

Chapter 4 General Planting 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 of the Tacoma Municipal Code.

4.1 Plant Quality and Condition

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 ANSI Z60.1 Standards and this Manual conflict, this Manual shall prevail. Plant material should be obtained from established commercial licensed nursery growers and installed by qualified landscape professionals.

To increase plant survivability, all plant material should 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.

4.1.1 Climate Adapted and Native Plant Requirements

All required plants to meet landscaping standards regulated under the TMC shall be climate-adapted. The retention and use of natives is encouraged and permitted for all landscaping. Invasive species, as identified in the UFM including Appendix 7D, shall not count toward meeting required plantings. Noxious weeds and weeds listed as Class A, B, or C as determined by the Pierce County Noxious Weed Control Board, are prohibited from being planted in required landscaped areas.

UR Zones

In UR-1 and UR-2 zones, 50 percent of all plants that are not trees must be native to western Washington and/or western Oregon.

Open Space Corridors and Fish and Wildlife Habitat Conservation Areas

100 percent of plants (excluding trees) required for landscaping located within Comprehensive Plan designated Open Space Corridors, and a minimum of 75 percent in adjacent areas within 50 feet of Open Space Corridors, must be native to western Washington and/or western Oregon. A minimum of 50 percent of required landscaping located within 50 feet of designated Fish and Wildlife Habitat Conservation Areas must be native to western Washington and/or western Oregon.

4.2 Trees

In accordance with City of Tacoma policies to establish a healthy and diverse urban forest, as defined in the Urban Forest Management Plan adopted in 2019, the following standards apply to all trees required by TMC 13.06.090B.

4.2.1 Tree Sizes

Trees are categorized as Small, Medium or Large based on the potential long-term canopy benefits of their species. Size is determined by Canopy Factor, which is calculated using the following formula:

$(\text{mature height in feet}) \times (\text{mature crown spread in feet}) \times (\text{growth rate number}) \times 0.01 = \text{Canopy Factor}$.

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 70

(B) Medium Trees = Canopy Factor from 40 to 70

(C) Small Trees = Canopy Factor less than 40

Reference Appendix 7 for pre-approved lists of Large, Medium, and Small Trees.

4.2.2 Tree Selection and Species Diversity

Diversification of plant species 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.
- 11 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

Edible fruit producing trees may be planted to satisfy tree planting requirements on-site, including in on-site parking areas/lots, as well as the public right-of-way. Be advised that some fruit tree pruning practices might be considered “excessive pruning” under TMC 13.06.090B, and not permitted under TMC 9.20.220, 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 enforcement provisions in TMC 13.06.090B, 13.05.150, and 9.20 including, but not limited to, fines and required plant replacement.

4.2.3 Tree Quality and Condition

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 – only proper pruning cuts (not flush cuts), pruned to the outside of the branch collar, are permitted.

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 three feet, measured from the ground elevation.
- All other deciduous street trees shall have a trunk free of branches to a minimum of five feet in height, measured from the ground elevation.
- All deciduous trees shall be species with the ability to develop a minimum branching width of six feet within five years. Weeping or excessively fastigiate or columnar species (e.g. weeping cedar) that do not meet this standard are not eligible to satisfy a tree planting requirement of the TMC.

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 six feet within five years. Weeping or excessively fastigiate or columnar species (e.g. weeping cedar) that do not meet this standard are not eligible to satisfy a tree planting requirement of the TMC.

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 with open soil access at the bottom of the raised bed (i.e. "open bottom" planters) 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's Public Works Traffic Engineering for alternative placement of street trees in the Right-of-Way (ROW) is required. The graphics below illustrate various alternative placement options.

