Design Guidelines

Interstate 5 North Coast Corridor Project

February 2013

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Design Guidelines
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Project Background

I. Project Background

A. Introduction

Millions of people per year travel the Interstate-5 (I-5) corridor from San Diego to Camp Pendleton. Most of these people will experience the corridor on a daily basis. In some cases, over an hour a day is spent on this corridor. A major part of their experience is created as a direct result of the immediate freeway environment. What should the travel experience be like? What should people feel? What are the elements that will create this experience? These design guidelines will guide the design and planning of the various physical elements that will affect not only vehicle drivers and passengers, but also those surrounding the freeway corridor.

An example of an inland view from I-5 (a view of bluffs north of San Elijo lagoon)

The I-5 North Coast Corridor, which stretches from Oceanside to San Diego, is unlike any other freeway corridor. The vertical fluctuations of freeway create a very unique experience for the freeway user. As opposed to a more typical freeway corridor such as the Interstate 405 corridor in the Los Angeles area, the I-5 North Coast Corridor maintains a unique rhythm between developed areas and open lagoon areas. In addition, there are many opportunities for the freeway viewer to experience views of the Pacific Ocean to the west. This is particularly true while traveling through the lagoon areas. These two factors alone create a freeway experience that, to the extent possible, should be retained and/or enhanced. Construction of standard freeway elements such as bridges and walls could diminish the uniqueness of this corridor.

An example of a lagoon and ocean view from I-5 (looking west at Batiquitos Lagoon)

Accordingly then, steps should be taken to ensure that this corridor maintain its uniqueness. These design guidelines will be a mechanism that will guide future physical improvements to the I-5 North Coast Corridor.

B. Purpose

The purpose of the design guidelines is to define and refine the visual mitigation measures contained in the I-5 North Coast Corridor Visual Impact Assessment (I-5NCVIA) in a way that meets the needs of internal and external stakeholders. These mitigation measures build upon the notion that the character of the I-5 North Coast Corridor is special and should be protected. These guidelines are intended to guide engineers, architects and landscape architects that will design the physical elements of the corridor improvements.

C. Components and Products

Planning

Product: An overall corridor site analysis and design concept plan that identifies corridor themes and context sensitive solutions.

Architecture

Product: Design concepts for features would include structures, retaining walls, noise walls, lighting, and other freeway appurtenances.

Landscaping

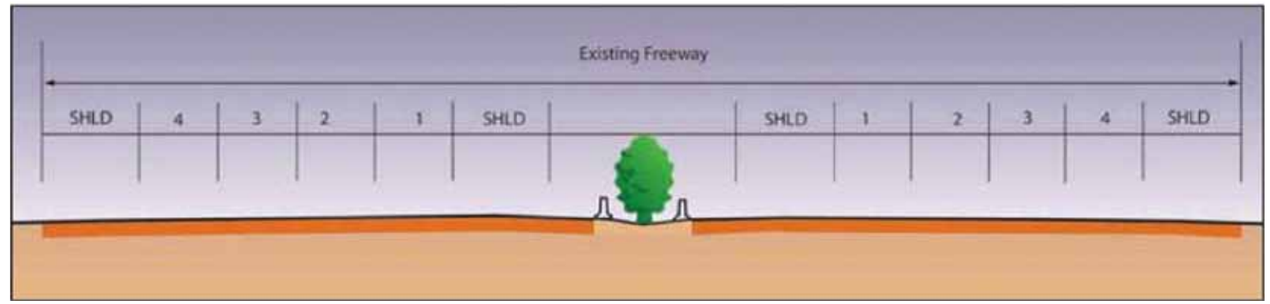
Product: A landscape design concept that addresses interface with communities (entries and edges), preservation of environmental resources (visual and biological), conservation of natural resources (water use, storm water pollution prevention and water harvesting), and sustainability (levels of maintenance).

Urban Design

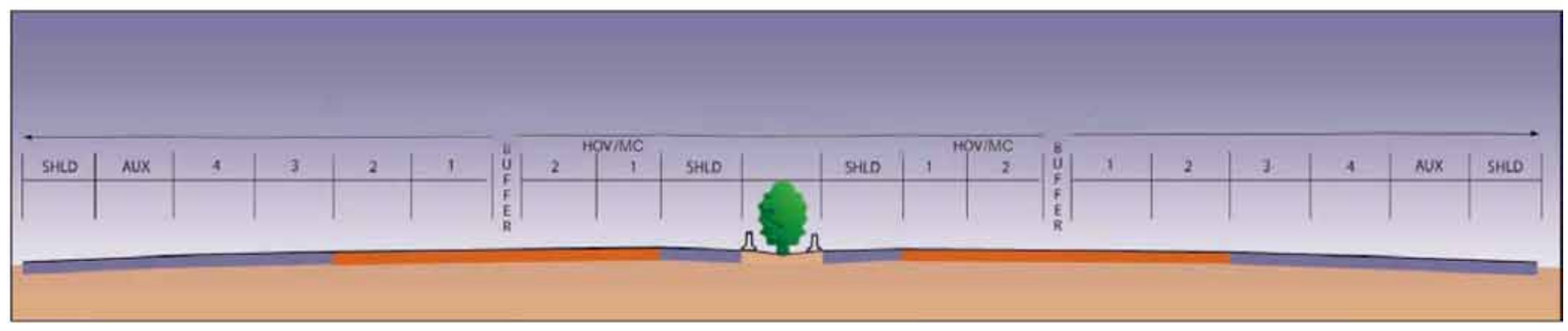
Product: Interchange design guidelines that address pedestrian and bicycle facilities, streetscape features, urban design amenities, community identity features, and specialized landscape features.

D. The Proposed Project

I-5 is proposed to be improved for 27 miles from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside. The California Department of Transportation (Caltrans) proposes to construct one to two High–Occupancy Vehicle (HOV / Managed) lanes, for an ultimate configuration of two HOV/Managed Lanes in each direction on I- 5 from La Jolla Village Drive in the City of San Diego to Harbor Drive in Oceanside. The project also proposes Direct Access Ramps (DARs) at Voigt Drive, Manchester Avenue, and auxiliary lanes at various locations. Essentially, 8 lanes plus 4 HOV/Managed lanes will be constructed as part of this project.



Existing Cross Section



Proposed Project: 8+4 with Buffer - Eight general purpose lanes and four HOV/Managed lanes separated by 1.2m (4 ft) wide striped buffer zones

E. Previous Relevant Documents

Interstate 5 North Coast Community Enhancement Plan (Completed 2008)

Caltrans studied the feasibility of development project concepts that, if implemented, would improve how the project would interface with adjacent communities. The purpose of the I-5 North Coast Community Enhancement Plan was to look at ways that the proposed freeway project could improve the urban design character of the I-5 North Coast Corridor Project through the implementation of synergy projects.

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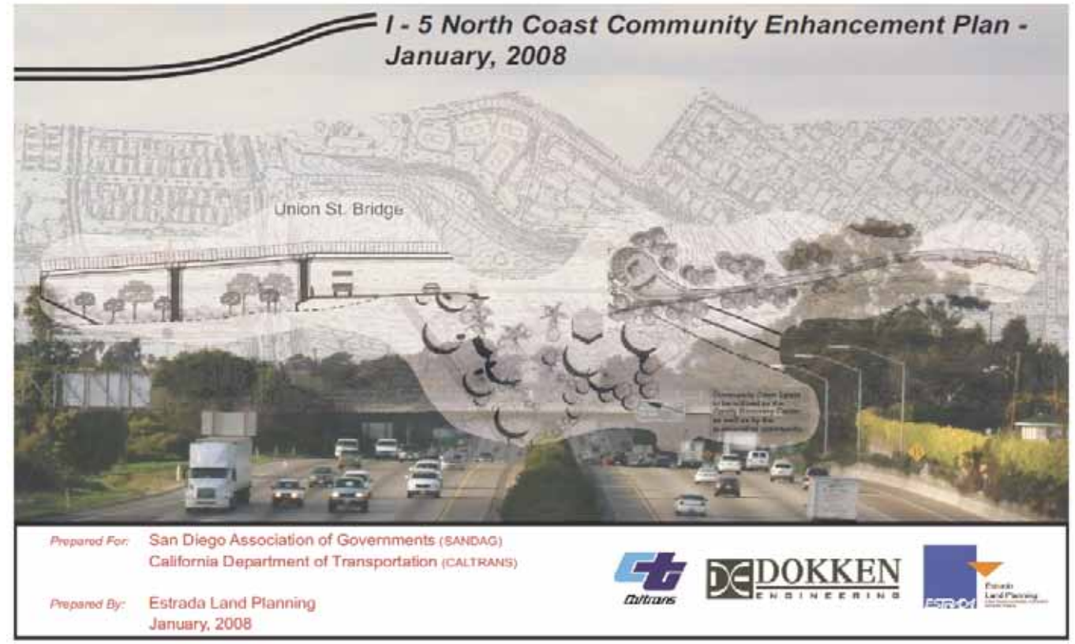

Interstate 5 North Coast Visual Impact Assessment (Completed 2009)

The purpose of this study, prepared by Caltrans staff, was to assess the visual impacts of the proposed project and to propose measures to mitigate any adverse visual impacts associated with the construction of the Interstate 5 North Coast freeway improvements on the surrounding visual environment.

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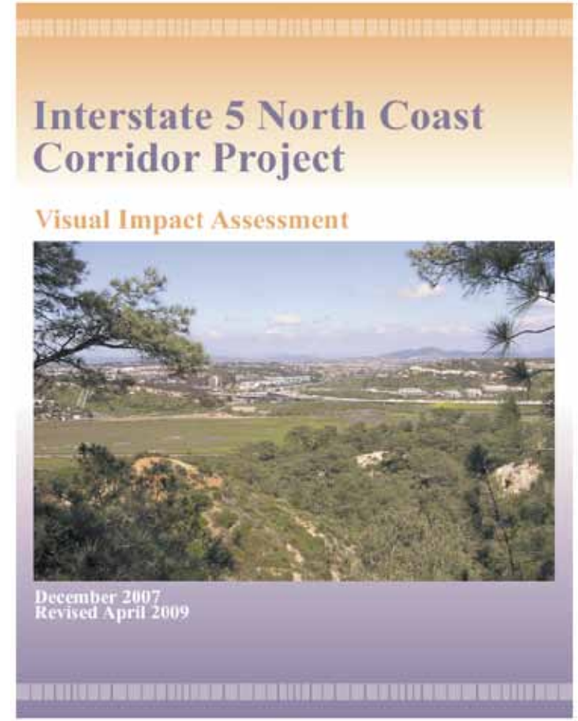

F. Use of Proprietary Items

The I-5 North Coast Design Guidelines proposes freeway design themes and components that the California Coastal Commission considers necessary to meet the requirements of the California Coastal Act. The actual appearance of the freeway is the measure of the project's compliance with the Coastal Permit.

The project is expected to be implemented over the course of many years and will consist of many separate construction projects. Each project will be governed by a separate contract and set of specifications interpreted and implemented by a different contractor and oversight engineer. Under the best of conditions, it is difficult to achieve the desired appearance of a freeway feature using a standard performance specification because the specification is quantitative in nature, while the item specified is characterized by its visual appearance and can be rightly judged solely by qualitative criteria. Implementing a set of visual design guidelines such as these for a multi-year multi-contract project by the exclusive use of standard performance specifications would be an unrealistic challenge.

To insure that the various construction phases of the project successfully and consistently implement these Guidelines and thereby comply with the Coastal Permit, certain proprietary items must be specified. Decorative light fixtures, benches, fencing, plant containers, and other types of site furnishings that have a necessary quality of appearance or function would merit a proprietary specification. In addition, certain patented construction systems or processes used to produce features such as unique concrete colors and surfaces, and other proprietary products used to produce decorative finished surfaces such as paints, stains, and tiles also need to be specified as such in order to maintain visual consistency and implement the design objectives contained in the Guidelines.

Some proprietary products proposed for this project will be maintained by others. Using proprietary specifications ensures the quality of each product and provides equipment that a local agency will be more likely to accept into their maintenance inventory. Products will be selected in consultation with partner agencies regarding performance characteristics, consistency with equipment in existing inventories, durability, energy use, and ease of maintenance.

The following products shall be used on the I-5/Genesee Avenue interchange improvement project, currently in design. It is the first I-5 North Coast corridor project to be governed by these guidelines. As public comment is incorporated and future projects are designed, this document will be amended to include additional proprietary items.

Lighting

Louis Poulsen Kipp Post Light

Kim Lighting Altitude Post Light

Louis Poulsen Skot Maxi Wall Light

Architectural Area Lighting Step Light

BK Lighting HP2 LED In-Grade Uplight

Bollard

Louis Poulsen Bysted Bollard

Exposed Aggregate Sidewalk Paving

Lithocrete #05-072C

Lithocrete #12-015D-SD

Integral Concrete Color for Walls and Structures

Davis Color #5447- Mesa Buff

Design Guidelines
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Design Parameters

II. Design Parameters

A. Design Goals and Objectives

The basis for these design guidelines are the following overall goals and objectives. These are general in nature and provide an overall framework on which design decisions were based.

Promote Sustainability

- Designs for structural components will be similar and modular to achieve economy of scale.
- Design elements that are easy to build and maintain will be used.
- Drought tolerant plant material will be utilized.
- Water harvesting and soil conservation practices will be implemented.

Maintain Consistency

- Designs will seek to use or modify standard freeway features.
- Designs will seek to achieve a balance between Caltrans policies and community goals.

Preserve Visual Quality

- *Create Opportunities for Freeway Replacement Planting*

  Since some existing landscape areas will be lost due to the proposed improvements, the location, quality and sustainability of any new landscaping will be a critical part of maintaining and enhancing the character of the corridor. This will necessitate the need for using drought tolerant and native plants for any freeway landscape replacement. This will include planting behind barriers (planting strips and planting pockets).

Establish an Overall Corridor Theme

- Create an overall theme for the entire corridor while creating opportunities for local enhancement as described below.

Reflect Local Character and Identity

- The local streets adjacent to the corridor will have opportunities to enhance the local character by incorporating design elements that are either unique to the immediate community or are indentified with it.

Provide Opportunities for Enhancement

- When appropriate, provide two sets of design alternatives to the public based on life cycle cost. One option, the baseline option, will feature components that would receive normal levels of maintenance by Caltrans forces. The other option will feature enhanced or specialized components that local agencies will agree to maintain.

Address North Coast Corridor Constraints

- Design within existing maintenance and water resources
- Avoid the use of invasive species
- Minimize footprint/right-of-way impacts
- Enhancements at the gateway to be maintained by local cities

Create a Living Document

- As with any large scale highway project, the I-5 North Coast Corridor Project is expected to be implemented in multiple phases over the course of many years. The purpose of this document is to define and refine the mitigation requirements of the I-5 North Coast Visual Impact Assessment. It is not intended in any way to be the final word, but instead, a work in progress. It is written to be the basis for shareholder comment, and will be amended accordingly. During the design process, shareholder interaction will continue, guidelines will become more and more specific, locally oriented design details will be added, and a design palette of specific features and products will be devel-

Important Note:

Enhancements will be incorporated into the I-5 North Coast Project if local agencies accept responsibility for maintaining them in perpetuity.

Enhancements or Enhanced Features are defined as freeway appurtenances or aesthetic features that are not contained in the Caltrans Standard Plans or Caltrans Design Manuals. Items such as decorative fencing, lighting, and street furniture are considered to be enhancements. Decorative surfaces and materials such as ceramic tile and colored plexiglass are also enhancements. In contrast, alternate bridge structure types, colored structural concrete, steel plates or solid glass blocks embedded in concrete, and concrete architectural features that can be sustained with current Caltrans maintenance practices are considered to be standard features.

Freeway landscaping that requires higher than standard levels of maintenance is also considered to be an enhancement and would be maintained in perpetuity by a local agency.

B. Design Context

Regional Context

Landscape

The northern coast of San Diego County is generally perceived as a series of coastal communities linked by the old Coast Highway and I-5 transportation corridors. Its natural landscape is characterized by the Pacific Ocean and natural features formed by the action of water on earth. Sandy beaches, sandstone bluffs, coastal lagoons, broad river valleys, steep canyons, expansive mesas, and rolling foothills constitute the predominant natural landforms.

Typical beach and adjacent bluffs in Encinitas

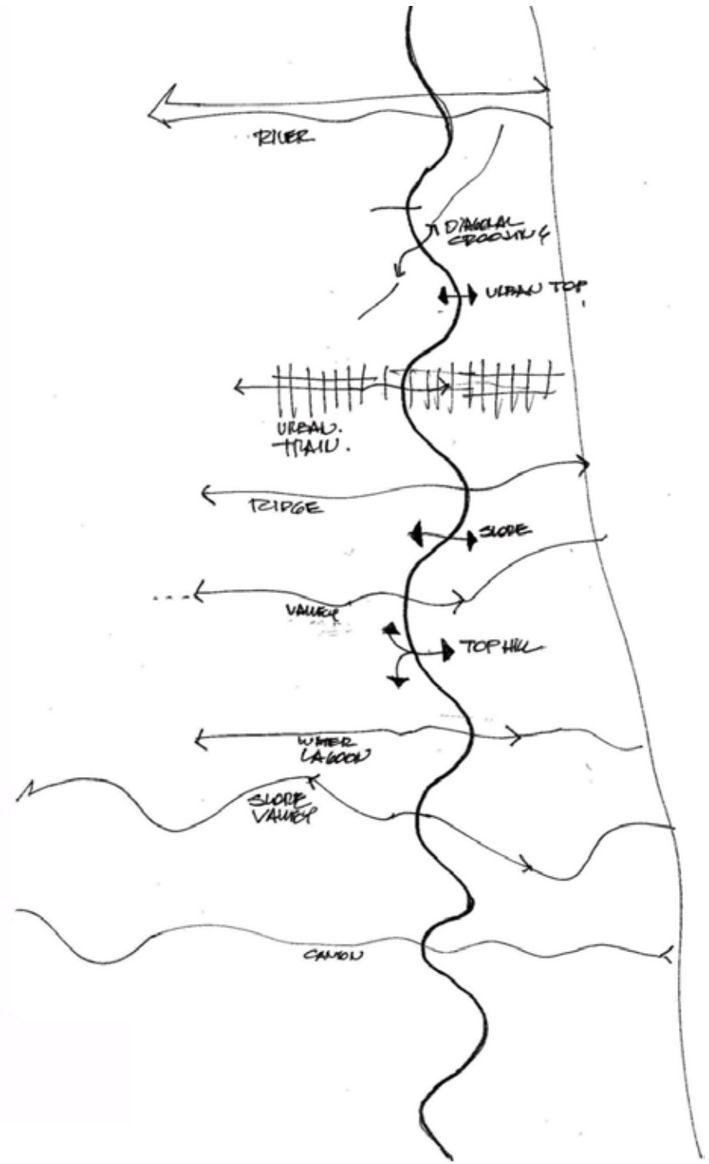
Vegetation consists of a wide range of native and introduced plant species. The characteristic native plant communities are coastal sage scrub and maritime sage scrub, and the signature native plant is the rare Torrey Pine, which grows naturally only on the coastal bluffs of La Jolla and Del Mar and on Santa Rosa Island. The mild coastal climate allows exotic cultivated plants to thrive, and the area is noted for its unique ornamental horticulture industry exemplified by the poinsettia farms of Encinitas and flower fields of Carlsbad. The seacoast is considered by many to be among the most scenic in the world, and the region is a major tourist destination. The I-5 freeway corridor passes through San Diego's North County coastal communities whose visual components establish the character of the corridor. Although each community has a unique visual identity, a powerful unity is also present because of shared landform components.

Native vegetation mixed with non-native vegetation creates a unique backdrop at Batiquitos Lagoon

Because of its outstanding climate and scenery, this portion of the California coast has taken on a cultural significance. The California dream of sun, surf, and the freedom of the open highway took form here and in similar communities up the coast. The scenic landscape components, both natural and man-made, continue to draw new visitors and residents each year. The coastal landscape, coastal communities, and unifying ribbon of highway are highly valued regionally, nationally, and globally.

Corridor Context

I-5 is a very unique freeway corridor. Its proximity to the Pacific Ocean and the various development patterns and topographic changes that the corridor traverses create a rhythmic pattern. The basic rhythm is one of lagoon to mesa top to lagoon to mesa top. In addition, the I-5 corridor parallels, at an equal distance throughout the corridor, the Pacific Ocean to the west. When one travels the corridor, the Pacific Ocean becomes quite visible while within the lagoon segments. By contrast, the Pacific Ocean is rarely visible from the mesa tops that are in between the lagoons. Unlike most urban freeway corridors that consistently travel through highly urbanized areas, the I- 5 corridor rhythm creates a highly unique traveling experience. The I-5 corridor is linked by a series of valleys, crests, and canyons that roll gently across its path. The corridor is bisected into natural segments at the east-west flowing lagoons and valleys that connect the water, natural biology, and trails to the Ocean. These natural rhythms become the basis for understanding and realizing the corridor in its new built form. It is therefore critical that any future freeway construction be designed to ensure that the visual quality of the corridor honors this unique environment.



A graphic illustrating the context of the corridor

Where each crossing intersects the path of the corridor, special attention to how the roadway, retaining walls and roadway infrastructure interact with these natural forms must be considered. Where the canyon, valley or lagoon intersect the corridor, the correct approach to organizing these elements is fundamental. Preserving the connections, light, openness and views from the corridor and to the corridor should be a key consideration.

The Rhythm of the Land

The unique rhythm of the corridor, that is the pattern created between the lagoons and the mesas in-between the lagoons, is one element that gives the I-5 corridor its uniqueness. There are low spots at the lagoons, then high spots at the mesas, then low spots again in the lagoons. This pattern repeats creating a unique spatial experience for the I-5 traveler. This rhythm is not only vertical as shown in the following graphic, but also horizontal. The lagoon areas open up while the mesa tops enclose.

The vertical rhythm of the natural landscape

The horizontal rhythm of the natural landscape

Scenic Resources

The I-5 corridor within the project area is part of the California Scenic Highway System and is eligible for designation as an Official Scenic Highway. A scenic resource may be an object, set of objects or a whole landscape that has exceptional visual quality, character, uniqueness, cultural significance, or historical value. The following visual elements of the I-5 North Coast Corridor project viewshed have been identified as Scenic Resources:

The Pacific Ocean

The I-5 freeway provides visual access to the ocean for hundreds of thousands of people each day. These views orient the viewer in the landscape and introduce visitors to the visual character of the region. Views such as these are rarely experienced while traveling on a major urban freeway and establish the corridor's unique visual identity.

Ocean views from the freeway occur at the following locations:

- Northbound lanes between Carmel Mountain Road and SR-56
- Northbound lanes between Del Mar Heights Road and San Dieguito River Bridge
- Southbound lanes between Via de la Valle and Lomas Santa Fe
- Northbound lanes between Lomas Santa Fe and Manchester Avenue
- Southbound lanes between Manchester Avenue and Birmingham Drive
- Vista Point adjacent to southbound lanes north of Manchester Avenue
- MacKinnon Avenue overcrossing
- All lanes at Encinitas Boulevard
- Southbound lanes between La Costa Avenue and Poinsettia Lane
- Southbound lanes at Oceanside Boulevard
- All lanes at the San Luis Rey River bridge

View of the ocean from I-5 overlooking the Penasquitos Lagoon

Image from the I-5 Visual Impact Analysis showing the views along the I-5

Coastal Wetlands

The coastal lagoons in the project area are some of the last surviving wetlands of their kind in southern California. The freeway also traverses two rivers that flow throughout the year, which is an unusual visual experience for southern Californians. Not only are the wetlands a rare commodity, the expansive open space associated with them offer relief from views of urban development and also serve as view corridors from freeway to foothills.

This scenic resource exists at the following locations:

- Penasquitos Lagoon in San Diego
- San Dieguito Lagoon in San Diego
- San Elijo Lagoon in Encinitas
- Batiquitos Lagoon in Carlsbad
- Agua Hedionda Lagoon in Carlsbad
- Buena Vista Lagoon in Oceanside
- San Luis Rey River in Oceanside

San Dieguito Lagoon

Torrey Pines State Reserve

The vivid sight of native Torrey Pines clinging to the picturesque sandstone bluff headland at Penasquitos Lagoon is considered to be one of the region's scenic treasures. The Reserve is visible from Sorrento Valley and Carmel Valley.

Torrey Pines State Reserve

Coastal Bluffs

The bluffs are ancient marine terraces cut by the sea and are composed primarily of cream-colored Torrey sandstone capped by a denser layer of rust red Linda Vista formation that contains protruding horizontal bands of cobblestones. These picturesque eroded cliffs are found near coastal beaches, lagoons, and rivers. The distinctive eroded appearance of the sandstone bluffs also appears in old road cuts and to a lesser extent on some freeway cut slopes.

Eroded sandstone is an iconic image of north coastal San Diego, and is particularly associated with the Torrey Pines, Del Mar and Solana Beach communities.

Areas in which this scenic resource exists are:

- Torrey Pines State Reserve
- Southern slopes of the San Dieguito River Valley
- Native slopes of the San Elijo Valley
- Native slopes adjacent to the northbound freeway lanes between Manchester Avenue and Birmingham Drive

Coastal Bluffs near MiraCosta College in Encinitas

Agricultural Land

The strawberry fields situated along I-5 near Manchester Avenue in Encinitas and Cannon Road in Carlsbad contribute significantly to the rural character of the corridor. They are highly visible artifacts of historic land uses, are in visual harmony with adjacent lagoons, and provide relief from the visual patterns of urban development. As development continues to displace agriculture in southern California, their uniqueness and value as a scenic resource increases.

Agricultural areas in Carlsbad

Encinitas and Leucadia Hillside Neighborhoods

These neighborhoods exemplify Encinitas' unique historic identity as a center of exotic horticulture and embody a vision of California living that has drawn millions of residents and tourists to the region over the years. The older homes in this area were built early in the twentieth century on large parcels of several acres that were utilized as avocado groves, exotic plant nurseries, or commercial greenhouse space. The homes were sited atop a coastal ridge that afforded views of the ocean to the west and mountains to the east. Most were designed in the romantic Spanish Colonial style and featured outdoor living areas surrounded by lush tropical landscaping that took full advantage of the mild year-round climate. Today, the visual character of the scene survives despite intense urban development that has occurred elsewhere along the coast. A few parcels have been subject to residential infill projects, but the original homes, large stands of tall trees, and some of the avocado groves, nurseries, and greenhouses remain. This is a viewshed that would not at first glance be considered scenic, yet it retains a high level of vividness due to the rarity of residential open space near the coast and the glimpse of the area's history that it affords.

Views of this resource are available from the freeway between Encinitas Boulevard and La Costa Avenue.

Leucadia Hills

Many natural and man-made landmarks occur throughout the corridor that have the potential to be embedded in these guidelines as design rationale. For example, the Del Mar Fairgrounds, the Oceanside City Hall, the Cedros Design District and the Solana Beach train station all are unique elements within each of the adjacent cities. However, for the purposes of these guidelines, a landmark is a place that can be viewed from the corridor itself that has developed as a place marker for the I-5 traveler. These landmarks include the following places.

Carlsbad Village

Holiday Park is at the heart of Carlsbad Village, and is in large part responsible for its scenic designation. The park is visible from the elevated northbound freeway lanes, but its many tall, mature trees are also visible to southbound travelers as well. The village that surrounds the park was developed in the first half of the twentieth century and is what urban planners now call a traditional or livable community. This means that commercial and residential land uses coexist, streets are relatively narrow and shaded with large trees, parking lots and commercial signage are barely noticeable, and commercial buildings are in scale with nearby custom-built single family homes. Freeway landscaping screens the sight of moving traffic from the community, and large trees enable it to be consistent with the Village's visual character. This scene forms a sharp contrast to the more contemporary and commonplace land use patterns and building types found in the Carlsbad Mesa landscape unit to the south.

Holiday Park in Carlsbad Village

Freeway Median Oleanders

As southbound freeway travelers approach the city of Oceanside, they are introduced to San Diego's metropolitan region by lush freeway landscaping of a type they did not experience as they passed through urban areas to the north. The route seems to change from a standard freeway to a green parkway principally due to the presence of large, flowering oleander shrubs in the median. Oleanders reduce the scale of the freeway by half as they screen views of oncoming traffic. They provide cooling visual relief with their soft, green, non-reflective, undulating, natural appearance. They are a visual link to scenic areas adjacent to the freeway. Median oleanders are an I-5 freeway feature unique to San Diego and vividly communicate the region's distinctive landscape character and civic identity to millions of visitors each year. The oleanders extend from Harbor Drive interchange in Oceanside to San Dieguito River Bridge in San Diego, and again from Genesee Drive interchange in San Diego past the southerly project limit.

Median Oleanders in Encinitas

Adjacent Land Uses

There are several major types of conditions that occur adjacent to the I-5 corridor.

Lagoons

As mentioned previously, the various lagoons that occur throughout the corridor are perhaps the single most important element that gives the I-5 corridor its uniqueness. Accordingly then, freeway improvements within this unique environment must be carefully designed. As mentioned previously, the lagoon segments represent the area within which the various landscape sections transition between each other. An abrupt change between the freeway character within the lagoon section and the adjacent more developed sections is not desirable. Gradual transitions between the various themes are critical to keeping the overall character of the corridor intact. The sections within the lagoons must be as visually unobstructed as possible. One must feel as though they are “floating” across the lagoons as they are traversed. In addition, the bridges that cross to lagoons must not be massive and bulky, but rather express an open, more natural feeling, particularly to those that are traveling east and west under the freeway.

