

The Choate Bridge

A greater awareness of the historic significance of this bridge within the engineering community is integral to its future survival.

EMMA FRANCIS & JULIA CARROLL

In 1764, Colonel John C. Choate, Esquire, oversaw the construction of the Choate Bridge in the town of Ipswich, Massachusetts. The Choate Bridge is located along Route 1A and, with the exception of the 1838 widening of the bridge, it has remained nearly unaltered since the time of its construction. The original construction was 80.5 feet long and 20.5 feet wide. In 1838, the bridge was widened to 35.5 feet to accommodate another lane of traffic.

The Choate Bridge (see Figure 1) is the earliest documented masonry arch bridge and the oldest extant bridge in Massachusetts. It is also the second documented masonry arch bridge and the second oldest extant bridge in the United States. The bridge has been in continuous use since its original construction and currently carries heavy commercial truck traffic and an estimated 20,000 vehicles per day.

The Choate Bridge is modeled in the same style as Roman arch bridge construction. The

Frankford Avenue Bridge, erected in 1697 in Philadelphia, Pennsylvania, was the first masonry arch bridge in the United States. Unlike the Frankford Avenue Bridge, which has undergone significant structural alterations over its life, the Choate Bridge has merely had its mortar joints repointed and only been subjected to routine parapet maintenance since its 1838 widening.

This landmark serves as a complete example of mid-eighteenth century bridge technology, particularly the use of random-coursed ashlar and dry stone wall construction. Furthermore, as seen in Figure 2, the adjacent arrangement of the 1764 and 1838 spans juxtaposes two distinct eras of masonry arch bridge construction. Of particular note are the differences in stone size and shape, demonstrating the advances in stone-cutting technology.

The Choate Bridge has served as a major transportation route since 1764. It is commonly believed to have served as a thoroughfare during the Revolutionary War, and is depicted as such in a nearby mural (see Figures 3 & 4). With its original construction intact, it is an authentic example of early stone construction in the history of American road building. The significance of this structure in both the historical and engineering arenas has already been demonstrated through its recognition by the Historic American Engineering Record and a listing in the National Register of Historic Places, and through designation as a Massachusetts

