



# CHAPTER 2

## BRIDGE ARCHITECTURE AND AESTHETICS

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## **CHAPTER 2**

# **BRIDGE ARCHITECTURE AND AESTHETICS**

### **2.1 INTRODUCTION**

Well executed architectural design and aesthetic treatment solutions are vital to developing a legacy of safe, functional, and beautiful Caltrans' structures. The Bridge Architecture and Aesthetics Design Branch works in a coordinated effort with the Division of Engineering Services Project Engineers, and District design personnel, to insure quality, safe, and beautiful structures on the state's highway system. The coordination and integration of complimentary design disciplines (e.g., bridge architecture and bridge engineering), are the keys for successful structure design and delivery. Utilizing an orderly design effort, the Division of Engineering Services Project Engineers, Bridge Architecture & Aesthetics Design Branch, and District staff, reduce the chance of late scope changes for aesthetics during the structure's design phase. Late changes are undesirable and may cause delays in project delivery, increase costs, and can result in projects with poor visual appearance. This chapter presents current Caltrans bridge architecture and aesthetics design guidelines and practice. For general bridge aesthetics, references are made to AASHTO (2010), Billington (1983 and 2003), Gottemoeller (2004 and 2014), and Leonhardt (1983 and 2014).

### **2.2 BRIDGE ARCHITECTURE AND AESTHETICS**

#### **2.2.1 The Bridge Architecture & Aesthetics Design Branch**

The Bridge Architecture and Aesthetics (BA&A) Design Branch is an accomplished team of architects, graphic artists, and model makers at the forefront of bridge architectural and aesthetics design. The architects' primary goals are visual, and the primary value of the architect in structures design is to create beautiful and pleasing structures. The BA&A Design Branch typically reviews and provides aesthetics recommendations for the following types of projects: bridges over bodies of water, valleys and canyons; highway overcrossings and undercrossings; highway interchanges, pedestrian overcrossings; highway viaducts; tunnels and tunnel portals; retaining walls; and rocksheds. While the term "bridge" has a specific meaning as structures built over bodies of water and canyons, the use of the terms "bridge" and "structure" are used interchangeably within the body of this chapter.

Every structure receives multiple architectural and aesthetic design reviews and recommendations during the design phase. The BA&A Design Branch also provides

research and development of material specifications, estimates for application, and feasibility of aesthetic recommendations for structures.

### **2.2.2 Context Sensitive Design**

The BA&A Design Branch utilizes a context sensitive design approach to structure design aesthetics. Context sensitive design acknowledges a concern for local architectural identity, and investment. The aesthetic design objective is to build a visual legacy of structures that recognizes the diverse and varied character of communities along the highway system. The BA&A Design Branch strives to create structure aesthetics, distinctive in their forms, as well as designs, that relate to a continuity of existing architectural traditions and aspirations.

The approach to context sensitive structure aesthetics is a an iterative process, with numerous aspects of aesthetic design reviewed many times over, as a cross-check, to build upon on a new framework for color, scale, style, direction, proportion, shape, form, balance, etc. These aspects of design are synthesized into parts of the structure, by what lies at the organic core of contextual design: harmony. Correspondingly, the key element drawing everything into a harmonious whole is the structure's site location. The site represents the foundation of local traditions, the built backdrop, the historical past, and present community aspirations for the future. In view of these core values affecting the site, the organic aspects of design (e.g., color, scale style, direction, proportion, shape, form, balance, setting, etc.), are then analyzed for the aesthetics of various structure components in the course of the design process.

Context sensitive design begins with a circle drawn around the project site that surveys and observes the established complexity of parts, and intricate patterning within the fabric of the surrounding community. The BA&A Design Branch then designs complimentary forms and shapes for structures that fit back into the local architectural fabric of the community. This process inspires a historical attitude in a structure's aesthetic design, that emanates from the beauty of new highway structures themselves; creating a Déjà vu affect. The new expression in design becomes, at the same time, a celebration of the aspirations of the people most concerned for the project and the site; and their real concerns for identity, continuity, and a sense of occasion. This design approach reinforces and satisfies those aspirations, when applied to new bridge structures.

### **2.2.3 Route and Corridor Themes**

Route and corridor themes are established by developing a complimentary appearance between varying bridge types and components along the route. The BA&A Design Branch has the responsibility for integrating, designing, and recommending visual solutions for bridges and other structures. The Branch uses its expertise in structure component design, architectural perspective drawing, and physical model making to lead the discussion and develop recommendations regarding opportunities and limitations that may affect a structure's design and appearance. The BA&A Design

Branch is also instrumental in the development of aesthetic guidelines, and details for planned structures that would be acceptable to both the Department and the community.

The BA&A Design Branch solicits and receives aesthetic input from the Districts, public groups, and from local officials, as a necessary part for gaining acceptance and cooperation of major highway projects affecting the highway corridor. The Branch's proactive design approach addresses future visual impacts by providing anticipated aesthetic strategies to address and/or mitigate those impacts. The Department is then able to achieve an overall strategic plan for visual continuity between geographically related highway structures, and correspondingly, aesthetically pleasing highway corridors.

Route and corridor themes are established by what is made visible to the traveling motorist. Overcrossing structures usually represent the aesthetic theme for state highway routes. Undercrossings and viaducts may vary from a particular route theme since these structures are usually not within the highway driver's focused viewing area. Other variations to the overall route theme are applied when local needs are considered during the aesthetics design phase. Water and valley-crossings, and structures on scenic routes are usually considered "special designs," and may also vary from the aesthetic route theme.

#### **2.2.4 Products and Services**

Graphically prepared materials are used primarily as tools for exhibiting a project's design features, and expenditures to the Caltrans Project Development Team, Project Managers, funding agencies, the public, and other interested parties and stakeholders. Typically, prepared materials include: drawings, illustrations, and physical models.

**Drawings:** Sketches, preliminary drawings, and finished contract drawings.

**Illustrations:** 3D Drawings - Three dimensional computer drawings that can be rendered into a photo-realistic representation of the proposed project.

Photographic Simulations – Retouched and manipulated photos of the existing project site with an insert of the proposed structure. The purpose of this illustration type is to give a visual indication of the proposed project, within its setting.