San Elijo Lagoon from Manchester Boulevard

Batiquitos Lagoon looking south from I-5

Other Open Spaces

In addition to the lagoons, there are many places where development does not occur immediately adjacent to the freeway. In some cases, the open spaces are more native and natural, such as just north of Encinitas Boulevard along Cottonwood Creek. In other cases, the open space adjacent to the freeway is more refined and manicured, like Holiday Park in the City of Carlsbad. The treatment of the walls and landscaping adjacent to these two very distinct areas must be designed accordingly. Ornamental landscapes within the freeway right-of-way should not be constructed adjacent to natural and native areas. Similarly, native planting may not be appropriate immediately adjacent to existing homes.

Cottonwood Creek adjacent to the freeway on Encinitas

Residential

There are two major types of residential development adjacent to the freeway. Many areas are denser and contain multiple attached and multi-story homes.

Example of higher density residential adjacent to the freeway in Oceanside

Other areas contain lower density single-family residential homes. In most cases the residential units back up to the freeway, however in some locations a frontage road provides some distance and the buffer between the freeway and the sections themselves. In some cases an intensive wall will be required to provide the required noise control. However, there are situations where because of topography, the sound walls need not be as large and dominating. Typically, the need to mitigate the freeway noise is highest next to these residential areas as well as park and recreation areas as discussed below.

Example of low density residential adjacent to the freeway in Carlsbad

Office/Industrial/Commercial

The existence of intensive industrial commercial uses adjacent to the freeway requires a different treatment than other areas. For example, blocking views of adjacent commerical areas is not necessarily desired from a marketing visibility standpoint. Adjacent businesses frequently rely on visual contact from freeway users to survive. Accordingly, treatments along these sections should be as open and unobstructed as possible without negatively affecting the experience of the commercial or industrial user. For example, freeway noise along a car dealership freeway interface is not as critical as one where outdoor eating areas are adjacent to the freeway.

Example of office uses next to the freeway in Carlsbad

Park and Recreation Areas

Parks occur along various places within the corridor. In situations where highly intense recreational uses, such as a playground occurs, considerable buffering is required from a sound and visual perspective. It is important that the benefit received from utilizing these parks not be compromised by negative impacts of the freeway. The relationship can be seen two ways. While views of adjacent park areas are important for freeway travelers to experience, it is also critical that park users not be negatively impacted by the freeway.

Holiday Park in Carlsbad

Other Uses

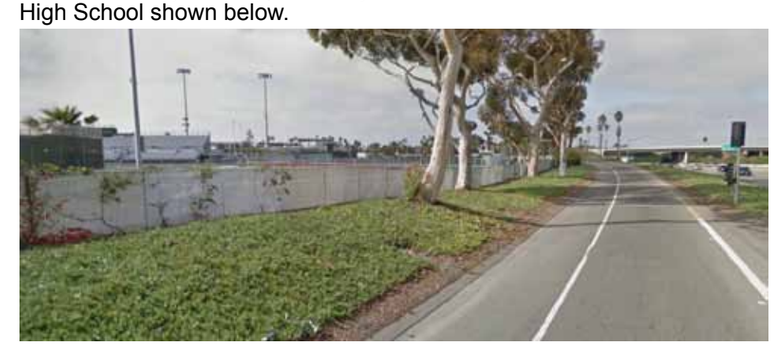
Frontage roads along the freeway help to provide distance between the freeway and adjacent uses. However this can also result in a greater number of viewers being negatively impacted by large retaining and sound walls. The situation occurs along Ida Avenue in Solana Beach.

Example of a frontage road in Carlsbad

At times, distant views of the ocean occur from other portions of the freeway that are not within the lagoon sections themselves. Traveling southbound above Ida Avenue in Solana Beach is an example where a distant significant view needs to be maintained.

Distant view of the ocean from a non-lagoon area in Solana Beach

There are many other types of adjacent land uses such as Oceanside High School shown below.



Oceanside High School

Human Context

In addition to the strict physical aspects of the corridor, it is important to understand what the freeway traveler experiences when traveling the corridor. Basically, the experience can be divided into three categories, the experience of space, the experience of speed, and the experience of scale. These are discussed in the following paragraph. However, why is this important? In developing these guidelines, three major questions need to be asked.

- Should all of the proposed improvements within the corridor look and feel the same?
- Should there be a different character to the improvements throughout the corridor?
- Where does one character begin and another end?

In order to answer these questions, the current experience needs to be clearly understood.

The Experience of Space

As discussed earlier, the corridor travels up and down in a rhythmic pattern. Generally, as the freeway elevation rises, it cuts through natural topography with views of manufactured slopes. As the freeway descends, natural topography drops away to allow distant views. This creates an alternating feeling of spatial compression and expansion.

An example of an “up” view in Oceanside

“Up” views (high freeway elevations) are enclosed with more vegetation, topography and structure compressing the immediate viewshed. By comparison, “down” views (views when in the lower areas) tend to be expansive, open, creating a feeling of floating over the lagoons. Therefore the project design should preseve these experiences. For example, tree planting should be concentrated in the enclosed “up” areas, and minimized in “down” areas with distant views.

Example of an expansive view in a low-lying area between Encinitas and Carlsbad

The Experience of Speed

The corridor is experienced while traveling at high speeds. Speed compresses distance, which affects design. For example the curve of a wall is magnified, while the details on its surface are diminished. Landscape plan textures and patterns that are too small or too busy will become a distraction. Because of the speed of the traveler, the visual experience is compressed in time into a single brief impression.

Intricate detail is not perceived by the freeway traveler along I-5 in this example in Orange County

The Experience of Scale

While traveling on the freeway, the horizontal is emphasized creating a need for vertical elements to balance the composition. By contrast, the experience of being in a community adjacent to the freeway results in the vertical being emphasized, creating the need for buffers and scale elements.

The horizontal is emphasized next to the freeway creating a need for vertical elements

The vertical is emphasized next to the freeway creating the need for buffers and scale elements as shown in this example along I-15 in Mira Mesa

C. Design Principles

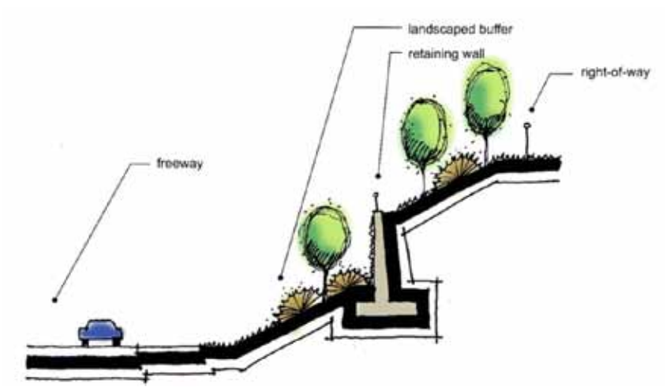
Prioritize Spatial Quality

A. Separate Walls from Viewers

The use of mid slope cut retaining, mid slope fill retaining, noise berm/wall combo, and transparent noise walls should be encouraged.

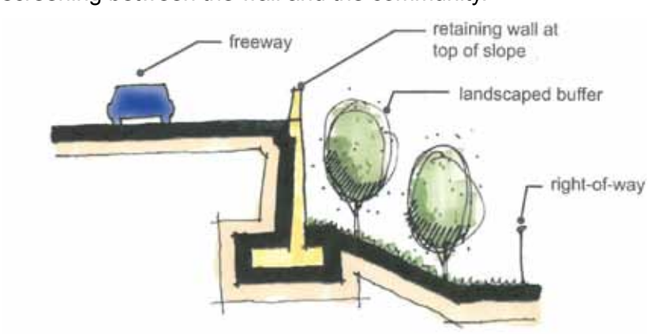
Mid-slope Retaining Walls in Cut Sections

Retaining walls should be located at mid slope wherever possible in cut sections to provide a buffer area for landscape screening between the wall and freeway.



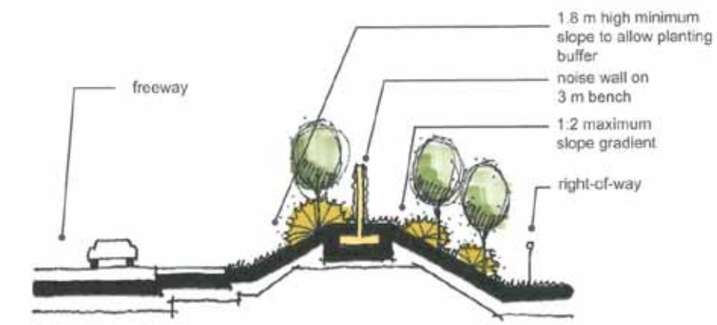
Top-of-slope Retaining Walls in Fill Sections

Retaining walls should be located at the top of slope wherever possible in fill sections to provide a buffer area for landscape screening between the wall and the community.



Noise Berm/Wall Combinations

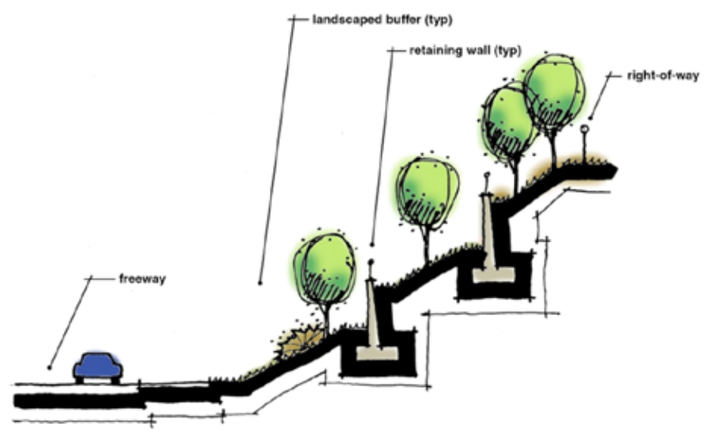
This barrier configuration is preferable in situations where a tall retaining wall at the toe of slope would create a visual impact to an adjacent property. To be effective, this option should incorporate a berm with a 1:2 slope on the freeway side that is 1.8m (6 ft.) high (minimum). This size berm should allow enough space to provide screening shrubs in front of the wall.



B. Create Buffers and Planting Strips

Terraced Retaining Walls

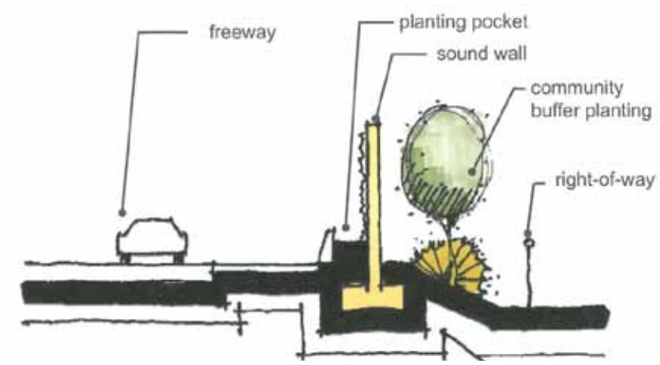
Where site conditions are favorable, retaining walls over 6m (20 ft.) in height should be divided into separate structures sufficiently offset from one another to create a planting area between the two.



These walls should not be constructed in one vertical plane. The use of terracing forms that curve with the landform and disappear into the slope help accentuate the smooth flowing rhythms of the corridor and avoid abrupt conflicts with the contours. This is keeping with the overall theme of blending in with the unique natural environment of the I-5 corridor. Retaining walls and sound walls are the most important elements that will establish what a traveler within the corridor experiences and remembers.

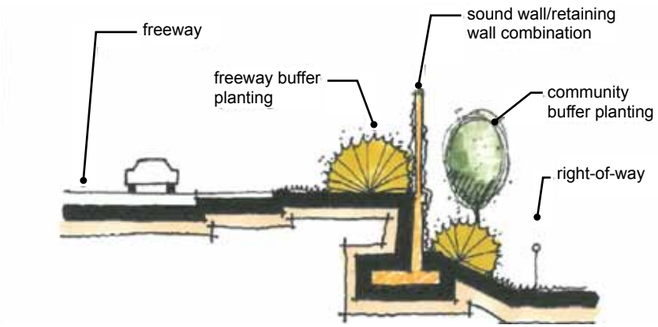
Noise Wall Planting Pockets

Where right-of-way is too narrow to employ the configurations listed above, a minimum 1.5m (5 ft.) wide planting area should be provided between the back of the barrier and the face of the wall.



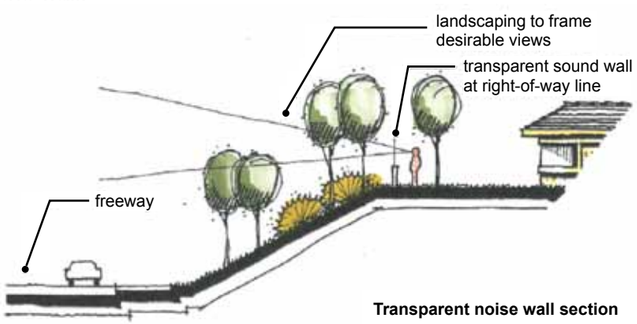
Noise Wall Landscape Buffers

In cases where berms are entirely unfeasible, sound walls should incorporate planting on both sides. In some cases, retaining walls and/or a concrete barrier at the edge of shoulder may be needed to provide the required planting space.



Transparent Noise Walls

In some cases, these walls need to be transparent. Translucent materials can be placed on top of noise walls to reduce their apparent height and create a greater sense of openness. Translucent materials should be placed above areas of potential vehicle impact, out of easy reach, and should consist of vandal-resistant materials. In addition, special treatments such as articulation or perforations can be used to improve the visual appearance of the wall.



Transparent noise wall section

Emphasize Form versus Surface

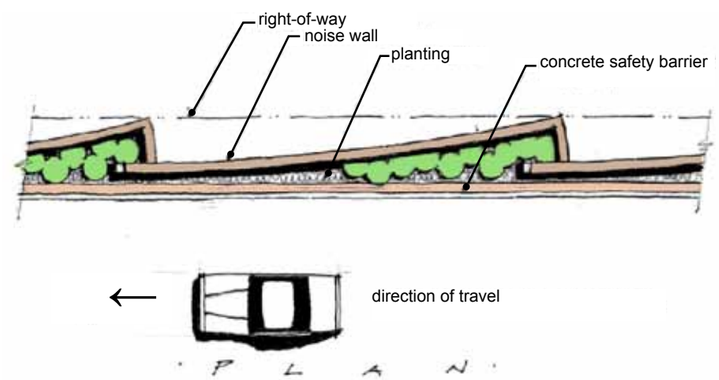
The structural elements should be designed as three dimensional forms rather than flat canvases. An example would be how a retaining wall transitions into adjacent slopes. Rather than force a rigid geometric plan onto the natural terrain of an adjacent hillside, retaining walls should respect the contours of the natural hillside to give the appearance of the wall growing from the hillside.

A. Use Varied Wall Alignments

Noise Wall Articulated Layout/Varied Profile

The use of setbacks and return sections in wall layouts reduces the monotonous visual effect of a single wall surface and helps reduce its apparent scale. This design can be used with a varied top of wall profile to further increase visual interest.

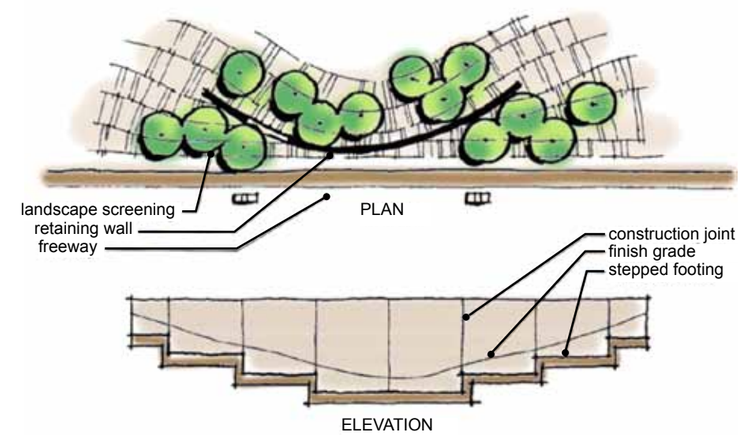
This design option is only feasible when right-of-way is available.



B. Create Sculptural Wall Forms

Terrain Contoured Retaining Walls in Cut Sections

Retaining walls that follow the contours of the topography and maintain a constant elevation at the top of the wall would be used where appropriate. Wall layouts and profiles should be composed of long radius curves, with no tangents or points of intersection. Wall faces should be battered at a 1:12 minimum horizontal/vertical ratio. Walls should be located at mid-slope. This type of wall is visually compatible with surrounding terrain and provides room at the base for a slope that contains landscape screening.



Communicate the Essence of a Place through Forms, Not Images

The third major principle is perhaps the most critical. The true essence and spirit of a place should be clear without the need for signs, murals or cliché images on walls (i.e. seagulls or palm trees). The basic form of the freeway structural elements should be derived from the place itself.

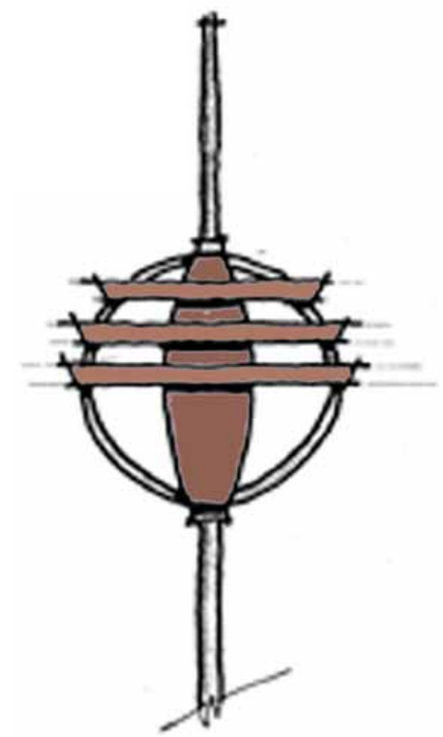
In Solana Beach, the rational character of the surrounding bluffs was the basis for the design of the walls

Place Community Identity Elements in the Community

Each community has the opportunity to enhance the retaining walls by incorporating unique community elements into their walls. For example, Solana Beach incorporated mosaics into their walls as shown below. In these types of cases, maintenance responsibility for enhancements falls to the local cities.

Solana Beach Mosaic Walls

Each community also has the opportunity to add unique community design elements. These kind of enhancements could also be used on bridges within the bridge fencing. An example of enhanced finial is shown below.



"Carlsbad Ranunculus"
Finial Detail

D. Design Themes

Corridor Theme Elements

Several design features will be utilized throughout the corridor to preserve the natural visual characteristics of the existing freeway and create a unifying visual thread for those traveling the corridor.

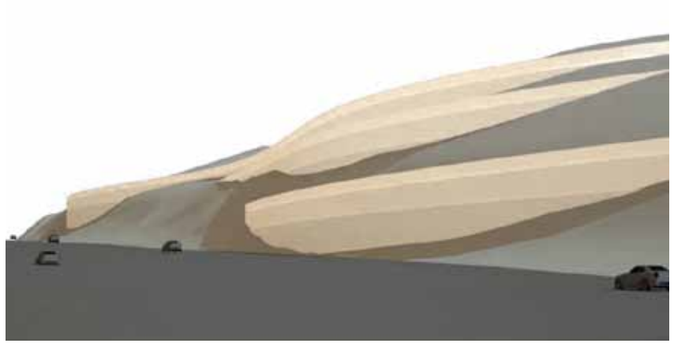
Terrain Contoured Retaining Walls

Alignment – Walls facing the freeway will be setback from travelers as much as possible to allow room for planting buffers and minimize the visual prominence of each wall.

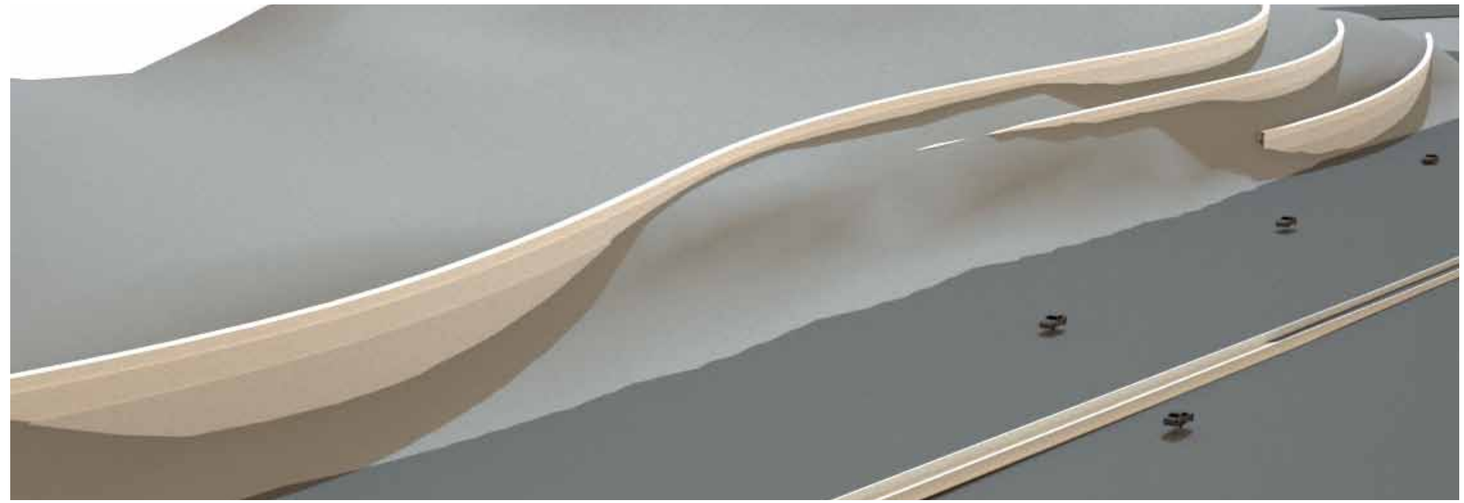
Layout – Walls will possess a natural, organic character by following the contours of natural topography. The layout will consist of long radius curves, and the use of tangent sections (straight lines) will be avoided if at all possible.

Profile – Since the wall layout will ideally follow a single topographic contour, the top of the wall will remain at that elevation and be essentially level. Wall height variations will become apparent at the bottom of the wall. When wall layouts must vary from adjacent contours, top of wall profiles should be kept at less than 10% if at all possible. The top of wall profile will consist of long radius curves, and use of tangent sections will be avoided.

Battered vertical surfaces – Wall surfaces will slope away from the viewer at a minimum of 1 foot horizontal change for every 12 feet of wall height. This will also contribute to a wall's natural appearance.



An example of terrain contoured retaining wall



An example of terrain contoured retaining wall

Indigenous Slopes

Natural contour grading should be practiced whenever space allows. In areas where slopes are cut into Torrey sandstone, large steps will be utilized to replicate the appearance of coastal bluffs and to detain eroded soils on flat benches created by the steps. Slope benches will also promote effective plant establishment.

Slope planting should consist of drought tolerant, non-invasive species that are historically associated and visually compatible with adjacent communities.

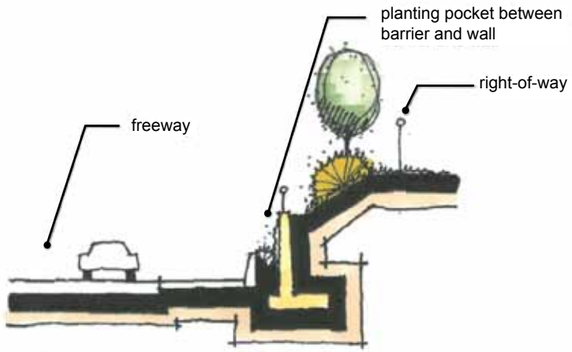
Example of revegetated slope just north of Carmel Mountain Road

Example of revegetated slope in Encinitas

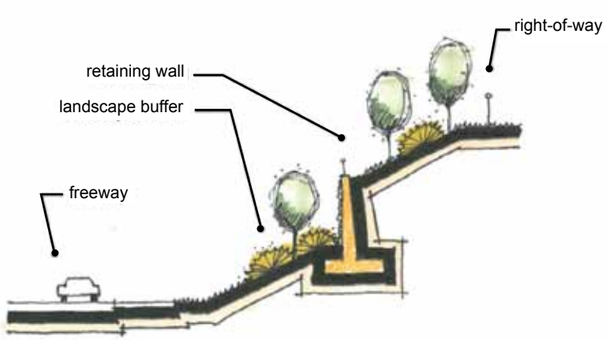
Spatial Buffers

Walls and freeway edges – A number of design solutions will be used to create space between the edge of freeway shoulder or concrete barrier and an adjacent retaining or noise wall in an effort to avoid the urbanizing effect to propose built forms. These techniques are found in the Visual Impact Assessment and include mid-slope retaining walls, articulated layout walls, wall/barrier pockets (planted or non-planted) and wall/barrier setbacks.

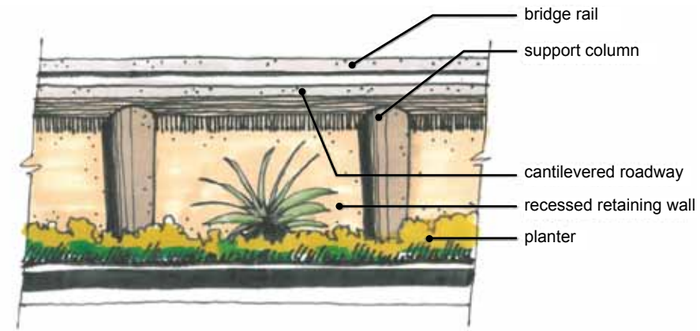
Walls and Community Edges – Buffers will be created between freeway retaining walls and adjacent properties by placing the wall at or near the edge of freeway shoulder if possible. This and other buffer strategies are contained in the Visual Impact Assessment. In particularly sensitive areas, the use of viaduct retaining walls will be considered.



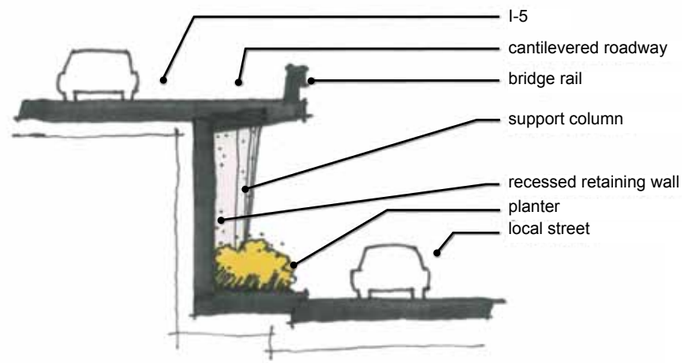
Retaining wall/Barrier planting pocket section



Mid slope retaining wall section



Viaduct retaining wall Elevation



Viaduct retaining wall Section

Median Planting

Preserve Existing Planting – Median oleanders now reduce the scale of the freeway by screening travelers from views of oncoming traffic. They also provide a soft, organic, colorful visual relief from the hard reflective concrete surfaces of the roadway. This role will become increasingly important as the freeway expands.

Protect with Enhanced Median Barrier – A concrete median barrier will protect median planting and will be integrally colored with an earth tone and be finished with a sandblast texture to give it a natural appearance.

Example of median planting in Solana Beach

Color

Concrete surfaces visible to the public will be integrally colored to be compatible with local design themes. Most of the corridor features will be colored in earth tones consistent with characteristic coastal bluffs. Enhanced metal surfaces will mostly consist of weathering steel, which possesses a deep rich patina which denotes the beauty that can result from the work of nature over time.

Example of Solana Beach wall

Corridor Theme Priorities

Primary importance in the hierarchy of corridor design.

The three most important elements that need special attention and will have the most impact on the character of the corridor include the community gateways, the lagoon bridge crossings and the retaining/sound walls.

