MARYLAND DEPARTMENT OF TRANSPORTATION / STATE HIGHWAY ADMINISTRATION	Office of Structures ***Guidelines and Procedures Memorandum***	DESIGN Number: OOS-GPM-D-101 Date: 02/20/2025
	SHA OFFICE OF STRUCTURES INVENTORIED STRUCTURES	Approval: Mauricio Agostino

OVERVIEW

The State Highway Administration Office of Structures (SHA OOS) owns and maintains thousands of structures classified as bridges or small structures; however, not all structures in the state are included in the SHA OOS inventory. The following guideline provides information on the definition of both bridges and small structures and when a structure is to be included on the OOS SHA inventory.

Note: SHA OOS **must** be contacted when structures meeting the following criteria are included in projects administered by SHA or any outside agency/entity. In addition, it is recommended that OOS SHA be consulted to determine if existing structures are currently in the inventory or if proposed structures should be inventoried. Projects involving inventoried structures are required to follow OOS-GPM-PM-202 Structure Milestones for plan development.

SHA OOS is the designated authority for reviewing structure plans for projects receiving federal funding (i.e. Local Government, Transportation Alternative Projects (TAP), etc.) In these instances, bridges and small structures that meet the following criteria but not inventoried by SHA OOS must also follow OOS-GPM-PM-202 Structure Milestones for plan development.

BRIDGES

SHA OOS is responsible for inspecting and maintaining approximately half of the over 5,000 bridges carrying motor vehicles, bicycles, pedestrians, and trains in Maryland. The other half of the bridges are owned and maintained by up to 15 different agencies, including county highway agencies, city or municipal highway agencies, state toll authorities, private owners, and even NASA. SHA generally owns and maintains bridges on (or over) numbered routes that do not have a toll (i.e. MD 468, US 219, I-83). Baltimore City owns and maintains all the bridges without tolls within its borders

Federal regulations and the National Bridge Inspection Standards (NBIS) define a bridge as follows ***(23 CFR 650 Subpart C)*** *A structure, including supports, erected over a depression or an obstruction such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes. It may also include multiple pipes, where the clear distance between openings is less than or equal to half of the smaller contiguous opening.*

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The following diagram is taken from Publication No. FHWA-HIF-22-017 Specifications for the National Bridge Inventory published by the US Department of Transportation Federal Highway Administration which "A" is the length of the structure. SHA must submit inventory and condition data for bridges meeting these criteria to the Federal Highway Administration (FHWA) on or before March 15th annually for all of Maryland's bridges.

Examples – NBIS Bridge Length

Report measurement A.

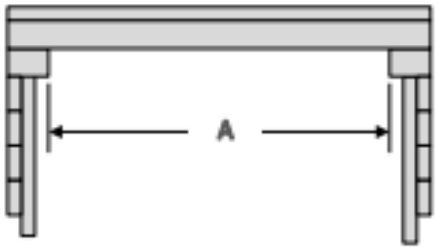

Figure 14. Profile view of a single span bridge with pile bent abutments.

Report measurement A.

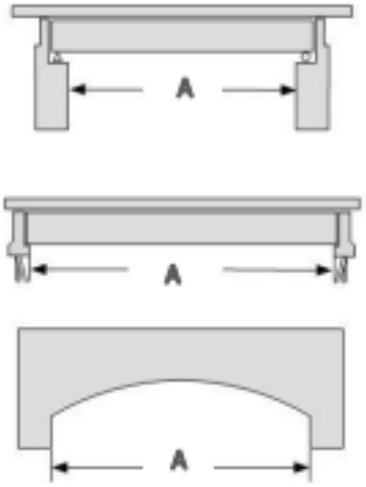

Figure 15. Profile views of various single span bridges.

Report measurement A.

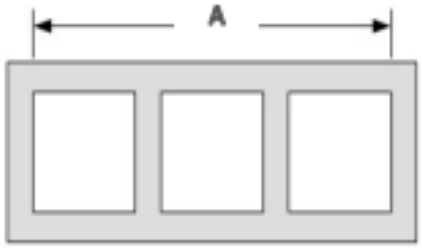

Figure 16. Profile view of a four-sided, multi-cell culvert under fill.

Report measurement A.

