

- (c) Requests from local agencies for improvement of aesthetics in their community.

Color selection for steel bridges should be mutually satisfactory to the Division of Engineering Services and the District. The Division of Engineering Services (DES) will initiate the color selection process by submitting the proposed color to the District Landscape Architect for review. The color for steel sign structures will be selected by the District Landscape Architect.

Topic 706 - Roadside Treatment

706.1 Roadside Management

A key concept in roadside management is that roadway and roadside design should consider the full life-cycle cost of transportation improvements including the long-term cost of maintenance. The design alternative with the lowest initial construction cost may not be the best solution if this approach will include high recurring maintenance costs. Designers should strive to select design approaches that do not require extensive recurring long-term activities.

A second key roadside management concept is that roadway and roadside design should contribute to the safety of Department maintenance workers by incorporating techniques that eliminate or reduce worker exposure to traffic. More specifically, these management concepts include the following techniques:

- Eliminate the need for recurrent maintenance activities such as vegetation control, herbicide application, pruning, mowing and graffiti removal;
- Facilitate the automation of recurrent maintenance activities such as herbicide application, mowing and litter collection;
- Locate facilities that require recurrent maintenance activity outside the clear recovery zone, or within protected areas;
- Provide safe maintenance worker access to facilities that require recurrent maintenance activity.

To implement this second roadside management concept, the following conditions must be considered in roadway and roadside design projects:

- Guardrail, including standard railing, terminal system end treatments, guard railing at structure approach and departures, and at fixed objects should include vegetation control. For more detailed information regarding placement of vegetation control consult with both the District Landscape Architect and District Maintenance. See the Standard Plans for minor concrete vegetation control.
- Thrie beam barrier, including single thrie beam barrier, double thrie beam barrier, at structure approach and at fixed objects should include vegetation control. For more detailed information regarding placement of vegetation control consult with both the District Landscape Architect and District Maintenance. See the Standard Plans for minor concrete vegetation control.
- 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 and appropriate vegetation control technique.
- Plants, which at maturity may encroach upon required site distances, should be removed. Consult the District Landscape Architect to identify potential encroaching plant material.

- Noise barriers should be designed with a textured aesthetic treatment or planted with vines to reduce maintenance required to control graffiti. Index 902.3 of this manual and the Project Development Procedures Manual contain information of the planting on noise barriers.
- Unpaved area beyond the gore pavement should be paved as per Index 504.2(2).
- Roadside facilities that require recurring maintenance, such as irrigation controllers, electrical controllers, backflow preventers, and valve boxes, should not be placed on the outside of horizontal curves, near gore areas, near auxiliary lanes, or near ramp termini. The designer should strive to place these facilities outside the clear recovery zone, or within a protected area if placement outside the clear recovery zone is not feasible.
- When placing roadside facilities that require recurring maintenance, the designer should strive to include improvements that facilitate safe maintenance access such as maintenance vehicle pullouts, maintenance access paths, walk gates and vehicle gates. It is preferred that access be provided from outside the right-of-way for all facilities that require maintenance access.
- When placing noise barriers in areas with a narrow right of way, the designer should consider locating a concrete safety shape barrier 3 feet from the face of the noise barrier to provide protected maintenance access to planting and irrigation facilities.

Formal safety reviews for roadside management issues should be accomplished as discussed in Index 110.8. Consult the District Landscape Architect and District Maintenance unit early during design development to identify and address potential roadside management issues, such as avoiding the redundant placement of roadside facilities, or allow for the consolidation of roadside facilities.

706.2 Vegetation Control

Weed control fabric or soil sterilant chemicals may be placed under pavement to prevent weed growth through medians, traffic islands, and other paved areas.

The Division of Maintenance is responsible for the selection of herbicides. Approval is required for any changes from the currently approved Standard Specifications and Standard Special Provisions for pesticides and herbicides.

Since soil sterilants may be transported by water, they should not be used where they may affect environmentally sensitive areas, habitat, native vegetation, landscape plantings, agricultural crops, adjacent residential, commercial or recreation areas, streams, or water bodies.

Before specifying soil sterilants, the District Landscape Architect should be consulted to determine the possibility of future planting.

706.3 Topsoil

In areas of new construction, quality existing topsoil should be stockpiled and spread during the final stages of construction. The native brush should be crushed or chipped and mixed with the stockpiled soil to maximize natural or organic matter in the soil. Since topsoil contains beneficial microorganisms and seed, it is best to stockpile it in shallow windrows and planted with temporary erosion control so that oxygen can penetrate the soil.

706.4 Irrigation Crossovers for Highway Construction Projects

Irrigation crossovers normally consist of a conduit with a waterline crossover and sprinkler control conduit with pull wire. Irrigation crossovers should be provided under new roadways and ramps when future highway planting is anticipated. The District Landscape Architect should be consulted to determine the need for such crossovers as well as size and location. Attention should also be given to extending existing conduits when widening or modifying roadways and ramps.

The following factors should be considered in sizing and locating crossovers:

- (a) A standard irrigation crossover consists of a minimum size of 8-inch diameter nominal (DN) conduit, with a 3-inch DN water supply line and a 2-inch DN sprinkler control conduit with pull wire. Sizes of irrigation crossovers and water supply lines are usually larger when nonpotable water is to be used.

- (b) Irrigation crossovers are typically spaced 1,000 feet apart on freeways where future highway planting is anticipated. Undercrossings may be considered alternative crossing opportunities.
- (c) Drainage facilities should not be used for waterline crossings.

Standard details and special provisions for the irrigation crossover should be furnished by the District Landscape Architect to the Project Engineer for highway construction projects.

706.5 Water Supply Line (Bridge) and Sprinkler Control Conduit for Bridge

Water supply line and sprinkler control conduit with pull wire should be provided in new bridge structures.

The District Landscape Architect should be consulted to determine the need for such water supply lines and sprinkler control conduits such as size and location.

Attention should also be given to modifying, changing existing, or installing new water supply lines and sprinkler control conduits when widening or modifying bridge structures.

The following factors should be considered in sizing and locating water supply lines and sprinkler control conduits:

- (a) Generally, locate on the side of the bridge, nearest the water source.
- (b) Consider the maximum water demand and number of irrigation controller stations anticipated to be used. The water supply line should be a minimum 3-inch DN and the conduit for the sprinkler control conduit should be a minimum 2-inch DN and contain a pull wire.
- (c) Ductile iron pipe is required for the water supply line for pipes 4-inch DN or larger because of its superior strength and flexible joints.

706.6 Water Supply for Future Roadside Rest Areas, Vista Points, or Planting

Provision for a permanent water supply should be included in the major construction project. In the preparation of a major highway construction project, consideration should be given to using the water source needed for construction as part of a future permanent water supply system. If this appears to be a feasible solution, consider such factors as:

- (a) Probability of a future planting, vista point, or roadside rest project.
- (b) Economy.
- (c) Possible reduction in the flexibility of the highway contractor's operation.

The District Landscape Architect should be consulted.

Topic 707 - Slope Treatment Under Structures

707.1 Policy

Structure end slope should be treated to:

- (a) Protect slopes from erosion.
- (b) Improve aesthetics.
- (c) Reduce long term maintenance costs.

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.

707.2 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