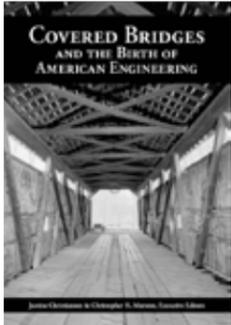


Recent Publications

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Justine Christianson and Christopher H. Marston, executive editors. *Covered Bridges and the Birth of American Engineering*. (Wash., DC: Historic American Engineering Record, National Park Service, 2015)

Covered bridges have fascinated us for decades, evoking a simpler America of small-town and rural life, horse-drawn transportation, and localized economies.

The few surviving examples are direct and poignant links to an earlier, romanticized pastoral existence. Yet of the approximately 10,000 covered bridges built in the United States from 1830 to the 1950s, only 672 remain, the majority having been destroyed by floods, wind, decay, and vandalism. The editors and contributors in this volume guide us through the evolution of American bridge engineering and the critical elements of wooden bridge construction as a basis for informed preservation work. “Judgments on the proper technique for a restoration or rehabilitation,” they write, begins with “understanding of the original decisions made in the creation of that structure.” With these technical insights, the reader will emerge with a profound appreciation for these bridges both aesthetically and as monuments to American inventiveness.

Bridge study and preservation received a boost with the National Historic Covered Bridge Preservation (NHCBP) Program administered by the Federal Highway Administration (FHWA) since 1998. The program used grants to “preserve, rehabilitate, and restore” historic covered bridges, and also to engage in “research, education, and technology transfer.” The Historic American Engineering Record (HAER), begun in 1969, performed much of the research and documentation of 80 existing bridges, producing surveys, drawings, photographs, and inventories of the bridges. Researchers tested 16 of the bridges with modern testing techniques to assess load capability and answer other questions. Five bridges were awarded National Historic Landmark status.

This volume emerged from HAER’s work and provides great detail on the unique engineering challenges of these “statically determinate forms.” We learn of the types of wood used and their qualities, truss type, abutments, joinery, prestressing of supports, splicing of lower chords, and use of metal. There is the variability and unpredictability of wood, “a viscous, hygroscopic material whose behavior depends on moisture content and is a function of time.” Consequently, these early bridge builders could not precisely determine load capabilities; they could only know the “lower bound for the actual strength or capacity of a real truss.” The main story is the constant innovation during the 19th century in the truss (the rigid framework), with designs ranging from the

basic Queenpost to the more complex Town lattice and Howe patterns, all fully illustrated and explained.

U.S. engineers and builders learned from European bridges and French engineers but soon made the United States the center for covered wooden bridge building. By 1820 timber bridges could extend to over 350 feet. Builders extended the length of the lower supporting chords with specialized splices known as the “fishplate joint” and “scarf joint.” They continually explored new truss types, added notched joints and wooden wedges to prestress the wood (accounting for shrinkage), added counterbraces for stiffness, used vertical iron bars for increased tension, used arches, and more. The variability of wood and increased loads over time, especially with rail traffic demanded innovation. In the chapter “Builders and Practices,” we learn in more depth about the most active and influential builders and their inventiveness. Joseph John Daniels, for example, often “built top chords over the piers” (for added load capacity) and used “iron rods rather than wooden tie beams in the upper lateral systems.” This technical information is presented succinctly and colorfully, but some concepts, such as tension and resistance, are a bit technical for the average reader.

A good, brief summary explains past and current preservation efforts, discusses prominent preservationists and the National Society for the Preservation of Covered Bridges (NSPCB), and HAER’s educational materials, as well as the online *World Guide to Covered Bridges*. An appendix identifies the covered bridges in the HABS/HAER Collection, listing their location, truss type, and date of construction. This volume expertly collects and presents a wealth of knowledge about American bridge engineering and construction, and the careful reader will be rewarded with a much deeper, more inspired appreciation of these American treasures.