

DESIGN INFORMATION BULLETIN (DIB) XX-XX
California Department of Transportation
Division of Design – Landscape Architecture Program
Division of Engineering Services Structures Design– Office of Transportation Architecture

WALL STRUCTURE AESTHETIC GUIDELINES



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WALL STRUCTURE AESTHETICS

1.0 INTRODUCTION

1.1 Background

Wall structures are prominent and high cost components of the highway system and their aesthetic treatments can have a strong influence on the visual character of a highway corridor. It is likely that they will be seen by millions of viewers and therefore their aesthetic treatments must be carefully considered in the context of long term corridor aesthetic planning as well as local community planning.

Constructability issues with the aesthetic treatments, such as misaligned patterns, staggered top of wall profile, or placement of expansion joints at locations that conflict with the aesthetic treatment, can compromise the wall structure appearance and create challenges for construction. Remediation of constructability issues may not be an easy or cost effective option, so these defects become permanent features of the wall.

Caltrans collaborated with the construction industry to identify constructability issues with aesthetic treatments of wall structures and developed design solutions to address them. This Design Information Bulletin (DIB) XX-XX establishes design guidance resulting from a collaborative effort to satisfy the expectations of designers, contractors, the local community, and other stakeholders.



The staggered appearance and misaligned patterns of this retaining wall are the unfortunate result of inadequate coordination of the aesthetic treatment between aesthetic design, structure engineering, construction practices, and site terrain.

1.2 Definitions

Wall Structures – Refers to concrete walls including Concrete Cantilever Walls and Soil Reinforcement System walls. It includes walls which are independent of other structures and walls which are part of bridge or other structure systems.

Aesthetic Treatment – For the purpose of this DIB, aesthetic treatment, also commonly referred to as “architectural treatment”, refers to the overall form of the wall, its features such as the wall cap, wall columns, end treatments, and safety shapes. It also refers to the incorporation of color, texture, pattern, and/or imagery to the surfaces of concrete wall structures to improve their appearance and integrate them into their surrounding urban or natural environment.

1.3 Purpose of Wall Structure Aesthetics

Wall structures are an essential and integral component of the State Highway System (SHS). They are generally massive in scale and can dominate the surrounding context and views to and from the highway corridor and adjacent community. A principle objective of highway corridor aesthetics is for the physical elements of the highway, including the wall structures, to visually relate to one another as a unified whole and be integrated into the surrounding context of the corridor. Aesthetic treatments and other techniques such as slope terracing, can reduce the apparent scale of a wall structure and help to integrate it into the surrounding natural and cultural context.



Aesthetic treatments on wall structures can reflect an image of the surrounding community and create visual interest for motorists.

Aesthetic treatments are incorporated into wall structures to achieve various objectives. Environmental analysis of transportation improvement projects often requires wall structures to incorporate aesthetic treatments to improve their appearance and reduce their visual impact on viewers. Required aesthetic treatments can help compensate for a loss of visual quality in the corridor due to the removal of vegetation or other existing aesthetic features by a transportation project, or for their potential urbanizing effect in rural areas.

Aesthetic treatments on wall structures also provide functional benefits. They reduce surface glare and provide visual interest, stimulating alertness in drivers. Graffiti is a potential aesthetic and maintenance problem on wall structures and must be considered in making aesthetic design decisions. For example, as an alternative to vines on walls, which may require long-term maintenance, aesthetic surface treatments incorporating rougher textures and varied patterns may discourage graffiti and improve worker safety by reducing the need for graffiti removal.



Wall structure aesthetic treatments should be coordinated with other highway elements in a well thought out design. In Orange County, repeating the orange motif aesthetic treatment from the MSE wall (left) to the sound wall columns and adjacent slope paving is one technique used to help provide unity to the appearance of the highway corridor.

The context sensitive solutions (CSS) process, which balances transportation goals with the goals of stakeholders, can lead to the selection of aesthetic treatments that reinforce overall corridor aesthetic themes and reflect local community aesthetic, scenic, cultural and historic values and provide community identity. A highway can be a major component of community image, having a significant impact on the local economy and quality of life. Therefore, identifying wall aesthetic treatments that meet stakeholder desires is often crucial to obtaining project approval from local agencies, community members and other stakeholders. Deploying an effective stakeholder involvement process and incorporating well designed aesthetic treatments into transportation projects can reduce the risk of project delay and foster public trust, which can lead to a streamlined approval process in subsequent projects, saving both time and dollar resources.

