

Landscape Architecture PS & E Guide

SECTION 4

Highway Planting Design, Plans, Plant List and Specifications Sheet

Contents

Design Guidelines

- 4-1 [General - for Highway Planting and Highway Planting Restoration Projects](#)
- 4-1 [Design Considerations - for Planting and Irrigation](#)
 - 4-1 [Median Planting](#)
 - 4-1 [Narrow Areas and Gore Areas](#)
 - 4-4 [Slope Paving](#)
 - 4-4 [Guidelines for Slope Treatment](#)
 - 4-4 [Procedure for Slope Treatment](#)
 - 4-4 [Design for Function & Maintainability](#)
- 4-5 [Sight Distance and Clear Recovery Zone Standards](#)
 - 4-5 [Sight Distance Setbacks](#)
 - 4-6 [Clear Recovery Zone](#)
 - 4-6 [Guide for Sight Distance and Recovery Area Setbacks for Highway Planting Projects](#)
- 4-9 [Planting Design](#)
 - 4-9 [Questions the Designer Should Ask Themselves](#)
 - 4-10 [A Review of the DON'TS of Good Design](#)
 - 4-10 [Mitigation Plan Check List](#)
- 4-11 [Plant Plan w/CADD Information](#)

Plant List & Planting Specifications Sheet

- 4-13 [Column Headings General](#)
- 4-14 [Repeating Information](#)
- 4-14 [Blank Boxes](#)
- 4-14 [Row Modifications](#)
- 4-14 [Abbreviations](#)
- 4-15 [Legend](#)
- 4-16 [Plant Group & Size](#)
- 4-17 [Plant Group & Size Designations](#)
- 4-18 [Nursery Plant Container Size](#)
- 4-19 [Palm Tree Height](#)
- 4-19 [Plant Number & Symbol](#)
- 4-20 [Botanical Name & Common Name](#)
- 4-21 [Calculating Plant Quantities](#)
- 4-22 [Plant Spacing & Area Chart](#)
- 4-22 [Quantity](#)
- 4-22 [Hole Size](#)
- 4-23 [Basin Type](#)
- 4-23 [Iron Sulfate & Soil Amendment](#)
- 4-23 [Commercial Fertilizer](#)

*Highway Planting Design Plans
and Plant List Specifications Sheet
Contents continued*

4-24	<u>Basin Mulch</u>
4-24	<u>Staking</u>
4-26	<u>Planting Limits</u>
4-26	<u>Points of Measurement</u>
4-27	<u>Remarks</u>
4-27	<u>Check List for Plant List and Planting Specifications Sheet</u>
4-29	<u>Plant List and Planting Specifications w/CADD Information</u>

Notice

This Section provides mandatory, advisory and permissive standards as defined in Index 82.1 of the Highway Design Manual. The Division of Design is responsible for approving exceptions to all mandatory standards (**Boldfaced** type) and the District Directors are responsible for approving exceptions to all advisory standards (indicated by Underlining) as discussed in Index 82.2 of the Highway Design Manual. All other guidance in this Section pertaining to the design of planting and irrigation systems is the responsibility of the Landscape Architecture Program (LAP). Exceptions to the guidance may be permitted with the approval of the Landscape Architecture LAP Coordinator.

The content of pages 4-1 and pages 4-4 thru 4-6 are from the Highway Design Manual, Chapter 900 Landscape Architecture (September, 1 2006), Topic 902 - Highway Planting Guidelines, except for additional information that has been added and is shown in *italics*.

Design Guidelines

General - for Highway Planting and Highway Planting Restoration Projects

Highway planting is vegetation placed for aesthetic, safety, environmental mitigation, stormwater pollution prevention or erosion control purposes, and includes necessary irrigation systems, inert materials, mulches, Design for Safety features and appurtenances.

In addition, highway planting is used to satisfy the need for headlight glare reduction, fire retardance, windbreak protection, or graffiti reduction on retaining walls and noise barriers.

Design Considerations - for Planting and Irrigation

Planting and irrigation systems should be designed to achieve a balance between aesthetics, safety, maintainability, cost-effectiveness, and resource conservation. Plantings should be responsive to local community goals.

Simple solutions are the best for highway work. Develop a clear design concept. Is your planting design simple and appropriate for viewing at highway speed? A motorist traveling through your project will only view it for a very few seconds. Shrub and tree masses should be large. Fussy detail is not visible to the motorist.

Median Planting

Median planting should not be permitted on freeways. Exceptions for the planting of freeway medians are approved by the District Director if the planting can be safely maintained.

Narrow Areas and Gore Areas

Narrow areas and gore areas should be paved whenever possible. Unpaved narrow strips often result from the construction of noise barriers or concrete barriers beyond the paved shoulder edge. Unpaved strips 15 feet or less in width, parallel and immediately adjacent to the roadway, should be paved to the barrier or wall. Paving these areas eliminates the need for manual vegetation control, and allows automated equipment to remove litter and debris. Pavement requirements are consistent with the guidance contained in

this manual. Contrasting surface treatment such as markings, delineation, or color may also be provided so drivers can distinguish these areas from those intended for vehicular use.

Unpaved areas greater than 15 feet in width may include vegetation control techniques such as weed control mats, patterned asphalt or stamped concrete paving, or the planting of low maintenance vegetation such as native grasses. Consult the District Landscape Architect and District Maintenance to select an appropriate vegetation control technique.

Unpaved area beyond the gore pavement should be paved as per Index 504.2(2), Highway Design Manual.

From Index 504.2(2), Highway Design Manual:

The exit nose shown on Figure 504.2B in the Highway Design Manual (Figure 4-2 below) may be located downstream of the 23-foot dimension; however, the maximum paved width between the mainline and ramp shoulder edges should be 20 feet. Also, see pavement cross slope requirements in Index 504.2(5).

Contrasting surface treatment beyond the gore pavement should be provided on both entrance and exit ramps as shown on Figures 504.2A, in the Highway Design Manual (Figure 4-1 below), 504.2B in the Highway Design Manual (Figure 4-2 below), and 504.3L in the Highway Design Manual (Figure 4-3 below). This treatment can both enhance aesthetics and minimize maintenance efforts. It should be designed so that a driver will be able to identify and differentiate the contrasting surface treatment from the pavement areas that are intended for regular or occasional vehicular use (e.g., traveled way, shoulders, paved gore, etc.) Consult with the District Landscape Architect, District Materials Engineer, and District Maintenance Engineer to determine the appropriate contrasting surface treatment of the facility at a specific location.

Refer to the HOV Guidelines for additional information specific to direct connections to HOV lanes.

