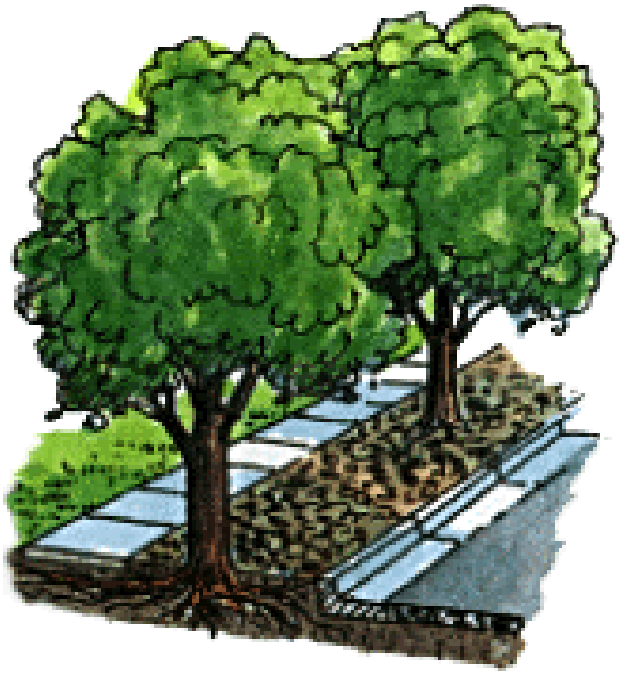
CITY OF SACRAMENTO

PARKING LOT TREE SHADING DESIGN AND MAINTENANCE GUIDELINES



June 17, 2003

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APPENDICES

I. INTRODUCTION / PURPOSE:

This document provides standards and guidance for the planting, maintenance, protection, removal and replacement of trees planted pursuant to the parking lot tree shading regulations as defined in the City Code. The purpose of the Parking Lot Tree Shading Design and Maintenance Guidelines is to improve the effectiveness of the City's parking lot shading ordinance. The standards and recommendations in this documents will help to encourage achievement of the City's 50 percent shading requirement for a greater number of parking facilities.

II. SHADING REQUIRMENTS AND CALCULATIONS:

The parking lot tree shading ordinance requires that all new parking lots include tree plantings designed to result in 50 percent shading of parking lot surface areas within 15 years.

The shading requirements calculations apply to all new impervious surfacing on which a vehicle can drive including:

- Parking stalls
- All drives within the property line (regardless of length)
- All maneuvering areas (regardless of depth)

Exceptions to the shading calculation include:

- Single family and two family residential parking areas
- Parking structures
- Truck loading areas in front of overhead doors
- Truck maneuvering and parking areas unconnected to and exclusive of any vehicle parking
- Surfaced areas not to be used for vehicle parking, driving or maneuvering, provided they are made inaccessible to vehicles by a barrier such as bollards, curb, or fencing
- Vehicle display, sales, service, and storage areas (parking facilities for these uses are subject to shading requirements)
- Parking areas under covered stalls and in garages

Shading Calculations:

1. If a site has two or more unconnected parking areas, shade is calculated separately for each area. If they are connected by a joining drive, they are calculated as one lot.

2. The amount of shade provided by a given tree is determined by using the appropriate percentage and square footage of the tree crown as indicated on the approved shade tree list (see Appendix A). Shading credit is given in 25 percent increments based on the amount of the tree crown that shades the parking area (see Exhibit A).

3. Overlapping shade does not count twice.

4. Street trees and existing on-site trees that shade parking lots will be given credit.

5. Provide shade calculations and shade legend. The planting plan may be used as the shade plan provided all required information is listed and the trees are drawn to scale at the size indicated on the approved shade list (see Appendix A).

Shade calculations should indicate:

1. Tree Symbols
2. Tree Type
3. Tree Quantity
4. Surfaced Area (including carports, garages, etc.)
5. Shade Area Required
6. Shade Area Proposed
7. Shading Credit Accorded to Each Tree (F or 100%, TQ or 75%, H or 50%, Q or 25%)

Sample Parking Lot Shade Calculation Table:

Symbol	Botanical Name/ Common Name	Quantity @ Full Shade / Sq. Ft.	Quantity @ ¾ Shade / Sq. Ft.	Quantity @ ½ Shade / Sq. Ft.	Quantity @ ¼ Shade / Sq. Ft.	Total (sq. ft.)
T1	*Laurus nobilis* / Sweet Bay	1 @ 491	2 @ 368	5 @ 246		2457
T2	*Quercus agrifolia* Coast Live Oak		2 @ 722	2 @ 481	2 @ 240	2886
T3	*Pinus Patula* Jelecote Pine		1@ 530	7 @ 354		3008
					TOTAL TREE SHADE	8351
Surfaced Area:	Parking Lot			16240	TOTAL SURFACED AREA =	17740
	Covered Stalls (garages, carports, etc.)			1500		
					SHADE AREA REQUIRED =	8870
					If applicable, TOTAL AUXILIARY SHADE* =	1450
					TOTAL SHADE PROVIDED =	9801
					PERCENT SHADE =	55.2%

*NOTE: *Auxiliary shade is the total **parking** area under covered stalls (carports, garages, etc.), not the total covered area.*

This method allows easy follow-up and coordination when a discrepancy is found in the plan check process.

III. TREE PLANTING PRACTICES:

Proper planting practices are essential in achieving the best growth of a tree and shall be utilized in the development of each new parking lot. These practices include, but are not limited to, the following measures:

1. Inside dimensions of tree wells should be a minimum of 6 feet by 6 feet (see Exhibit B). Irregular tree well design may be allowed if a minimum of 36 square feet of surface area is provided and adequate rootable soil volume (minimum 85 cubic feet) is incorporated into the tree well planting. Smaller dimensions may be considered subject to the approval of the City Landscape Architect.

