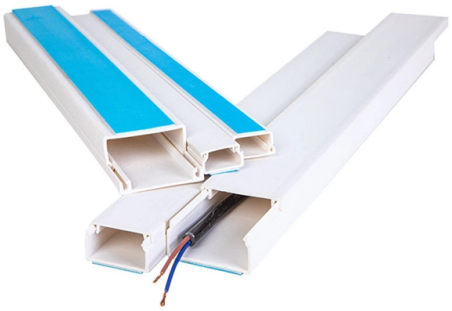
Bend of the bridge structure at the bend



Overview

What Is a Bridge Bent?

Bents vs. Piers ExplainedThink of a pier as a single leg and a bent as a frame with multiple legs tied together at the top. In pract.

Key Takeaways

A bridge bent is a substructure support consisting of two or more columns connected by a horizontal cap beam, transferring loads from the bridge deck to the ground.

Definition and Function

A bridge bent is a structural frame located beneath the bridge deck, designed to support the bridge and its traffic by transferring vertical and lateral loads to the foundation. While the terms "bent" and "pier" are often used interchangeably, a pier typically has a single column on one footing, whereas a bent has two or more columns, each with its own footing. Bents are commonly used in wide highway overpasses or bridges carrying heavy loads, providing a rigid frame that resists tipping and lateral forces from wind, earthquakes, or vehicle braking.

Components of a BentCap Beam: The horizontal member at the top of the bent that supports the bridge deck or girders and channels the load to the columns. Columns: Vertical members that carry both vertical and lateral forces down to the footings. Bents can have two, three, or more columns depending on bridge width and load requirements.

Footings: Foundations at the base of each column that distribute the load over a wider area of soil or rock to prevent uneven settlement.

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Types and Materials

Bents can be classified based on the number of columns: single-column, two-column, or multicolumn bents. Specialized types include outrigger bents, where columns are outside the bridge deck, and drop bent caps, which support girders directly on top. Materials commonly used include concrete, steel, timber, or a combination, depending on design requirements and site conditions.

Load Transfer and Design Considerations

The primary role of a bent is to transfer dead loads (bridge weight) and live loads (traffic, snow) from the deck through the cap beam and columns to the footings and ground. Bents also resist lateral forces, providing stability against wind, seismic activity, and other horizontal forces. Design considerations include column spacing, cap beam type (integral, drop, or inverted tee), and connection to the superstructure, which may be fixed or pinned.

Summary

Bridge bents are essential substructure elements that provide both vertical and lateral support for bridges. Their multi-column design, material selection, and configuration are tailored to the bridge's span, load, and environmental conditions, ensuring safety, stability, and durability.

Article Content

What Is a Bridge Bent? Bents vs. Piers Explained

Think of a pier as a single leg and a bent as a frame with multiple legs tied together at the top. In practice, engineers choose between them based on the span of the bridge, the loads

BDD Chapter 7 Bent

The BENT (PIER) LAYOUT and BENT (PIER) DETAIL sheets provide specific details for the bridge bents and piers. By definition, bridge supports can only be labeled as PIERS if a span crosses a

Bridge Inspection: Piers and Bents (BIRM)

A pier or bent is an intermediate substructure unit located between the ends of a bridge. Its function is to support the bridge at intermediate intervals with minimal obstruction to the flow of traffic or water

7.1 Bents

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The BENT (PIER) LAYOUT and BENT (PIER) DETAIL sheets provide specific details for the bridge bents and piers. By definition, bridge supports can only be labeled as PIERS if a span crosses a

Bridge Mechanics (BIRM)

Bending forces in bridge members are caused when a load is applied perpendicular to the longitudinal or neutral axis. A moment is commonly developed by the perpendicular loading which causes a

Bent (structural)

An "outrigger bent" is one where the vertical piers are located outside the bridge''s deck, hence the horizontal bent is wider than the bridge deck. The term bent is probably an archaic past tense of the

2 Forces acting on bridges

Bending is a combination of compression and tension forces that cause a material to bend or flex. Bridges are subjected to bending forces when loads are applied off-center or unequally distributed

Bridge Structure Terminology Guide

This document defines various structural engineering terms related to bridges, including components like abutments, anchors, arches, beams, bents, cables, decks, footings, girders, piers, trusses, and more.

Straddle Bent Design for Light Rail Bridge

The document discusses the modeling and analysis of a post-tensioned straddle bent that is integral with a multi-span light rail bridge superstructure.

Horseshoe Bend | Colorado River Overlook, Page, AZ

Horseshoe Bend is a 270° meander of the Colorado River near Page, AZ. Hike 0.6 miles from the parking lot to one of the most photographed views in the

The Beam Bridge | HowStuffWorks

Bridge building doesn''t get any simpler than this. In order to build a beam bridge (also known as a girder bridge), all you need is a rigid horizontal structure (a

Engineering for Structural Stability in Bridge Construction

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Bent (structural)

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A bent in American English is a transverse rigid frame (or similar structures such as three-hinged arches). Historically, bents were a common way of making a timber frame; they are still often used

NYT Connections archive

Every NYT Connections puzzle ever published is listed here, organised by date, with all four category groups and their sixteen words. The NYT only offers the current day''s puzzle for free,

The Ultimate Bending Guide

Bending is a fundamental concept in mechanics of materials and structural analysis. It occurs when a beam or a structural element is subjected to a load that causes it to curve or bend.

How bridges work

A simple explanation of how bridges work, including descriptions of the many different types, and the reasons why bridges collapse.

Bridge Basics, Typical Sections

Bridges are an integral part of a roadway system. The functional part of a bridge where vehicles and pedestrians travel on is the bridge deck

What is a Bent in Construction?

In the realm of construction and civil engineering, the term "bent" refers to a structural element that forms a key part of a bridge, trestle, or similar structure.

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