Community Gateways

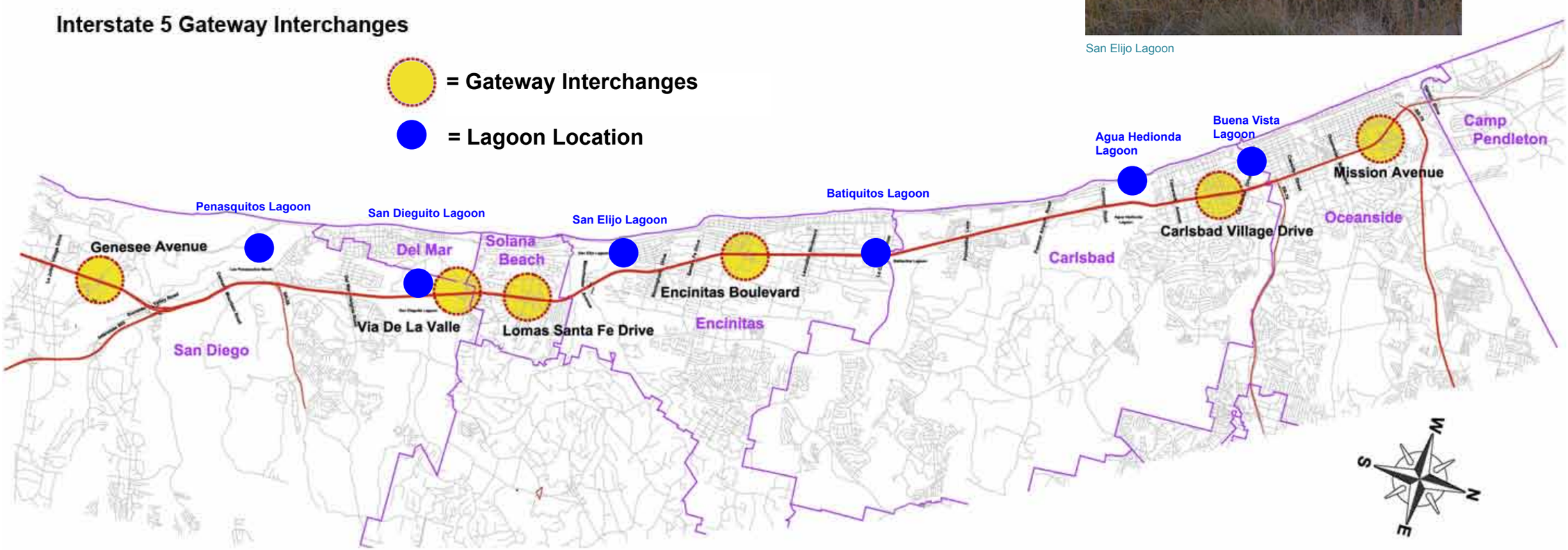
These interchanges provide major access to town centers/historic villages that characterize the specific communities. The Gateways are located at:

- Genesee Avenue
- Via De La Valle
- Lomas Santa Fe Drive
- Encinitas Boulevard
- Carlsbad Village Drive
- Mission Avenue

Lagoon Bridge Crossings

Lagoons make this portion of I-5 unique. Nowhere else in southern California do freeway travelers experience this sequence of views. Because of this uniqueness, as well as the scenic quality of the views both on and off the freeway, the proposed lagoon bridges merit special treatment.

San Elijo Lagoon



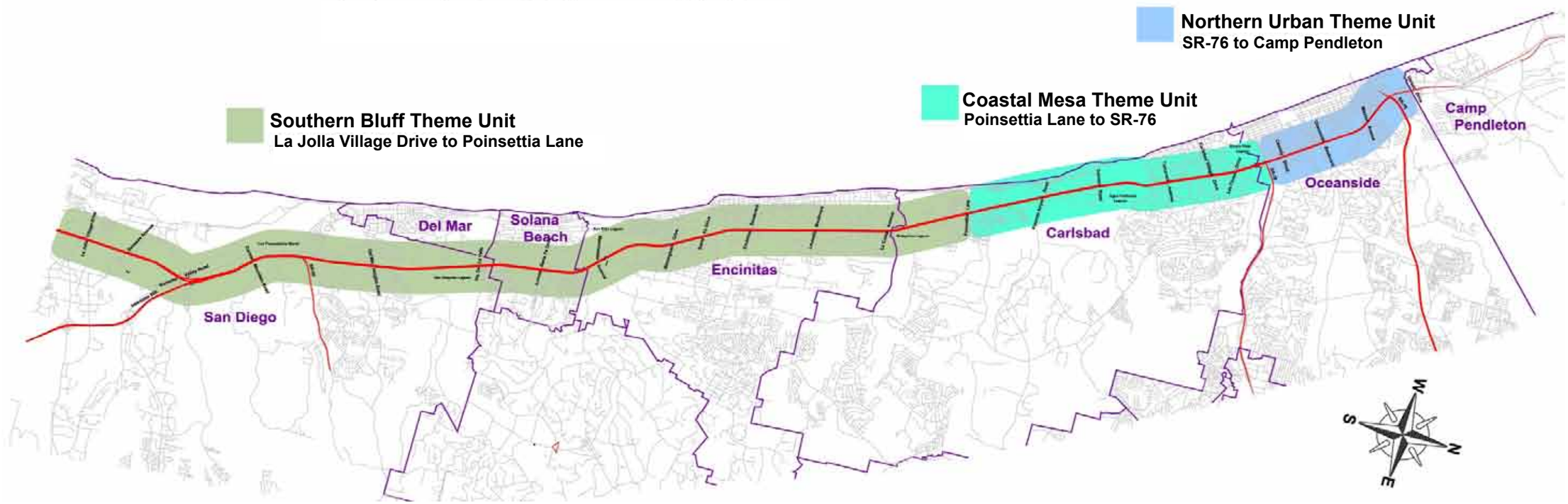
Corridor Theme Units

The I-5 North Coast Corridor possesses an overall natural, open, coastal character, but the perceptive traveler can sense subtle variations in those attributes. Residents that make their home along this portion of the coast are well aware of qualities that make their individual communities unique. For example, native landscapes in the south subtly morph to more cultivated and park-like natural forms to the north. As one travels south, the corridor begins with pleasing views of a modern resort marina and ends with the ancient beauty of Torrey Pines State Reserve. The result is a corridor that possesses an overall visual unity, but is far from being uniform. These guidelines seek to reflect this pleasant duality.

The entire corridor is divided into three basic Theme Units. The Theme Units designated by these guidelines bear no relationship to political boundaries such as city limits, but are determined by the visual character of the landscape. The following existing characteristics were used as determinants to establish the Theme Units.

- Natural landscape character (topography, bluffs, vegetation, color, etc.)
- Visual character of adjacent land uses (the degree of urban character)
- Proximity and nature of adjacent land uses

This designation does not imply that the character within the entire Theme Unit is entirely the same. There are sections within each Theme Unit that are unique and result in variations within each Unit. These variations contribute to the character of each unit, but are not as distinctive on their own. Each of the three Theme Units are shown in the graphic below.



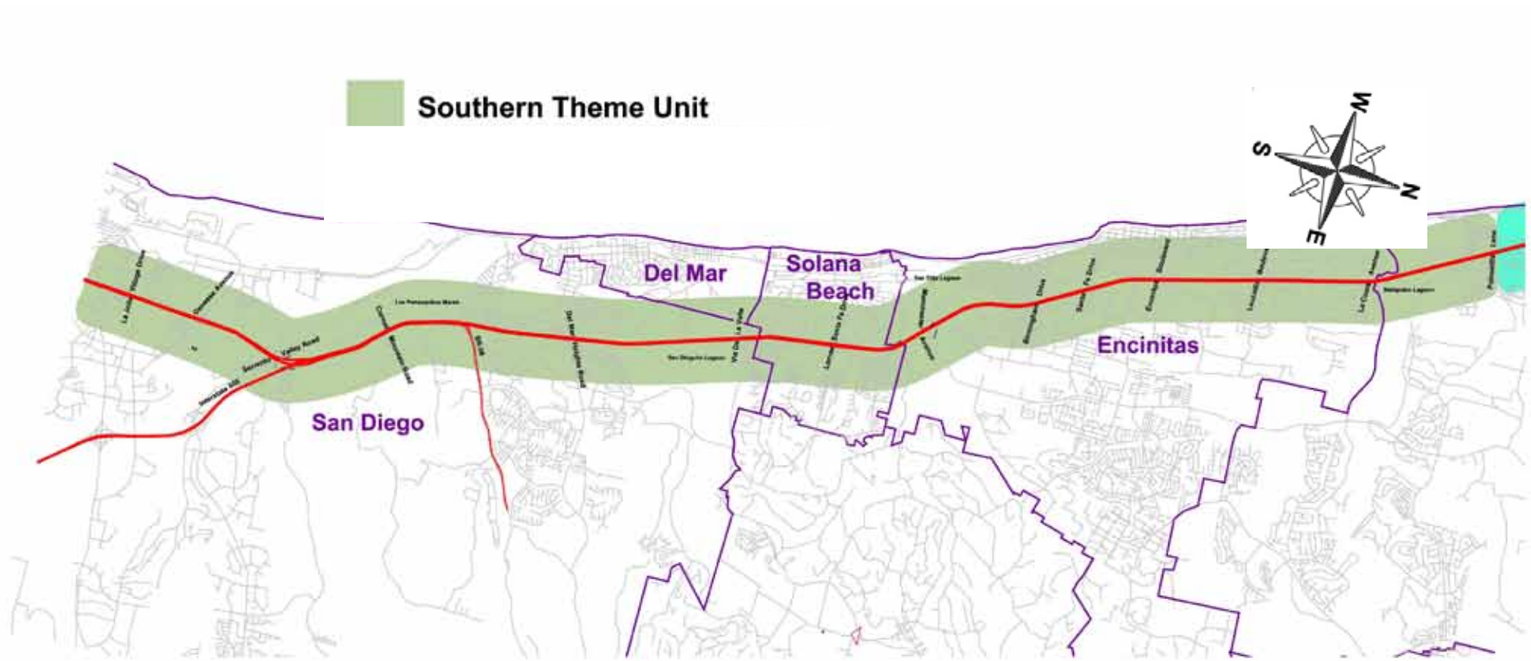
Description of Theme Units

Southern Bluff Theme Unit - La Jolla Village Drive in La Jolla to Poinsettia Lane in Carlsbad

This portion of the corridor is best characterized by coastal bluffs of Torrey sandstone that buttress the coast as well as river valley slopes farther inland. The design of corridor retaining walls is meant to recall these iconic forms. The weathered, eroded quality of bluffs will be reflected in architecture pilasters, rough surface textures, integral earth tones, and weathered steel ancillary materials. This earthen theme will be carried through the bridges and sound walls as well. Bridges will utilize the integral earth tones in the cast-in-place concrete structures with accents of the textures that characterize the corridor retaining walls throughout this section. Steel railing elements will be comprised of weathered steel and fine mesh materials will help to emphasize transparency and highlight the connection to the sky.

Torrey Pines State Reserve

Encinitas Cantebria Gardens Trail



Southern Bluff Theme Unit

San Elijo Hills

Coastal Mesa Theme Unit - Poinsettia Lane in Carlsbad to State Route 78 in Oceanside

North of Batiquitos Lagoon, upland topography shifts from rolling hill to expansive coastal mesa. Extensive commercial development and an older, tree lined, established urban village border the freeway on these flatlands. Between them, Agua Hediona lagoon and adjoining agricultural fields form a natural punctuation mark. Also punctuating the sky is the Encina power plant exhaust stack that has been an orienting feature for over fifty years. This vertical element combines with the coast highway, Carlsbad State Beach, and Carlsbad sea wall to form a visual signature of coastal Carlsbad.

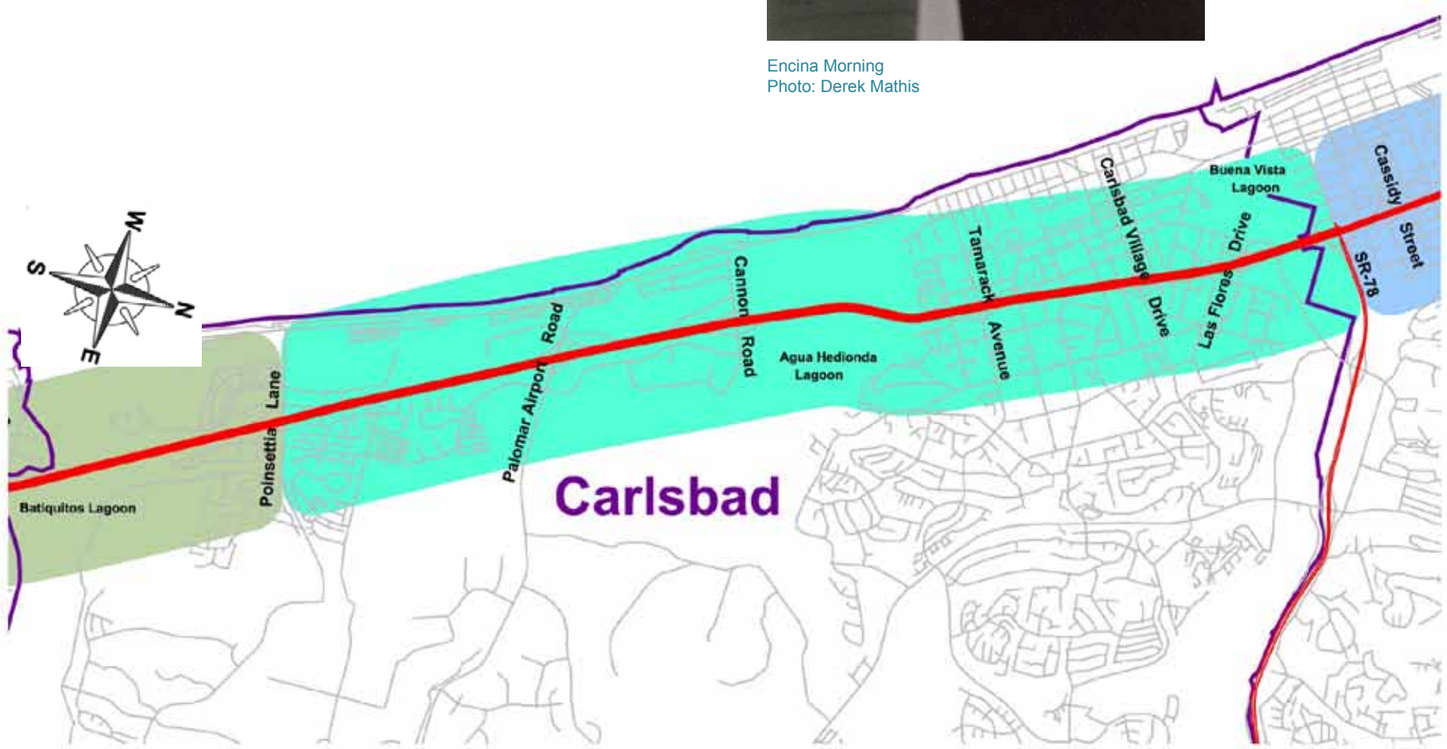
Design themes for this unit will be inspired by the areas natural coastal forms that harmonize with the rhythm of land and sea. In key locations, sound walls will use cast-in-place construction to enable an organic, free-form design vocabulary to be used. Bridge pedestrian screening will be composed of natural curved forms that harmonize with the rhythm of land and sea.

Encina Morning
Photo: Derek Mathis

Encina Creek Bridge

Example of flower in Carlsbad

Carlsbad Flower fields



Coastal Mesa Theme Unit

Northern Urban Theme Unit - State Route 78 to Vandegrift Boulevard in Oceanside

In this unit, coastal bluffs recede, and broad sand beaches lined with development are characteristic. In general, a more urban quality appears both on the coast and along the freeway corridor. The Strand, the Oceanside Pier, and Oceanside Harbor establish coastal character. This unit also is home to the most significant architecture in the corridor. Mission San Luis Rey inspired the works of Irving Gill, which in turn inspired Charles Moore's Oceanside Civic Center. All combine to form a rich architectural heritage and historical continuity.

Freeway architecture will exhibit more tectonic forms than other units of the corridor consistent with the immediate context. Rectilinear forms, smoother surfaces, lighter colors, and refined ancillary materials such as ceramic tile and galvanized steel will distinguish this unit from the others.

San Luis Rey Mission

Oceanside Beach

Oceanside City Hall

Northern Urban Theme Unit

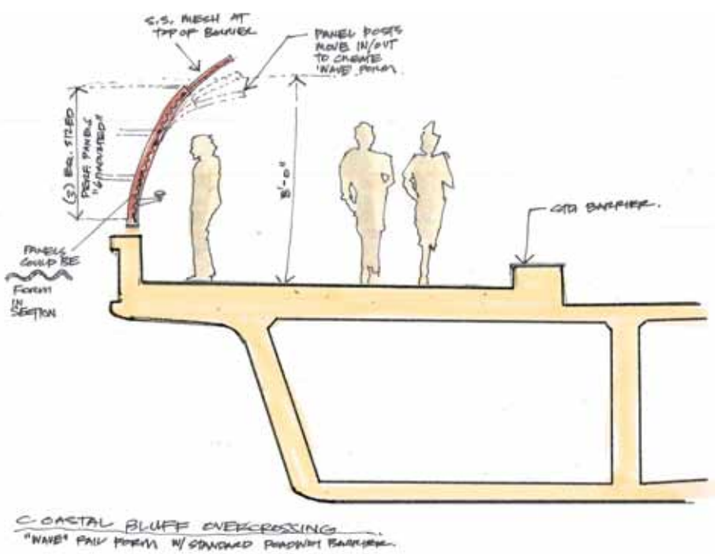
Design Guidelines
Interstate 5 North Coast Corridor Project

Design Concepts

III. Design Concepts

The major design features that will visually define the corridor include retaining walls, sound walls, bridges and landscaping. This is particularly true from the realm of the freeway traveler. Just as critical will be the view from the pedestrian realm. The elements that define this pedestrian realm include sidewalks, bollards, street furniture and other typical streetscape features. Each major design feature will be discussed with design concepts recommended in the form of sketches, renderings and associated text.

The design concepts were carefully developed to respond to the surrounding physical environment of the corridor. For example, the lagoons are such a special and unique feature within the corridor that future bridges crossing the lagoons are designed to respect and enhance the characteristics of each lagoon. As seen below, the immediate views of the lagoon as well as the distant views of the ocean can be honored and enhanced by a well designed bridge.



An example of pedestrian realm recommendations

Similarly, each of the other major elements such as retaining walls and sound walls were designed to respect the environment that the corridor sits within.

A lagoon bridge rendering

In addition to the visual character and function from and for the freeway, the proposed freeway improvements need to respond to adjacent community and pedestrian needs. Renderings and sketches are used in this document to help illustrate the importance of the pedestrian experience.

The use of an * within this section indicates that the highlighted feature is an enhanced item, not a standard. Some design elements that are indicated are standard while the enhnaced items are optional if the associated city wishes to maintain the item.

A. Bridges

General Bridge Design Issues

Throughout history, bridges have provided connectivity between people and places. They have the potential to define cities, such as the Golden Gate Bridge has done in San Francisco. Highway bridges have long had the ability to create memorable driving experiences and create visual landmarks for the freeway traveler.

The West Lilac Road Bridge over Interstate 15

In addition, where the construction of freeway bridges has divided communities, a good bridge design can help heal those separate connections. As seen to the right, an excellent example of a bridge helping to reconnect a neighborhood is the El Cajon Boulevard bridge overcrossing at SR-15 in San Diego.

A simple widening of a bridge can help to reconnect neighborhoods

Most bridges within the I-5 corridor will need to be reconstructed due to the expanded width of the freeway. After the visual dominance of the walls within the corridor, the aesthetic appearance of the bridges will be the next most memorable feature as one travels the I-5 corridor. As such, the proposed bridges have been evaluated using the following factors:

- Type (overcrossing, undercrossing, lagoon, etc)
- Location along the corridor (significance/gateway)
- Shape (box, haunched, arch, other)

The I-5 Corridor has three basic bridge types that are described in these design guidelines:

- Lagoon bridges (high clearance and shallow clearance)
- Gateway bridges
- Non-gateway bridges

The lagoon type bridges include those listed in the chart below. All lagoon bridges to be replaced will see a reduction in the frequency of columns. Reducing columns and obstructions in the lagoons is a goal, however the extent of this may be limited due to freeboard requirements. In the case of San Dieguito, opportunities to enhance the widening will be studied.

	Clearance					
Lagoon Bridge	**High**	**Shallow**	**Pedestrian**	**No Pedestrian**	**Replaced**	**Widened**
Penasquitos Lagoon						
San Dieguito Lagoon			●			
San Elijo Lagoon	●		●		●	●
Batiquitos Lagoon		●	●		●	
Agua Hedionda Lagoon		●	●		●	
Buena Vista Lagoon				●	●	

View of lagoon bridge at lagoon

Lagoon Bridges – High Clearance

Arched Bridge

These bridges and crossings interface with the environmentally sensitive lands and thus should be designed in a way that elevates and enhances these areas. The use of open, light, airy arches is illustrated in a way to promote a solution that allows the structures to lightly touch on the waters and land. Special attention to the use of concrete with integral colors that take cues from the surroundings should enhance the view of the structure from within the lagoon/valley.

The San Elijo Lagoon Bridge at Manchester Avenue was chosen as the example bridge by which all lagoon bridges should be built.

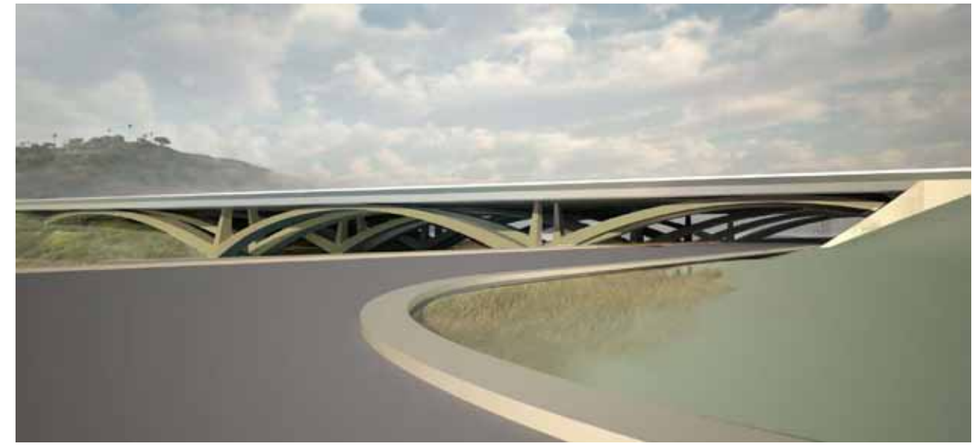
The Experience

In these landscape section transitions, the lagoon bridges are viewed from the surrounding communities, trails and from within the wetland itself. It is important that these structures are as visually unobtrusive as possible. The notion of an exposed arch structure is presented here to reinforce a transparency and fluidity over the water. The structures should feel as if they are floating about lagoons.

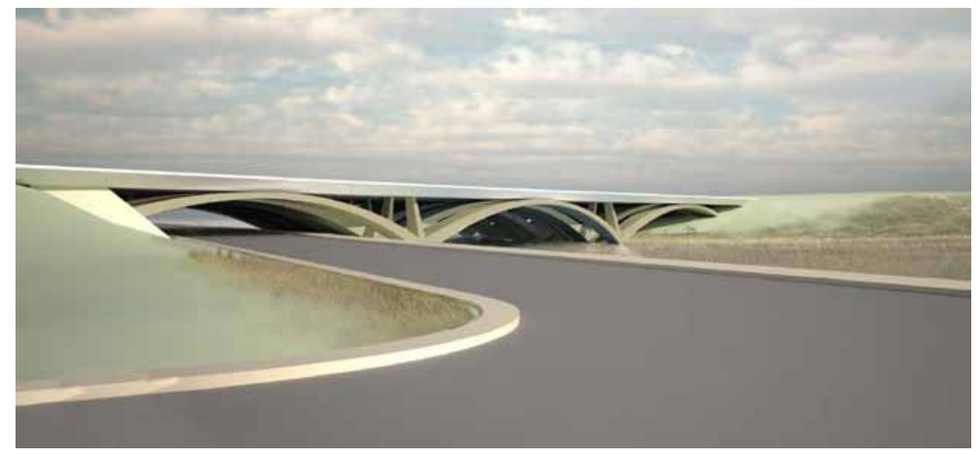
From the corridor, these bridges and the infrastructure should dematerialize in a way as to emphasize the open character and views to the lagoon valleys as much as possible.

The Opportunities

These crossings lend themselves to having long spans. It is recommended that the structural system emphasize this long span nature to provide light, air, and views that penetrate the area below the bridge. In order to emphasize the openness and light below the bridge, the bridge type should allow for a gap in the roadway crossings wherever possible. This bridge type could be implemented in each of the lagoon sections for consistency. There is a certain modularity of the arch span that allows the horizontal nature of these arches to be reused in different conditions and respond to each crossing as required. Careful study of the site-specific colors, materials, landscape and texture is required. These cues from nature should inform the designer of these structures in selecting materials and finishes for the structure.



View of lagoon bridge from east intersection



View from off-ramp

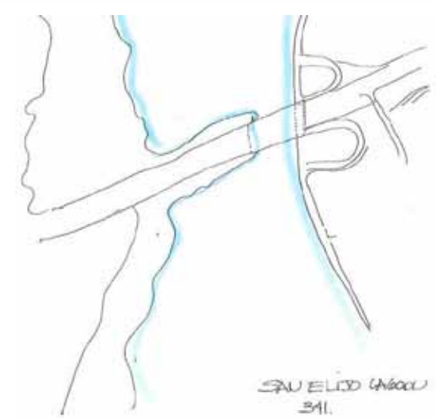


Diagram plans of lagoon crossings

View of lagoon bridges at lagoon edge

Lagoon Bridge – High Clearance with Pedestrian Crossing

These lagoon crossings also provide unique opportunities to enhance connectivity for trail users, nature lovers, hikers, runners, equestrians, and wildlife. Two types of lagoon crossings have been identified: low crossings and high crossings. Each of these crossing types requires a slightly different approach to how the inter-connectivity of the trails can be implemented. Each type is illustrated to show how these crossings can be achieved in a careful manner that enriches the experience for the users.

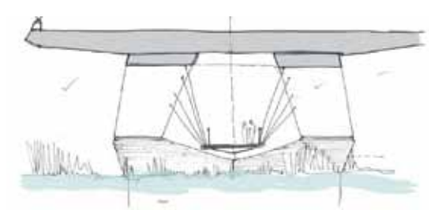
At the lagoon crossings, pedestrian connections will be constructed and accommodated below the bridge structure.

One way that this structure may be attached to the bridge superstructure is by hanging the pedestrian structure from the bridge structure below the roadway arches.

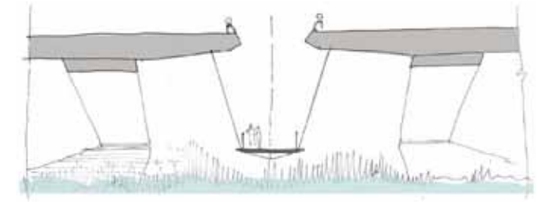
The notion of a simple hanging structure that sits lightly above the water contrasts with the heavier concrete arch forms and emphasizes its lighter pedestrian function. The materials of the pedestrian bridge form should also contrast with the concrete bridge form with warmer, more natural finishes of weathered steel, light stainless steel mesh, and wood decking.

Possible pedestrian connection across lagoon

Pedestrian bridge suspended from arched structures



Walkway between arches



Walkway between bridge decks

View from pedestrian bridge suspended from arched structures

* Non-structural elements of pedestrian crossings would be maintained by a local agency.

View of the pedestrian walkway adjacent to the lagoon bridge.

Lagoon Bridge – Shallow Clearance

Tapered Box

The shallow lagoon bridges require a special design approach that still allows pedestrian users to cross from east to west and south to north and maximizes the use of the volumes under the bridge to create a space that does not feel cave-like. The Batiquitos Lagoon crossing is an example for the low lagoon bridge type. A tapered box bridge that begins its springings above the 100-year flood line is envisioned. The use of the tapered section adds needed height and articulation to the underneath portion of the bridge, enhancing the user experience from below.

The Experience

As with the arched lagoon bridge options, these bridges are viewed from the surrounding communities, trails and from within the wetland itself. The structures should attempt to allow light and air to filter underneath the structure. In addition, the structures should evoke the colors of the landforms, surround nature and feel like inviting places to cross beneath. Given the low profile of these bridges, this is a particular challenge.

The Opportunities

The structural solution for these crossings should attempt to minimize the number of times the water is interrupted by columns. Following is an example of a tapered box that has planar sloped soffits that create interest from below as well as allowing more air and light to penetrate underneath the crossings. The resulting geometry of the underneath side of the roadway will be appreciated by the users of the trail system. In addition, the roadway above has been separated to allow a band of light to break the otherwise dark recess. The use of integral colored concrete that recalls the natural bluff colors is used on the superstructure to further reinforce the bridges' connection to the place. Where the bridge touches the water, the columns have been stained to symbolize the mud that they rise from.

Shallow Lagoon Bridges with Pedestrian Crossings

Several lagoon bridges are low slung and the cars pass above the lagoon's very shallow clearances. Due to these shallow clearances, accommodations for pedestrian trail users will need special consideration. As illustrated here, the concept for the Batiquitos Lagoon crossing indicates how the pedestrian trail should attach parallel to the bridge structure on the west side. Sloped walkways are utilized to raise the pedestrian path above the waterway. Care has been taken to allow the pedestrian walking path adjacent to the highway to be lower than the roadway to provide greater separation between the pedestrians and the vehicles. In addition, the pedestrian path has been constructed out of lighter and more human-scale materials in order to accentuate a clear hierarchy between that of the roadway and that of the trail. The pathway could be supported by a series of cantilevered steel beams that support either hardwood decking or a lightweight aluminum bar grating. The path rail system is appointed with a lightweight cable rail system that allows for maximum visibility to the surrounding nature preserve.

* Non-structural elements of pedestrian crossings would be maintained by a local agency.

Lagoon Bridge – Shallow Clearance Cont.

Elevation view of the lagoon bridge.

The form of the lagoon bridge with an adjacent pedestrian walkway.

* Non-structural elements of pedestrian crossings would be maintained by a local agency.

Gateway Undercrossings

Three freeway undercrossing locations have been identified as potential candidates for the incorporation of gateway interchanges. These locations are significant because they represent primary entries to the communities they serve. The three undercrossings are Via de la Valle, Encinitas Boulevard, and Carlsbad Village Drive.