Figure 4-1: Tree Placement in Bulb-Outs

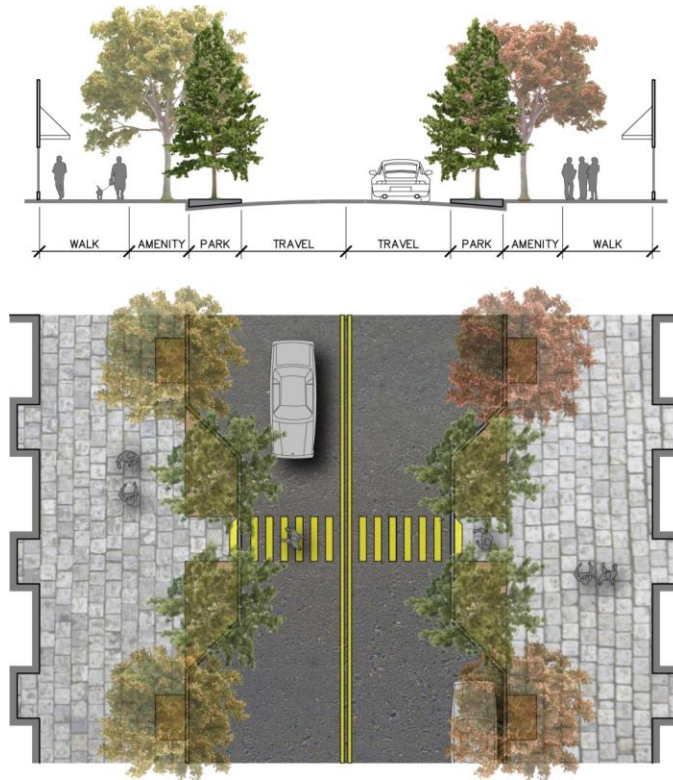
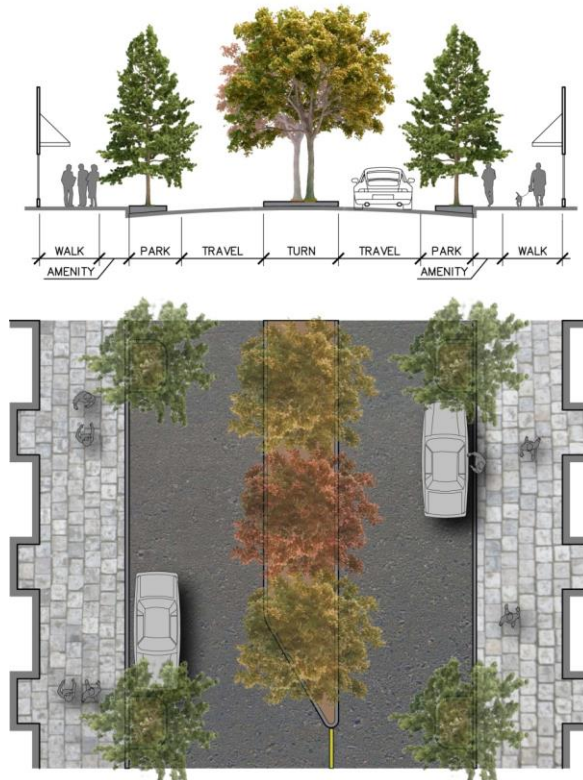


