

Article Overview

Cross-bridge supports, or cross-frames, are structural elements designed to stabilize bridge girders, distribute loads, and resist lateral and torsional forces according to AASHTO LRFD specifications.

Purpose and Function

Cross-bridge supports, commonly referred to as cross-frames, serve multiple purposes in bridge structures. They:

- o Stabilize longitudinal girders against lateral-torsional buckling.
- o Distribute vertical dead and live loads across the bridge superstructure.
- o Resist dynamic and construction-stage loads, ensuring structural integrity throughout the bridge's life .

Design Standards

Design of cross-frames follows the AASHTO LRFD Bridge Design Specifications, currently the 9th or 10th edition depending on the project . Key considerations include:

- o Load combinations: Cross-frames must be designed for all relevant limit states, including service, strength, fatigue, and extreme events.
- o Construction stages: Cross-frames are analyzed for both temporary and final conditions to account for staged construction effects .
- o Stability bracing: Cross-frames provide lateral and torsional bracing to prevent buckling of main girders .

Material and Geometry

- o Materials: Typically fabricated from structural steel, with corrosion-resistant coatings or weathering steel for long-term durability .
- o Geometry: Cross-frames can be diagonal, K-type, or X-type, depending on bridge span, girder spacing, and load requirements. Geometric properties, such as member length, cross-section, and connection details, are critical for performance .

Load and Resistance Considerations

- o Vertical loads: Dead and live loads are distributed through cross-frames to adjacent girders.
- o Lateral and torsional loads: Wind, seismic, and braking forces are resisted by the cross-frame system.
- o Capacity checks: Each member is checked for axial, bending, and combined stress limits according to LRFD criteria .

Specifications of cross-bridge support

Detailing and Installation

- o Connections: Bolted or welded connections are designed to transfer forces efficiently.
- o Integration: Cross-frames are coordinated with diaphragms, hangers, and other superstructure elements to ensure overall stability .
- o Maintenance: Proper detailing and corrosion protection extend service life and reduce maintenance demands . In summary, cross-bridge supports are essential for structural stability, load distribution, and long-term performance of bridges, and their design must comply with AASHTO LRFD specifications, considering material, geometry, load effects, and construction stages .

Stringer material Stringer dimensions Decking material Decking dimensions Min. 50" to diversion

Whether it's solid, cross, herringbone, or X-bridging, each type plays a crucial role in

A structure, including supports, erected over a depression or an obstruction (e.g., water, a highway, or a railway) with a

CSUB designs and fabricates GRP subsea crossings and bridges for pipelines and umbilicals where controlled separation, reliable

In the present handbook, actions on bridges and load combinations according to Eurocode 1_2 are illustrated, stressing the

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

Bridges - initial design The choice of bridge form is usually made at an early stage and one or more initial configurations with

All of the bridge designs consider constructability as part of the design, including the wind on the steel framing, deck placement

Bridge Design Specifications. This edition of the Handbook was updated to be current with the 9th edition of the AASHTO LRFD

These Road and Bridge Specifications are standard for all contracts awarded by the Commonwealth Transportation

Pipe Cradle Supports Typical installations of Ductile Iron pipe on bridges involve a basic "pipe-on-supports"

Specifications of cross-bridge support

approach, depending on

Also, according to AASHTO LRFD Bridge Design Specification (2007) 5.13.2.2, cross beam should be placed obligatorily at supports

Cross-chain bridges like the Avalanche Bridge facilitate the transfer of various assets and data across different

Occasionally pipeline designers encounter situations where a bridge-supported aerial pipeline installation is

The USDA Forest Service Standard Trail Plans and Specifications are the design, construction, and

This report is part of the so-called Technical documents (Type 2 above) and contains a comprehensive description of the practical

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