1.4 How to Use this DIB

This DIB is to be used in conjunction with the Highway Design Manual, including but not limited to, Topic 81 Project Development Overview; Topic 109 Scenic Values in Planning and Design; Topic 210 – Reinforced Earth Slopes and Earth Retaining Systems; and Topic 1102 Noise Barrier Design Criteria; as the current state of the practice for the planning, design, and construction of aesthetic treatments for certain wall structures on the SHS.

2.0 DESIGN GUIDANCE

2.1 Collaboration and Coordination

All members of the project development team (PDT), including Division of Engineering Services (DES) Structures Design (Structures) engineers and architects, district landscape architects and engineers, design consultants, and partners, must collaborate on critical aesthetic design decisions throughout wall structure development beginning in the planning phase and continuing through construction. The architectural design of aesthetic treatments must be compatible with the structural design of the wall and design efforts must be coordinated so that the constructed wall structure satisfies the design intent. The involvement of individual PDT members will fluctuate throughout the project development process and the landscape architect should coordinate communication of aesthetic issues with all members throughout the project development phases.

The PDT, including key community stakeholders, should develop a clear and concise aesthetic design intent statement for the wall aesthetics early in project development. The PDT determines the format and content of the aesthetic design intent statement to fit project specific needs. At a minimum the aesthetic design intent statement should account for requirements of the environmental document, in particular the visual impact assessment, and should reference applicable corridor master plans or community planning goals and objectives. It should provide guidance to the PDT throughout planning and design to ensure that the wall structure and related corridor features are coordinated aesthetically and can be built and maintained to fulfill the design intent. It should also be used to provide aesthetic continuity on the project if changes in project personnel or community partners occur. The aesthetic design intent statement should provide the flexibility to be updated if changes to the aesthetic design, agreed upon by the PDT, must be accommodated.

The layout of the aesthetic treatment and the wall structure must be carefully considered if the desired aesthetic results are to be achieved. Appropriate grading, location and dimensioning of footing steps, footing heights, expansion joints, weakened joints, horizontal wall angle points, and horizontal curve layout are critical for aesthetic treatments to align correctly to create a continuous and homogenous appearance. When architectural and engineering design is not coordinated, constructability issues such as misaligned patterns, staggered profiles, or poor placement of expansion joints, drainage features, and weep holes are more likely to occur, compromising the design intent and the final appearance of the wall.

To contribute to a uniform corridor concept, wall structures require aesthetic coordination with related corridor features such as fencing, safety cable railing, safety shape barriers, lighting, landscape planting, transportation art and community identifiers. Aesthetic treatment may also be influenced by other corridor features such as bicycle and transit elements; utilities; signage; hydraulics; grading; erosion control; and adjacent paving including vegetation control, slope paving, and paving beyond the gore.



The design of aesthetic treatments must be well coordinated with the engineering design of the wall structure. Aesthetic treatments must be compatible with footing steps, footing heights, and expansion joints to avoid misalignment issues in construction that will negatively affect the wall appearance.

2.2 Concrete Cantilever Walls

2.2.1 Wall Layout and Profile

Concrete wall structures should be designed to facilitate a gang form system construction methodology. Gang form systems are based on 8-foot and 24-foot panels connected together to achieve the planned wall length and 8-foot panel heights to achieve the planned wall height. During construction wall panels are typically used multiple times to efficiently construct the entire length of the wall. To accommodate this construction methodology, wall layout should be based on 4-foot or 8-foot dimensions. Strive to place all expansion joints, weakened plane joints, begin and end curves, and wall footing step lengths on 8-foot increments. This will match typical form liner dimensions to facilitate the alignment of textures and patterns and reduce labor and material costs. Expansion joints should be aligned with footing step locations in order to avoid conflicts with the aesthetic textures and patterns.



Gang form systems are the common methodology for wall structure construction and must be accommodated in aesthetic treatment design.

Wall footing step heights should be in 1, 2, or 4-foot increments to facilitate gang form system construction and provide for the alignment of horizontal seams. When aesthetic treatments include vertical patterns, wall footing step heights should match the vertical pattern repeat dimensions to facilitate alignment of the vertical pattern. When horizontal patterns are used, footing step heights should be consistent with horizontal pattern repeat dimensions, whenever practicable, to facilitate alignment of the horizontal pattern.

Wall profiles are important to the overall aesthetics of a wall structure and should be integrated with the aesthetic design. Top of wall profile lines that are continuous and gently flowing are generally considered more aesthetically pleasing than those that are staggered or have abrupt changes in elevation.



