



OpenBuildings Designer

Onboarding Guide

Bentley Building

10/1/20

Version 1

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1. About OpenBuildings Designer

OpenBuildings Designer is a multidiscipline building design application that enables BIM workflows to provide information-rich models for the design, analysis, simulation, and documentation of buildings. It incorporates OpenBuildings Designer computational design and energy services for building performance evaluation. OpenBuildings Designer immerses you in a 3D modeling environment and provides site content by referencing reality models. The application shares a catalog of design components across the project team. Built-in clash detection allows designers to coordinate building systems.

The federated data approach to modeling and drawing management allows users to work on any size models simultaneously across distributed geographies. Using OpenBuildings Designer you can:

All Disciplines

- Start designing in 3D to explore ideas with free-form modeling
- Design in context with referenced reality models and point clouds
- Perform in-product clash detection
- Produce lifelike renderings and movies
- Apply company and project standards to models and drawings
- Exchange data in common formats (i.e. IFC, COBie, RealDWG™, Revit Family RFA, and Sketchup SKP)
- Incorporate project documents, media, web links, and more with hypermodeling
- Easily manage data with bidirectional editing in Microsoft Excel
- Share project information with iModels
- Enforce production standards within a ProjectWise managed environment
- Accelerate skillset with access to personalized learning
- Automate coordinated drawings by controlling drafting styles and annotations

Architectural

- Accelerate design with a catalog of walls, doors, windows, and furniture
- Manage floor definitions for reference planes and floor groups
- Define custom grid systems
- Manage spaces to ensure compliance with owner's requirements
- Model custom design stairs and handrails
- Interactively design configurations of curtain walls

Structural

- Model steel, concrete, and timber structures
- Model steel trusses, bar joists, handrail, and ladder assemblies
- Reference a comprehensive library of international steel and concrete shapes
- Produce quantity reports and volume and weight analyses
- Share structural models and analysis using Bentley's Integrated Structural Modeling (ISM) technology
- Exchange data with detailing applications using industry standards (i.e. CIS/2, and SDNF)

MEP

- Parametrically model HVAC, piping, and plumbing systems
- Define components, paths, and angles to be modeled automatically when completing connections in HVAC and piping systems
- Dynamically route pipe systems with slope applied or apply as a post process
- Create and configure air handling units using standard modules
- Size ductwork based on air flow, velocity, and friction rate
- Export designs to Trimble's FabShop for fabrication

- Streamline lighting design using smart symbol arrangement tools that are aligned with ceiling grid and wall-mounted components
- Design electrical circuits and associate with lighting, power, or fire protection panels
- Automatically label components using user-definable labeling formats for switch designation, circuit numbers, and device IDs
- Model cable trays, baskets, conduits, and wireways
- Evaluate lighting level with a bidirectional interface with Relux & DIALux for lighting analysis
- Produce drawings and block diagrams, lighting, cable, and panel schedules based on user-definable templates

Computational Design

- Define objects, assembly relationships, and dimensional constraints to capture design intent to explore a broad range of what-if scenarios
- Use visual programming techniques to create design solutions, manage dependencies, and orchestrate behaviors between design objects
- Use mathematical statements to control geometry and define dependencies between design objects
- Create reusable geometric assemblies extending the range of geometry with embedded intelligent behaviors
- Define input controls (i.e. sliders and law curves) to dynamically manipulate design components and propagate change within the design
- Play forward and reverse incrementally the design script to visualize the design intent and behaviors of design relationships

Energy Simulation

- Perform whole building energy analysis with analytical space models and conceptual mass models using industry standard EnergyPlus
- Calculate design and satisfy building regulation requirements using industry-standard building load calculations (i.e. CIBSE Maxi Gain)
- Reference a catalog of predefined standard HVAC system templates
- Calculate daylight factors using industry-standard Radiance engine
- Model surrounding buildings to simulate the effect of their shade on the design
- Create reports and charts for all aspects of building simulation including heating and cooling loads, LEED compliance, annual energy use, equipment sizing requirements, and CO2 emissions

1.1 System Requirements for OpenBuildings Designer

Operating System	Windows 10 (64-bit) Windows 8 and 8.1 (64-bit) Windows 7 (64-bit)
Processor	Intel® or AMD® processor 1.0 GHz or greater. OpenBuildings Designer is not supported on a CPU that does not support SSE2.
Memory	16 GB minimum 32 GB recommended. More memory almost always improves performance, particularly when working with larger models.
Hard Disk	24 GB free disk space (which includes the 16 GB install footprint for a complete installation), 10-25 GB depending on additional installations such as Companion Features and Companion Products.
Screen Resolution	1024 x 768 or higher

2. Building Products Offering

Upon completion, resource should be able to:

- Have a working knowledge of the building products offerings and capabilities.
- Understand the building products licensing options.

2.1 Building Products Offering

SL	Topic
1	Bentley Building products (Bentley webpage)
2	Product Licensing (Bentley webpage)
3	Bentley Communities-Building

3. MicroStation for Building Designers

Upon completion, resource should be able to:

- Have a working knowledge of the basic MicroStation functionality and how it applies to building products.