**Models:** Physical models are produced by the BA&A Design Branch as requested. There are two types of models: the detailed presentation model and the study model. The detailed presentation models show the project as proposed. Requests for these types of models are becoming rare due to modern 3D CADD drawing and illustration technology. 3D CADD drawings and illustrations satisfy the need for demonstrating various detailed aspects of proposed projects in their environment.

Study models are the second type of models produced by the Branch. This model type is developed using 3D CADD printing technology. These models are limited in size, and therefore, are mainly produced to focus on various components of structure design (e.g., column detail studies, railing studies, superstructure studies, etc.) during the structure's design phase.

Services: Project Presentations to Caltrans, public meetings, outside agencies, and stakeholders.

Construction support is provided as required.

### 2.2.5 Recommended Levels of Aesthetic Treatments

The BA&A Design Branch designates a level of architectural and aesthetic treatment for all structure design projects. This information is transmitted to the structure project engineer at the beginning of the design process:

#### Level Designation

Level 1 = **Standard Aesthetics** – Standard treatments applied to one or more parts of the structure.

Level 2 = **Moderate Aesthetics** – Elevated aesthetic considerations. Custom design and graphics, or a level of standardized aesthetics applied to multiple components on the structure.

Level 3 = **Complex Architectural Forms and Aesthetics** - Highly elevated architectural forms and shapes: a custom-designed structure along with corresponding components and aesthetics.

Level 4 = **Complex Environmental & Community Sensitive Project** – These complex projects may be located within corridors of environmentally sensitive areas, projects that are politically sensitive, or projects having substantial community involvement or external agency reviews.

## 2.3 BRIDGE ARCHITECTURE AND AESTHETICS DELIVERY MILESTONES

The BA&A Design Branch coordinates the aesthetic and architectural recommendations with the project delivery schedule for each project. The Branch may be involved with project support from project initiation through construction completion. See Attachment 1 for the BA&A Delivery Flowchart.

### **2.3.1 Advanced Planning Study**

#### **2.3.1.1 General**

The Advanced Planning Study (APS) phase is a planning activity that may occur several years in advance of initiating structure design. The basic objective of the APS is to develop a feasible structure type with an appropriate cost for a future structure project. This activity includes identifying potential applicable structure design/cost alternatives, and reaching consensus with internal/external stakeholders on those alternatives addressed.

The BA&A Design Branch supports the APS effort through early identification of aesthetic requirements that may affect the appearance and cost of structures. Projects that may have substantial requirements for architectural treatment, thus increasing costs, are those projects located within corridors of environmentally and politically sensitive areas (e.g., large retaining wall projects, or any project having substantial community involvement).

Where there is less environmental and public sensitivity, the BA&A Design Branch continues using a disciplined approach for making the best possible aesthetic recommendations. All structures on State routes receive aesthetic recommendations that reflect the latest artistic, technological, and safety innovations in structure design. The aesthetic recommendation may be in the form of a brief comment, or it may result in a thorough investigation into several alternatives with preliminary design and drawing support.

#### **2.3.1.2 Preliminary Architectural/Aesthetic Recommendation Form**

The BA&A Design Branch responds to the Division of Engineering Services (DES) Project Engineer's request for aesthetic design concepts in the form of sketches and the Preliminary Architectural/Aesthetic Recommendation Form (PAAR), see Attachment 2. The PAAR is a checklist indicating the project's aesthetic requirements, including the level of aesthetic complexity; existing route conditions and themes; and the conceptual design recommendation for project aesthetics. A PAAR form for each aesthetic alternative is attached to the APS for consideration by the Project Engineer.

The BA&A Design Branch may coordinate its review efforts with District's aesthetics representatives during the APS phase; however, this interaction depends largely on the complexity and sensitivity of the proposed project. Usually, the time allocated for determining aesthetic criteria during the planning phase is short; therefore, design interaction is typically between the BA&A Design Branch and the DES Project Engineer.

## **2.3.2 Structures General Plan**

### **2.3.2.1 Bridge Site Data Submittal**

The Bridge Site Data Submittal package (BSDS) is a checklist of pertinent layouts, environmental criteria, aesthetics considerations, site information, and other constraints needed for the design of structures. District delivery of this package to DES essentially initiates the start of structure design. The BA&A Design Branch starts preliminary aesthetics design concepts and recommendations, upon receiving the BSDS from the DES Project Engineer.

### **2.3.2.2 Preliminary Design and Details**

The draft General Plan work includes the preparation of preliminary structure plans, estimates, foundation recommendations, and aesthetic recommendations. The Type Selection Meeting is also a part of this activity.

The BA&A Design Branch responds to the DES Project Engineer's request for aesthetic recommendations at this stage of design in the form of sketches and the PAAR form. The Branch reviews and updates previous PAAR forms submitted for projects during the APS phase, if an APS was done. A new PAAR form and sketches for each alternative-design/cost scenario are produced and attached to the Structure Type Selection Memo for consideration in the Type Selection Meeting.

The BA&A Design Branch typically interacts with the structure's project engineer in one of two ways in order to develop appropriate aesthetic recommendations for a project. The design engineer usually provides the first orientation to the proposed project by developing one, or several structural alternatives, and introducing them to the BA&A Design Branch for review and comment. The second form of interaction may be a request for the Branch to work jointly with an engineering team comprised of both DES and District design personnel, to develop several architectural/aesthetic recommendations. The format can be fluid, depending on the complexity and magnitude of the project.

### **2.3.2.3 District Review Coordination**

The BA&A Design Branch typically initiates communication and coordinates its design efforts with District landscape architects during the draft General Plan development phase. The District provides BA&A with reviews and comments of the BA&A's design recommendations; which may include the District's emphasis for aesthetics development on the project. These reviews are usually in the form of written text, pictures, references to physical examples, thumbnail sketches, verbal descriptions, etc. In some instances, the District may not have a preconceived notion about the project's aesthetics prior to the BA&A Design Branch's initial contact. In this case, the District typically relies on the BA&A Design Branch to develop design criteria, aesthetic emphasis, and solutions for joint DES and District consideration, and inclusion into the PAAR.

The District may be involved in discussions of context sensitive design issues, environmental impact statements, visual impact assessments, public hearings/meetings/workshops, or in writing various project planning documents pertinent to the project corridor. The objective is to have these activities concluded prior to the Type Selection Meeting. All pertinent material that may impact the preliminary aesthetic design is shared with the BA&A Design Branch for consideration and inclusion into the structure aesthetics recommendations package for Type Selection.

