

3.4 TIMBER SMALL STRUCTURES

Historical Overview

Although written documentation is not readily accessible, the majority of early small structures were most assuredly of timber construction. This is because timber was often easily available and a small span would be relatively easy to construct. These small structures were probably simple timber beams (stringers) spanning the crossing with plank decks atop the beams. There may also have been small king or queen post timber truss structures since these too were relatively easy to construct.⁹

The 1899 Geological Survey Report on the Highways of Maryland contained the following reference to early eighteenth century timber bridge construction:

The overseers of the highways were frequently hindered in repairing bridges by the refusal of the owners of the adjacent lands to permit them to cut trees for that purpose. Therefore, in 1724, the overseers were authorized, by a law [chap xiv] supplementary to that of 1704, to make use of any trees except those fit for clapboards or cooper's timber, for building or repairing any bridge maintained at a public or county expense; i.e. for which appropriations were made distinct from those for highways (Sioussat 1899: 121).

In the engineers' reports of the 1830s concerning construction and maintenance of the National Road in western Maryland, engineers expressed the desire to erect structures with stone abutments and wingwalls and wooden superstructures rather than the stone arch-type structures specified for use on the National Road (Searight 1971: 71). This method was proposed as a cost-saving measure. The 1835 report from the Commissioners of the State of Maryland to the Senate and US Congress concerning the National Road indicates that some wood structures were built on the National Road. The Commissioners reported that "the floors of the wooden bridges must be removed every two or three years and the whole structure of the bridges themselves must be built every twenty or twenty-five years" (Searight 1971: 35).

A statewide survey of highway bridges conducted by the Geological Survey in 1899 revealed that:

. . . a majority of the small bridges with spans up to 30 feet, culverts and drains are of wood. The shortest spans are a simple beam to which is nailed the flooring and rails. For spans from 10 to 30 feet, a simple triangular frame with a central tension rod or post forms the supporting truss (Johnson 1899: 205-206).

The triangular frame structures were probably king or queen post trusses. The 1899 Geological Survey's Report also noted that "some of the small wooden bridges have been replaced by steel beam-bridges with wooden flooring" (Johnson 1899: 253).¹⁰

⁹ There are no known extant small structures of timber truss construction.

¹⁰ Carroll County reported that an "A-frame" timber structure stood on an abandoned roadway until a few years ago (Butler 1997).

In the first decade of the twentieth century, Walter Wilson Crosby, Chief Engineer of the Geological Survey's Highway Division, advocated for reconstructing every wood bridge and forever doing away with "further expense for the maintenance of expensive and dangerous structures" (Crosby 1906: 379).

Despite the general sentiment in the early part of the twentieth century to replace wood structures with concrete, timber structures continued to be built. They were low in cost and relatively easy to construct and for areas of the Eastern Shore, timber structures were the most suitable structure for the environment (e.g. salt, sand, water, flat terrain). They are not included in the Standard Plans of the first three decades of the twentieth century. As late as 1933, however, the State Roads Commission included two designs for small timber beam structures in the Standard Plans. These designs were both for use only on secondary roads. One design was for a timber beam structure from 10 feet to 18 feet in length and for an H-10 load. A note on this design stated that the structures were "to be used only on infrequently traveled roads with the approval of the Chief Engineer" (Maryland State Roads Commission 1933: Standard Plans). The second design was for the same size timber beam structure but with a higher (H-15) load capacity. The State Roads Commission Report of 1934 stated that "several hundred wooden structures, both bridges and culverts, have been rebuilt or replaced" (Maryland State Roads Commission 1934: 72). That same report also mentioned the use of "creosoted timber" (Maryland State Roads Commission 1934: 44).

In the late 1930s composite timber and concrete structures came into use "in the flat terrain of the Tidewater region" (Spero 1995: 44). These structures, however, were generally bridges as opposed to small structures. The 1946-47 Report of the State Roads Commission stated that "structures in the tidal tributaries will find a considerable use of timber especially in the substructure and should the crossing be near a community where it is desirable to construct a bridge of pleasing appearance, this can be accomplished through the medium of a combination of timber and concrete" (Maryland State Roads Commission 1947: 56). The next State Roads Commission Report claimed that timber structures were still widely constructed on county or local highways (Maryland State Roads Commission 1949: 63). Timber construction is still used today for small structures in the state, mainly on the Eastern Shore.

Description

Timber beam small structures are comprised of timber beams (stringers) supported by either timber, masonry or concrete abutments (Figure 3.15). The railings and floor are generally of wood.

