City of OAKLAND California

STANDARD SPECIFICATIONS FOR STREET TREE PLANTING

All street trees shall be owned and maintained by property owners with required irrigation.

Tree Planting

The purpose of these specifications is to establish a set of standards for the planting of street trees in the public right-of-ways to ensure quality tree materials are used and that new plantings are acceptably established in their new environment. All trees planted within public rights-of-way must be pre-approved by the Public Works Agency (PWA),

Selection

Tree species selection is a cooperative decision between property owners and PWA, except for major streets. The species must appear on the most current "Master Street Tree List" (Appendix A) and shall be used as a guideline for street trees. Trees not on this list will be considered unacceptable unless approved by the City Arborist. Two tree species per block are encouraged; up to four species are allowed. Nursery trees must meet the acceptance specification (Appendix B). The species must be adaptable to the conditions at the planting site (climate, soil, sunlight, root space, utilities, proximity to structures and hardscape, space for mature height and spread, space for the trunk and root crown of a mature tree, availability of irrigation).

Major Streets

Plantings on major streets should match the existing designated tree species unless it is being phased out in favor of more desirable species. If the existing species is not on the official list it is being phased out. The use of large trees is encouraged.

Location

The planting location of trees in street areas must be approved by PWA staff and shown on a landscape plan. Trees can either be planted in the planting strip between the curb and sidewalk, in an area cut out of the sidewalk, or on the building side of the sidewalk, as long as it is within the public right-of-way.

Spacing

The intent of these standards is to allow every interested property owner at least one street tree as planting site conditions permit. Spacing for street trees must be approved by PWA staff. Because lots vary in width and other interfering factors, minimum spacing guidelines are;

20' – 30' canopy diameter (small tree)……...15' – 20' spacing
30' – 40' canopy diameter (medium trees)….20' – 25' spacing
40' – 50' canopy diameter (large trees) …….25' – 35' spacing

Imposed factors such as the frequency of driveway cuts, underground utilities, signs, light and telephone poles, and other streetscape elements will, of course, alter the desired center spacing (see, Clearance with Other Structures & Utilities, below).No tree that grows taller than 35' shall be planted under high voltage lines.

Intersections
Street trees must not be planted where they will obstruct the views of stop signs or traffic signals. Trees are not to be planted within 20' distance from side street curb face to first street tree.

Street trees must be placed to allow for visibility of all information signs on the street. Informational signs and street trees shall not occupy the same opening.

Clearance with Other Structures & Utilities
The following spacing requirements are used to determine appropriate planting locations of street trees:

STRUCTURE	PREFERRED DISTANCE FROM TREE
Utility and light poles	5 ft. (no light) -20 ft. (with light); adjust depending on canopy diameter of mature tree.
Commercial driveways	10 ft.
Residential driveways, fire hydrants, water or gas meters, valve boxes, sewer line	5 ft.
Underground electrical, gas, Sewer mains, water mains, basements	10 ft. laterally (minimum).

Tree wells
See the "Master Tree List" (Appendix A) for the minimum planting space required for various species. Tree well sizes are; Small = 2'x 4', Medium = 3'x 6', Large = 4'x 8', X-large = 5'x 10'. The minimum width needed for a continuous planting strip or center median is; Small = 2', Medium = 3', Large = 4', X-Large = 5'. Property owners are responsible for keeping planting wells free of weeds, turf, litter, etc. and for preventing them from becoming tripping hazards.

Tree Planting Guidelines
The guidelines for planting street trees in neighborhoods are contained in Appendix C.

Size Fifteen gallon container grown trees are the standard planting size used in parks, neighborhoods and commercial areas. A twenty-four inch box sized container is optional and is used occasionally.

Tree Root Barriers
Approved root barriers shall be installed to provide protection for infrastructure from tree roots. Linear root barriers are to be installed when planting a street tree 8 feet or less from hardscape in any parkway or median strip. The root barrier will be designed such that the major root structure will be restrained from extending into other utility corridors, but still allow for the normal growth of the tree (Appendix C).