2. Trees should be planted at a distance of one half the required planter size behind a curb. Where a walk falls adjacent to a curb, any 35' crown diameter tree within 10' of the curb face receives 50 percent shade credit. The tree should be planted at a distance of one half the required planter size behind a walk for this credit to apply.

3. Two feet of vehicle overhang into a planter area is allowed, provided the planter is the correct minimum width of six feet (see Exhibit B). Vehicle overhang is not allowed into required setback areas.

4. Provide a mix of tree types (species or cultivars) if more than ten trees are required.
   - If 20 to 40 trees are required, no more than 50 percent of the trees may be of the same type.
   - If more than 40 trees are required, then no more than 25 percent of the trees may be of the same type.

5. The City encourages 20 percent of the tree selection for a site to be oak or other native tree species.

6. Parking lot lighting should not conflict with required shade tree locations or growth. Light standards no greater than 16 feet in height are strongly encouraged. Buildings located close to streets will reduce potential conflicts between trees and free-standing signs.

7. Trees should be planted and soil volume should be amended as described below and shown in Exhibit C.
   - Tree wells should be excavated to a depth of 3 feet or greater before being backfilled.
   - Root barriers, where provided, should be of a material specifically designed for containing tree roots.
   - Irrigation in tree wells shall be adapted for deep watering.
   - Backfill in planting pit shall be 75 percent native soil and 25 percent soil amendment.

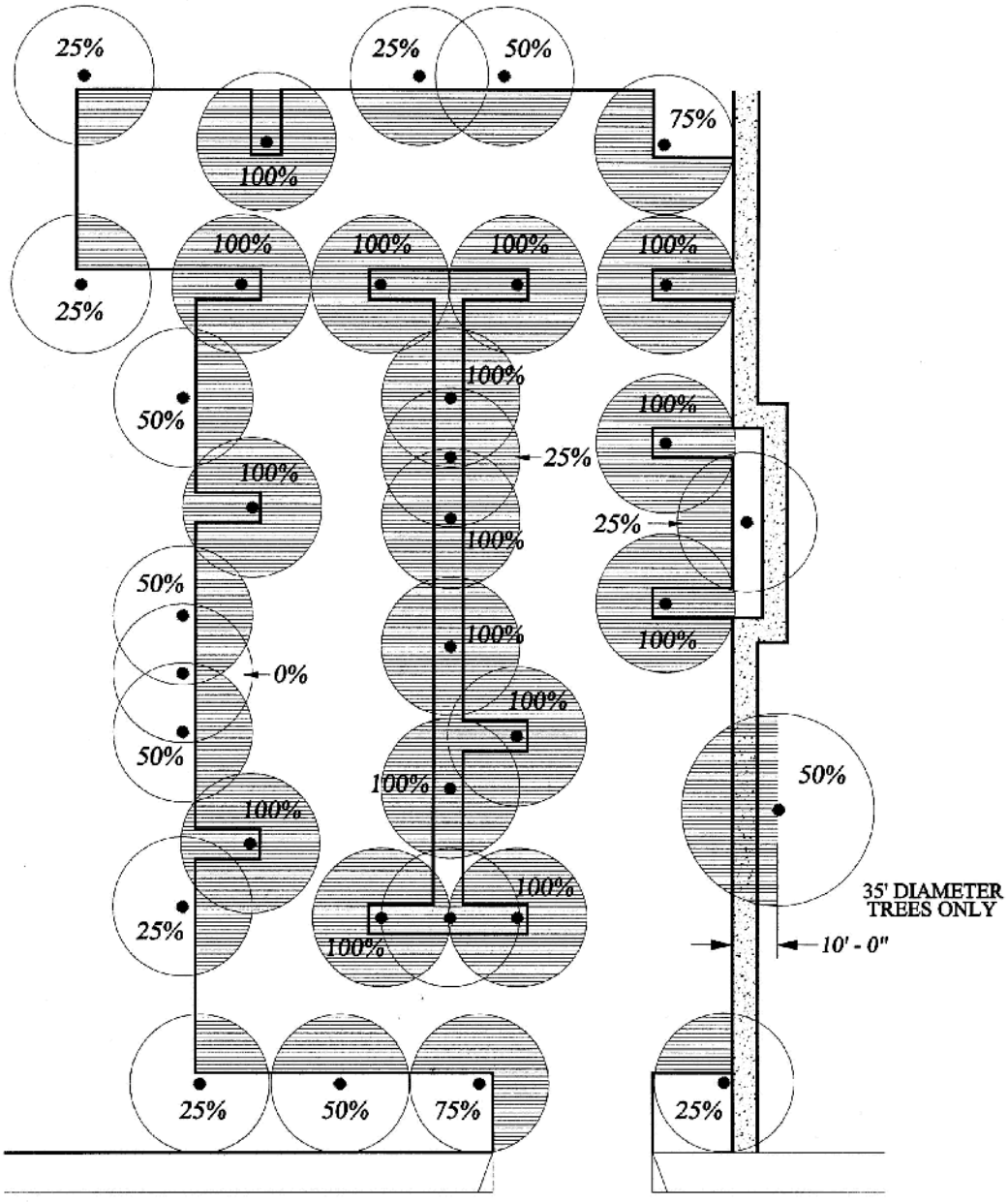
- Fertilizer tabs should be of slow-release design lasting for a minimum of 10 months.
- Entire planters, including backfill, shall be free of aggregate base (or other materials or construction debris detrimental to optimal plant growth).
- Tree stakes shall be two inches below the lowest scaffold branch and be made of rot resistant material.
- Trees should be tied loosely in a figure-8 pattern at the lowest point required to keep the tree in an upright position. Trees with trunks too weak to stand alone may be tied at two positions. If a single stake is used, it should be on the side of prevailing winds. If two stakes are used, they should be parallel to prevailing winds.
- Tree wells and continuous planting islands may include root barriers (24 inches deep) to prevent potential root damage to parking lot surfaces.

8. Continuous planting islands are encouraged to allow for multiple tree plantings and increased rootable soil volume. These islands might also be designed to incorporate surface water runoff treatment measures such as bio-swales (see Exhibits D and E).

