

Course No. 1543

Building Information Modeling (BIM) for Civil Engineering Training Course

CIVIL & STRUCTURAL ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Building Information Modeling (BIM) for Civil Engineering Training Course is a specialized professional program designed to develop the practical knowledge and capabilities required to apply Building Information Modeling methodologies across civil engineering projects. The course focuses on using digital models to improve engineering coordination, information management, design quality, construction planning, and project delivery while supporting more structured decision-making throughout the project lifecycle.

The program provides a comprehensive understanding of BIM principles and their application to civil and infrastructure projects, including three-dimensional modeling, civil and structural elements, multidisciplinary coordination, engineering documentation, project information, and model-based workflows. Participants explore the relationship between digital models, drawings, specifications, quantities, schedules, and technical data, enabling project teams to work with more consistent and accessible engineering information.

A major focus of the Building Information Modeling (BIM) for Civil Engineering Training Course is multidisciplinary coordination. Participants examine how civil engineers, structural engineers, architects, MEP specialists, contractors, consultants, and project managers can collaborate through coordinated digital models. The course addresses clash detection, model review, design changes, information exchange, and quality control to help identify coordination issues before they develop into costly construction problems.

The course also explores practical applications of BIM in quantity takeoff, project planning, construction coordination, progress monitoring, and information management. Participants learn how model information can support estimating, scheduling, procurement, construction activities, and project documentation. Attention is also given to model revisions, information requirements, data exchange, and maintaining reliable project information throughout different project stages.

Through practical exercises, case studies, coordination activities, and an integrated final workshop, participants develop the ability to create, review, coordinate, and manage BIM models for civil engineering projects. The program supports organizations seeking to strengthen digital engineering practices, improve project coordination, enhance information quality, and establish more efficient workflows across design, construction, handover, and operational stages.

Objectives

- Analyze the fundamental principles of Building Information Modeling and their application to civil engineering projects throughout the five-day training program.
- Develop structured digital models representing civil and structural project elements according to defined project requirements.
- Apply three-dimensional modeling principles to create clear, coordinated, and reviewable engineering models.
- Evaluate the relationship between digital models, engineering drawings, specifications, quantities, schedules, and technical project information.
- Apply effective multidisciplinary coordination methods between civil, structural, architectural, and building services models.
- Analyze model clashes and coordination issues, identify their underlying causes, and determine appropriate corrective actions.
- Improve model quality by applying structured procedures for information review, validation, version control, and coordination.
- Evaluate the use of BIM models for quantity extraction, estimating, planning, construction coordination, and project monitoring.
- Implement appropriate procedures for managing model revisions and exchanging project information among engineering and construction teams.
- Strengthen collaboration between designers, consultants, contractors, project managers, and other project stakeholders through coordinated digital workflows.
- Assess the application of BIM across design, construction, handover, and operational stages of the project lifecycle.
- Develop a practical BIM implementation approach that supports improved information management and project coordination within a civil engineering project.

Who Should Attend

This course is designed for civil engineers, structural engineers, project engineers, design engineers, construction engineers, engineering consultants, contractors, BIM coordinators, and professionals involved in the preparation, coordination, review, and management of digital engineering models. It is particularly relevant to professionals responsible for engineering drawings, technical documentation, quantities, design coordination, model development, and project information management.

The program is also suitable for project managers, engineering managers, design managers, planning engineers, quantity surveyors, cost engineers, quality engineers, construction managers, document controllers, information managers, and professionals responsible for coordinating engineering disciplines. Managers and technical decision makers can also benefit from understanding how BIM workflows influence project coordination, information quality, construction planning, and delivery performance.

The course is highly relevant to government entities, ministries, municipalities, engineering organizations, construction companies, infrastructure developers, engineering consultancies, real estate developers, industrial organizations, and major project owners. It is particularly suitable for professionals working on complex building, infrastructure, civil, structural, and multidisciplinary projects where effective information management and engineering coordination are essential.

Learning Outcomes

- Explain the fundamental concepts, principles, and workflows of Building Information Modeling for civil engineering projects.
- Create structured three-dimensional digital models representing civil and structural project components.
- Organize model elements and associate them with relevant engineering, technical, and project information.
- Review BIM models and assess the quality, consistency, completeness, and usability of the information contained within them.
- Coordinate civil and structural models with architectural and building services models to support multidisciplinary project delivery.
- Identify and analyze clashes between project elements and determine appropriate corrective actions.
- Use BIM models to support design review, engineering coordination, construction planning, and project execution.
- Extract project information and quantities from digital models to support estimating, planning, procurement, and cost-related activities.
- Manage model versions, revisions, and information exchanges using structured project information workflows.

