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Did You Know: Superstructure and Substructure Dates

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Did You Know…

…That bridge superstructures and substructures often have different construction dates, leading to confusion in dating bridges? The substructure of a bridge refers to the supporting structures underneath the deck, including piers and abutments. The superstructure is the portion of the bridge that supports the deck and connects one substructure element to another. Throughout history, there have been many cases in which the superstructure of a bridge needed to be replaced, but the substructure was in good enough condition to justify reusing it, sometimes with alterations or enhancements, to support the new superstructure. In more recent times, many historic bridges have been restored and/or relocated on all-new substructures.

Various sources of information including government bridge inventories, interpretive signage, books, and websites sometimes present misleading information by stating that a particular bridge was built in the year its substructure was built, when the superstructure is in fact newer. This can lead to confusion and misunderstanding. In nearly all cases, bridge historians refer to the construction date of the superstructure of a bridge as the primary construction date for a bridge. For example, a metal truss superstructure built in 1935 on the piers and abutments of a previous 1890 wooden covered bridge would be described as a "metal truss bridge built in 1935." The reason for this is that the superstructure of a bridge is the most prominent and defining feature of a bridge. This mirrors the common practice of categorizing bridges by the type of superstructure. A metal truss bridge is not called a "stone pier bridge."

That said, this does not always mean that the substructure of the bridge has no historical significance. There are some cases where a substructure might also have an unusual design or be associated with a famous engineer. Also, historically, the substructure of a bridge was often a major component of bridge design and construction and this is evidenced by the fact that when engineers wrote about their bridge projects in periodicals, they often devoted substantial portions of their discussion to the design and construction of the substructure. Despite the significance of a substructure, it is still traditionally the

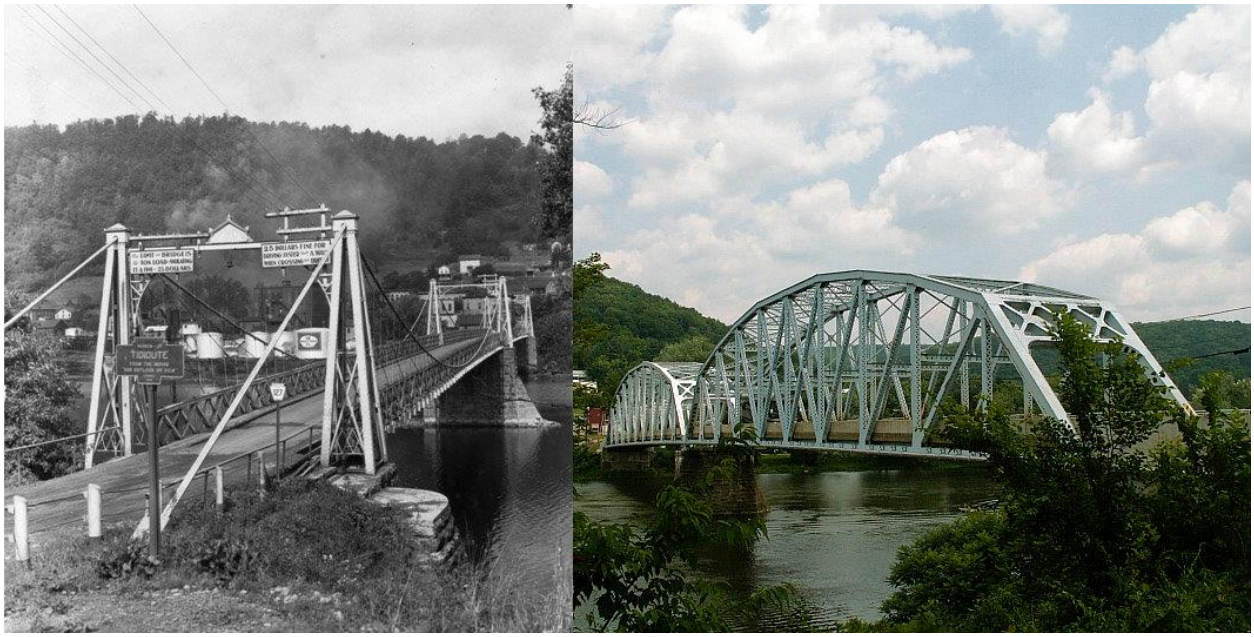
superstructure that defines the overall construction date and the majority of a bridge's historical significance. There are rare exceptions to this rule, and in these cases it is important that narratives, interpretive signs, and other documentation clarify the details of the bridge's construction dates and areas of significance.

The State Street Bridge in Bridgeport, Michigan is a 1906 Pratt through truss bridge. The truss bridge was restored and placed on a new substructure in 2010. The replacement of the substructure does not affect the bridge's historical significance.

The Lafayette Avenue Bridge in Bay City Michigan is a bascule bridge that consists of an 1988 superstructure on a 1938 substructure from the previous bascule bridge. The bridge was previously significant as a riveted plate girder bascule bridge with a Scherzer rolling lift bascule design. These elements were lost when the superstructure was replaced. The bridge has thus lost the superstructure that gave the bridge historical significance.

The Hazen Road Bridge in Illinois is a historic Pratt through truss bridge built in 1893 that includes a very rare use of cast iron bents for its substructure. Both its superstructure and substructure were built at the same time, and both are significant.

The River Road Bridge in Branchburg New Jersey is an exception to the rule. It is a 1949 timber stringer bridge that rests on rare 1886 cast iron bents. In this case, it is only the substructure that is significant; the superstructure does not have significance. To avoid confusion, this bridge requires a more detailed description than the simple description of a 1949 timber stringer bridge.



The Tidioute Bridge in Warren County, Pennsylvania is a metal Parker through truss bridge built in 1933. The 1933 superstructure was built on the stone substructure of a previous suspension bridge that is assumed to date to the 19th century. While the survival of the substructure is of interest, it is neither the primary area of significance of the bridge, nor would it be appropriate to refer to the bridge seen today as a 19th century bridge.