Architectural Treatment

First meeting September 21, 2012

A few issues were addressed by the Industry

Second Meeting March 22, 2013

The issues were presented in a PowerPoint format , responded by Caltrans and discussed

Third Meeting September 20, 2013

Update provided by Caltrans

Summary of the issues discussed internally after the second meeting of March 22, 2013

1. Coordination of plans

As much as practical, provide consistency of architectural treatment throughout the entire project. For instance, RW and abutments may include different architectural treatment details requiring different form liners, which may or may not be justified. Limit the amount of one-time-use texture detail.

2. Wall layout

Wall layout including expansion joints, weakened plane joints, angle points, footing steps, begin and end curve shall be consistent with the 8' or 24 ' layout to utilize gang forms.

Summary of the issues discussed internally after the second meeting of March 22, 2013 (cont.)

3. Footing steps

Steps need to be in 1, 2, or 4 foot increments to facilitate gang form use. Expansion joint locations shall be consistent with footing steps. Try to match footing step heights with the vertical pattern repeat dimension.

4. Liner

Consider alternative form liners whenever acceptable. The current specification requires the use of an elastomeric form liner to provide the requested architectural treatment. Limited by the specifications, the contractor is forced to use expensive form liners, which may not be necessary for a limited number of use.

Summary of the issues discussed internally after the second meeting of March 22, 2013 (cont.)

5. Repetitive vs. non-repetitive patterns

When a non repetitive pattern is requested, it forces the contractor to either dedicate an additional or multiple panels to the project for use or requires the contractor to remove and replace the form liner. Make primary patterns stay 1'± inside the typical 4x8 form panel dimension.

6. Inward vs. Outward Treatments

Inward or recessed architectural treatments create problems for the contractors because they require cutting down the form liner product to achieve the line and grade requested by the engineer.

An outward pattern allows contractors to block out the form liner above the grade to achieve the line and grade requested without cutting form liner.

Summary of the issues discussed internally after the second meeting of March 22, 2013 (cont.)

7. Horizontal wall angle points
Instead of trying to "continuously wrap" the texture around the angle point, locate a vertical "shiner" (smooth surface, no texture) at wall angle points.

8. Horizontal patterns create problems.
Horizontal patterns create construction problems. Vertical patterns are preferable whenever possible.

Summary of the issues discussed internally after the second meeting of March 22, 2013 (cont.)

9. Revise the specs to require aligning horizontal joints or providing full height liners.

Summary of Discussions

The issues were discussed in our Department with our Landscape architects and designers. The comments will be incorporated in the new DIB (design information bulletin). It will be distributed to all district and headquarter units involved and should provide consistent design at all our projects in all **12** districts. The DIB is available in a draft form only. Whenever document is complete, it will be placed on the DOD (division of design) website.

Draft DIB (design information bulletin)

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: DISTRICT DIRECTORS
DEPUTY DIRECTORS
DIVISION CHIEFS

Date: October XX, 2013

File:

From: TIM CRAGGS, Chief
Division of Design

Subject: Design Information Bulletin XX-XX:

Design Information Bulletin (DIB) XX, Wall Structure Aesthetic Guidelines, has been created and is now available on the Division of Design website: www.dot.ca.gov/hq/oppd/dib/dibXX-XX.pdf and is effective as of the date of this memorandum, and shall be implemented as outlined below.

BACKGROUND

As a result of input from the contracting industry, this DIB provides specific design and procedural information regarding the design of wall structures.

SUMMARY OF KEY ELEMENTS IN DIB XX-XX

- This DIB clarifies and documents wall aesthetic procedures and guidelines to reduce project costs, improve the constructability of wall structures and meet expectations of our transportation stakeholders.
- Provides language to be consistent with other guidance.
- Provides a Structure Aesthetic Scoping Team Checklist.

IMPLEMENTATION

All projects, regardless of funding source or implementing agency, programmed for delivery and/or scheduled to achieve RTL status after XXXX XX, 201X shall comply with all of the provisions of this DIB.