Figure 4-1
Single-Lane Freeway Entrance

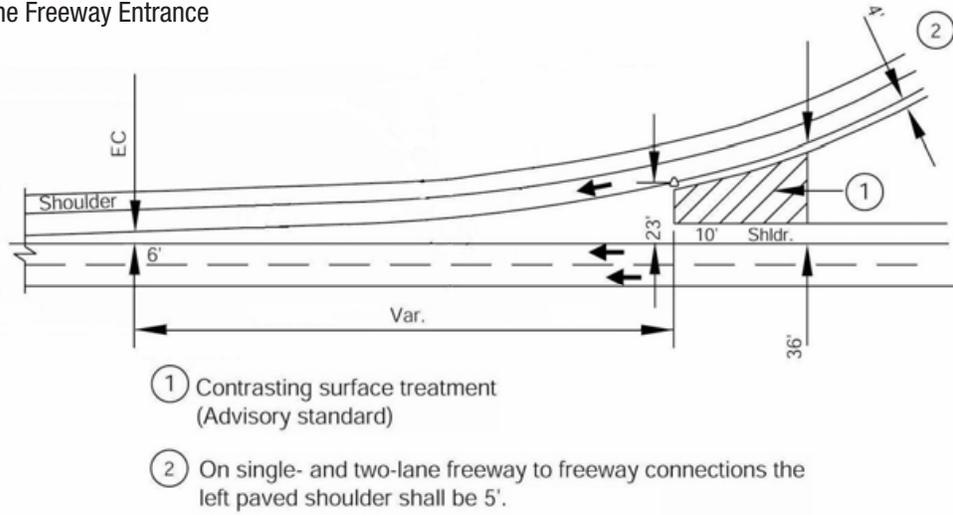


Figure 4-2
Single-Lane Freeway Exit

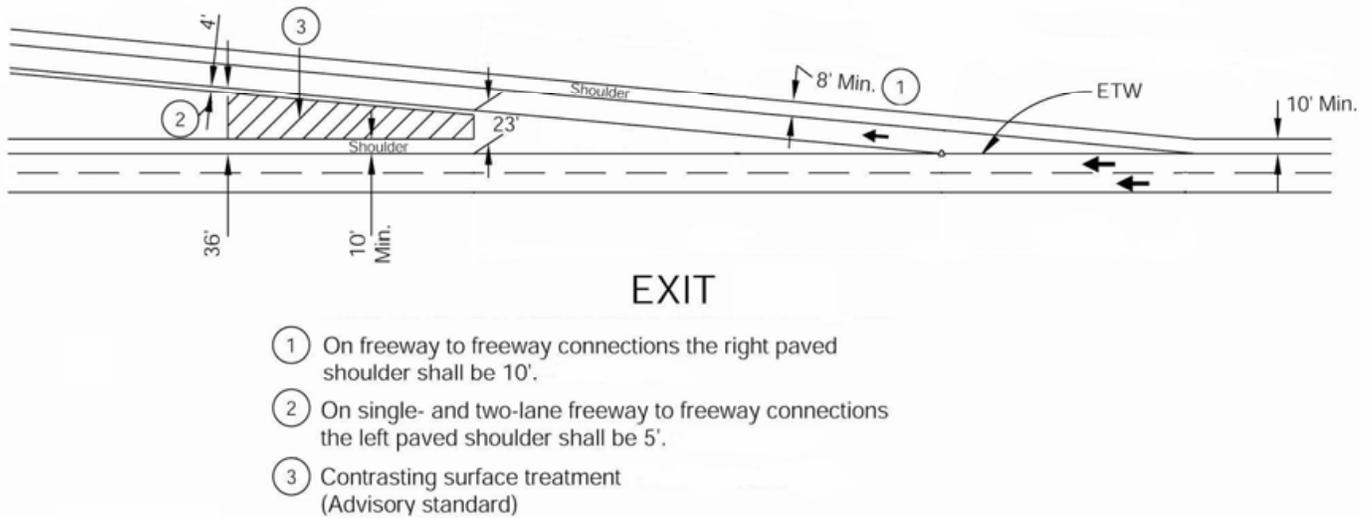
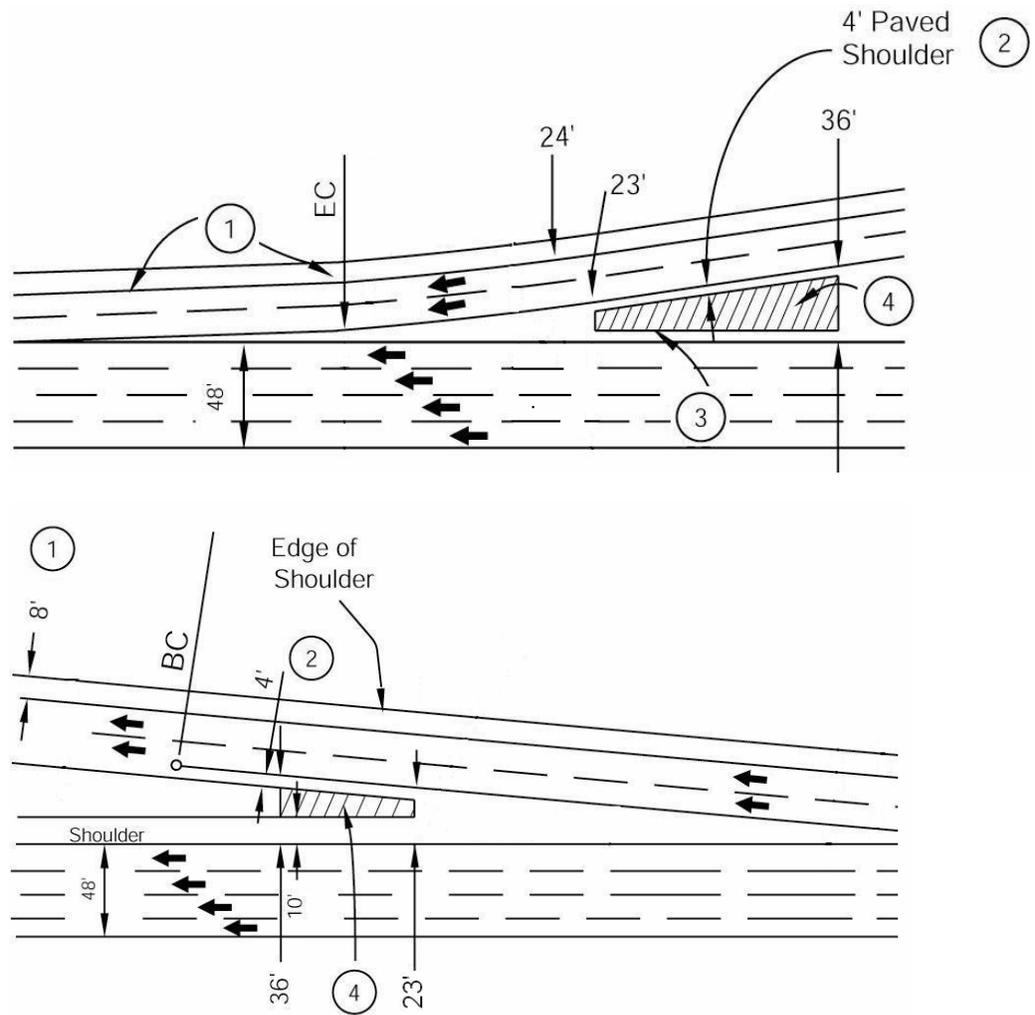


Figure 4-3
Two-Lane Entrance and Exit Ramps



- ① 10' for Branch Connections
- ② 5' for Branch Connections
- ③ B-4 Curb Optional
- ④ Contrasting surface treatment beyond the gore pavement (Advisory standard)

Slope Paving

Structure end slope should be treated to:

- Protect slopes.
- Improve aesthetics.
- Reduce long term maintenance costs.

Slopes need to be protected. The District will determine where slopes are to be paved or the type of treatment to be used. Caltrans maintenance, landscape architecture, materials, design, and other affected units will furnish input to determine slope treatment needed at each site. Local agency input should be obtained for urban undercrossings.

All types of slope treatments require adequate drainage facilities for water from the upper roadway. Inadequate drainage is a major source of slope erosion.

Guidelines for Slope Treatment

- a. Full slope paving shall be installed where it is anticipated that erosion by pedestrians, wind, storm water, or other causes will occur. High landscape maintenance costs caused by inadequate moisture, sunlight, instability to establish vegetation etc., may also justify the use of full slope paving in lieu of planting. The District Landscape Architect will provide input for aesthetics and waterline crossover conduit, as well as locations for slope paving.
- b. Landscaped structure end slopes may be justified when adjacent slopes are landscaped and when landscaping is compatible with adjacent development. Conditions must exist where plants would have strong likelihood of survival.
- c. Bare slopes have minimum initial costs and higher maintenance costs which vary with the site. Bare structure end slopes may be justified at rural sites and other areas where anticipated maintenance activity will be low and there is little likelihood for erosion. Appropriate drainage design is critical when slopes are left bare.
- d. Adequate drainage facilities must be provided to prevent saturation of abutment foundation materials and damage to slope treatment.

- e. Additional protection may be required at stream crossings to provide for flow velocity.

Procedure for Slope Treatment

Based on consultation with the District Landscape Architect and Structures Bridge Architect, and in consideration of economic and aesthetic factors, the District will determine, and set forth with the bridge site plan submittal, the type of slope treatment indicating whether:

- a. The Division of Engineering Services is to design the slope treatment with the bridge and include the cost in the Structure items; or
- b. The District will design the slope treatment and include the details with the road plans.

Design for Function & Maintainability

Maintenance-intensive activities should be identified and minimized by design. These activities can be determined through field observation or discussions with maintenance personnel during project development. See Section 1 for Field Check List. Ongoing communication between designers, landscape specialists, landscape maintenance personnel, and construction inspectors will ensure that maintenance concerns are addressed.

Think "end result"... what will your project look like in 5 years, 10 years, or 20 years? What are the long term costs and tasks associated with the proposed design?

Design projects that solve existing and possible future stormwater pollution problems. Do not use mulch to solve long term erosion problems.

Provide for the simplest possible planting design that will meet design objectives for an attractive landscape. The simpler the design, the simpler the irrigation system (fewer valves, less pipe, less wire, etc.).

Design should accommodate typical maintenance practices and equipment, e.g. not interfering with pulling hoses, mowing, edging and minimizing the need to maintain slope areas and recovery areas, etc.

Design for Function & Maintainability continued

Planting shall maximize cover (including adequate on center spacing) by the end of the three year plant establishment period.

Mulch is a temporary weed suppression method until plants fill in.

Planting and irrigation shall reflect the goal of reduced herbicide use.

Maximize use of overhead irrigation to enhance safety and maintainability. Whenever possible, include the placement of irrigation mains, wire and laterals away from shoulders to reduce possible damage caused by future construction or vehicles parked on the roadside and allow safer maintenance.

Adequate plant establishment and irrigation test periods shall be provided. The length of Plant Establishment (PE) should be consistent with the amount of new planting vs. existing planting to remain. For example, a 3-year PE period is inappropriate on an irrigation upgrade project that contains only a minor amount of new planting.

Identify areas subject to recurring traffic accidents or shoulder traffic and design projects accordingly. For example, do not place plant material or irrigation equipment in areas where trucks frequently pull off the highway to park.

If the existing irrigation system is greater than 15 years old and poorly maintained, remove and replace the entire system.

Provide a road edge treatment to reduce or eliminate weeds adjacent to the pavement.

Use mulch, inert materials or plants that will fill in within 3-4 years. Soil areas where improvements are not included will become weedy and will detract from the appearance of your design, and require long term maintenance.

Sight Distance and Clear Recovery Zone Standards

Sight distance and safety are of primary importance, and shall not be subordinated to aesthetics. Applicable minimum horizontal and vertical sight distance standards are set forth in Topic 201, Sight Distance in the Highway Design Manual

Two types of safety setbacks affect the placement of landscape elements:

- To keep the continuous length of highway ahead visible to the driver (sight distance).
- To keep the clear recovery zone free of physical obstructions.

Sight Distance Setbacks

Sight distance limits are measured from the edge of traveled way to the outside edge of the mature growth. Care shall be taken to ensure that future growth will not obstruct sight distance.

Proposed mature planting should maintain horizontal and vertical sight distance required by the design speed of the facility. In cases where, due to geometric restrictions, the existing facility does not provide 80 mph sight distance, no further reduction should be caused by planting.

For Interchanges, all planting shall provide ramp and collector-distributor road sight distance equal to or greater than that required by the design speed criteria with a minimum provision of sight distance for 38 mph. At points within an interchange area where ramp connections or channelization are provided, plantings shall be clear of the shoulders and sight line shown in Figure 504.3J, Location of Ramp Intersections on Crossroads, in the Highway Design Manual.

Particular attention should be paid to planting on the inside of curves, in interchange loops, in median areas, on the ends of ramps, and on cut slopes so that shoulders are clear and designed sight distances are retained.

Sight distance setbacks restrict the height of plants or the horizontal distance of plants from the traveled way. Low growing plants may be placed in front of the setbacks as long as the requirements for sight distance are met as discussed in Index 201.6 and illustrated in Figure 201.6, Stopping Site Distance on Horizontal Curves, in the Highway Design Manual.

Sight Distance Setbacks continued

Taller growing plants shall be placed beyond these setbacks. In interchange areas, generally, from the edge of traveled way, a 50 foot setback within the loops is considered as the sight distance setback for trees and shrubs that will grow above 18 inches in height.