- Evaluate the impact of engineering changes on models, quantities, drawings, schedules, and associated project information.
- Strengthen collaboration between engineering teams, consultants, contractors, and project stakeholders through coordinated BIM workflows.
- Develop a practical BIM implementation plan for a civil engineering project and establish procedures for model development, coordination, review, and information management.

Course Outline

DAY 01

BIM Fundamentals and Applications in Civil Engineering

- Introduction to Building Information Modeling and its role in digital transformation within engineering projects
- Core BIM concepts, terminology, workflows, and project applications
- BIM across the project lifecycle from design and coordination to construction and operation
- Structure and components of a BIM model
- Three-dimensional modeling principles for civil and structural elements
- Relationship between digital models, drawings, specifications, quantities, and technical information
- Information requirements and model development requirements at different project stages
- Roles and responsibilities of engineers, designers, contractors, consultants, BIM coordinators, and information managers
- Principles of collaborative working environments and information exchange
- Model quality requirements and basic model validation procedures

PRACTICAL APPLICATION

Develop an initial BIM model for a civil engineering project and identify its key elements and information requirements

DAY 02

Civil and Structural Modeling and Multidisciplinary Coordination

- Principles of developing digital models for civil engineering projects
- Modeling structural and reinforced concrete elements
- Representation of buildings, infrastructure components, and civil engineering elements
- Organization of levels, grids, coordinates, and engineering components
- Assigning properties and technical information to model elements
- Connecting digital models with drawings, specifications, and engineering documentation
- Coordination between civil, structural, and architectural models
- Coordination with mechanical, electrical, plumbing, and other building services systems
- Managing design changes and model updates across different disciplines
- Maintaining consistency between coordinated models and project documentation

PRACTICAL APPLICATION

Develop a multidisciplinary project model and review consistency between civil, structural, architectural, and services elements

DAY 03

Engineering Coordination, Clash Detection, and Information Management

- Principles of multidisciplinary engineering coordination and its importance during design and construction
- Types of clashes and coordination conflicts between project elements and systems
- Clash detection processes and methods for identifying coordination issues
- Classification and prioritization of clashes according to project impact
- Analysis of clash causes, responsibilities, and required corrective actions
- Model review procedures before construction and implementation
- Managing coordination comments, issues, and corrective actions
- Model version control and management of project information
- Information exchange between consultants, contractors, designers, and project owners

DAY 03 — CONTINUED

- Model quality assurance and validation of information accuracy and consistency

PRACTICAL APPLICATION

Review a coordinated model containing multiple clashes, identify the underlying issues, prioritize them, and develop corrective actions

DAY 04**BIM for Quantity Takeoff, Planning, and Construction**

- Extracting project information and quantities from BIM models
- Using model-based information to support quantity takeoff and cost estimation
- Relationship between BIM models and construction planning
- Linking model elements with construction activities and project schedules
- Principles of model-based planning and construction sequencing
- Using digital information to support progress monitoring and project reporting
- Assessing the impact of design changes on quantities, schedules, and construction activities
- Supporting procurement and contractor coordination through reliable model information
- Using BIM models to review construction requirements and implementation sequences
- Updating models and project information throughout the construction stage

PRACTICAL APPLICATION

Use a project model to extract quantities, review construction information, and develop a model-supported implementation and planning approach

DAY 05**BIM Management and Lifecycle Implementation**

- Developing an organizational approach to BIM implementation
- Defining project information requirements, responsibilities, and information management processes
- Managing BIM models and information throughout design, construction, handover, and operation

DAY 05 — CONTINUED

- Establishing procedures for model review, approval, revision, and information control
- Using digital project information to support facility handover and future operations
- Improving collaboration between engineering teams, consultants, contractors, and project owners
- Managing risks associated with information quality, coordination, design changes, and model inconsistency
- Developing performance measures for BIM model quality and information management
- Best practices for implementing BIM within civil engineering and infrastructure projects
- Integrating BIM workflows into organizational engineering and project management processes

FINAL WORKSHOP

Develop, coordinate, review, and assess an integrated BIM project model, identify coordination issues, extract project information, and prepare a practical BIM implementation action plan

Register or Request More Information

Course page: <https://quest-training.com/courses/building-information-modeling-bim-for-civil-engineering-training-course>

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