If you have any questions on this DIB, please contact: Keith Robinson, Principal Landscape Architect, Division of Design, at (916) 654-6200 for Division of Design guidance or Bob Travis, Division of Engineering Services, at (916) 227-3962 for Division of Engineering Services guidance. Project specific applicability and questions should be referred to the Division of Design District Coordinators, or the Division of Design Landscape Architecture District Coordinators.

c: Karla Sutliff, Chief Engineer
Bob Pieplow, Chief, Division of Engineering Services
Deputy District Directors for Design
Deputy District Directors for Project Management
Deputy District Directors for Planning

K. Robinson:

DESIGN INFORMATION BULLETIN NUMBER XX-XX

California Department of Transportation
Division of Design – Landscape Architecture Program and
Division of Engineering Services –
Transportation Architecture Program

Wall Structure Aesthetic Guidelines

APPROVED BY:

Tim Craggs Chief, Division of Design	Bob Pieplow Chief, Division of Engineering Services

October XX, 2013

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1.0 INTRODUCTION

Many important aspects must be considered to achieve a successful wall structure design. The wall structure must be structurally sound, durable, safe for the motorist, safe and easy to maintain, visually attractive and should complement the environment in which it is placed. A successful wall structure design may be achieved through the use of an inter-disciplinary planning and design approach in which a team of professionals coordinate their efforts to achieve identified design goals. Highway engineers, structural engineers, architects, and landscape architects all need to provide input from their own area of professional training. An architect and landscape architect should provide design assistance throughout the planning process, not as a last minute cosmetic treatment.

1.1 Wall Structure Definition

For the purposes of this Design Information Bulletin, 'wall structures' shall include retaining walls, sound walls, and abutment walls.

1.2 Purpose of Aesthetic Treatments

The intent of providing wall aesthetic treatments is to integrate the transportation system improvements with and reflect the character of the surrounding environment. The aesthetic treatment may, in some cases, be the mitigation for the visual impacts of the transportation project and may be part of a corridor master plan.

1.3 Wall Structure Aesthetic Expectations

It is the expectation that any project that includes wall structures will accomplish the following:

- The Project Development Team shall use the context sensitive solutions approach to integrate community values with safety, maintenance and performance goals of the system.
- Wall structure aesthetic treatments shall result from collaboration between Division of Engineering Services (DES) Structural Engineer, DES Structures Architect, District Project Engineer, District Landscape Architect, and/or equivalent professionals in private firms or local agencies.
- Consistent architectural treatment shall be provided throughout the entire project.
- Perpetuate existing aesthetic treatments in the project corridor area and/or conform to existing corridor master plans.
- Protect the safety, and/or geometric aspects of the facility
- Provide sufficient detail of desired treatment without being unduly prescriptive. Use referee samples where appropriate to convey specific design details.
- Consider designs that provide for cost effective reuse of form liners.
- Strive to place all expansion joints, weakened plane joints, angle points, footing steps and begin and end curves on 8-foot increments.
- Expansion joint locations shall be consistent with footing step locations.
- Footing steps shall be in one, two or four-foot increments.
- Elastomeric form liners are most appropriate when the number of uses exceeds four.
- Consider the use of alternative form liner material to achieve aesthetic treatments where possible if expected reuse is less than four times.
- Repetitive patterns are preferred, but non-repetitive patterns and unique aesthetic features are acceptable to achieve design consensus from local stakeholders or to conform with existing aesthetic features or to comply with established aesthetic guidelines.

- Recessed aesthetic treatments can create constructability and cost issues due to the need to cut form liners to achieve line and grade.
- Horizontal patterns can create constructability issues, but may be used where carefully evaluated in relation to grade, steps, and expansion joints.

2.0 PROCESS

2.1 Development of Project Initiation Documents (PID)

The District Landscape Architect and the DES Structures Architect should collaborate to provide the PDT with conceptual recommendations for aesthetic treatments for all projects that include wall structures. The District Landscape Architect and DES Structures Architect should assist the PDT to identify, contact, and engage external stakeholders (local communities, chambers of commerce, historical societies, tourism and recreational agencies, Native American Tribes, etc.) to assist in assessing the natural, cultural, and aesthetic context of the project. The context analysis studies and conceptual aesthetic treatments are prepared by the District Landscape Architect, in consultation with the DES Structures Architect and other PDT members, and included in the PSR.

