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BRIDGE ENGINEERING COURSE WITH MIDAS CIVIL

WHO IS THIS COURSE FOR?

- Structural Engineers
- Civil Engineers with experience in structural designs
- Highway Engineers with experience on bridge design
- Final Year students in structural Engineering
- Final Year students in highway Engineering with interest in bridge design

HOW LONG IS THE COURSE?

The course is delivered into two parts:

1. Indoor training

Indoor training consists of the first step of this course. It will be taking 60 hours. Within this time schedule, the recap on bridge design theories that will be delivered along with the software application for good understanding of how bridge designs are done in engineering industry.

2. Project study

After the aforementioned period training, the course participants will be given a realistic project study for the enhancement of what was taught during indoor training. The project will have to be completed and delivered within 1 month. The delivery consists of presenting the completed project to the external board. During this period of project study, the course participant is not required to attend the class sessions; they only come for presentation of the progress once a week.

COURSE OBJECTIVE:

The main objective of this course is to deliver professional skills through a practical design of a real project.

The course will involve different practical exercises and assignments but the final goal is to deliver a technical design study of Highway Bridge project.

The MIDAS CIVIL will be used for 3D Modelling, analysis and design of the bridge structure. Entire work flow will be based on latest standard of Great Britain (BS5400-2) as well as ASHTTO (LRFRD approach).

WHO TEACHES THIS COURSE?

The instructor of this course must be MIDAS approved professional. Find the appointed instructor(s) of this course by clicking the following link
https://nzizatraining.ac.rw/trainers/

WHAT WILL BE THE OUTCOME?

At the end of this course training, you will have picked up the useful tips needed when utilizing MIDAS Civil, specific features within the software that help you complete your bridge design project with exact and effective construction documents for all concepts with standard bridge types. Moreover, this course is accredited by Midas therefore any participants who will attend and complete it successfully will leave with Midas certificate of proficiency.

TRAINING COURSE CONTENT

NOTE: It can be updated anytime to match the market needs.

PART 1: GETTING STARTED

Lesson 1: Introduction to Midas Civil for Beginners: Course Overview, Why Learn Midas Civil, What to Expect from this bridge design course.

Lesson 2: Introduction to Basics of Bridge Design: understanding and terminology of bridge components, understanding the identification of traffic loads, identification of critical points for bridge elements design.

Lesson 3: Midas Civil Installation & License: Midas Civil download & installation, license & registration and how to use the on-line manual

Lesson 4: Mastering Software: Midas Civil (Model Generation): Windows & Menu System, Preference Settings, Manipulate Model View, Selection & Activation, Model Generation and Verify Input.

Lesson 5: Interactive class: 2D Portal Frame (Model Generation): Initial Setting (Units), Structure definition: Structure Type, Define Point Grid, Property Definition: Material Definition, Section Definition, Geometric Modelling: Create Elements, Extrude Elements, Boundary Definition: Defining Supports, Defining Node Local Axis, Boundary Definition: Defining Spring Supports.

Lesson 6: Mastering Midas Civil - (Load, Analysis & Result): Load Definition, Verify Input (2/2), Analysis and Result Interpretation.

Lesson 7: Interactive class: 2D Portal Frame (Load, Analysis & Result): Load Definition: Defining Static Load Cases, Load Definition: Element Beam & Nodal Loads, Load Definition: Trapezoidal Line Beam Load, Results: Deformations, Results: Beam Diagrams, Results: Beam Forces, Results: Reactions, 2D Portal Frame Tutorial & Model File.

PART 2: 2D BOX CULVERT BRIDGE

Lesson 1: Geometric Modelling of 2D Box Culvert: Overview and Fundamentals of culverts, Initial Settings & Material Definition, and Geometric Modelling.

Lesson 2: Boundary Condition & Static Loads for 2D Box Culvert: Soil Springs for Boundary Condition, and Static Loads.

Lesson 3: Moving Load with Dispersion: Moving Load Cases, and Moving Load with Dispersion.

Lesson 4: Analysis, Result & RC Design: Analysis & Result Interpretation, Report Generation, and RC Design.

PART 3: PSC BOX GIRDER BRIDGE

Lesson 1: Project Application - PSC Box Girder Bridge: Loading & Analysis: Overview & Initial Settings, Material & Section Definition, Geometric Modelling, Group Definition, Boundary Definition, Static & Prestress Load Definition, Construction Stage Definition, Temperature Load Definition, Moving Load Definition, Moving & Construction Stage Analysis Control, Defining Reinforcement and Analysis & Result.

Lesson 2: Longitudinal Analysis: Longitudinal Analysis: Overview, Fundamentals of PSC Box Girder Bridge, Bridge Project Overview, Material and Section Properties Definition, Geometry Generation, why Construction Stage Analysis? Construction Stage Group Definition, Boundary Definition, Load Calculation, Static Load Definition, Prestress Load Definition, Temperature Load Definition, Understanding Moving Load Analysis, Moving Load Definition, Construction Stage Formulation, and Result Interpretation.

Lesson 3: Transverse Analysis: Overview, Introduction & Need for Transverse Analysis, Model Generation, and Result Interpretation.

Lesson 4: Ultimate Limit State Design: Overview, Load Combination, Ultimate Limit State: Flexure, Ultimate Limit State: Shear, and Ultimate Limit State: Torsion.

Lesson 5: Serviceability Limit State Design: Overview, Stress for Cross Section at CS & Service Load, Tensile Stress for Tendons & Principal Stresses, Crack Control and Deflection Checks.

Lesson 6: Substructure Modelling: Overview, Geometric Model of Pier & Pile Foundation, Soil Structure Interaction with Pile Springs, Critical Loads for Substructure and Result Interpretation.

Lesson 7: Substructure design: Overview, Design of Pier: Biaxial Check, Design of Pier: Irregular Section, and Design of Pile in Midas Civil.

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PART 4: PSC COMPOSITE I GIRDER BRIDGE

Lesson 1: PSC Composite I Girder Bridge: Geometric Modelling: Overview, Structure Overview & Material Definition, Why Time-dependent material properties, Section Property, Model setup & geometry generation, Defining groups & boundary conditions.

Lesson 2: Static & Bridge Specific Loads: Overview, Generating Load Cases & Defining Dead Load, Tendon Prestress Load, Uniform & Gradient Temperature, Wind Load, Moving Load Definition and Seismic Load Definition.

Lesson 3: Construction Stage (CS) Sequence with Composite Deck Action: Overview, Significance of Construction Stage, and Sequence of Construction for composite I girder bridge.

Lesson 4: PSC Composite I Girder Bridge: Result Interpretation

Lesson 5: PSC Composite I Girder Bridge: Design: Overview, Design Load Combination, Design Parameters & Design Data.

Lesson 6: Manual Vs Midas Civil Verification: Manual Method Vs Midas Civil Verification: Overview, Verification: Stress in Composite Section, and Verification: Temperature Gradient.

End!