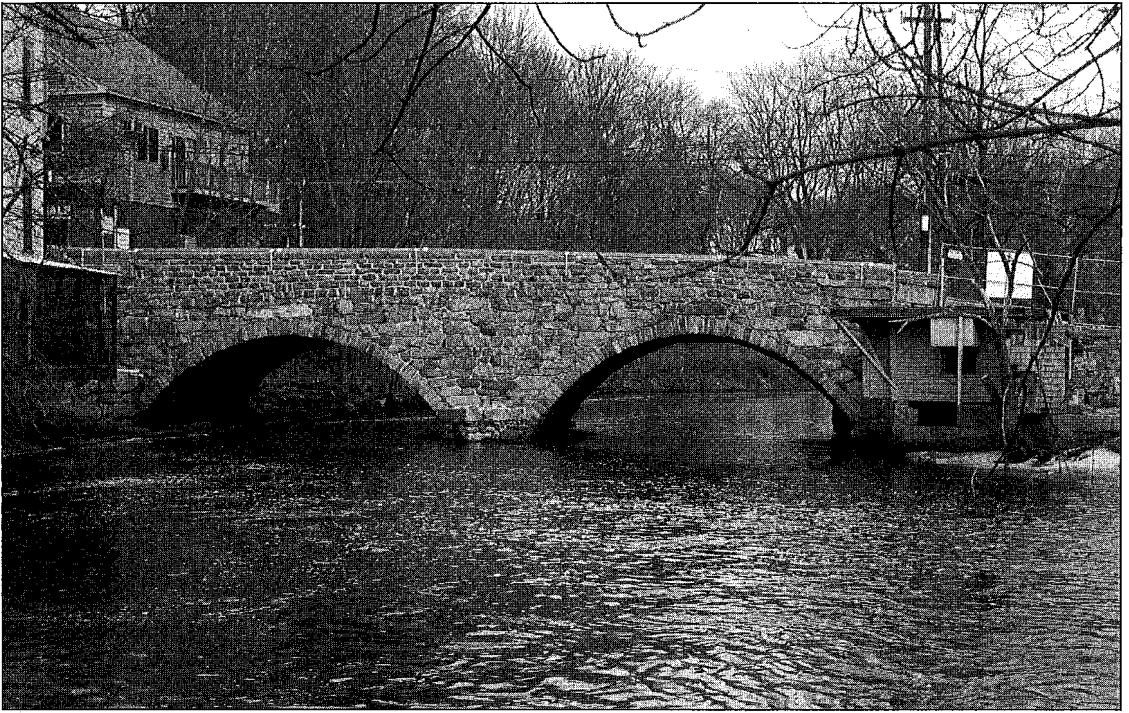


FIGURE 1. Overview of the Choate Bridge from the west.

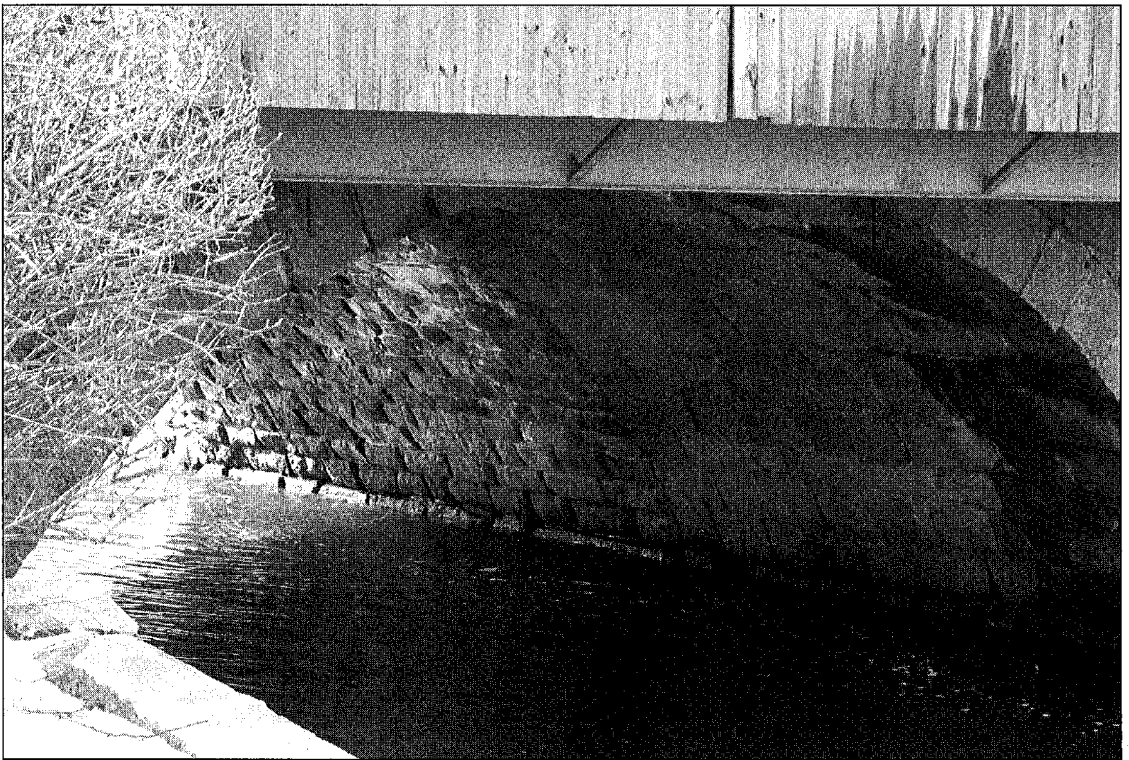


FIGURE 2. The bridge's southern arch from the east side. Note the distinction between the random-coursed ashlar and dry stone wall construction.