Top of wall profiles are an important consideration in the overall aesthetic design of a wall structure. Profile lines that are unbroken and smooth flowing as demonstrated in this wall in San Juan Capistrano, contribute to the aesthetics of the wall rather than detract from it.

2.2.2 Concrete Form Liners

Form liners used for imprinting aesthetic treatments into the face of concrete walls are available in various materials including elastomeric (urethane), fiberglass, plastic, and foam.

Elastomeric form liners are the most durable and can be used 100 times or more without degrading the clarity and definition of the aesthetic design. They produce the highest quality finishes in terms of texture definition, pattern complexity, level variation, surface coarseness, edge clarity, and the depiction of realistic stone and brick masonry. Elastomeric form liners should be specified for wall structure aesthetic treatments when multiple uses (5 or more) is expected, when aesthetic treatment is conducive to gang forming, and when complex or finely detailed surface treatment is desired. For consistent quality, elastomeric form liners should also be used on small projects (less than 5 uses) if it is reasonably foreseen that a future project - adjacent or nearby - will use the same aesthetic treatment over a large area. Other cost efficient types of form liners may be considered for small projects when the above criteria are not met.



Elastomeric form liners are preferred for aesthetic treatment for the high quality results they provide.

Foam form liners are used for limited applications where unique and distinctive context sensitive designs are desired for the aesthetic treatment of wall structures. Foam form liners produce high quality finishes but do not provide the durability required for multiple uses and are therefore limited to single use applications.

Fiberglass form liners can be used multiple times with proper cleaning between uses and can provide satisfactory finishes in some applications but do not provide the durability and high quality finishes provided by elastomeric form liners.

Plastic form liners are not appropriate for highway wall structure aesthetics because they are not durable, are limited to one use, and produce low quality finishes and poorly fitted seams.

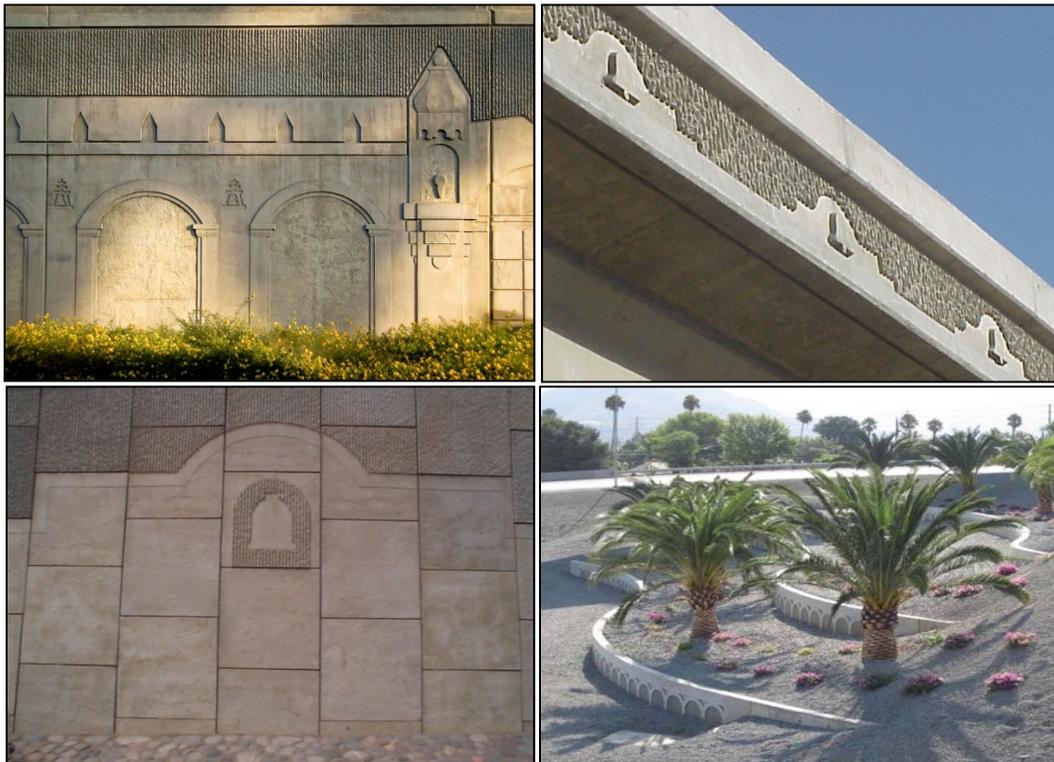
Contractor requests to substitute another form liner type, such as fiberglass, for elastomeric form liners in a Cost Reduction Incentive Proposal (CRIP) must be reviewed and approved by the District Landscape Architect in order to ensure that the quality and integrity of the aesthetic treatments on the project and within the highway corridor are maintained.