Figure 17. Profile view of a multi-pipe culvert under fill.

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SMALL STRUCTURES

A small structure (excluding retaining walls) is defined as a structure with a total length (combined spans or openings) from 5 feet to 20 feet as measured along the centerline of roadway; however, the criteria for placing a small structure on the SHA OOS inventory is more complex than this simple definition. SHA OOS owns and maintains approximately 4000 small structures which include small bridges, box culverts, rigid frames, single pipes, batteries of pipes, and retaining walls. These structures are not required to be reported as part of Maryland's annual submission to the FHWA but are routinely inspected every four years by SHA OOS and monitored for condition.

SMALL STRUCTURE CRITERIA FOR PIPE STRUCTURES

Most of the structures within the OOS Small Structure Inventory are pipe structures; however, not all SHA pipes meet the criteria to be placed on this inventory. The following cases define the criteria for pipes to be considered small structures:

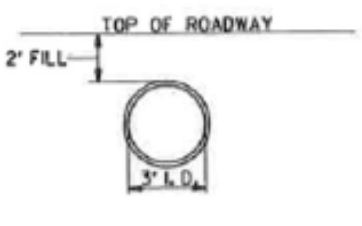
CASE NO. 1

Any pipe with an opening equal to or greater than 5 feet and less than or equal to 20 feet with any depth of fill is a small structure.

Example:
*This **IS** a small structure.*

CASE NO. 2

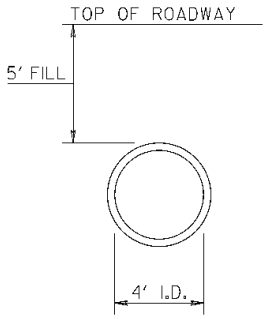
Any pipe with an opening equal to or greater than 3 feet and less than 5 feet with a depth of fill less than the pipe opening is a small structure.



Example:
*This **IS** a small structure.*

CASE NO. 3

Pipe(s) with an opening equal to or greater than 3 feet and less than 5 feet with a depth of fill equal to or greater than the largest pipe opening are not small structures.



Example:
*This **IS NOT** a small structure.*

CASE NO. 4

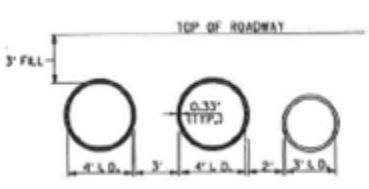
Pipe(s) with an opening less than 3 feet for any depth of fill is not a small structure.

Example:
*This **IS NOT** a small structure.*

CASE NO. 5

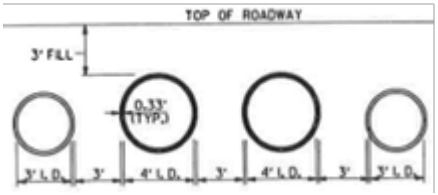
Multiple pipes carrying the same stream is a small structure if the depth of fill is less than the largest pipe opening, pipe openings equal to or greater than 3 feet and less than 5 feet, the clear distance between any pair of pipes is less than the largest pipe opening and:

(#1) The structure length is less than or equal to 20 feet.



Example:
*This **IS** a small structure with a "span" length of 17.3 feet.*

(#2) The structure length is greater than 20 feet and the clear distance between any pair of pipes is equal to or greater than half the smallest pipe opening of the adjacent pipe.

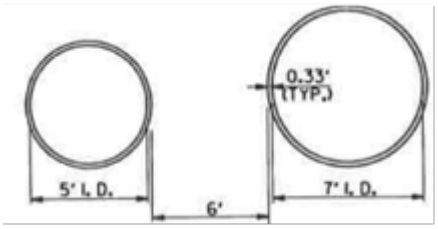


Example:
*This **IS** a small structure with a "span" length of 25.0 feet.*

CASE NO. 6

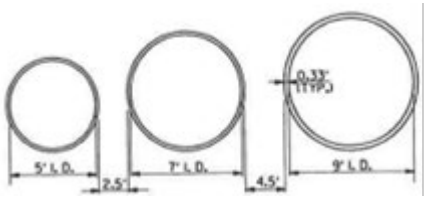
Multiple pipes carrying the same stream is a small structure if the pipes have pipe openings equal to or greater than 5 feet, the clear distance between any pair of pipes is less than the largest pipe opening, and:

(#1) The structure length is less than or equal to 20 feet.