9. The use of structural soil mixes is encouraged to promote root growth, especially where irregular tree wells are proposed, or extra shading credit is desired.

Note: *The use of structural soil mixes is encouraged as they will increase the rootable soil volume as well as reduce the potential for root invasion into parking lot paving*.

EXHIBIT A



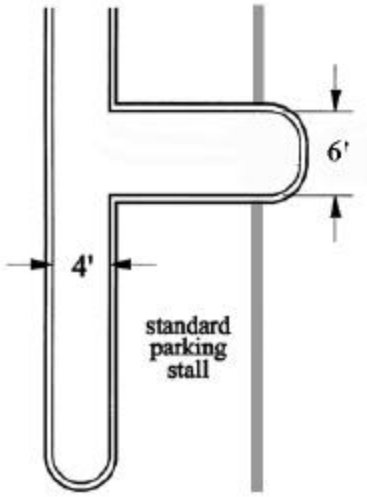
PARKING LOT

NOTES:

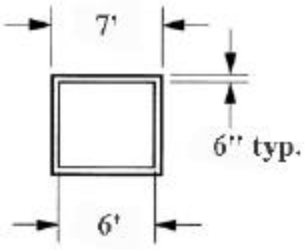
1. This diagram is intended to reflect the manner in which shade is credited under various conditions. It is not necessarily an illustration of 50% coverage.
2. Trees may receive 25%, 50%, 75% or 100% credit as shown.
3. Shade overlap is not counted twice.

EXHIBIT B

TYPICAL PLANTER SPECIFICATION



END ISLAND PLANTER



TREE WELL/PLANTER

TYPICAL POURED CURB WITH OVERHANG

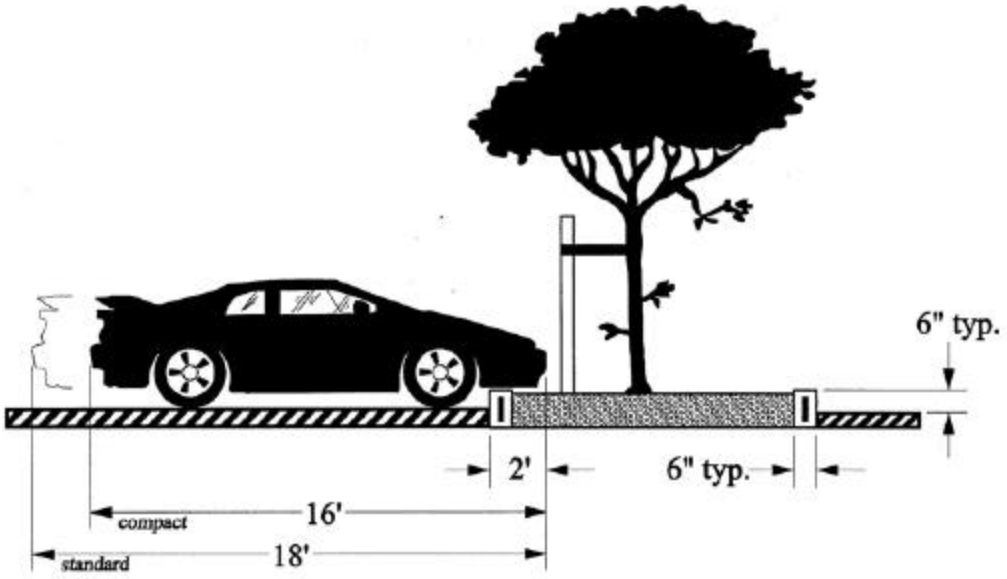
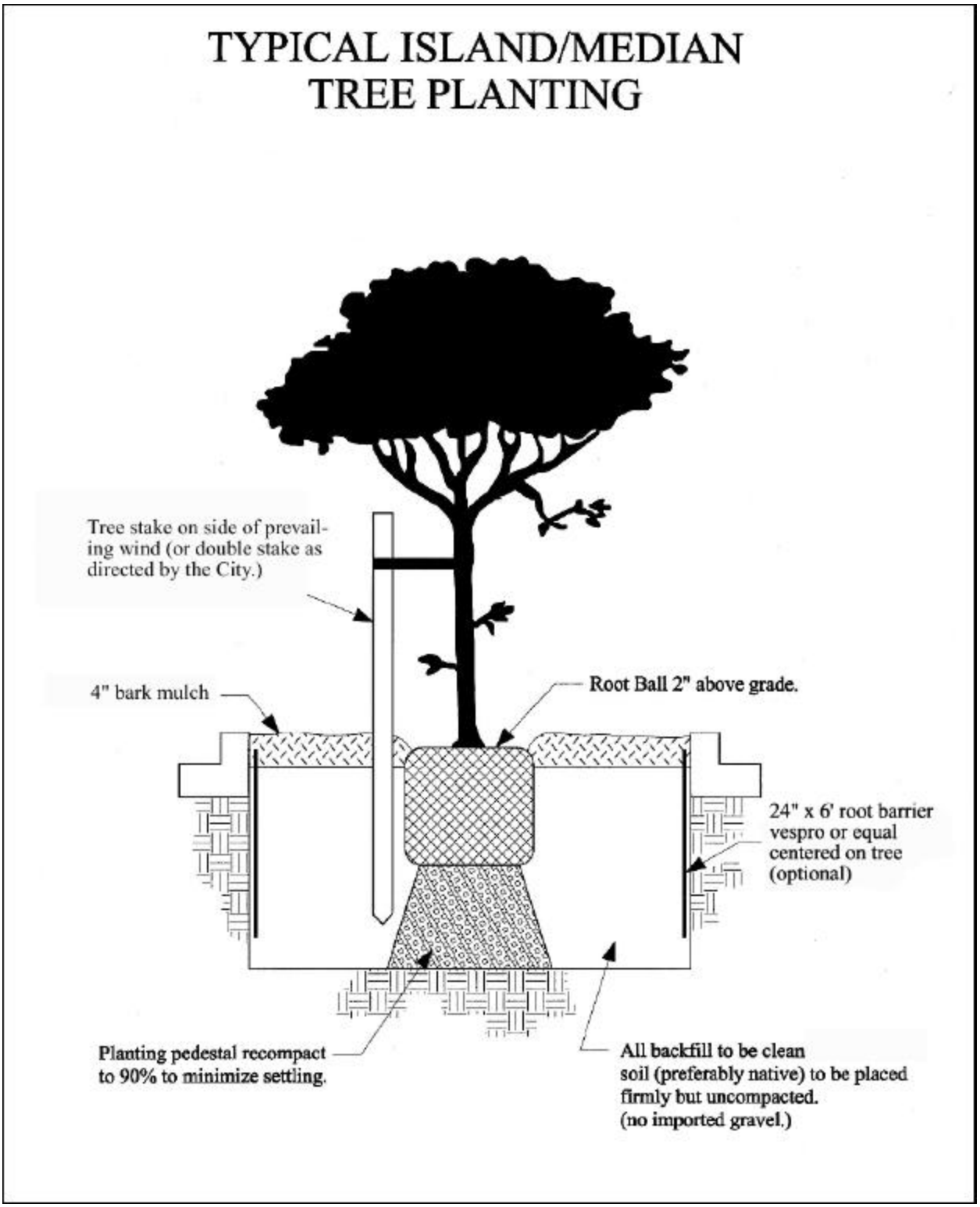