2.2.3 Aesthetic Texture and Pattern

In the practice of highway corridor aesthetics the various features of the highway such as the retaining walls, bridge abutments, slope paving, concrete barriers, and sound walls should all visually complement one another through a well-thought-out design to form a cohesive and unified whole. The aesthetic treatments for these features must be thoughtfully considered during planning and design so that their textures, patterns and colors are compatible from one feature to the next so that they visually relate to one another. For example, the textures and

patterns used for the aesthetic treatment of a retaining wall structure could be repeated on an adjacent sound wall, bridge abutment, and/or slope paving so that they are all visually tied together through the similar aesthetic treatments. When individual highway features are designed in isolation, without careful consideration of the other features along the highway, they can be seen as an intrusion on the landscape, appear as a collection of incompatible and disjointed parts, be distracting, and diminish the aesthetic appeal of the adjacent community.

The texture and pattern options available to the designer for aesthetic treatments on wall structures are nearly unlimited. When making design decisions for textures and patterns the designer must consider the entire context of the corridor including other highway features, the viewers, the aesthetic preferences of the local community, the prevalence of or potential for graffiti, and maintainability. Is the wall on a busy urban freeway or on a two-lane scenic highway? How close will viewers be to the wall and what is the duration of time they will be viewing it? What image does the local community want the aesthetic treatments to convey about who they are? What maintenance will be required and will the level of maintenance be appropriate considering available resources? Will the wall be safe to maintain? Questions such as these need to be asked early in the planning and design of the wall structure in order to choose the appropriate textures and patterns for the aesthetic treatments.



The aesthetic treatments used for the retaining wall (top left) were repeated in the bridge barriers, MSE walls, and low landscape walls to help unify the aesthetics of the overall highway corridor in Riverside.

Aesthetic textures and patterns should extend outward from the structural wall section, adding thickness to the outer face of the wall. Textures and patterns should not be recessed into the face of the structural wall section. Recessed textures and patterns cause constructability issues to occur when the aesthetic design requires the form liners to be cut to conform to line and grade, which wastes material and increases material cost. Outward extending textures and patterns allow the contractor to block out the form liner to conform to line and grade without cutting the form liner, allowing for its reuse and resulting in cost savings. Also, textures and patterns should not be recessed into the face of the structural wall section because minimum clearances between steel reinforcement and the face of concrete wall may be compromised, which could affect the structural integrity of the wall.



Textures and patterns should extend outward from the face of the structural concrete section to avoid constructability issues and control construction costs.

Many textures and patterns require deep relief in order to meet the aesthetic design intent and satisfy stakeholder expectations. Some patterns, like the simulation of stone masonry, need sufficient depth to provide the forms, grout lines, and shadows necessary to produce the realistic effect of a stone wall. However, the deeper relief adds thickness to the concrete form and increases its weight. The heavier forms require more effort to place and move during construction which can increase construction costs. Therefore the depth of relief must be considered early in planning and design of the wall structure and should be minimized whenever appropriate to provide cost savings. Consideration of the depth of relief and wall thickness, as well as the overhang of the wall cap and column dimensions, need to be identified early in the project development process so they are accommodated in the project budget.



Rock masonry patterns that include color staining of individual “rocks” are often a context sensitive aesthetic treatment for retaining walls and bridge abutments.

Repetitive patterns are preferred for ease of construction and cost savings but non-repetitive patterns are acceptable to match existing corridor aesthetic features, comply with established corridor aesthetic guidelines, and achieve local stakeholder expectations for the aesthetic treatments.



Integrating repeating patterns in the aesthetic treatment of a wall can provide a sense of rhythm and movement and add interest and visual appeal. The backside of the concrete barrier at the top of the wall also functions as a wall cap that provides definition to the wall.

Vertical patterns are preferred over horizontal patterns because their construction can be more straightforward and result in cost savings. Though more complicated to construct, horizontal patterns such as those in simulated masonry designs are often required to achieve a context appropriate aesthetic treatment for the wall structure. A common constructability issue with horizontal patterns is the misalignment of pattern that can occur when aesthetic design is not adequately coordinated with the structural design of the wall. This constructability issue can be alleviated by carefully evaluating the horizontal pattern in relation to the wall structure line and grade, footing steps, expansion joints, and weakened plane joints. Transitions for both vertical and horizontal patterns must be carefully considered for tapering wall heights, across expansion joints, and at wall corners to provide continuity of pattern.

