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Abstract:

“Minnesota’s Preservation of State-owned Historic Bridges for Long- term Transportation Use”

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This paper presents an innovative approach to the management of historic bridges that was developed for the Minnesota Department of Transportation (Mn/DOT) by Mead & Hunt and HNTB. It was first employed in the preparation of individual management plans for 22 state-owned Minnesota bridges listed on the National Register of Historic Places. Two historic bridge case studies involving complex engineering and historical issues will be presented. The paper’s authors include the engineer and historian who worked on the management plans and the case studies.

Prior to the adoption of regulations that implemented the National Historic Preservation Act, there was little pressure to preserve and rehabilitate historic bridges. Starting in the late 1980s, new federal regulations, especially Section 106 procedures, brought historic preservation considerations into the environmental review process. Bridge owners were called upon to manage historic bridges with National Register significance, as well as to maintain structures in accordance with current safety and functional requirements.

Mn/DOT found the task of working through the historic and engineering issues to be time-consuming, inefficient, and costly. Hoping to streamline this process, Mn/DOT worked with Mead & Hunt and HNTB in the development of management plans for selected historic bridges that would incorporate a new collaborative approach by the historian and the engineer. The historian evaluates a bridge’s significant character-defining features, the engineer identifies the work needed for continued service, and the two jointly consider these issues together in light of the Secretary of the Interior’s Standards for the Treatment of Historic Properties. Costs are estimated, based on the collaborative evaluations. The resulting management plan establishes an efficient and effective treatment program for the historic bridge that meets Section 106 requirements.

The technical issues associated with preserving historic bridges within a transportation system vary widely. Geometrics, load capacity, and railings are the dominant issues for preserving highway bridges. Historic park bridges do not require the same level of functionality as highway bridges. Some historic bridges (those in good condition with good geometrics and load capacity) are relatively uncomplicated situations. Others present more complex problems. The two case studies involve the preservation of a nineteenth-century Pratt truss, constructed of iron and located on a trunk highway (see Bridge 5721 photo), and a 1904 concrete-arch park bridge with a rare Melan reinforcing system (see L5853 photo). The preservation of the truss includes

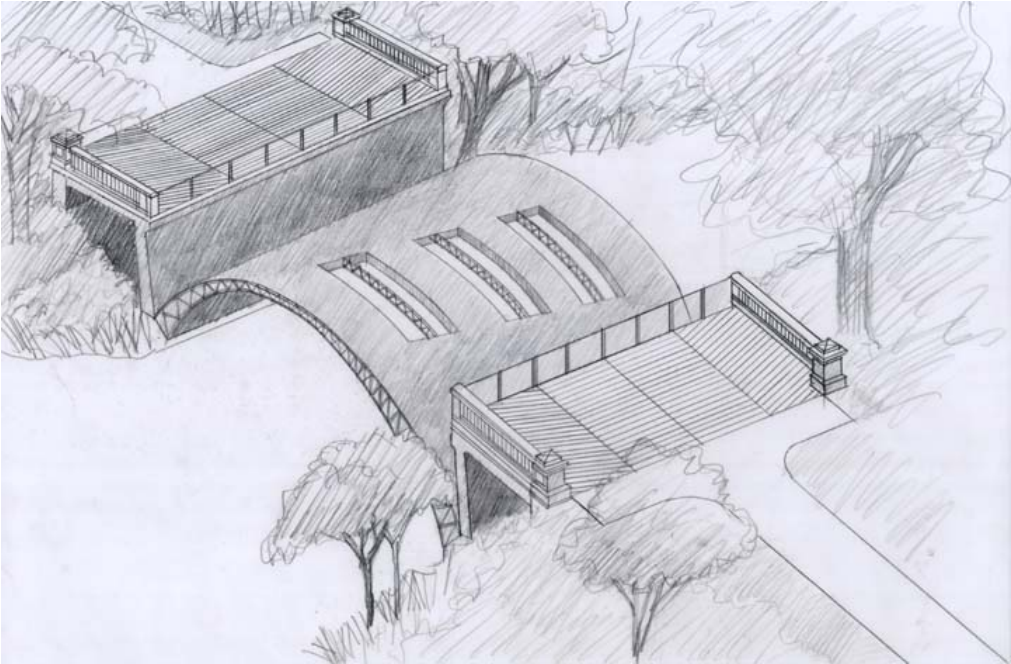
disassembly, refurbishment, and reassembly several hundred miles away for pedestrian/bicycle trail use. The park bridge involves the reworking of the structure to expose and interpret the unusual Melan system (see Bridge L5853 rendering). While the two cases involve very different structures, treatments, and preservation outcomes, both exemplify the collaborative process presented in Mn/DOT's management-plan approach.



Bridge 5721 Photo



Bridge L5853 Photo



Bridge L5853 Rendering