#### **2.3.2.4 Structure Type Selection**

The structure type selection process is a fundamental step in the design of structures. At the Type Selection Meeting, the structures project engineer presents the proposed structure and briefly discusses issues pertinent to the selection of the preferred structure type; particularly requirements for foundations, hydraulics, construction (including falsework), seismic design, retrofit strategy, aesthetics, traffic handling, safety, and other information needed to support the selected structure type. The BA&A Design Branch prepares an aesthetics recommendation package for the project engineer prior to the Type Selection Meeting. The aesthetic recommendations require coordination with the District, DES project engineers, and BA&A staff. The BA&A Design Branch prepares project sketches and details for the DES Project Engineer.

The goal of the Type Selection Meeting is to approve the structure type. This approval is based on satisfactorily addressing all issues raised in prior design reviews, and in the course of the meeting itself. In many instances the aesthetics package will have a direct bearing on major components of the preferred structure type. If the aesthetics package is regarded as incomplete, it may preclude the definitive determination for components of the structure and estimated costs. As with all other issues pertinent to the design, major aesthetic issues are resolved prior to the Type Selection Meeting to the satisfaction of all stakeholders concerned. Failure to accomplish this task could jeopardize the project schedule.

#### **2.3.2.5 Final Architectural Aesthetics Recommendation**

Aesthetic features may change as a result of discussions at the Type Selection Meeting. If this occurs, the BA&A Design Branch will assist the DES Project Engineer in revising the aesthetics design details prior to General Plan distribution.

The BA&A Design Branch prepares final aesthetics recommendations in the form of drawings, and the Final Architectural Aesthetic Recommendation Form (FAAR, see Attachment 3). The FAAR indicates the project's aesthetic requirements as a result of the structure's type selection process.

### **2.3.2.6 General Plan Distribution**

The approved General Plan, which includes the final aesthetics design recommendation, is distributed by the DES Project Engineer to all DES functional units involved in the design of the project, and also to the District for their review and comment.

### **2.3.3 Structure Plans, Specifications, and Estimate Development**

The Plans, Specifications, and Estimate (PS&E) phase includes the development of structures aesthetics plans, specifications, and estimates. Comments received during the General Plan distribution period are incorporated into the aesthetics design during this phase.

The BA&A develops and prepares complete details and plan sheets for structures aesthetics in concert with the DES project design team of bridge designers, specification engineers, and structure estimators. The aesthetic details are coordinated for conformance with standard design practices for: safety, engineering, specifications, constructability, budget, and aesthetic requirements.

#### **2.3.3.1 Plans and Quantities**

The BA&A Branch design plans and details for structure aesthetics are quantified for all items of aesthetics work and are included as part of the Plans and Quantities (P&Q) distribution package.

#### **2.3.3.2 Draft Specifications and Estimate Support**

The BA&A Design Branch aids in developing draft specifications and estimates for structures' aesthetics in concert with the DES design team.

#### **2.3.3.3 Draft Plans, Specifications, and Estimate**

The Draft PS&E, which includes all aesthetic design recommendations, is distributed by the DES Project Engineer to all DES functional units involved in the design of the project, and also to the District for their review and comment.

The BA&A Design Branch reviews the Draft PS&E package for aesthetics design intent and conformance with structures' details, specifications, and estimates practices. The Branch coordinates this review with the District aesthetics representatives and addresses District aesthetic review comments prior to the Final Structures PS&E.

#### **2.3.3.4 Final Structure Plans, Specifications and Estimate**

The Final PS&E consists of complete sets of project plans, specifications, and estimates to advertise and construct a project. As part of preparing the Final Structures

PS&E Expedite Package, BA&A addresses all aesthetics comments on the Draft Structures PS&E for incorporation into the Final Structures PS&E.

## 2.4 STRUCTURE TYPES AND COMPONENTS

The following photographs and photographic simulations illustrate various architectural and aesthetic treatments used on a variety of structures types and components.

