

1.0 INTRODUCTION

Purpose

The purpose of this report is to present a historical context for small structures on Maryland's roadway system. The context will provide sufficient materials to assist in the assessment of the eligibility of small structures for the National Register of Historic Places and will facilitate Section 106 consultation regarding these structures. The report contains: 1) historical overview of the development of Maryland's roadway system focusing, when possible, on small structures; 2) discussion of the types of small structures found on Maryland's roadways; and 3) guidance for assessing the state's small structures for National Register eligibility.

A 1995 report prepared for the State Highway Administration (SHA) entitled *Historic Highway Bridges in Maryland: 1631-1960: Historic Context Report* (Spero 1995) provides a context for the state's historic bridges. The Spero report provides an excellent context that relates the history of transportation in Maryland to bridge construction. The report does not, however, address small structures as a group and consequently provides insufficient data to assist in Section 106 consultation regarding small structures.¹

What is a Small Structure?

The small structures addressed in this report are those with lengths of less than 20 feet. In Maryland today, roadway structures under 20 feet in length are often referred to as "culverts" whether they are subsurface drains or simply small bridge structures that span narrow waterways. Historically, however, culverts referred only to subsurface road drainage systems. Culverts were distinct from small structures that functioned as bridges, carrying traffic loads and having a clear, open span above a waterway.

In the nineteenth century, references in various governmental reports were made to culvert construction and repair on the National Road in western Maryland. A road inspector in 1833 wrote concerning the National Road that "the culverts are too few and small . . . culverts 2' x 3' should be constructed at convenient distances to carry off water" (Searight 1971: 70). These early small drainage structures were probably built of stone (Figure 1.1).

In the first decade of the twentieth century, the Maryland Geological Survey (Geological Survey), which evolved into the SHA, promoted replacement of old wooden structures with "permanent bridges and culverts" (Crosby 1905-06: 346). Their first published annual report provided an estimate of the money that had been spent on bridges; the estimate included the cost for "culverts and smaller drains" (Johnson 1899: 205). The report also described culverts as tile pipes laid across and under the roadway (cross drains) with a headwall at each end (Johnson 1899: 274). In the 1905-06 report of the Geological Survey on highways in the state, Highway Engineer A. N. Johnson reported on plans to replace the old wooden structures "with pipe culverts or concrete bridges

¹ For more information on transportation history in Maryland and on the State's bridges, refer to the Spero report, which is on file at the Maryland State Highway Administration and the Maryland Historical Trust. Relevant portions of the report are summarized and referenced in this report.

and thus forever do away with further expense for the maintenance of expensive and dangerous wooden structures” (Crosby 1907: 379).

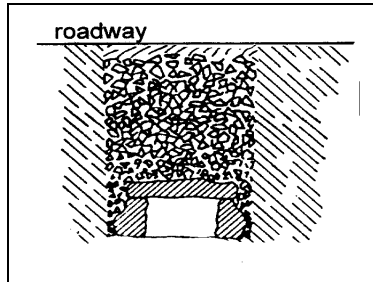


Figure 1.1. Drawing of stone culvert
(Adapted from Johnson 1899:
275, Figure 10).

Following the trend of other states, during the first decade of the twentieth century Maryland began development of standardized bridge and culvert plans for newly-built or replacement structures along the state’s roadways. The first plans (Standard Plans) were issued in 1912 by the Maryland State Roads Commission. In the Standard Plans issued between 1912 and 1933, culverts were subsurface drainage structures that did not directly carry traffic loads. Examples are the reinforced concrete box structures such as the “steel-concrete culvert” of 1912 and the “box culvert” of 1931. The structures in the Standard Plans that did directly support traffic loads and featured a clear open span above a waterway were called “bridges,” even for those spans as short as six feet. Figures 1.2 and 1.3 illustrate, respectively, a subsurface pipe culvert that does not directly carry traffic loads² and a small bridge over a waterway that does directly carry traffic loads.