EXHIBIT C


TYPICAL ISLAND/MEDIAN
TREE PLANTING
Tree stake on side of prevailing wind (or double stake as directed by the City.)
4" bark mulch
Root Ball 2" above grade.
24" x 6' root barrier vespro or equal centered on tree (optional)
Planting pedestal recompact to 90% to minimize settling.
All backfill to be clean soil (preferably native) to be placed firmly but uncompacted. (no imported gravel.)

IV. DRAINAGE / WATER QUALITY OPTIONS:

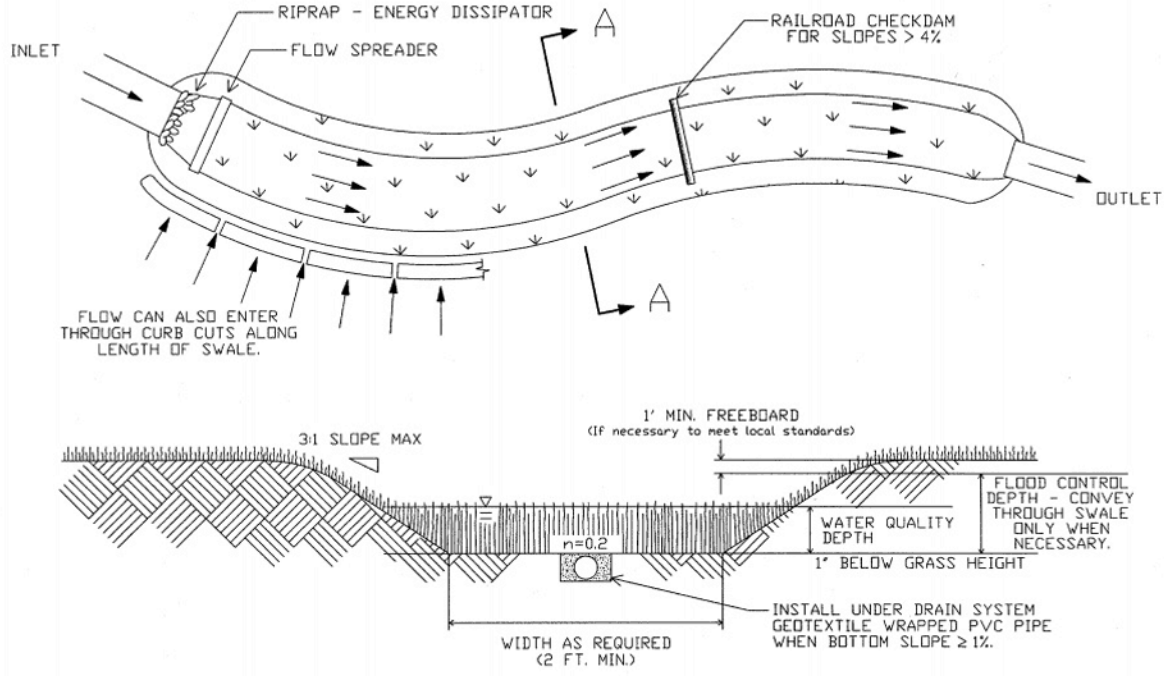
With early planning and design it is possible for areas required for tree planting to also be used to satisfy the City's requirement to provide on-site treatment of stormwater. In accordance with the Federal Water Pollution Control Act, the City is required to implement a Comprehensive Stormwater Management Program in order to reduce pollutants in urban runoff to the maximum extent practicable.

Parking lots which are part of new developments with one (1) acre or more of impervious area are generally required to provide treatment control measures that capture and treat stormwater runoff through settling, filtration, and/or biodegradation. The treated runoff is then released to the storm drain system or percolated into the ground.

Integrating treatment control measures within areas used for tree shading may significantly reduce land requirements and costs. The following figures (Exhibit D and Exhibit E) describe criteria for vegetated swales and filter strips which can be integrated effectively with tree shading. The Department of Utilities' Stormwater Management Program should be referred to for specific design criteria. Contact the Department of Utilities for plan approval requirements related to stormwater treatment control measures.

Trees planted within stormwater runoff areas should only be species adapted to heavy to moderate irrigation, such as riparian species.

