

Horizontal bridges on slopes



AI Overview

Bridges on sloped terrain require careful alignment, cross slope management, and end bent design to ensure structural stability, proper drainage, and safe travel. Alignment and Geometry Bridges should ideally be located on straight horizontal alignments to simplify construction and reduce costs, as curved bridges are more complex to fabricate and build. When a bridge must be on a curve, the radius should be large enough to allow straight girders and deck, minimizing complex camber and superelevation transitions. Horizontal curves should extend beyond the bridge length where possible to reduce design and construction complexity. Cross Slope and Deck Design The preferred minimum cross slope on a bridge deck is 2 percent, which facilitates drainage and prevents icy conditions. Constant cross slopes are recommended across the bridge length to simplify construction. Transitional cross slopes or superelevation changes should be avoided if possible, as they create flat areas that can trap water and increase maintenance issues. If unavoidable, scuppers or drainage features should be installed to manage water accumulation. End Bent Slopes and Berms End bent slopes should be designed according to the terrain: typically 1.5:1 in fill sections and 2:1 in cut sections, unless otherwise recommended by geotechnical engineers. Slopes should be normal to the end bent cap, and slope protection or berms may be required to prevent erosion and maintain stability. Berms are often provided at the toe of fill slopes or cut/fill transitions, with widths and heights adjusted based on slope protection and hydraulic considerations. Vertical Considerations Bridges on slopes must maintain a minimum grade of 0.2% to ensure proper drainage. Vertical curves, such as sag or crest curves, are used to provide smooth transitions between grades and should ideally extend beyond the bridge to reduce drainage and construction issues. Clearance under the bridge should meet minimum standards, typically 2 feet for interstate an...

Article Content

Bridge Design Details 2.1 February 2025

It is recommended that horizontal curves extend beyond the bridge length, if possible, to minimize the design and construction complexity of the bridge structure.

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Research on the Influence Mechanism of the High-Steep Slope on the ...

Compared with flat areas, the substructure of bridges on a high-steep slope is more complicated and has many differences in bearing mechanism and stress conditions. Given its stress

Section 2 Geometric Design Policy for Bridges

Purpose This policy provides the minimum requirements for bridge roadway and facility widths, vertical under-clearances and design live loads for NYSDOT projects. These standards have been

CHAPTER 11 BRIDGE LAYOUT

When slope protection is used, the berm shall be sloped away from and normal to the cap at a rate of 1/2 in/ft (50 mm/m). The proper berm width should be used in determining the length of bridges. The

Lateral Behavior of Piled Bridge Foundation and Stabilizing Piles on ...

In this study, model test and numerical simulations were carried out aiming at clarifying the lateral behavior of piled bridge foundation and stabilizing piles on steep slope. Evolution of bending

2.1 Bridge Layout

Horizontal and vertical alignments for all roadways, railroads, and channels (existing/proposed) which are over, under, or near bridge Structure barrier type(s) Approach slab

Chapter 2

Superelevation Transition Slope Rates for Rural Highways, Urban Freeways and

Chapter 12 Abutments

Slopes greater than 1.5 horizontal to 1 vertical are difficult to construct and generally are not specified. It is sometimes advantageous to have the roadway contractor place extra fill that later must be

260 Bridge Structures

Bridges with one-way traffic typically have a uniform cross slope applied over all travel lanes and required shoulders; however, the use of deck slope-breaks can be considered on a case

Soil Cut Slopes

The stability of soil cut slopes can be assured through appropriate geotechnical investigation, analysis, and design thereby preventing landslides, slip outs, slumps, severe erosion, safety issues,

Microsoft Word

C.9.b.3.(b) On Turning Roads3-433-403-403-38 Sight Distance for Intersection Maneuvers3-433-403-403-38

BDD Chapter 2 Bridge Layout

It is recommended that horizontal curves extend beyond the bridge length, if possible, to minimize the design and construction complexity of the bridge structure.

BDP 11.1 Abutments

11.1.2 TYPES OF ABUTMENTS The most common types of abutments used for highway bridges are shown in Figure 11.1.2-1. In general, abutments can be classified as open-end and closed-end. The

Design and Construction of Soil Slopes

The design of stable slopes in soil has been extensively studied by engineers and geologists. In recent years, substantial advancements have been made in understanding the engineering characteristics

Clear Zone and Horizontal Clearance

It presents procedures to determine a recommended minimum clear zone on tangent sections of roadway with variable side slopes and adjustments for horizontal curvature.

DESIGN OF BRIDGES

In the present handbook, actions on bridges and load combinations according to Eurocode 1_2 are illustrated, stressing the philosophy and methodological criteria that have brought to the definition of

Effects of Landslides on the Displacement of a Bridge Pile Group ...

When designing a bridge pile foundation on a high and steep slope, its deformation capacity and embedment effect under a horizontal load should be determined in addition to the vertical

CHAPTER SIX

End bent slopes will be paved or stabilized on all bridges over roads and at other locations as stipulated in the Bridge Policy (see 6-1, of this Chapter). End bent slopes beneath bridges will be on 1.5:1

Bridge: Horizontal and Vertical Alignment

The preferred minimum cross slope on a bridge deck is 2 percent, which will facilitate travel lanes drainage and help avoid an icy bridge deck.

PDDG Chapter 4

See Section 4.4 for more information regarding the combination of the design of horizontal and vertical alignments. Horizontal curves should be avoided on

IRC:5-2015

Span is the horizontal distance between the centre line of adjacent supports of a bridge superstructure, or maximum distance between the inner walls of a culvert, measured along its axis.

BDD Chapter 2 Bridge Layout

Bridge Design Details 2.1 February 2025 Bridge Layout This section describes vertical and horizontal curve information used to establish the control points and primary geometric characteristics of a

CH 2 Bridge Layout

Design Details 2.5 January 2023 Horizontal Alignment A horizontal alignment is provided in the Bridge Site Submittal from the District and is given as a stationed layout line for highways, off-ramps, walls,

Effects of Landslides on the Displacement of a Bridge Pile Group ...

However, full-scale field tests for investigating the stress generated in bridge pile foundations on high and steep slopes have not been conducted yet. The only related field tests were

Clear Zone and Horizontal Clearance

Clear Zone and Horizontal Clearance What is the definition of clear zone? The Roadside Design Guide defines a clear zone as the total roadside border area, starting at the edge of the

Bridge Geometry Manual

Bridge Geometry Manual Publication No. FHWA-HIF-22-034 Infrastructure Office of Bridges and Structures

321.1 Design of Earth Slopes

321.1 Design of Earth Slopes ... This article provides requirements for design of earth slopes commonly encountered in transportation rights of way.

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