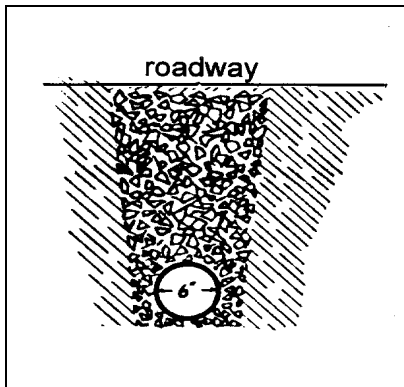


Figure 1.2. Drawing of a culvert
(Adapted from
Johnson 1899: 275)

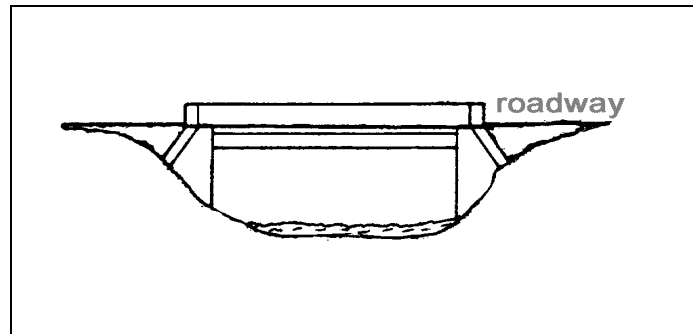


Figure 1.3. Drawing of a small bridge.

² The fill, between the top of the structure and the road, helps support and distribute the load.

The general perception of culverts as subsurface drainage structures that do not directly carry traffic loads and of bridges as structures that provide a clear open span (or spans) above a waterway and have load-carrying decks at or just below the road-level persisted until the late 1970s. In 1979, the Federal Highway Administration (FHWA) adopted the 20-foot or greater parameter in its bridge definition for the National Bridge Inspection Standards.³ Structures less than 20 feet in length were often considered “culverts” regardless of whether they were subsurface road structures or small “bridges.” The 1979 Federal Highway Administration *Bridge Inspector’s Training Manual* defines culverts as:

A small bridge constructed entirely below the elevation of the roadway surface and having no part or portion integral therewith. Structures over 20 feet in span parallel to the roadway are usually called bridges, rather than culverts; structures less than 20 feet in span are called culverts even through they support traffic loads directly (US Department of Transportation 1979: G-13).

This definition left a structure with a 20-foot span defined as neither a bridge or a culvert. In 1983, the 20-foot structure was addressed by the American Association of State Highway and Transportation Officials (AASHTO) who defined culverts in their *Transportation Glossary* as “any structure under the roadway with a clear opening of twenty feet or less measured along the center of the roadway” (AASHTO 1983: 19). (The 1991 *Bridge Inspector’s Training Manual* again defined a bridge as a structure “having an opening of more than 20 feet” [USDOT 1991:A-1]).

Although AASHTO considers structures with total lengths of 20 feet to be culverts, for the purposes of this report, all structures on Maryland’s roadways that are less than 20 feet in length are considered “small structures” and structures 20 feet or over are considered “bridges.” This parameter is used because the state uses the 20-foot and over parameter to define bridges in their state-wide bridge inventory. In the historical discussions contained in this report, however, the term “bridge” is often used even for structures under 20 feet. The term “bridge” in these cases is included according to its historic usage. A good example of this is the State Roads Commission references to slab structures with spans as short as 6 feet in the Standard Plans as “bridges.”

The small structures on Maryland’s state highways are enumerated in the SHA Office of Bridge Development’s Small Structures Inventory, currently about 90 percent complete.⁴ County and city bridges that are not on the state highway system are not included in the state’s inventory; instead, each county maintains its own inventory and follows the

³ Only bridges are eligible for FHWA bridge replacement funds. These bridges must be inspected and made part of the National Bridge Inspection Inventory. Structures having a span of less than 20 feet may be included on a state’s bridge inventory but they are not eligible for FHWA bridge replacement funds. Consequently, state highway departments often inventory and address structures that are less than 20 feet (small structures) separately, as does Maryland’s State Highway Administration.

⁴ Other structures that do not meet the definition of “culverts,” such as retaining and noise walls, are also included in the state’s Small Structure Inventory. At the instruction of the SHA, these other structures are not discussed in this report.

state's lead of classifying all structures 20 feet and over as bridges and those under 20 feet as small structures.