



## 1.0 Background

The Federal highway Administration (FHWA) and the Wisconsin Department of Transportation in the structures inspection manual<sup>1</sup> have defined bridges in most cases to span an opening of more than 20 feet. Culverts have traditionally been structures not meeting the Federal definition or criteria for a bridge.

### 1.1 Terms and Definitions

'C' – Structures – Pipes, culverts and other structures specifically designed as part of a highway project are often assigned a number beginning with the letter 'C'. Most structures of this type have a bronze plaque attached to the structure (similar to that of all Wisconsin bridges) with the number embossed it. The plan for a 'C' structure should be found in the 'as-built' plans for that highway segment and should also be available in the Highway Structures Inventory System (HSIS). However, some other structures may have also been assigned a 'C' number even though they were not designed by WisDOT and a plan may not be available. Generally all structures with a span from 10 to 20 feet have been assigned a 'C' number statewide. Some structures from 5 feet up to 10 feet may have a number as well.

Culvert Pipes - WisDOT classifies culvert pipes as a generally round, circular or elliptical structure which is not classified as a bridge (hereinafter called **culvert pipes**) and used for storm-water drainage purposes which cross under the highway pavement. Structures which are square or rectangular with flat side walls and a flat ceiling and floor are considered **box culverts** and are not culvert pipes. Three sided structures, rigid frames and arch structures with a footing or without a floor are not considered to be culvert pipes. Except for the term, "culvert pipes", all other terms are defined in Part 4 of the Wisconsin Department of Transportation Structure Inspection Manual, Chapter 6 or the "Great Lakes Road Stream Crossing Inventory Instructions".

Culvert Pipes identified as a Bridge – as defined in the WisDOT Structures Inspection Manual - Chapter 6, a culvert larger than 20 foot diameter or certain combinations of multiple pipes (sometimes called 'nested') where, in general, the diameters of adjacent culverts add up to more than 20 feet, are classified as a bridge and therefore are inspected by certified bridge inspectors. This policy does not apply to culvert pipes identified as a bridge.

Off-system Culvert Pipes – culvert pipe structures which do not pass under the pavement of the highway will not be included in the inventory or inspection schedule described in this chapter. If there are off system culvert pipes on the highway right of way, they are parallel to the centerline of the road and provide drainage for local roads or driveways.

## 2.0 Inventory and Inspection

The department is responsible to keep an inventory of all culvert pipes (regardless of its diameter / size) crossing under the pavement of any state or federal highway in order to maintain the mobility and safety of motorists on that highway. These are "cross draining" culvert pipes. The inventory for cross draining culvert pipes shall include but is not limited to the following data:

- Location information
- Size of culvert pipe (diameter and length)
- Composition of culvert pipe (steel, concrete, aluminum, etc.)
- Culvert pipe end treatments

Cross draining culvert pipes shall be inspected every 48 months – at a minimum. The inspector or a maintenance engineer is encouraged to increase the frequency of inspections if conditions warrant. The inspection shall include the following:

- Condition of culvert pipe elements
- Any maintenance actions required to keep the culvert pipe from collapsing, separating or causing erosion or anything that would prevent storm-water from passing through the pipe as intended
- Verification of the inventory data

Pipes running parallel to the highway (off-system culvert pipes) such as a driveway or side road culvert shall not be included in the inventory. Pipes, whether parallel or cross draining, that are within the connecting highway limits of a city or other municipality need not be included in the inventory, but are recommended to be inventoried and inspected by that municipality. Other structures such as box culverts will be inspected and inventoried by appropriately trained structural engineers as assigned by the WisDOT - Bureau of Structures.

### **3.0 Inspector Qualifications**

The department requires any inspector of culvert pipes be appropriately trained to inspect the culvert pipes. Culvert pipe inspectors shall not inspect box culverts or bridges unless they are a Wisconsin Certified Structures Inspector trained by WisDOT.

The department or WisDOT regional office may elect to train county employees or limited term employees to become inspectors of culvert pipes.

### **4.0 Installation of New Cross Draining Culvert Pipes (or Replacement of an Existing Culvert Pipe)**

In rare instances, new culvert pipes may need to be installed for drainage purposes by maintenance forces. New culvert pipes under state and federal system highways and all other roads should be designed according to Chapter 13 of the Facilities Development Manual<sup>2</sup>.

New culvert pipes under driveways need to follow Chapter 9, Section 10 of the Highway Maintenance Manual.

#### References:

<sup>1</sup> State of Wisconsin - Structure Inspection Manual, Chapter 6

<sup>2</sup> State of Wisconsin – Facilities Development Manual, Chapter 13