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BRIDGES AT NIGHT HOW TO LIGHT A BRIDGE?

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1. Introduction

Bridge design aims to capture the spirit of its site, and to create an appropriate structure that matches its surroundings.

But what happens as darkness falls?

The day and the night images of a bridge are closely related to one another - in both a positive and a negative sense.

In the positive scenario, the built structure maintains its identity, atmosphere, and potential, integrating into its surroundings by day and night, when light accentuates or even enhances its characteristics in a distinctive way.

In negative scenarios the quality of the place is no longer recognizable at night. A lack of light allows the structure to disappear, while too much illumination causes the place to stand out awkwardly; in either case randomly arranged lighting produces unstructured areas that make orientation difficult and do not feel safe.

Selectively and purposefully employed lighting creates understandable hierarchies.

So what is high quality bridge lighting? What are the essential requirements? This paper and presentation aim at answering these questions. The presentation is not strictly scientific or too theoretical; it covers practical considerations and the most significant "hard" and "soft" factors of lighting.



Fig. 1 (left) Brücke Flugfeld, Böblingen, Germany, Photo by Ingolf Pompe

Fig. 2 (right) Donaubrücke, Linz, Austria, Rendering by schlaich bergemann partner

2. Requirements for bridge lighting

Principal criteria for bridge lighting include: an optimal combination of lighting position; intensity of illumination and evenness of light; and the choice of an adequate lighting level or illuminant. All of these components should be considered throughout the design, including the planning phase. Optimal lighting reflects the architectural aspiration of a bridge, allows it to integrate into its surroundings, and assures safe use of the bridge by day and by night.

The requirements for lighting interact with one another. This means constant alignment and weighting during the design process, as the bridge structure intervenes decisively in this iteration: Which structural components are to be illuminated, or provide an opportunity to arrange the lamps? Every bridge has, for instance, a railing which can be used to integrate the lighting for the superstructure. For a safe crossing and the ability to recognize people (to see who is approaching) illumination from above would be favorable, which in turn requires a load bearing structure above the deck to which to fasten the lamps.

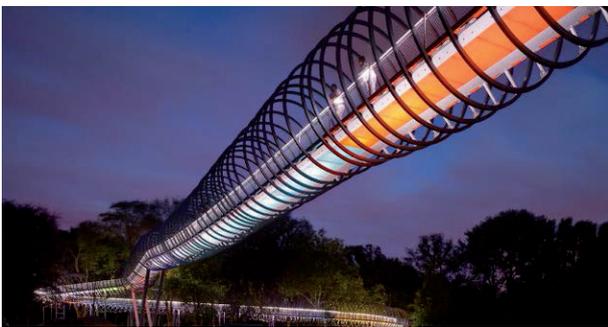


Fig. 3 (left) Bridge Sculpture “Slinky springs to fame”, Oberhausen, Germany, Photo by Roman Mensing
Fig. 4 (right) Weinbergbrücke, Rathenow, Germany, Photo by Anja Prusseit

Besides reasonable assembly and maintenance methods (along with a consideration of investment and upkeep costs), the design should also include protection against vandalism.

Another important task lies in analyzing the impact the bridge illumination has on the environment, which raises issues of light pollution, operating time, and timing/scheduling of the lighting system.

Whether all requirements have been successfully met will not only be evident at night. The better these components are integrated, the less the lighting installation affects the bridge’s daytime appearance.



Fig. 5 (left) Bleichwiesensteg Backnang, Germany, Photo by Michael Zimmermann
Fig. 6 (right) Telekom-Brücke, Bonn, Germany, Photo by Lukas Roth

3. Process

Lighting design is similar to bridge design in that it is a complex process, and should be integrated as part of the overall planning right from the beginning. The goal of successful lighting design is not the pure quantity of light alone, but rather the quality of light which is the key parameter adding to the comfort and quality of the users’ experience on the bridge at all times of day and night.

In the best moments, it brings a special kind of magic.