



Aesthetics of Bridge Structures

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Summary

Good engineering design and aesthetics are synonymous. Methodologies for bridge design that create bridges that preserve the existing landscapes and complement, and even enhance their settings should be given due weightage. When proportion, Order and symmetry are applied well, the object so produced has aesthetic value. Five important aspects Form, Character, Detail, Scale and Proportion must be considered from first principles.

Keywords: Aesthetics, Bridges, Arch, Conceptual Design, Creative Process



Fig. 3: Chenab Bridge at Akhnoor, J&K



Fig. 6: Kalipai Bridge, Meghalaya



Fig. 8: Sanjenthong Bridge Imphal 3D Model

1. Introduction

Bridges are among the most ancient and honourable members of society with a background rich in tradition and culture. Aesthetics should be integral part of the design..

Bridge Aesthetics

2.1 4Cs of Bridge Aesthetics

Context, Comprehensiveness, Cost, Constructability

Some aesthetically pleasing solutions proposed and designed / proof checked by us are:

1. *Chenab Bridge at Akhnoor, J&K (Fig: 1, Fig: 2, Fig: 3)*
Award: 'Outstanding Concrete Structure for 2008' by Indian Concrete Institute.
Span Arrangement 60+160+60 m, largest cantilever spans in India.
2. *Bridge over River Kalipai, Meghalaya. (Fig: 4, Fig: 5, Fig: 6, Fig: 7)*
Concrete Arch Bridge with span 79 m
3. *Sanjenthong Bridge, Imphal (Fig: 8, Fig: 9)*
Span Arrangement 1@56m, Bow String Steel Arch
4. *Tharia Bridge, Meghalaya. (Fig: 10)*
Span Arrangement: 1@150m (Steel trussed Arch)
5. *Dawki Bridge, Meghalaya. (Fig: 11)*
Span Arrangement: 1@125 m (Steel Arch)



Fig. 10: Tharia Bridge, Meghalaya 3D Model



Fig. 11: Dawki Bridge, Meghalaya 3D Model



Fig. 12: Chikni Bridge, Himachal Pradesh



Fig. 14: ROB at Mohindergarh,

6. Chikni Bridge, Himachal Pradesh (Fig: 12)
Span Arrangement 2@35m, Bow String Concrete Arch
7. ROB at Mohindergarh, Haryana (Fig: 13 & 14)
8. Chakki Bridge, Himachal Pradesh (Fig: 15)
Length 520m, Continuous RCC Bridge

The structures are chosen such that these complement the existing landscape. Aesthetics has been intrinsic in the design in which simple form & slender structure has been adopted to provide aesthetically pleasing design. Structures have been chosen so as it blends seamlessly with the surroundings.

The bridges should stand as proud inheritor of Indian tradition of bridge design and building.

2.2 The Creative Process

First step in creative process is Initial shape in the mind's eye of the

Bridges generally will look aesthetically pleasing if these are Simple in form, have slender decks, Continuous lines and Shape of structural members is guided by flow of forces. Arches are the boldest and most expressive elements available to Bridge designers.

2.3 Conceptual Design:

The conceptual design phase of a bridge project provides the necessary groundwork for the best aesthetic opportunity. Making simple decisions early on can make bridges more striking.

2.4 Design Methodology

The design methodology for aesthetics includes a quantitative and qualitative sorting of natural site features to determine proper shapes for the superstructure and substructure.

2.5 'Form follows function' but Structural Efficiency is not sufficient condition for Aesthetics:

2.6 Engineers vs Architects

2.7 Structural Engineering Education

2.8 Design Guidelines

Design Guidelines need to be developed on Aesthetics.

2.9 Conclusion

There are sweeping changes in transportation sector and Bridge Engineers have contributed a major role. Designers of concrete bridges should remain ever mindful of their responsibility to current and future generations to create bridges that celebrate the technology of the time and the community's sense of place with aesthetic intrinsic in design. We need to create the bridges that stand the test of time. Bridges should just not last but leave a lasting legacy of excellence for future generations.