evenly spaced around the central leader, except for trees with ascending branches (ex. *Ulmus americana* and *Zelkova serrata*); and,
- For trees that have been pruned - show only proper pruning cuts (not flush cuts), pruned to the outside of the branch collar, for trees that have been pruned.

Deciduous Trees shall meet the following requirements:

- At least 50% of the deciduous trees provided shall be a minimum of 2-inch caliper at the time of planting. The remaining deciduous trees shall be a minimum of 1½-inch caliper at the time of planting.
- Street trees with ascending branches (ex. *Ulmus americana* and *Zelkova serrata*) shall have a trunk free of branches to a minimum of five feet, measured from the ground elevation.
- All other deciduous street trees shall have a trunk free of branches to a minimum of six feet in height, measured from the ground elevation.

Evergreen Trees shall meet the following requirements:

- At least 50% of the evergreen trees provided shall be a minimum of six feet tall and shall have a trunk free of branches up to two feet in height, measured from finish grade. The remaining evergreen trees shall be a minimum of five feet tall at the time of planting.
- All evergreen trees shall be species with the ability to develop a minimum branching width of eight feet within five years.

4.2.3 Street Trees

In addition to the tree requirements outlined in TMC 13.06.090B, street trees are required when:

- street or sidewalk improvements are required in association with Preliminary Plats or Short Plats with 5 or more lots;
- constructing new Permanent Roadways (see glossary for definition), excluding residential Local Improvement Districts;
- altering the width of existing Permanent Roadways;
- constructing a new sidewalk along more than 50% of a sites frontage (when 50 linear feet or more is being constructed). In the case of new constructed sidewalk, street trees shall be required proportionate to the linear footage of sidewalks constructed.; or,
- replacing more than 50% of an existing sidewalk along a site's frontage (when 50 linear feet or more is being replaced). In the case of sidewalk replacement, street trees shall be required proportionate to the linear footage of sidewalks replaced.

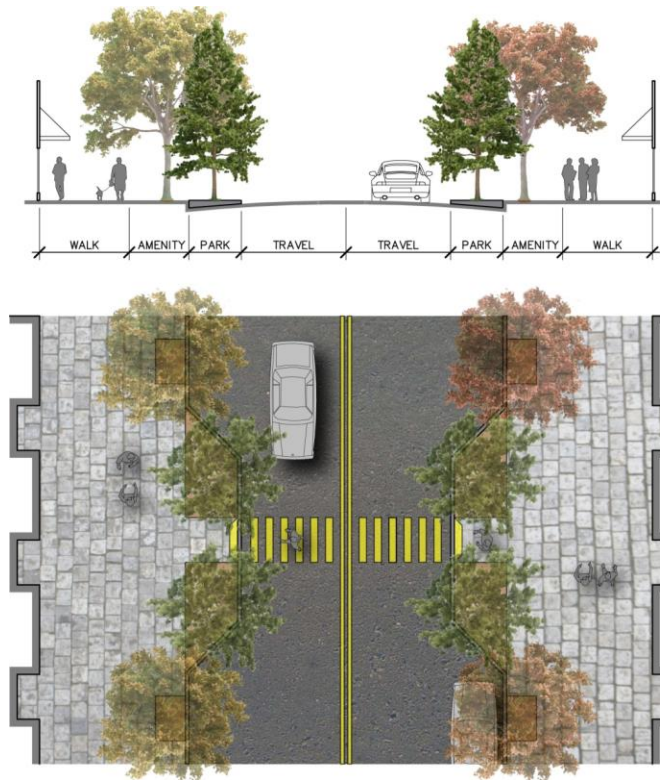
4.2.4 Tree Placement in the Right-of-Way

While the preferred placement of street trees is in the amenity zone (between the back of curb and the pedestrian walkway), often there are other suitable locations to place street trees. Medians, bulb-outs and converted parking spaces offer additional opportunities for street tree placement. If placement of street trees in the amenity zone is not desired due to potential conflicts with signage, buildings or other infrastructure, alternative placement locations such as those described above may be accepted provided that a minimum of 5'-0" free and clear walkway is maintained. In the case of narrow or vaulted walks which provide less than the required soil volume, alternate locations and/or in-lieu fees are the preferred approach to meeting the street tree requirements, contact PDS for approval requirements.

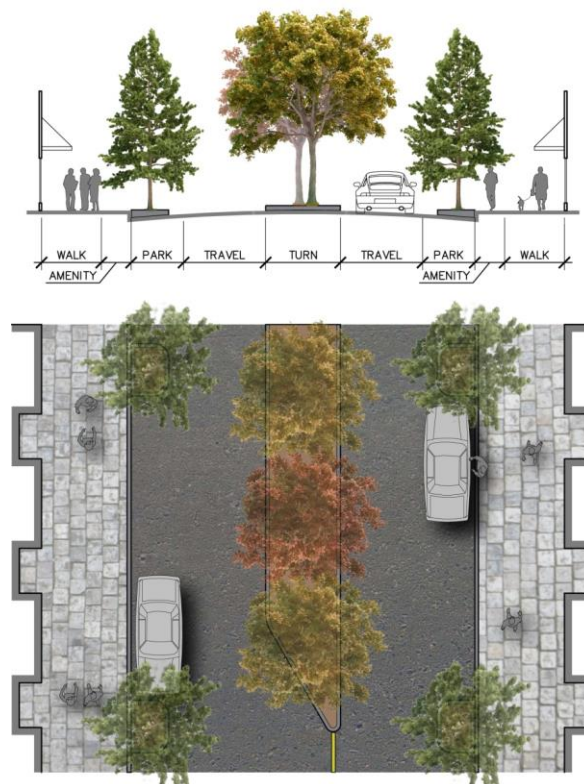
Trees planted in pots do not count towards street tree requirements, as defined in TMC 13.06.090B, due to the impeded ability of the tree to reach its full intended size and function. Trees planted in raised planting beds may count towards the Street Tree requirement only if it can be demonstrated that the raised bed meets the required minimum soil depth and unpaved planting area requirements contained in section 4.2.6 of the UFM.

Permission from the City Engineer for alternative placement of street trees in the Right-of-Way (ROW) is required. The graphics below illustrate various alternative placement options.

TREE PLACEMENT IN BULB-OUTS



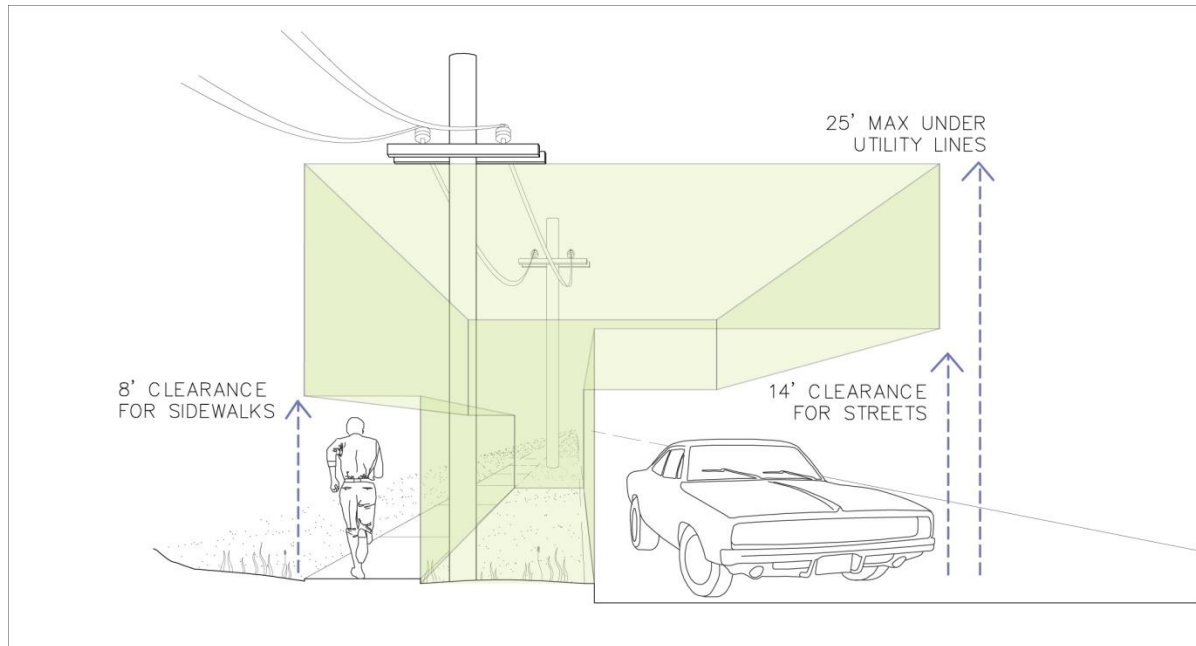
TREE PLACEMENT IN MEDIANS AND CONVERTED PARKING SPACES



4.2.5 Tree Placement under Overhead Utilities

In order to avoid conflicts with overhead utilities, trees planted under overhead utility lines must be tree species that have a maximum mature height (at 25 years of age) not greater than 25 feet. For preapproved trees which meet this criteria, refer to Appendix 7, Approved Tree List.

The graphic below illustrates the clearance constraints of a tree planted under overhead utilities.



4.2.6 Soil Depth and Unpaved Planting Area

A minimum 3 foot depth of amended existing native soil or new topsoil non-mechanically compacted to account for settling shall be provided for all newly transplanted trees, except when the tree is planted within the drip line of existing mature trees. In the case of street trees, the finished soil level including mulch (finished grade) shall be one inch below the adjacent pavement surface or curb. Refer to Standard Plan LS-01 Street Tree Planting Detail.

All newly transplanted trees shall be provided a minimum unpaved planting area as follows:

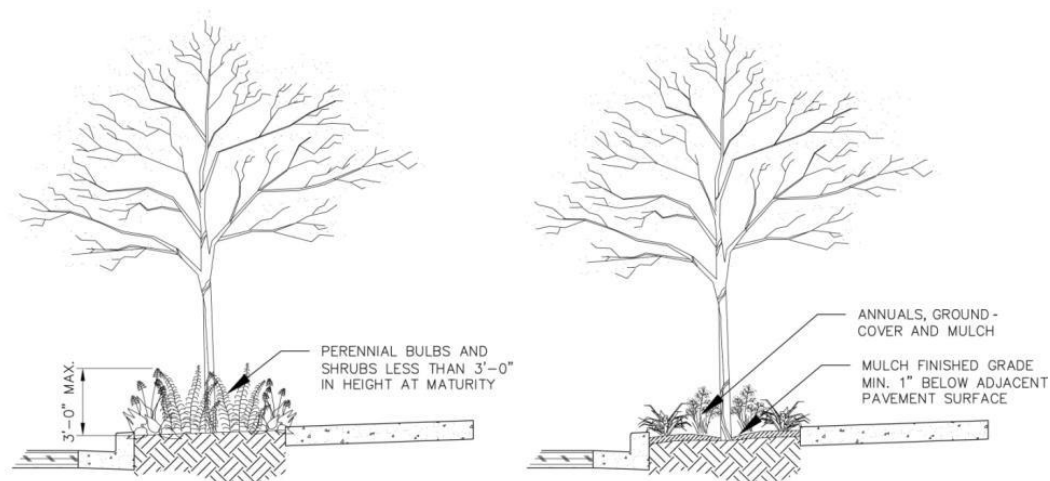
Minimum Unpaved Planting Area per Tree			
	Small Trees *	Medium Trees *	Large Trees *
Minimum unpaved planting area (sq. ft.):	24	40	60
Minimum tree pit width (any direction) (ft.):	4	5	6
Typical tree pit length (ft.)	6	8	10
Minimum soil volume (cu. ft.):	72	120	180

* as defined in glossary under "Tree Sizes"

For specific requirements regarding paving around existing trees, refer to Chapter 7 Tree Protection During Construction.

Approved options for the treatment of unpaved planting areas include:

- Planting: groundcovers, perennials and shrubs with mulch covering exposed soil area. Plants (other than trees) must be less than 3 feet in mature height if planted in the public right-of-way.
- Mulch: organic wood chip mulch and/or permeable inorganic mulch. Finished grade after mulch application shall be a minimum of 1" below the adjacent pavement surface or curb.



