

How to construct a bridge span



Overview

Span by Span Casting Method of Bridge Construction The Span by Span method incorporates several essential components that make the construction process feasible.

Key Takeaways

Constructing a bridge span involves careful planning, foundation work, and incremental assembly of the deck using methods like span-by-span casting or prefabricated segments.

Planning and Design

Bridge construction begins with site surveys, geological investigations, and hydrological studies to understand terrain, soil conditions, and water flow, which influence foundation and span design. Engineers evaluate traffic loads, span length, and environmental constraints to select the most suitable bridge type, such as beam, arch, or cable-stayed. Structural analysis software like STAAD Pro or SAP2000 is used to model forces and optimize member sizes. The span, the distance between two supports, is a critical factor in determining materials and structural design.

Foundation and Substructure

The substructure transfers loads from the bridge deck to the ground. Depending on site conditions, foundations may include piles, caissons, or spread footings, sometimes requiring dewatering or cofferdams for underwater construction. Piers and abutments are constructed to support the bridge spans, ensuring stability and alignment.

Superstructure Construction



For the bridge deck, one common modern method is the span-by-span casting technique:

- **Segment Placement:** Construction starts at one abutment, placing the first deck segment. Subsequent segments are added incrementally toward the other end .
- **Support Systems:** Segments are positioned using assembly trusses or temporary stay masts, which hold each segment in place until the span is complete .
- **Transportation:** Precast segments are transported to the site by lorry or barge and carefully slid into position on sliding pads .
- **Prestressing:** Once all segments are in place, longitudinal prestressing tendons are threaded through ducts in the segments and tensioned to strengthen the span .
- **Deck Joints and Grouting:** Deck joints are cast and closed, and ducts are grouted to ensure continuity and durability . For shorter spans or smaller bridges, in-situ casting with reinforced concrete and formwork may be used instead of precast segments .

Finishing and Safety

After the structural system is complete, sensors and strain gauges may be installed to monitor performance . The bridge undergoes inspection and safety clearance before opening to traffic. Post-construction, regular maintenance is essential to ensure longevity, including monitoring deck joints, bearings, and structural integrity .

Key Considerations

- **Material choice:** Steel, concrete, or composite materials are selected based on span length, load, and environmental conditions .
- **Alignment and aesthetics:** Curved or skewed bridges may require special design adjustments .
- **Construction efficiency:** Span-by-span casting minimizes traffic disruption and allows rapid construction of long spans . By following these steps, engineers can construct a safe, durable, and efficient bridge span that meets both functional and environmental requirements.

Article Content

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Span Definition in Bridge Construction

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Continuous Span Standards

Standard plans for single span bridges ranging from 80 ft to 300 ft span lengths. This document includes details for girders, cross

Step 4c A versatile and scaleable bridge design for

The longer the bridge and the heavier the load, the more important this becomes. On smaller bridges you

How to Build a Simple Bridge

Learn how to build a simple bridge over a stream, and what kinds of factors to consider before

Step 3 A very versatile and scaleable bridge design for

—» To make the first arch component, mark the three registration holes on the center-line. These 3 holes

Step 5

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How to Build a Bridge

Instructions Step 1: Study the location Decide where to put the bridge. Measure the space and assemble your materials, keeping in

Step 4 A very versatile and scaleable bridge design for

Lay out the arches symetrically, where you intend the bridge to be. With smaller bridges you might

How to Build a Classic Arched Backyard Bridge

The curves are simple, the look is divine, and you can build it! Whether you have a small

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By Larry Walton A bridge is one of those things that are often taken for granted until you

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Step by step instructions on how to build an 8½ foot bridge using 2x3s, with railings. |
Step 1 | Step 2 | Step 3 | Step 4 | Step 5 |

Bridge Construction Methods | Fluidconstructions

Different bridge construction methods Before bridge construction methods are discussed to select the most suitable

How to Build a simple beam bridge

Step 2: Position two pier blocks Place two concrete pier blocks in the ground at one end of the bridge site. The blocks

Types of Bridges Based on Span, Materials, Structures, Functions ...

There are various types of bridges classified based on span, materials, types of bridge structures, functions, utility and position etc.

How to Build a Wooden Garden Bridge - A Step-by-Step Guide

Introduction A wooden garden bridge can be a stunning addition to any backyard, offering both functionality and

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BATS: The Basics of Bridge Design | HowStuffWorks

The key differences between these four bridge types comes down to the lengths they can cross in a single span, which is the

Timber Bridge Span Types | York Bridge Concepts Bridge Builder

A multiple span bridge combines one longer free span section—typically over the main channel—with shorter repetitive span

How Bridges Are Built: Engineering the Impossible

How are bridges built underwater? Underwater work is routine in bridge construction, but it demands the right method

Bridge Construction Methods

Building a bridge is a complex undertaking requiring knowledge and expertise. Several variables, including engineering constraints,

How a bridge is built over deep water | Suspension Bridge

This is a quick demonstration to explain how a giant suspension bridge is built over a deep body of water. This video

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2060 A very versatile and scaleable bridge design for

These Plans are for lumber 1½" x 5½" (38mm x 140mm) lumber and may be suitable for spans up to 50"

Precast Segmental Bridge Construction Part 2

A broader understanding of these structures and basic outline of the processes for Precast Manufacturing, Substructure Erection,

Building a Bridge

Bridge Deck. One key was to make the crossing be part of the landscape rather than something "applied" over the top

Span (engineering)

In engineering, span is the distance between two adjacent structural supports (e.g., two piers) of a structural member (e.g., a beam).

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