Clear Recovery Zone

Recovery zone setbacks provide areas for errant vehicles to regain control. The policy along freeways and expressways, including interchange areas, should be to strive for 40 feet or more of clearance between the edge of traveled way and large trees, but with a minimum clearance of 30 feet. Special considerations should be given to providing additional clearance in potential recovery areas. The 30 foot distance is measured horizontally to the trunk of the tree. For setback purposes large trees are defined as plants which at maturity, or within 10 years, have trunks 4 inches or greater in diameter, measured 4 feet above the ground. Large trees may be planted within the 30 foot limit where they will not constitute a fixed object; for example, on cut slopes, above a retaining wall or in areas behind guard railing or barrier which has been placed for reasons other than the tree planting.

Small trees are those with smaller trunks or plants usually considered shrubs, but trained in tree form which would not develop 4 inch diameter trunks within 10 years. Examples of small trees are Western Redbud (*Cercis occidentalis*), Crape Myrtle (*Lagerstroemia indica*), Bottle Brush (*Callistemon* sp.), and Oleander (*Nerium oleander*).

Exceptions to the 30 foot setback may also be considered on cut slopes which are 2:1 or steeper or when there are physical barriers such as retaining walls. The minimum setback in these cases should be 25 feet.

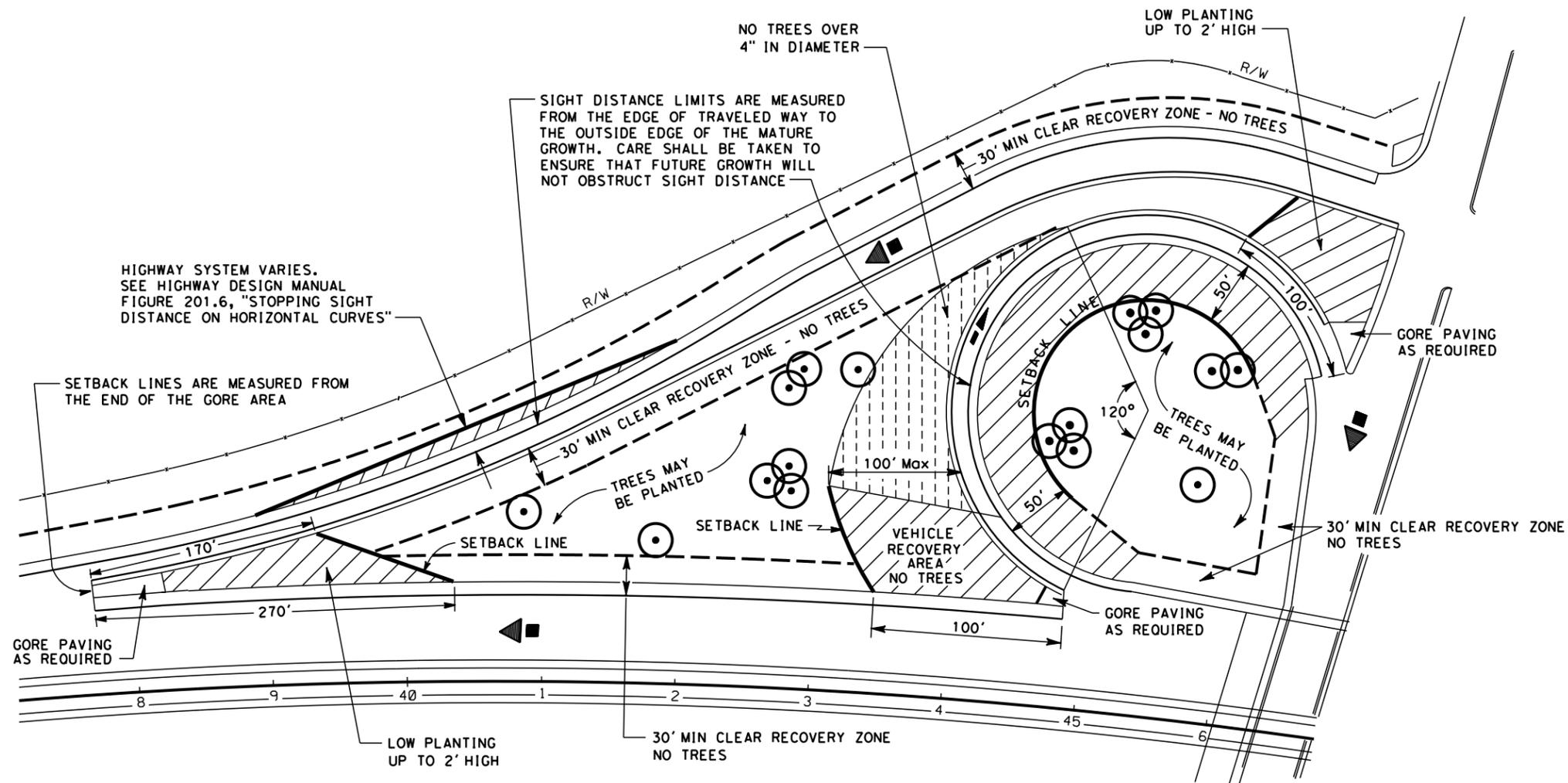
Offset distances greater than 30 feet should be provided at locations such as on the outside of horizontal curves, near ramp gores, at points of congestion, or where evasive maneuvers may be required.

Large trees should not be planted in unprotected areas of freeway or expressway medians with the possible exception of separated roadways with medians of sufficient width to meet the setback requirements for tree planting.

Guide for Sight Distance and Recovery Area Setbacks for Highway Planting Projects

Due to questions regarding interpretation of the Highway Design Manual the Landscape Architecture Program (LAP), in coordination with the Division of Traffic Operations, has developed the following diagram on Pages 4-7 and 4-8. Though interchanges vary throughout the transportation system, these diagrams provide general guidance for safe placement of plant material to comply with sight distance and vehicle recovery areas. If you have any questions regarding these diagrams, please contact your LAP, District Coordinator.

Guide for Sight Distance and Recovery Area Setbacks for Highway Planting Projects

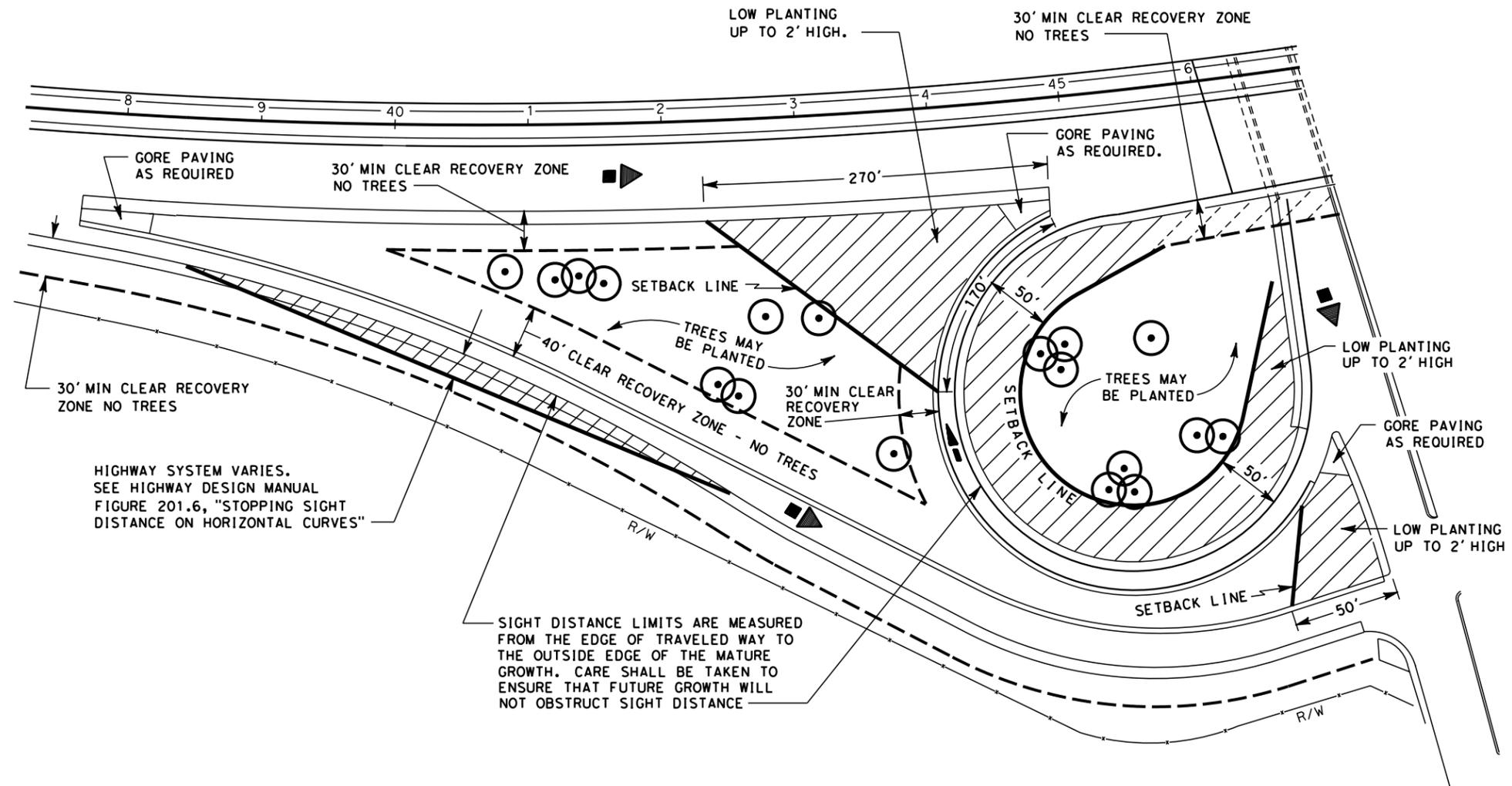


NOTES:

1. TREES 4" MAXIMUM DIAMETER AND TREES AND SHRUBS 30' AND TALLER SHALL BE PLANTED BEHIND THE SETBACK LINES SHOWN ON THE DIAGRAM.
2. FOR MORE INFORMATION ON THE RECOVERY ZONES AND RECOVERABLE SLOPES, REFER TO THE HIGHWAY DESIGN MANUAL, CHAPTER 900.
3. CLEAR RECOVERY ZONE, 30' MINIMUM, STRIVE FOR 40'. DISTRICT COORDINATOR APPROVAL REQUIRED FOR TREES PLANTED BETWEEN 30' AND 40'.