It is vital that these crossings visually communicate their role as gateways to freeway drivers as well as those using local surface streets. On local surface streets, gateway crossings should provide both bicycle and pedestrian-friendly elements. The associated intersections should be visually prominent, while at the same time providing enhanced human-scale elements such as lighting and material textures. Shown here, these concepts illustrate how modifying the typical freeway bridge to create a three-span undercrossing with tapered grading up to bridge abutment seats can create a pedestrian friendly zone, and at the same time open up the undercrossing to allow for both natural light and views through the space.

There will be two options for landscape treatments. The standard option reflects current Caltrans landscape treatment elements. However, if a City agrees to provide maintenance, an enhanced landscape option is possible. Please refer to Section III. Design Concepts: Landscape, pages 64 and 65 for examples.

The significance of these entry points will be communicated to freeway drivers through the use of gateway features. The exhibit shown here illustrates the use a of a vertical tower element. However, specific guidelines for the final designs will be determined with input from Resource Agencies, City Staff and input from the Community.

Street view of a gateway undercrossing with vertical entry feature.

Freeway view of a gateway undercrossing.

* Monuments and other non-standard gateway features would be maintained by a local agency.

Gateway Undercrossings Cont.

At Gateway undercrossings, the color, texture, finishes and cross-sectional geometries of the crossings and associated retaining walls will remain consistent with the design guidelines set for the corresponding Theme Unit. In addition to the notion of creating a gateway feature, these interchange designs will incorporate pedestrian enhancements. These examples illustrate how the undercrossing will be opened up by the use of 2:1 slopes at abutments which will allow for more light and views through the structure. An arcade of columns that carry the bridge spans reinforce the pedestrian experience. Columns could be located between the traffic lanes and the sidewalk to further emphasize the separation of pedestrians from motorists. Materials, finishes, lighting, and the use of details throughout these pedestrian linkages should be enhanced throughout the Gateway locations.

Gateway undercrossing bridge deck section

View of gateway from approach with columns at front of sidewalk

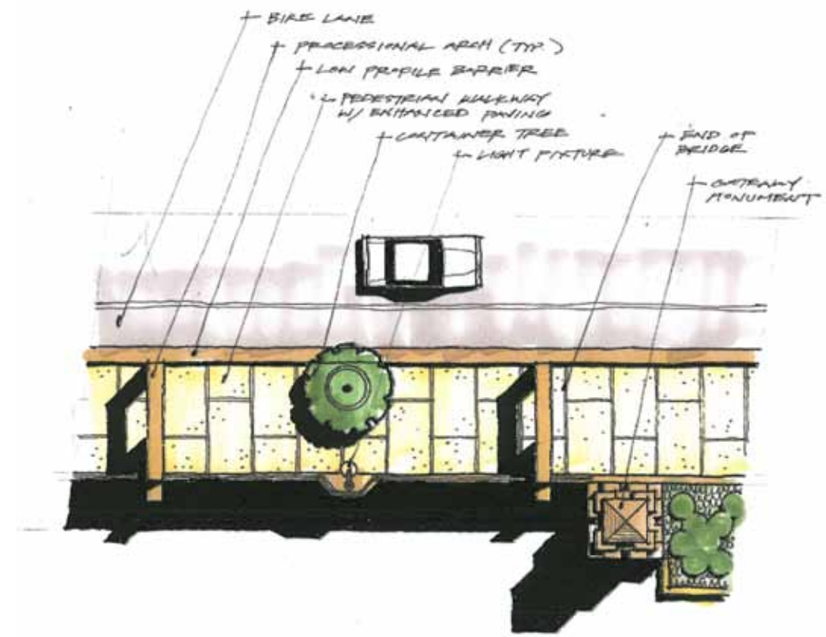
View of gateway from approach with columns at back of sidewalk

Gateway Overcrossing – Mission Avenue, Oceanside

The sole gateway overcrossing in the I-5 North Coast Corridor is located in Oceanside at the Mission Avenue interchange. Mission Avenue connects the freeway to Oceanside's historic town center. It also serves as a primary pedestrian route from nearby Oceanside High School to residential areas east of I-5. These factors shaped the design for the proposed reconstructed overcrossing. The first design objective is to reflect the character of Oceanside's rich architectural heritage through the use of context sensitive structural forms. Second, the design seeks to indicate to freeway viewers the importance of Mission Avenue as a gateway by incorporating monumental bridge pylons that serve as way-finding features and distinctive entry elements. Third, the importance of pedestrian circulation is celebrated by a tree lined archway that forms a processional promenade protected from vehicular traffic and containing visual enhancements that can be fully appreciated at a human scale and walking pace. These include colorful tile work, decorative walkway light fixtures, and artfully designed bridge fencing.

View of the monument's composition, including ceramic tiles, vertical formliner texture, and sandblasted concrete

The gateway overcrossing features a processional arch along the pedestrian path and is anchored by four monumental structures at the edges on each side



I-5 North Coast
Gateway Overcrossing Concept Plan

View of pedestrian crossing featuring the enhanced paving, tree planters and light fixtures enclosed between a decorative fence and low profile barrier adjacent to the roadside.

* Non-standard features located above bridge decks would require maintenance by a local agency

Perspective of overcrossing from Interstate

Typical Freeway Overcrossing Southern Bluff Theme

All Overcrossings in both the Southern Bluff and Coastal Mesa Theme areas will employ the use of a standardized box girder section with tapered faces and cantilevered perimeter edge conditions. This structural system and design response represents a typology that has been widely accepted by the engineering and construction communities as efficient and cost effective approaches to spanning freeway conditions.

Although these structures may use a familiar framework as a basis of design, the design guidelines describe how the bridges will be architecturally customized, reflecting the particular theme unit design intents. The bridge structure itself will utilize integrally colored concrete that will reflect the natural colors in the local coastal bluffs. Columns located at center-span employ a central arch motif that can be adapted depending on the width of the bridge deck being carried. For instance, at this location the arch is infilled with concrete, but at a wider overcrossing the arches may separate and allow for an actual opening between columns.

Shown here, the Southern Bluff overcrossings bring forth the textured wall cap details seen in the adjacent retaining wall design guidelines. The random tile pattern is used within the concrete band that runs the length of the bridge barrier rail. This band, known as an entablature in classical architecture, is recessed allowing the depth to emphasize this design element by allowing shade and shadow play across their uneven surfaces. In addition, these overcrossings utilize weathering steel as seen in adjacent wall tiles to create an outward leaning post and panel system to further strengthen the connection to the adjacent retaining wall design motifs.

View from center median

Aerial view of overcrossing

Southern Bluff bridge deck section

Perspective of overcrossing from Interstate

Typical Freeway Overcrossing Coastal Mesa Theme

As with the Southern Bluff, the Coastal Mesa Theme has a similar standardized box girder section with tapered faces and cantilevered perimeter edge conditions. This structural system and design response represents a typology that has been widely accepted by the engineering and construction communities as efficient and cost effective approaches to spanning freeway conditions.

The colors and design approach to the columns are the same as the Southern Bluff Theme.

The Coastal Mesa Theme overcrossings bring forth the arching/wave details seen in the adjacent retaining wall design guidelines. The arching/wave motif forms is used within the recessed concrete band that runs the length of the bridge barrier rail. Similar to the Southern Bluff Theme, a similar entablature element is created. This recessed pattern emphasizes the wave design element by allowing light and shadows to play across their uneven surfaces. The design theme continues in an inward facing wave form that creates the pedestrian fencing system. The fence material recalls the color of the weathering steel tiles seen in adjacent walls. See page 43 for additional details on proposed pedestrian fencing.

View from center median

Aerial view of overcrossing

Coastal Mesa bridge deck section

Perspective of overcrossing from Interstate

Typical Freeway Overcrossing Northern Urban Theme

Throughout the Northern Urban Theme unit, the bridge overcrossing structures shift from the bluff inspired colors and textures to the more urbanistic context. The structure and the architecture draws inspiration from the built environment as seen in the Mission San Luis Rey, City Hall, and other works.

A lighter/warm grey color is utilized to create a marked difference between the other bridge structures. In addition, the shapes of both the bridge box itself and the column supports are changed to a rectangular section which has been detailed with crisp edges that further reinforce the tectonic feel of the urban context. The railing and fencing system use a deep blue vertical picket and pedestrian scale lighting to form a unique edge condition over the freeway. The ends of these Northern Urban Theme units are anchored by a strong post design element that recalls some of the architecture seen in the Oceanside Civic Center.

Perspective from bridge approach

Aerial view of overcrossing

Northern Urban bridge deck section

Typical Freeway Undercrossings

At typical freeway undercrossings (at non-gateway locations), the color, texture, finishes and cross-sectional geometries of the crossings and associated retaining walls will remain consistent with the design guidelines set for the corresponding Theme Unit. The concepts shown illustrate both a two-span and a single-span condition. Preference should always favor the two-span option with tapered grading up to the bridge abutments as this variation allows for more light and visibility beneath the freeway. Constraints at each undercrossing location will influence the selection of the actual bridge type and number of spans. In locations where the right-of-way is limited or other factors necessitate an abbreviated crossing, the single-span option with vertical abutment walls may provide the only solution.

View of one-span undercrossing from approach

View of two-span undercrossing from approach

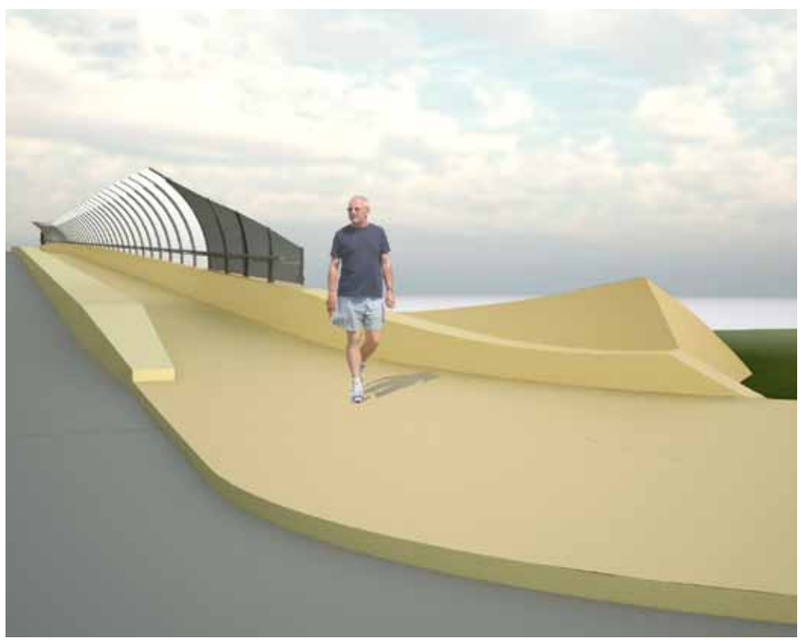
View of one-span undercrossing from approach

Typical Bridge Details

Typical Overcrossing Landings

At every overcrossing, special attention must be paid to how the bridge form transitions to the neighborhood streets. Here, it is shown how the abutment type engages the slope and how the bridge barrier concrete can be varied to help anchor the bridge to the land as well as create a welcoming form for pedestrians. In addition, these areas are transitional zones where the barriers can begin to taper from the 8 foot height requirement down to a 42 inch pedestrian scale rail. This could be a location that the local jurisdiction could choose to enhance the bridge rail with artwork that expresses community character.

Aerial view of bridge landing treatment

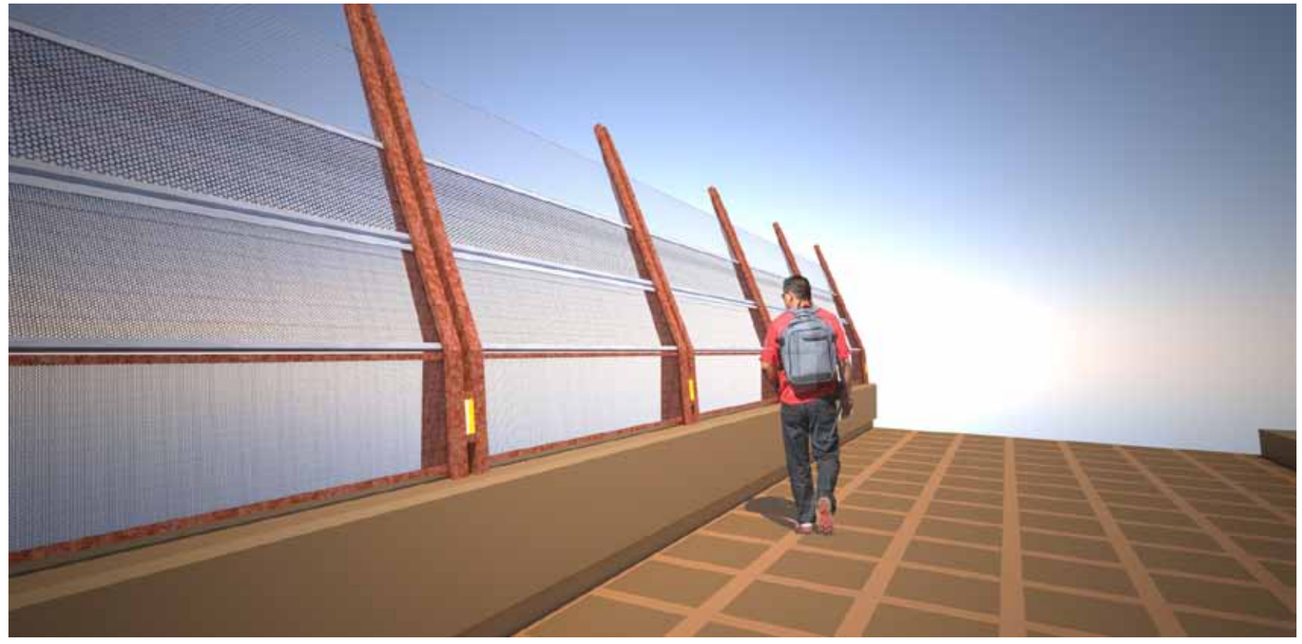


Enlarged view of bridge landing treatment showing pedestrian zone

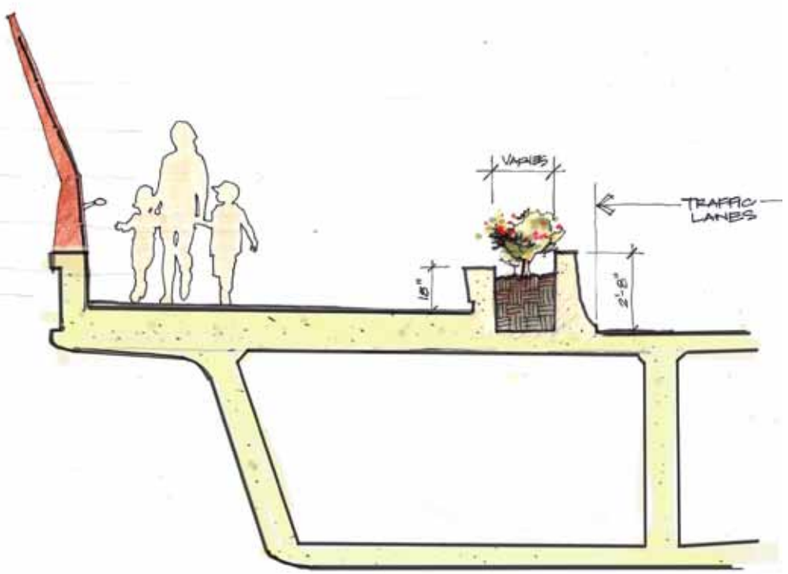
Elevation view of bridge landing treatment

Southern Bluff Overcrossing Details

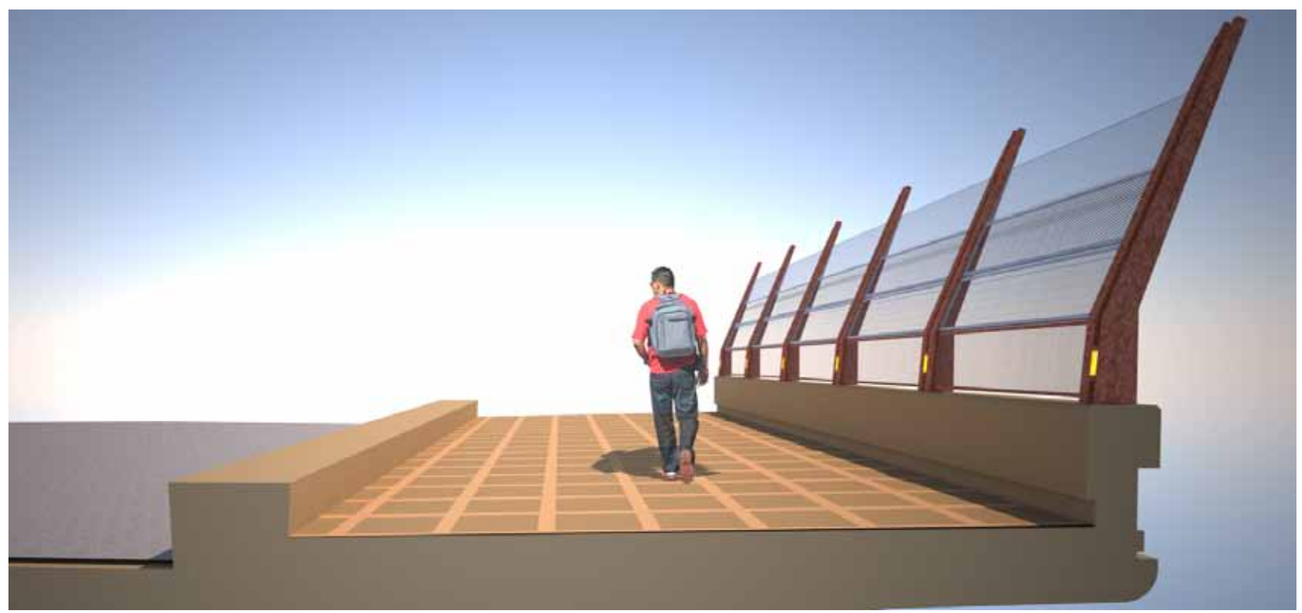
The Southern Bluff Bridge pedestrian barriers are intended to accentuate the local coastal bluffs. By angling outward, the bridge user gets a broader sense of openness to the sky and neighborhoods beyond. As these groups of bridges begin the transition toward the more urban sections, the forms of the double posts' vertical elements are more linear in nature. The barrier itself is intended to be made up of a series of four bands of translucent materials that vary in their degrees of opacity. The lowest portion of the rail is more opaque and as the bands ascend to the high point, the material becomes almost transparent (all while meeting the 1" minimum spacing for fence materials). The lower section is made of up a weathering steel perforated metal panel that spans between posts. The two middle panels are made of perforated steel panels in a silvery powder-coated finish with the upper perforated panel being more transparent than the lower. Finally, a stainless steel mesh that is highly transparent is utilized at the uppermost panel. The views shown here indicate an enhanced pedestrian section that incorporates a landscape buffer between the roadway and the pedestrian path. In addition, low cut-off lighting sandwiches between the double posts to create a soft and consistent glow on the path.



View of pedestrian walkway and angled barrier



Conceptual sketch of overcrossing section

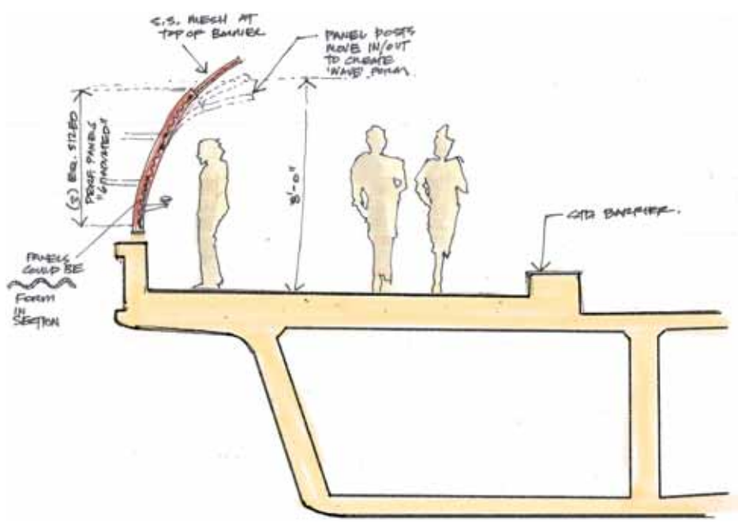


View of pedestrian walkway with adjacent road

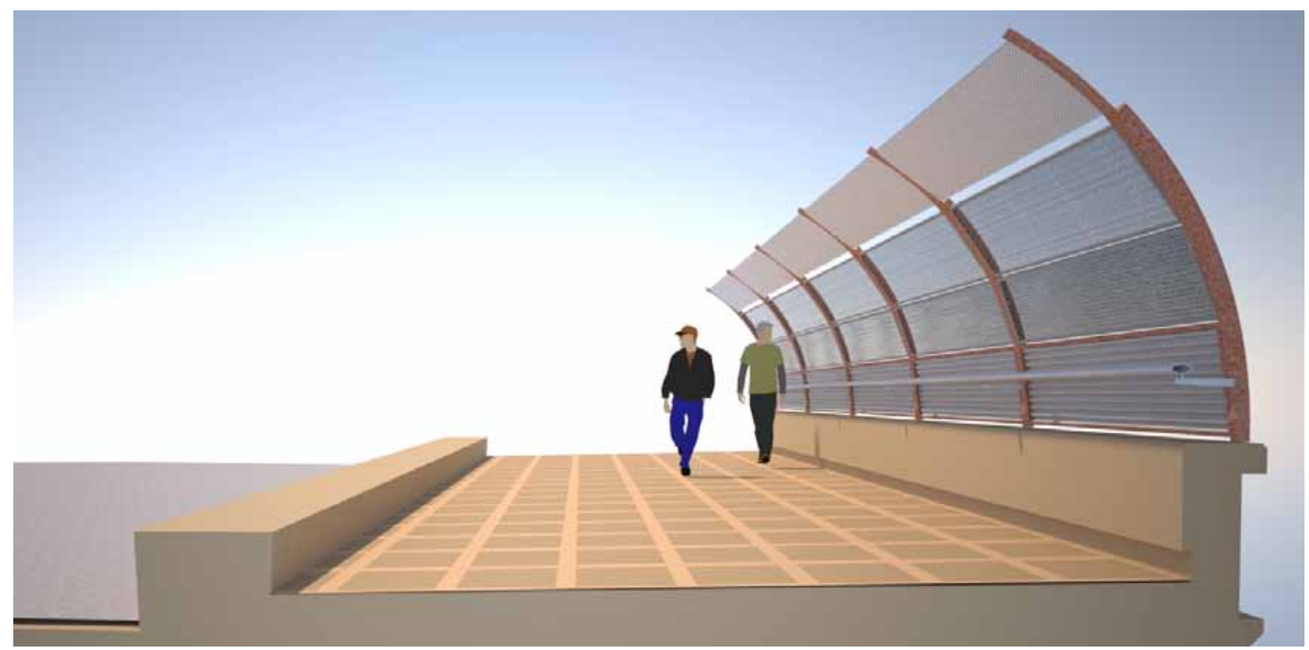
Coastal Mesa Overcrossing Details

The Coastal Mesa Bridge pedestrian barriers are intended to evoke the curvature of a wave form. A series of weathering steel pipe sections are constructed with varying radii to further give the sense of movement to the bridge rail. Similar to the Southern Bluff Bridge, the same material selection of ascending graduated panels is used. This allows for some consistency of materials throughout the corridor while allowing the forms to provide variety. Pedestrian scale lighting is located just inside the low barrier that separates the vehicles from the pedestrian realm. The selection of the forms of the light fixture and pole accentuates the curvilinear wave form, therefore; the rounded form of the light fixture and curved light pole further defines the pedestrian realm.

View of overcrossing barrier depicting wave form



Conceptual sketch of overcrossing section

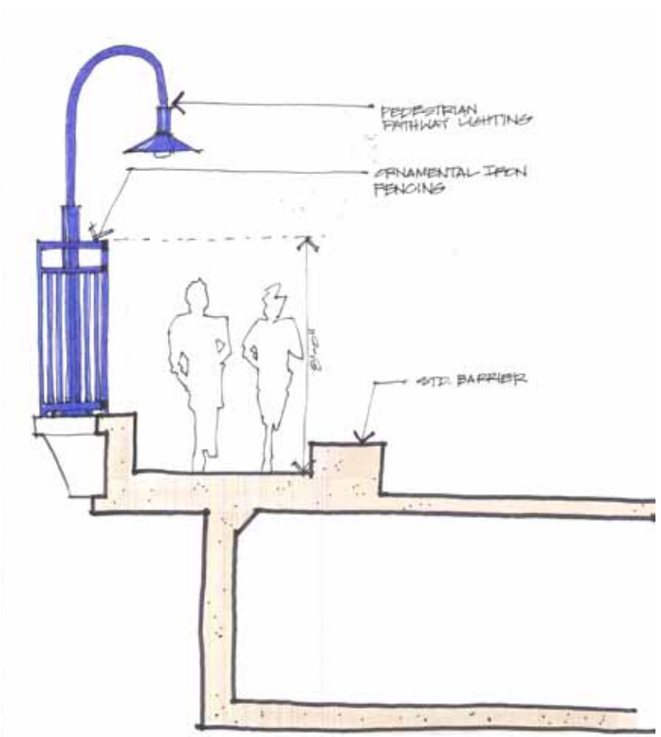


View of pedestrian walkway and curved barrier

Northern Urban Overcrossing Details

The Northern Urban Bridge pedestrian barriers draw their inspiration from the colors and texture of the urban context and in particular the Oceanside Civic Center and the Mission San Luis Rey. The pilasters at the ends of the bridge echo some of the same forms seen in those architectural examples. Bridge pedestrian rails are simple vertical ornamental iron pickets that are pre-finished in a vibrant blue finish that contrasts against the crisp light/warm grey cement that forms the bridge structure. Pedestrian scaled lighting has been incorporated into the bridge structure and utilizes the same blue finish as the railing material.