In considering an aesthetic texture for a wall structure, generally the greater the distance the viewer will be from the wall and the shorter the duration of time they view it the rougher the texture should be to create adequate contrast and define shapes. Rougher textures create more shadow across the face of the wall making them appear darker when placed adjacent to smoother textures. This makes them appear to recede into the background, emphasizing depth and creating a three dimensional effect.

Wall structure aesthetic designs should consider forming an integral concrete cap detail at the top of the wall to establish a top border for textures and patterns and provide a finished appearance to the wall. The proportions of the wall cap should be considered in relationship to the scale of the wall and the scale of the pattern.

2.3 Soil Reinforcement Systems

2.3.1 Mechanically Stabilized Embankment (MSE) Walls

Precast concrete face panels for MSE walls typically have square, rectangular, or cruciform shapes that are erected in an offset alternate pattern. The offset alternate pattern in itself can create a striking aesthetic pattern for the wall even without the incorporation of texture and pattern into the face panels. However, this inherent aesthetic pattern can be enhanced when the face panels are fabricated with standard textures and patterns or custom imagery to satisfy project specific aesthetic requirements. Patterns and custom imagery must be compatible with the dimension of the modular face panel and the offset alternate pattern method of construction to assure proper alignment of patterns and images.



Precast concrete face panels for MSE walls can be fabricated with standard textures and patterns or customized with context sensitive imagery to satisfy local community aesthetic goals.

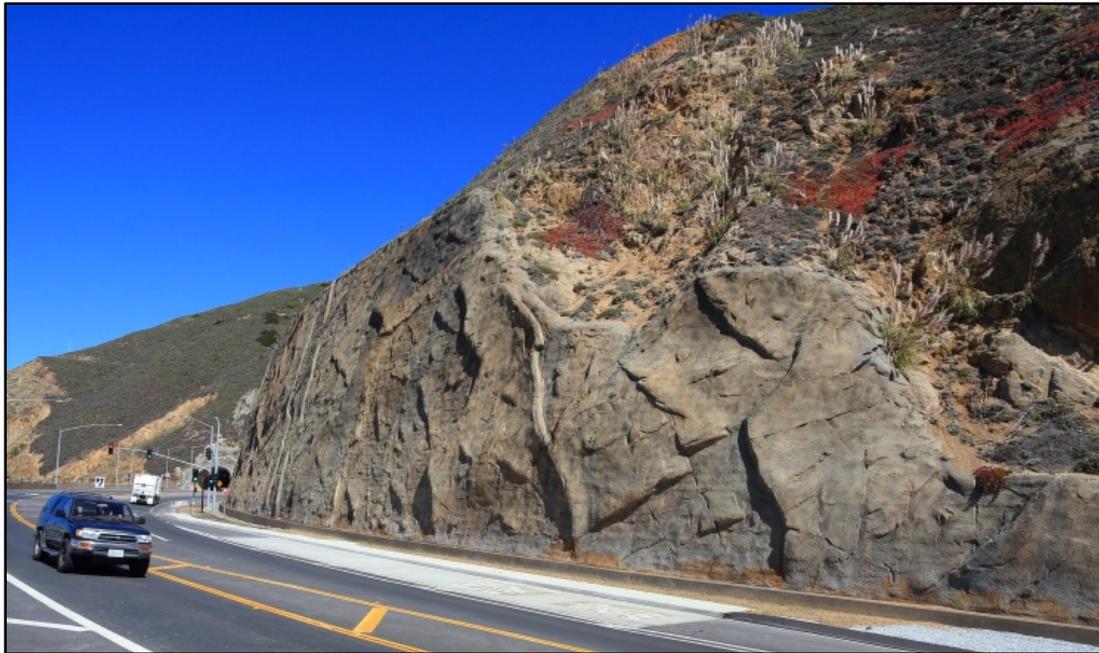
2.3.2 Soil Nail Walls

Soil Nail walls that have sculpted shotcrete faces may be needed to comply with environmental mitigation requirements and satisfy stakeholder aesthetic desires for retaining walls that have the appearance of natural rock formations that blend with natural surroundings. This aesthetic treatment is often required for Soil Nail walls along scenic rural corridors. To be successful the simulated rock design should be modeled after indigenous geological formations, textures, and colors. A reference site in the vicinity of the wall that demonstrates the type of rock formation desired should be identified, documented and provided during advertisement for bid and referred to during construction.