4.2.7 Tree Spacing Standards

It is recommended that all required trees are planted according to the minimum spacing standards listed below in order to achieve their full benefits. The distance between trees is measured from stem to stem, referred to as “on-center” (OC). The distance between trees and structures shall be from stem to structure wall.

Minimum Spacing Standards for Trees (OC)			
	Small Trees *	Medium Trees *	Large Trees *
Minimum spacing from primary structures and other trees, in feet:	10	25	40

* as defined in glossary under “Tree Sizes

Note: TMC13.06.090B states that the minimum spacing requirements for small, medium and large trees is 10 feet, 25 feet and 40 feet respectively. These minimum tree spacing requirements may be reduced to 10 feet for small trees, 20 feet for medium trees, and 30 feet for large trees if it can be demonstrated that the reduced spacing will not have any negative impacts on the health of the trees.

For tree spacing and minimum unpaved area standard plans, refer to Standard Plan No. LS-03 Tree Well Dimension.

4.2.8 Tree Setback Standards

The following are minimum tree setback and clearance standards to avoid infrastructure conflicts:

Minimum Tree Placement Setback Checklist	
Center Line of Tree to Center Line of:	Distance (feet)
<input type="checkbox"/> Street Corner (extension of outside face of curb)	25
<input type="checkbox"/> Stop or Yield Signs	25
<input type="checkbox"/> Utility Poles	15
<input type="checkbox"/> Other Traffic Control Signs	5
Center Line of Tree to Edge of:	
<input type="checkbox"/> Driveways	5
<input type="checkbox"/> Face of Curb	2.5
<input type="checkbox"/> Pavement	2
Edge of Tree to Edge of:	
<input type="checkbox"/> Utility Worker Access Lids	5
<input type="checkbox"/> Gas Shutoff Valves	5
<input type="checkbox"/> Fire Hydrants and Hydrant Branches	10
<input type="checkbox"/> Water Meter, Water Service and Water Mains	5
<input type="checkbox"/> Storm Inlets, Catch Basins and Manholes	5
<input type="checkbox"/> Storm/Sanitary Service Connections and Mains	5

Minimum Tree Clearance (at Maturity) Checklist	
Lowest Branch to Surface of:	Branch Clearance (feet)
<input type="checkbox"/> Streets	14
<input type="checkbox"/> Sidewalks	8

4.3 SHRUBS

Existing shrubs, which comply with the minimum plant sizes below, may count toward the required plantings. Invasive and Noxious Weeds as defined by the Pierce County Noxious Weed Control Board are not permitted to be planted in the landscaped areas. Fruit producing shrubs may be planted in all landscaped areas, provided that they meet all other applicable requirements for sizing and diversity. Shrubs planted adjacent to roadways and sidewalks (within 15 feet of sidewalk/curb edge) in the right-of-way should have a maximum mature height of three feet in order to maintain site distance for vehicles and pedestrians.

For shrub transplanting standards, refer to Standard Plan LS-05 Shrub Planting.

4.3.1 Shrub Diversity

When planting shrubs to satisfy landscaping requirements the following standards must be applied:

- If more than 25 shrubs are required, no more than 20 percent may be of one species.

4.3.2 Shrub Stock

- All shrubs provided shall be a minimum 1-gallon container size at the time of planting, or 18-inches in height if bare root stock is used.

4.4 GROUNDCOVER

Turf forming grasses and mulch are not considered groundcover. Invasive and Noxious Weeds as defined by the Pierce County Noxious Weed Control Board are not permitted to be planted in the landscaped areas. Fruit producing groundcovers may be planted in all landscaped areas, provided that they meet all other applicable requirements for sizing and diversity.

For groundcover transplanting standards, refer to Standard Plan LS-06 Groundcover Planting.

4.4.1 Groundcover Stock

- Groundcover plants provided shall be at least a 4-inch pot size, 10-inch plugs/cones or 6-inches in height if bare root stock is used at the time of planting.

4.4.2 Groundcover Spacing

Groundcover plants are required to be planted in the remainder of the landscaped area, not otherwise covered by trees and shrubs, so that they fill the area within the first three years of planting. The recommended spacing between individual groundcover plants is commonly described on the label accompanying plant material and/or from published horticultural sources. Groundcover width at maturity can also be used to determine groundcover plant spacing.

The following steps can be used to calculate the quantity of groundcover plants needed to fill a given area using a standard triangular spacing pattern:

Step 1) Convert the area of planting space from square feet to square inches (multiply square feet by 144).

Step 2) Calculate the space occupied (sq. in.) per plant =

X = mature width or recommended plant spacing

Y = spacing between plant rows, (which is equal to X (0.866)

X*Y = space occupied in square inches per plant

The table below illustrates this process for typical plant spacing (mature width) of groundcover plants.

Spacing in inches between plants (mature width) = X		Spacing in inches between rows of plants = Y or 0.866X			Space occupied in square inches per plant = X(Y)	
X=	6	Y =	6(0.866)	=5.196	6(5.196)	=31.176
X=	8	Y =	8(0.866)	=6.928	8(6.928)	=55.424
X=	10	Y =	10(0.866)	=8.66	10(8.66)	=86.6
X=	12	Y =	12(0.866)	=10.392	12(10.392)	=124.704
X=	18	Y =	18(0.866)	=15.588	18(15.588)	=280.584
X=	24	Y =	24(0.866)	=20.784	24(20.784)	=498.816
X=	30	Y =	30(0.866)	=25.98	30(25.98)	=779.4
X=	36	Y =	36(0.866)	=31.176	36(31.176)	=1122.336
X=	48	Y =	48(0.866)	=41.586	48(41.586)	=1996.128

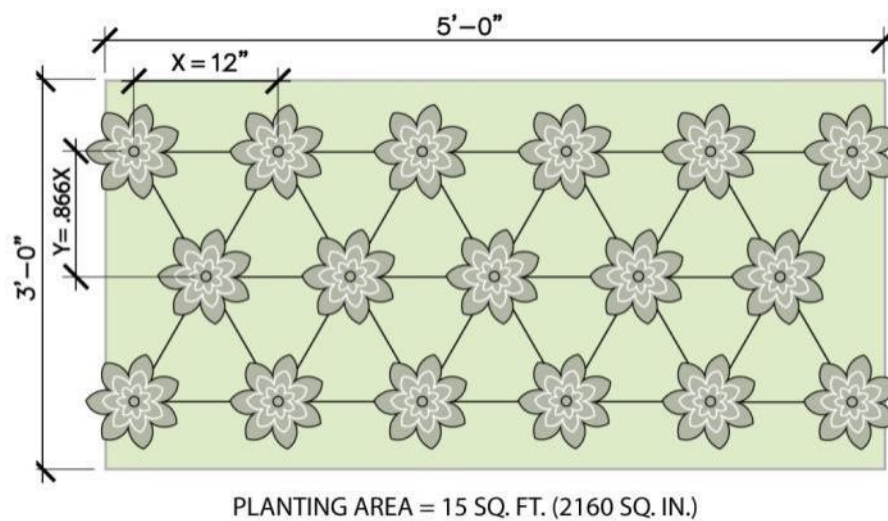
Step 3) Calculate the total number of plants needed for the planting area.

$$\frac{\text{total planting area in square inches}}{\text{space occupied per plant}} = \text{total number of plants}$$

The following table provides examples of the plant quantities needed to fill 100 square feet of planting space.

If the recommended spacing (mature width) is:	Plants required to fill 100 square feet of area:
6 inches	460
8 inches	260
10 inches	167
1 foot	115
1.5 feet	51
2 feet	29
2.5 feet	19
3 feet	13
4 feet	7

An illustrated example of the triangular spacing pattern for groundcover spaced apart at 12" on center in a planting area that is 15 square feet is shown below.



CHAPTER 5 LANDSCAPE PLANS

When required by TMC 13.06.090B, Landscape Plans shall be prepared by a Registered Landscape Architect, Certified Landscape Technician, or Certified Professional Horticulturalist. Developments with less than 500 square feet of landscaped area may submit a Landscape Plan prepared by a non-professional.

Landscape Plans must be drawn to scale and show all of the following:

- Plant species names (common and scientific);
- Plant stock sizes, condition, and quantity;
- Installation location of plant materials;
- Existing and proposed utilities, underground and overhead;
- Existing and proposed bus stops (as applicable);
- Existing trees planned to be retained, including their tree protection zones;
- Finished grade; and,
- Required irrigation systems; if irrigation options 1 and/or 2 are selected per Chapter 6 of this Manual.

For an approved Sample Landscape Plan, see Appendix 2 of this Manual.

CHAPTER 6 LANDSCAPE MANAGEMENT PLANS (LMPs)

When required by TMC 13.06.090B, Landscape Management Plans (LMPs) shall be submitted for all development that requires Landscape Plans. Developments with less than 500 square feet of required landscape area are not required to submit a LMP. New Permanent Roadways that require less than 10 street trees do not require a LMP. LMPs may be incorporated into another maintenance plan, such as an overall site maintenance plan, if applicable.

Landscape Management Plans shall address the following:

- Entity responsible for maintenance of the landscape during the establishment period (3 years following planting);
- A schedule of maintenance activities, including, but not limited to, pruning, watering, fertilization, control of Noxious Weeds and Nuisance Plants and replacement of dead and/or damaged plant materials;
- Irrigation option(s) selection and maintenance schedule; and,
- Inventory of trees to be filled out upon project completion and updated during the establishment period.

NOTE: It is intended that all plants installed in the required landscaped areas will reach their full mature size. Pruning that adversely affects the healthy living condition of the plant, significantly damages the natural growing form of the plant, eliminates or significantly reduces the plant function will be considered removal, and is subject to provisions in TMC 13.06.090B and 13.05.150 enforcement including, but not limited to, fines and plant replacement.

Refer to Appendix 3 for an approved Sample Landscape Management Plan template.

Note: Per the City of Tacoma Stormwater Management Manual, facilities that manage stormwater are required to have Operations and Maintenance (O&M) Manuals. You do not need to recreate this information as part of the LMP, but rather reference the O&M Manual for the facility and where the O&M can be found.

6.1 IRRIGATION OPTION(S) SELECTION AND MAINTENANCE SCHEDULE

– APPENDIX 3, PAGE 7

One or more of the irrigation options listed below must be selected for all required landscaping, per TMC 13.06.090B . If more than one irrigation option is selected, the required Landscape Plan must clearly demarcate where landscaping is to be irrigated and which irrigation option is proposed for each area.

- Option 1: A permanent built-in irrigation system with automatic controller designed to provide sufficient water to ensure that all required landscaping survives through the establishment period. The system design shall be prepared by a Registered Landscape Architect, Certified Landscape Technician, Certified Professional Horticulturalist, or irrigation specialist.

- Option 2: A temporary irrigation system with automatic controller designed to provide sufficient water to ensure that all required landscaping survives through the establishment period. After the establishment period, temporary irrigation systems may be abandoned or removed if removal will not damage the established plants. The irrigation system design shall be prepared by a Registered Landscape Architect, Certified Landscape Technician, Certified Professional Horticulturalist, or irrigation specialist.
- Option 3: Irrigation by hand. If this option is chosen, an inspection may be required once a year during the three-year establishment period, after the final construction inspection, to ensure that the vegetation in the Landscaped Area(s) is in good health. If it is deemed that the required vegetation is not in good health including conditions such as excessive pruning, death or damage to the natural growing form of the plant, or significant reduction of the plant function, provisions in TMC 13.06.090B and 13.05.150 enforcement including, but not limited to, fines and plant replacement may be enacted.

Refer to Appendix 3 for an approved Sample Landscape Management Plan template.