View of pedestrian walkway and barrier



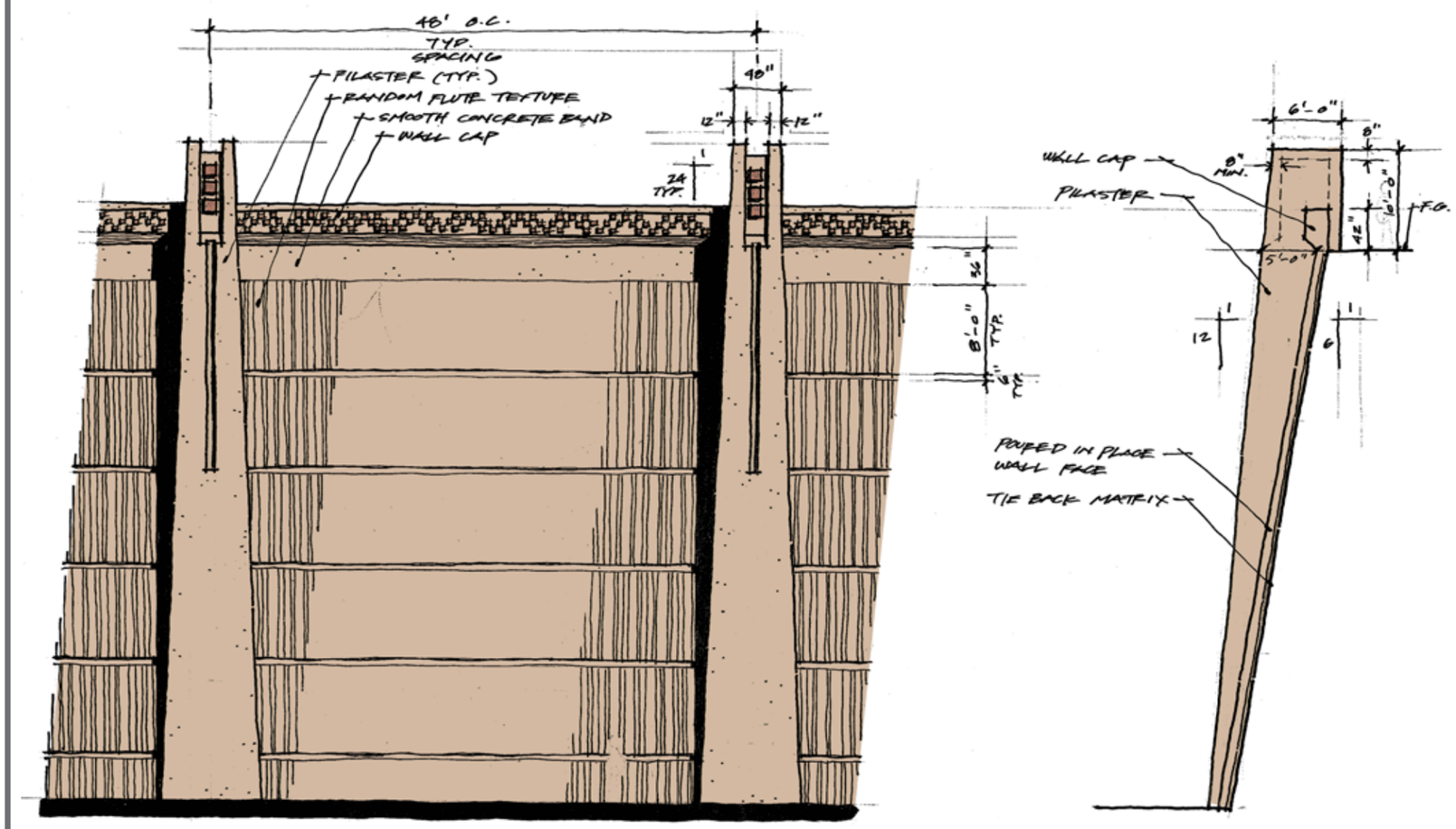
Conceptual sketch of overcrossing section

B. Walls

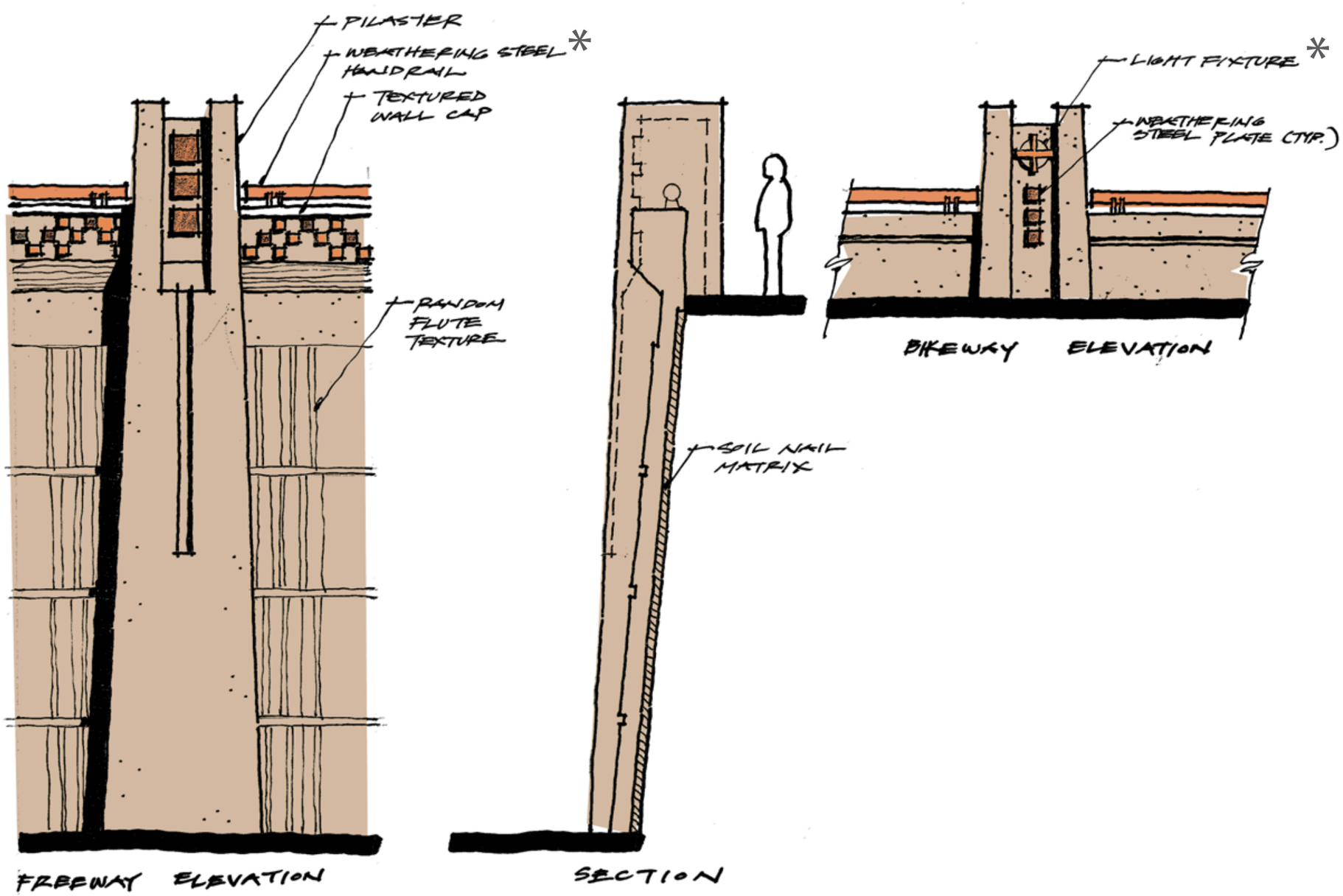
Theme Unit Specific Wall Concepts

This section describes concepts for both sound walls and retaining walls. There are 3 different types of wall characters throughout the corridor. A Southern Bluff theme, a Coastal Mesa theme and a Northern Urban theme. The design theme for the Southern Bluff Unit will build on the success of the existing Lomas Santa Fe Drive interchange. Wall surfaces will be designed to harmonize with the earth form theme of the corridor. The Carroll Canyon interchange improvements now under construction and the I-5/Genesee interchange now in design carry forward these themes, which are illustrated following.

The Lomas Santa Fe interchange retaining walls in Solana Beach



Southern Bluff Theme Unit
Scripps Retaining Wall Concept



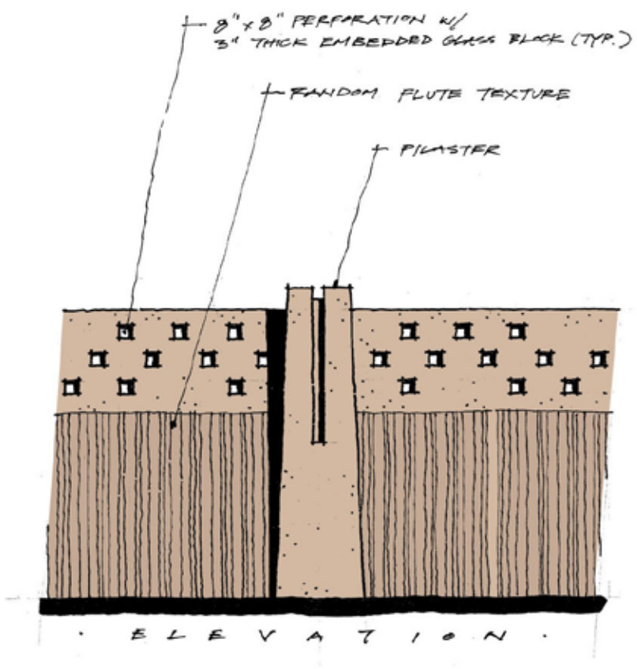
Southern Bluff Theme Unit
Lower Bike Path Retaining Wall Concept

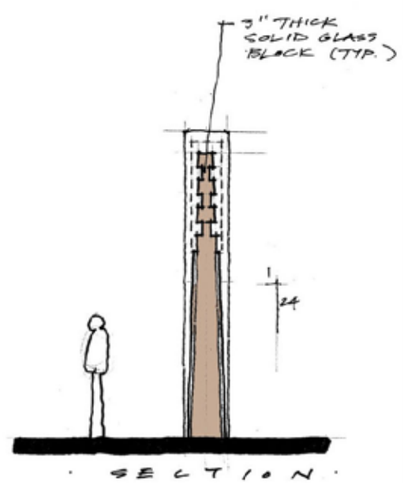
* Enhanced feature, requires maintenance agreement from local cities.

Noise Walls on Caltrans Right-of-Way

Wall designs for the Southern Theme Units seek to be compatible with the earthform appearance of retaining walls while adding a quality of transparency to further reduce the walls' apparent height.

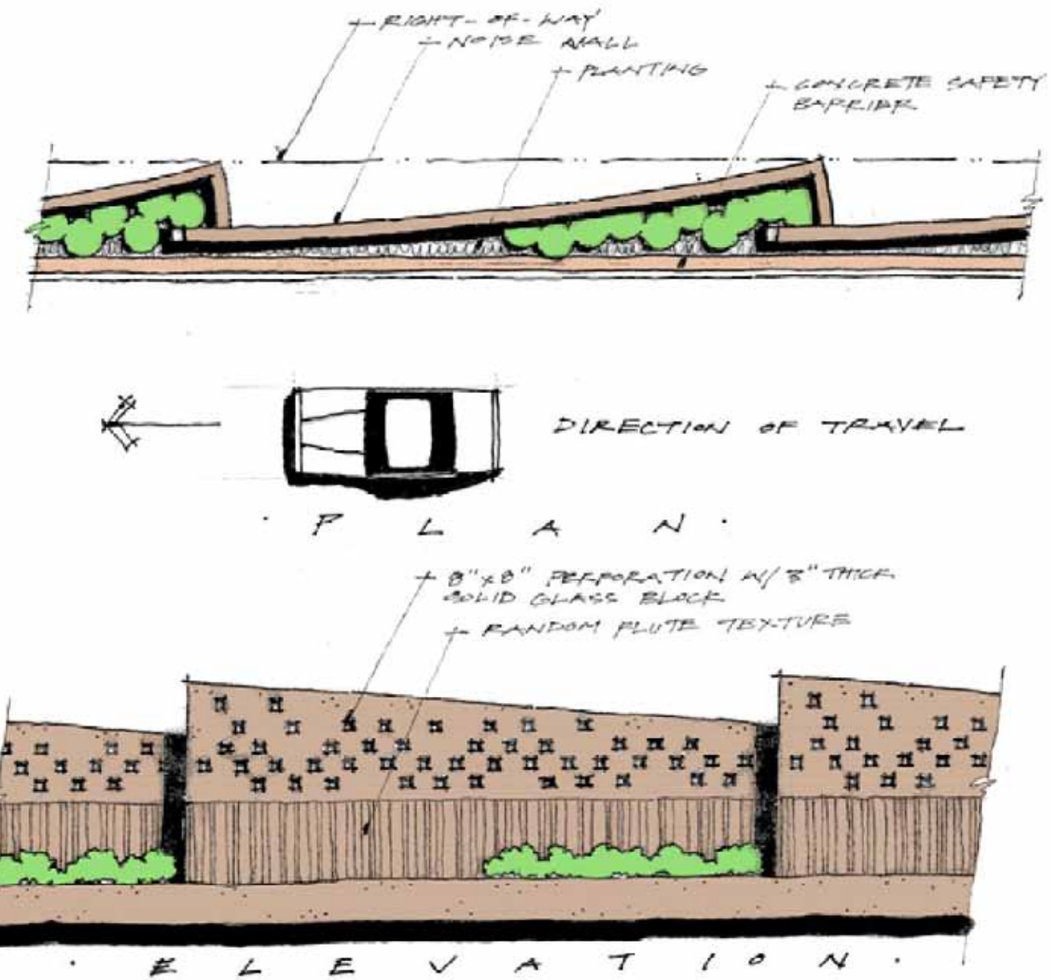
For constrained right-of-way conditions, the following poured-in-place perforated soundwall can be used in the Southern Bluff Theme Unit.





Southern Bluff Theme Unit
Poured-in-Place Perforated Noise Wall

For other non-constrained right-of-way conditions, the following articulated poured-in-place perforated soundwall can be used in the Southern Theme Unit.

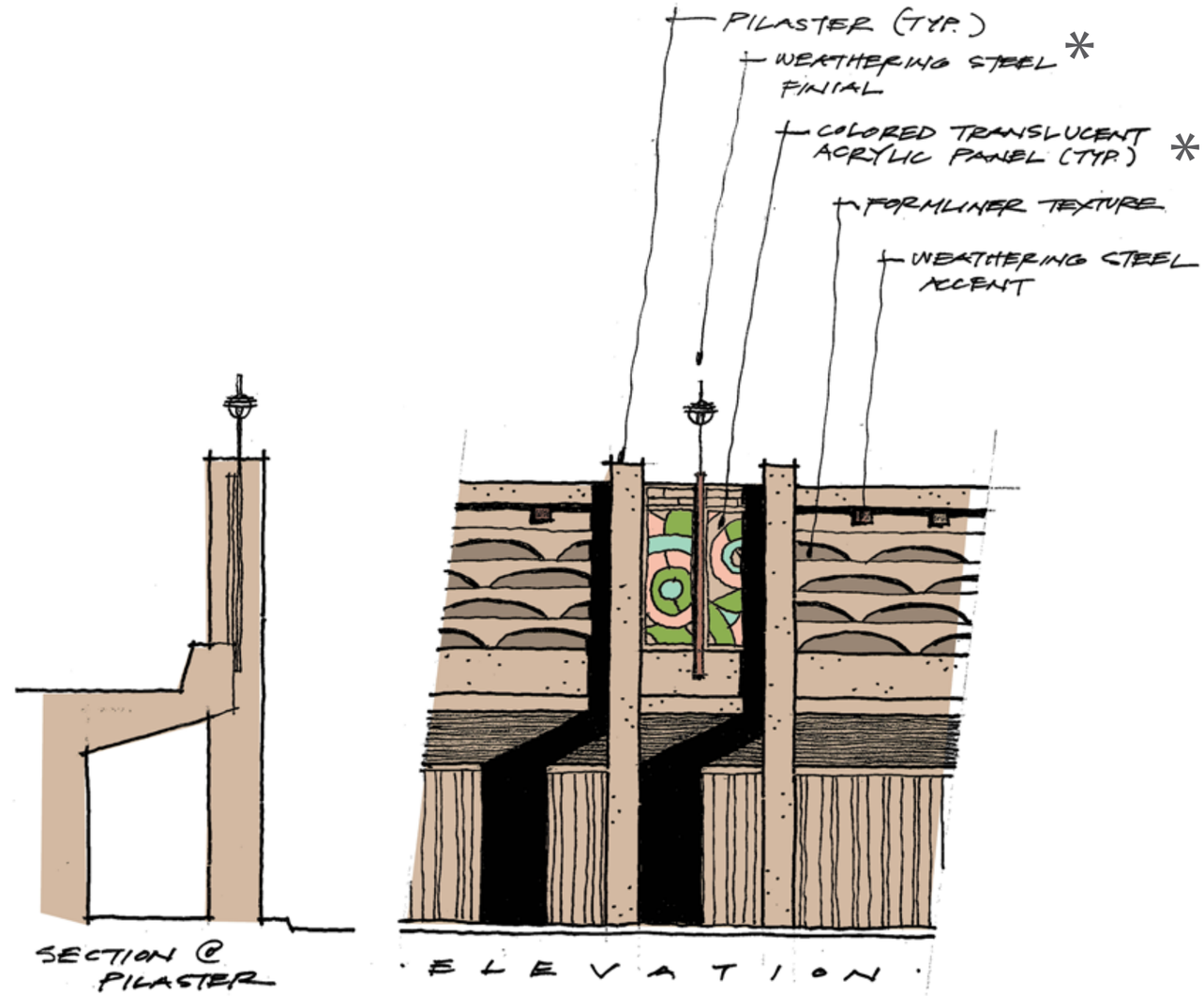


Southern Bluff Theme Unit
Articulated Perforated Noise Wall

Viaduct Retaining Walls (Coastal Mesa Theme Unit)

In areas where insufficient space exists to include planting buffers between freeway retaining walls and adjacent community features such as frontage roads, the use of viaduct retaining walls would be considered. Viaduct retaining walls would cantilever the roadway to form a wall recess in which spatial articulation and planting can occur.

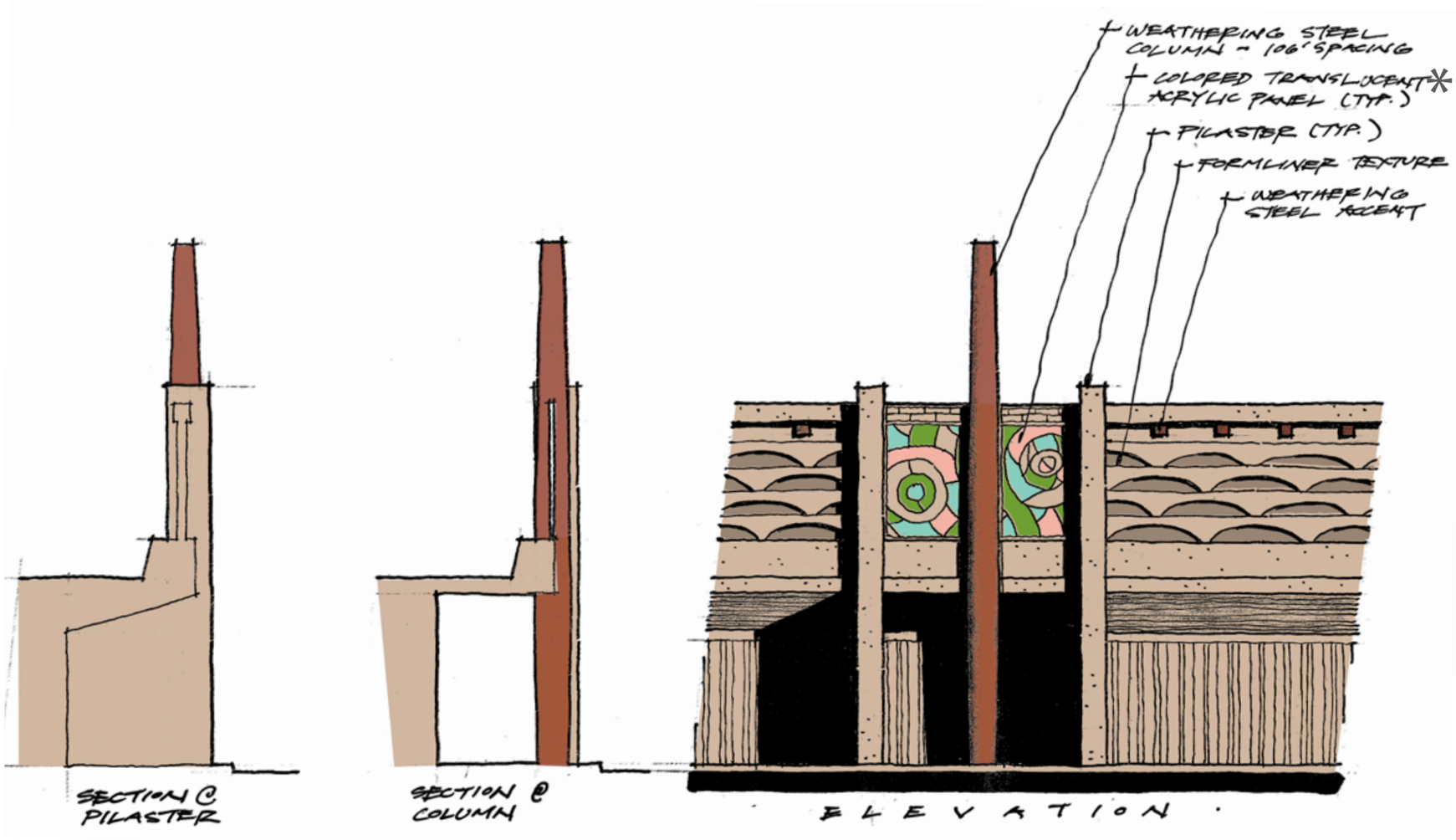
The view from Pio Pico in Carlsbad where a viaduct wall would be used



Coastal Mesa Theme Unit

Cantilevered Retaining Wall/Noise Wall at Pio Pico Secondary Plaster Unit

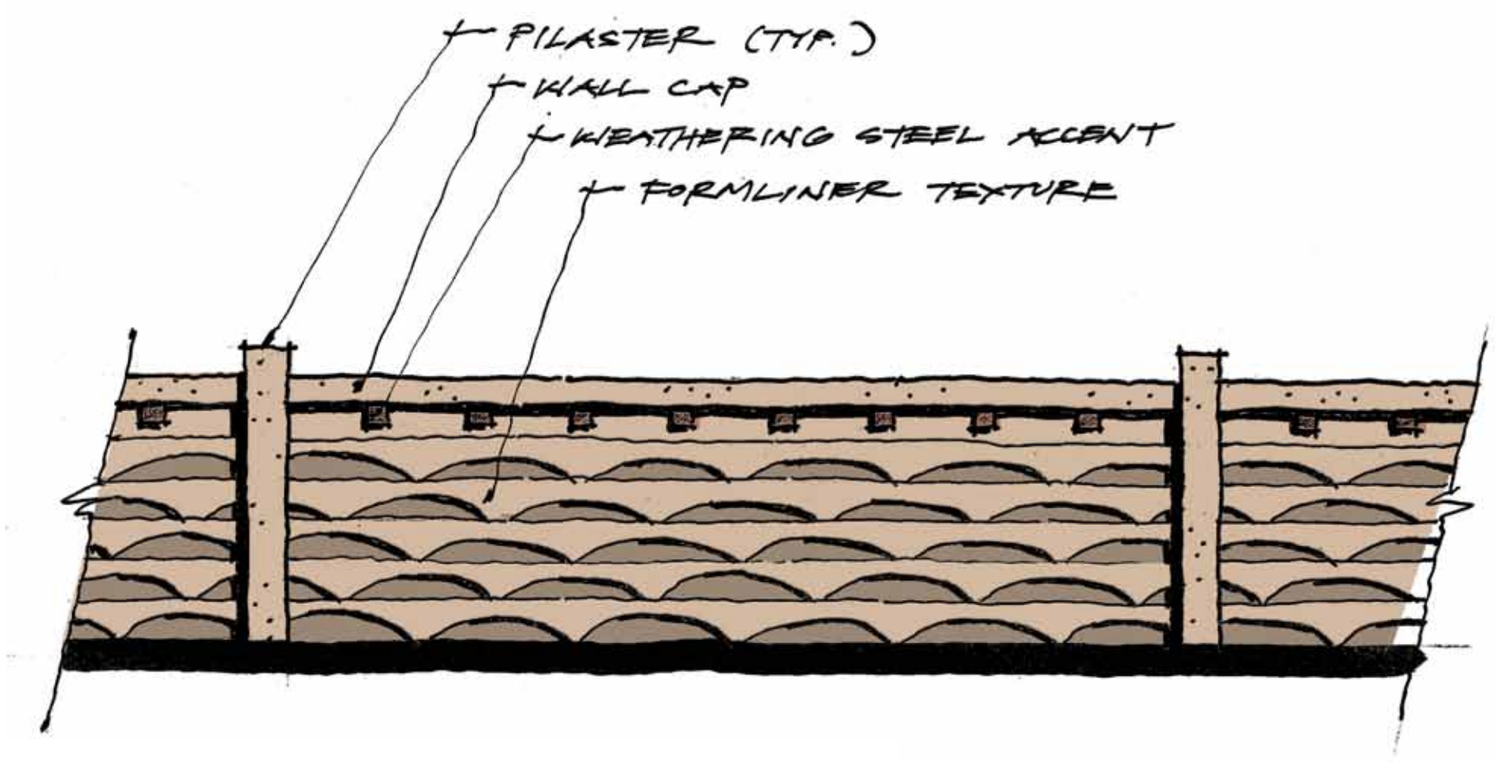
* Enhanced feature, requires maintenance agreement from local cities.



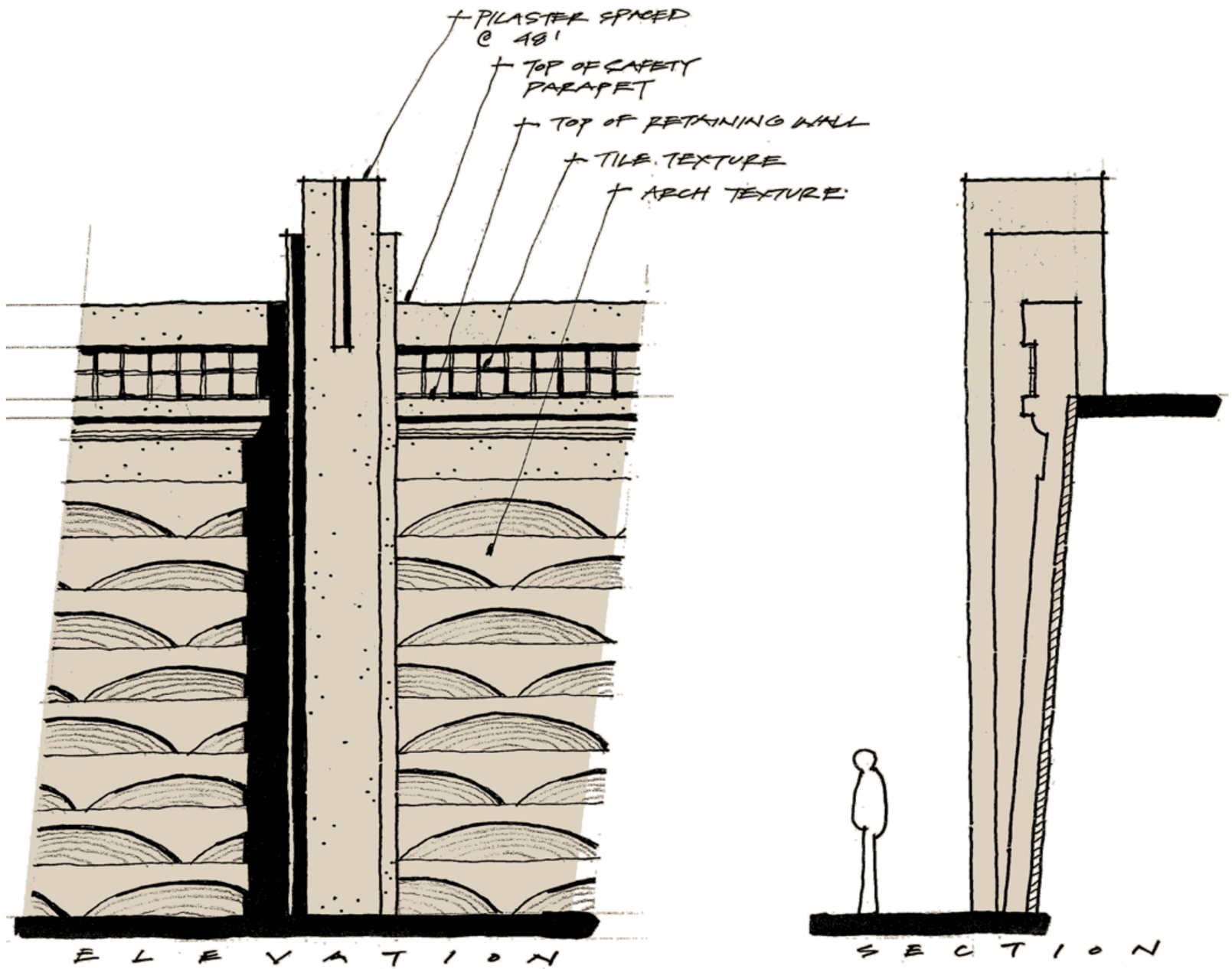
Coastal Mesa Theme Unit

Cantilevered Retaining Wall/ Noise Wall at Pio Pico
Primary Pilaster/Column

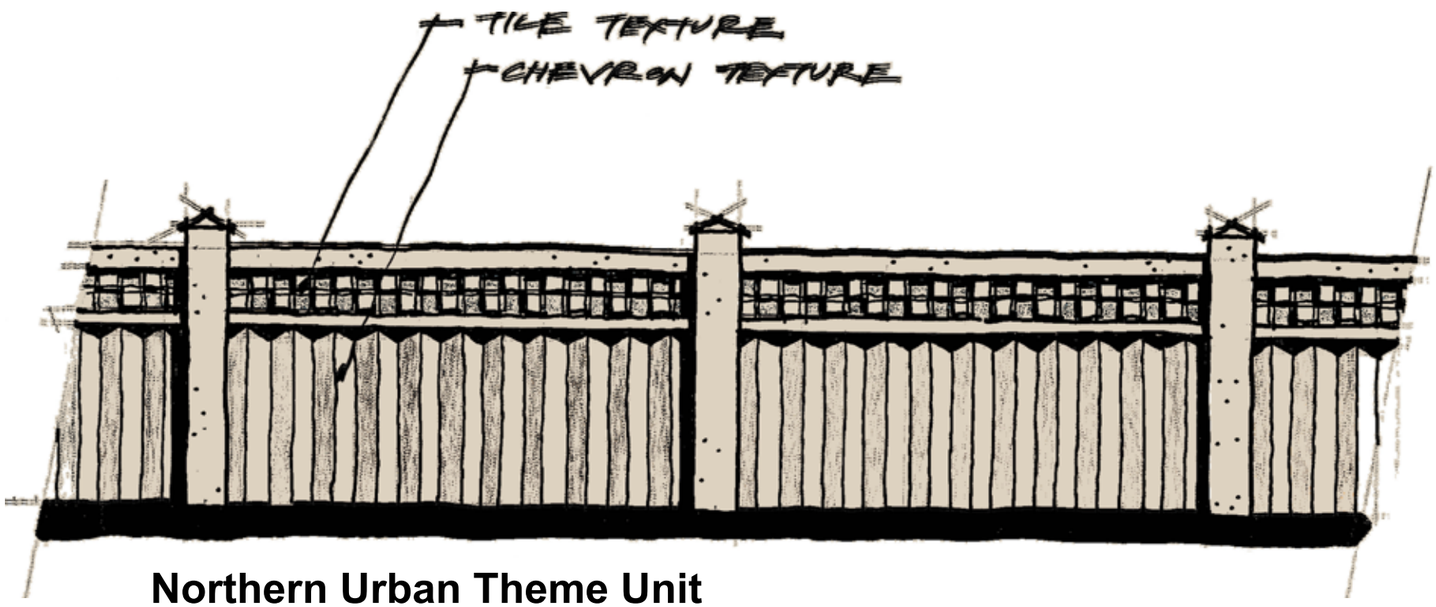
* Enhanced feature, requires maintenance agreement from local cities.



