

OpenSite Designer – Comprehensive Site Design & Infrastructure Modeling

Target Audience

This course is designed for civil engineers, site development engineers, land development professionals, infrastructure consultants, transportation engineers, surveyors, and CAD/BIM professionals involved in site planning and design projects. It is also suitable for project engineers and designers seeking to enhance their capabilities in terrain modeling, grading optimization, utility design, and construction documentation using Bentley OpenSite Designer. Professionals transitioning from traditional CAD workflows to model-based site design will greatly benefit from this training.

Course Objectives

Upon completion of this course, participants will be able to effectively utilize OpenSite Designer for end-to-end site development projects. The training focuses on creating intelligent terrain models, designing site layouts, performing grading and earthwork optimization, developing utility networks, and generating construction documentation. Participants will learn to integrate survey, geotechnical, and reality modeling data while leveraging advanced visualization and analysis capabilities. The course also emphasizes industry best practices for improving design efficiency, accuracy, and project delivery workflows.

Course Outcomes

After successfully completing the training, participants will be able to:

1. Create and manage complete site development projects using OpenSite Designer.
2. Develop intelligent terrain models from survey, LiDAR, and point cloud data.
3. Design site layouts including parking lots, driveways, pathways, and parcels.
4. Perform grading design and optimize earthworks for cost-effective construction.
5. Create and analyze stormwater, sanitary, and utility networks with conflict detection.
6. Generate profiles, cross sections, quantity take-offs, and construction estimates.
7. Integrate geotechnical, reality modeling, and engineering datasets into site design workflows.
8. Produce professional construction documentation, reports, visualizations, and project deliverables.
9. Export models for machine guidance, iModels, and stakeholder presentations.
10. Execute complete site development projects following modern model-centric engineering practices.

Course Outline

The course comprises **40 hours of theory and hands-on laboratory sessions** and is divided into **10 comprehensive modules**. Each module is followed by practical exercises and real-world site development workflows designed to reinforce learning and evaluate the participant's understanding of the concepts covered.

Table of Contents

Module 1: Introduction to OpenSite Designer and Site Design Fundamentals

- Overview of OpenSite Designer
- Site Development Workflow
- User Interface and Workspace Navigation
- Project Creation and File Management
- Design Standards and Project Setup

Module 2: Integrated CAD Environment and Data Management

- DGN and DWG Integration
- Engineering Data Integration
- Working with MicroStation Environment
- Project Data Organization
- Collaboration and Interoperability Workflows

Module 3: Terrain Modeling and Existing Conditions

- Importing Survey and Terrain Data
- LiDAR Data Management
- Creating Terrain Models
- Surface Analysis and Validation
- Modeling Existing Site Features

Module 4: Dynamic Geometric Design

- Horizontal Alignment Design
- Vertical Alignment Design
- Geometric Constraints and Rules
- Interactive Design Techniques
- Design Validation and Design Checks

Module 5: Site Layout Design and Parking Modeling

- Site Layout Planning
- Building and Site Relationships
- Parking Lot Design
- Driveway Design
- Parcel and Site Element Creation
- Design Standards Customization

Module 6: Earthworks and Grading Design

- Grading Fundamentals
- Surface Creation and Editing
- Earthwork Optimization
- Breaklines and Surface Controls
- Slope and Elevation Management
- Cut and Fill Analysis

Module 7: Pathways, Roads, and Access Design

- Sidewalk Design
- Pathway Modeling
- Access Road Design
- On-Street Parking Configuration
- Shoulder and Buffer Design
- Grading Controls for Corridors

Module 8: Subsurface Utility and Drainage Design

- Utility Network Fundamentals
- Stormwater Network Design
- Sanitary Sewer Network Design
- Combined Utility Systems
- Utility Conflict Detection
- Pond Volume Calculations and Reporting

Module 9: Profiles, Cross Sections, and Quantity Management

- Profile Generation
- Cross Section Creation
- Existing vs Proposed Surface Analysis
- Quantity Take-Offs
- Area, Linear, and Volume Calculations
- Construction Estimation Workflows

Module 10: Documentation, Visualization, and Advanced Integration

- Plan Production and Sheet Creation
- Annotation and Labeling
- Construction Deliverables
- Reality Modeling and Point Cloud Processing
- Geotechnical Data Integration
- LumenRT Visualization