EXHIBIT D



NOTES:

1. An energy dissipator and flow spreader should be installed at the entrance to the entrance to the swale to reduce velocity and evenly distribute flows across the swale.
2. Maximum allowable side-slope 3:1.
3. Grass height maintained in accordance with design specifications. Design grass height between 4 to 6 inches.
4. Flow height to be one-inch below design grass height for water quality design storm flow. (2-year - 6 hour storm) Use a Mannings roughness coefficient of 0.2 to design for flow through the swale vegetation.
5. If the swale bottom slope exceeds 4% or soils very permeable, install check dams every 50 feet to slow the velocity to prohibit scouring and promote infiltration.
6. If the swale bottom slope is less than 1% install under drain system to prevent standing water.
7. Flows in excess of water quality volume should be diverted around the swale. If necessary for swale to convey flood waters, provisions shall be made to ensure conveyance in accordance with City Standards. Provide 1 ft. freeboard if necessary for flood control.
8. n value above water quality height determined based on type of vegetation used. Typical value: 0.035

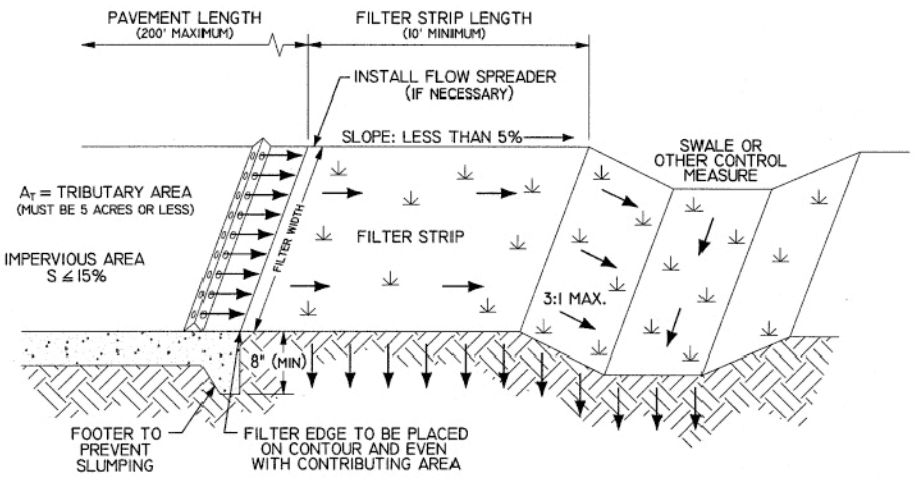
CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

VEGETATED SWALE

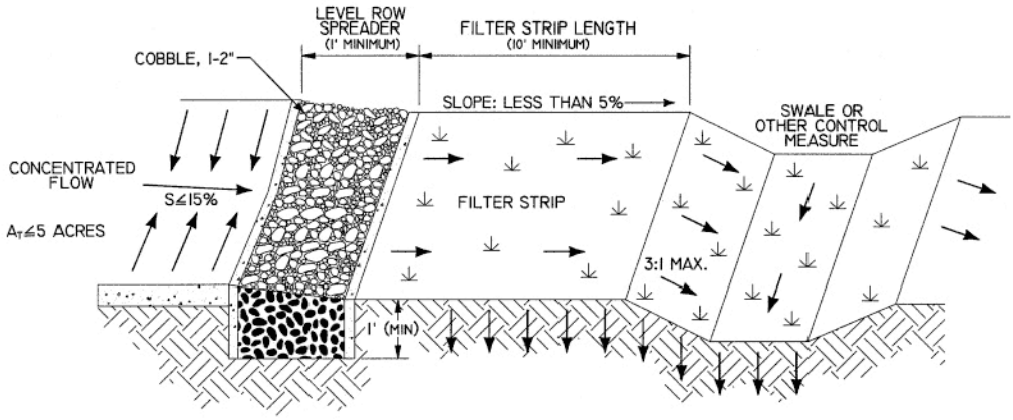
SCALE: NONE
DATE DRAWN: 27 MAY 1999
DRAWN BY: RLW
FILE NAME: jim_mcd\001-02.dwg

ADAPTED FROM PUGET SOUND STORMWATER MANAGEMENT MANUAL

EXHIBIT E



ONSITE FLOW CONTROL



CONCENTRATED FLOW CONTROL

NOTES:

1. Maximum contributing drainage area 5 acres.
2. Maximum slope of contributing area 15%.
3. Situate upstream edge of filter on contour to prevent channelization.
4. Install a level spreader at top edge of filter.
5. Slope of filter should be as level as possible yet permit drainage, not to exceed 5%.
6. Minimum length of filter for grass or turf 10 feet, for forested (shrubs and trees) 50 feet.
7. Filter to be as wide as contributing area.
8. Grass height maintained in accordance with design specifications. Design grass height between 4 to 6 inches.
9. Flow height to be one-inch below design grass height for stormwater quality volume. Use a Mannings roughness coefficient of 0.2 to design for flow through vegetation.
10. City code for maximum drainage areas allowed to sheet flow off-site must be met.

ADAPTED FROM URBAN STORM DRAIN CRITERIA MANUAL
VOL. 3 - BMP STORMWATER QUALITY,
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, SEPT. 1992

CITY OF SACRAMENTO
DEPARTMENT
OF UTILITIES

FILTER STRIPS

SCALE: NONE
DATE DRAWN: 27 MAY 1999
DRAWN BY: RLW
FILE NAME: jim_mcd\001-01.dwg

V. GENERAL SHADING PLAN REQUIREMENTS:

All projects submitted for building permits must include site grading plans, landscape planting plans and irrigation plans with irrigation calculations. All plans that include parking must also include a shade plan. The planting plan may be used as the shade plan provided the trees are drawn to scale at the size indicated on the approved shade list, and shade calculations are included. Plans will not be accepted into the building permit plan check process unless these items are included. Calculations of how these areas meet shade requirements must be shown and all areas and their dimensions used in shading calculations must be shown on the shading and/or landscape planting plan.

All landscape, irrigation and shade plans shall be approved by the City of Sacramento (Landscape Architect) or authorized representative. This approval occurs as part of the building permit plan check process.