Staking
The Reddy Stake U-Stake it system is preferred. Only one 9' metal tree stake is needed per tree. As an alternative, two, eight foot tall, three inch diameter, lodge pole stakes driven 18" into solid undisturbed soil outside the root ball may be used. The tree is then secured with rubber tree ties or other tree tie material no less than 1" wide.

Water Basin
A water basin (3" berm of soil) capable of holding 10 gallons of water shall be formed around the root ball where irrigation systems are not required.

Tree Watering
The property owner is responsible for watering the newly planted trees. An appropriate amount of water (10 gallons) must be applied each week, for three years during the non-rainy season, to establish the trees in the landscape. Where feasible the trees shall be watered by an irrigation system and timer. The trees must remain as a permanent part of the landscape.

Grates
Grates are considered an extension of the sidewalk. Property owners are responsible for maintaining and repairing tree grates; and for preventing grates from damaging trees. Grates with concentric rings allow adjustments to be made as the tree trunk expands.

APPENDIX - A

City of Oakland Master Street Tree List April 2016 – April 2017 Botanical Name / Common Name	Small – 15 to 25 Feet Tree Well Min. 2'x3'	Medium – 25 to 40 Feet Tree Well Min. 4'x4' or 3'x6'	Large – 40+ Feet Tree Well Min. 5'x5' or 4'x6'	Extra Large – 40+ Feet Tree Well Min. 6'x8'	Foliage E – Evergreen D – Deciduous	Growth Rate Fast – F Med. – M Slow - S	Notes
Acer buergerianum Trident Maple		X			D		
Acer campestre 'Queen Elizabeth' or 'Evelyn' Hedge Maple		X			D		**Limited use on a trial basis.***
Acer nigrum Black Maple		X			D		
Acer rubrum 'October Glory' or 'Brandywine' Red Maple			X		D		
Aesculus carnea 'Briotii' Red Horse Chestnut			X		D		
Albizia julibrissin Silk Tree, Mimosa Tree		X			D		
Arbutus 'Marina' Hybrid Madrone, Strawberry Tree		X			E		**Limited use on a trial basis.*** Fruit in fall/winter. Can be messy
Carpinus betulus 'Fatigiata'or 'Frans Fontaine' European Hornbeam		X			D		
Cercis canadensis Eastern Redbud	X				D		
Chionanthus retusus Chinese Fringe Tree	X				D		**Limited use on a trial basis.***
Fraxinus americana 'Autumn Purple' or 'Empire' American Ash			X		D		
Fraxinus oxycarpa 'Raywood' Raywood Ash			X		D		
Geijera parviflora Australian Willow		X			E		
Ginkgo biloba 'Saratoga' or 'Fairmont' Maidenhair Tree		X			D		
Gleditsia triacanthos inermis 'Shademaster' or 'Skyline' Thornless Honey Locust			X		D		
Gymnocladus dioica 'Espresso' Kentucky Coffee Tree			X		D		**Limited use on a trial basis.***
Heteromeles arbutifolia Toyon	X				E		**Limited use on a trial basis.*** Needs training to encourage upright form.
Koelreuteria bipinnata Chinese Flame Tree		X			D		
Koelreuteria paniculata Golden Rain Tree		X			D		
Lagerstroemia indica x L. fauriei Hybrid Crape Myrtle – 'Muskogee', 'Natchez', 'Tuscarora'	X				D		
Laurus nobilis 'Saratoga' Saratoga Laurel		X			E		
Lophostemon confertus Brisbane Box		X			E		**Limited use on a trial basis.***
Lyonothamnus floribundus asplenifolius Catalina Iron Wood			X		E		**Limited use on a trial basis.***
Magnolia grandiflora 'Saint Mary' Saint Mary Magnolia		X			E		
Metrosideros excelsus New Zealand Christmas Tree		X			E		
Nyssa sylvatica Sour Gum or Tupelo			X		D		