In order to mimic rugged rock outcrops the wall structure should be engineered for an uneven load and have sufficient shotcrete thickness to allow for the sculpting of deep recesses, and/or include a steel framework for the forming of extensive relief. Soil Nail walls that lack sufficient relief or lack variety in form, texture and color tend to look artificial and do not blend into the natural environment as intended. Sharply angled protrusions, ledges, fissures, and recesses increase the realism of the wall appearance. Repetitive patterns tend to be obvious and appear unnatural and should be avoided. Color alone should not be relied on to compensate for a lack of sufficient relief and texture. In shotcrete walls that are terraced, it may be desirable to continue any strata lines from upper walls to lower walls to provide a sense of continuity as would be experienced in a natural rock formation.

The interface between a sculpted shotcrete Soil Nail wall and the adjacent landform and land cover can be a noticeably artificial characteristic when not adequately considered during design.

These interfaces, especially the top of wall profile, should mimic the rough and uneven profile of a rock formation found in nature, including protrusions specifically intended for aesthetic purposes. Abrupt changes in elevations may be necessary to mimic natural rock forms to create a naturally appearing profile. Where maintenance efforts would not be increased, it may be desirable to allow for naturalized and native grasses and other vegetation to encroach onto the top of wall to enhance a natural interface. In such cases, potential conflicts with above-wall drainage features, cable railing, and fencing must be considered. Planting pockets can be incorporated into the wall face to introduce vegetation to help the wall appear more natural and integrated.



The shotcrete face of this Soil Nail wall was sculpted and stained to create the appearance of a natural rock formation. This aesthetic treatment helps to reduce the visual impact of the wall by helping to integrate it into the surrounding scenic environment.

The contract plans for the aesthetic design of Soil Nail walls should delineate the major wall elevation shapes and forms, top of wall profile, major strata lines, and placement of expansion and other construction joints. Joints should be placed at the separations in the simulated rock shapes rather than cutting across them in straight lines. Details of the shotcrete sculpting, texturing and color staining are difficult to delineate on plans and rely on the contract specifications, expertise of an experienced contractor, reference site, sample photographs, and close construction oversight by the Landscape Architect and the Resident Engineer (RE).



Workers sculpting and texturing the wet shotcrete face of a Soil Nail wall. This work is highly specialized and must be performed only by contractors experienced in the techniques of simulated rock fabrication.

Specialized construction techniques are required to sculpt into the wet shotcrete surface to create realistic rock forms and textures and apply stains. The contract should specify that only contractors with a specialty in simulated rock fabrication and a demonstrated expertise in this construction technique should perform the sculpting, texturing, and color staining work. Reference site information, photographs, and other information that demonstrate the design intent of the aesthetic treatment should be provided to the RE and contractor to assure desired results.

Construction of the sculpted shotcrete walls should not begin until after review of the test panels by the Landscape Architect and their recommendation for approval is provided to the RE.

2.4 Color Treatment and Coatings

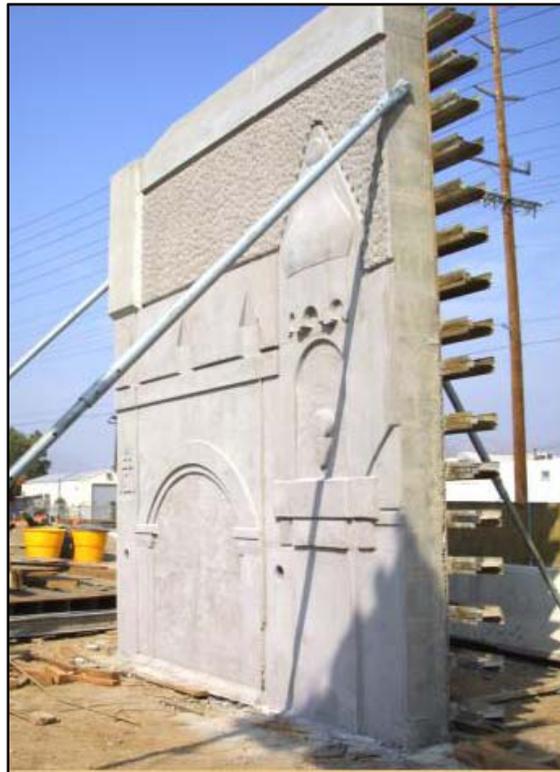
Color for aesthetic treatments of concrete wall structures can be accomplished through integral coloring and surface staining. Painting is not recommended due to long term maintenance concerns. Color choices depend on design intent, but in general should integrate the wall structure into its natural or built context and help reduce surface glare. Colors exposed to sunlight will fade over time, even with the application of ultraviolet inhibitors and color hardeners and should be taken into account when making color choices. While some colors such as earth tones may simply fade to a lighter shade of brown or tan, other colors can fade resulting in an unintended color, for example, from a pleasing brick red or terra cotta to an undesirable pink. A variety of colors should be specified for rock patterns to resemble the appearance of

natural rock walls. The contract should specify any special application techniques for accomplishing the color work such as veining, speckling, gradations, overlapping, highlights, accents, or other coloring techniques.