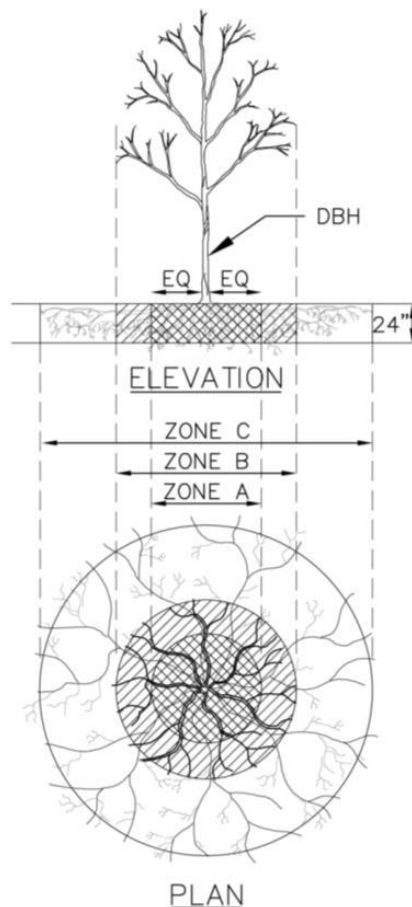
CHAPTER 7 TREE PROTECTION DURING CONSTRUCTION

Urban trees need to be protected from damage to maximize their health, safety, benefits and functionality. Mature, young and newly transplanted trees need protection from construction activities. Tree protection involves activities designed to preserve and protect tree health by avoiding damage to tree parts such as roots, trunk and crown.

This Chapter describes mandatory actions for construction activities around existing trees that are to be retained to comply with TMC 13.06.090B landscaping requirements or for Stormwater Flow Control credits per the City of Tacoma Stormwater Management Manual. For more information on tree protection during construction, the following resources are suggested:

- Tree Protection on Construction and Development Sites- A Best Management Practices Guidebook for the Pacific Northwest
- American National Standards Institute (ANSI) A300 (Part 5) -Construction Management Standard
- International Society of Arboriculture Best Management Practices (BMP)- Managing Trees During Construction

7.1 TREE PROTECTION AREAS



(Zone A) Critical Root Zone (CRZ)

“Critical root zone” means the area around and under a tree. The radius of the Critical Root Zone measures 1 foot per 1 inch of diameter at breast height (DBH) from the trunk outwards and twenty-four inches in depth. For example, for a 10 inch DBH tree, the Critical Root Zone is located at least 10 feet out from the trunk and 24 inches deep.

Tree Diameter	CRZ radius	CRZ Diameter (including tree trunk)
2 inches	2 feet	4 feet + tree trunk
6 inches	6 feet	12 feet + tree trunk
20 inches	20 feet	40 feet + tree trunk
50 inches	50 feet	100 feet + tree trunk

(Zone B) Drip Line

“Drip line” is the area on the ground below the tree with a boundary designated by the edge of the tree’s crown. Refer to glossary for definition of tree crown. For young trees, Zone A and B may be one and the same.

(Zone C) Feeder Root Zone

“Feeder Root Zone” is the area under and around a tree. The radius of the Feeder Root Zone measures 2 feet per one inch of DBH from the trunk outwards and 24 inches in depth. For example, for a 10 inch DBH tree, the Feeder Root Zone is located at least 20 feet out from the trunk and 24 inches deep.

Tree Protection Zone (TPZ)

“Tree Protection Zone” is an Arborist defined area surrounding the trunk intended to protect the roots and soil to ensure future tree health and stability. A TPZ consists, at a minimum, of Zone A or B, whichever is greater, or may be another area (typically larger) as defined by the Arborist. Fencing may not be required in portions of the Tree Protection Zone that are covered by pavement, that will remain undisturbed during the construction activities, but other restrictions and protection measures are required as discussed in this Chapter.

7.2 TREE PROTECTION PLANS

Any person conducting construction activities such as: excavation, filling, tunneling, trenching, compacting, demolition, utility work or other land disturbing activity in the Critical Root Zone or Drip Line of any tree, must submit a Tree Protection Plan to be approved by the City prior to commencement of work if the trees are to be retained to comply with TMC 13.06.090B or for Stormwater Flow Control credits per the City of Tacoma Stormwater Management Manual. The tree protection site plan shall be incorporated into the demolition and temporary erosion and sediment control plans.

Tree Protection Plans shall include each of the following elements:

1. An Arborist Report (refer to Appendix 4), detailing the tree’s(s’) health, condition and recommendation for or against retention; and
2. A site plan that is drawn to scale and shows:
 - all trees to be preserved on the site including their species, diameter at breast height (DBH) and Tree Protection Zone (including required fencing location);
 - location of existing and/or proposed utilities;
 - proposed grade changes and cross-sections; and,
 - location of proposed new trees.

For an approved Sample Tree Protection Plan refer to Appendix 4.

7.3 ALTERNATIVE TREE PROTECTION PLANS

If the requirements for a Tree Protection Plan contained in this Chapter cannot be met, an alternative Tree Protection Plan may be submitted by an Arborist. The alternative must show alternative means for achieving tree protection and include a statement by the Arborist that the plan provides the same level of protection as the requirements in this chapter. The City will make the final decision on whether an alternative plan is acceptable based on the likelihood of the construction impacts affecting the tree’s health and stability.

7.4 TREE PROTECTION FENCING

Any person engaging in work that requires a Tree Protection Plan, or any person causing such work to be performed, must ensure that trees shall be sufficiently guarded and protected by those responsible for such work.

Requirements for tree protection fencing for trees to be preserved during construction are as follows:

1. Trees not located directly adjacent to retained pavement (refer to Standard Detail LS-09):
 - Erect readily visible 6 foot high chain link fencing at the edge of the Tree Protection Zone, and at the boundary of any open space tracts or conservation easements that abut the construction site except where, due to space restrictions, a specific distance is specified and approved by the Arborist/City.
 - The fencing shall be secured by 6 foot metal posts with movable footings located above ground.
2. Trees located directly adjacent to retained pavement (refer to Standard Details LS-10 and LS-11):
 - Erect readily visible chain link or reusable temporary tree and landscape protection fencing (such as high visibility fencing, plywood or similar fencing material) at the edge of the tree well/planting strip or at a minimum width of 4 feet on all sides, whichever is greater.
 - All fencing height shall be between 4 feet to 6 feet high. Chain link fencing shall be secured by metal posts with movable footings located above ground. Metal posts shall not be more than 10 feet apart.
3. All trees regardless of location:
 - 1) Fencing shall be flush with the initial undisturbed grade.
 - 2) Tree Protection Signs (Appendices 5 &/or 6) shall be attached to the fencing. Maintain the fencing in place until the City authorizes removal or a final certificate of occupancy is issued, whichever occurs first. DO NOT affix signs to trees.
 - 3) Ensure that any clearing, grubbing or landscaping done in the TPZ, subsequent to the removal of the fencing, shall be accomplished with light machinery (ex. sod cutter) or hand labor.
 - 4) No construction activity shall occur within the TPZ without prior written approval from the City. If construction activities are desired to be conducted within the TPZ, the City shall be given at least 24 hour notice prior to the anticipated commencement of construction activities. Prohibited work needing approval includes but is not limited to:
 - dumping of construction waste;
 - storage of materials;
 - storage of vehicles or equipment;

- trenching;
- changing soil grade;
- compacting soil with vehicle or equipment traffic;
- installing pavement of any kind;
- attaching anything to trees using nails, crews and/or spikes; or,
- causing injury by fire or excessive heat.

Penalties pursuant TMC 13.06.090B and 13.05.150 are applicable for non-compliance with this Chapter.

For Tree Protection Zone fencing standard plans, refer to Standard Plans LS-09, LS-10 and LS-11. For standard Tree Protection Zone Signs, refer to Appendices 5 and 6.

7.5 WORKING IN THE TREE PROTECTION ZONE – PROTECTIVE MEASURES

While certain construction activities are limited or prohibited within the TPZ, it is recognized that some activities cannot be avoided. If any construction activities are to be conducted within the TPZ, the following protective measures shall be conducted.

7.5.1 Surface Protection Measures

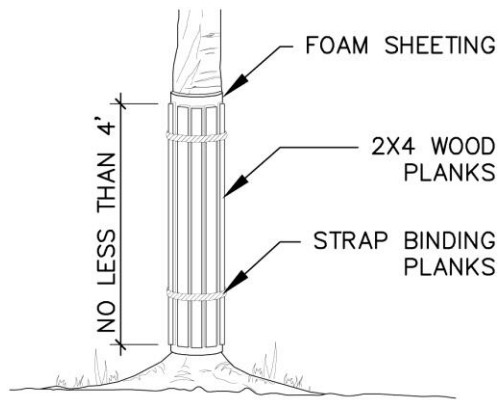
If traffic and construction activities cannot be kept out of the Tree Protection Zone for the entire duration of construction, actions shall be taken to disperse the vehicular load and/or surface compaction to protect the roots and minimize root damage.

Surface Protection Measures include:

1. applying 6 to 12 inches of wood chip mulch to the area;
2. laying $\frac{3}{4}$ -inch plywood over 4 x 4 wood beams over a 4+inch thick layer of wood chip mulch;
3. applying 4 to 6 inches of gravel over a taut, staked geotextile fabric;
4. placing steel plates on top of a 4+inch thick layer of wood chip mulch; or,
5. placing commercial or logging road mats on top of a 4+inch thick layer of wood chip mulch.

7.5.2 Trunk Protection Measures

If traffic and construction activities cannot be kept out of the TPZ for the entire duration of construction, actions shall be taken to protect the trunk from incurring damage.



Trunk Protection Measures:

Install 2-inch thick wood planks around the trunk of the tree with $\frac{1}{4}$ " or greater closed-cell foam pads between the trunk and planks. The height of the wood planks shall be 4 feet minimum, or match the height of the vehicle clearance, whichever is greater. Use straps or wire to bind the planks in place. DO NOT drive fasteners into the tree. If the protective planks are to be in place for longer than 6 months, loosen and adjust the planks every 3 months to allow for growth.

7.5.3 Supplemental Irrigation

If construction activities are conducted within the TPZ during the months of May through September supplemental irrigation, which could include hand watering or another regular source of water, shall be provided. Trees shall be irrigated to provide at least 1 inch of water applied once a week directly to the root system using a slow delivery method to allow for adequate infiltration. The delivery method shall be identified on the work plan.

All trees elected to be retained through construction shall be monitored for signs of drought stress. Signs of drought stress include:

- Leaf curling or rolling
- Leaf drop
- Early fall color
- Dieback on leaders (esp. in conifers).

If signs of drought stress persist or worsen after providing regular irrigation, promptly notify the City's Planning and Development Services at (253) 591-5030.

7.5.4 Canopy/Clearance Pruning

If canopy/clearance pruning is required to provide adequate clearance for construction equipment, the crown raising method of pruning shall be applied to achieve clearance. Typical vehicular clearance is 14 feet over vehicular trafficked areas.

Where excessive pruning would be necessary for construction clearance, temporary tie-up of lower limbs may be considered appropriate so long as the limbs are not structurally damaged.

7.6 WORKING IN THE TREE PROTECTION ZONE – TRENCHING/EXCAVATION

7.6.1 General

Boring /Tunneling/Jacking is permitted in all Zones providing that:

1. All soil disturbance is at a minimum depth of 2 feet below grade;
2. The receiving / insertion point is not located within Zones A and B; and,
3. The diameter of the tunnel is not to exceed 6 inches.

7.6.2 Zone A (Critical Root Zone)

1. No disturbance allowed without site-specific inspection and approval of methods to minimize root damage, except in the case of tunneling / boring / jacking.
2. Severing roots larger than 2 inches in diameter requires City approval.
3. Tunneling/boring/jacking is required to install lines 3 feet below grade or deeper.

7.6.3 Zone B (Drip Line)

1. Operation of heavy equipment and/or stockpiling of materials are subject to City approval, and requires specific surface protection measures, refer to Section 7.5.1.
2. Trenching may be allowed if adhering to the following:
 - excavation by hand or with a hand-driven trencher may be required;
 - trench width must be limited;
 - no disturbance in Zone A is allowed; and,
 - 2/3 or more of Zone B must be maintained in an undisturbed condition.
3. Tunneling may be required for trenches deeper than 3 feet.

7.6.4 Zone C (Feeder Root Zone)

1. Operation of heavy equipment and/or stockpiling of materials is subject to City approval, and may require specific surface protection measures, refer to Section 7.5.1.
2. Trenching is allowed with strict adherence to the following:
 - excavation by hand or with a hand-driven trencher may be required;
 - trench width must be limited;
 - no disturbance in Zone A is allowed; and,
 - 2/3 or more of Zone C must be maintained in an undisturbed condition.

