

203-2.02(10) Culvert Sumping [Rev. Mar. 2013]

Sumping consists of placing the structure-invert elevation and scour protection at a specified depth below the waterway or stream flowline to satisfy the IDEM Water Quality Section 401 permit requirements. Sumping allows the natural movement of stream-bed material through the structure. Sumping should be provided for each structure over Waters of the United States and Waters of the State.

1. Three-Sided Structure. The sump depth should be 18 in. for a stream bed of sand, 12 in. for a stream bed of other soil, or 3 in. for a stream bed of rock or till. The stream bed and scour protection should be as shown on the INDOT *Standard Drawings*. A base slab should be used only if the geotechnical report identifies flowline-area soil that will not support riprap. No increase in structure size is required due to sumping. The sump area will not require backfill as part of the contract work, but will be allowed to fill in naturally over time.
2. Pipe or Box Structure. Such a structure should be sumped as shown on the INDOT *Standard Drawings* and Figure [203-2E](#), Pipe- or Box-Structure Sump Requirement.

If the required sump exceeds 3 in., the structure diameter or rise may need to be increased by the sump value. The structure's design capacity should be checked to determine if such increase is required. If a pipe end section or riprap is required, these should be sumped to the same depth as the structure. The sump area of the structure and end section or riprap will not require backfill as part of the contract work, but will be allowed to fill in naturally over time.

Changes to the flowline elevation can occur between the initial project survey and construction. Significant changes to the flowline elevation may require an adjustment to the invert or top of footing elevation to ensure the appropriate sump is constructed. Where sumping is required, a note should be placed on the General Plan sheet for Bridge Plans or Structure Details and General Notes sheets for Road Plans as follows:

Contractor shall verify the existing flowline elevation to set the appropriate sump depth.

The designer should coordinate with the Office of Hydraulics to determine the necessary elevation adjustments. Typically, if the difference between the flowline elevation shown on the plans and existing flowline is half the sump depth or greater, the structure elevations should be lowered accordingly to provide the sump as shown on the plans. If the existing flowline elevation is higher than the flowline elevation shown on the plans, no changes are required to the structure elevations.

Scour-protection limits should be shown on the plans. Quantities for geotextile and riprap, or a base slab intended for scour protection, should be determined and identified as such in the Structure Data table for each applicable structure. Appropriate columns have been incorporated into the Structure Data table.

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