



Bridge Design

Introduction:

Bridge design is one of the oldest subjects in civil engineering. This course deals with bridge substructure systems, highlighting the more technical aspects of the design and rehabilitation of the bridge substructure. Focusing on the components comprising and affecting bridge substructures, this course addresses the different types of each component and discusses specific selection or design criteria, with a focus on traditional and innovative practical solutions in professional applications. The main objective is to present practical and economic methods of evaluation, inspection, reinforcement and rehabilitation of bridges.

Topics to be covered:

- **Day -1: Session Duration (6-8 Hours per Day)**

Introduction

- Allowable Stress Design
- Load and Resistance Factor Design

Principles of Limit States Design

- Design Procedures
- Allowable Stress Design (ASD)
- Load and Resistance Factor Design (LRFD)

Loads

- Permanent Loads
- Dead Loads
- Transient Loads
- Vehicular Live Load LL
- Pedestrian Live Load PL
- Water Load and Stream Pressure Force WA
- Wind Load WS and WL
- Earth Loads

Geotechnical Site Characterization

- Planning Exploration and Testing Programs
- Soil and Rock Variability
- Field Test Methods
- Ground Water Location

Geotechnical Design Parameter Selection

- Test Method Selection
- Field Test Methods
- Parameter Evaluation
- Reliability of Tests for Estimating Design Parameters



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- **Day 2 : Session Duration(6-8 Hours Per Day)**

Spread Footing Design

- Design Methods
- Comparison of Spread Footing Design Using LRFD and ASD
- Footing Embedment
- Buoyancy and Uplift

Driven Pile Design

- Introduction
- Design Methods
- Comparison of Driven Pile Design Using LRFD and ASD
- Geotechnical Design
- Fixity of PileCap Connection

Conventional Retaining Wall and Abutment Design

- Design Methods
- Comparison of Wall Design Using LRFD and ASD
- Loss of Passive Resistance
- Drainage

Bridge Substructure Rehabilitation

- Rehabilitation strategies - techniques to strengthen the bridge substructure without replacing it
- Material deterioration: concrete, steel, timber, fatigue assessment and seismic retrofit

Benefits:

- Internship offers by the Organizing partner
- Training coupons
- Exciting goodies
- Participation certificate from Wissenaire, IIT Bhubaneswar and Organizing partner.

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