Figure 4-2: Tree Placement in Medians and Converted Parking Spaces

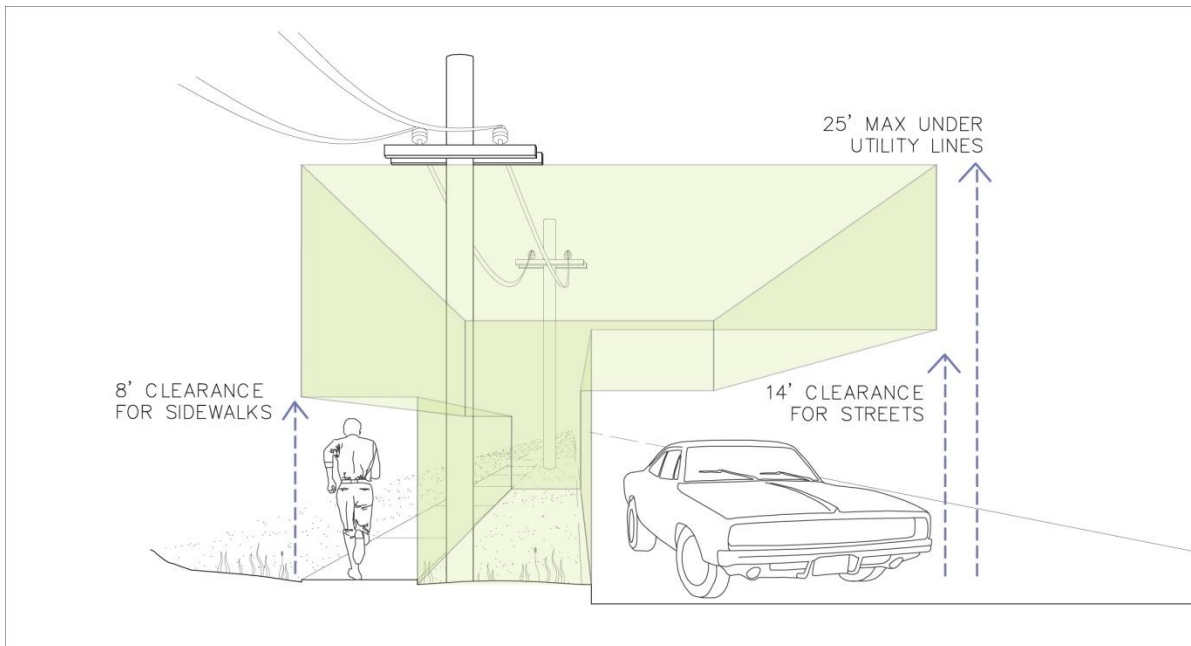


4.2.5 Tree Placement under Overhead Utilities

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, adjacent to a sidewalk (required vertical feet minimum clearance) and a roadway (required 14 vertical feet minimum clearance). There is a reduced quantity of tree species that are able to meet these growing conditions, and careful consideration for tree selection is advised.

Figure 4-3: Tree Placement 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 flush with the adjacent pavement surface or curb. Refer to Standard Plan LS-01 Street Tree Planting Detail.

Minimum tree trunk setbacks, surface planting diameter, soil volumes and spacing requirements shall be provided for healthy tree growth, as follows:

Figure 4-4: Soil Standards

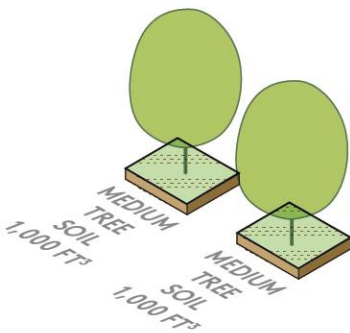
Per Tree Minimum	Small Trees	Medium Trees	Large Trees
Unpaved planting area, assuming 3 ft soil depth (sq. ft.):	167	334	400
Soil volume (cu. ft.)¹	500	1,000	1,200
Soil volume per tree, if soil is shared by multiple trees (cu. ft.)	500	800	1,000
Unpaved surface planting diameter (ft.)²:	5	6	7

¹ Minimum soil volume shall be achieved with soil depths of 3 feet where possible, but in no case shall be less than 24 inches. Soil depth provided to meet this cubic foot minimum can increase to 4' depths only where a soil depth of 3' would not allow Tree Canopy Credits to be met on-site.

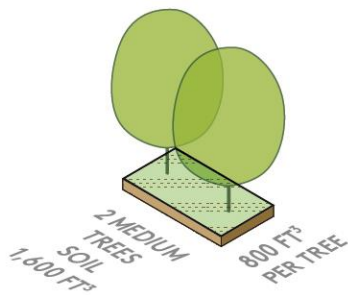
² This is the minimum unpaved dimension of planting area in any direction, often referred to as a “tree pit opening”. Provided that suspended pavement systems are used to meet required soil volume underground, this diameter can be reduced to 4' if compliance with ADA accessible sidewalk width standards is otherwise infeasible.

Exceptions to these minimums may be approved by the Director of Planning and Development Services, if a certified arborist confirms that healthy tree growth will be achieved, and infrastructure and other conflicts will be avoided.