### 2.4.1 Water Crossing Bridges



Figure 2.4.1-1 Smith River Bridge Rendering – District 1 – Route 199

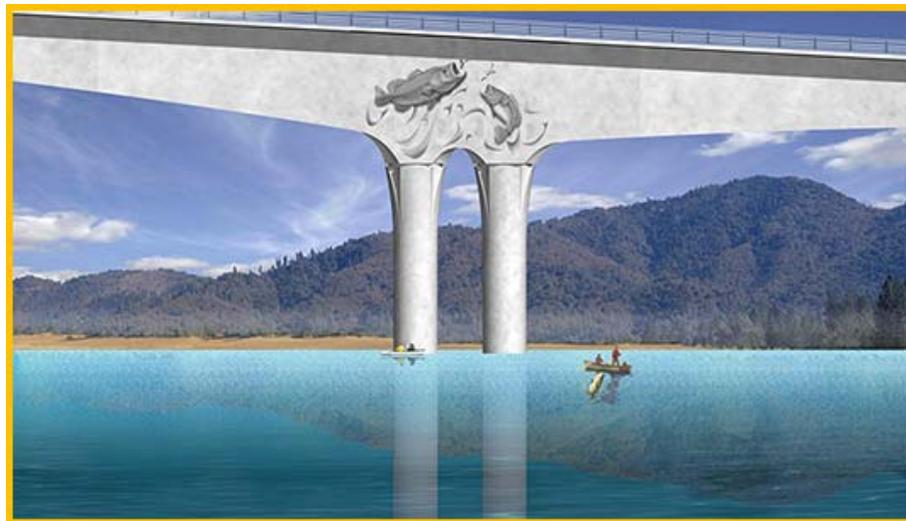


Figure 2.4.1-2 Antler's Bridge Rendering – District 2 – Route 5

## 2.4.2 Valley Crossing Bridges

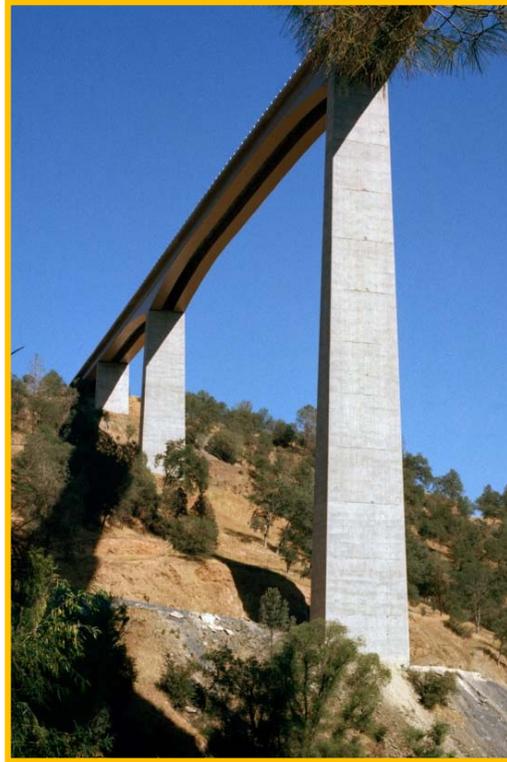


Figure 2.4.2-1 Archie Stevenot Bridge – District 10 – Route 49

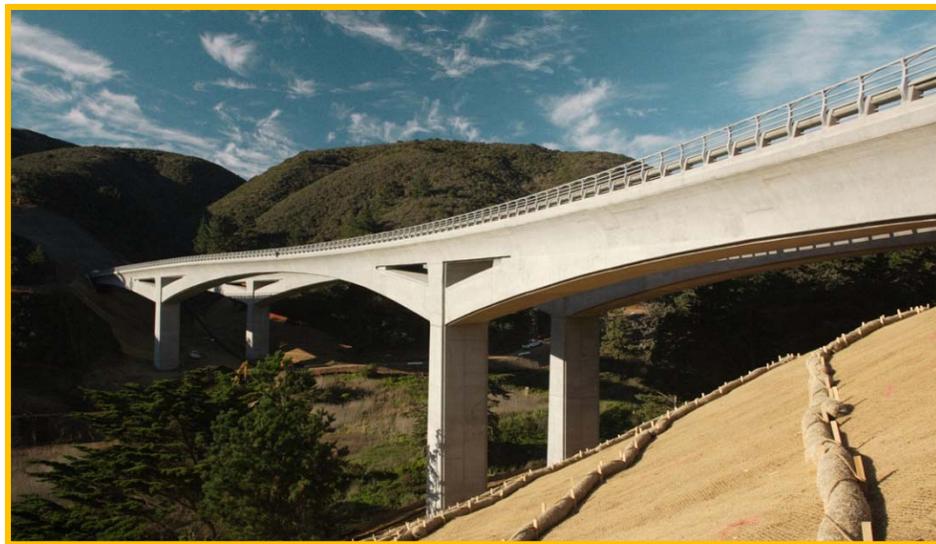


Figure 2.4.2-2 Devil's Slide Bridge – District 4 – Route 1

### 2.4.3 Overcrossings

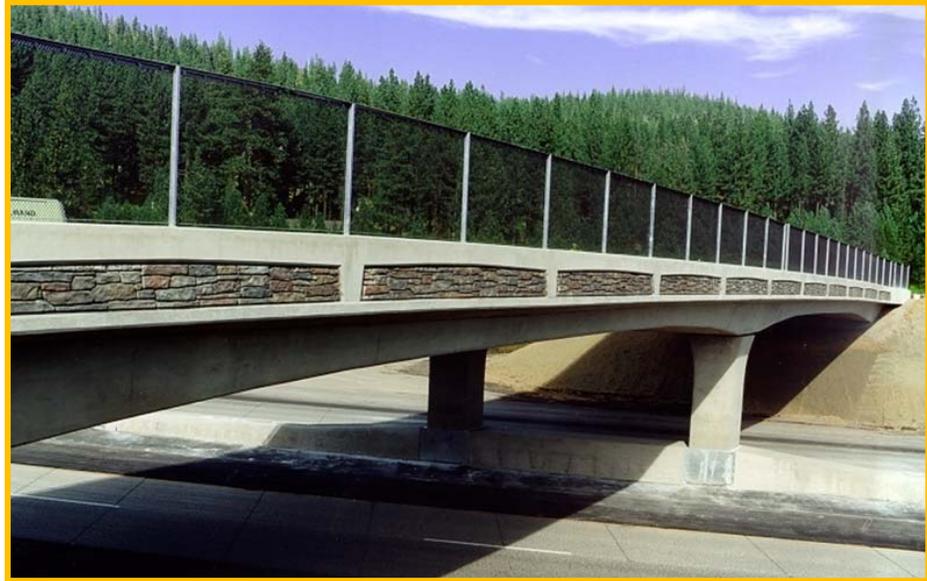


Figure 2.4.3-1 Donner Park Overcrossing – District 3 – Route 80



Figure 2.4.3-2 Linden Avenue Overcrossing Rendering  
– District 5 – Route 101



2.4.3-3 Casitas Pass Overcrossing (Proposed) – District 5 – Route 101

#### 2.4.4 Undercrossings



Figure 2.4.4-1 Cacique Street Undercrossing Rendering – District 5 – Route 101



Figure 2.4.4-2 Puente Avenue Undercrossing (Proposed) – District 7 – Route 10