Where graffiti is prevalent or is a potential issue, a non-sacrificial anti-graffiti coating should be applied to the wall surface as a part of the contract to facilitate maintenance and help preserve the appearance of wall aesthetics over the long term.

2.5 Referee Sample and Test Panel

A referee sample for all wall aesthetic textures, patterns, and colors should be made available for review during advertisement for bid, when available. Referee samples help ensure that the specified textures, patterns, and colors are being considered and all bidders are pricing the same materials and construction techniques. The project specifications should identify where the samples are available for bidder review. When existing wall aesthetic treatments within a corridor are being matched on a new project it can be beneficial to direct bidders to locations where they can view the existing aesthetic treatments in addition to, or in lieu of, providing referee samples.



Test panels serve as a benchmark for measuring consistency and controlling the quality of the wall structure aesthetic treatments.

Project specifications should require that the contractor construct test panels that demonstrate the wall aesthetic treatments required by the project. More than one round of test panels may be necessary to allow for adjustment and refinements to achieve the desired appearance. The specifications, cost estimate, and construction schedule should reflect the potential need for multiple test panels. Test panels should be constructed using the same materials, methods, forming techniques, scale, colors, textures, patterns, and/or graphics that will be used for the wall structure construction. To ensure consistent quality in all aesthetic wall treatments the test panels should be constructed by the same workers who will do the actual sculpting, texturing, and coloring of the contract walls. Test panels should be constructed within close proximity to the wall structure whenever possible so they can be easily referenced by the Landscape Architect, Structures Architect, RE, and contractors as the wall is constructed.



A reference site (top) located within the vicinity of the proposed Soil Nail wall is used to influence the aesthetic treatment design and guide the fabrication of the test panel (bottom).

3.0 PROCESS

Caltrans practices a CSS approach engaging a multidisciplinary team to develop wall structure aesthetic treatments. The CSS process begins early in the planning phase to balance transportation goals with the goals of local stakeholders and leads to aesthetic treatments that reflect community aesthetic, scenic, cultural, or historic values. PDT members can include engineers, landscape architects, architects, maintenance personnel, consultants, representatives of the affected community and other stakeholders, all having a common goal to preserve and/or improve the aesthetics of a highway corridor and satisfy environmental commitments. Collaboration must occur between team members throughout project development to share expertise, ascertain expectations for the aesthetic treatments, analyzing corridor context, understand roles and responsibilities, evaluate wall structure alternatives, and coordinate design and construction efforts.

Important decisions concerning wall structure aesthetic treatments must be made by the PDT during the various phases of the project development process. Though the process may differ slightly depending on district and project specifics, in general, it will include the following activities and considerations:

Project Initiation Document (PID)

- Landscape Architecture provides visual scoping of the existing highway corridor and reviews the project alternatives to determine potential visual impacts that may require mitigation in the form of wall structure aesthetics.
- Include aesthetic treatments in wall structure budget scoping. Provide for sufficient wall thickness to allow multiple aesthetic design options. Consider wall thickness, column extrusion, wall cap overhangs and potential wall terracing with regard to right of way needs. Consider special wall features and construction limitations. Include adequate budget for aesthetic treatment of other highway features that should complement the aesthetic treatment of the wall structures, such as for slope paving, concrete barriers, and bridge abutments.
- The project schedule should include adequate time in the environmental and design phases to allow for PDT discussion on aesthetics, visual impact assessment, community outreach which may result in multiple meetings and the development of multiple aesthetic alternatives, aesthetic coordination with other corridor design elements, aesthetic design refinements, and the development and approval of non-standard details and specifications. All functional units that have input on the wall structure aesthetics should include time in work plan estimates to plan and design aesthetic treatments.
- Identify risks involving aesthetic treatments in the Risk Registry, including the risk of not including aesthetic treatments, risks involved in public outreach, and risk of potential changes during construction (i.e. the contractor presents a CRIP to change the type of wall or the look of aesthetics).

DES Structures Type Selection

Consider the requirement for aesthetic treatment in the wall structure type selection process and determination based on the project aesthetic goals and preliminary design

concepts. Type selection should include adequate structural engineering design characteristics to accommodate the range of aesthetic elements required.