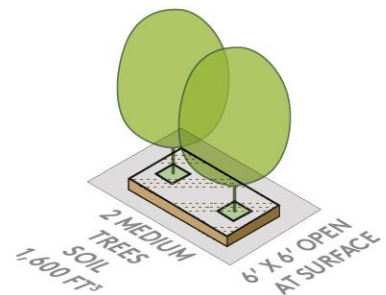
Figure 4-5: Multiple Ways to Achieve Required Soil Volume



Each tree needs a minimum amount of soil to survive into maturity.



But shared soil volumes allow a lower volume to be used per tree.



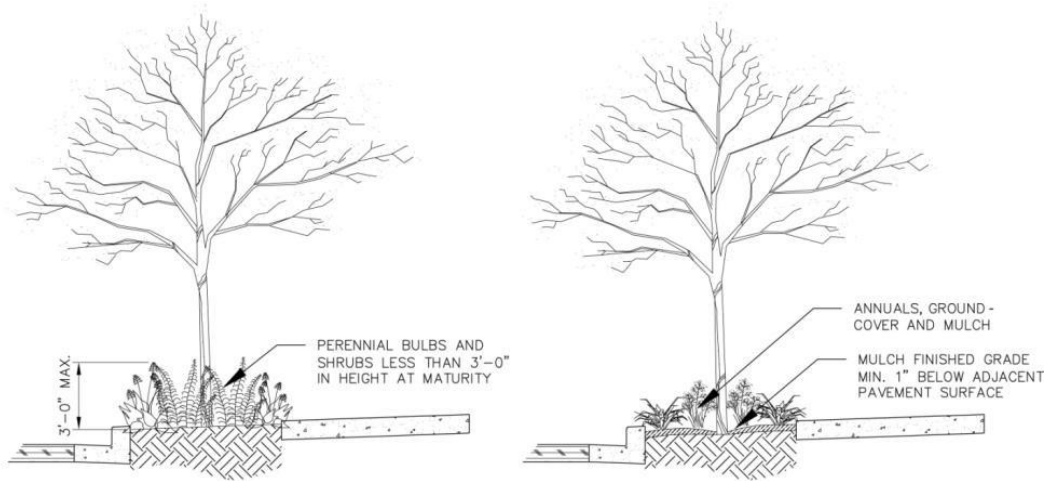
And with suspended pavement systems, paving can extend over soil, provided the minimum opening is maintained at the surface.

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.

Figure 4-6: Treatment of Unpaved Planting Areas



4.2.7 Tree Spacing Standards

It is recommended that all required trees are planted according to the minimum spacing standards listed below 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.

Figure 4-7: Minimum Spacing Standards for Trees (OC)

	Small Trees *	Medium Trees *	Large Trees *
Minimum spacing from primary structures and other trees, in feet:	10	16	22

* 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, 16 feet and 22 feet respectively. These minimum tree spacing requirements may be reduced, with approval from the City, 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:

Figure 4-8: Minimum Tree Setbacks

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

Figure 4-9: Minimum Tree Clearances (at Maturity)

Lowest Branch to Surface of:	Branch Clearance (feet)
Streets	14
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 (Class A, B or C) 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 they meet all other applicable requirements for sizing and diversity.

Except in cases where required landscaping is intended to provide dense visual buffers or to enhance natural conditions, trees and shrubs planted within or directly adjacent to the right-of-way (within 15 feet of sidewalk/curb edge) and other publicly accessible areas shall be selected and maintained to maximize visibility at eye level for safety. To meet this requirement, shrubs shall be chosen that will grow to a mature height under 3 feet. Tree species shall be selected and pruned (once tall enough) to maximize views below 7 feet in height.

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 (Class A, B, or C) 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 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 sq. ft. 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.

Figure 4-10: Groundcover Spacing Standards

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.

Figure 4-11: Plant Quantities per 100 sq ft

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.

Figure 4-12: Groundcover Planting Spacing Example