GUIDE FOR SIGHT DISTANCE AND RECOVERY AREA SETBACKS FOR HIGHWAY PLANTING PROJECTS

SCALE 1"=50'



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GUIDE FOR SIGHT DISTANCE AND RECOVERY AREA SETBACKS FOR HIGHWAY PLANTING PROJECTS

SCALE 1"=50'

Planting Design

Questions the Designer Should Ask Themselves

- Is your planting design simple and appropriate for viewing at highway speed?
- Do you have a clear understanding of the needs of all stakeholders?
- Does the project fit in with the adjacent community?
- Is the project compatible with surrounding highway planting, pavement, and structure design? Corridor design consistency is an important issue.
- Does this design provide safe access to all work areas?
- Are there sufficient access gates, maintenance vehicle pullouts (MVP) and access roads? Are they in the proper locations?
- Does this design minimize maintenance worker's exposure to traffic?
- Does the design avoid planting in difficult or dangerous to maintain areas; such as gore areas or behind noise barriers?
- Will plant selection and location minimize pruning and edging, and provide sufficient space or eliminate the need for mowing?
- Is there access for minimal pruning and removing debris?
- Does the plant selection and placement provide enough space to allow plants to mature without encroaching on the roadway, adjacent properties, ditches and signs? Are setback requirements met?
- Is the plant selection appropriate for the area and environmental conditions (soil, rain, and temperature)? Are the requirements (sun exposure, water) for the plants similar and compatible?
- Are the proposed plant materials "tried and true"? If not, are they used in such a manner as not to leave maintenance a weedy mess if they fail?
- Will the plants selected minimize pest and disease problems?
- Are noxious or invasive weeds present in the area? Has this project addressed their removal?
- Are diseased plants removed and properly disposed of?
- Does this design minimize cover for transients or others?
- Are all gore areas and narrow areas paved or treated for permanent weed control?
- Does this design provide for minimum weed control and minimize the need for herbicide spraying?
- Is mulch specified properly and in appropriate locations and quantities?
- Has mulch only been placed where it is not intended to be a permanent erosion control or weed suppression solution?
- Does the design, including mulch placement, avoid interrupting the flow in ditches and swales? Does the design facilitate access for cleaning and repairing drainage systems?
- Does the design avoid or remove trees that are under overhead facilities, and in front of signs or billboards?
- If this is a rehabilitation project, will the proposed improvements make the existing landscape and irrigation systems easier to maintain?
- Are the plant materials available and have you checked on the supply of materials?

Note: As designers, you have to remember how your design will be seen and how it will be maintained. Highway planting design is entirely different from park or back yard design. Fussy design with a multitude of plant varieties is not warranted or maintainable!

A Review of the DON'TS of Good Design

DON'T:

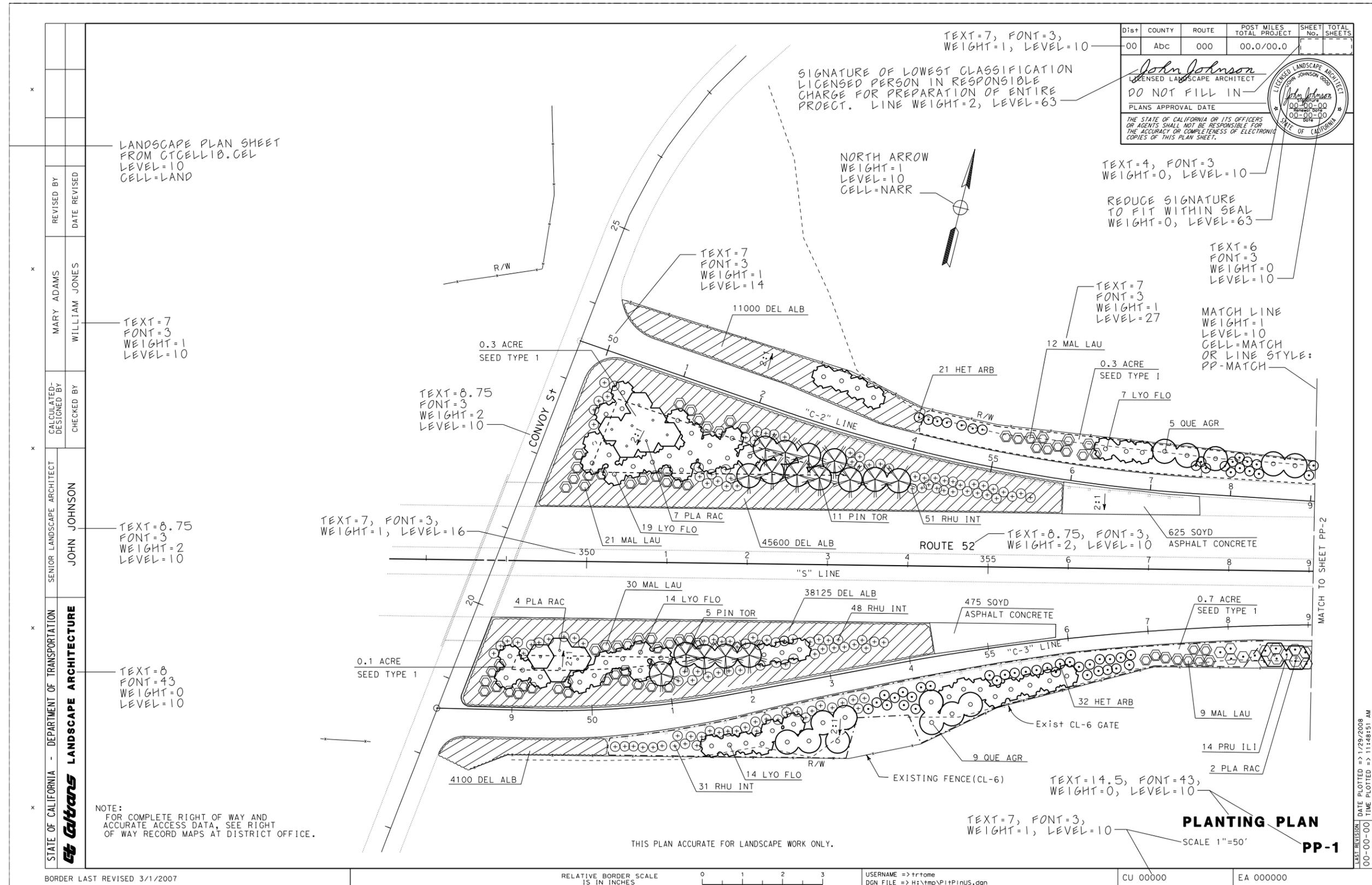
- Plant trees under utility lines.
- Plant trees within the clear recovery zone.
- Plant trees and shrubs on inside of curves on off-ramps or on-ramps that will block sight distance for the driver.
- Plant trees or shrubs that will eventually screen on-premise signs for businesses or shopping centers.
- Plant trees or shrubs that will screen highway advisory signs.
- Plant trees that will screen existing billboards.
- Plant trees with brittle branches where they can fall or blow onto the traveled way.
- Plant in narrow gore areas that are less than 30 feet wide.
- Plant trees and shrubs with edible or attractive fruit (they may attract people to get out of their cars and wildlife).
- Plant vines on bridge structures.
- Plant median areas unless the area can be safely maintained.
- Disregard the minimum setbacks from traveled way, pavement, fences, walls, paved and earth ditches as provided in the Plant Setback and Spacing Guide.
- Use mulch as a permanent ground cover.

Mitigation Plan Check List

- Review the environmental assessment (preferably while still draft) with the Environmental generalist and/or Biologist.
- Review the proposed mitigation and permit requirements with the Environmental generalist and/or Biologist to determine if implementation is reasonable and appropriate.
- Discuss plant establishment period and what is reasonable, appropriate and meets Caltrans policies.
- Discuss if mitigation work will be accomplished with the road contract or by a separate contract (with funding from the parent project).
- Review project report and section on biological mitigation
- Review mitigation site with engineer and biologist
- Determine if replacement plant ratios from the environmental assessment or project report are realistic, it may be appropriate to request an amended agreement if replacement ratios are unreasonable
- Photograph site, request aerial photographs

- Determine with biologist and engineer boundary of ESA if applicable
- Identify with biologist all native plants on site
- Determine if salvaging plants is a viable option to container grown plants
- Determine existing percent plant cover of site with biologist
- Order a soil test of the site if necessary
- Determine if duff is a viable option for the site, often required in permit
- Determine if stock-piling soil is a viable option, often required in permit
- Ascertain if rodent control is required or is a raptor perch a viable alternative to bait control, also consider root protectors
- Discuss with biologist if browsing animals frequent the site, consider foliage protectors if appropriate
- Determine how plants will be watered, hand watered, temp irrigation system, truck watering, deep pipe irrigation, etc.
- Read permits for use of restricted pesticides and consider options
- Review DFG 2080 permit restrictions
- Discuss with biologist planting windows and planting time frame
- Determine if collecting seed on site is an option
- Discuss with biologist pros and cons of contract growing
- Determine appropriate growing container for each plant species if contract growing, i.e., super cells, tall pots, etc.
- Discuss with biologist any permit restrictions imposed by permitting resource agency

Plant Plan w/CADD Information



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Plant List & Planting Specifications Sheet

Column Headings General

Headings may not be altered, but circled note numbers may be added. Do not change names or add additional information in column heading boxes.

PLANT GROUP	PLANT No.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY EACH	HOLE SIZE (INCH)		BASIN TYPE	IRON SULFATE	SOIL AMEND
							DIA	DEPTH		①	①
COMMERCIAL FERTILIZER		①	BASIN MULCH	STAKING	PLANTING LIMITS						REMARKS
PLANTING	PLT ESTB	MINIMUM DISTANCE (Ft) FROM				ON CENTER (Ft)					
		TRVD WAY	PVMT	FENCE	WALL		PAVED DITCH	EARTH DITCH			

Standard Notes - When standard notes are applicable, circle the note number in the Standard Note list below and show the number circled in the appropriate box. Additional numbered notes may be added following the standard notes.