Parrotia persica 'Vanessa' Persian Parrotia	X				D		**Limited use on a trial basis.***
Photinia x fraseri Photinia	X				E		
Pistacia chinensis 'Keith Davey' or 'Pearl Street' Chinese Pistache		X			D		
Platanus x hispanica 'Columbia' London Plane			X		D		
Podocarpus gracilior (Afrocarpus falcatus) African Fern Pine			X		E		Fruit can be an issue
Prunus cerasifera 'Thundercloud' or 'Krauter Vesuvius' Purple Leaf Plum	X				D		
Prunus x blireana Double Pink Flowering Plum	X				D		
Pyrus calleryana 'Aristocrat' Aristocrat Pear		X			D		Limited Use Fire Blight
Pyrus kawakamii Evergreen Pear	X				E/D		Limited Use Fire blight
Quercus agrifolia Coast Live Oak				X	E		**Limited use on a trial basis.*** Acorns
Quercus coccinea Scarlet Oak				X	D		Acorns
Quercus douglasii Blue Oak				X	D		Acorns
Quercus palustris Pin Oak				X	D		Acorns
Quercus shumardii Shumard Red Oak			X		D		Acorns
Quercus suber Cork Oak			X		E		Acorns
Rhus lancea African Sumac	X				E		Requires training when young to encourage upright growth.
Robinia x ambigua 'Purple Robe' Purple Flowering Locust		X			D		
Sapium sebiferum Chinese Tallow Tree		X			D		Possible Invasiveness.
Tilia tomentosa Silver Linden		X			D		
Tristania laurina 'Elegant' (*Tristaniopsis laurina* 'Elegant') Water Gum, Elegant Brisbane Box	X				E		
Ulmus 'Frontier' Frontier Hybrid Elm			X		D		
Ulmus Americana 'Jefferson' or 'Princeton' American Elm			X		D		

***Trees on a trial basis will be approved for planting from April 2016 through April 2017. Park and Tree Services Division will review the performance of these trees and may extend the trial basis status, remove planting restrictions, or remove from list.**

APPENDIX - B

NURSERY PLANT STANDARDS

1. All container grown nursery stock shall be healthy, vigorous, well rooted, have and established root system reaching the size of the container to maintain a firm ball when the container is removed, but shall not have excessive root growth encircling the inside of the container.

2. All trees shall have a single straight trunk, a well-developed leader free of co-dominant stems or competing vigorous upright branches, with tops and roots characteristic of the species cultivar or variety.

3. All trees must be free of insects, disease, mechanical injury, and other objectionable features when planted.

4. At time of inspection or delivery, the tree shall show no signs of moisture stress from under or over watering, as indicated by wilted, shriveled, or dead leaves or branch die back.

5. For a tree in a 15 gallon size container, the trunk diameter (caliper) shall be 0.75 inches to 1.5 inches with the approximate tree height of 8 to 10 feet.

6. The trunk diameter and taper shall be sufficient so that the tree will remain vertical without the support of a nursery stake.

7. All trees shall be true to name and legibly tagged as to name and size and shall be labeled individually or in groups by species and cultivar.

8. The City shall have the right to reject any container grown tree that does not meet the specifications set forth in these standards.

TREE PLANTING GUIDELINES

1. **Digging.** Planting holes shall be dug a minimum of twice the diameter of the root ball. The depth of the planting hole is slightly less than the depth of the tree's root ball. Measure the depth of the root ball and dig the hole one inch less deep. Digging deeper than necessary is bad for the tree because the root ball will settle over time and allow water to accumulate at the root crown. The excess water can promote root fungus that can cause the destruction of the tree. The walls of the hole are to be gouged, creating an uneven surface in order to assist with lateral development of roots. A smooth wall has a hard surface and is difficult for roots to penetrate.