Few timber structures are listed in the SHA Office of Bridge Development's partially completed Small Structures Inventory for state highways. Timber structures may be much more prevalent on the county roadways. For example, Cecil County reported at least three small timber structures on county roadways (Dominick 1997).

Examples of timber construction of small structures on Maryland's roadways are:

CE3013 Stevens Road, Cecil County ca. 1925
Timber beam on rubble stone abutments with wood handrail.

18048XO MD 472 over Branch of Patuxent River, St. Mary's County N.D.
 12.75-foot timber beam with timber bulkhead abutments and timber wingwalls,
 20-foot wide roadway.

22022XO MD 54 over Mockingbird Creek, Wicomico County 1940
 17.75-foot timber beam with timber bulkhead abutments, 18-foot wide
 roadway.

Tips for Dating Timber Small Structures

Older wooden structures (unless covered) had relatively short life spans because of the effect of both traffic and weathering on the wood. In addition, many of the early twentieth century timber structures were eradicated before World War II by the efforts of the state and counties to upgrade their roads. Because of these two factors, it would be unlikely to find an early timber structure dating prior to 1920.

In 1933, the state's Standard Plans included a timber structure for use of secondary roads (Appendix A, pages A-43-44). A comparison of extant timber structures to these plans could assist in dating. Some structural elements that can be compared to the Standard Plans are the size and spacing of the stringers (shown in a table on the plans), the configuration of the superstructure and the size and spacing of the bridge rail posts(6 inch by 8 inch posts spaced five feet center to center).

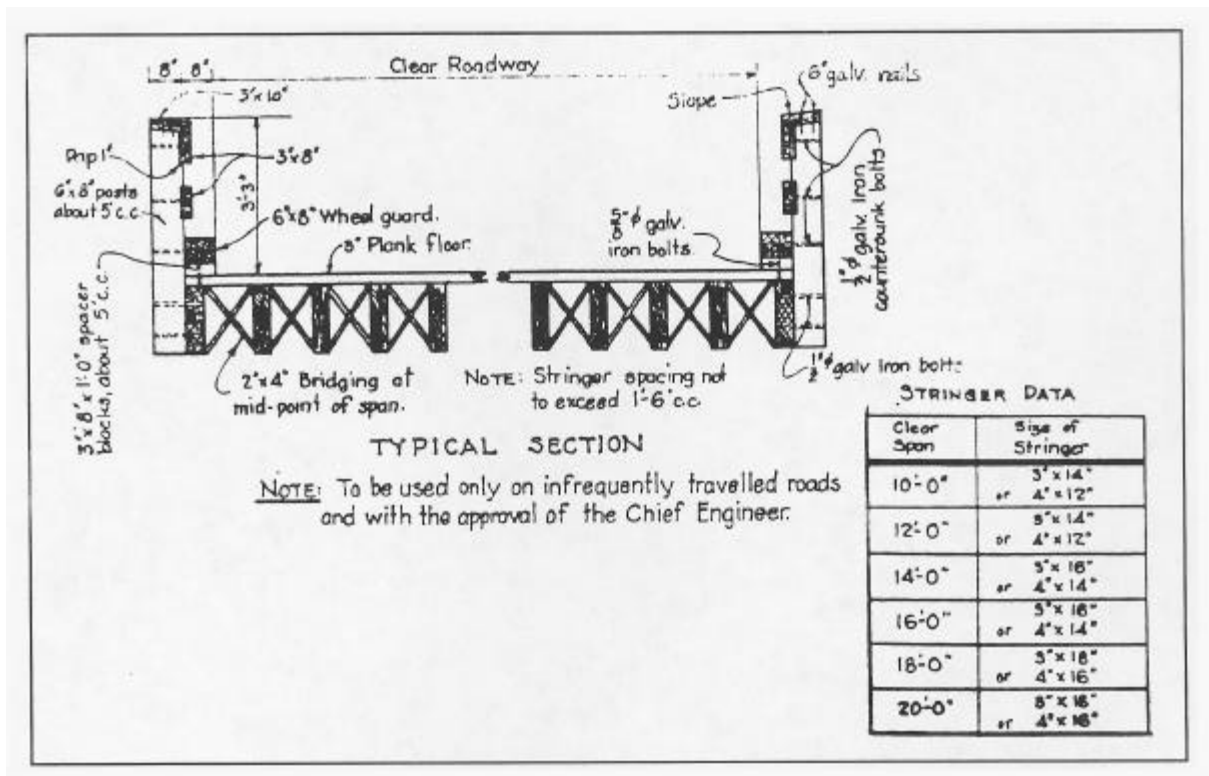


Figure 3.15. Timber Bridge from Standard Plans of 1933 (Source: Maryland State Roads Commission 1933).