Bentley OpenRoads Designer – Road Design Modeling

Course Objectives

- To provide participants with a comprehensive understanding of Bentley OpenRoads Designer for roadway design and civil infrastructure modeling.
- To develop practical skills in terrain modeling, geometry creation, corridor design, and road layout development.
- To enable learners to create intelligent road models using templates, alignments, and cross-section workflows.
- To build competency in quantity estimation, earthwork analysis, and construction documentation processes.
- To prepare users for real-world highway and transportation design projects using BIM-based workflows.

Course Outcomes

- Participants will be able to navigate the OpenRoads Designer interface and manage roadway design projects efficiently.
- Learners will create terrain models, horizontal/vertical alignments, and corridor models for road projects.
- Users will apply templates, superelevation, and advanced corridor tools for accurate roadway modeling.
- Participants will generate quantities, earthwork reports, and coordinated drainage/utility layouts.
- Learners will produce professional plan, profile, and cross-section drawings for project deliverables.

Target Audience

- Civil engineers, highway engineers, and transportation professionals involved in road design projects.
- CAD designers and BIM modelers working in infrastructure and land development sectors.
- Survey engineers and planners requiring integration of terrain and alignment data into road models.
- Students and fresh graduates seeking specialization in roadway design software tools.
- Professionals preparing for Bentley OpenRoads Designer certification or project implementation roles.

Course Outline

The course comprises **32-hours** of theory and labs and is divided into **9** different Modules. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Table of Contents: -

Module 1: Introduction to OpenRoads Designer

1.1 Overview of OpenRoads Designer Platform
1.2 Road Design Workflow in Bentley Environment
1.3 Interface, Ribbon Tools, and Navigation
1.4 Workspaces, WorkSets, and Project Standards
1.5 File Management and Civil Data Concepts

Module 2: Terrain Modeling

2.1 Existing Ground Data Import
2.2 Creating Terrain Models from Survey Data
2.3 Editing Terrain Surfaces
2.4 Contours, Triangles, and Boundaries
2.5 Terrain Analysis and Visualization

Module 3: Civil Geometry Design

3.1 Horizontal Alignment Creation
3.2 Vertical Profile Design
3.3 Superelevation Basics
3.4 Geometry Constraints and Standards
3.5 Annotation of Alignment Elements

Module 4: Template Creation & Typical Sections

4.1 Introduction to Templates
4.2 Pavement Layers and Components
4.3 Shoulders, Kerbs, Drains, and Medians
4.4 Parametric Constraints
4.5 Reusable Template Libraries

Module 5: Corridor Modeling

5.1 Creating Corridors from Alignments
5.2 Assigning Templates to Corridors
5.3 Template Drops and Transitions
5.4 Dynamic Cross Sections
5.5 Corridor Editing and Review

Module 6: Advanced Corridor Design

6.1 Corridor Clipping and Targeting
6.2 Point Controls and Linear Templates
6.3 Intersections and Widening
6.4 Roundabouts and Junction Modeling
6.5 Corridor Optimization Techniques

Module 7: Quantities and Earthwork Analysis

7.1 Material Quantities from Corridor Models
7.2 Cut and Fill Computation
7.3 Earthwork Balancing
7.4 Quantity Reports
7.5 Construction Estimate Support

Module 8: Drainage & Utility Coordination

8.1 Introduction to Drainage Design Tools
8.2 Stormwater Components Placement
8.3 Utility Conflict Detection
8.4 Coordination with Road Corridor
8.5 Integrated Civil Infrastructure Modeling

Module 9: Drawing Production

9.1 Plan Sheets Creation
9.2 Profile Sheets
9.3 Cross Section Sheets
9.4 Annotation Groups and Labels
9.5 Automated Sheet Generation