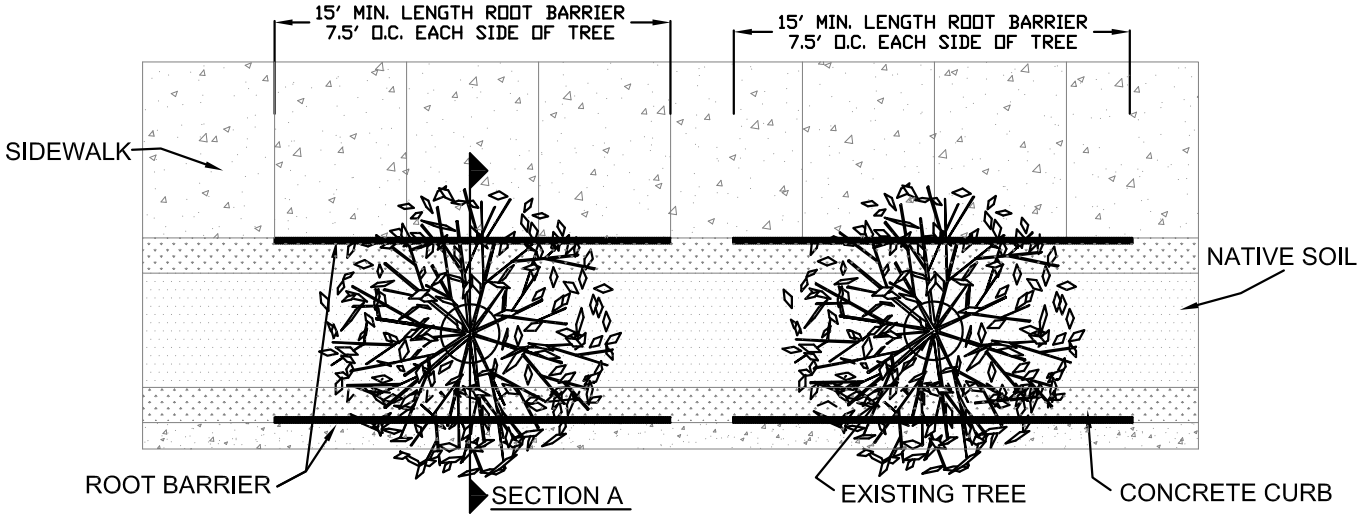
2. **Root Barriers.** Linear root barriers are to be installed when planting a street tree 8 feet or less from hardscape in any parkway. The barrier shall be made of high density polyethylene plastic, 40 mil thick, UV protected. The barriers shall be 18" in height and sized to fit the perimeter of the tree well. The top edge of the barrier must always be above the soil line. Roots can easily grow over the top of a barrier installed below or flush to the grade.

3. **Container.** Take a hammer or shovel and tap around the sides of the container to loosen the root ball. Lay the container on its side using one person to hold the container and another person to hold the tree. The person holding the tree gently pulls the tree out of the container and sets the tree upright. Inspect the root ball. Prune kinked, broken or girdling roots if needed – top quality stock should have none of these. Slice the sides of the root ball vertically in four places with a sharp knife (scarify), cutting into the ball one inch deep. Do not shave off the root ball and soil with a shovel. Scarifying the root ball encourages the roots to grow out laterally versus continuing a circling pattern.