All plan submittals must include the following information:

1. Name and address of project, assessor's parcel number(s) and locator/vicinity map
2. Property lines and easements (Project limits if other than property lines)
3. All site dimensions (This includes planters, parking layout, walks, building distances, covered parking areas, etc. Planter dimensions must be indicated on the inside of the face of curb).
4. Adjoining property use(s) and existing building setbacks
5. Structures (existing and proposed)
6. Walls and fences
7. Roads, walks, curbs and wheelstops
8. Mowing strips and header boards
9. Drop inlets, catch basins, maintenance holes, power poles, etc.
10. Mounds, banks and swales
11. Location of lighting fixtures

Each sheet must include the following information:

1. Sheet number and title
2. Scale of drawing
3. North arrow
4. Date drawn
5. Date of revision (Each revision must be submitted with clouds, deltas and dates).
6. Tree legends, plant legends, and/or shade calculations where appropriate
7. Appropriate stamp and signature

A. Irrigation Plans:

1. Sprinkler spacing shall not exceed the manufacturer's recommendation.
2. Include irrigation legend defining all symbols used. For each sprinkler head, provide diameter of throw, GPM, precipitation rate and type of head. Denote any other pertinent information such as low angle spray, adjustable spray, diameter, etc.
3. Irrigation system should be designed to meet the City standard pressure flow of 40 psi.
4. Provide backflow prevention device in accordance with the list of approved devices published by the University of California Foundation of Hydraulic Research and Cross-Connection Control. This list is on file in the Building Inspections Division, Commercial Permits counter.
5. Install all valves with threaded unions for easy replacement.
6. Provide controller with at least two (2) programs and at least three (3) start times per station.
7. Provide an irrigation schedule.
8. Provide shut-off valve at point-of-connection.
9. Show locations of all irrigation components and points of connection. Include symbols for each component in a legend (i.e., quick couplers, hose bib and washer boxes).

10. Indicate all main and lateral line sizes. Include class or schedule.

11. Provide Maximum Applied Water Allowance (MAWA) calculations.

12. No sprinklers on risers shall be installed next to walks, streets and/or pavement. Sprinklers in hazardous locations shall be flush mounted or only high-pop models mounted on single or double swing joints are to be used.

13. Irrigation systems shall comply with the City Water Conservation Ordinance.

B. Landscape Plans:

1. Identify any existing tree species, street trees, or covered parking on site for consideration in shade credit calculations.

2. Show location and size of all existing trees and identify those that are to be removed. Existing trees shall be preserved whenever possible and shall be given shading credit, if applicable. No tree over two (2) feet in diameter at breast height shall be removed without specific approval of the City Arborist. A tree removal permit is required for City street trees and heritage trees.

3. Planters in parking lots shall be protected with minimum six (6) inch high/wide concrete curbs. Identify type of curb (extruded or poured). If extruded curbing is used, a detail must be provided to clarify planter width available. All reference to planter size is to clear inside soil width, excluding surrounding curbing and asphalt or foundation intrusions (see Exhibit B).

4. Show location of all proposed trees and shrubs. All shrubs shall be drawn to reflect the average specimen size at maturity. All shade trees shall be drawn to the size indicated on the Shade Tree List (Appendix A) which shows the specimen size at 15 years of age.

5. The soil surface of all planters shall be covered with living groundcover and/or mulch within two (2) years. Exceptions include areas covered with pedestrian pathways and decorative hardscape (i.e. art, archways, arbors, etc.). If mulch is used, spread two (2) inches to six (6) inches of shredded mulch (no wood chips), not to exceed curb or retaining device. Bark mulch is not allowed in a planter area adjacent to a public right-of-way unless six (6) inch curbing is provided.

6. Show the types, quantities and sizes of all trees, shrubs and groundcover. Parking lot shade trees shall be a minimum 15 gallon size.

7. All plants and trees shall be listed by correct botanical name and common name.

8. Lawn shall be indicated by common name of species and method of installation (seed, sod or hydromulch). Sloped areas specifically designed for grass shall be sodded or hydromulched.

9. All parking lots must be screened from view of City streets by either a three (3) foot high earth berm or shrubbery, or combination of both, that can be easily maintained at thirty (30) inch height. Minimum inside planter width is four (4) feet.

10. No tree shall be planted within the sight clearance area of driveways or street/alley intersections. Coniferous trees shall not be planted within five (5) feet of the sight clearance areas.

11. Shrubs must be maintained at a 30" maximum height in site clearance areas.

12. Provide landscape details (i.e., soil preparation, tree staking, etc.) where appropriate.

Note: W*hen planting under power lines, consider tree height. Use species with a maximum height of 25 feet.*

C. Grading Plans:

1. Grading plans showing drainage of all planting areas and heights of mounds shall be provided. Include contour intervals.

2. Mounds and berms shall not have slopes that exceed twenty (20) percent (or 5:1 slope). The toe of any sloping section shall be a minimum of twenty-four (24) inches behind a curb or sidewalk.

3. Mounds over 30 inches high shall not be placed in sight clearance areas.

D. Maintenance:

1 Tree trimming and removal permits are required from City of Sacramento Tree Services to prune or remove parking lot shade trees. There is no cost associated with these permits.

2. All pruning work shall be completed pursuant to International Society of Arboriculture (ISA) and American National Standards Institute (ANSI) standards.

3. Removed trees must be replaced. The formula for replacement shall be as follows:

   Any required trees or other plantings that die or are improperly maintained shall be replaced with healthy specimens of similar species and size. However, replacement trees shall not be required to exceed 48" box size. Removal and replacement of trees that have caused damage to city sidewalks or other city infrastructure shall be reviewed and approved by the City Arborist prior to tree removal. If the removed tree is greater than 48" boxed tree size, then a 48" box tree shall be planted.

VI. TREES FOR PARKING LOT SHADING:

The list of trees for parking lot shading, identified in Appendix A, was compiled to aid in species selection. Any trees proposed to be planted that are not on the list must receive approval from the City Landscape Architect or the City Arborist. Such requests must be submitted through the City Building Division of the Planning and Building Department.

