

Broad-crested Weir Coefficients

Bridge Link roadway overtopping can be represented as a Broad-crested weir with the following coefficient attributes based on the FHWA Design Manual.

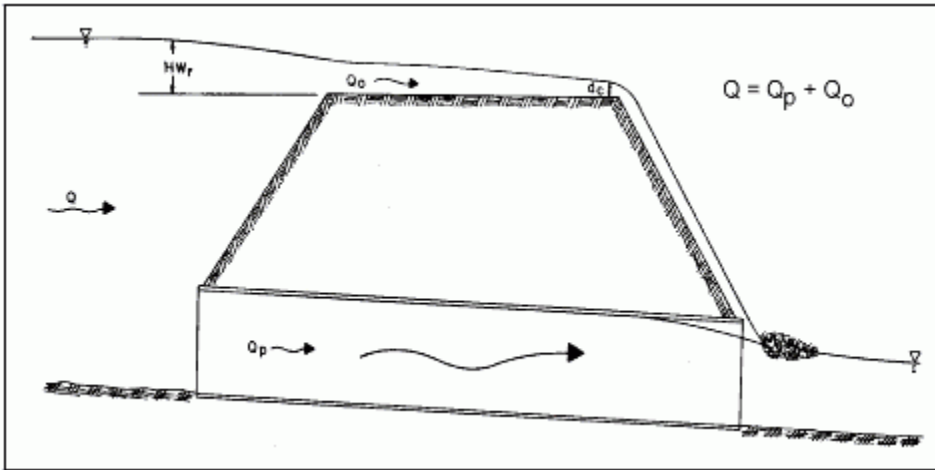


Figure 1: Roadway overtopping

Roadway overtopping will begin when the headwater rises to the elevation of the roadway (Figure 1). The overtopping will usually occur at the low point of a sag vertical curve on the roadway. The flow will be similar to flow over a broad crested weir. Flow coefficients for flow overtopping roadway embankments are found in HDS No. 1, Hydraulics of Bridge Waterways, as well as in documentation of HY-7, the Bridge Waterways Analysis Model. Curves from the Bridge Waterways Analysis Model reference are shown in Figure 2 below. Figure 2-A is for deep overtopping, and Figure 2-C is a correction factor for downstream submergence. The equation below defines the flow across the roadway.

$$Q_o = C_d L H_w^{1.5}$$

Where:

Q_o = the overtopping flow rate in m^3/s (ft^3/s)

C_d = the overtopping discharge coefficient (for use in SI units, see note below)

L = the length of the roadway crest, in m or ft

H_w = the upstream depth, measured from the roadway crest to the water surface upstream of the weir drawdown, in m or ft.



C_d is determined from Figure 2, and other English unit research must be corrected by a factor of 0.552 [C_d (SI) = 0.552 (C_d English)]

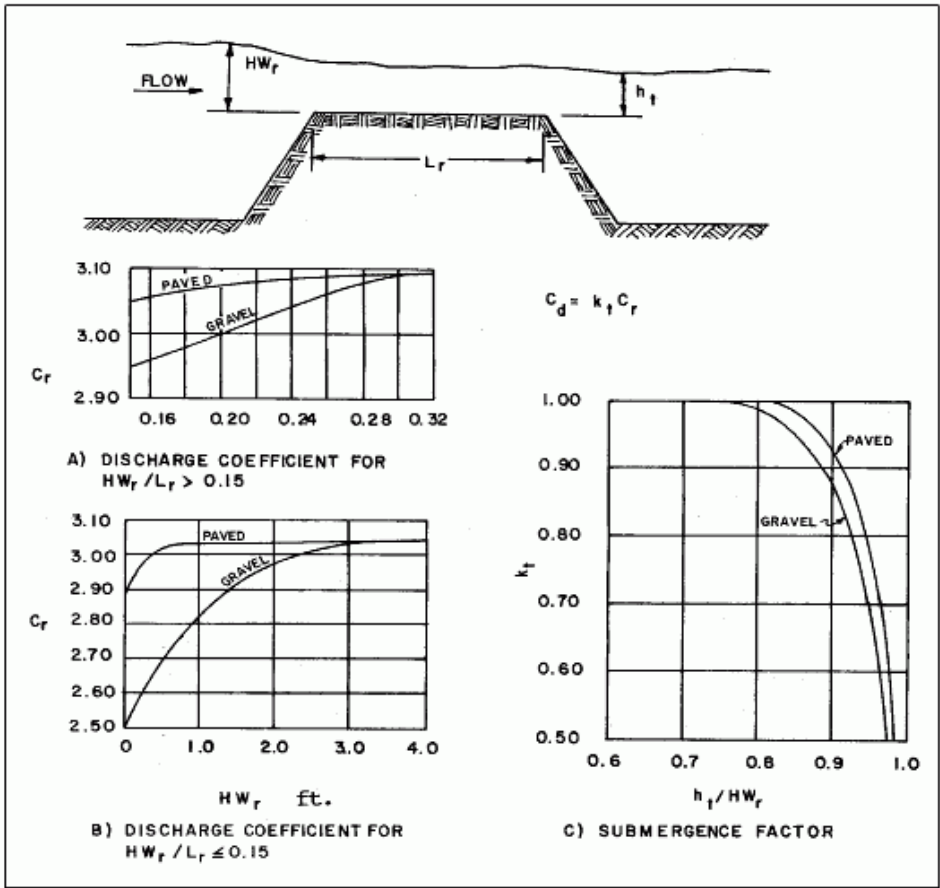


Figure 2 - English Discharge Coefficients for Roadway Overtopping

Other Bridge Link Data is discussed on the [Bridge Link](#) Help topic section.