For tree protection during construction standard plans, refer to Standard Plans LS-08, LS-09, LS-10 and LS-11.

7.7 CRITICAL ROOT ZONE – PROHIBITED CONSTRUCTION ACTIVITIES

The following activities are prohibited within the Critical Root Zone:

- Dumping or storing materials such as building supplies, soil, waste items, vehicles or equipment;
- Parking vehicles;
- Excavating for utility or building construction;
- Constructing new paved surfaces; and

- Significant changes to the grade or drainage patterns to the tree(s).

Any landscaping done in the CRZ subsequent to the removal of the fencing shall be accomplished by hand operated equipment or, when not feasible to be done by hand, shall be conducted with the smallest mechanized equipment necessary.

7.8 POST-CONSTRUCTION TREE MONITORING

All trees retained through construction shall be monitored and maintained including mulching, irrigation and pruning where necessary, for the next 3 years following construction. Trees shall be inspected annually to look for changes in condition and signs of pests or disease. If symptoms persist or worsen, promptly notify the City's Planning and Development Services at (253) 591-5030.

Ongoing protection activities following construction include:

- maintaining a mulched, grass-free area around the trunk to avoid damage by mowers or string trimmers;
- keeping building and other maintenance activities away from the limbs and trunks of trees during repair projects;
- avoiding soil contamination from oil, gasoline, paint, paint thinner, or other chemicals; and,
- not attaching wires, cables, conduit, mailboxes or other objects to the trees.

GLOSSARY

In addition to the terms contained in the definitions section of Tacoma Municipal Code (TMC) 13.01, the following terms shall be used according to the following definitions.

Annual: An annual plant germinates, flowers, seeds and dies (completes its lifecycle) within one year.

ANSI A300 Standards: Industry developed standards of practice for tree care; acronym for American National Standards Institute.

ANSI Z60.1 Standards: Industry developed standards for nursery stock sizing and describing plants to facilitate the trade in nursery stock; acronym for American National Standards Institute.

ANSI Z133.1: Industry developed safety standards for tree care operations.

Arborescent Shrub: A woody stemmed plant usually free branching from the base, which can reach heights of 15 to 20 feet. Whereas a tree usually has a single stem, an Arborescent Shrub has several stems arriving at or near the ground.

Arborist; also see **Certified Arborist:** An individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for or supervise the management of trees and other woody plants.

Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

Bare Root Stock: Plants grown in the ground in the nursery without artificial root restriction devices, such as containers or fabric bags. When dug the soil is removed from the root systems and the plants are transported and sold without soil.

Caliper: Diameter of a tree's trunk or stem measured at a point 6 inches above finish grade if the resulting measurement is up to and including 4 inches. If the resulting measurement is more than 4 inches the point of measurement shall be relocated to 12 inches above finish grade.

Central Branch; Central Leader: A singular, dominant, upright branch or stem which does not have any stems arising from a common junction having nearly the same size and diameter.

Certified Arborist: An individual who has achieved a level of knowledge in the art and science of tree care through experience and by passing a comprehensive examination developed by some of the nation's leading experts on tree care. Certified Arborists must maintain their certification and be in good standing with the International Society of Arboriculture (ISA), or equivalent agency.

Climate adapted: Both native and non-native plant species which are able to thrive in the local climate and soil conditions of a specific region. The two most authoritative references on climate adaptation for plants are the USDA Plant Hardiness Zones and the Sunset Climate Zones. Plants that are considered climate adapted shall be selected in accordance with one or both of these resources.

Codominant Branches; Codominant Leaders: Branches of stems arising from a common junction, having nearly the same size diameter.

Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant.

Cultivar: Contraction of “cultivated variety”. A group of plants within a species having distinct differences that retain those characteristics when reproduced sexually or asexually.

Critical Root Zone (CRZ): The area under a tree whose diameter measures one foot per one inch of DBH from the trunk outwards and twenty-four inches in depth.

Deciduous: A plant that loses its leaves and remains leafless for some months of the year, usually in winter (temperate zones) or the dry season (tropical zones).

Diameter at breast height (DBH): A tree’s trunk or stem diameter measured at four and one-half feet above the ground.

Drip Line: The area on the ground below the tree in which the boundary is designated by the edge of the tree’s crown.

Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

Establishment Period: A minimum of a three year time period following the transplanting/installation of vegetation wherein maintenance is critical to the survival of the vegetation.

Evergreen: A plant that bears leaves throughout the year.

Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with a well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

Feeder Root Zone: The area under a tree whose diameter measures two feet per one inch of DBH from the trunk outwards and twenty-four inches in depth. For example, for a ten-inch DBH tree, the Feeder Root Zone is at least twenty feet in diameter and 24” deep.

Finish Grade: Elevation of finished surface of planting soil.

Genus (pl. genera): A group of plants within a family that is morphologically similar and contains one of more species.

Groundcover: Low and dense growing plants that cover the ground which can be planted for ornamental purposes, habitat or to prevent soil erosion. Turf lawn and mulch do not count as groundcover.

Hardiness Zones; USDA Plant Hardiness: Developed by the U.S. Department of Agriculture, Plant Hardiness Zones divide North America into geographic zones based on average winter lows.

Invasive Weeds; Noxious Weeds: Non-native plant species which have been proven to have a negative impact on the environment and are highly destructive, competitive, and difficult to control or eliminate. For a current listing of Pierce County Invasive/Noxious weeds consult the Pierce County Noxious Weed Control Board.

Manufactured Topsoil: Soil produced off-site by homogenously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

Perennial: A plant having a life cycle lasting three or more years.

Permanent Roadway: Roadway constructed with a designed full depth subgrade and road surface section with an established curb and gutter alignment.

Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, herbicides, fungicides, rodenticides, and molluscicides.

Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

Planting Area: Locations on private property or the public right-of-way proposed or required to be planted.

Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that that may be modified with soil amendments to produce a soil mixture best suited for plant growth.

Plants; Plant; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, groundcovers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

Right-of-Way or Rights-of-Way (ROW) Per TMC 13.01: The public streets, roadways, courts, alleys and any other public passages, whether developed or undeveloped, over which the City has a possessory interest or right of use either by easement, license, permit or other such authority, or by fee simple ownership. For purposes of this definition developed rights of way may contain items such as pavement, parking or loading areas, retaining walls or other structures, landscape or planting strips, sidewalks, curbs, vehicle, bicycle or pedestrian traffic lanes, traffic circles and other such development. This definition is intended to be construed so as to be consistent with other definitions of the term Right-of-Way or Rights-of-Way as may be found in Tacoma Municipal Code or Washington State statutory and case law.

Root Flare: Also called “trunk flare.” The area at the base of the plant’s stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

Shrub: A woody perennial plant that is generally less than fifteen feet in height at maturity.

Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

Street Tree(s). From TMC 13.06.090B: A tree(s) whose trunk is wholly or partially located within the public right-of-way. Street trees may be owned by the City or by a private party.

Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the topsoil surface or a fill or backfill before planting soil is placed.

Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

Sunset Climate Zones: Geographic regions which are divided according to their total climate. This total climate is governed by the length of growing season, timing and amount of rainfall, winter lows, summer highs, wind, and humidity.

Surface Soil: Soil that is present at the top layer of the existing soil profile at the project site. In undisturbed areas, the surface soil is typically the topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Tree Protection Zone (TPZ): The area surrounding the trunk of a tree intended to protect roots and soil within the Critical Root Zone and beyond, to ensure future tree health and stability. The location of the Tree Protection Zone is at the edge of the Critical Root Zone or Drip Line, whichever is greater.

Tree sizes: Categorized as Large, Medium or Small as determined by the Canopy Factor, which takes into account the trees mature height, mature crown spread and growth rate. The Canopy Factor is calculated using the following formula: (mature height in feet) x (mature crown spread in feet) x (growth rate number) x 0.01 = Canopy Factor. The growth rate number is 1 for slow growing trees, 2 for moderately growing trees, and 3 for fast growing trees.

(A) Large Trees = Canopy Factor greater than 90

(B) Medium Trees = Canopy Factor from 40 to 90

(C) Small Trees = Canopy Factor less than 40

Variety: A group of plants within a species having distinct differences that occur naturally and usually within a specific geographic region.



APPENDIX 1: LANDSCAPING CALCULATIONS WORKSHEET

OVERALL SITE LANDSCAPING		
1: AREA NOT COVERED BY STRUCTURES	SF	
2: LANDSCAPING AREA REQUIRED	SF	
3: REQUIRED TREES	NUMBER	SPECIES
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
SITE PERIMETER LANDSCAPING		
1: PERIMETER STRIP REQUIRED (WIDTH)	LF	
2: TOTAL AREA OF PERIMETER	SF	
3: REQUIRED TREES	NUMBER	SPECIES
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
LANDSCAPING BUFFERS		
1: BUFFERS REQUIRED (WIDTH)	LF	
2: TOTAL AREA OF BUFFER	SF	
3: REQUIRED TREES	NUMBER	SPECIES
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
STREET TREES		
1: STREET TREES ARE REQUIRED		
2: SITE FRONTAGE	LF	
3: REQUIRED TREES	NUMBER	SPECIES
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
PARKING LOT LANDSCAPING		
1: PARKING LOT LANDSCAPING IS REQUIRED		
2: TOTAL AREA OF PARKING LOT	SF	
3: INTERIOR PLANTING		



TOTAL TREES REQUIRED		
FLEXIBILITY OPTIONS USED:		
LANDSCAPED AREAS	NUMBER	TOTAL SF
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
TOTAL INTERIOR LANDSCAPE AREA		SF
4: PERIMETER PLANTING		
REQUIRED PERIMETER WIDTH	LF	
TOTAL AREA OF PERIMETER PLANTING AREA	SF	
REQUIRED TREES	NUMBER	SPECIES
SMALL TREES		
MEDIUM TREES		
LARGE TREES		
X DISTRICT FRONT YARD AND FOUNDATION LANDSCAPING		
FOUNDATION PLANTING REQUIRED		
SHRUBS/GROUNDCOVER PROVIDED		
CREDITS AND FLEXIBILITY		
TREE RETENTION		
EVERGREEN TREES		
URBAN FORESTRY FUND		

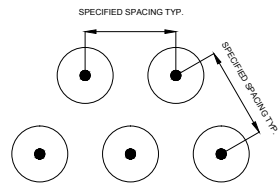
PLANT SCHEDULE (TYP)

Symbol	Botanical Name	Common Name	Container Caliper	Size	Quantity	Detail	S/M/L	PNW Native?
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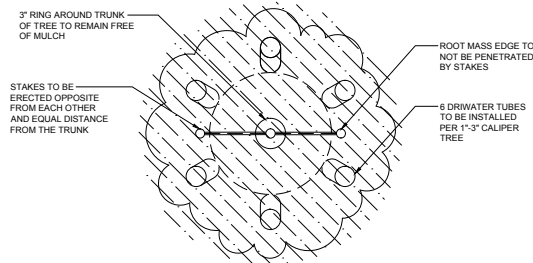
PLANT SCHEDULE