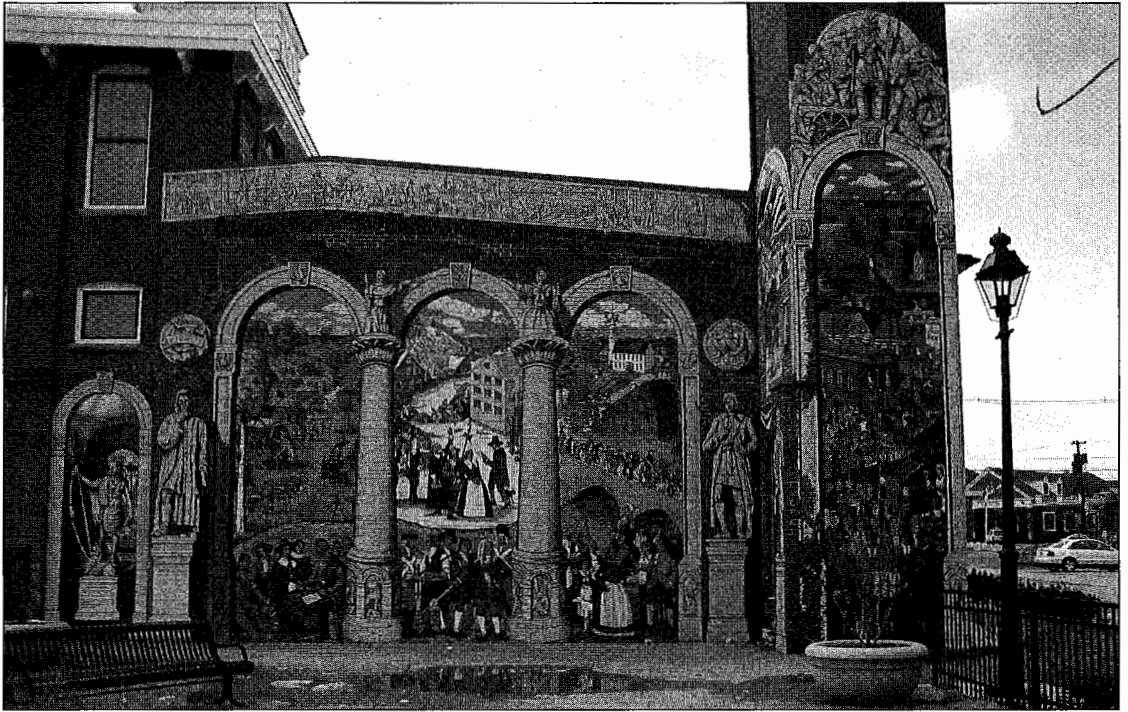


FIGURE 3. Mural depicting historical Ipswich, adjacent to Ipswich River and the Choate Bridge.