## 2.4.5 Pedestrian Bridges



Figure 2.4.5-1 Bedford Avenue Pedestrian Overcrossing – District 3 – Route 50



**Figure 2.4.5-2 Bess Avenue Pedestrian Overcrossing Rendering  
– District 7 – Route 10**



**Figure 2.4.5-3 White Rock Road Pedestrian Overcrossing – District 3 – Route 50**

2.4.6 Viaducts



Figure 2.4.6-1 Doyle Drive High Viaduct Rendering – District 4 – Route 101



Figure 2.4.6-2 HOV Viaduct #2 – District 7 – Route 110

## 2.4.7 Interchanges

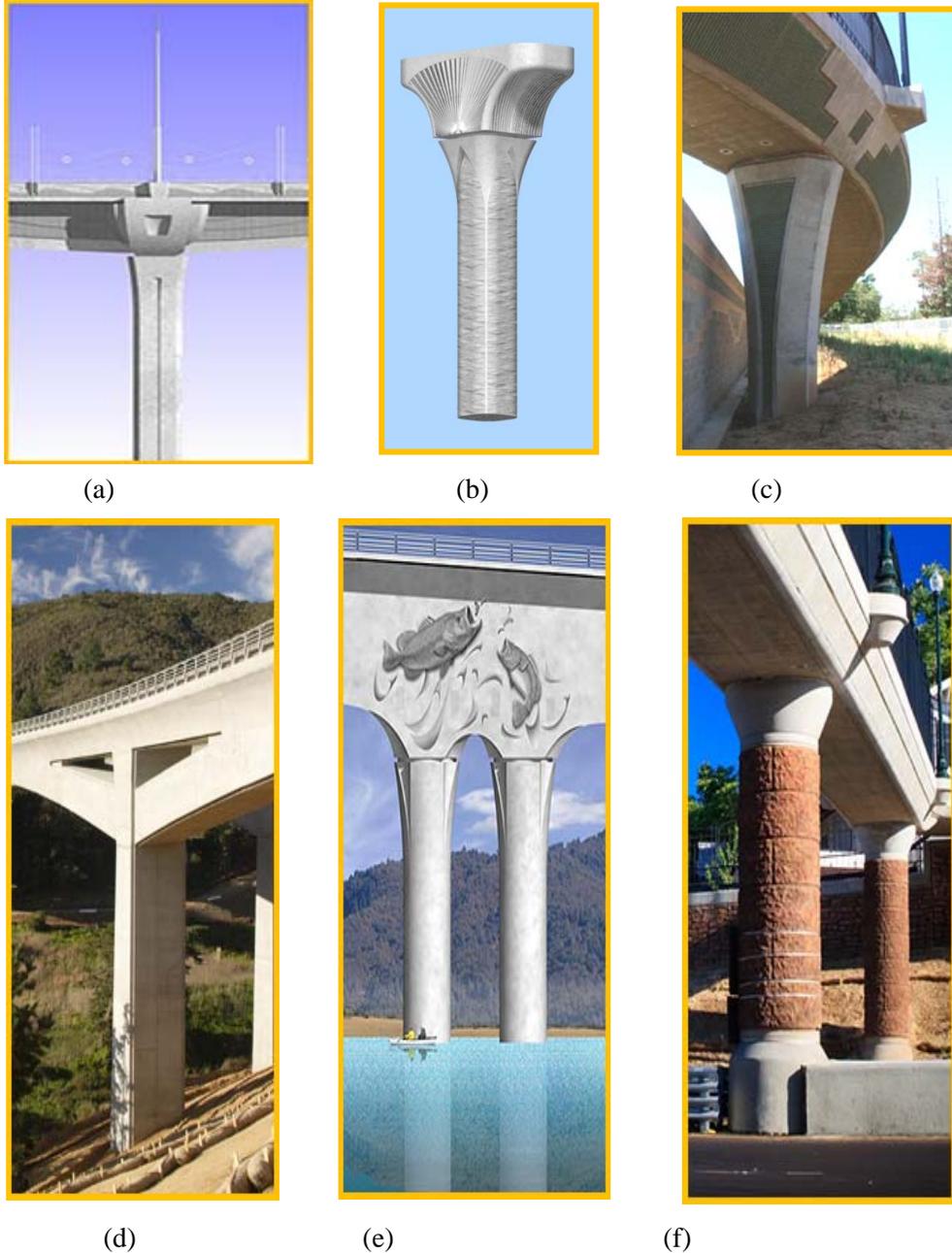


Figure 2.4.7-1 5/14 Interchange – District 7



Figure 2.4.7-2 280/680 Interchange – District 4

### 2.4.8 Bridge Columns/Bents



**Figure 2.4.8-1** (a) Schuyler Heim Bridge Rendering – Dist 7 – Route 47  
 (b) Bess Ave POC Rendering – Dist 7 – Route 10  
 (c) White Rock POC – Dist 3 – Route 50  
 (d) Devil’s Slide – Dist 4 – Route 1  
 (e) Antlers Bridge Rendering – Dist 2 – Route 5  
 (f) Bedford POC – Dist 3 – Route 50

