

University of Missouri Extension

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Design Criteria for Formless Concrete Flumes

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Editor's note

The printed version of this publication includes illustrations.

The formless concrete flume is a spillway constructed of concrete without forms. The earth is excavated to the dimensions and shape of the structure. Concrete is placed on this earth form to the required depth and floated into shape. Two types of formless concrete flumes are shown in Figure 1.

Adaptability

This structure is best adapted to overfalls of less than 6 feet. It may be used to control overfalls in natural and constructed channels; to prevent erosion at the ends of waterways and diversions; and to lower runoff water over drainage ditch banks.

Advantages

The use of earth as a form eliminates the need for construction of wood forms.

Limitations

Hand labor is required to form the earth to the desired shape and to place the concrete. This structure is limited to sites that have good natural drainage and it should not be used as a water impounding structure.

Design

After the desired capacity has been determined, the size of the notch for Type A structure can be determined from Table 1, and for Type B structure from Figure 1. The principal dimensions needed for construction are given in Figure 1. If the width of notch is greater than 8 feet or if the height of the overfall is 6 feet or more, increase the thickness of the concrete in the floor of the Type A structure to 5 inches and use additional reinforcing.

Construction

The earth form should be smooth and shaped to the proper grade to prevent the use of an excessive amount of concrete. The soil must be damp and firm to provide a good base for the concrete. Use concrete with a 28-day strength of at least 2,500 pounds per square inch. Use a stiff mix to prevent the concrete from slumping down the slopes.

Take precautions during construction to ensure that the proper thickness of concrete is obtained with the reinforcing mesh placed as indicated in Figure 1. Work the concrete into proper shape with a wood float. Use a curing compound or cover the structure with straw, earth or other type of cover and keep moist for at least one week following construction.

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