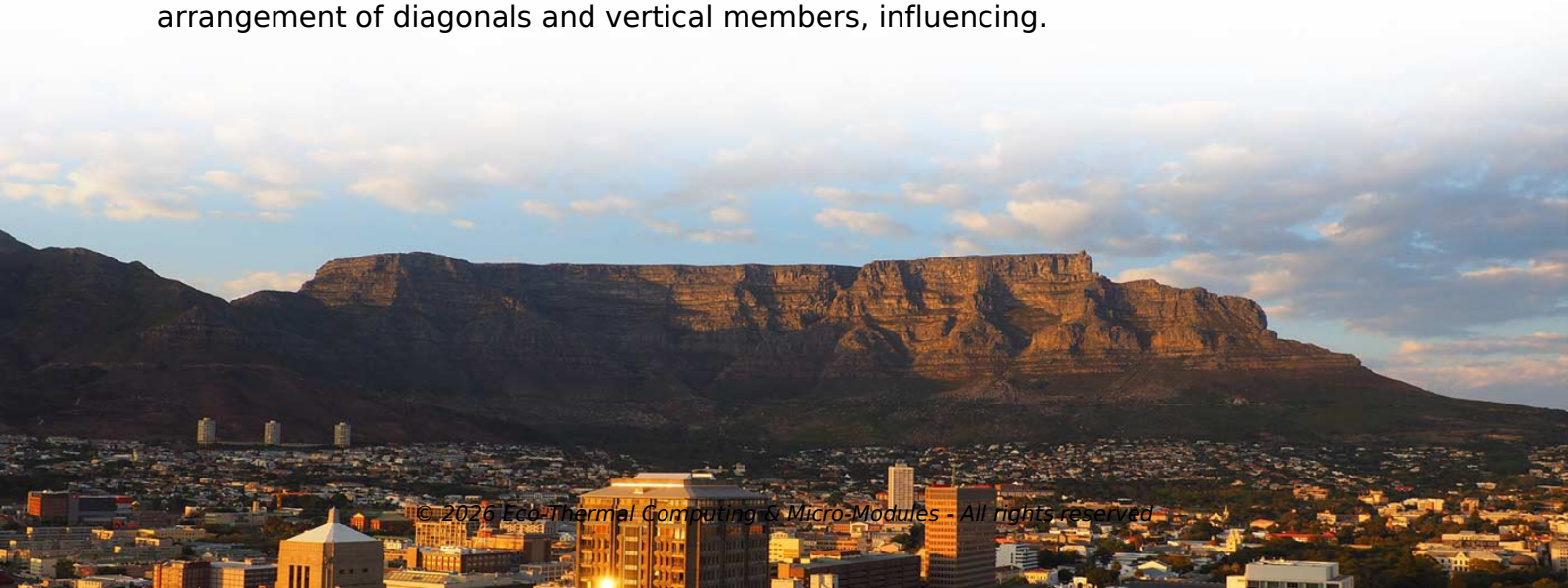
Bridge-type tension frame

Overview

A truss bridge is a bridge whose load-bearing superstructure is composed of a truss, a structure of connected elements, usually forming triangular units. The connected elements, typically straight, may be stressed from tension, compression, or sometimes both in response to. Four primary steel truss types — Warren, Pratt, Howe, and K-Truss — differ by web member arrangement across spans from 6m to 100m+. Each handles internal forces in a fundamentally different way. The Fink truss is a roof-specific variant, not a primary bridge type, but included here because it. The design of truss bridges involves the analysis of the structure to obtain the internal forces due to moving traffic and permanent loads (self-weight), selection of adequate steel members, design of the connections, and check for fatigue. Also, not every type suits the purpose of the structure. There are. In order to be considered an effective brace, the cross frame must satisfy both strength and stiffness requirements. Cross frames can utilize a variety of layouts: the X-Type and K-Type cross frames are commonly used in current practice for steel I-girder bridges, while the single diagonal Z-Type. Trusses are load-bearing structures composed of triangular units, designed to spread the weight evenly across a wide area. The Warren Truss, Howe Truss, and Pratt Truss each have unique design frameworks. These truss systems differ in their arrangement of diagonals and vertical members, influencing.



Article Content

Nov 30, 2025

Frame bridges

Frame bridges are often the most economical solution for smaller spans. Orthogonal and trapezoidal frames are particularly suitable for grade separations (flyovers, underpasses – modest structures in

Nov 25, 2025

PPCO Twist System

The Post-Tensioned Box Girder Design Manual focuses on cast-in-place, post-tensioned concrete box-girder bridges with superstructure cross sections similar to those shown in Fig. 1. The manual serves

Mar 16, 2026

Different Types of Bridges

Different types of bridges constructed in the world are discussed in the article. Nature of construction, load distribution, types of materials used for construction, and

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Post-Tensioning Tendon Installation and Grouting Manual

The principal types of post-tensioning tendons in these bridges are cantilever and continuity tendons. The cantilever tendons are stressed to resist the cantilever dead load moments during construction

Nov 14, 2025

The Basic Types of Bridges

These types of bridges are modern variations of the cable-stayed bridges. In such bridges, the distribution of forces does not depend entirely on the cantilever action of the spar (supporting tower).