Standard Notes

EXPLANATION

Standard Note "1" is pre-circled and is shown in the column headings for Iron Sulfate, Soil Amendment, and Commercial Fertilizer.

APPLICABLE WHEN CIRCLED:

- ① Quantities shown are "per plant" unless shown as SQFT or SQYD application rates.
- 2 Sufficient to receive root ball
- 3 Does not apply to mulch areas
- 4 As shown on plans
- 5 Unless otherwise shown on plans
- 6 See detail
- 7 See Special Provisions

Repeating Information

Exp. 1	Exp. 2	
SIZE	SIZE	Examples of Repeating Information
No. 1	No. 1	
No. 1		Identical information listed more than once in a column under the same heading can be repeated in each applicable box, as shown in example 1.
No. 1		or
No. 1		Identical information listed more than three consecutive times in a column may be indicated by showing an "Arrow" between the first and last listing, as shown in example 2.
No. 1		or
No. 1		Identical information listed more than three consecutive times in a column may be indicated by showing an "Arrow" between the first and last listing, as shown in example 2.
No. 1		You must show the arrow entering the top and bottom boxes as shown.
No. 1	No. 1	<u>"Dittos" are not allowed.</u>

Blank Boxes

Show a single dash in each box which has no entry.

Row Modifications

Row heights may be increased or reduced to accommodate data. When a project specifies only a few plants, the excess lines (rows of boxes) may be removed, planting notes may be repositioned. The resulting space may be used for additional planting notes, non-standard planting details, etc.

Abbreviations

Abbreviations listed below are those used on the Plant List and Planting Specifications sheet. Note that only the abbreviation "No." is followed by a ".". Do not add periods to other abbreviations.

At your option, these abbreviations may be deleted since they appear in the Standard Plans. This option requires Standard Plans A10B and H1 to cover all of these abbreviations. The reason they have been included in both locations is to eliminate the need for the Contractor to look up the meaning of the abbreviations in the **Standard Plans** booklet.

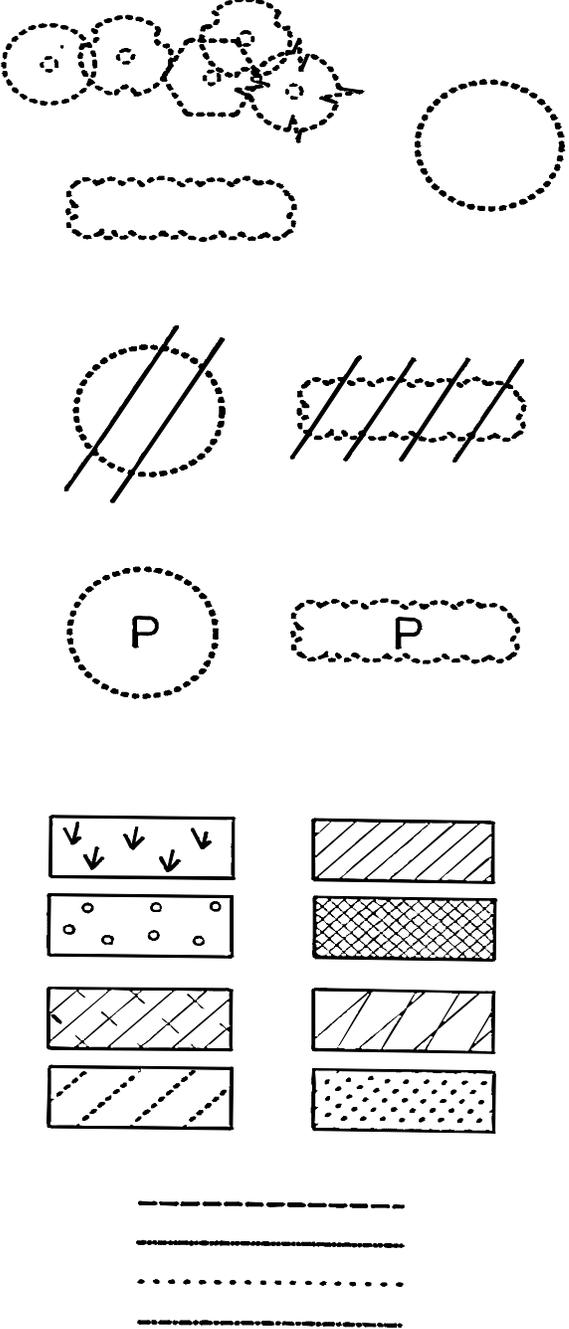
<i>Description</i>	<i>Abbreviation</i>
amendment	AMEND
balled and burlapped	B & B
cubic feet	CF
diameter	Dia
each	EA
foot/feet	Ft
maximum	Max
minimum	Min
no common name	NCN
number	No.
ounce	Oz
packet	Pkt
pavement	Pvmt
plant establishment	PLT ESTB
pound	LB
right of way	R/W
square feet	SQFT
square yard*	SQYD
state-furnished	SF
traveled	TRVD

* Must add to Plant List and Planting Specifications sheet if not in list of abbreviations.

Legend

A legend should be added to the bottom of the Plant List sheet to show symbols for existing plants, plants to be removed, wildflower seeding areas, erosion control, asphalt paving, minor concrete, environmentally sensitive areas (ESA), etc. Do not repeat legend on each plan sheet.

The following symbols are shown for example only. There are no standard symbols for the items shown. Choose a symbol that is easy to read on the plans and not time consuming to draw.

<p>Symbols can be used to show existing plant material either in dashed circles or dropped out with solid or dashed lines. When existing plant material is to be maintained as part of the project it MUST be shown on the plans.</p> <p>Use hatched lines thru a symbol to illustrate plants to be removed.</p> <p>A symbol may be used to indicate which plants to be pruned. Give pruning instructions beside the symbol or in the special provisions.</p> <p>Show symbols for wild flower seeding and erosion control areas. Seed mixes do not belong on the plant list. Seed mixes are described in the special provisions.</p> <p>Symbols should be used to show areas to receive pavement, rock blanket, concrete, decomposed granite, etc.</p> <p>Lines around an area can be used to identify limits of certain work, i.e., areas to be mulched.</p>	
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Plant Group & Size

The Plant Group indicates the plant container size. In the “Plant Group” column, indicate each plant group by letter designation and by placing a line between groups. In the

“Size” column, show the appropriate corresponding size for each plant. The standard plant group and size designations are listed on the next page.

EXAMPLE:

Plant Group	Plant No.	Symbol	Botanical Name	Common Name	Size
A	1		<u>ESCALLONIA RUBRA</u>	RED ESCALLONIA	No. 1
	2		<u>MYOPORUM LAETUM</u>	—————	No. 1
	3		<u>NERIUM OLEANDER</u> <u>'SISTER AGNES'</u>	OLEANDER 'SISTER AGNES'	No. 1
B	4		<u>ALBIZIA JULIBRISSIN</u>	SILK TREE	No. 5
	5		<u>SCHINUS MOLLE</u>	CALIFORNIA PEPPER TREE	No. 5
F	6		<u>VINCA MAJOR</u>	PERIWINKLE	IN FLATS
U	7		<u>KOELREUTERIA BIPINNATA</u>	CHINESE FLAME TREE	No. 15
Z	8		<u>WASHINGTONIA ROBUSTA</u>	MEXICAN FAN PALM	6 Ft* 9 Ft 15 Ft*

*See [Palm Tree Height](#) on page 4-19

Plant Group & Size Designations

<i>"Plant Group" Designations</i>	<i>Definitions</i>	<i>"Size"</i>
A	No. 1 container ²	No. 1
B	No. 5 container ²	No. 5
C	Balled & Burlapped	B & B
D	Root Clump	ROOT CLUMP
E	Bulb	___" BULB Size of bulb in inches or a size range of bulb in inches
F	Flat ⁵	IN FLATS
G	Rooted Cutting	ROOTED CUTTING
H	Cutting ^{1,7}	CUTTING
I	Pot ³	POT
K	Box ⁴	___"BOX Size of box in inches.
L	Pot (State Furnished) ^{1,3}	POT
M	Liner ³	LINER
N	No. 1 container ² (State Furnished) ¹	No. 1
O	Acorn	ACORN
P	Plug	PLUG
R	Seedling (State Furnished) ¹	SEEDLING
S	Seedling	SEEDLING
T	Turf (Sod)	TURF (SOD)
U	No.15 container ²	No. 15
W	Willow Cutting ⁷	WILLOW CUTTING
X	Tamarix Cutting ⁷	TAMARIX CUTTING
Z	Palm Tree ⁶	B & B or ___"BOX Size of box in inches. Add a circled note number to specify "tree height" or "trunk height." See <u>Palm Tree Height</u> on page 4-19

¹ If State Furnished show "SF" in the "Remarks" column.

² See "Nursery Plant Container Size" on the next page for an explanation.

³ Indicate the "Size" of the pot, liner or cutting in the special provisions and show the word **POT, LINER, CUTTING, WILLOW CUTTING OR TAMARIX CUTTING** and use standard note "7" "See Special Provisions" in the size column. SEE ⁷ BELOW.

⁴ Indicate size in inches, i.e., **24" BOX**.

⁵ Use **"IN FLATS"** (DO NOT ALTER) Show quantity of plants to be delivered in flats on the project in the "QUANTITY" column. Do not show the quantity of FLATS.

⁶ See Palm Tree Height on page 4-19.

⁷ Show standard note "8", "See Standard Specifications" in the size column for Carpobrotus or Delosperma cuttings.