Selection of the trees listed is based on adaptability to parking lot conditions. The characteristics identified in the tree list are provided to help select a good shade tree. The species listed are not suitable for all situations. Consultation with a nursery representative or landscape architect is desirable before any selections are made. Professional guidance is recommended to assure that optimal design is achieved to meet the needs of each development. Proper planting procedures, optimal spacing distance, soil, water requirements and maintenance programs should be ascertained at the start of the landscape project. It is important to note that proper planting procedures may include digging past the hardpan layer to assure deeper and proper growth.

All other energy conservation ordinances, resolutions and measures are available from the Planning and Building Department. Building permit plan approval will be based on these guidelines.

APPENDIX A

Tree List

35' DIAMETER TREES

Shading Calculations: 100% = 962 SQ. FT. 75% = 722 SQ. FT 50% = 481 SQ. FT. 25% = 240 SQ. FT

Botanical Name COMMON NAME	Minimum Planter Width	Height To:	Growth	Roots	Remarks
Celtis australis EUROPEAN HACKBERRY	6'	50'	Moderate	Deep	Deciduous, mod. irrigation, fruit
Fraxinus americana 'Autumn Purple', 'Chicago Regal' WHITE ASH	6'	40'	Fast	Shallow	Deciduous, fall color, some insect & disease damage Mod. irrigation
Fraxinus pennsylvanica 'Patmore', 'Leprechaun', 'Centerpoint' GREEN ASH	6'	40'	Fast	Shallow	Deciduous, some insect and disease damage
Fraxinus uhdei EVERGREEN ASH	6'	40'	Fast	Medium	Evergreen, prone to insect and disease damage
Platanus acerifolia 'Yarwood', 'Bloodgood', x hispanica 'Columbia' LONDON PLANE TREE	6'	70'	Fast	Shallow	Deciduous, red spider, powdery mildew, anthracnose, smog tolerant
*Platanus racemosa CALIFORNIA SYCAMORE	6'	60'	Moderate	Medium	Deciduous, red spider, powdery mildew, anthracnose
*Quercus agrifolia COAST LIVE OAK	6'	40'	Moderate	Deep & greedy	Evergreen, drought tolerant
Quercus coccinea SCARLET OAK	6'	60'	Fast	Deep	Deciduous
Quercus ilex HOLLY OAK	6'	50'	Moderate	Deep	Evergreen, has caterpillars, drought tolerant
*Quercus lobata VALLEY OAK	6'	60'	Moderate	Deep	Deciduous, litters
Quercus macrocarpa BUR OAK	6'	50'	Moderate	Deep	Deciduous, litters
Quercus robur	6'	50'	Moderate	Deep	Deciduous, litters

*California native

ENGLISH OAK					
Quercus rubra RED OAK	6'	60'	Moderate	Deep	Deciduous, avoid clay soils
Quercus suber CORK OAK	6'	70'	Moderate	Deep	Evergreen, drought tolerant
Quercus virginiana SOUTHERN LIVE OAK	6'	60'	Moderate to Fast	Deep	Evergreen, tolerates moisture

30' DIAMETER TREES

Shading Calculations: 100% = 706 SQ. FT. 75% = 530 SQ. FT. 50% = 354 SQ. FT. 25% = 177 SQ. FT.

Botanical Name **COMMON NAME**	**Minimum Planter Width**	**Height To:**	**Growth**	**Roots**	**Remarks**
Acer fremanii 'Autumn Blaze' AUTUMN BLAZE MAPLE	6'	50'	Moderate	Deep	Deciduous, fall color, mod. irrigation
Acer platanoides 'Crimson Sentry' CRIMSON SENTRY MAPLE	6'	40'	Moderate	Shallow	Deciduous, fall color
Acer rubrum 'October Glory' OCTOBER GLORY RED MAPLE	6'	50'	Moderate	Medium	Deciduous, deep watering to keep roots down
Eucalyptus microtheca Coolibah	6'	40'	Fast	Medium	Drought and soil tolerant
Ginkgo biloba MAIDENHAIR TREE	6'	40'	Slow	Deep	Deciduous, gawky when young, use male tree only
Koelreuteria paniculata, bipinnata, elegans GOLDENRAIN, CHINESE FLAME, FORMOSAN FLAME	6'	35'	Slow Moderate	Deep	Deciduous, mod. irrigation, flowers, litters
Magnolia grandiflora SOUTHERN MAGNOLIA	6'	50'	Slow	Deep	Evergreen, litters, Moist, well drained, slightly acid soil
Pinus patula JELECOTE PINE	6'	30'	Fast	Medium	Evergreen, drought tolerant
Pistacia chinensis CHINESE PISTACHE	6'	50'	Moderate	Deep	Deciduous, drought tolerant, fall color, young tree lopsided and gawky
Quercus frainetto 'Forest Green'	6'	50'	Fast	Deep	Deciduous, drought tolerant, acorns

*California native

FOREST GREEN OAK					
Quercus shumardii SHUMARD RED OAK	6’	70’	Moderate	Medium	Deciduous, more drought tolerant than other red oaks
Taxodium distichum BALD CYPRESS	6'	50'	Moderate	Deep	Deciduous, mod. irrigation
Tilia americana AMERICAN LINDEN	6'	50'	Slow to Moderate	Deep	Deciduous, deep rich soil, plenty of water, aphids
Tilia cordata LITTLE LEAF LINDEN	6'	40'	Slow to Moderate	Deep	Deciduous, aphids
Ulmus ‘Frontier’, ‘Prospector’ FRONTIER, PROSPECTOR ELM	6'	40'	Fast	Medium	Deciduous, mod. irrigation, Disease resistant
Ulmus parvifolia ‘Athena’, ‘Allee ATHENA, ALLEE CHINESE ELM	’6'	40'	Fast	Medium	Deciduous, mod. irrigation, Frequent pruning
Zelkova serrata ‘Green Vase’ GREEN VASE ZELKOVA	6'	50'	Moderate	Medium	Deciduous, drought tolerant

25' DIAMETER TREES

Shading Calculations: 100% = 491 SQ. FT. 75% = 368 SQ. FT. 50% = 246 SQ. FT. 25% = 123 SQ. FT.