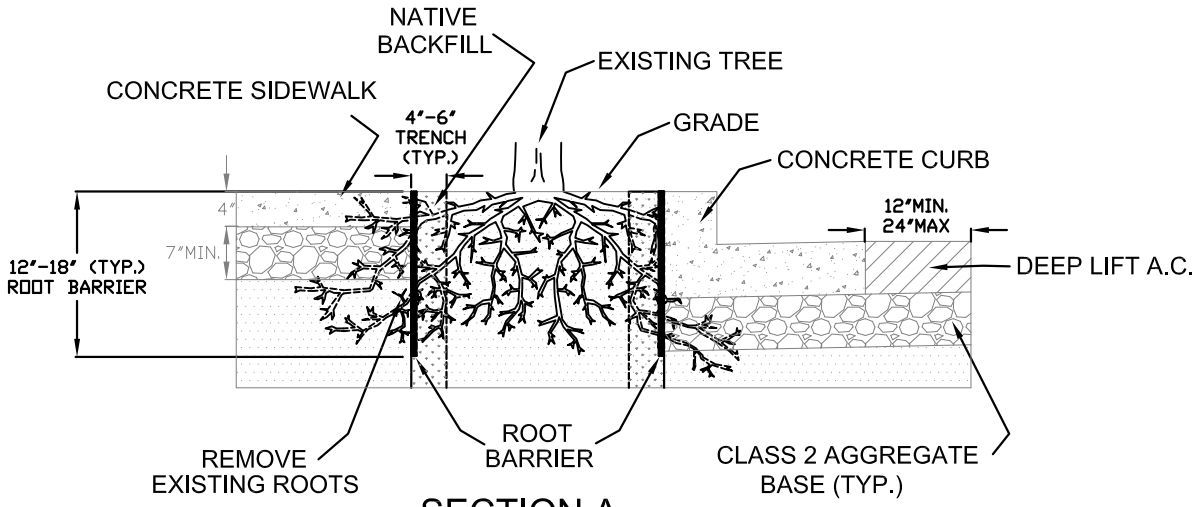
4. **Tree.** Gently lift the tree into the hole, making sure the tree is centered and standing upright. Add and firm the back-fill soil gradually. When the hole is about half filled, add water to eliminate air pockets and settle the soil. Continue adding and gently firming the back-fill soil until the hole is filled. The root ball and back-fill should be thoroughly saturated.

5. **Staking.** The Reddy U-Stake system is preferred with one 9' metal stake per tree. Optionally, two, eight foot, three inch diameter lodge pole stakes may also be used with tree tie material no less than 1" wide.

6. **Berm & Mulching.** After backfilling, staking and initial watering a 3" berm of soil is formed around the root ball capable of holding 10 gallons of water. A mulch layer is then to be placed outside the berm area to improve water retention.



PLAN VIEW



SECTION A

NOTES:

1. ROOT BARRIER SHALL BE BLACK, INJECTION MOLDED PANELS OR LINEAR ROLL WITH 90° DEFLECTING RIBS.
2. ROOT BARRIER SHALL BE MANUFACTURED WITH 50% POST CONSUMER POLYPROPYLENE PLASTIC WITH ADDED ULTRAVIOLET INHIBITORS; RECYCLABLE.
3. INSTALL MINIMUM 12" TO MAXIMUM 18" HIGH ROOT BARRIER.
4. ROOT BARRIER SHALL HAVE A MINIMUM WALL THICKNESS OF 0.06" (60 mil) & RIB THICKNESS OF 0.08" (80 mil).
5. THE VERTICAL ROOT DEFLECTING RIBS SHALL BE FACING INWARDS TO THE ROOT BALL.
6. ROOT BARRIER SHALL BE 15' LONG; 7.5' O.C. FROM TREE UNLESS APPROVED OTHERWISE BY ENGINEER.
7. ROOT BARRIER TRENCH SHALL BE 4" WIDE TO 6" WIDE.
8. ROOT BARRIER SHALL BE INSTALLED VERTICAL IN TRENCH ADJACENT TO SIDEWALK AND CURB AT GRADE.
9. THE CITY ARBORIST SHALL BE NOTIFIED BEFORE EXTENSIVE CUTTING OF ROOTS.

CITY OF OAKLAND | DEPARTMENT OF ENGINEERING AND CONSTRUCTION

TREE ROOT BARRIER INSTALLATION

ENGINEERING DESIGN MANAGER

DATE: DECEMBER 2014

REV. DATE: _____

DWG. M-6