SYMBOL	BOTANICAL NAME/ COMMON NAME	SIZE	QTY	REMARKS
TREES				
T1	PINUS FLEXILIS/ LUMBER PINE	4'-5' HT.	2	B&B/WELL-BRANCHED
T2	LAGERSTROEMIA 'NATCHEZ'/ NATCHEZ CRAPE MYRTLE	15 GAL. CONT.	3	WELL-BRANCHED
T3	CHAMAECYPARIS NOOTKATENSIS 'PUNDULA'/ WEEPING ALASKA CEDAR	6'-7'	4	B&B/WELL-BRANCHED
SHRUBS				
S1	FOTHERGILLA GARDENII/ DWARF FOTHERGILLA	3 GAL. CONT.	12	FULL AND BUSHY
S2	PHYSOCARPUS OPUL. 'DART'S GOLD'/ DART'S GOLD NINEBARK	3 GAL. CONT.	6	FULL AND BUSHY
S3	LAVANDULA STOECHAS 'ANOUK SILVER'/ SPANISH LAVENDER	1 GAL. CONT.	128	24" TRI. SP. TYP.
S4	SEDUM SPECTABILE 'AUTUMN JOY'/ AUTUMN JOY STONECROP	1 GAL. CONT.	25	24" TRI. SP. TYP.
S5	SANTOLINA CHAMAECYPARISSUS/ LAVENDER COTTON	1 GAL. CONT.	80	24" TRI. SP. TYP.
GRASSES/GROUNDCOVERS				
G1	PANICUM VIRAGATUM 'HEAVY METAL'/ HEAVY METAL SWITCH GRASS	1 GAL. CONT.	29	30" TRI. SP. TYP.
G2	PENNISETUM ALOPECUROIDES 'HADELN'/ DWARF FOUNTAIN GRASS	1 GAL. CONT.	25	30" TRI. SP. TYP.
G3	FESTUCA AMETHYSTINA 'SUPERBA'/ AMETHYST FESCUE	1 GAL. CONT.	200	24" TRI. SP. TYP.
G4	FRAGARIA 'LIPSTICK'/ LIPSTICK STRAWBERRY	4" POTS	85	24" TRI. SP. TYP.
G5	GENISTA LYDIA/ DYER'S GREENWOOD	1 GAL. CONT.	82	24" TRI. SP. TYP.
BIORETENTION PLANTS				
B1	CAREX OSHMENSIS 'EVERCOLOR EVERILLO'/ EVERCOLOR SEDGE	1 GAL. CONT.	41	24" TRI. SP. TYP.
B2	IRIS SIBIRICA 'RUFFLED VELVET'/ RUFFLED VELVET SIBERIAN IRIS	1 GAL. CONT.	42	18" TRI. SP. TYP.
B3	JUNCUS EFFUSUS 'QUARTZ CREEK'/ QUARTZ CREEK RUSH	1 GAL. CONT.	14	24" TRI. SP. TYP.
	JUNCUS INFLEXUS 'BLUE ARROWS'/ BLUE ARROWS RUSH	1 GAL. CONT.	28	24" TRI. SP. TYP.
B4*	CAREX ELATA 'BOWLES GOLDEN'/ GOLDEN SEDGE	1 GAL. CONT.	28	24" TRI. SP. TYP.
	JUNCUS EFFUSUS 'QUARTZ CREEK'/ QUARTZ CREEK RUSH	1 GAL. CONT.	28	24" TRI. SP. TYP.

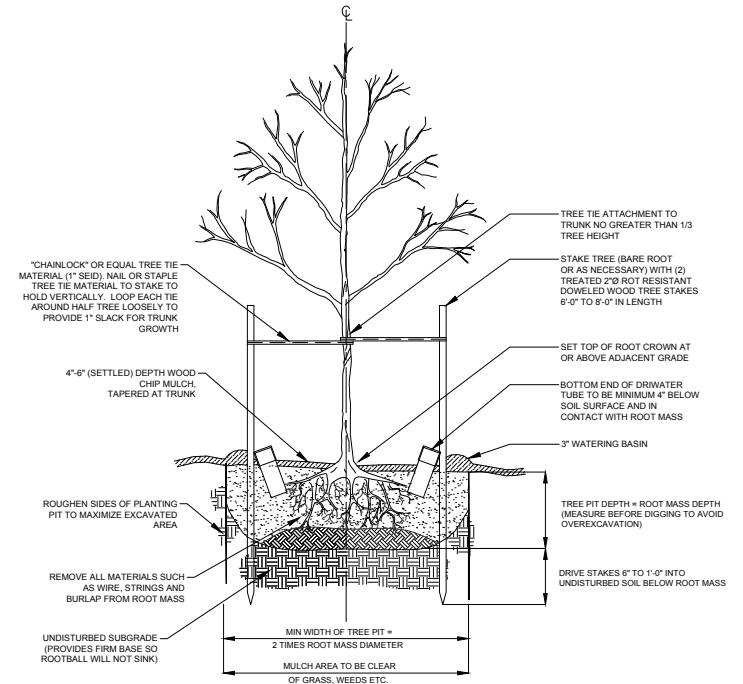
* PLANT IN GROUPS OF 3-7 OF EACH SPECIES



TYPICAL GRASS/GROUNDCOVER/BIORETENTION PLANT SPACING DETAIL
NTS



TYPICAL TREE PLANTING LAYOUT DETAIL
NTS



TYPICAL TREE PLANTING DETAIL
NTS

CALL 2 DAYS
BEFORE YOU DIG
1-800-424-5555



NO	REVISION	DATE	APPD	FIELD WORK	DESIGNED	CHECKED	DATE	SCALE
					3/14/2014			1" = 5'
					DESIGNED	CHECKED		
					DATE	PROJECT NAME		
					DRAWN			
					DRAWING NAME			
					615Sprague_Planting			

CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
615 SPRAGUE BIORETENTION RAIN GARDEN

LANDSCAPE SCHEDULE

IPIS NO.	
DES NO.	
SHEET NO.	
SHEET 6 OF 6	

APPENDIX 2: SAMPLE LANDSCAPE PLAN

APPENDIX 3: LANDSCAPE MANAGEMENT PLAN (LMP)

When required by TMC 13.06.090B, a Landscape Management Plan (LMP) shall be submitted for developments that require Landscape Plans. Developments with less than 500 square feet of required landscape area are not required to submit a LMP. New Permanent Roadways that require less than 10 street trees do not require a LMP.

Landscape Management Plans shall address the following:

- Entity responsible for maintenance of the landscape during the establishment period (3 years following planting);
- A schedule of maintenance activities, including, but not limited to, pruning, watering, fertilization, control of Noxious Weeds and Nuisance Plants and replacement of dead and/or damaged plant materials;
- irrigation option(s) selection and maintenance schedule; and,
- inventory of trees to be filled out upon project completion and updated during the establishment period.

NOTE: this form is not required to be submitted, however, it is meant a guide to help management activities through the establishment period.

Before finalizing development plans, contact Planning and Development Services (PDS) at (253) 591-5030, or visit Planning and Development Services, located at 747 Market St., 3rd floor, to verify that all other applicable City codes have been met.

Contents

- 1.0 Required Landscaping Types
- 2.0 Landscape Management Schedule
- 3.0 Landscape Management Areas
- 4.0 Special Landscape Areas
- 5.0 Irrigation Option(s) Selection and Maintenance Schedule

Development Information	
Person responsible for maintenance, Name:	Number:
Location or address:	
Name of project:	Permit number:
Date of application:	Land use category:

1.0 REQUIRED LANDSCAPING TYPES

The required landscaping is to conform to specified landscape areas as defined by Tacoma Municipal Code 13.06.090B and Chapters 1 and 2 of the Urban Forest Manual. Check all of the Landscape Areas required for this development below as applicable

Landscaped Areas	
	Overall Site Landscaping
	Site Perimeter Landscaping
	Landscaping Buffers
	Street Trees
	Parking Lot Landscaping
	X District Front Yard and Foundation Landscaping

All landscape management tasks and activities shall be carried out in a manner to preserve the intended function(s) of the required landscaped area's intent as described in TMC 13.06.090B, and Volume 3, Chapters 1 and 2 of the Urban Forest Manual. Required Landscaped Areas must be continuously maintained in a healthy manner. Plants that die must be replaced one for one.

The intended functions of the required landscaping are as follows (check all that apply):

☐ **Overall Site:**

The general intent of the landscaping across the entire site is to contribute to the aesthetic environment of the City; to provide green spaces that can support wildlife, such as birds, in the urban environment; help reduce stormwater runoff; filter pollution; buffer visual impacts of development and contribute to the planting, maintenance, and preservation of a stable and sustainable urban forest.

All landscaped Areas must be maintained in a manner as to not degrade or negatively impact the landscape. Such negative impacts to the landscaping include, but are not limited to:

- excessive pruning of trees and shrubs such that it adversely affects the healthy living condition of the plant, significantly damages the natural growing form of the plant, or eliminates or significantly reduces the purpose for the planting;
- removal of required living plants;
- failure to replace dead plants one for one; and
- intentional planting of invasive species or noxious weeds as defined by the Pierce County Noxious Weed Control Board

☐ **Site Perimeter:**

The intent of the site perimeter Landscaping is to grow a combination of trees, shrubs, and groundcover to provide visual relief and to enhance the aesthetic appearance of the site. When applicable, a Site Perimeter is required around the entire perimeter of the site.

☐ **Landscaping Buffers:**

The intent of the landscaping buffers is to grow substantial vegetative screening to provide physical and visual separation between dissimilar districts to soften visual and aesthetic impacts. It is used in those instances where visual separation is required.

☐ **Street Trees:**

Street Trees are intended to provide multiple benefits to include aesthetic appeal, traffic calming, environmental benefits, shading, visual buffering and noise separation from streets. Street Trees are applied as described in TMC 13.06.502 and the Urban Forest Manual.

☐ **Parking Lot:**

The intent of Parking Lot Landscaping is to grow a combination of trees, shrubs, and groundcover to provide shade, storm water management, aesthetic benefits, and screening to soften the impacts of large expanses of pavement and vehicle movement. It is applied to parking and loading facilities or to similar paved areas.

☐ **X District Front Yard and Foundation Landscaping:**

The intent of X District Front Yard and Foundation Landscaping is to grow a combination of shrubs and groundcover to soften the visual appearance of exposed foundations and building frontages in highly trafficked pedestrian areas.

2.0 LANDSCAPE MANAGEMENT SCHEDULE

For all of the required landscaping, indicate the month and year the planned management activity will be carried out.

*The year of the management activity is indicated by the number input into the cell, i.e. the number 2 is input into the cell if the management activity is to be carried out during year 2. Year 0 is the as-built year, and year 1 is the first growing season. In many cases, management activities will be carried out during multiple years, the cell should indicate all years when the management activity will be carried out.

Trees												
Management Activity	J	F	M	A	M	J	J	A	S	O	N	D
Pruning:												
Crown Raising (for clearance)												
Crown Cleaning (removal of dead/ diseased/ dying branches)												
Structural Pruning (for healthy tree structure)												
Removal:												
dead/diseased/dying trees												

tree support (to be removed first year after planting)												
Inventory (Update):												
include # of trees to be replaced												
Replacement:												
dead/diseased/dying trees												

Shrubs												
Management Activity	J	F	M	A	M	J	J	A	S	O	N	D
Pruning:												
for public safety / visibility												
dead / diseased / dying branches												
Removal:												
dead/diseased/dying shrubs												
selective thinning of overplanted areas												
Inventory (Update):												
include dead/diseased/dying shrubs to be replaced												
Replacement:												
dead/diseased/dying shrubs												

Groundcover												
Management Activity	J	F	M	A	M	J	J	A	S	O	N	D
Pruning (Trimming):												
remove from beyond the face of curbs and sidewalks												
dead / diseased / damaged groundcovers												
Removal:												
dead/diseased/dying groundcovers												
selective thinning of overplanted areas												
Inventory (Update):												
include dead/diseased/dying groundcovers to be replaced												
Replacement:												

dead/diseased/dying groundcovers												
-------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--

Fertilization (if applicable): indicate frequency, and N-P-K content:

<input type="checkbox"/> weekly	<input type="checkbox"/> biweekly	<input type="checkbox"/> monthly	<input type="checkbox"/> bimonthly	<input type="checkbox"/> other
Nitrogen _____	Phosphorus _____	Potassium _____		

Weed Control: indicate frequency, mode of action or trade name:

<input type="checkbox"/> weekly	<input type="checkbox"/> biweekly	<input type="checkbox"/> monthly	<input type="checkbox"/> bimonthly	<input type="checkbox"/> other
mode of Action:		trade / common name:		

Mulch

Management Activity	J	F	M	A	M	J	J	A	S	O	N	D
Add:												
2" thick layer in planters, tree wells, and planting beds												

*As-built Tree Inventory		Quantity in good health			Quantity to Replace
	species code	Year 1	Year 2	Year 3	
existing trees retained:					
new trees planted:					

* During the Establishment Period, the As-built Tree Inventory shall be updated with the quantities of trees that have died and/or been damaged and need to be replaced.