2.4.9 Bridge Abutments and Wingwalls



Figure 2.4.9-1 Carmenita Avenue Overcrossing Rendering – District 7 – Route 5

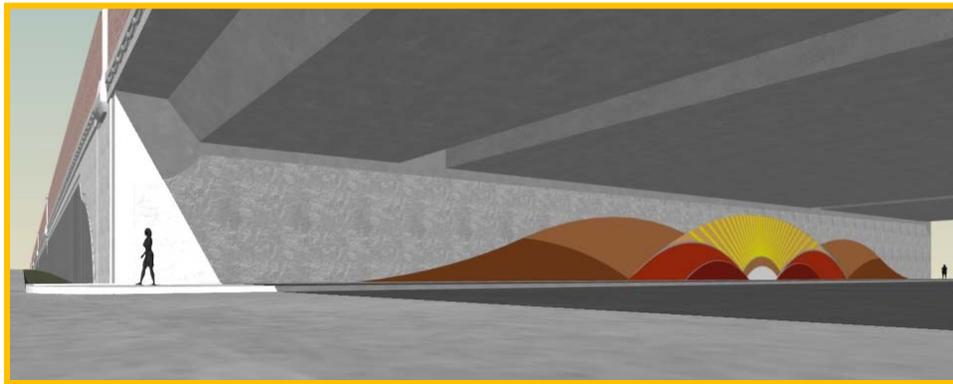


Figure 2.4.9-2 Rosencrans Avenue Overcrossing Rendering – District 7 – Route 5



Figure 2.4.9-3 Route 101/41 Separation Rendering – District 5

2.4.10 Slope Paving



Figure 2.4.10-1 Placerville Project - District 3 – Route 50

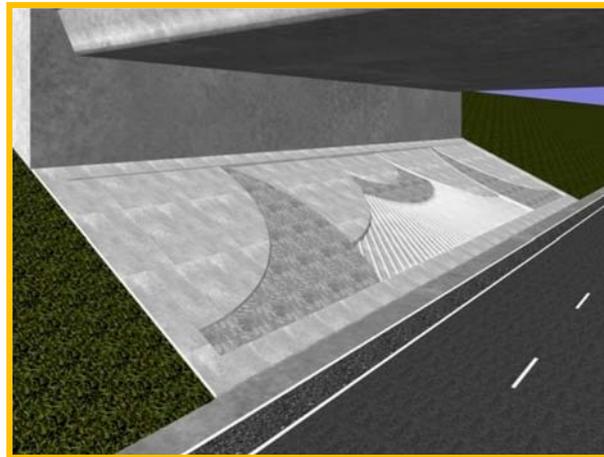


Figure 2.4.10-2 Carmenita Avenue Overcrossing Rendering - District 7 – Route 5



Figure 2.4.10-3 San Jose Airport Slope Paving – District 4 – Route 87

### 2.4.11 Bridge Barriers



**Figure 2.4.11-1 Devil's Slide – District 4 – Route 1**



**Figure 2.4.11-2 Ten Mile River Bridge – District 1 – Route 1**



**Figure 2.4.11-3 Emerald Bay – District 3 – Route 89**



**Figure 2.4.11-4 Pitkins Curve – District 5 – Route 1**



**Figure 2.4.11-5 Pitkins Curve – District 5 – Route 1**



Figure 2.4-11-6 Placerville Project – District 3 – Route 50



Figure 2.4.11-7 Placerville Project – District 3 – Route 50



Figure 2.4.11-8 Bear River Bridge – District 3 – Route 49

## 2.4.12 Fences and Railings



Figure 2.4.12-1 Placerville Project – District 3 – Route 50



Figure 2.4.12-2 Cold Spring Canyon Bridge – District 5 – Route 154



Figure 2.4.12-3 La Conchita Rendering – District 7 – Route 101



Figure 2.4.12-4 10<sup>th</sup> Street Bridge – District 3 – Route 20

### 2.4.13 Light Fixtures



(a)



(b)



(c)

**Figure 2.4-13-1 (a) Doyle Drive Rendering - District 4 – Route 101  
(b) Mace Boulevard Overcrossing – District 3 – Route 80  
(c) Bedford POC – District 3 – Route 50**