Nursery Plant Container Size¹

Relation of Container Classes with Imperial Volumes:

Each container class includes a range of acceptable container volumes, and is not limited to a single container volume (e.g., a certain number of “gallons”). The volume ranges for container classes #1 through #100 include the volume of a container that, if such a container were manufactured, would hold the equivalent number of gallons as the container class number. Standard users should refer to container manufacturers’ volume specifications for compliance with the Standard. *Nursery stock specifications that reference only an imperial volume measurement, such as “quarts” or “gallons,” are not in accordance with the Standard.*

Small Plant Containers (“SP” designation):

Generally, containers commonly referenced in the industry as ‘4-inch’ or ‘quart’ containers are #SP4 containers (1 qt. = 57.75 cubic inches). If growers, buyers or specifiers include dimension measurements or imperial volume references, they are encouraged to also specify ‘round’ or ‘square,’ and to reference the appropriate container classification in the Container Class Table in order to assure adequate soil volume in the container. *Dimension measurements foursquare containers shall be taken along one side and not diagonally.*

Retail Consumer Transactions:

The Standard is only applicable to nursery stock transactions within the trade, and does not apply to retail consumer transactions. The Standard does not recognize or sanction the practice of using only an imperial volume or dimension measurement of a certain container to indicate the size of a plant in retail consumer transactions.

Container Class	Container Volume Cubic Inches / min – max
#SP1	6.5 – 8
#SP2	13 – 15
#SP3	20 – 30
#SP4	51 – 63
#SP5	93 – 136
#1	152 – 521
#2	320 – 474
#3	628 – 742
#5	785 – 1242
#7	1337 – 1790
#10	2080 – 2646
#15	2768 – 3696

¹ This material from the American Standard for Nursery Stock, Copyright 2004 by American Nursery & Landscape Association, 1000 Vermont Avenue, NW, Suite 300, Washington, DC 20005, ISBN 1-890148-06-7.

Palm Tree Height

In size grading palm trees, height shall take precedence. Either of two heights may be specified: **overall height** or **trunk height**.

Overall height is the perpendicular height from the ground, which should be at or near the top of the root zone, to the top of the arc made by the uppermost arching frond with the tree standing in natural position.

Trunk height is measured from the ground line, which should be at or near the top of the root zone, to the base of the heart leaf.

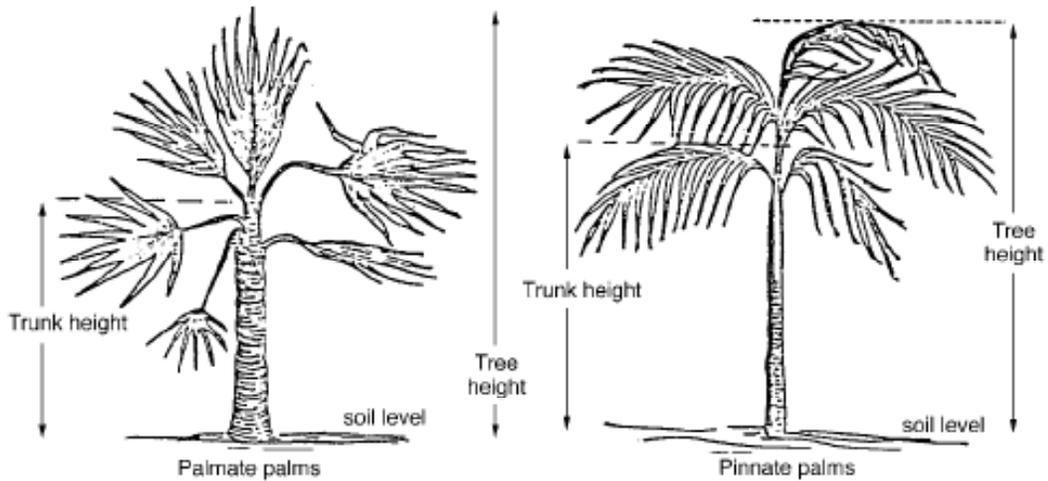
In Size column show palm tree height, with circled note 6. Add a detail like one of the following and the above matching definition to a detail sheet. See Figure 4-4

Plant Number & Symbol

Each plant species should have an identification number, beginning with number "1" at the top of the list (See next page).

Show the plant symbol used on the planting plans. Symbol size may be reduced minimally to accommodate the box size. Create your own plant symbols. Plant symbols have not been standardized.

Figure 4-4



Definitions and Drawings from American Standard for Nursery Stock (ANSI Z60.1) Approved May 12, 2004, Pages 12 and 13, American Nursery & Landscape Association, 1000 Vermont Avenue, NW, Suite 300, Washington, DC 20005

Botanical Name & Common Name

Botanical and common names for plants should be as shown.

If common names do not exist, show a single dash or NCN in the box.

Plants are arranged alphabetically in the Botanical Name column within each plant group.

Use capital letters for both botanical and common names. Underline the botanical name as shown in the current edition

of the Caltrans [Plant Setback & Spacing Guide](#) to indicate the abbreviations shown on the planting plans.

If a plant does not appear in the [Plant Setback & Spacing Guide](#), underline the first three letters of the botanical name (genus and species) to indicate the abbreviations shown on the planting plans. If a plant has two or more varieties used on a project, underline the first letter(s) of the variety name.

EXAMPLE:

<i>Plant Group</i>	<i>Plant No.</i>	<i>Symbol</i>	<i>Botanical Name</i>	<i>Common Name</i>	<i>Size</i>
A	1		<u>ESCALLONIA</u> <u>RUBRA</u>	RED ESCALLONIA	No. 1
	2		<u>MYOPORUM</u> <u>LAETUM</u>	—————	No. 1
	3		<u>NERIUM</u> <u>OLEANDER</u> ' <u>PETITE</u> <u>PINK</u> '	OLEANDER 'PETITE PINK'	No. 1
	4		<u>NERIUM</u> <u>OLEANDER</u> ' <u>SISTER</u> <u>AGNES</u> '	OLEANDER 'SISTER AGNES'	No. 1
B	5		<u>ALBIZIA</u> <u>JULIBRISSIN</u>	SILK TREE	No. 5
	6		<u>SCHINUS</u> <u>MOLLE</u>	CALIFORNIA PEPPER TREE	No. 5
F	7		<u>VINCA</u> <u>MAJOR</u>	PERIWINKLE	IN FLATS
U	8		<u>KOELREUTERIA</u> <u>BIPINNATA</u>	CHINESE FLAME TREE	No. 15

Calculating Plant Quantities

As specified in the May 2006, Standard Specifications, Section 20-4.05 PLANTING, where shrubs are shown on the plans to be planted in groups, the outer rows shall be parallel to the nearest roadway or right of way fence. Shrubs in adjacent rows shall be staggered (triangular spacing). Adjustments in the number or alignment of plants shall be made between the outer rows.

Ground cover plants shall be planted in straight rows parallel to the nearest roadway. Plants in adjacent rows shall be staggered (triangular spacing).

It appears that most designers calculate the wrong quantity for shrub masses and groundcover.

For Example:

Measuring an area on the plan where ground cover is to be planted, the area measures 43,560 sq ft. Because the area to be planted is on a slope, the actual area to be planted is larger than what was calculated from measurements taken directly off the plan. If the area is sloped, a slope factor must be used to determine the actual size of the area to be planted. Below are the slope factors for typical slopes used on highway projects.

Let's say the area we just measured has a 2:1 slope. The correct area measurement is $(43,560 \text{ sq ft}) \times 1.1108$ (slope factor for a 1:2 slope) = 48,386.45 sq ft. Round it off to 48,387 sq ft. That is an increase in area size of 4,827 sq ft.

Slope Factors for slopes

Horizontal Measure		Vertical Measure	Multiplying Factor
3/4	to	1	1.667
1	to	1	1.4142
1 1/2	to	1	1.2019
2	to	1	1.1108
2 1/2	to	1	1.0770
3	to	1	1.0541
4	to </td <td>1</td> <td>1.0308</td>	1	1.0308
5	to	1	1.0198

Continuing the Example:

Let's say you want to plant ice plant at 1.5 feet on center with triangular spacing. We must determine how much space each ice plant cutting will take.

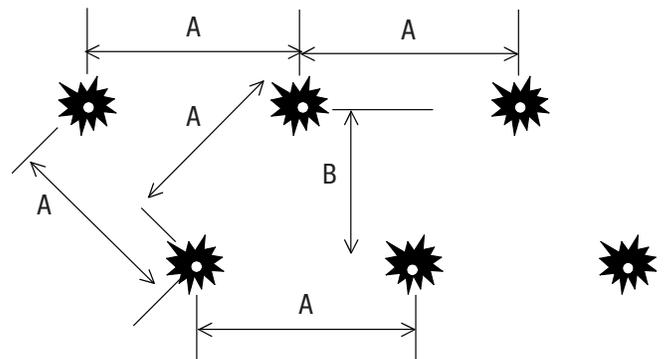
1 Acre + Flat land, Triangular Spacing

Using triangular spacing the rows are closer than 1.5 feet, they are actually (0.86×1.5) 1.29 ft apart and the plants within each row are 1.5 ft apart. Therefore, each cutting takes up $1.5 \times 1.29 = 1.94$ sq ft of space. Using triangular spacing and the planting area of 1 acre (43,560 sq ft) on flat land it takes 22,454 cuttings $(43,560 \text{ sq ft} / 1.94 = 22,454 \text{ cuttings})$ per acre.

1 Acre + Slope Factor, Triangular Spacing

Using triangular spacing and the planting area of 1 acre on a 2:1 slope is $(43,560 \text{ sq ft} \times 1.1108 \text{ slope factor} = 48,387 \text{ sq ft Area to be planted})$ it would take 24,942 cuttings $(48,387 \text{ sq ft} / 1.94 \text{ area per cutting} = 24,942 \text{ cuttings})$ per acre.

Figuring Area per Plant planted on Triangular Spacing



A = Spacing Between Plants is an equal distance along the row
 B = Spacing Between Rows is a shorter distance. The distance between rows is always $0.86 \times$ the on center spacing of the plants within a row (A).

"A" X "B" equals area per plant.

If you calculate your planting areas by measuring from the fence or wall to the shoulder, dike or curb (see [Point of Measurement](#), page 4-26), be sure to subtract the setback area for the plant material minus 1/2 the plant spacing (from the center of the root ball) (see [Planting Limits](#) page 4-26) from the total area measured. Make this adjustment for the linear areas along fences, walls, shoulders, dikes, curbs, sidewalks, etc. If you don't make this adjustment the quantities of plants will be on the high side.