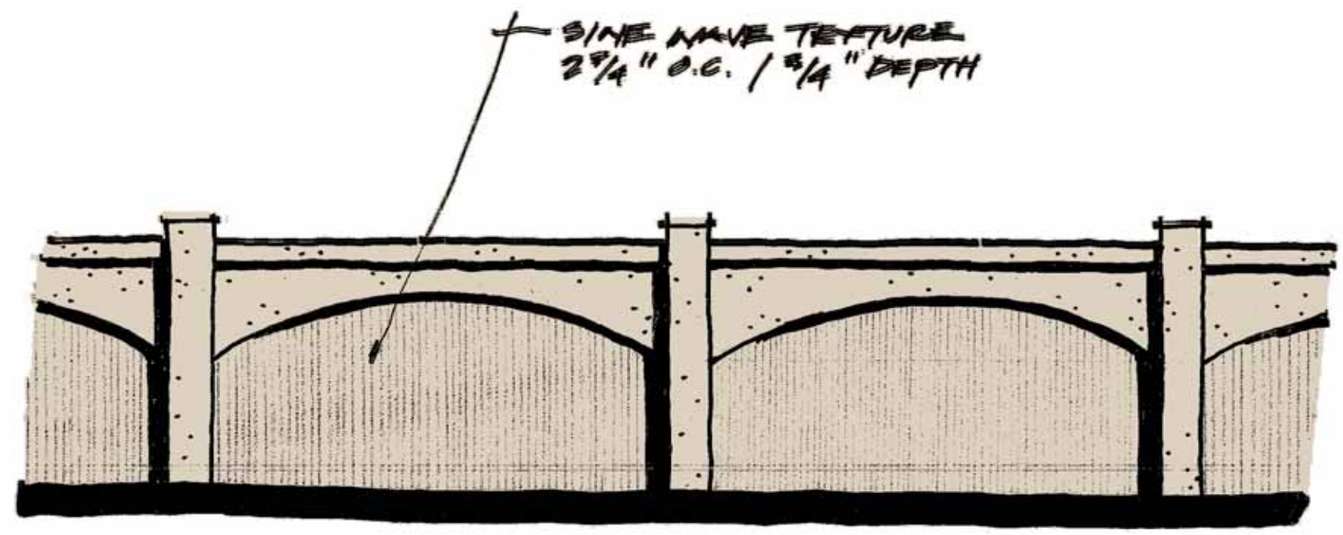
Coastal Mesa Theme Unit
Noise Wall/Retaining Wall Concept



Northern Urban Theme Unit
Retaining Wall Concept



Northern Urban Theme Unit
Noise Wall Alt 1

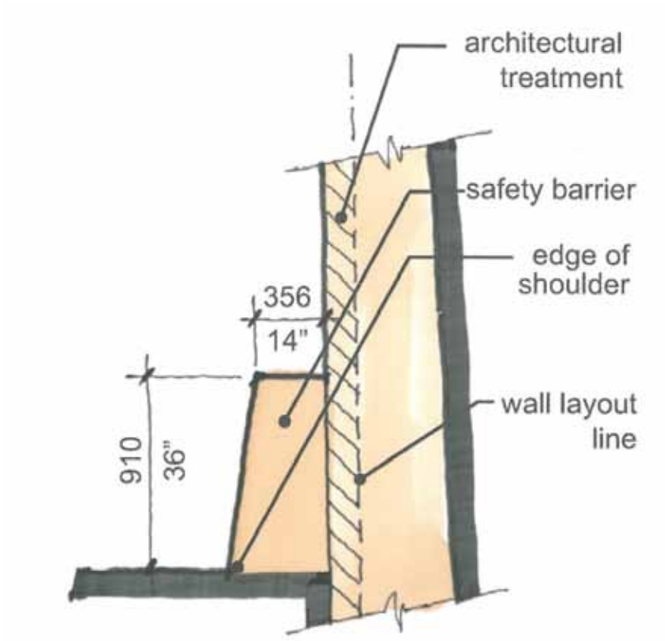


Northern Urban Theme Unit
Noise Wall Alt 2

Barriers (Bridge & Median)

Retaining Wall/Barrier Setbacks

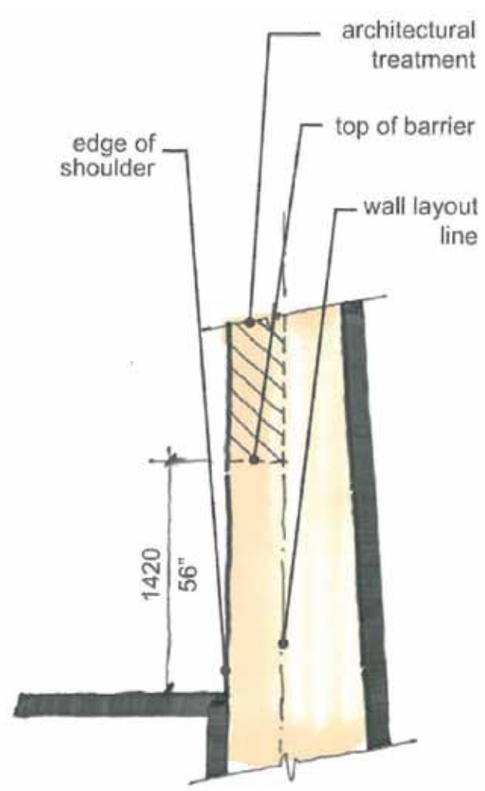
In areas too narrow to place a planting pocket, the retaining wall should be recessed behind the face of barrier at a sufficient distance to allow architectural features to be included on the face of the retaining wall.



Barrier setback section

Vertical Concrete Safety Barriers

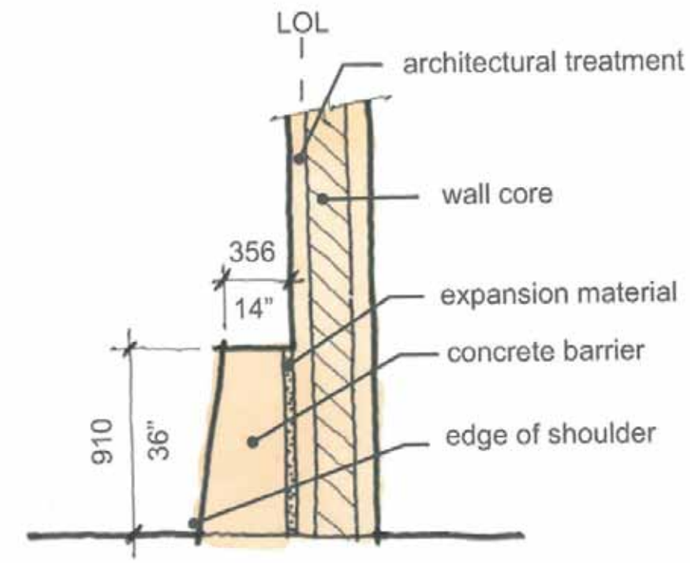
In constrained areas, vertical concrete safety barriers should be considered. Vertical barriers add 300 mm (12”) of additional width in which architectural elements such as mechanically stabilized earth wall panel relief, pilasters, and wall caps can be included.



Vertical concrete safety barrier section

Noise Wall/Barrier Setbacks

In areas too narrow to place a planting pocket, the noise wall should be recessed behind the face of the barrier at a sufficient distance to allow architectural features to be included on the face of the noise wall. Placing a noise wall directly on top of a concrete barrier should be avoided if at all possible



Although by no means elegant, roadway and bridge barriers provide the necessary safety for the public user in the freeway setting. Standard heights and geometry reflect crash tested performance required at freeway speeds. Barriers will generally conform to existing Caltrans standards due to FHWA and Caltrans liability requirements. However, with some forethought, barriers can be integrated in the overall user experience using similar themes and materials developed for the bridge and retaining wall elements.

Alternative Railings and Access Control Barriers

Alternatives to standard cable rail barrier can be used to complement enhanced wall designs. Options could include integral solid concrete parapets or alternative metal materials. Depending on the location, integral color and alternative railing materials can be used to customize the freeway and enhance the pedestrian experience. In particular, bridge barriers at lagoon crossings should be “see through” to preserve existing views. Caltrans Type 80 barrier is an example of see-through a post-and-beam system. Use of integral color should be considered to emphasize or blend the barriers into the overall bridge form.

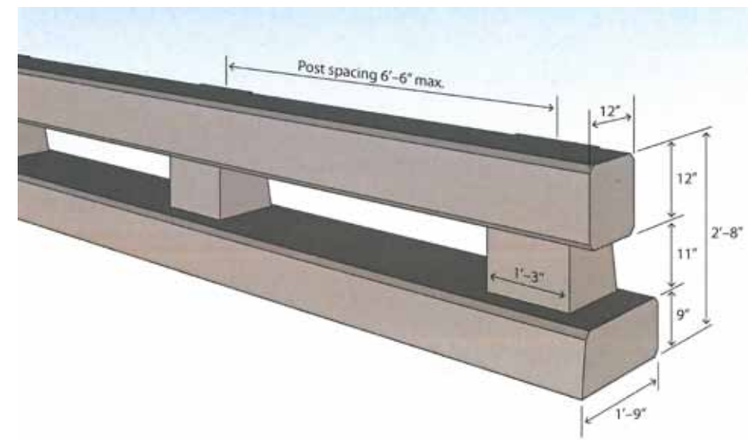
Alternative access control barrier in Solana Beach

Low Profile and See-through Safety Barriers

Low profile (e.g. Caltrans Type 60S) or see-through (e.g. Caltrans Type 80) safety barriers should be used if at all possible in areas where standard height barriers would diminish views of scenic resources from the freeway.

An example of a barrier maintaining an open view over Lake Hodges

Example of Type 80 Concrete Barrier in coastal areas



Example of Type 80 Concrete Barrier dimensions

Coastal Commission

The California Coastal Act of 1976 established specific policies for guiding the Commission's planning and regulatory responsibilities. Section 30251 of the Act, in particular, addresses the design and aesthetics of bridge railings and barriers. It specifies that "the scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance." Provisions of the Act give clear policy direction for siting and designing development to achieve the objectives listed below.

- Views both of and from the ocean and scenic areas should be protected.
- The alteration of natural landforms should be minimized.
- Development should be designed and sited to ensure compatibility with the context of the surrounding area.
- Visual qualities in visually degraded areas should be enhanced.
- Development in highly scenic areas should be subordinate to the character of its setting.

In general, there are several guiding principles that can be followed to help meet Coastal Act and Local Coastal Program scenic and visual quality policies as the pertain to bridge designs. Some of these are briefly summarized below.

- Visibility for users of the bridge may be the single most important consideration. Where the primary scenic resource is the public view from the bridge deck, the railing should be designed to minimize impairmentof such views. Rail elements should be as thin as possible and should avoid "blocky" forms. In addition to keeping the railing as unobtrusive as possible, the design and materials should be selected to harmonize with surroundings (while meeting all essential safety requirements).
- The lowest possible railing heights should be applied, consistent with the minimum allowable height for the class of anticipated users (i.e., motor vehicle, bicycle, or pedestrian).
- Appropriate color and texture can assist in visually blending railings with their surroundings. Metal railings can be treated to create a weatherized look; concrete elements can be stamped and colorized to match the surrounding landscape or to simulate appropriate materials (e.g., wood grain, stone).
- Curved and arched elements, where appropriate, can create a graceful and pleasing structure.
- Views of bridges from public areas are also important considerations. Ensuring the architectural and visual compatibility of railings with the underlying bridge structure is essential. Within the parameters of engineering and safety requirements, the scale and style of all bridge elements should be subordinate to and harmonious with the character of the surrounding area.
- Because of the loss of many historic and attractive bridges throughout California, railing designs should seek to incorporate elements of historic bridge where such an approach is consistent with modern safety standards. As appropriate, scale, materials, and other factors that evoke traditional bridge forms in California should be explored.
- A coherent and unified railing design that incorporates the elements necessary for pedestrian and bicycle safety is preferable to simply adding decorative elements onto existing vehicle barrier designs.

C. Urban Design and the Pedestrian Realm

An important part of any freeway interchange or bridge crossing is the treatment of the pedestrian realm. To truly be a complete street, the pedestrian realm must be carefully considered in every design.

Some of the following design concepts have been extracted from a variety of urban design guidelines that have been prepared by transportation agencies across the country.

Implement Sustainable Practices

Sustainable processes or states can be maintained indefinitely at a specific level. Sustainable design for streetscape affects the flow of stormwater through the area, the materials used, and the consumption or renewal of energy and resources. Elements of sustainable streetscape design include:

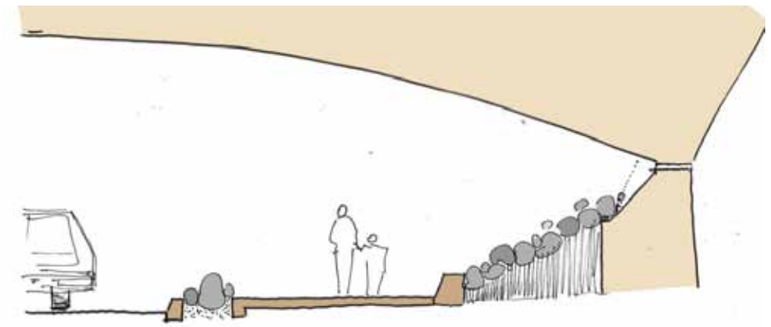
- Stormwater management
- Use of sustainable materials
- Low water use and low maintenance plant material

Use Cohesive Design Elements

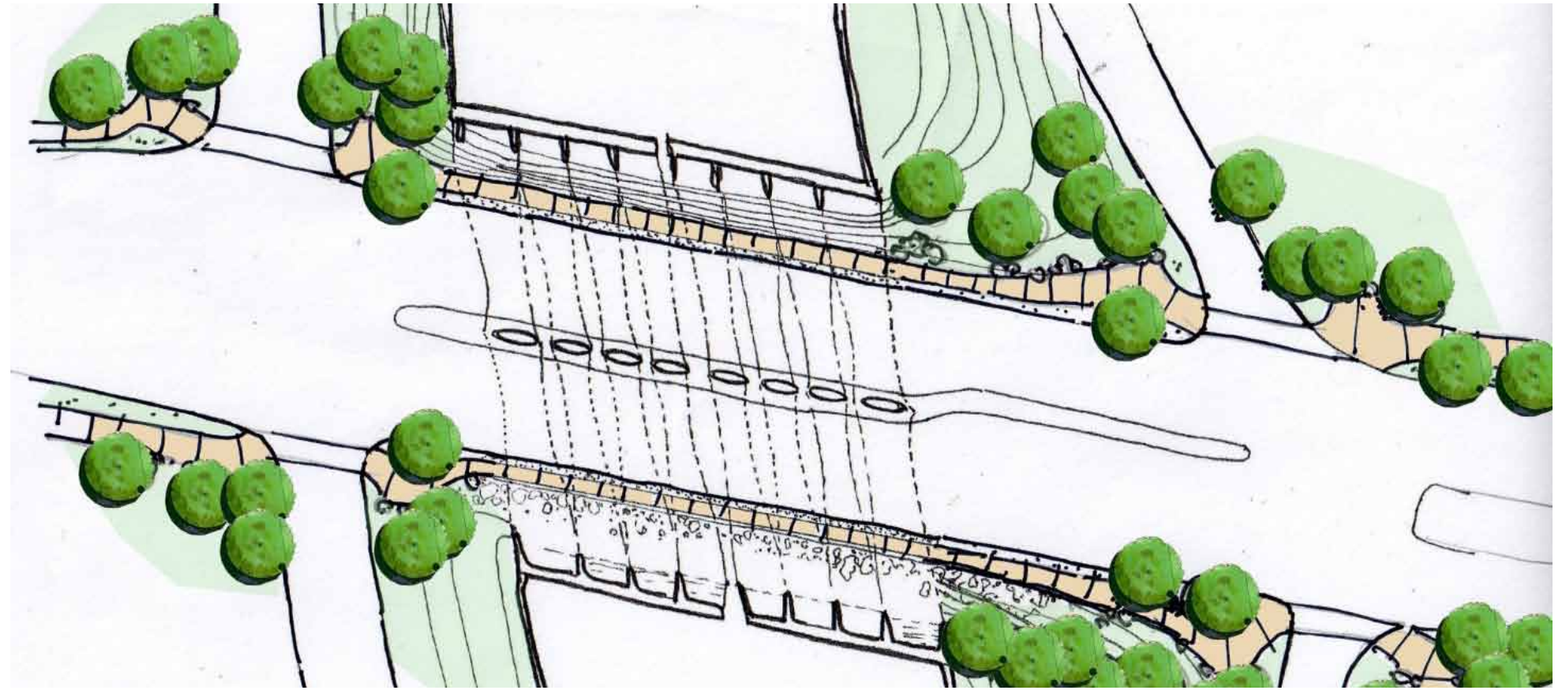
- A well-designed pedestrian realm includes:
- Well-defined edges between pedestrian and vehicle domains.
- A rhythmic and logical use of trees, furniture, paving and planting.
- Attractive and functionally appropriate street lighting.
- A consistent and harmonious family of street furnishings.
- A hierarchy of spaces that helps define the use of the streetscape.
- Attractive and durable materials, varied to reflect functional and aesthetic needs.

There are a number of ways to create an appropriate pedestrian realm within a complete street freeway intersection. These include:

- Strong spatial definition of outdoor “rooms” and “hallways” generated through strong edges, appropriate walls, fences, plantings, etc. as well as overhead tree canopies. Rooms developed in a hierarchy of sizes and intended uses provide a wide variety of pedestrian experiences in streetscape settings.
- A sense of unity that emerges from consistent textures, colors and forms in trees and other plantings, furniture, paving and other elements.
- Strong rhythms created by regular repetitions of features and dimensions, such as streetlights, hard and landscape surfaces and height of elements.
- Strategic use of dominant streetscape features (flowers, signage/banners, etc.) to focus pedestrian or driver attention to information, safety considerations, etc.



Section under bridge showing enhanced pedestrian treatment



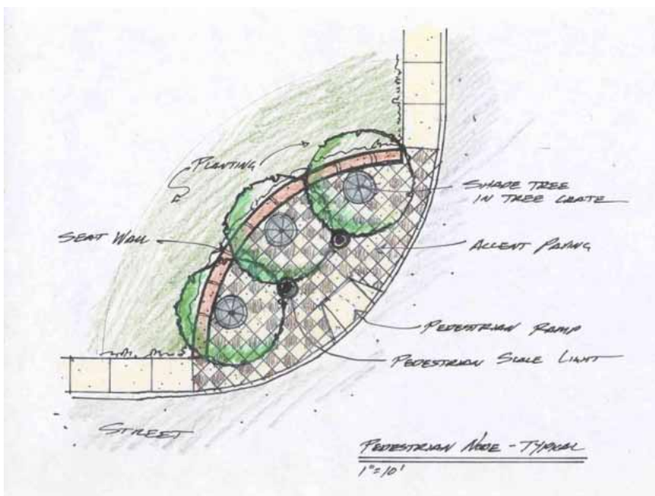
A typical gateway interchange is shown here. Note that pedestrian pockets are located at each crosswalk to provide a safer and more pleasant pedestrian experience

General Design Concepts

- Provide pedestrian-scaled lighting to create a separation from street traffic and spatial definition that is human scale. Pedestrian-scale street lights should be lower than conventional street lights and provide more illumination of the sidewalk. Pedestrian-scale street lights are lower and more closely spaced than conventional street lights. To provide identity to certain districts, consider special light standards such as antique replicas, etc. Provide lighting over crosswalks.

- Provide continuity of streetscape features along the length of a street, particularly Gateway Interchanges.

- Provide opportunities for “stationary” pedestrian activities. These generally can occur at off and on-ramp intersections and at special locations such as under a lagoon bridge.



Pedestrian nodes can be designed in a variety of ways. Small walls can be constructed that also provide opportunities for seating.

Pavement Treatments

Pavement treatments, including colored or textured pavements, brick pavers, and interlocking pavers represent a step up from standard crosswalk treatments such as paint markings. These options are available if the adjacent city wished to upgrade to an enhanced design. Although usually more costly to implement and maintain, they can enhance a complete street by more visibly establishing spaces for bicycles and pedestrians.

These special treatments can also have traffic calming effects at key locations. Linking the design of these treatments with the architectural character of surrounding land uses creates an even more attractive and cohesive complete street. Inserting artistic design treatments intermittently, rather than along the entire sidewalk, is also a cost-effective way to enhance the streetscape.

Treatments such as raised brick pavers should not be used in bicycle lanes, as they can be hazardous or uncomfortable for bicyclists to navigate. They should also be carefully evaluated in their use for pedestrian crosswalks to ensure they are not excessively slippery in wet conditions. Likewise, decorative sidewalk or crosswalk treatments should not interfere with ADA compliance.

Special Considerations for Younger, Older, and Disabled Pedestrians

When streets are designed primarily for vehicles, they become barriers for children, who cannot safely walk or bicycle along or across them.

Even when streets have been designed with basic pedestrian facilities, they often do not fully consider the needs of the growing population of older Americans. Street crossings are often long, sidewalks are absent or blocked by fixed objects, and transit stops have no place to sit. Older Americans need the public right-of-way to better serve them by providing safe places to walk, bicycle, and by designing streets to better accommodate older drivers.

Incomplete streets are a constant source of frustration and danger for people with disabilities. They often are difficult to navigate for people who use wheelchairs, can’t see well, or for older people who move more slowly. Complete streets should be safe and comfortable for everyone to use – particularly for these younger, older and disabled people who cannot choose to drive.

Seating

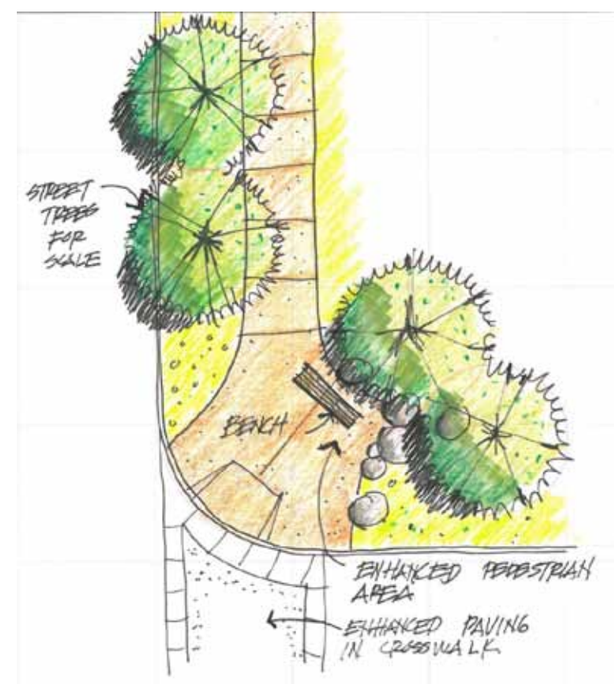
Benches in the streetscape provide outdoor seating for more than one person, with or without backs and/or arm rests. Although most pedestrians desire to travel through a freeway intersection as fast as possible, it is sometimes necessary to create pedestrian refuges as distances through a freeway interchange can be quite long.

- Benches should provide comfortable, low maintenance seating. They should be built of durable, non-abrasive materials that withstand cracking, rotting, or sagging. Wood, nails or wire should be avoided in construction or repair of benches in the streetscape.

- Seating surfaces should be 16 to 18 inches high and should have a minimum depth of 16 inches for seats without backs, 14 inches for seats with backs.

- Seating walls, ledges, steps, or terraces should be between 12 and 20 inches high and at least 16 inches deep when possible. Two-sided seating walls should be at least 30 inches wide. Benches should avoid sharp edges.

- Place seating in functional and accessible locations. Users should be able to reach seating directly from public sidewalks or pathways in all weather conditions.



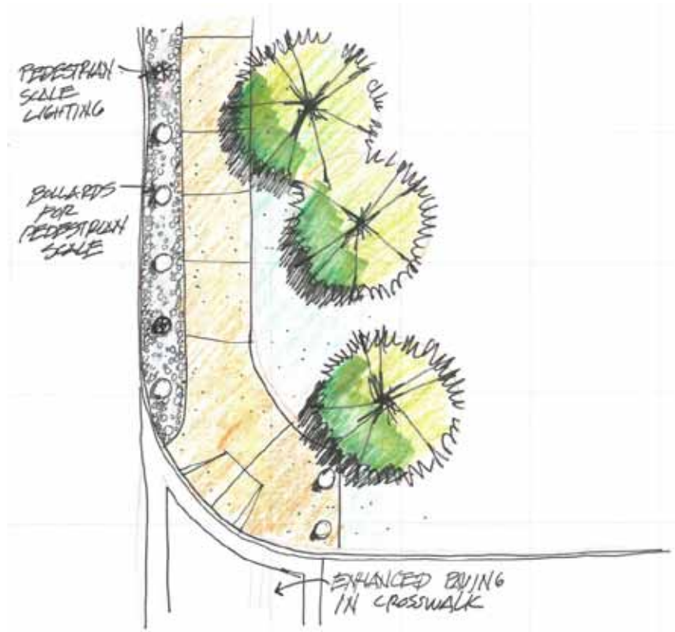
Seating cont.

- Benches should be convenient to and accessible from, but not obstruct the pedestrian pathway.
- Use materials that complement other streetscape elements such as streetlights, trash and recycle receptacles, bicycle racks, railings, and surrounding structures.
- Locate benches logically. Potential locations include places intended for gathering, logical resting places along sidewalks and pathways.
- When possible, locate benches near lighting and plantings, making them more useful at night and improving observability. Trees provide shade during the day and some shelter from rain.
- Benches with backs and armrests are generally more comfortable for people with physical disabilities. Benches without backs allow people to face different directions. Armrests or dividers discourage sleeping but can restrict seating and reduce flexibility and comfort.
- Bench design should emphasize comfort, straightforward form and detail, maintenance, durability and resistance to vandalism.

Bollards

Bollards help prevent vehicle encroachment into pedestrian areas, discourage pedestrians from entering a street and provide pattern and a sense of rhythm.

- Bollards should coordinate with other street furnishings.
- Bollards should be finished in a durable finish consistent with the other street furniture.
- Placement of bollards shall be a minimum of 2 feet from the curb zone. Spacing of bollards should be 5 feet minimum from each other.
- Use bollards as part of a designed environment to avoid cluttering the streetscape.
- Bollards should not create hazardous and unexpected obstacles to pedestrians, cyclists, and other non-motorized users.
- Incorporate contrasting detail at base or waist level to aid people with sight impairments.
- Lighted bollards provide useful light for pedestrians and motorists and emphasize travel pathways.



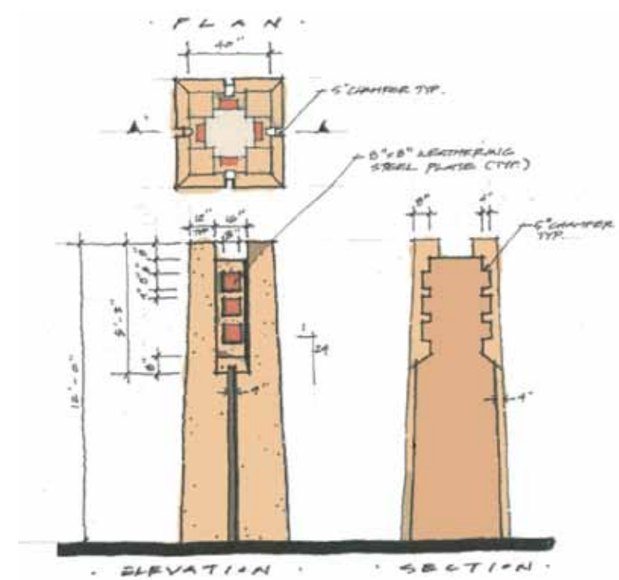
Bicycles

Bicycles provide safe, comfortable mobility opportunities for a range of users and are considered a fundamental part of a complete street and need to be carefully considered in the design of all I-5 interchanges and bridges.

Bicycle travel on sidewalks should be generally discouraged, even if the sidewalk width meets the width requirements of a shared multi-use path. Bicycles on sidewalks travel at higher speeds than pedestrians, creating the potential for serious injury. Bicyclists might collide with obstacles on sidewalks including street furniture, sign posts, etc. Additionally, drivers do not expect bicyclists on sidewalks, creating conflicts at intersections and driveways. For these reasons, it is desirable to provide a bike lane adjacent to the traveled way within all freeway interchanges.