### 2.4.14 Retaining Walls



Figure 2.4.14-1 District 4 – Route 37



Figure 2.4.14-2 Buena Park Rendering - District 12 – Route 5



Figure 2.4.14-3 Mission Avenue UC – District 8 – Route 61



Figure 2.4.14-4 Route 605/405/22 Project Rendering – District 12



Figure 2.4.14-5 San Juan Capistrano – District 12 – Route 5



Route 10 Mountain Motif Rendering – District 8



Fractured Rib



Split Face



Split Slate



Heavy Sandblast



Combined Textures

**Figure 2.14-6 Concrete Retaining Wall Surface Treatment Examples**

### 2.4.15 Sound Wall Pilaster Design



Figure 2.4.15-1 Mobility Project Rendering – District 7 – Route 5

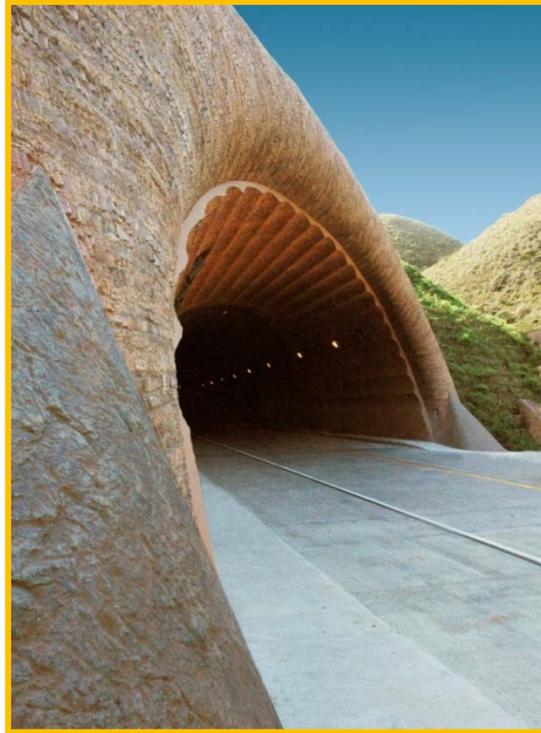


Figure 2.4.15-2 Orange County Pilaster – District 12 – Route 22

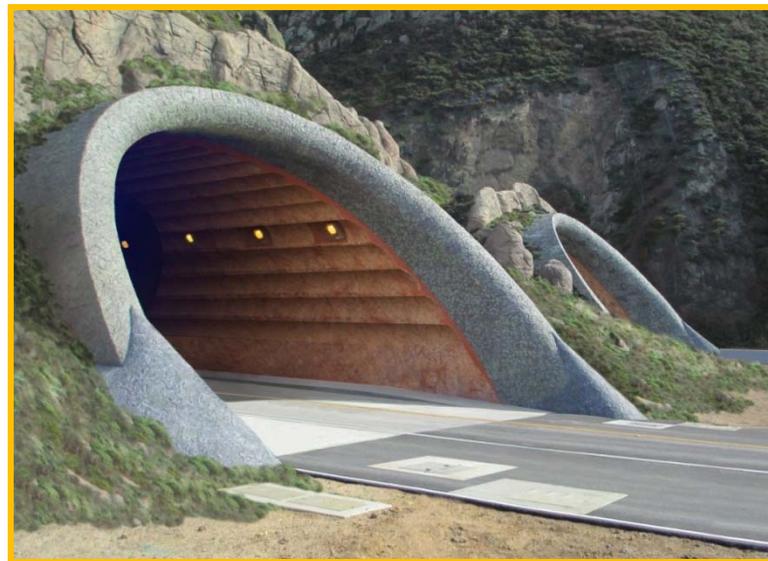


Figure 2.4.15-3 District 7 Rendering – District 7 – Route 710

### 2.4.16 Tunnel Portal Design



**Figure 2.4.16-1 Devil's Slide North Tunnel Portals – District 4 – Route 1**



**Figure 2.4.16-2 Devil's Slide South Tunnel Portals – District 4 – Route 1**



Figure 2.4.16-3 Devil's Slide Rendering – District 4 – Route 1

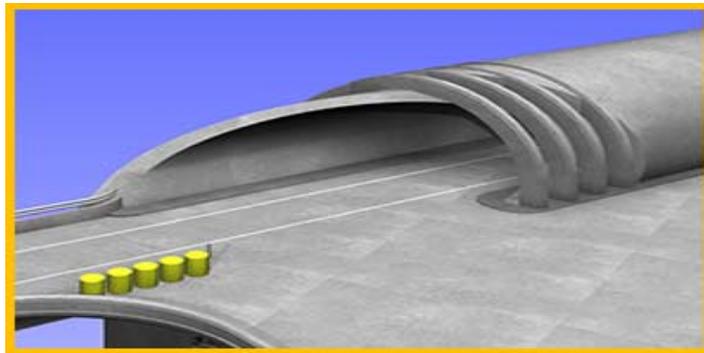


Figure 2.4.16-4 Devil's Slide Rendering – District 4 – Route 1



Figure 2.4.16-5 Doyle Drive Rendering – District 4 – Route 101

### 2.4.17 Rocksheds



Figure 2.4.17-1 Pitkins Curve Rockshed Rendering – District 5 – Route 1

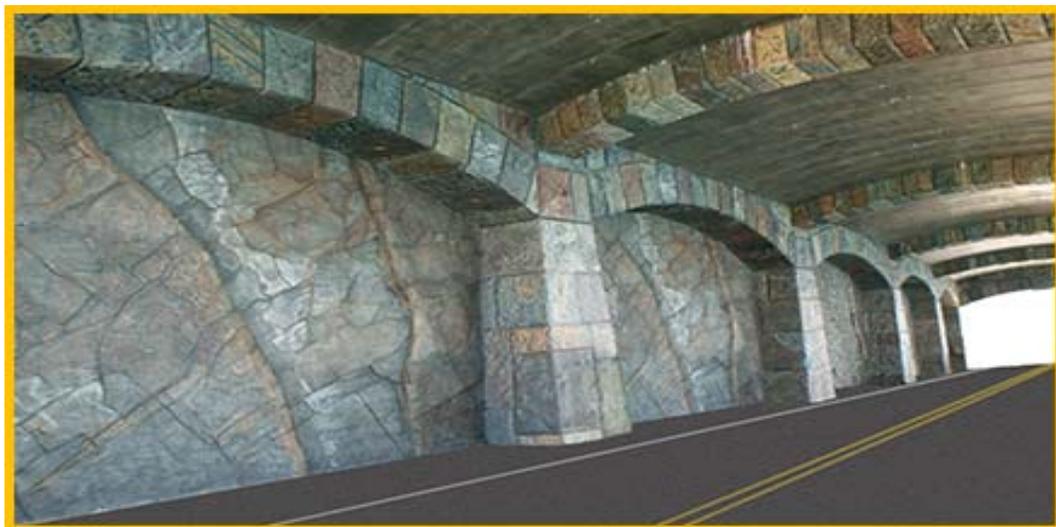


Figure 2.4.17-2 Pitkins Curve Rockshed – District 5 – Route 1



(a)



(b)



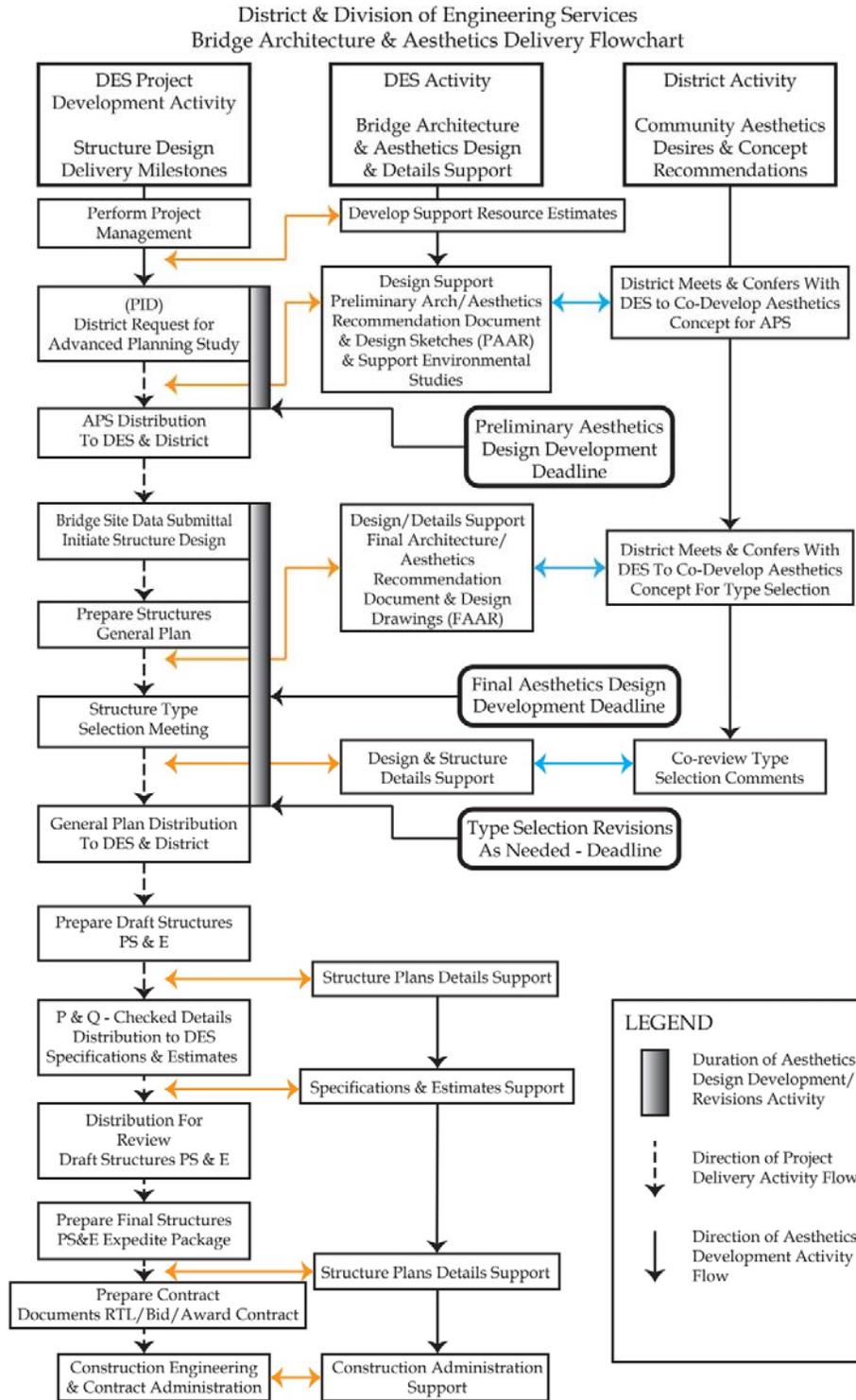
(c)



(d)

Figure 2.4.17-3 Pitkin's Curve (Proposed Alternatives) – District 5 – Route 1

## ATTACHMENT 1: BRIDGE ARCHITECTURE AND AESTHETICS DELIVERY FLOWCHART





ATTACHMENT 2: PRELIMINARY ARCHITECTURAL AESTHETIC RECOMMENDATION FORM

Bridge Architecture & Aesthetics Preliminary Architectural/Aesthetic Recommendation (PAAR)

1. PROJECT TYPE

Dist: EA: Co Rte PM Ahd PM Back

2. PROJECT DESCRIPTION

Project Name

- OC, POC, UP, RW, PH, VARIOUS, UC, OH, BR, SW, TUN, Other...