Sep 05, 2025

Truss types and configurations | Bridge Engineering Class... | Fiveable

Truss bridges come in various types, each with unique geometric arrangements. From the simple Warren to the complex Baltimore, these designs distribute loads differently through tension and

Dec 26, 2025

Brace Stiffness and Forces for X-Type, K-Type, and Z-Type Cross

In the course of this research, the torsional brace stiffness and the vertical brace stiffness for the X frame, K frame, and Z frame cross frame layouts was examined.

Jul 16, 2025

Post-Tensioning Details for Long-Span Concrete Bridges

Nonetheless, the economic pressure to use a smaller number of larger, multi-ple-strand tendons for the longitudinal post-tensioning of segmental bridges has resulted in the use of anchorage types which

Sep 03, 2025

(a) Tension-Only System and (b) Compression System

Cross frames improve the stability of steel bridges by providing lateral and torsional restraint along the girder length. In order to be an effective brace, the cross frame

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Suspension Bridges

A suspension bridge is defined as a type of bridge where the deck is hung below suspension cables supported by vertical suspenders, utilizing main cables that carry loads through tension. This design

Apr 02, 2026

Steel Bridges: Bracing System Design

Cross frames are necessary at all supports of straight and curved I-girder bridges to transfer lateral loads from the superstructure to the bearings, to provide no-twist boundary conditions for lateral

Jun 22, 2026

The Main Bridge Types and Their Structural Design

The structural design of a bridge varies according to the specifications, but structural safety and stability, along with optimum

Jul 10, 2025

Structural Analysis and Design of Truss Bridges

Internal Forces in Truss BridgesMembers of Truss BridgesAnalysis of Truss BridgesWorked Example: Design of Truss BridgeBottom Chord Analysis ResultsDesign of The Web MembersConclusionThe chords and web members of truss bridges can be made out of a variety of steel sections. For the tension and compression chords as well as the web members of short-span (30–50 m) highway trusses, rolled “H” sections and square hollow sections are suitable. Larger fabricated sections, such as a “top hat” section or box section, will be needed for...See more on structville Structural Basics

11 Types of Trusses [The MOST Used] - Structural Basics

Warren Truss. Click for Warren Truss Guide. The Warren truss is a very Fink Truss. Click for Fink Truss Guide. The Fink Truss is mainly used for roof Howe Truss. Click for Howe Truss Guide. The Howe Truss is mainly used for Pratt Truss. Click for Pratt Truss Guide. The Pratt Truss is very similar to the King Post Truss. Click for King Post Truss Guide. King post trusses are See full list on structuralbasics Wikipedia

Truss bridge - Wikipedia

While rare as a bridge type due to higher costs compared to a triangulated truss, it is commonly employed in modern building construction as it allows the resolution of

Jan 07, 2026

Variations among Warren Truss, Howe Truss and Pratt

In this design, the diagonal members are in tension, while the verticals experience compression. The tension-dominated design makes the Pratt Truss a popular

Apr 30, 2026

Cross Frame Design for Curved and Skewed Bridges

Cross frame design Curved Bridges: Cross frames are required to maintain stability in curved girder structures. Cross frames must be included in the design model. A two-dimensional grid model is

Nov 02, 2025

Steel Bridges: Design of Steel Stringer Bridges

Once a bridge type is selected, the designer then advances to the detailed design of the bridge. Since the vast majority of steel bridges designed today are steel girders made composite with concrete

May 30, 2026

Post-Tensioning Institute > Education > PT Applications > Bridges

Episode 4: An Engineer''s Perspective on PT Bridges Join Tim Christle, Executive Vice President of the Post-Tensioning Institute, as he welcomes Nick Amico, South Atlantic Major Bridge Lead at HDR,

Oct 20, 2025

Cross-Frame Design Questions!!! | Eng-Tips

Hello All, I am designing my first cross-frame (K-type) for a straight, two-span continuous bridge under LRFD specs. I am looking at a typical intermediate cross-frame, and a pier cross-frame.

Dec 13, 2025

Rigid-frame bridge

A rigid-frame bridge is a bridge in which the superstructure and substructure are rigidly connected to act as a continuous unit. Typically, the structure is cast monolithically, making the structure continuous

Oct 22, 2025

Steel Bridge Design Handbook

Owners will occasionally choose a bridge because they desire to construct a specific bridge type at a location. In some cases these desires come directly from the owner, but often public opinion

Jun 05, 2026

Types of Truss Bridges: Warren, Pratt, Howe & K-Truss Guide

Types of truss bridges — Warren, Pratt, Howe, K-Truss, and Fink — differ by span range and load behavior. Learn which geometry fits your steel structure project.

Oct 11, 2025

ESDEP LECTURE NOTE

Design principles are presented, e.g. span ranges, span-to-depth ratios and arrangement of diagonals. Different sections for chords and diagonals are shown

Mar 22, 2026

Understanding and Analysing Trusses | The Efficient

There are two main methods we can use to do this – the Method of Joints, and the Method of Sections. The method of joints involves applying the

Jan 25, 2026

Frame bridges

Frequent types of frame bridges and their fields of application are illustrated on the right. Historically, frame bridges were often idealised to simplify global analysis by introducing hinges. This is still useful

Jun 09, 2026

7 Types of Bridges Every Engineer Should Know About

Learn about the 7 different types of bridges and read about the advantages and disadvantages of each method of construction.

Apr 10, 2026

Steel Bridge Design Handbook Vol. 5

This course was adapted from the U.S. Department of Transportation Federal Highway Administration Publication No. FHWA-HIF-16-002 - Vol. 5,”Steel Bridges: Selecting the Right Bridge Type” which is

Contact Us

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