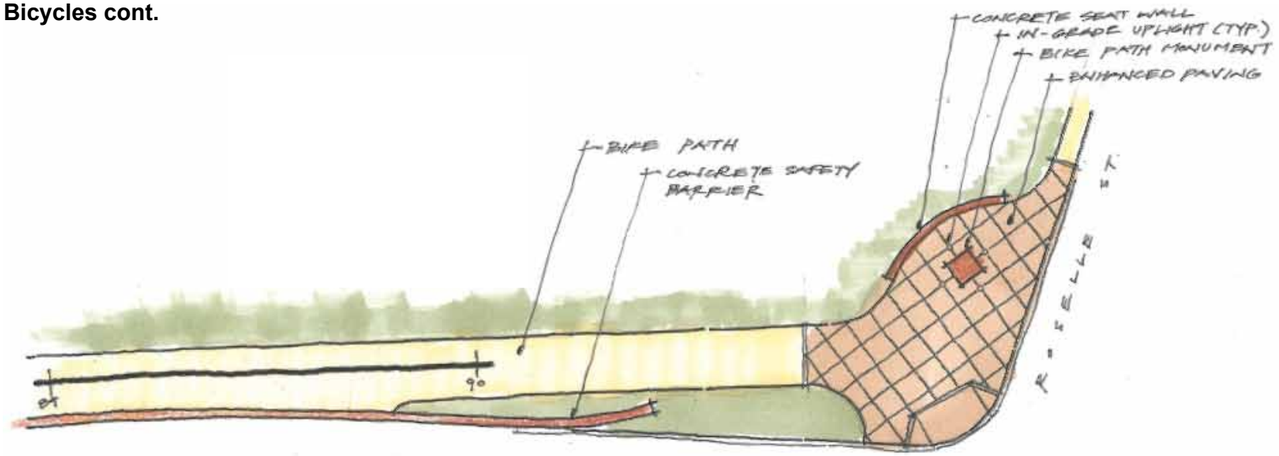
Colored surfaces may be used to define a bicycle lane. Lanes should be clearly and simply marked. Lanes should be a minimum of five feet wide. Lanes should be clear of hazards such as sewer grates with long openings in the direction of bicycle travel.

Within the Southern Bluff unit, bike path nodes will also be provided at the Genesee interchange. These areas provide a special place and identity. In addition, they will also incorporate a monument structure to help provide a unique community identity.

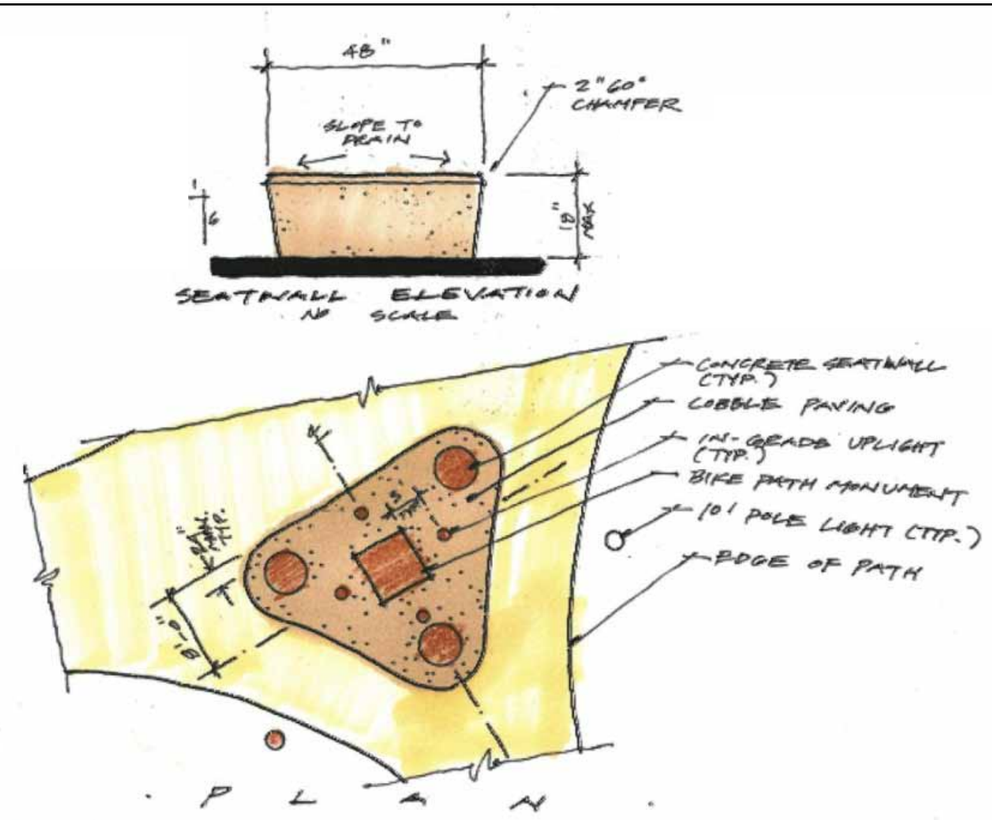


Example of bike path monument

Bicycles cont.



Example of conceptual plan of bicycle path node at Roselle



Example of bicycle path node.

Lighting

Studies have shown that the presence of lighting not only reduces the risk of traffic crashes, but also their severity. In most cases, roadway street lighting can be designed to illuminate the sidewalk area as well. The visibility needs of both pedestrian and motorist should be considered. The addition of lower level, pedestrian-scale lighting to streetlights with emphasis on crossing and intersections may be employed to generate a desired ambiance and create a sense of security, pedestrian scale and rhythm. Lighting should provide both safety illumination of the traveled way and intersections, as well as pedestrian-scaled decorative light standards illuminating the pedestrian way where appropriate. Lighting should be carefully coordinated with landscaping design to ensure its effectiveness.

Lighting is important in urban environments. Appropriate lighting levels promote a feeling of comfort and security and encourage pedestrian activity. Illuminating bridge and wall facades can highlight interesting architectural features and strengthen the character of a community. Proper lighting also directs ambient light to the vertical plane at eye level, creating higher visual contrast and recognition of faces. Proper lighting levels in pedestrian areas also provide visual cues to motorists, reducing areas of shadow that hide pedestrians from view. Light may be used to illuminate specified objects, such as public art; create an atmosphere; or provide subtle directional information.

Basic lighting concepts include the following:

- Ensure pedestrian walkways and crossways are sufficiently lit
- Install lighting on both sides of streets
- Provide enough illumination to light all four corners of urban intersections with striped crosswalks.
- Lighting should be installed no closer than 2-1/2 feet to a curb to provide adequate clearance for vehicles.
- Low mount fixtures provide for better uniformity and vertical surface illumination.
- Fixture location and mounting height, fixture type, and lamp intensity should optimize light distribution and minimize glare. Uplighting can be provided from above-ground fixtures or from well lights with louvers. Well lights reduce street clutter.
- Light source should not be visible. Use wells or low lying vegetation to hide fixtures.
- The concept of “dark skies” minimizes extraneous light and directs light to areas and surfaces that should be illuminated.

Crossings

Crossings provide safer domains for pedestrians crossing intersections by defining and delineating pedestrian paths across streets.

- Full or partial medians can act as mid-crossing refuges for pedestrians when crossing streets.
- Crosswalks may be defined by contrasting pavement colors or patterns, such as gridded scoring pattern. Brick pavers in crosswalks are not recommended. Experience indicates that brick pavers are easily damaged during routine maintenance of the street. However, contrasting treatments using more conventional materials can improve visibility and create texture in the streetscape.

Fencing

Typically Caltrans has provided metal fencing as a means to define the right-of-way for the freeway. In most cases this standard would still be implemented. Alternatives to this type of fencing are possible if the adjacent Cities are willing to provide maintenance. These alternative fencing types might be used in conjunction with future residential or commercial projects that are adjacent to the I-5 right-of-way.

Coordinate Maintenance with Design

A quality streetscape must continue to look good over time. Long-term maintenance is a critical design determinant and is a serious matter for both the City and the local community. Community stewardship can help stretch city resources, and neighborhoods should be involved in both the design and maintenance processes.

A maintenance agreement process should be a part of project design. The agency ultimately responsible for maintenance should provide input to the project team. In addition, initial maintenance should be part of construction contracts.

Community Gateway Interchange

These interchanges are the primary symbolic entries into each municipality. Community gateway treatments for the I-5 corridor will occur at five locations as described in the General Bridge Design Issues section. All five locations are regional gateways into the adjacent communities from the I-5 corridor. These locations will also be points of first impression of the community from the corridor. As such, it is important that an initial statement be made that identifies the uniqueness of each City. Detail should be given to the walls, fencing, lighting and the bridge design as described earlier. Variations in these elements will allow for each of the municipalities to establish its own unique “statement”. Some of these variations may include art elements that are incorporated into the design of the bridge.

The pedestrian realm, that is walking and bicycling, needs to be given the upmost importance within these ceremonial gateways. Sidewalks must be wide with separate bike lanes provided.

Trellises can also be used at key interchanges to enhance community entries

D. Landscape

General Concepts

The purpose of these landscape guidelines is to integrate landscape into the project and reinforce the natural character of the corridor. The landscape should be:

- Predominantly California native plant material
- Sustainable, low maintenance and cost effective
- Ecologically sound
- Appropriately designed for highway uses
- Functional and provide value
- Safe for all users

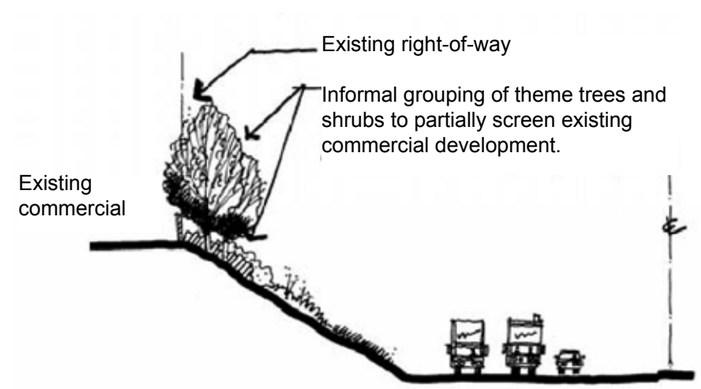
A well designed landscape corridor becomes an important component of the entire freeway and community street network. It is one of the key elements that contribute to the character of an area – the combination of landscape and built form helps provide a unique sense of place of value to the community.

- It helps integrate or fit the freeway into its setting.
- It provides structure and a three dimensional scale to the corridor.
- It helps unify the road corridor environment, providing interest and a milestone to users as well as helping create a simple strong and intuitive driving experience.
- It is valuable in terms of impact mitigation. It screens undesirable views of roads and traffic, helps filter air and water pollutants, suppresses weed growth, helps reconnect habitat, and can help recover threatened species.
- It can contribute to a safer road, for example, by screening headlight glare, slowing errant vehicles and helping create an intuitive, self-explaining driving experience.
- It helps stabilize slopes and minimize erosion.

The objective of the landscape concept is to improve the visual experience from the freeway while providing a design that reflects the unique qualities within the corridor. The landscape concept plan will improve the visual experience by providing an effective means for screening unsightly adjacent land uses, utilities and appurtenances while focusing and protecting views to major landmarks and natural features. In addition, it will be critical that non-invasive species be utilized so the sensitive habitats that occur within the corridor are not negatively impacted.

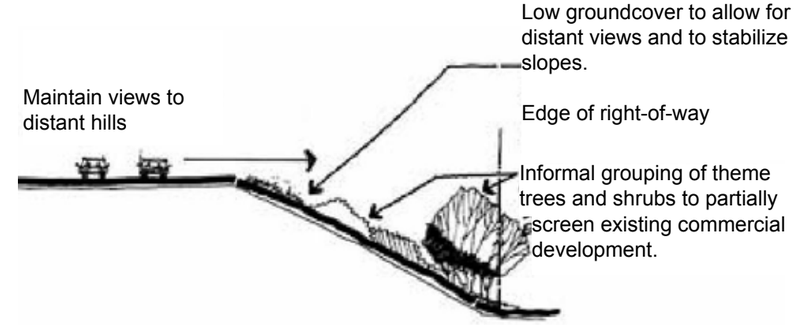
Typical Issues

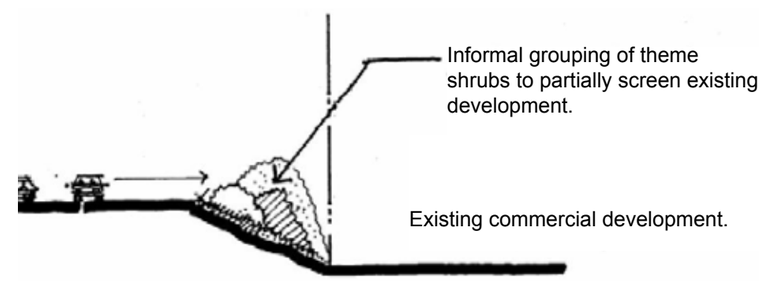
Foreground screening would be necessary while maintaining distant views



Plant material at top of slopes can screen unwanted views

Views of the lagoons should not be blocked by landscaping





Plant material close to the freeway could block unsightly foreground views

An example of a view that requires screening with plant material

Views to adjacent natural areas should remain open. This is a view looking east of the Batiquitos Lagoon.

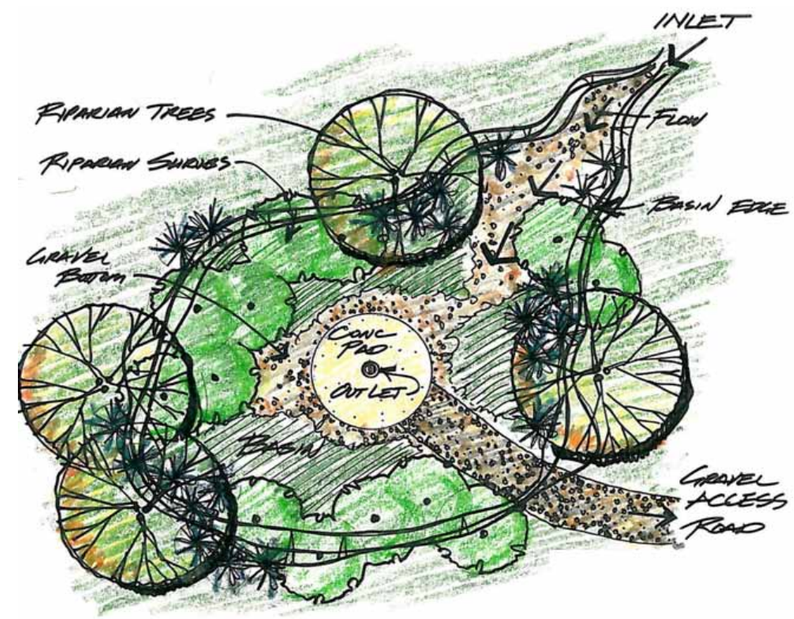
The visual impact of tall manufactured slopes can be mitigated by plant material

Slope Paving

Rounded creek cobble could be used where possible for slope paving under the bridge structures and in areas of the project that are too shady to plant

Water Harvesting Basins

To help collect and retain rain water in low lying areas for landscape irrigation purposes, water harvesting basins could be provided in areas where appropriate.



This is an example of a typical water harvesting basin within an interchange

Coastal Native Landscape Theme

General Concepts

The design goal is to connect the freeway viewer with the coastal experience through landscape design and architectural treatment that considers local topography, weather, vegetation and the unique north coast communities. A California native plant palette is proposed for natural and developed areas. The landscape should:

- Live in harmony with the coastal native setting and provide a sense of place
- Soften walls and built features with native plants adapted to dry summers and winter rains
- Seamlessly blend with native slopes and frame views to lagoons
- Thrive despite the challenge of erodible soils, water restrictions and low maintenance
- Feature signature native plants found in the local natural setting such as torrey pines, sycamores, lemonade berry, toyon and coastal sage scrub

Native slope planting in Spring

View of freeway entry with signature native trees

Signature native plants

These three large-scale natives are signature plants of the I-5 North Coast. They will be used as theme plants to unify the planting design of natural, transitional, and developed areas.

Pinus torreyana
Torrey Pine

Platanus acerifoia
Western Sycamore

Rhus integrifolia
Lemonade Berry

Standard Landscape Treatment

General Concepts

Standard Landscape treatment is typically simple and deliberately low key. Torrey pines and oaks are randomly planted in gray-green native ground covers or coastal sage scrub. The landscape should:

- Be sustainable, low maintenance and require minimal irrigation
- Promote fire safety and weed suppression
- Blend with native slope vegetation and urban landscapes
- Control erosion and improve water quality
- Utilize appropriate native plants with long life spans

View of standard landscape after five years

View of standard landscape after one year

Typical Accent Plants

These three coastal sage scrub plants with aromatic foliage and spring flowers are used as accent plants for standard landscapes. In summer, without irrigation, they go dormant and may drop leaves or turn olive brown.

Eriogonum fasciculatum
Coast Buckwheat

Encelia californica
Bush Sunflower

Salvia clevelandii
Cleveland Sage

Enhanced Landscape Treatment

General Concepts

Enhanced landscape treatment is an opportunity for each community to create a unique entry experience with special landscape plantings and design features. The landscape should:

- Be sustainable, low maintenance and drought tolerant
- Utilize select native hybrid cultivars with a well-mannered appearance during summer dormancy
- Feature enhanced pavings, decorative rock mulches, accent boulders and specimen trees
- Incorporate pedestrian lighting, street furnishings, container plants and custom architectural treatment
- Must be maintained and irrigated by a local agency through a Landscape Maintenance Agreement

View of enhanced landscape after one year

View of enhanced landscape after five years

Typical Accent Plants

These three cultivars are examples of native plant selections with a more refined appearance suitable for enhanced landscapes in developed areas.

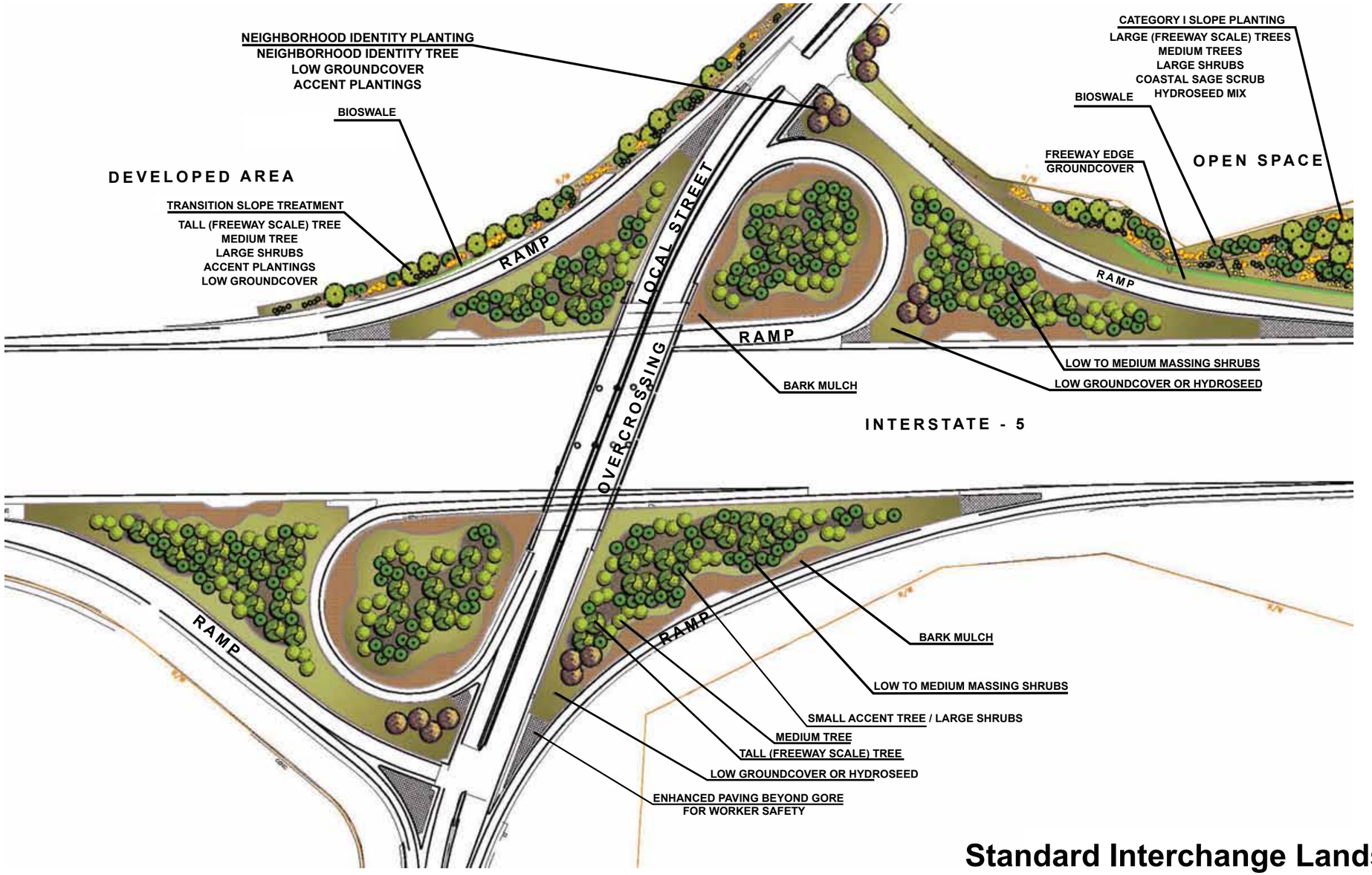
Manzanita Cultivar

California Lilac Cultivar

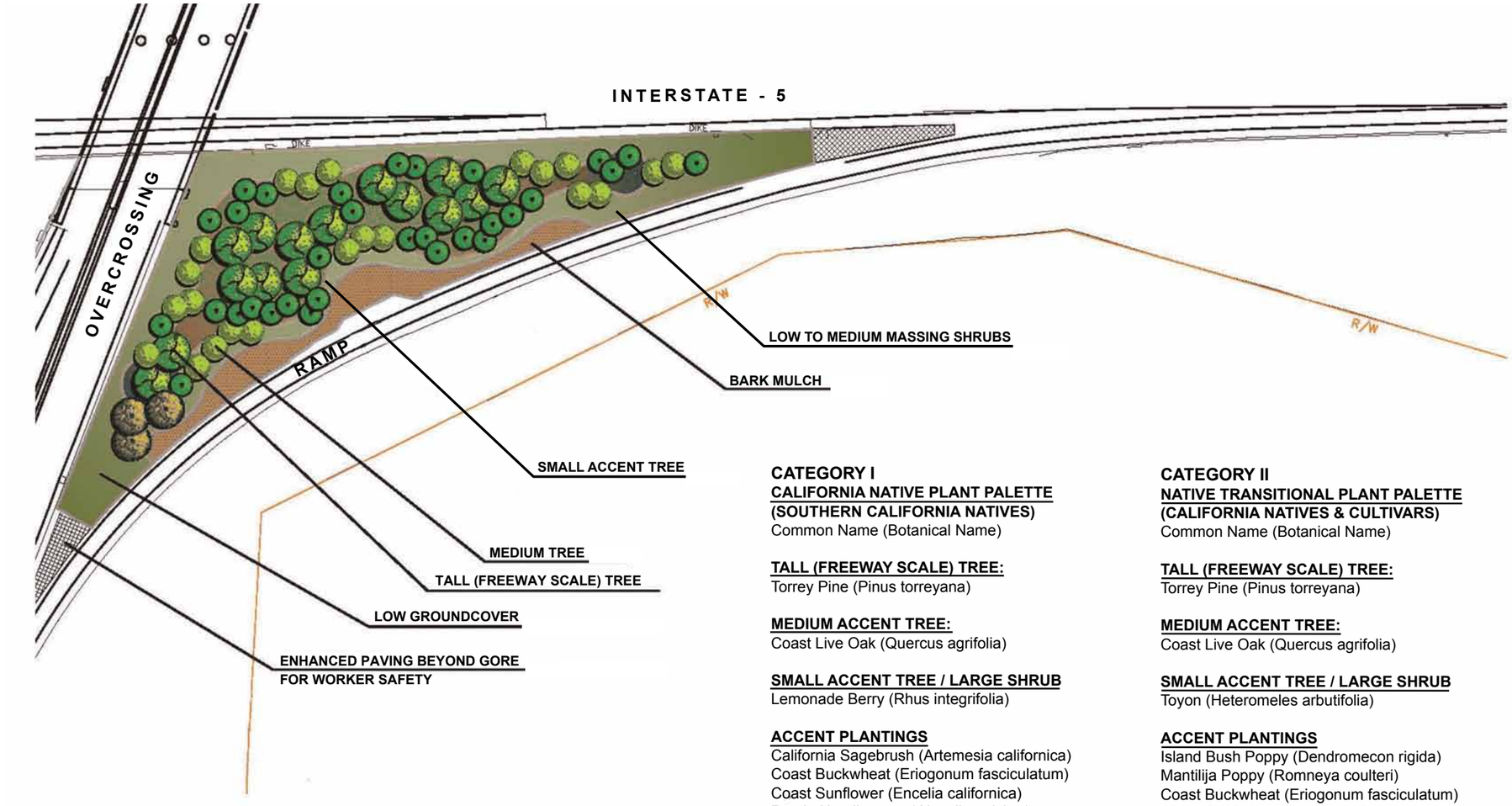
Monkey Flower Cultivar

Typical Interchange Planting Plan

There will be 2 options for landscape treatments. The standard option is a basic Caltrans landscape treatment. However, if a City wishes to provide for the maintenance, an enhanced option is possible. Following is a typical interchange with both options shown.



Standard Interchange Landscape Concept



CATEGORY I
CALIFORNIA NATIVE PLANT PALETTE
(SOUTHERN CALIFORNIA NATIVES)
Common Name (Botanical Name)

TALL (FREEWAY SCALE) TREE:
Torrey Pine (Pinus torreyana)

MEDIUM ACCENT TREE:
Coast Live Oak (Quercus agrifolia)

SMALL ACCENT TREE / LARGE SHRUB
Lemonade Berry (Rhus integrifolia)

ACCENT PLANTINGS
California Sagebrush (Artemesia californica)
Coast Buckwheat (Eriogonum fasciculatum)
Coast Sunflower (Encelia californica)
Purple Needlegrass (Nasella pulchra)
Deergrass (Muhlenbergia rigens)
Cleveland Sage (Salvia clevelandii)

SHRUBBY GROUNDCOVER
Black Sage (Salvia mellifera)

LOW GROUNDCOVER
Native Color Hydroseed Mix

BIOSWALES
Native Sod

CATEGORY II
NATIVE TRANSITIONAL PLANT PALETTE
(CALIFORNIA NATIVES & CULTIVARS)
Common Name (Botanical Name)

TALL (FREEWAY SCALE) TREE:
Torrey Pine (Pinus torreyana)

MEDIUM ACCENT TREE:
Coast Live Oak (Quercus agrifolia)

SMALL ACCENT TREE / LARGE SHRUB
Toyon (Heteromeles arbutifolia)

ACCENT PLANTINGS
Island Bush Poppy (Dendromecon rigida)
Mantilija Poppy (Romneya coulteri)
Coast Buckwheat (Eriogonum fasciculatum)
Coast Sunflower (Encelia californica)

LOW SHRUBBY GROUNDCOVER
Dwarf Coyote Brush (Baccharis pilularis)

LOW GROUNDCOVER
Bees Bliss Sage (Salvia 'Bees Bliss')

BIOSWALES
Native Sod

CATEGORY III
STANDARD LANDSCAPE PLANT PALETTE
(CALIFORNIA NATIVES & CULTIVARS)
Common Name (Botanical Name)

TALL (FREEWAY SCALE) TREE:
Torrey Pine (Pinus torreyana)
California Sycamore (Plantanus recemosa)
Western Cottonwood (Populus fremontii)

MEDIUM ACCENT TREE:
Coast Live Oak (Quercus agrifolia)

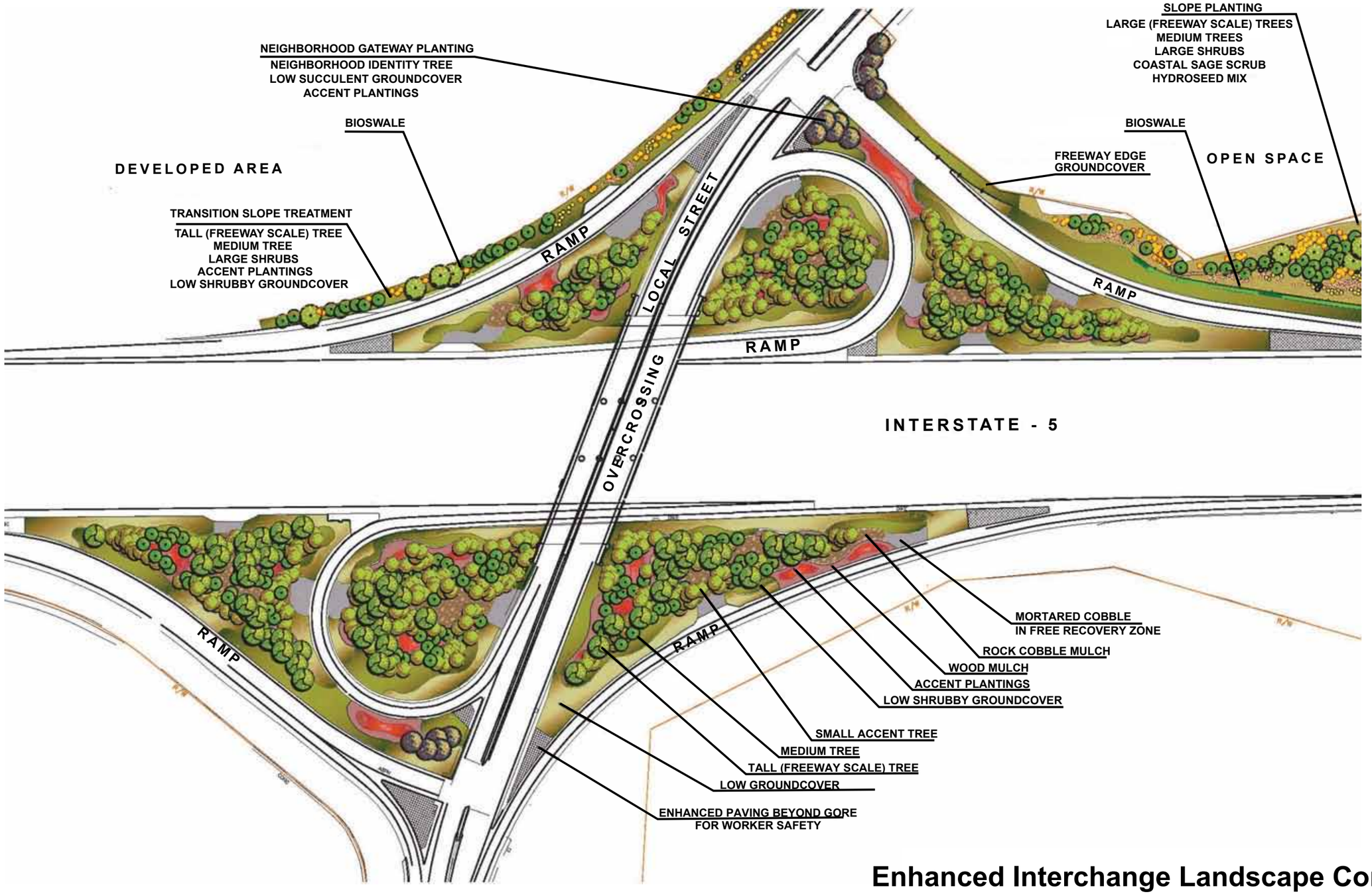
SMALL ACCENT TREE / LARGE SHRUB
Laurel Sumac (Malosma laurina)