Botanical Name **COMMON NAME**	**Minimum Planter Width**	**Height To:**	**Growth**	**Roots**	**Remarks**
Carpinus betulus EUROPEAN HORNBEAN	6'	40'	Moderate	Medium	Deciduous, densely pyramidal, availability problems
Laurus nobilis SWEET BAY	6'	30'	Slow	Deep	Evergreen, good drainage, drought tolerant
Nyssa sylvatica TUPELO OR SOUR GUM	6'	40'	Slow	Deep	Deciduous, fall color tolerate poor drainage
Pyrus calleryana ‘Trinity’, ‘Chanticleer’, ‘Redspire’ CALLERY PEAR	6'	40'	Moderate to Fast	Medium	Deciduous, flowers
*Umbellularia californica CALIFORNIA BAY	4-6'	25'	Slow	Medium	Evergreen, drought tolerant, deep soil

*California native

20' DIAMETER TREES

Shading Calculations: 100% = 314 SQ. FT. 75% = 236 SQ. FT. 50% = 157 SQ. FT. 25% = 79 SQ. FT.

Botanical Name COMMON NAME	Minimum Planter Width	Height To:	Growth	Roots	Remarks
Acer buergerianum TRIDENT MAPLE	6'	25'	Moderate	Shallow	Deciduous
Acer campestre HEDGE MAPLE	6'	30'	Slow	Shallow	Deciduous
Acer palmatum JAPANESE MAPLE	4-6'	30'	Moderate	Shallow	Deciduous, fall color, part to full shade
Acer truncatum 'Norwegian Sunset' NORWEGIAN SUNSET MAPLE	6'	30'	Slow	Deep	Deciduous, fall color
Cercis canadensis EASTERN REDBUD	4'	35'	Moderate	Medium	Deciduous, moderate irrigation
Lagerstroemia indica x L. faurei clones CRAPE MYRTLE (Catawba, Cherokee, Pecos, etc.)	4-6'	25'	Slow	Shallow	Deciduous, full sun, mildew. summer flowers
Prunus 'Cascade Snow' CASCADE SNOW CHERRY	4-6'	20'	Moderate	Medium	Deciduous, white flowers, ample water
Prunus cerasifera 'Krauter Vesuvius', CHERRY PLUM	4-6'	20'	Fast	Medium	Deciduous, dark purple leaves, white flowers, fruit
Quercus buckleyi TEXAS RED OAK	6'	30'	Moderate	Deep	Deciduous, fall Color, drought tolerant
Vitex agnus-castus CHASTE TREE	4-6'	20'	Fast	Deep	Deciduous, drought tolerant, flowers
Pyrus kawakamii EVERGREEN PEAR	4-6'	20'	Fast	Medium	Deciduous, white flowers, moderate irrigation.

Note: *Other tree species may be considered on a case-by-case basis, subject to the approval of the City Landscape Architect or City Arborist.*

*California native

APPENDIX B

Definitions

Amended Soil - Soil that is brought to the site to enhance plant growth and typically contains approximately 33 percent clay, 33 percent silt and 33 percent sand.

Clone - Asexually propagated plants with distinguishing characteristics identical to the parent plant.

Continuous Planting Island - Long strips of pervious material that contains trees, shrubs, and ground covers.

Crown - The leaves and branches of a tree or shrub; the upper portion of a tree from the lowest branch on the trunk to the top.

Cultivars - Seed propagated plants that have certain distinguishing characteristics such as fruitlessness, form and pest/disease resistance.

Irregular Tree Well - Tree wells with less than a 6 feet by 6 feet (square) interior dimension.

Native Top Soil - Top soil from the construction site. Native soil may not be suitable for growing plants if it has been altered by previous construction.

Root Barrier – a tool used to deflect tree roots downward as they grow in order to prevent and mitigate damage to land and hardscapes caused from migrating roots that may uplift streets and sidewalks.

Rootable Soil Volume - The volume of soil in and around tree wells and planting islands that tree roots utilize.

Structural Soil- Soil mix that is a load bearing matrix of coarse stone aggregate, topsoil, and binding polymer (to bond top soil with aggregate) that can be extended out under asphalt from the tree well to increase rootable soil volume.

Tree Well - An isolated planting area for a tree to provide limited soil volume for tree roots and rainfall infiltration.

CITY OF SACRAMENTO

PLANNING AND BUILDING DEPARTMENT

LANDSCAPE REQUIREMENTS: WATER CONSERVATION ORDINANCE/SHADING GUIDELINES

CERTIFICATE OF COMPLIANCE

(For commercial, industrial, office, institutional, multi-family, residential common areas, model homes and city maintained planting areas)

Project Information

Project Name: _____

Project Address: _____

Project Type:

- **G** Model Home/Multi-Family
- **G** Commercial/Industrial
- **G** Park/Landscape Corridor/Common Area
- **G** Other: _____

Contractor Certification

I/We certify that the landscape planting and irrigation system have been installed in accordance with the approved plans and specifications.

_____

Contractor Signature | Date | State License Number

Landscape Architect/Designer Certification

Landscape Architect/Designer: _____

State License Number: _____

Address: _____

City/State/Zip Code: _____

Telephone #: _____

Email Address: _____

I/We certify that the above referenced project has been substantially installed in accordance with the "Water Conserving Landscape Requirements," and the "Parking Lot Tree Shading Design and Maintenance Guidelines," and that the installed landscape plantings and irrigation system conform to the approved plans and specifications.

_____

Landscape Architect/Designer Signature or Irrigation Consultant | Date | State License Number