2.2 Refinement during Project approval and Environmental Document (PA&ED)

Aesthetic treatments are often used to mitigate the negative visual and environmental impacts of a transportation project. Aesthetic treatment concepts may be refined during the PA&ED phase to meet specific project needs.

2.2.1 XXXX
2.2.2 XXXX
2.2.3 XXXX

2.3 Coordination of Plans, Specifications and Estimates (PS&E)

Wall structure aesthetic plans, specifications and estimates are typically a joint effort between the District and the Division of Engineering Services. Regular coordination is necessary to ….

2.3.1 XXXX
2.3.2 XXXX

3.0 WALL STRUCTURE AESTHETIC STRATEGIES

3.1 Form Liner Selection Criteria

Whenever possible, specifications and/or referee samples should allow the contractor to choose the means and methods for constructing the wall structure aesthetics.

- Elastomeric form liners are the most expensive but typically provide the highest quality finishes in terms of texture relative definition, pattern complexity, level variation, surface coarseness, edge clarity, and the depiction of real rustic stone or other surfaces. Elastomeric form liners should be used when more than four uses are expected. Elastomeric form liners are ideal when the aesthetic treatment is conducive to gang patterning.

- PVC form liners are less expensive than elastomeric but can result in a lower quality finishes and seams. PVC form liners should be considered for simple, low relief patterns for tilt-up or cast-in-place applications with four or fewer uses.

- Semi elastomeric form liners bridge the gap between the quality and cost of elastomeric and PVC form liners and may be used for up to ten uses.

3.2 Aesthetic Treatment Design Considerations

- Constructability is improved when gang form systems are used based on 8-foot and 24-foot long panels and 8-foot panel height that are put together to achieve the wall length and height. This system works well with the maximum 96-foot wall joint detail specified in the Standard Plans. The goal is to cycle the gang form system to efficiently construct the wall.
- Wall layout and aesthetic treatment pattern should be based on 4-foot or 8-foot dimensions. Strive to place all expansion joints, weakened plane joints, angle points, footing steps, and begin and end curves on 8' increments. This will typically match forming dimensions, saving labor and material costs while providing an improved aesthetic treatment.
- Footing step heights should match with the vertical pattern repeat dimension. If possible, use step heights in 4-foot increments to line up the horizontal seams. In most cases texture is fabricated in vertical lengths in multiples of four.
- Inward or recessed architectural treatments create constructability problems because they require cutting down the form liner product to achieve the line and grade, thus limiting the reuse of the form liner and causing additional form liner to be used. An outward pattern allows the form liner to be blocked out above the grade to achieve the desired line and grade without cutting the form liner.
- Horizontal patterns can create constructability problems when walls include steps to follow the natural geography, especially when horizontal seams must remain level and continuous over the length of an entire wall. If horizontal patterns are used, the step heights being specified are consistent with the horizontal repetitive pattern.

- Walls with angle points can create a gap between adjacent form liner. The use of a vertical "shiner", with a smooth, un-textured surface, at the angle points as part of the overall aesthetic treatment can reduce the appearance of an inconsistent aesthetic treatment.
- Deeper pattern reliefs require the use of thicker form liners. Elastomeric form liner material is inherently heavy and deep pattern liners increase form weights requiring

much larger cranes to construct the wall, increasing construction costs.

- A mock up of the texture should be fabricated and made available as a referee sample during the bid process so bidders can adequately estimate the construction cost. Use of referee samples can ensure the contractor and inspector fully understand the desired aesthetic treatment, reducing potential conflict during the test panel approval process.

4.0 REFERENCES

4.1 XXXX
4.2 XXXX

Structure Aesthetic Scoping Checklist

Team Members

- District Landscape Architect
- District Project Engineer
- DES Structures Architect
- DES Structural Engineer
- Project Manager
- Field Maintenance
- Environmental Cultural Resource Specialist

Information/Data to Bring to the Aesthetic Review

- Corridor Aesthetics Master Plan (if available)
- Existing corridor treatments within 5 miles of project
- Preliminary project plans
- Documented feedback from stakeholders

Research/Review Before the Aesthetic Review

- Stakeholder outreach