Project Approval and Environmental Document (PA&ED)

- Landscape Architecture provides Visual Impact Assessment recommendation regarding mitigation measures that relate to wall structure aesthetics and help the PDT to discern between mitigation, standard aesthetic treatment, and enhancements. Include mitigation based aesthetic treatments into the Environmental Commitment Record (ECR).
- Develop an aesthetic design intent statement with local community input to guide the PDT on aesthetic design decisions throughout the project development process.
- District Landscape Architecture and DES Structures collaborate as needed and reach agreement on aesthetic goals and develop preliminary aesthetic design concepts.
- Wall structure aesthetic treatment alternatives are presented to external stakeholders and local community members by the architects and/or landscape architects.
- Update the project budget to include any changes to aesthetic elements resulting from design development and/or public input.

Plans, Specifications, and Estimate (PS&E)

- **Design - 30% Milestone** - Obtain concurrence from the PDT for the preferred aesthetic treatments and confirm consistency with aesthetic design intent statement. Develop wall structure aesthetic treatment design based on the preferred alternative. Meet with local agency and community members as needed to communicate aesthetic design issues. Identify trade-name or proprietary aesthetic elements and any structural accommodations needed for future transportation art or community identification, if applicable. Coordinate structural and aesthetic design with maintenance, hydraulics, drainage, roadway and other relevant issues. Structures plan sheets typically reference the district civil plan sheets for aesthetic treatments but this practice is flexible. For example, plans, elevations, and details for wall structure aesthetic treatment can be placed on Structures plan sheets signed by the Architect or Structures Engineer, on separate plan sheets signed by the Landscape Architect, or on district civil plan sheets signed by the Project Engineer. Flexibility is important when coordinating aesthetic treatments for multiple structure types within the same PS&E package.
- **Design - 60% Milestone** - Refine aesthetic design details and specifications. Local partners and stakeholders should be kept updated on progress and design changes and given opportunity to review and comment. Resolve conflicts and concerns as necessary and obtain concurrence from local partners and stakeholders. Review budget for aesthetic treatments and construction methods and update as needed.
- **Design - 95% Milestone** - Include all aesthetic details and specifications, including nonstandards, in the 95% constructability review package. Structures should be on the same review and revision schedule as the district team members so revisions are completed efficiently. Structures should submit all of their revisions resulting from 95% review to the District Landscape Architect for concurrence before the final PS&E package is submitted to District Office Engineer (DOE). Update the Risk Registry to reflect potential design changes during construction including contractor proposals to change the aesthetic treatment or the wall type.

- **DOE Review** – Resolve DOE review comments. Obtain nonstandard special provision (NSSP) approval from owner.

Construction

- **RE File** - Include the visual impact assessment, the aesthetics design intent statement and all necessary aesthetic references and material samples in the RE File.
- **Bidder Inquiries and Construction** – Respond quickly to all requests from the Duty Senior for clarification during advertisement for bid.
- **Construction Support** – The Architect or Landscape Architect provides on-site support to the RE as necessary to ensure the aesthetic design intent for the wall structure is not compromised in construction. Whenever possible the Architect or Landscape Architect should be present during the construction of test panels to provide oversight. The test panels are reviewed to assure they satisfy the aesthetic design intent and recommendation for approval provided to the RE. The Architect or Landscape Architect review CRIPs and other change requests that relate to wall aesthetic treatments and recommendations made to the RE.
- **Final Walk-Through** – The Architect or Landscape Architect should perform final walk-through of wall structure aesthetic treatments with the District Maintenance personnel who will be maintaining the wall and provide information on long-term maintenance requirements of the aesthetic treatments. Provide District Maintenance with a copy of the aesthetic design intent statement and review it with them to ensure their understanding of the aesthetic design intent of the various treatments.

4.0 ROLES and RESPONSIBILITIES

The District Landscape Architect is responsible for the coordination of all aesthetic treatments for the project and must review and approve aesthetic treatment designs for all wall structures.

District Landscape Architecture is responsible for design of aesthetic treatments for Standard Plan wall structures engineered by the district. Structures Office of Transportation Architecture will design aesthetic treatments for special designed walls engineered by Structures on a project by project basis and will collaborate with District Landscape Architecture in a CSS process to ensure local community interests for wall structure aesthetics are addressed. The responsibility for the design of aesthetic treatment for special designed wall structures engineered by Structures can be negotiated between DES Transportation Architecture and District Landscape Architecture as necessary. This negotiation must occur early in the project development process and documented so that roles and responsibilities are clearly understood between offices and support resources identified.