- 150 APS, 165 ENV, 175 Display, 240 Model, 250 PS&E, UNKNOWN, 160 APS, 165 Graphic, 240 Graphic, 240 PS&E, 270 Const., Other..., 160 Graphic, 165 Model, 240 GP, 240 TSM., OVERSIGHT

Aesth Proj Contact: Designer:

DES Design Senior

4. CHECKED

- Route Books, Maintenance Books, BIRIS (as built), Photo File, Other...

3. PROJECT REQUIREMENTS

- Level 1 - Standard Aesthetic Rec. Req, Level 2 - Moderate Aesthetic Rec. Req, Level 3 - Complex Aesthetic Rec. Req, Level 4 - Politically Sensitive Project

5. EXISTING CONDITIONS- BRIDGE NAME -

Route Theme Description

No Route Theme exists

Description of previous bridge

Description of next bridge

Other

Ext Girder Vertical, Sloped, Ratio: 1:2, Ratio: 1:1, Special, Other...

Overhang

Abutment Open, Closed, Sloped In, Sloped Out, Other...

Rail Type 25, 26M, 28, 29M, 80, Pattern, 25M, 27, 28M, 732, 80SW, Other..., 26, 27M, 29, 736, Texture

Column Type 1, Type 3 (two way flare), RW, HW, OW, Pattern, Type 2 (one way flare), R, H, O, Texture, Other...

\*R-Round, RW-Round Wide, H-Hexagonal, HW-Hex/Wide, O-Octagonal, OW-Oct/Wide

Wing Wall

Retaining Wall

See Drawing

6. ARCHITECTURAL/AESTHETIC RECOMMENDATION

Match Existing (see box #5)

Recommendations (see below)

Ext Girder Vertical, Sloped, Ratio: 1:2, Ratio: 1:1, Special, Other...

Overhang

Abutment Open, Closed, Sloped In, Sloped Out, Other...

Rail Type 25, 26M, 28, 29M, 80, Pattern, 25M, 27, 28M, 732, 80SW, Other..., 26, 27M, 29, 736, Texture

Column Type 1, Type 3 (two way flare), RW, HW, OW, Pattern, Type 2 (one way flare), R, H, O, Texture, Other...

\*R-Round, RW-Round Wide, H-Hexagonal, HW-Hex/Wide, O-Octagonal, OW-Oct/Wide

Wing Wall

Retaining Wall

See Drawing

Comments

Blank lines for comments



ATTACHMENT 3: FINAL ARCHITECTURAL AESTHETIC RECOMMENDATION FORM

Bridge Architecture & Aesthetics Final Architectural/Aesthetic Recommendation (FAAR)

1. PROJECT TYPE

Dist: EA: Co Rte PM Ahd PM Back

2. PROJECT DESCRIPTION

Project Name

- OC, POC, UP, RW, PH, VARIOUS, UC, OH, BR, SW, TUN, Other...

- 150 APS, 160 APS, 160 Graphic, 165 ENV, 165 Graphic, 165 Model, 175 Display, 240 Graphic, 240 GP, 240 Model, 240 PS&E, 240 TSM, 250 PS&E, 270 Const, OVERSIGHT, UNKNOWN, Other...

Aesth Proj Contact: Designer:

DES Design Senior

4. CHECKED

- Route Books, Maintenance Books, BIRIS (as built), Photo File, Other...

3. PROJECT REQUIREMENTS

- Level 1 - Standard Aesthetic Rec. Req, Level 2 - Moderate Aesthetic Rec. Req, Level 3 - Complex Aesthetic Rec. Req, Level 4 - Politically Sensitive Project

5. EXISTING CONDITIONS- BRIDGE NAME -

Route Theme Description, No Route Theme exists, Description of previous bridge, Description of next bridge, Other, Ext Girder, Overhang, Abutment, Rail, Column, Wing Wall, Retaining Wall, See Drawing

6. ARCHITECTURAL/AESTHETIC RECOMMENDATION

Match Existing (see box #5), Recommendations (see below), Ext Girder, Overhang, Abutment, Rail, Column, Wing Wall, Retaining Wall, See Drawing

Comments

Comments text area with lines

## REFERENCES

1. AASHTO. (2010). *Bridge Aesthetics Sourcebook*. American Association of State Highway and Transportation Officials, Washington, DC.
2. Billington, D. P. 1983. *The Tower and The Bridge: The New Art of Structural Engineering*. Basic Books, Inc., New York, NY.
3. Billington, D. P. (2003). *The Art of Structural Design, a Swiss Legacy*. Princeton University Art Museum, Princeton, NJ.
4. Gottemoeller, F. (2004). *Bridgescape, The Art of Designing Bridges*. 2nd Ed., John Wiley & Sons, Inc., New York, NY.
5. Gottemoeller, F. (2014). “Chapter 3: Bridge Aesthetics: Achieving Structural Art in Bridge Design,” *Bridge Engineering Handbook, 2<sup>nd</sup> Edition: Fundamentals*, Ed. Chen, W.F. and Duan, L., CRC Press, Boca Raton, FL.
6. Leonhardt, F. (1983). *Bridges—Aesthetics and Design*, MIT Press, Cambridge, MA.
7. Leonhardt, F. (2014). “Chapter 2: Aesthetics: Basics,” *Bridge Engineering Handbook, 2<sup>nd</sup> Edition: Fundamentals*, Ed. Chen, W.F. and Duan, L., CRC Press, Boca Raton, FL.



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