Plant Spacing & Area Chart

On Center Spacing (Feet)	=	Square Feet Area per Plant
0.25		0.05
0.5		0.22
0.75		0.48
1		0.86
1.25		1.34
1.5		1.94
1.75		2.63
2		3.44
2.25		4.35
2.5		5.38
2.75		6.50
3		7.74
3.25		9.08
3.5		10.54
3.75		12.09
4		13.76
4.25		15.53
4.5		17.42
4.75		19.40
5		21.50
5.5		26.02
6		30.96
6.5		36.34
7		42.14
7.5		48.38
8		55.04
8.5		62.14
9		69.66
9.5		77.62
10		86.00
10.5		94.82

On Center Spacing (Feet)	=	Square Feet Area per Plant
11		104.06
11.5		113.74
12		123.84
12.5		134.38
13		145.34
13.5		156.74
14		168.56
14.5		180.82
15		193.50
15.5		206.62
16		220.16
16.5		234.14
17		248.54
17.5		263.38
18		278.64
18.5		294.34
19		310.46
19.5		327.02
20		344.00
20.5		361.42
21		379.26
21.5		397.54
22		416.24
22.5		435.38
23		454.94
23.5		474.94
24		495.36
24.5		516.22
25		537.50
25.5		559.22
30		774.00

Quantity

QUANTITY EACH
53

Indicate the quantity of each plant.

For Plant Group F plants show the quantity of plants needed on the project. Do not show the number of flats.

11

Indicate the quantity of each plant

Hole Size

HOLE SIZE (mm)	
DIA	DEPTH
18	36

Indicate diameter and depth in inches.

2	2
---	---

If standard Note 2 "Sufficient to receive root ball" is used, show the note number circled in both the DIA and DEPTH columns.

OR

2

Remove the vertical line between the columns and show only one note number.

8	8
---	---

For Carpobrotus cuttings add a Note 8 "See Standard Specifications." The planting instructions are given under Section 20-4.05 "Planting".

OR

8

Remove the vertical line between the columns and show only one note number.

7	7
---	---

For palm tree use standard Note 7 "See Special Provisions." And indicate hole size in the SSP or Note 4 "As shown on plans" and add a detail or both depending on your approach.

Basin Type

BASIN TYPE
I

Indicate basin detail, i.e., I, II or III. See the *Standard Plan H3* on page 4-25. Do not use Roman Numerals I, II and III.

OR

I ⑨

When the standard basin diameter (24 inches) is not sufficient for a plant, add a note following the standard notes and show the number circled in the box to modify the standard basin diameter, e.g., ⑨ "Basin area equivalent to 36 inches in diameter."

Iron Sulfate & Soil Amendment – application rates

IRON SULFATE ①	SOIL AMEND ①
½ LB	1-1/2 CF/SQYD

Standard precircled Note 1 is part of the column heading and indicates "Quantities shown are per plant unless shown as SQYD or SQFT application rates."

Indicate application rates.

OR

½ LB	269 CY/Acre
------	-------------

Indicate application rates.

OR

—	—
---	---

Show a single dash in the appropriate box(es) for plantings not requiring iron sulfate or soil amendment.

Commercial Fertilizer – application rates

COMMERCIAL FERTILIZER ①	
PLANT-ING	PLT ESTB
2 Pkt(s)	8 Oz
4 Oz	¼ LB
10 LB/1000 SQFT	10 LB/1000 SQFT
2 Pkt(s)	—

Standard precircled Note 1 is part of the column heading and indicates "Quantities shown are per plant unless shown as an m2 application rate."

Indicate application rates only.

Note: Only one application of commercial fertilizer is applied during planting. The number of applications of commercial fertilizer to be applied during plant establishment is specified by the designer in the special provision SSP 20-550, "Plant Establishment".

OR

Show a single dash in the box(es) for plantings not requiring fertilizer.

The chemical analysis of fertilizer (slow release, granular and packet) is specified in SSP 20-353, Commercial Fertilizer for all general plant materials. A few specialized special provisions such as SSP 20-257, "Transplant Existing Palm Tree" contain their own chemical analysis section.

Do not specify the chemical analysis of fertilizer on the Plant List.

Basin Mulch

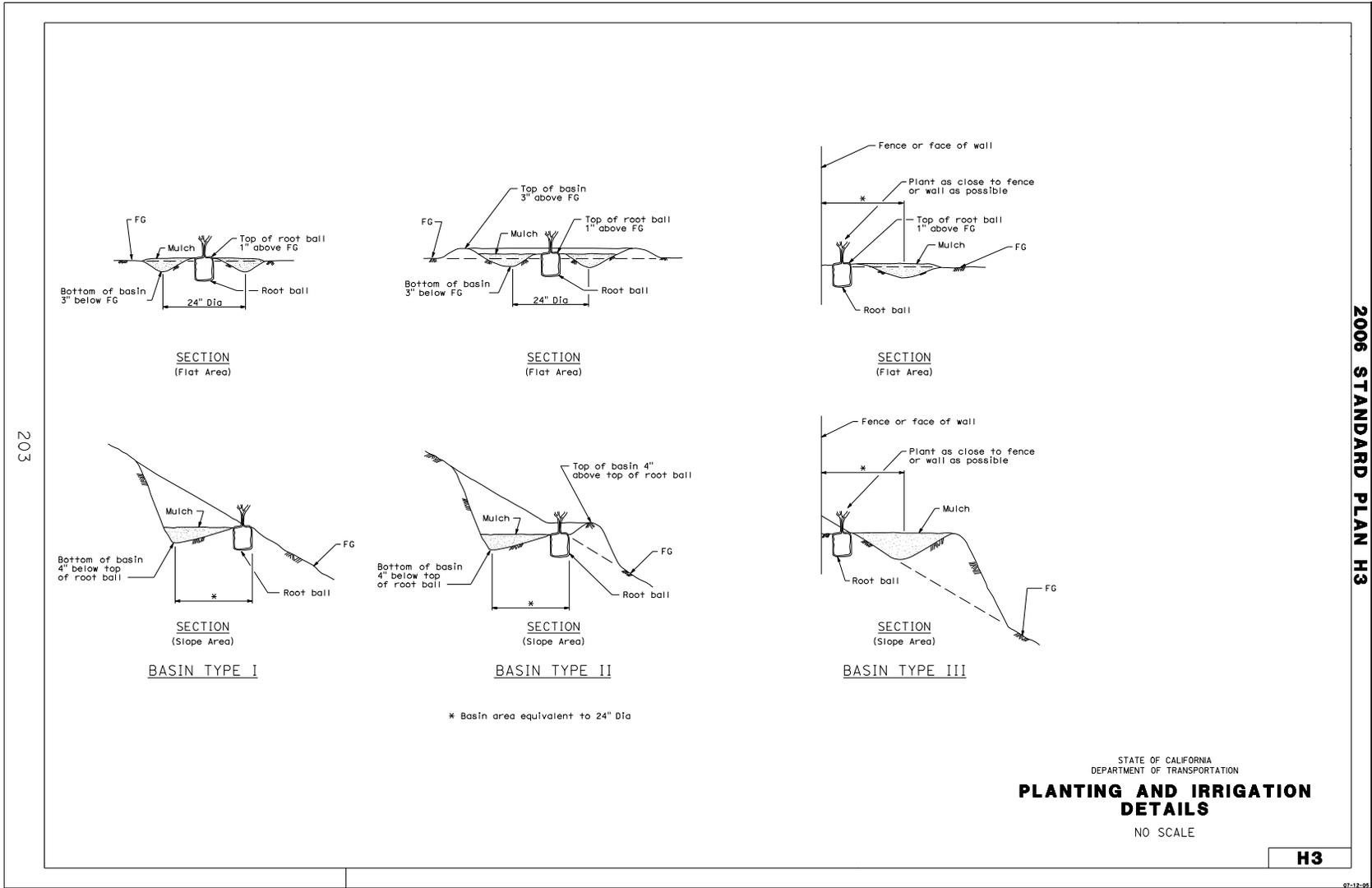
BASIN MULCH	Type of mulch, e.g., green material, wood chips, tree bark, etc., must be specified in the special provisions. Use SSP 20-352, "Mulch". The depth of the mulch is shown in SSP 20-500, "Planting" Para 7.
1 CF	Show the quantity of mulch required in each plant basin only. Show quantity as CF*.
OR	
—	Show a single dash when mulch is not required.

*NOTE: Do not show mulch quantities for areas outside of plant basins on the Plant List.

Application rates for areas to be mulched outside of basins shall be identified and called out (area total) on the Planting Plans. Show quantity as CF or CY at each location. Total quantity is shown in the Engineers Estimate.

Staking

STAKING	
⑥	Use standard Note 6 "Required" when staking is required. See Standard Plan H4 for staking detail.
OR	
⑧	If a non-standard detail is required, add a note following the standard notes and show the note number circled in the box, e.g., "⑧ 24" Box Staking detail."
OR	
—	Show a single dash when staking is not required.



H3

67-12-95

203

Planting Limits

The Standard Plan “Points of Measurement” detail below shows the heading items listed in the following table (except fence and wall). Distance is measured from the center of the root ball to the item. The “Points of Measurement” detail is located on sheet H8 of the Standard Plans.

Refer to the [Plant Setback & Spacing Guide](#) available on the Landscape Architecture Program Internet web site for guidelines on minimum setback and on center spacing of plants.

PLANTING LIMITS						
MINIMUM DISTANCE (Ft) FROM						ON CENTER (Ft)
TRVD WAY*	PVMT	FENCE	WALL	PAVED DITCH	EARTH DITCH	
6	6	6	6	6	8	1.5
—	15	15	10	10	12	10 ⁽⁵⁾
40	—	30	30	20	22	4

The “ON CENTER” column should show a distance and/or note number, e.g., Note 4 “As shown on plans” or 5 “Unless otherwise shown on plans.”