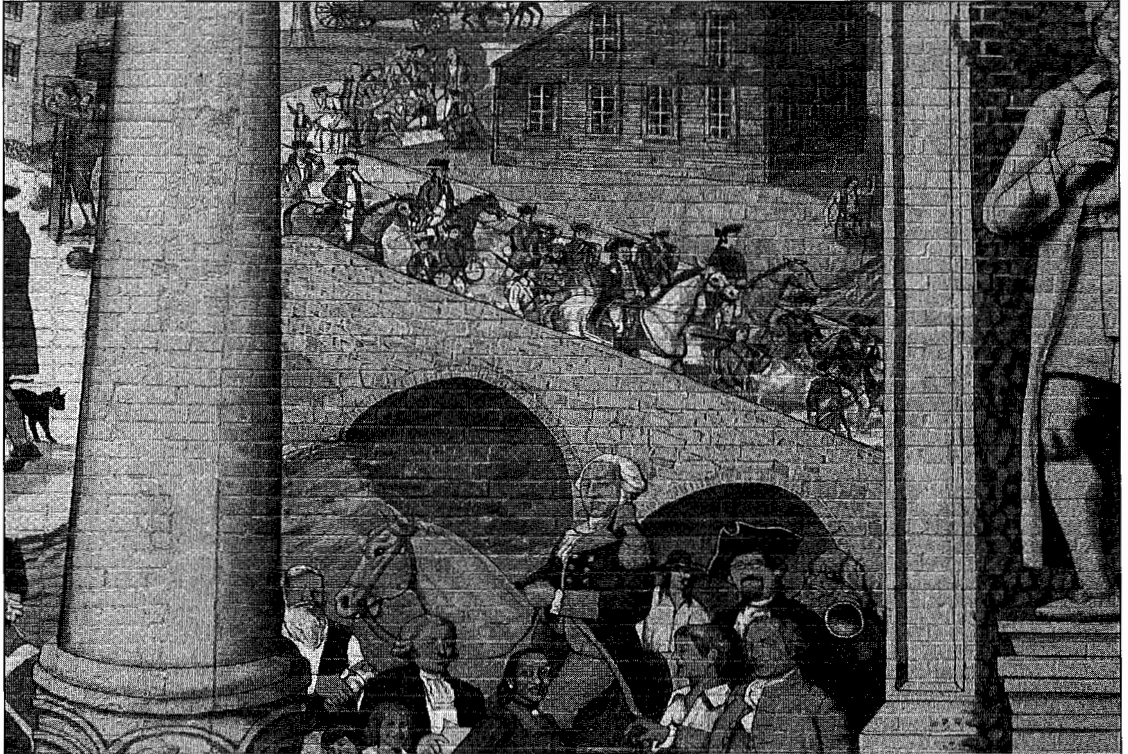


FIGURE 4. Close-up of the Choate Bridge mural showing its use during the Revolutionary War.

Historic Landmark by the Massachusetts Historical Commission.

Though the time-tested nature of its construction and structural form has ensured its longevity, the bridge has already been exposed to natural weathering degradation. In June 2006, the Choate Bridge was closed for 27 days due to scour of the piers, greatly compromising the economy of the nearby businesses. The town of Ipswich has made a great effort to preserve this landmark, but future continued success depends on national recognition by the greater engineering community. In the interests of garnering the attention of the engineering community and the continued preservation of the Choate Bridge, Julia Carroll and Emma Francis, in association with the Boston Society of Civil Engineers Section ASCE (BSCES), prepared the nomination packet for the History and Heritage Committee of the American Society of Civil Engineers (ASCE) to recommend the Choate Bridge for recognition as an ASCE National Historic Civil Engineering Landmark on September 19, 2007. The nomination was approved by the ASCE Board of Direction on May 2, 2008. There will be a formal dedication ceremony at a date to be determined, and a bronze plaque will adorn the bridge.

ACKNOWLEDGMENTS — A.G. Lichtenstein and Associates worked as a historic preservation consultant on the restoration of the Choate Bridge in the 1990s. PTAI served as the official engineer/architect during the 1990s restoration.



EMMA FRANCIS is an associate with Wiss, Janney, Elstner Associates in Cambridge, Mass. She has worked in repair and preservation for seven years and will obtain her graduate degree in Structural Engineering from Tufts University in 2009. Notable projects in which she has participated include the Omni Parker House exterior envelope repair in Boston, Mass.; the historic Mason Temple restoration in Providence, Rhode Island; the Bank of America make-safe annual inspections in Providence, Rhode Island; and the Leonard P. Zakim Bridge Bunker Hill Memorial girders investigation in Boston, Mass.



JULIA CARROLL received her B.S. in Civil and Environmental Engineering from Carnegie Mellon University in 2005. Having conducted research in bridge design history, engineering education and sustainable building practices, she will receive her M.Eng. in Structural Engineering from Tufts University in 2008. In October, she will join DMJM Harris as a Structural Engineer I.