3.0 LANDSCAPE MANAGEMENT AREAS

The landscape management areas section specifically outlines the type of landscape element, and any specialized management instructions that are not captured in the landscape management schedule.

These specialized management instructions include, but are not limited to:

- General site cleanup
- Plant species specific care practices (such as reduction of irrigation, pest management, maintaining single leaders on non-multi-stem trees, etc.)
- Landscaped Area specific care practices (such as Buffers, Perimeters, etc.)

Landscaping Element:

Specialized Management Instructions:

4.0 SPECIAL LANDSCAPE AREAS

The special landscape areas section includes specific maintenance instructions for specialized landscape features including but not limited to:

- Pervious paving
- Stormwater management features (such as rain gardens, swales, etc.)
- Raised planting beds
- ROW plantings (other than trees)
- Mitigation for wetlands and/or shorelines

Specialized Landscape Area:

Specialized Landscape Feature Instructions:

5.0 IRRIGATION OPTION(S) SELECTION AND MAINTENANCE SCHEDULE

Select one or more of the irrigation options listed below for all landscaping. If more than one irrigation option is selected, the required Landscape Plan must clearly demarcate which landscaping is to be irrigated using which irrigation option.

- ☐ Option 1: A permanent built-in irrigation system with automatic controller designed to provide sufficient water to ensure that all required Landscaped Areas survive the Establishment Period. The system design shall be prepared by a Registered Landscape Architect, certified landscape professional, certified professional horticulturalist, or irrigation specialist.
- ☐ Option 2: A temporary irrigation system with automatic controller designed to provide sufficient water to ensure that all required Landscaped Areas survive the Establishment Period. The system design shall be prepared by a Registered Landscape Architect, certified landscape professional, certified professional horticulturalist, or irrigation specialist.
- ☐ Option 3: Irrigation by hand. If this option is chosen, an inspection will be required once a year during the establishment period after the final inspection to ensure that the landscaped area(s) has become established. Inspection fees shall be paid in advance at the time of project application.

Irrigation Maintenance Schedule (Options 1 and 2)												
Management Activity	J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.
Spring Startup:												
open main valve												
test sprinkler heads												
set ET-based, seasonal, or weather-based manual or automatic programs												
Winterization:												
completely drain (blowout) pipes and sprinkler heads												
close valves and shut down automatic controllers												
System Monitoring:												
activate, monitor, and adjust irrigation settings and heads												

For all Irrigation Options, the following information is required. If irrigation information (frequency and duration) varies by Landscaped Area, indicate for all irrigation zones.

Irrigation: Duration (minutes) / Frequency**Zone 1: Duration:** _____ minutes **Frequency:** (check below)☐ More than
once a day☐ daily☐ every
other day☐ 3 days a
week☐ weekly**Zone 2: Duration:** _____ minutes **Frequency:** (check below)☐ More than
once a day☐ daily☐ every
other day☐ 3 days a
week☐ weekly**Zone 3: Duration:** _____ minutes **Frequency:** (check below)☐ More than
once a day☐ daily☐ every
other day☐ 3 days a
week☐ weekly

APPENDIX 4: SAMPLE ARBORISTS REPORT

TO: CITY OF TACOMA, PLANNING AND DEVELOPMENT SERVICES
FROM: ARBORISTS NAME, COMPANY NAME
SUBJECT: PROJECT NAME AND PERMIT NUMBER (IF APPLICABLE)
TREE PRESERVATION ASSESSMENT AND PROTECTION PLAN

DATE:

ASSIGNMENT AND SCOPE OF REPORT

This report is provided for Project Name and Permit Number, (Parcel #0000000000), for the portion of land Description of the Subject Area, wherein landscaping improvements are proposed to be constructed around existing trees. The Permit Applicant or Property Owner has elected to retain several trees through construction activities to comply with City of Tacoma Municipal Code 13.06.090B. This report satisfies the requirements of the City of Tacoma Urban Forest Manual (UFM) Chapter 7, Section 7.2 Tree Protection Plans and TMC 13.06.090B.

The scope of this report is to provide the following:

- A visual tree assessment for health and condition;
- An inventory of all trees within the site extent (as described above) over 1-inch in diameter, not including two dense patches of quaking Aspen (*Populus tremuloides*) as noted on the attached plan, which were measured by the extents of the canopy;
- Recommendations regarding which trees should be saved based on their health and proximity to construction activities; and
- Construction management recommendations for protection of trees identified to be saved, including specifications for the required tree protection fencing around the tree protection zones (TPZ).

The subject site is proposed to be improved with a new 8-foot sidewalk on the southern edge of the hillside on the entrance drive. In addition, a new bioretention facility will be constructed in the southwest corner where the two hillsides meet (see attached plan), as well as new proposed trees, shrubs and groundcovers around the existing vegetation on the hillside.

Draft development plans for the Cheney Phase 2 Improvements were reviewed (90%), and a "Preservation Value" for each tree was determined based on the trees' health, defects and potential impacts from construction activities. Each tree has been assigned an identification number and a preservation value (See inventory table) that correlates to the attached plan.

TREE PROTECTION ZONE/FENCING

The TPZ is measured at 1-foot outwards from the tree trunk (radius) for every 1-inch of tree trunk diameter at breast height (DBH), and completely encircles the tree. For example, a tree with a twelve-inch DBH would have a TPZ of twelve-feet in radius from the tree trunk.

Tree protection fencing should be placed at the edge of the TPZ or at the edge of the drip-line (whichever is greater) before construction activities begin. When the TPZ or drip-line is interrupted by paved surfaces that will not be disturbed through construction, tree protection fencing may be installed at the edge of pavement. Tree protection fencing should also be installed at the boundary of any open space tracts or conservation easements that abut the construction site.

Tree protection fencing should be installed flush with the initial undisturbed grade, and should be a readily visible 6-foot high chain link, where feasible, or high-visibility fencing where topographic conditions do not allow for chain link. Fence posts should be installed using above ground pier blocks only.

CONSTRUCTION MANAGEMENT

All fencing should remain in place until the Engineer authorizes removal or substantial completion is issued, whichever occurs first. Signs should be attached to the fencing stating that the area inside the fencing is a tree protection zone (TPZ), and that the area is not to be disturbed, unless prior approval has been obtained from the City, project Engineer and/or a Certified Arborist. Approved tree protection signs are attached.

The following construction activities shall not be performed within the tree protection zone:

- Dumping or storage of materials such as building supplies, soil, waste items, vehicles or equipment;
- Parking or maneuvering vehicles;
- Excavation for utility or building construction;
- Construction of new paved surfaces; and/or
- Changes to the grade.

Any landscaping done in the TPZ subsequent to the removal of the fencing shall be accomplished with light machinery or hand labor.

If fencing needs to be moved closer to a tree or group of trees for construction ease, contact a Certified Arborist for additional assessment specific to the tree(s) in question.

ID #	Scientific Name	Common Name	DBH, Height, Width	*Preservation Value	Recommendation	TPZ dia.	Flow Control Credit
1	<i>Alnus rubra</i>	red alder	21.25", 40', 30'	Low	Remove	NA	NA
2	<i>Fraxinus latifolia</i>	Oregon ash	21.25", 60', 50'	High	Save	50'	196
3	**MS <i>Fraxinus latifolia</i>	Oregon ash	(6)2.25", 12', 12'	Moderate	Save	12'	98
4	**MS <i>Fraxinus latifolia</i>	Oregon ash	(6)1.75", 12', 15'	Moderate	Save	12'	98
5	<i>Fraxinus latifolia</i>	Oregon ash	10", 40', 35'	High	Save	35'	196
6	<i>Fraxinus latifolia</i>	Oregon ash	3", 25', 15'	Moderate	Save	15'	98
7	**MS <i>Salix schouleriana</i>	Schouler's willow	(10)2.25", 20', 20'	Moderate/Low	Thin, clearance prune (16'HT)	20'	NA
8	<i>Fraxinus latifolia</i>	Oregon ash	2.75", 20', 17'	High	Save	17'	98
9	<i>Malus sp.</i>	crabapple	4", 16', 20'	Low	Remove	NA	NA
10	**MS <i>Fraxinus latifolia</i>	Oregon ash	(6)2", 25', 20'	Moderate	Thin, clearance prune (16'HT)	20'	98
11	**MS <i>Malus sp.</i>	crabapple	(2)3.5", 25', 16'	Moderate/Low	Remove	NA	NA
12	**MS <i>Fraxinus latifolia</i>	Oregon ash	(3)2.25", 25', 16'	Moderate	Save	16'	98
13	<i>Malus sp.</i>	crabapple	3.5", 20', 20'	Low	Remove	NA	NA
14	<i>Malus sp.</i>	crabapple	3", 16', 16'	Low	Remove	NA	NA
15	<i>Malus sp.</i>	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
16	<i>Malus sp.</i>	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6

ID #	Scientific Name	Common Name	DBH, Height, Width	*Preservation Value	Recommendation	TPZ dia.	Flow Control Credit
------	-----------------	-------------	--------------------	---------------------	----------------	----------	---------------------

17	Fraxinus latifolia	Oregon ash	5", 25', 20'	High	Save	20'	98
18	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
19	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
20	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
21	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
22	Pseudotsuga menziesii	Douglas fir	12", 60', 25'	High	Save	25'	63
23	Fraxinus latifolia	Oregon ash	21.5", 50', 40'	High	Save	43'	98
24	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
25	Malus sp.	crabapple	3-4", 12-20', 12-20'	Moderate/Low	Save	20'	6
26	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
27	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
28	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
29	Pseudotsuga menziesii	Douglas fir	5", 25', 20'	High	Save	20'	47
30	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
31	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
32	**MS Arbutus menziesii	Pacific madrone	(2)19.75", 60', 60'	High	Save	60'	192
33	Pseudotsuga menziesii	Douglas fir	22.25", 70', 50'	High	Save	50'	63
34	Pseudotsuga menziesii	Douglas fir	22.25", 60', 50'	High	Save	50'	63
35	Malus sp.	crabapple	3-4", 12-20', 12-20'	Low	Remove	NA	NA
36	Arbutus menziesii	Pacific madrone	20", 35', 25'	High	Save	25'	192

*Note, "Preservation Value" is a direct correlation to tree health/condition and does not take into account cultural relevancy or ecological implications of the tree, which can otherwise add value.

**MS, Multi-Stemmed. Trees are listed by average stem diameter preceded with the number of stems in parenthesis; width and TPZ is determined by edge of drip-line of the group of trees.

Total Retained Trees	25
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CONCLUSIONS

The recommendations in this report reflect the current development proposal. Any changes made regarding the location, size, or extent of impact of the construction of the proposed landscaping, infrastructure, or utilities will require further assessment to meet the requirements of the City of Tacoma City of Tacoma Urban Forest Manual (UFM) Chapter 7, Section 7.2 Tree Protection Plans and TMC 13.06.090B.

The recommendations in this report are based on the current conditions of the existing trees dated _____, and their current associated preservation values. Should the conditions and/or health of the trees decline prior to construction activities, an additional assessment may be needed. To the best of my knowledge and belief, the statements and opinions here are correct, subject to any limiting conditions set forth. This report satisfies the City of Tacoma's Certified Arborists Report requirements per the City of Tacoma Urban Forest Manual (UFM) Chapter 7, Section 7.2 Tree Protection Plans and TMC 13.06.090B and should therefore prove eligibility of Tree Retention Credit therein.