ACCENT PLANTINGS
Island Bush Poppy (Dendromecon rigida)
Bush Sunflower (Encelia californica)
Canyon Silver Yarrow (Eriophyllum 'Canyon Silver')
Allen Chickering Sage (Salvia clevelandii 'Allen Chickering')

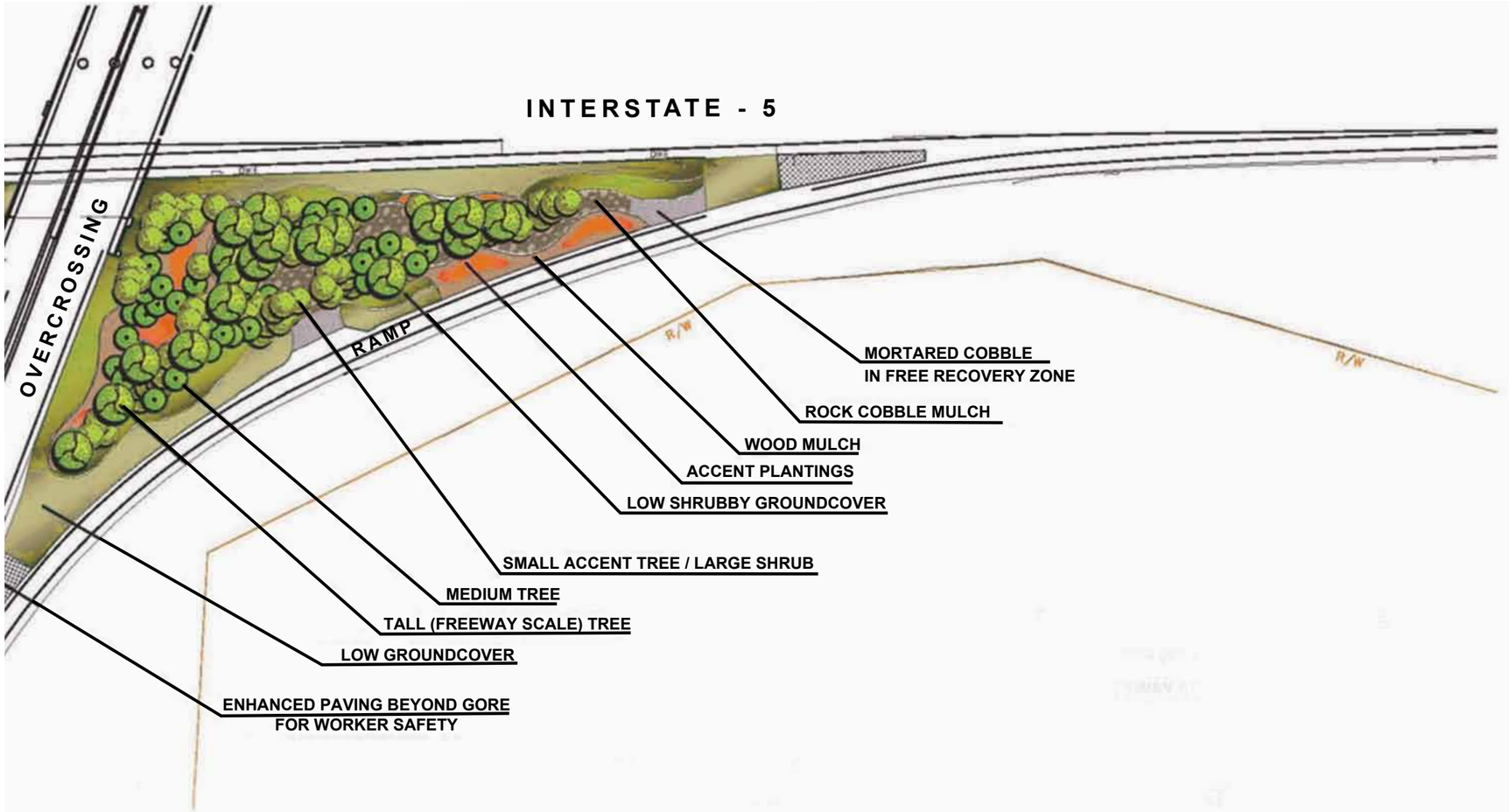
LOW GROUNDCOVER
Dwarf Coyote Brush (Baccharis pilularis)

BIOSWALES
Native Sod

Standard Interchange Landscape Concept



Enhanced Interchange Landscape Concept



CATEGORY IV
ENHANCED LANDSCAPE PLANT PALETTE
(CALIFORNIA NATIVES & CULTIVARS)
Common Name (Botanical Name)

TALL (FREEWAY SCALE) TREE:
Torrey Pine (Pinus torreyana)
California Sycamore (Plantanus recemosa)
Western Cottonwood (Populus fremontii)
California Fan Palm (Washingtonia fillifera)

MEDIUM ACCENT TREE:
Coast Live Oak (Quercus agrifolia)

SMALL ACCENT TREE / LARGE SHRUB
California Lilac (Ceanothus cultivars)

ACCENT PLANTINGS
Saint Catherine's Lace (Eriogonum giganteum)
Island Snapdragon Cultivars (Galvezia speciosa)
California Fuchsia Cultivars (Epilobium canum)
Canyon Silver Yarrow (Eriophyllum 'Canyon Silver')
Allen Chickering Sage (Salvia clevelandii 'Allen Chickering')

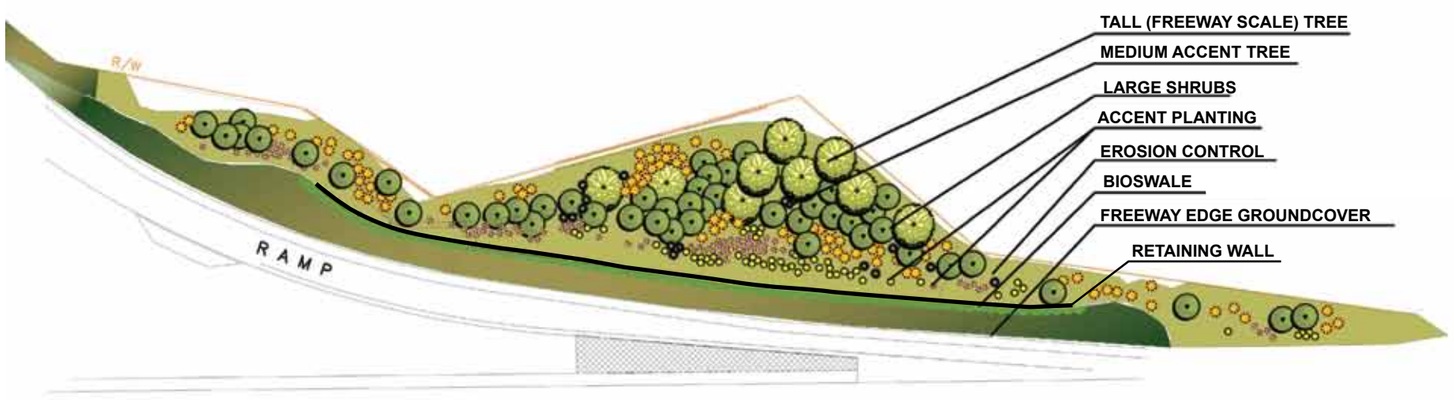
LOW SHRUBBY GOUNDCOVER
Dwarf Coyote Brush (Baccharis pilularis 'Pigeon Point')

LOW GROUNDCOVER
Little Sur Manzanita (Arctostaphylos 'Little Sur')

BIOSWALES
White Yarrow (Achillea Millefolium)
California Meadow Sedge (Carex Pansa)

Enhanced Interchange Landscape Concept

Adjacent Land Use: OPEN SPACE OR DEVELOPED
Caltrans Slope Treatment: NATIVE



NATIVE PLANT PALETTE

Common Name (Botanical Name)

TALL (FREEWAY SCALE) TREE:
Torrey Pine (Pinus torreyana)

MEDIUM ACCENT TREE:
Coast Live Oak (Quercus agrifolia)

LARGE SHRUB
Toyon (Heteromeles arbutifolia)
Laurel Sumac (Malosma laurina)
Lemonade Berry (Rhus integrifolia)

ACCENT PLANTINGS
California Sagebrush (Artemesia californica)
Coast Sunflower (Encelia californica)
Bladderpod (Isomeris arbutifolia)
Red Monkeyflower (Mimulus aurantiacus)
Coyote Brush (Baccharis pilularis)

EROSION CONTROL NATIVE HYDROSEED
Coastal Sagebrush (Artemesia californica)
Beach Evening Primrose (Camissonia cheiranthifolia)
Coast Sunflower (Encelia californica)
Coast Buckwheat (Erigonum fasciculatum)
California Poppy (Eschscholzia californica)
Salt Heliotrope (Heliotropium curassavicum)
Spreading Goldenbrush (Isocoma menziesii)
Goldfields (Lasthenia californica)
Deerweed (Lotus scoparius)
Purple Needlegrass (Nassella pulchra)

BIOSWALES
Native Sod

FREEWAY EDGE GROUNDCOVER
Creeping Sage(Salvia sonomensis)
Native Color Hydroseed Mix

Freeway Slope Treatment Concept

Plant Material

Landscape concepts are presented here on a typical issue approach. There are basically four different types of landscape areas with a variety of specific treatments. Specific plant species are listed in the following plant matrices.

Plant Categories

- **Category I (California Native):** California Coastal Native Plants. Adjacent to native habitat. Plants and seed are used for revegetation. Requires no irrigation after plant establishment. Will receive minimal maintenance.
- **Category II (Native Transitional):** Mixed California Natives and California Native Cultivars. Used at interchanges with views of native areas and at slopes with freeway walls. Walls may have vines to discourage graffiti. Plants and seed are used for revegetation. Requires minimal irrigation once established. Will receive minimal maintenance.
- **Category III (Standard Landscape):** Mixed California Natives and California Native Cultivars. Used at urban interchanges. Accent areas and pedestrian/bike nodes may have ornamental native plantings. Walls may have vines to discourage graffiti. Low native groundcovers at freeway edges require irrigation to suppress weeds/fire. Flat areas may be mowed or mulched with wood chips. Requires low amounts of irrigation once established. Will receive low maintenance and minimal weeding after establishment.
- **Category IV (Enhanced Landscape):** Mixed California Natives and California Native Cultivars. May be used at city gateway interchanges, city streets and medians, accent areas and pedestrian/bike nodes. Includes Category III plants and ornamental natives. Receives regular maintenance and weeding. Decorative rock mulches and pavings may be used in accent areas. This above-standard enhanced landscape requires a Landscape Maintenance Agreement for landscaping in State right-of-way. Requires low amounts of irrigation once established.

BOTANICAL NAME	COMMON NAME	CATEGORY			
		I	II	III	IV
TREES (TALL)					
Pinus torreyana	Torrey Pine	x	x	x	x
Platanus racemosa	California Sycamore		x	x	x
Populus fremontii	Western Cottonwood		x	x	x
Washington fillifera	California Fan Palm				x
TREES (MEDIUM)					
Palos Verde 'Desert Museum'	Desert Museum Palos Verde			x	x
Quercus agrifolia	Coast Live Oak	x	x	x	x
TREES (SMALL)					
Ceanothus 'Ray Hartman'	California Lilac (multi trunk)			x	x
Heteromeles arbutifolia	Toyon (multi trunk)	x	x	x	x
Sambucus mexicana	Blue Elderberry	x	x		

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BOTANICAL NAME	COMMON NAME	CATEGORY			
		I	II	III	IV
SHRUBS (LARGE)					
Atriplex canescens	Four-Wing Saltbush	x	x		
Baccharis salicifolia	Mule Fat	x	x		
Comarostaphylos diversifolia	Summer Holly	x	x	x	x
Heteromeles arbutifolia	Toyon	x	x	x	x
Malocothamnus fasciculatus	Bush Mallow	x	x		
Malosma laurina	Laurel Sumac	x	x	x	x
Prunus iliciflia	Holly Leaf Cherry	x	x		
Prunus lyonii	Cataline Cherry			x	x
Rhus integrifolia	Lemonade Berry	x	x	x	
SHRUBS (MEDIUM)					
Arctostaphylos 'Sunset'	Sunset Manzanita			x	x
Rhamnus californica	California Coffeeberry	x	x		
Rhamnus californica 'Mound San Bruno'	California Coffeeberry			x	x
Rhamnus californica 'Leatherleaf'	California Coffeeberry			x	x
Ribes vigurnifolium	Catalina Current			x	x
SHRUBS (COASTAL SAGE SCRUB)					
Artemisia californica	Coastal Sagebrush	x	x	x	x
Baccharis sarothroides	Broom Baccharis	x	x	x	x
Baccharis pilularis	Coyote Bush	x	x	x	x
Encelia californica	Bush Sunflower	x	x	x	x
Eruiductyon crassifolium	Felt-Leaf Yerba Santa	x	x		
Eriogonium fasciculatum 'fasciculatum'	California Bushwheat	x	x	x	x
Isocoma menziesii	San Diego Goldenbush	x	x		
Isomeris arborea	Bladderpod	x	x		
Iva hayesiana	San Diego March-Elder	x	x		
Minimus aurantiacus	Sticky Red Monkey Flower	x	x		
Salvia apiana	White Sage	x	x	x	x
Salvia clevelandii	Cleveland Sage	x	x	x	x
Salvia mellifera	Black Sage	x	x		
Viguiera laciniata	San Diego Sunflower	x	x	x	x

Plant Categories

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BOTANICAL NAME	COMMON NAME	CATEGORY			
		I	II	III	IV
SHRUBS (GROUNDCOVER)					
Arctostaphylos 'Carmel Sur'	Little Sur Manzanita			x	x
Baccharis pilularis 'Piegon Point'	Dwarf Coyote Brush		x	x	x
Ceanothus griseus 'Anchor Bay'	Creeping Wild Lilac			x	x
Erigonum 'Theodore Payne'	Creeping California Buckwheat			x	x
Rhamnus californica 'Seaview Improved'	Creeping California Coffeeberry				x
Salvia 'Bees Bliss'	Bees Bliss Sage		x	x	x
Salvia mellifera 'Tera Seca'	Terra Seca Sage		x	x	x
Salvia leucophylla 'Point Sal Spreader'	Point Sal Sage		x	x	x
Salvia sonomensis	Creeping Sage	x	x	x	x
CACTI & SUCCULENTS					
Agave shawii	Shaw Agave	x	x		
Dudleya edulis	Lady Fingers	x	x		
Dudleya pulverulenta	Chalk Lettuce	x	x		
Hesperoyucca whipplei	Our Lords Candle	x	x		
Yucca schidigera	Mojave Yucca	x	x		
FLOWERING ACCENT PERENNIALS					
Achillea millefolia	White Yarrow			x	x
Coreopsis maritima	San Diego Sea Dahlia	x	x	x	x
Dendromecon rigida	Island Bush Poppy	x	x	x	x
Encelia californica	Bush Sunflower	x	x	x	x
Epilobium canum	California Fuschia	x	x		
Eriogonium giganteum	St. Catherine's Lace			x	x
Eriophyllum confertiflorum	Golden Yarrow	x	x		
Eriophyllum nevinii 'Canyon Silver'	Canyon Silver Yarrow			x	x
Galvezia speciosa 'Firecracker'	Island Snapdragon			x	x
Gnaphalium californicum	California Everlasting	x	x		
Mimulus aurantiacus	Sticky Red Monkey Flower	x	x		
Romneya coulteri	Matilija Poppy	x	x	x	x
Salvia clevelandii	Cleveland Sage	x	x	x	x
Salvia clevelandii 'Allan Chickering'	Cleveland Sage			x	x

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BOTANICAL NAME	COMMON NAME	CATEGORY			
		I	II	III	IV
GRASSES, RUSHES, SEDGES - (Bioswales*)					
Aristida purpurea	Purple Three-Awn	x	x		
Carex pansa*	California Meadow Sedge			x	x
Festuca glauca	Blue Fescue			x	x
Festuca rubra*	Molate Fescue	x	x	x	
Koeleria macrantha*	June Grass	x	x	x	
Muhlenbergia rigens	Deer Grass	x	x	x	
Nasella lepida	Foothill Needle Grass	x	x	x	
Nasella pulchra*	Purple Needle Grass	x	x	x	
Sporbolus airoides	Alkali Sacaton	x	x		
ANNUAL/PERENNIAL COLOR - SEEDED					
Abronia maritima	Sand Verbena	x	x		
Camissonia cheiranthifolia	Beach Evening Primrose	x	x		
Encelia californica	Bush Sunflower	x	x		
Eremocarpus setigerus	Dove Weed	x	x		
Eriogonum fasciculatum	California Buckwheat	x	x		
Eriophyllum confertiflorum	Golden Yarrow	x	x		
Eschscholzia californica	California Poppy	x	x		
Dichelostemma pulchellum	Blue Dicks	x	x		
Gnaphalium californicum	Cudweed	x	x		
Heliotropium curassavicum	Salt Heliotrope	x	x		
Isocoma menziessi var. menziessi	Spreading Goldenbush	x	x		
Lasthenia californica	Goldfields	x	x		
Layia platyglossa	Tidytips	x	x		
Lotus scoparius	Deerweed	x	x		
Nasella pulchra	Purple Needlegrass	x	x		
Sisyrinchium bellum	Blue Eyed Grass	x	x		
Viguiera laciniata	San Diego Sunflower	x	x		

Corridor Landscape Concept

The basic landscape types for the entire corridor are depicted in the following plans. They are conceptual in nature and are intended to provide an overall framework for the basis of future plant material selection within the corridor.

Category I (California Native): Southern California Native Plants

This landscape type will be used at areas adjacent to native habitat. The new landscaping would look natural and harmonize with the existing native vegetation. Requires no irrigation once established.

The landscape planting theme has the following characteristics:

- Plants and seed will be native to the coastal zone of San Diego and Orange County.
- Planting design will be site specific and species will be selected with input by a biologist.
- Walls will be screened with native shrubs where space allows.
- Biofiltration swales will be planted with native sod. Swales may be planted with native seed only if irrigation is not feasible.
- Plantings will typically receive three to five years of plant establishment which will include irrigation and weeding.
- After plant establishment, no weeding or overhead spray irrigation will be provided. Trees could be irrigated by a bubbler system.
- Maintenance includes permanent bmp maintenance, trash pickup and mowing or brush removal as directed by the Fire Marshal.

Category II (Native Transitional): Mixed California Natives with drought tolerant California Native Cultivars

Native Transitional is used at interchanges with views of native areas and at slopes with views of freeway walls. The new plantings create a visual transition from native to urban landscapes. Requires minimal water once established.

The landscape planting theme has the following characteristics:

- The dominant plant type is California native plants and drought tolerant native cultivars. Seed is native to the coastal zone of San Diego and Orange County.
- Planting design will be site specific. A biologist will review the design and may provide input on the plant palette where transitional plantings occur near Category I (Native) plantings.
- Native tree species will be planted to take advantage of drainage water. Riparian trees (Sycamores and Cottonwood) will be planted at low areas. Torrey Pines will be the dominant tree. Slopes will be planted with Torrey Pines and Oaks.
- Walls will be screened with native shrubs where space allows. Vine plantings to deter graffiti may occur at walls in urban areas or where space is limited. Although a native vine is the design preference, a non-native, non-invasive vine will be used. It has been determined that native vines cannot cling to the walls.
- Biofiltration swales will be planted with native sod.
- Plantings will typically receive three to five years of plant establishment which will include irrigation and weeding.
- After plant establishment, some overhead spray irrigation will occur at firebreak plantings. Trees will be irrigated by bubblers.
- Standard Caltrans Maintenance includes trash pickup, permanent bmp maintenance, irrigation work and brush removal as required by the Fire Marshal.

Category III (Standard Landscape): California Natives with drought tolerant California Native Cultivars

This landscape type will be used at interchanges with a more refined, urban setting. The landscape design will blend with local community landscape themes. Requires low amounts of irrigation once established.

The landscape planting theme has the following characteristics:

- The standard landscape plant palette is mixed California natives and dought tolerant native cultivars. Ornamental native trees, and shrubs and succulents can be used as accents.
- Walls will be screened with native shrubs where space allows. Vine plantings will be used to deter graffiti at walls.
- Freeway edges will have permanently irrigated, spreading native groundcovers to suppress weeds and fire.
- Biofiltration swales will be planted with native sod or mixed native sod and flowering native perennials.
- Plantings will typically receive three to five years of plant establishment which will include irrigation and weeding.
- After plant establishment, low amounts of supplemental water will be required. Overhead spray irrigation will be used at native shrub and groundcover areas. Trees will have a bubbler irrigation system. Receives Standard Caltrans Maintenance and no weeding.

Category IV (Enhanced Landscape): California Natives with drought tolerant California Native Ornamental plantings

Used at gateway interchanges and landscapes maintained by others. Requires low amounts of irrigation once established.

The landscape planting theme has the following characteristics:

- Includes Category III plants, decorative rock mulches and regular landscape maintenance to complement the local community landscaping. May include street trees, median plantings and gateway accent plantings. Requires a city Maintenance Agreement for enhanced landscaping in State right of way.

Category I (California Native): Used for revegetation near native habitat. California coastal native plants and hydroseed. No irrigation once established.
Category II (Native Transitional): Used at interchanges near native areas and at slopes with freeway walls. California natives/ cultivar plants and hydroseed receive minimal maintenance. Walls have no vines. Requires minimal irrigation once established.
Category III (Standard Landscape): Used at urban interchanges. California native/cultivar plants with mulch areas receive low maintenance once established. Requires low amounts of irrigation once established.
Category IV (Enhanced Landscape): Used at gateway interchanges and landscapes maintained by others. California native/ ornamental plantings receive regular maintenance and weeding. Decorative rock mulches and pavings are used. Above standard landscape in State right-of-way requires a Landscape Maintenance Agreement. Requires low amounts of irrigation.

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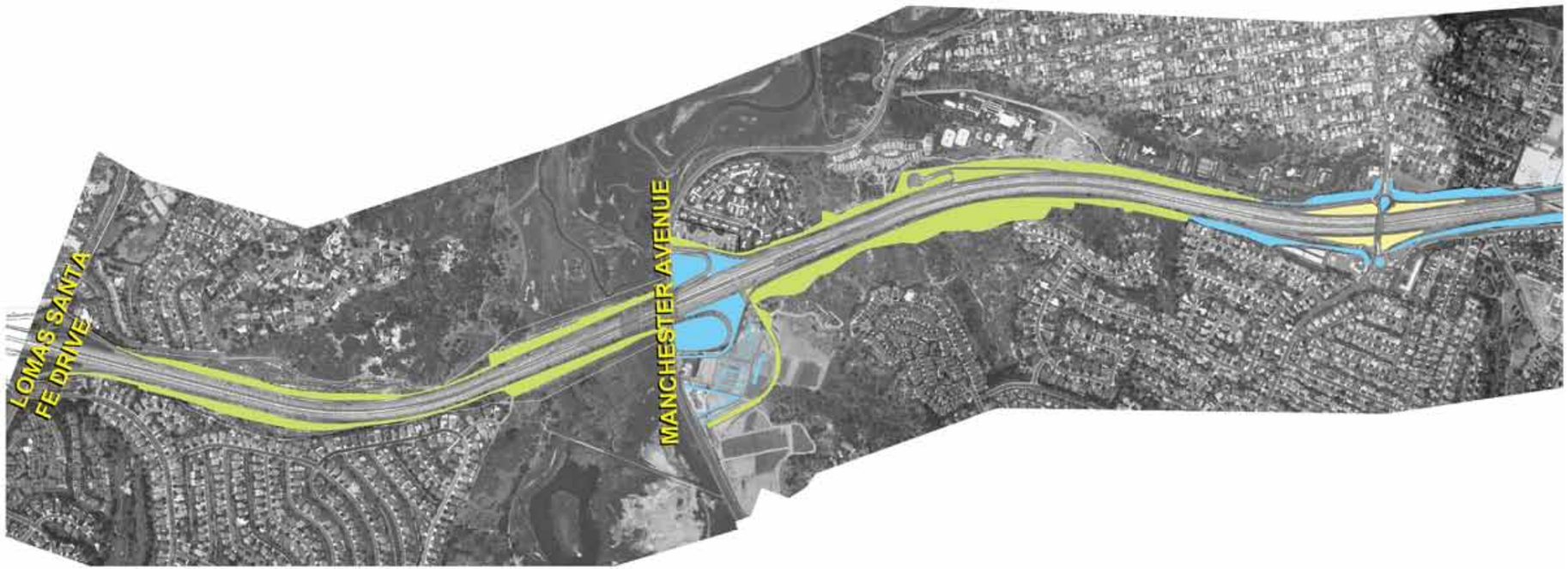

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Category I (California Native): Used for revegetation near native habitat. California coastal native plants and hydroseed. No irrigation once established.
Category II (Native Transitional): Used at interchanges near native areas and at slopes with freeway walls. California natives/ cultivar plants and hydroseed receive minimal maintenance. Walls have no vines. Requires minimal irrigation once established.
Category III (Standard Landscape): Used at urban interchanges. California native/cultivar plants with mulch areas receive low maintenance once established. Requires low amounts of irrigation once established.
Category IV (Enhanced Landscape): Used at gateway interchanges and landscapes maintained by others. California native/ ornamental plantings receive regular maintenance and weeding. Decorative rock mulches and pavings are used. Above standard landscape in State right-of-way requires a Landscape Maintenance Agreement. Requires low amounts of irrigation.

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Maintenance

IV. Maintenance

When features of the design include components that are not standard of Caltrans plans, these features are deemed as enhanced. Caltrans will install the ehanced components with the understanding that the local cities will be responsible for the upkeeping and maintenance of the advanced features. The details of these maintenance issues will be specified in a maintenance agreement between Caltrans and the local agencies.

The purpose of this section is to identify those design features that, if implemented, must be maintained by the local communities.

Retaining Walls, Noise Walls, Structures and Fences

- Integrally colored concrete, heavy textured concrete surfaces, and alternative materials are proposed for retaining walls and noise walls to reduce the effectiveness and thus discourage graffiti.
- Planting pockets used in front of retaining walls at freeway level will incorporate low water plantings that further discourage graffiti.
- Rust staining of wall concrete caused by weathering steel elements is anticipated. This is a desired effect and does not require further maintenance over the life cycle of the structure.
- Transparent noise walls that feature operable casement windows and are constructed along the Right-of-Way boundary could be maintained (cleaned) by property owners.
- Maintenance requirements for the smooth tapered box bridge will be the same as Caltrans typical box girder bridges. The bridge form will allow ready access to inspect bearings, joints, etc.
- Rust staining of bridge concrete caused by weathering steel elements is anticipated. This is a desired effect and does not require further maintenance over the life cycle of the structure.

Lagoon Bridges

- Concrete arch lagoon bridges will require more time and/or be more difficult to inspect than a traditional box girder bridge due to the complex substructure geometry and limited access.
- Stainless steel elements are recommended for bridge railings and any other steel features in marine environments to extend design life and minimize maintenance.
- Pedestrian bridges that are suspended from or supported by the freeway bridge will use multiple materials and will require additional inspection. Use of alternative materials such as composite or recycled lumber decking should be considered to maximize sustainability and minimize maintenance.

Landscape

- California native, non-invasive material will be utilized.
- Drought tolerant plant material will be utilized.
- Water harvesting and soil conservation practices will be implemented.
- Landscape will be sustainable.
- Increase shared maintenance responsibilities with local communties.
- Increase the use of non-vegetative treatments.

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Next Steps

V. Next Steps

The following represent potential next steps for this document.

- Submit Draft Design Guidelines to City Staff for review
- Submit Draft Design Guidelines to resource agencies for review
- Include Design Guidelines in the North Coast Corridor Public Works Plan for public review
- Conduct Feasibility/Constructability Study for the San Elijo Lagoon Arched Bridge Concept
- Work with Cities and communities to address their comments on Design Guidelines
- Formal Submittal of Design Guidelines with Public Works Plan to the California Coastal Commission
- Initiate Design for first phase of project