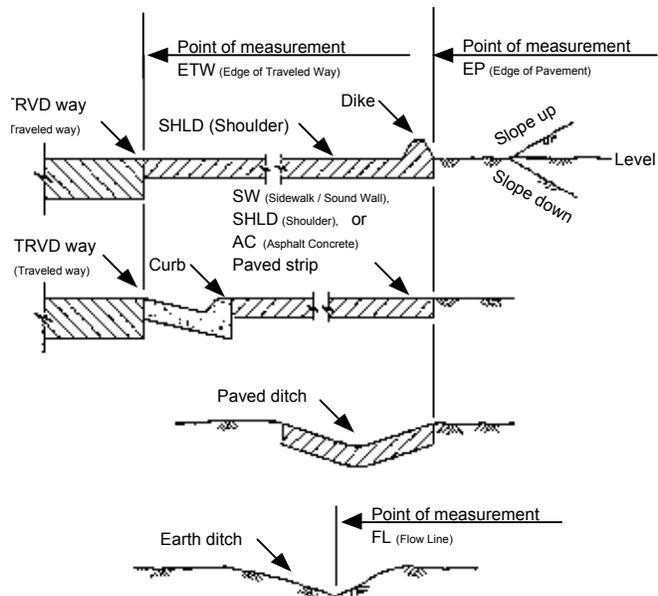
For plants designated as TREES in “REMARKS” column (see, [Points of Measurement](#)) show:

Recovery zone setbacks provide areas for errant vehicles to regain control. The policy along freeways and expressways, including interchange areas, should be to strive for 40 feet or more of clearance between edge of traveled way and large trees, but with a minimum clearance of 30 feet.

In the “TRVD WAY” column. See pages 4-5 through 4-8 and Chapter 900 “Landscape Architecture” of the Highway Design Manual for clarification of setback requirements for trees.

Show a single dash in the box(es) that are not filled in with a distance and/or note.

Points of Measurement



Section

This detail is from the Standard Plans H9.

Remarks

REMARKS	
TREE	Describe the type of plant, e.g., Tree, Multi-Trunk Tree, Shrub, Ground Cover, Vine or Bulb.
SHRUB	
GROUND COVER	AND
BULB	
TREE ROOT PROTECTOR REQUIRED	If foliage and/or root protectors are required add one of the following after plant type: "ROOT PROTECTOR REQUIRED"
SHRUB FOLIAGE PROTECTOR REQUIRED	"FOLIAGE PROTECTOR REQUIRED" "ROOT AND FOLIAGE PROTECTOR REQUIRED" If a root barrier is required add after plant type: ROOT BARRIER REQUIRED
TREE ROOT & FOLIAGE PROTECTOR REQUIRED	<i>See the Standard Plans, "Planting and Irrigation Details," sheet H4, for root and foliage protector details.</i>
TREE MALE ONLY	ALSO Specify a male or female plant when desired.
TREE SF	If plants are State furnished, show "SF."
PALM TREE ⁹	When a Palm Tree is specified use note nine (circled here and in the list of notes.) See Palm Tree Height page 4-19.
—	Additional remarks may be added as required. OR If there are no remarks show a single dash.

Check List for Plant List and Planting Specifications Sheet

- Abbreviations, except for Botanical Names, conform to ABBREVIATIONS list and/or Standard Plans sheet H1.
 - Numbered notes shown in appropriate columns are circled in APPLICABLE WHEN CIRCLED notes list.
 - Underlined portions of Botanical Names correspond with abbreviations on Planting Plans
 - Plant sizes shown conform to standard size descriptions listed in "Landscape Architecture Standards Manual".
 - Appropriate Basin Type(s) shown and Standard Plans sheet H3 is marked on Standard Special Provision StdPln.
 - Quantities shown in QUANTITY EACH column have been checked (initials in left hand margin for verification) (when using the lump sum item "Highway Planting," quantities are to be shown on the Plant List and in SSP 20.201, Cost Break-Down).
 - Plants with application rates (e.g., 1 1/2 CF per SQYD) in SOIL AMENDMENT and/or BASIN MULCH columns have appropriate CF Note on Planting Plans.
 - Note 6 shown ("See Detail") for staked plants in STAKING column and Standard Plans sheet H4 is marked on SSP StdPln.
 - Planting limits specified are appropriate for field conditions shown on Planting Plans.
 - Plants designated as Trees in REMARKS column show 30 feet* (or more) setback for PLANTING LIMITS in TRVD WAY column.
- *See Chapter 900 "Landscape Architecture" of the Highway Design Manual for clarification of setback requirements for trees.

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Plant List and Planting Specifications Sheet w/CADD Information

ABBREVIATIONS

AMEND— amendment
 B & B— balled and burlapped
 Dia— diameter
 EA— each
 LB— pound
 Oz— ounce
 Ft— foot/feet
 SQFT— square feet
 CF— cubic feet
 Max— maximum

Min— minimum
 NCN— no common name
 No.— number
 Pkt— packet
 PLT ESTB— plant establishment
 Pvmt— pavement
 R/W— right of way
 SF— state furnished
 TRVD— traveled

IN STANDARD PLANS, MAY BE DELETED

TYPE OF MULCH IS SPECIFIED IN SSP'S

DO NOT FILL IN

TEXT=7
 FONT=3
 WEIGHT=1
 LEVEL=10

DO NOT FILL IN

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

DESCRIBE TYPE OF PLANT, INDICATE IF STATE FURNISHED OR ANY OTHER SPECIAL REQUIREMENTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

SHOW PLANT SYMBOLS ON PLANTING PLANS, IN THE SAME SCALE IF SPACE PERMITS

PLANTS ARE ARRANGED ALPHABETICALLY IN INDIVIDUAL PLANT GROUPS

PLANT LIST AND PLANTING SPECIFICATIONS

EACH PLANT SPECIES SHOULD HAVE A NUMBER

PLANT GROUP	PLANT No.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY EACH	HOLE SIZE (INCH)		BASIN TYPE	IRON SULFATE ①	SOIL AMEND ①	COMMERCIAL FERTILIZER ①		BASIN MULCH	STAKING	PLANTING LIMITS						REMARKS	
							Dia	DEPTH				PLANTING	PLT ESTB			TRVD WAY	PVMT	FENCE	WALL	MINIMUM DISTANCE (Ft) FROM			ON CENTER (Ft)
																				PAVED DITCH	EARTH DITCH		
A	1	●	COTINUS COGGYGRIA	SMOKE TREE	No. 1	195	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	15	—	—	15	—	10	SHRUB
	2	⊙	FREMONTODENDRON 'CALIFORNIA GLORY'	FLANNEL BUSH	No. 1	195	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	15	—	—	10	—	10	SHRUB
	3	⊙	PHORMIUM TENAX 'MAORI QUEEN'	NEW ZEALAND FLAX	No. 1	185	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	10	—	—	10	—	7	SHRUB
	4	☼	HEMEROCALLIS HYBRIDS	DAYLILY	No. 1	1,555	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	3	—	—	3	—	3	YELLOW FLOWER EVERGREEN
	5	▨	HYPERICUM CALYGINUM	AARON'S BEARD	No. 1	1,762	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	3	—	—	3	—	2	GROUNDCOVER
	6	●●●	PARTHENOISSUS TRICUSPIDATA	BOSTON IVY	No. 1	985	②	②	I	—	1 CF	1 Pkt	0.5 LB	1 CF	—	—	—	—	—	—	—	10	VINE
B	7	⊙	BETULA PENDULA 'FASTIGATA'	EUROPEAN WHITE BIRCH	No. 5	151	②	②	II	—	1 CF	2 Pkt	1 LB	1 CF	⑥	30	—	—	20	—	—	18	TREE
	8	⊙	LIQUIDAMBAR STYRACIFLUA 'FESTIVAL'	NCN	No. 5	75	②	②	II	—	1 CF	2 Pkt	1 LB	1 CF	⑥	30	—	—	15	—	—	23	TREE
	9	⊙	PODOCARPUS GRACILLIOR	AFRICAN FERN PINE	No. 5	63	②	②	II	—	1 CF	2 Pkt	1 LB	1 CF	⑥	30	—	—	20	—	—	18	TREE
H	10	☼	CARPOBROTUS EDULIS	ICE PLANT	CUTTING	61,200	⑧	⑧	—	—	⑦	⑦	⑦	—	—	—	6	—	6	—	—	1.5	USE CUTTINGS FROM EXISTING PLANTS
U	11	⊙	PRUNUS SERRULATA 'SHIROTAI'	MT FUJI FLOWERING CHERRY	No. 15	140	②	②	II	—	2 CF	2 Pkt	1.25 LB	2 CF	⑥	30	—	—	20	—	—	18	TREE
	12	⊙	SCHINUS MOLLE	CALIFORNIA PEPPER	No. 15	9	②	②	II	—	2 CF	2 Pkt	1.25 LB	2 CF	⑥	30	—	—	20	—	—	18	TREE

QUANTITY OF F & H PLANTS ARE ROUNDED PER RTL GUIDE

FT=3, TX=20, WT=4, LV=49

FT=43, TX=8, WT=0, LEVEL=10

APPLICABLE WHEN CIRCLED:

① - Quantities shown are "per plant" unless shown as SQFT or SOYD application rates.
 ② - Sufficient to receive root ball.
 3 - Does not apply to mulch areas.
 4 - As shown on plans.
 5 - Unless otherwise shown on plans.
 ⑥ - See detail.
 7 - See Special Provisions.
 ⑧ - See Standard Specifications

ADD ADDITIONAL NUMBERS AND NOTES AS REQUIRED

LEGEND

MULCH

AC PAVING

WILD FLOWER SEEDING AREA

ADD LEGEND ITEMS AS APPROPRIATE

NOTE: Underlined portions of botanical name indicate abbreviations used on Planting Plans.

ALL TEXT, EXCEPT PLANT GROUP LETTERS: FT=3, TX=7, WT=1

DESCRIBE TYPE OF PLANT. INDICATE IF STATE FURNISHED OR ANY OTHER SPECIAL REQUIREMENTS

PLANT LIST

PL-1

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN INCHES

0 1 2 3

USERNAME => trtime
 DGN FILE => H:\tmp\Judy_Quon\Plt\US.dgn

CU 00000

EA 000000

DATE PLOTTED => 1/29/2008
 TIME PLOTTED => 3:23:36 PM

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