Sincerely,

Arborist Signature

Arborist Name, Title and Company Name

ISA Certified Arborist Number PN-1234A

Email

Telephone Number

Mailing Address

PROTECT TREE

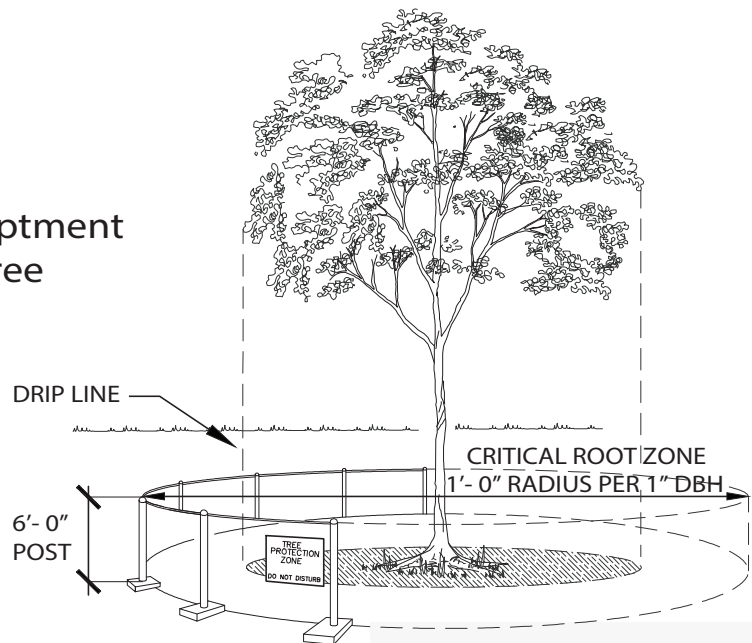
**This tree is to be retained and protected
from construction impacts**

DO:

- Contact City of Tacoma Urban Forestry before commencement of work within the Tree Protection Zone
- Provide tree protection fencing at the edge of Tree Protection Zone
- Protect roots (retain existing pavement/mulch nonpaved surfaces)

DO NOT:

- Remove or prune tree
- Excavate, trench, operate equipment or stack materials within the Tree Protection Zone



TREE PROTECTION ZONE IS AT THE EDGE OF THE CRITICAL ROOT ZONE OR DRIP LINE, WHICHEVER IS GREATER

For more information about this project, please call _____



PROTECT TREE

**This tree is to be retained and protected
from construction impacts**

DO:

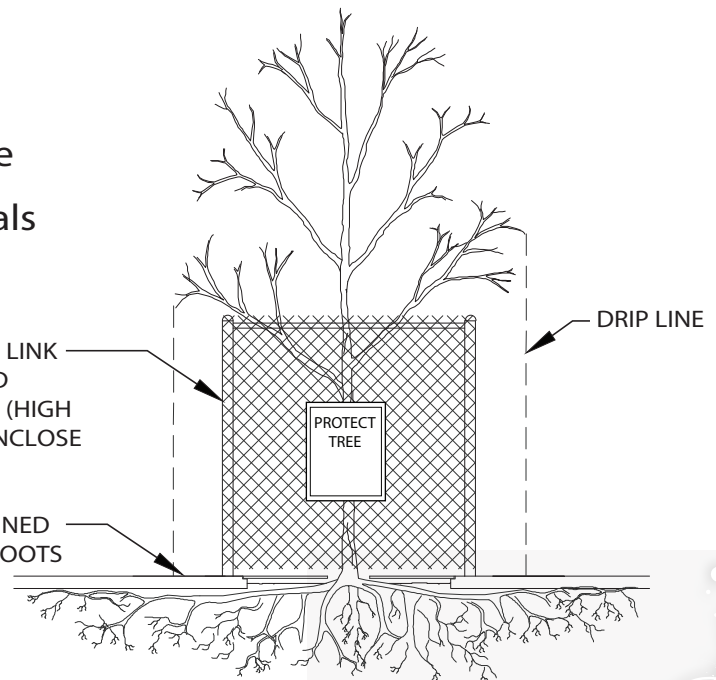
- Contact City of Tacoma Urban Forestry at before commencement of work within the Drip Line
- Provide tree protection fencing at the edge of tree pit or planting strip
- Protect roots (retain existing pavement/mulch nonpaved surfaces)

DO NOT:

- Remove or prune tree
- Excavate or trench within Drip Line
- Operate equipment/stack materials within the Drip Line

4'-6" TO 6'-0" HIGH CHAIN LINK
OR TEMPORARY TREE AND
LANDSCAPE PROTECTION (HIGH
VISIBILITY) FENCING TO ENCLOSE
ENTIRE TREE PIT

PAVED SURFACE MAINTAINED
TO PROTECT EXTENDED ROOTS
OUTSIDE FENCE



For more information about this project, please call _____





NOT RECOMMENDED TREES

City of Tacoma
Urban Forest Manual
cityoftacoma.org/ufm

Tree Genus	Tree Species and Cultivar or Variety	Tree Common Name	Select Cultivars (height, width, growth rate and canopy factor do not reflect Select Cultivars. Please research cultivars to ensure they are still appropriate)	Anticipated Mature Height (in feet)	Anticipated Mature Width (in feet)	Growth Rate (Fast 3, Medium 2 or Slow 1)	Canopy Factor (see TMC 13.06.502)	Minimum Planting Strip Width Recommended	West Coast Native	Form	Justification
THE FOLLOWING TREES ARE NOT RECOMMENDED											
<i>Acer</i>	<i>Sp.</i>	maple species		28	28	3	23.52	4			Diversity
<i>Fraxinus</i>	<i>Sp.</i>	Ash species		20	18	1	3.6	4			Insect/Disease
<i>Liquidambar</i>	<i>styraciflua</i>	American sweetgum		50	30	3	45	10			Aggressive root system
<i>Prunus</i>	<i>laurocerasus/ lusitanica</i>	Cherry/ Portugese Laurel		20	15	2	6	4			Invasive species
<i>Prunus</i>	<i>Sp.</i>	Cherry Species		20	15	2	6	4			Diversity and Aggressive root system
<i>Pyrus</i>	<i>calleryana</i>	Ornamental Pear		20	15	2	6	8			Diversity and Aggressive root system
THE FOLLOWING TREES ARE PROHIBITED											
<i>Acer</i>	<i>campestre</i>	hedge maple		28	28	2	15.68	8			Invasive species
<i>Acer</i>	<i>macrophyllum</i>	Oregon or big leaf maple*		50	45	3	67.5	8	✓		Poor branch structure for a street tree
<i>Acer</i>	<i>platanoides</i>	Norway maple		50	40	3	60	10			Invasive species
<i>Ailanthus</i>	<i>altissima</i>	tree of heaven		40	30	3	36	8			Invasive species
<i>Eleagnus</i>	<i>angustifolia</i>	Russian olive		20	20	2	8	4			Invasive species
<i>Ilex</i>	<i>aquifolium</i>	English holly		40	15	2	12	6			Invasive species
<i>Populus</i>	<i>sp.</i>	poplar/ cottonwood*		100	25	3	75	12	✓		Aggressive root system/ Weak wood
<i>Robinia</i>	<i>pseudoacacia</i>	black locust		40	25	3	30	6			Invasive species
<i>Salix</i>	<i>Sp.</i>	willow trees*		30	35	3	31.5	12			Aggressive root systems
<i>Sorbus</i>	<i>acuparia</i>	European mountain ash*		30	20	1	6	4			Invasive species
N/A	N/A	fruit trees (except ornamental types)*		N/A	N/A	N/A	N/A	N/A			Trip and fall hazard
N/A	N/A	nut trees*		N/A	N/A	N/A	N/A	N/A			Trip and fall hazard

*Trees prohibited in the right-of-way per TMC 9.19.030



Preapproved Small Trees

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Urban Forest Manual
cityoftacoma.org/ufm

Small (per TMC 13.06.502)

Tree Genus	Tree Species and Cultivar or Variety	Tree Common Name	Select Cultivars (height, width, growth rate and canopy factor do not reflect all Select Cultivars, Please research cultivars to ensure they are still appropriate)	Anticipated Mature Height (in feet)	Anticipated Mature Width (in feet)	Growth Rate (Fast 3, Medium 2 or Slow 1)	Canopy Factor (see TMC 13.06.502)	Minimum Planting Strip Width Recommended	West Coast Native	Form	Special Characteristics Overhead Utility friendly: Ornamental: Evergreen: Deciduous:
<i>Abies</i>	<i>pinsapo</i>	Spanish fir		50	20	1	10	4			
<i>Acer</i>	<i>circinatum</i>	vine maple	Pacific Fire	15	10	2	3	4	✓		
<i>Acer</i>	<i>ginnala</i>	amur maple	Flame	20	20	3	12	4			
<i>Acer</i>	<i>griseum</i>	paperbark maple		25	14	1	3.5	4			
<i>Amelanchier</i>	<i>alnifolia</i>	standing ovation serviceberry	Obelisk	15	3	2	0.9	4	✓		
<i>Amelanchier</i>	<i>x grandiflora</i>	apple serviceberry	Princess Diana, Cole's Select, Ballerina, Autumn Brilliance	20	20	2	8	4	✓		
<i>Amelanchier</i>	<i>laevis</i>	snowcloud serviceberry	Spring Flurry, Snowcloud	25	15	2	7.5	4	✓		
<i>Arbutus</i>	<i>unedo</i>	strawberry tree		20	25	2	10	4			
<i>Betula</i>	<i>utilis</i> var. <i>jaquemontii</i>	jacquemonti birch		40	30	3	36	6			
<i>Callitropsis</i>	<i>nootkatensis</i>	weeping Alaska yellow cedar	Pendula, Green Arrow, Van Der Akken	35	8	3	8.4	6	✓		
<i>Callitropsis</i>	<i>nootkatensis</i>	Alaska yellow cedar		50	25	3	37.5	6	✓		
<i>Calocedrus</i>	<i>decurrens</i>	incense cedar		70	12	2	16.8	6	✓		
<i>Carpinus</i>	<i>betulus</i>	European hornbeam		40	25	1	10	6			
<i>Carpinus</i>	<i>caroliniana</i>	American hornbeam		25	20	1	5	4			
<i>Cercidiphyllum</i>	<i>japonicum</i>	katsura tree	Red Fox	50	25	2	25	6			
<i>Cercis</i>	<i>canadensis</i>	Eastern redbud	Forest Pansy	25	30	1	7.5	4			
<i>Chamaecyparis</i>	<i>obstusa</i>	hinoki cypress	Gracilis	15	8	1	1.2	4			
<i>Chamaecyparis</i>	<i>pisifera</i>	sawara cypress		50	15	2	15	4			
<i>Chamaecyparis</i>	<i>lawsoniana</i>	Port Orford cedar or Lawson cypress		60	20	3	36	6	✓		



Preapproved Small Trees

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Small (per TMC 13.06.502)

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<i>Chionanthus</i>	<i>retusus</i>	Chinese fringe tree		15	15	1	2.25	4			
<i>Cladastris</i>	<i>kentukea</i>	American yellowwood		30	40	2	24	6			
<i>Cornus</i>	<i>controversa</i>	June snow dogwood	June Snow-JFS	30	40	3	36	6			
<i>Cornus</i>	<i>mas</i>	Cornelian cherry		25	20	2	10	6			
<i>Cornus</i>	<i>kousa</i>	kousa dogwood	Satomi (Pink), Milky Way, Heart Throb (Pink)	25	25	2	12.5	4			
<i>Cornus</i>	<i>kousa</i> x <i>nuttalii</i>	starlight dogwood	Starlight	30	20	2	12	4	✓		
<i>Cotinus</i>	<i>coggygria</i> or <i>obovatus</i>	smoke tree	Grace, Pink Champagne	25	20	1	5	4			
<i>Crataegus</i>	<i>crusgalli</i> var. <i>inermis</i>	thornless cockspur hawthorn		25	25	3	18.75	6			
<i>Crataegus</i>	x <i>lavalleyi</i>	lavalley hawthorn		25	20	3	15	4			
<i>Crataegus</i>	<i>viridis</i>	winter king hawthorn	Winter King	25	25	3	18.75	6			
<i>Cryptomeria</i>	<i>japonica</i>	black dragon Japanese cedar	Black Dragon	15	10	1	1.5	4			
<i>Cryptomeria</i>	<i>japonica</i>	Japanese plume cedar	Elegans Aurea, Sekkan Sugi, Yoshino	30	10	2	6	6			
<i>Cupressus</i>	<i>arizonica</i> var. <i>glabra</i>	smooth cypress	Blue ice	30	15	3	13.5	6			
<i>Davidia</i>	<i>involucrata</i>	dove tree		30	30	2	18	6			
<i>Eucalyptus</i>	<i>neglecta</i> or <i>parvula</i>	hardy silver gum		40	15	2	12	4			
<i>Fagus</i>	<i>sylvatica</i>	fastigate beech	Dawyk Purple, Dawyk Gold	25	6	3	4.5	4			
<i>Franklinia</i>	<i>alatomaha</i>	franklin tree		25	20	2	10	4			
<i>Ginkgo</i>	<i>biloba</i>	maidenhair tree	Autumn Gold, Princeton Sentry	45	35	1	15.75	4			
<i>Gleditsia</i>	<i>triacanthos</i>	Honey locust		40	30	3	36	4			



