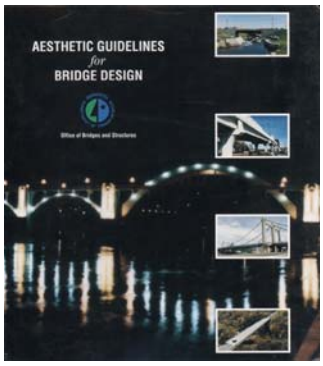
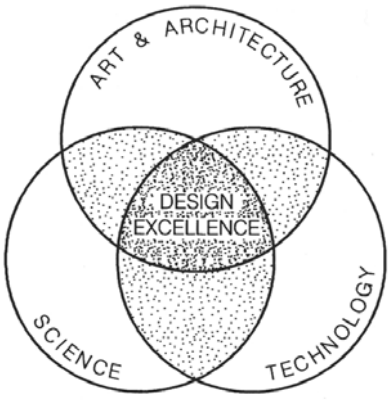
AESTHETIC GUIDELINES FOR BRIDGE DESIGN



Minnesota Department of Transportation, Office of Bridges and Structures (1995). *Aesthetic Guidelines for Bridge Design.* St. Paul, MN.

ABSTRACT

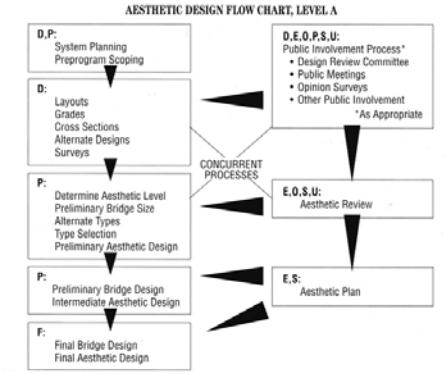
Mn/DOT's *Aesthetic Guidelines for Bridge Design* summarizes recommended policies, practices, and guidelines for the design of bridges and related structures in Minnesota. It is intended for professionals involved in the programming, design, and delivery of bridges. The document is contained in a three-ring binder with tabbed sections for each of the different content areas. Numerous color photos and sketches are used to highlight examples and to illustrate concepts. Each chapter begins with a large color photo and quotation. In most cases the large color photo illustrates an aesthetically pleasing bridge or bridge component constructed in Minnesota. The three-ring binder format is designed to allow the user to easily update and add supplementary information to the document.

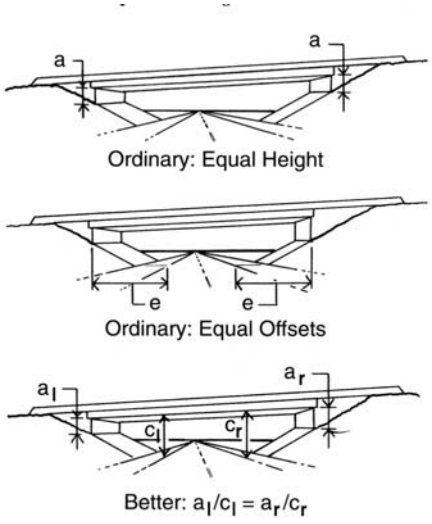


Chapter 1: Introduction emphasizes that aesthetically pleasing bridges are the result of the focused effort of a team of people. Aesthetics are to be considered throughout the bridge design process and cannot be achieved with a few cosmetic treatments added at the end. Four goals for the document are also presented. The goals are: 1) raise the aesthetic awareness of those involved in bridge design, 2) serve as a reference during the design process, 3) provide general observations and specific suggestions for designing bridges, and 4) encourage bridge designers to include aesthetics along with science and technology in the design of bridges and highway structures.

Chapter 2: Fundamentals of Aesthetic Design presents basic information on the fundamental concepts associated with aesthetic design. The concepts include: 1) Visual Design Elements (line, shape, form, color, texture), 2) Aesthetic Qualities (proportion, rhythm, order, harmony, balance, contrast, scale, unity), 3) Aesthetic Design Objectives (functional clarity, scale and proportion, order and balance, simplicity and continuity, site/environment integration), and lastly 4) Aesthetic Design Hierarchy (principal design factors, secondary design factors).

Chapter 3: Aesthetic Design Process presents the Mn/DOT Aesthetic Design





Process. After setting the stage with specific considerations for public involvement, highway corridors, interchanges, and scenic/environmentally sensitive sites, flowcharts are provided for the aesthetic design process. Aesthetic design is performed at three different performance levels. Level A is associated with structures having major cultural or aesthetic significance. Level B is utilized for mid-level structures. The Level C process is used for bridges requiring a low level of aesthetic consideration. In addition to the aesthetic design flowcharts, a table is provided which lists participants in different parts of the process. Participants are identified for involvement in the design of various aesthetic elements by aesthetic design level (A, B, or C). They range from preliminary designers, to final designers, to construction personnel. Input is solicited from personnel in the Environmental Services Unit (now the Landscape Architecture Unit), Mn/DOT Districts and the general public.

Chapter 4: Superstructure—Aesthetic Design Guidelines discusses the aesthetics of superstructures. As one of the primary aesthetic elements of a bridge, superstructures should receive significant attention. The type of superstructure (girder, arch, etc., and its material, steel or concrete) and the geometric relationships between the superstructure and other bridge components (abutments, piers, parapets, etc., and number of spans) are critical elements to investigate during design to achieve good aesthetics.

Chapter 5: Substructure—Aesthetic Design Guidelines provides guidance for the aesthetic design of a variety of substructure elements. As primary aesthetic elements of a bridge, piers and abutments are critical elements of a good design. Attention should be given to the entire collection of substructure units, the geometrics of individual substructure units, and the design of subcomponents of each substructure unit.

Chapter 6: Bridge Related Components—Aesthetic Design Guidelines provides guidance for the design of a number of secondary aesthetic elements. This includes railings, utilities, signage, and lighting. Often a bridge is part of a larger roadway project where retaining walls and noise walls are used. All of these elements should be woven together as part of the aesthetic design process for a project.

Chapter 7: Bridge Categories—Aesthetic Design Guidelines contains guidance for the aesthetic design of different bridge types. Types range from corridor bridges to grade separation structures to interchanges and pedestrian bridges. Additional content is provided to aid in the design of Major River Crossings or Landmark Structures. The chapter concludes with guidelines pertinent to historic bridges, parallel bridges, and rehabilitation projects.

SUMMARY

This document is useful for professionals involved in the programming, design, and delivery of bridges. It summarizes recommended policies, practices, and guidelines for the design of bridges and related structures in Minnesota.

KEY WORDS

Applicable Project Delivery Stages: Administration, Planning, Design

Applicable Transportation Professionals: Structural Engineers, Planners, Urban Designers, Landscape Architects, Architects

Applicable Transportation Modes: Vehicular, Bicycle, Pedestrian

Transportation Topics: Bridges, Aesthetics, Aesthetic Design Process, Superstructure, Substructure, Visual Design Elements, Aesthetic Hierarchy, Aesthetic Qualities, Aesthetic Design Objectives, Walls, Piers, Abutments, Beams, Spans, Deck, Parapet