Example:
*This **IS** a small structure with a "span" length of 18.7 feet.*

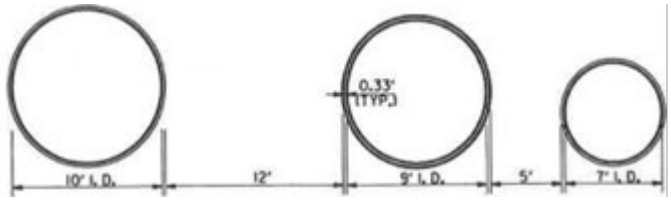
(#2) The structure length is greater than 20 feet and the clear distance between any pair of pipes is equal to or greater than half the smallest pipe opening of the adjacent pipe.



Example:
*This **IS** a small structure with a "span" length of 29.3 feet.*

CASE NO. 7

Pipes shall be considered as individual structures if the distance between outer pipe openings to the extreme inside faces as measured along the centerline of highway is greater than 20 feet and the clear distance between any pair of pipes is equal to or greater than the largest pipe opening.



Example:
*These **ARE** two small structures; structure lengths are 10.0 feet and 21.7 feet.*

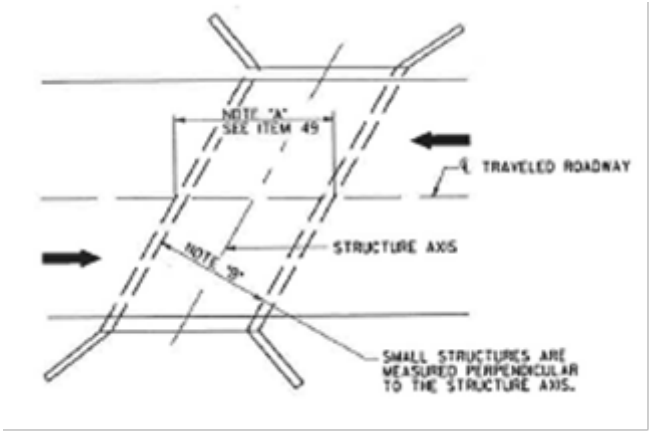
NOTE: Pipes that are **NOT** classified as small structures in the OOS Inventory typically represent drainage structures that are inventoried by the Office of Highway Development's Highway Hydraulics Division (OHD HHD)

SMALL STRUCTURE CRITERIA FOR NON-PIPE STRUCTURES

Non-pipe small structures may be small bridges, box culverts or other structures meeting the criteria below:

- Structures with a length equal to or greater than 5 feet and less than or equal to 20 feet, as measured along the centerline of traveled roadway.

- Structures with a clear span equal to or greater than 3 feet and less than 5 feet and a depth of fill less than the clear span



Note 'A'
If a structure length as measured along the centerline of traveled roadway is greater than 20 feet, then the structure is considered a bridge.

Note 'B'
The clear span length is the distance between the extreme inside edges of the structure and is measured perpendicular to the structure axis.