Preapproved Small Trees

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Small (per TMC 13.06.502)

Tree Genus	Tree Species and Cultivar or Variety	Tree Common Name	Select Cultivars (height, width, growth rate and canopy factor do not reflect all Select Cultivars, Please research cultivars to ensure they are still appropriate)	Anticipated Mature Height (in feet)	Anticipated Mature Width (in feet)	Growth Rate (Fast 3, Medium 2 or Slow 1)	Canopy Factor (see TMC 13.06.502)	Minimum Planting Strip Width Recommended	West Coast Native	Form	Special Characteristics Overhead Utility friendly: Ornamental: Evergreen: Deciduous:
<i>Gymnocladus</i>	<i>dioicus</i>	Kentucky coffee tree	Espresso	50	35	2	35	6			
<i>Halesia</i>	<i>tetraptera</i>	Carolina silverbell		35	30	2	21	4			
<i>Hamamelis</i>	<i>x intermedia</i>	witchhazel	Arnold Promise, Diane, Jelena	20	15	2	6	4			
<i>Juniperus</i>	<i>scopulorum</i>	rocky mountain juniper	Skyrocket	15	6	3	2.7	4	✓		
<i>Koelreuteria</i>	<i>paniculata</i>	golden rain tree		25	20	2	10	4			
<i>Laburnum</i>	<i>x watereri</i>	golden chain tree	Vossi	25	20	2	10	4			
<i>Lagerstroemia</i>	<i>indica</i>	crepe myrtle	Muskogee, Zuni, Natchez	20	10	1	2	4			
<i>Maackia</i>	<i>amurensis</i>	amur maackia		25	25	2	12.5	4			
<i>Magnolia</i>	<i>stellata</i>	star magnolia		20	15	1	3	6			
<i>Magnolia</i>	<i>acuminata x denudata</i>	butterflies magnolia	Marilyn, Galaxy, Butterflies	20	20	1	4	4			
<i>Magnolia</i>	<i>kobus</i>	kobus magnolia		25	15	2	7.5	4			
<i>Magnolia</i>	<i>x soulangeana</i>	saucer magnolia		30	30	2	18	6			
<i>Malus</i>	<i>sp.</i>	crabapple	Purple Prince, Golden Raindrops, Sentinel, Snowdrift, Royal Raindrops	20	12	3	7.2	4			
<i>Malus</i>	<i>tschonoskii</i>	Tschonoski crabapple		35	22	3	23.1	4			
<i>Nyssa</i>	<i>sylvatica</i>	tupelo	Wildfire, Red Rage, Forum, Green Gable, David Odom	40	30	2	24	4			
<i>Ostrya</i>	<i>virginiana</i>	American hophornbeam		40	25	2	20	4			
<i>Oxydendrum</i>	<i>arboreum</i>	sourwood		25	20	1	5	4			
<i>Parrotia</i>	<i>persica</i>	Persian ironwood	Vanessa and Ruby Vase	30	25	2	15	4			
<i>Picea</i>	<i>orientalis</i>	oriental spruce	Skylands, Aureospicata	50	20	2	20	6			



Preapproved Small Trees

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<i>Picea</i>	<i>omorika</i>	Serbian spruce	Berliner's Weeper, Pendula, Bruns	50	25	3	37.5	6			
<i>Picea</i>	<i>abies</i>	Norway spruce		60	20	3	36	6			
<i>Pinus</i>	<i>mugo</i>	mugo Pine		20	20	1	4	8			
<i>Pinus</i>	<i>parviflora</i>	Japanese white pine		25	15	1	3.75	4			
<i>Pinus</i>	<i>contorta</i> var. <i>contorta</i>	shore pine		30	15	1	4.5	8	✓		
<i>Pinus</i>	<i>flexilis</i>	Vanderwolf's pyramid pine	Vanderwolf's Pyramid	40	20	2	16	6	✓		
<i>Prunus</i>	<i>virginiana</i>	chokecherry	Canada Red	25	20	3	15	6			
<i>Quercus</i>	<i>myrsinifolia</i>	bambooleaf oak		30	25	2	15	4			
<i>Quercus</i>	<i>robur</i> x <i>bicolor</i>	regal prince oak		45	18	3	24.3	4			
<i>Rhamnus</i>	<i>purshiana</i>	cascara		25	20	3	15	4	✓		
<i>Sciadopitys</i>	<i>verticillata</i>	Japanese umbrella pine		25	20	1	5	6			
<i>Sequoiadendron</i>	<i>giganteum</i>	blue giant sequoia	Glaucum	50	25	2	25	8	✓		
<i>Stewartia</i>	<i>pseudocamellia</i>	Japanese stewartia		25	12	1	3	4			
<i>Styrax</i>	<i>japonicus</i>	Japanese snowbell	Snowcone, Pink Chimes	25	20	2	10	4			
<i>Styrax</i>	<i>obassia</i>	fragrant snowbell		25	25	2	12.5	4			
<i>Syringa</i>	<i>reticulata</i>	Japanese tree lilac	Ivory Silk, China Snow, Summer Charm	25	20	2	10	4			
<i>Trochodendron</i>	<i>aralioides</i>	wheel tree		20	20	3	12	4			
<i>Tsuga</i>	<i>mertensiana</i>	mountain hemlock		20	8	1	1.6	4	✓		
<i>Tsuga</i>	<i>diversifolia</i>	Northern Japanese hemlock		40	20	1	8	6			



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<i>Ulmus</i>	<i>caprinifolia x parvifloia</i>	frontier elm		40	30	3	36	6			
<i>Zelkova</i>	<i>serrata</i>	Japanese zelkova	Wireless, City Sprite	24	30	2	14.4	6			



Preapproved Medium Trees

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Medium (per TMC 13.06.502)

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<i>Betula</i>	<i>papyrifera</i>	paper birch		50	30	3	45	8	✓		
<i>Betula</i>	<i>nigra</i>	river birch		40	35	3	42	8	✓		
<i>Catalpa</i>	<i>bignoniodes</i>	Eastern catalpa		40	30	3	36	6			
<i>Catalpa</i>	<i>x erubescens</i>	purple catalpa	Purpurea	45	45	3	60.75	6			
<i>Catalpa</i>	<i>speciosa</i>	Northern catalpa		50	30	3	45	6	✓		
<i>Cedrus</i>	<i>deodara</i>	deodar cedar		50	30	3	45	6			
<i>Celtis</i>	<i>occidentalis</i>	hackberry	Prairie Pride	45	35	3	47.25	6			
<i>Cupressus</i>	<i>bakerii</i>	Baker cypress		50	35	3	52.5	6	✓		
<i>Eucommia</i>	<i>ulmoides</i>	hardy rubber tree		45	45	2	40.5	6			
<i>Juglans</i>	<i>regia</i>	English walnut	Carpathian	50	50	3	75	6			
<i>Magnolia</i>	<i>acuminata</i>	cucumber magnolia		50	40	3	60	8			
<i>Phellodendron</i>	<i>amurense</i>	eyestopper cork tree	Longnecker, His Majesty	40	35	3	42	6			
<i>Quercus</i>	<i>bicolor</i>	swamp white oak		50	50	3	75	6			
<i>Quercus</i>	<i>canby</i>	Sierra red oak		45	40	3	54	6	✓		
<i>Quercus</i>	<i>chrysolepis</i>	canyon live oak		55	30	3	49.5	6	✓		
<i>Quercus</i>	<i>coccinea</i>	scarlet oak		50	40	3	60	6			
<i>Quercus</i>	<i>garryana</i>	Oregon white oak		60	50	2	60	6	✓		
<i>Quercus</i>	<i>ilex</i>	holm oak		50	50	2	50	6			
<i>Quercus</i>	<i>imbricaria</i>	shingle oak		55	50	3	82.5	6			
<i>Quercus</i>	<i>kelloggii</i>	California black oak		60	45	3	81	6	✓		



Preapproved Medium Trees

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Tree Genus	Tree Species and Cultivar or Variety	Tree Common Name	Select Cultivars (height, width, growth rate and canopy factor do not reflect all Select Cultivars. Please research cultivars to ensure they are still appropriate)	Anticipated Mature Height (in feet)	Anticipated Mature Width (in feet)	Growth Rate (Fast 3, Medium 2 or Slow 1)	Canopy Factor (see TMC 13.06.502)	Minimum Planting Strip Width Recommended	West Coast Native	Form	Special Characteristics Overhead Utility friendly: N/A Ornamental: Evergreen: Deciduous:
<i>Quercus</i>	<i>macrocarpa</i>	bur oak	Urban Pinnacle, Cobblestone	50	50	3	75	6			
<i>Quercus</i>	<i>muehlenbergii</i>	chinquapine oak		50	45	3	67.5	6			
<i>Quercus</i>	<i>phellos</i>	willow oak		50	50	3	75	6			
<i>Quercus</i>	<i>rubra</i>	red oak		50	40	3	60	6			
<i>Sophora</i>	<i>japonica</i>	Japanese pagoda tree	Millstone, Regent	40	40	3	48	6			
<i>Tillia</i>	<i>tomentosa</i>	silver linden	Sterling Silver, Satin Shadow	60	50	3	90	6			
<i>Ulmus</i>	<i>parviflora</i>	emerald vase elm	Emer II Alea	50	35	3	52.5	6			
<i>Zelkova</i>	<i>serrata</i>	Japanese zelkova	Halka, Green Vase, Village Green, Spring Grove	60	50	2	60	6			
<i>Zelkova</i>	<i>carpinifolia</i>	caucasian elm		60	50	2	60	4			



Preapproved Large Trees

City of Tacoma
Urban Forest Manual
cityoftacoma.org/ufm

Large (per TMC 13.06.502)

Tree Genus	Tree Species and Cultivar or Variety	Tree Common Name	Select Cultivars (height, width, growth rate and canopy factor do not reflect all Select Cultivars. Please research cultivars to ensure they are still appropriate)	Anticipated Mature Height (in feet)	Anticipated Mature Width (in feet)	Growth Rate (Fast 3, Medium 2 or Slow 1)	Canopy Factor (see TMC 13.06.502)	Minimum Planting Strip Width Recommended	West Coast Native	Form	Special Characteristics Overhead Utility friendly: N/A Ornamental: Evergreen: Deciduous:
Aesculus	hippocastanum	horse chestnut	Buanmannii	75	70	2	105	8			
Fagus	sylvatica	European beech	Aspenifolia, Atropurpurea, Riversii	80	50	3	120	12			
Liriodendron	tulipifera	tulip tree*	Fastigiatum, Emerald City	60	25	3	45	8			
Lithocarpus	densiflorus	tanoak		75	90	3	202.5	8	✓		
Metasequoia	glyptostroboides	dawn redwood		70	25	3	52.5	10			
Pinus	ponderosa	ponderosa pine*		100	22	3	66	12	✓		
Platanus	x acerifolia	London plane tree	Ovation, Bloodgood, Exlimation, Yarwood	55	40	2	44	8			
Platanus	orientalis	America sycamore		75	75	3	168.75	12			
Psuedotsuga	menziesii	Douglas-fir*		80	20	3	48	12	✓		
Quercus	falcata	Spanish oak		80	50	3	120	8			
Quercus	frainetto	Italian oak	Forest Green	80	60	3	144	8			
Sequoia	sempervirens	coastal redwood*		100	25	3	75	12	✓		
Sequoiadendron	giganteum	giant redwood		80	50	3	120	12	✓		
Thuja	plicata	Western red-cedar*	Excelsa, Atrovirens	100	25	3	75	12	✓		
Ulmus	americana	American elm	Jefferson, New Harmony, Valley Forge	70	65	3	136.5	10			
Ulmus	japonica x wilsoniana	Accolade elm	Morton glossy	70	60	3	126	10			

*Recognizing that canopy factor does not account for trunk volume - these trees are considered large despite their canopy factor to be calculated as less than 100