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Example: Box Culvert

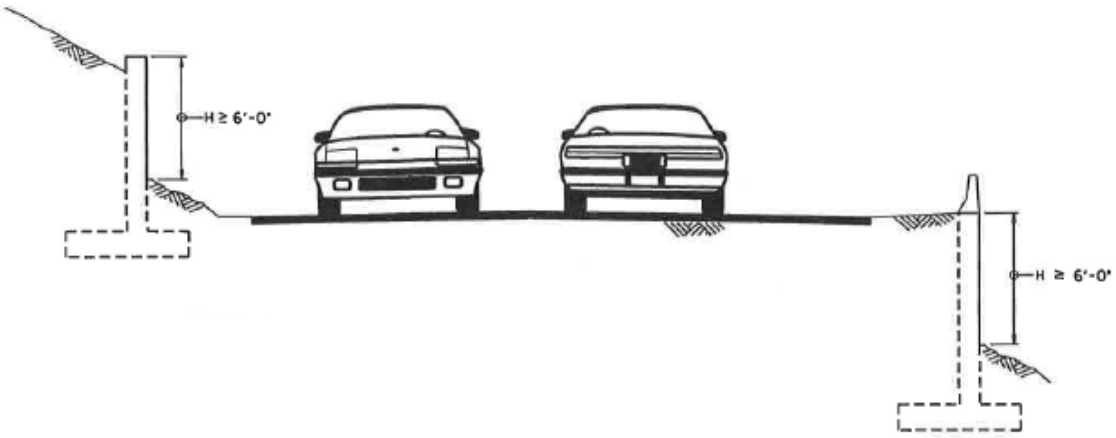
Example: Small Bridge

SMALL STRUCTURE CRITERIA FOR RETAINING WALLS

A retaining wall is defined as a structure that provides lateral support for a mass of soil and that owes its stability primarily to its own weight and the weight of any soil located above its base. To be identified as a small structure, retaining walls must meet one of the cases outlined below:

CASE NO. 1 (H ≥ 6 FEET)

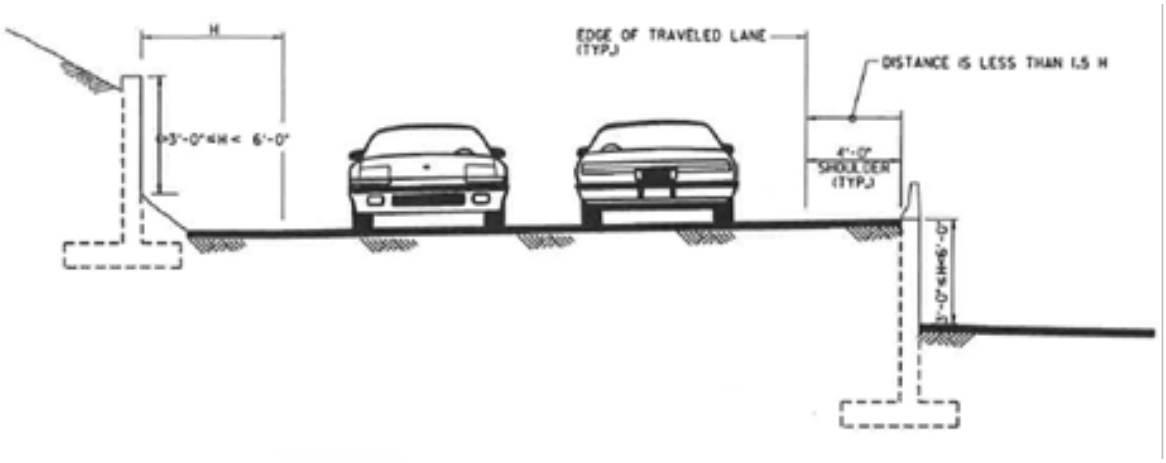
All retaining walls with an exposed height above the groundline greater than or equal to 6 feet shall be inventoried as a small structure.



CASE NO. 2 (3 FEET ≤ H < 6 FEET)

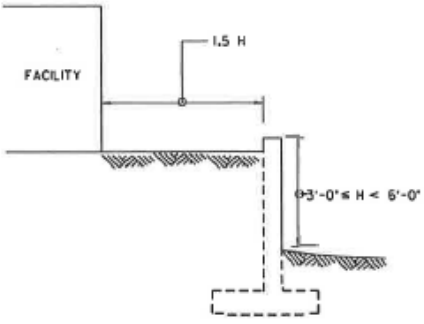
Retaining Walls supporting fill above a roadway with an exposed height (H) less than 6 feet but greater than or equal to 3 feet within a distance of 'H' to the edge of a traveled lane shall be inventoried as a small structure.

Retaining walls supporting roadway with exposed height (H) less than 6 feet but greater than or equal to 3 feet within a distance of 1.5 H from the edge of the traveled lane shall be inventoried as a small structure.



CASE NO. 3 (3 FEET ≤ H < 6 FEET)

Retaining walls supporting any facility with an exposed height (H) greater than or equal to 3 feet and less than 6 feet shall be inventoried as a small structure if the distance to the facility is less than or equal to 1.5 times the height of the wall (1.5H). A facility is defined as any building, structure, roadway, sidewalk, bike path, parking lot, or other improvement.



Example: Retaining Wall supporting a facility