3.1 Introduction to MicroStation CONNECT Edition

SL	Topic	Description	Link
1	Introduction to MicroStation CONNECT Edition Course Introduction	In this video, you will learn about the Introduction to MicroStation CONNECT Edition course	Click Here
2	Welcome to MicroStation	In this video you will learn how to access the Welcome Page, interact with a WorkSpace and WorkSet, open and “brand” MicroStation design file to the active WorkSet and navigate the MicroStation CONNECT user interface.	Click Here
3	The MicroStation CONNECT Edition User Interface	Continuing with our introduction to MicroStation, we find ourselves in need of becoming familiar with the basic layout, tool locations, and functionality found in the MicroStation CONNECT Edition. This video covers that information.	Click Here
4	MicroStation for Building Designers	This Learning Path contains courses to teach you how to create Buildings in accordance with standards using PowerDraft/MicroStation CONNECT Edition.	Click Here
	MicroStation CONNECT Edition Basics for Building Designers	This learning path contains exercises intended to help a new MicroStation user become familiar with the MicroStation CONNECT Edition. This will be done from the point of view of a building designer or drafter working at a design firm, that is new to MicroStation, and has been awarded a design project that they will be involved with.	Click Here
5	3D Modeling in MicroStation CONNECT Edition	This learning path covers the concepts and capabilities of MicroStation CONNECT Edition for modeling of Curves, Surfaces, Solids and Meshes in a 3D design file. It also teaches the basic tools for ease of viewing and navigating in the 3D space. Logical extensions or applications like parametric modeling or animation are touched upon too with examples. Hands on exercises are provided to reinforce the learning.	Click Here
6	Creating Visualizations with Bentley LumenRT in a Building Project	In this Learning Path, you will learn how to create real-time visualizations with Bentley LumenRT in a Building Project.	Click Here
	Deliverables – Sheet Creation and Annotation in MicroStation CONNECT Edition	This Learning Path contains courses that help you create the deliverables from your MicroStation design files, such as sheets and annotated drawings.	Click Here
	Producing Deliverables in MicroStation CONNECT Edition within a Building Project	Want to optimize your designs and organize your projects? Capitalize on the powerful capabilities found in MicroStation CONNECT that will enhance and streamline the process of producing deliverables for your Building Project -- from design composition to sheet composition. Discover how to browse file contents and index DGN files for quick discovery of data and related information using Explorer. Learn how to batch print your plan set, be it small or large, utilizing MicroStation's Integrated Print Organizer which can reliably produce consistent, intelligent deliverables for your project.	Click Here

4. OpenBuildings Designer

Upon completion, resource should be able to:

- Have a working knowledge of the basic OpenBuildings Designer functionality and how it applies to building products.
- How to model basic building elements such as walls, doors, columns, slabs, ductwork and lights.
- Also, user should be able to produce plan, section, and elevation drawings.

4.1 Welcome to OpenBuildings Designer

SL	Topic	Description	
1	Welcome to the CONNECT Edition for Existing Users	This Learning Path contains courses that introduce an existing OpenBuildings Designer user to new features and workflows in the latest CONNECT Edition of OpenBuildings Designer.	Click Here
2	Welcome to the CONNECT Edition for New Users	This Learning Path contains courses that introduce a new user to the initial installation, setup and interface of the CONNECT Edition of OpenBuildings Designer. The primary course, 3D and BIM Essentials, will help you better understand the 3D workflow and the addition of information to a 3D model. There are several additional reference courses for users unfamiliar with basic platform functions such as AccuDraw, annotation and publishing. After completing this Learning Path the student should continue with a discipline specific BIM QuickStart course.	Click Here
3	Welcome to the CONNECT Edition for Revit Users	This Learning Path contains courses that introduce a user with a Revit background to OpenBuildings Designer CONNECT Edition. The 3D and BIM Essentials course notes the similarity of OpenBuildings Designer tools and concepts to Revit tools and concepts where relevant. Other courses continue the introduction to the application. After completing this Learning Path the student should continue with a discipline specific BIM QuickStart course.	Click Here

4.2 Architectural Track

SN	Topic	Description	Link
1	QuickStart for OpenBuildings Designer: Architectural BIM Modeler Accreditation	In this Learning Path you will learn how to use OpenBuildings Designer to model architectural BIM models. You will create a building model of a small commercial building using modeling tools for walls, doors, windows, stairs and roofs. In addition, you will generate drawing views and schedules from the BIM model. Once you have completed the BIM QuickStart Architecture Live Bundle, you will have the opportunity to become a Bentley Accredited BIM Modeler by completing the required coursework.	Click Here
2	Training for OpenBuildings Designer Architectural BIM Professional Track	In this Learning Path you will learn how to use OpenBuildings Designer for professional project delivery. You will go beyond basic modeling and placement of objects and learn how to create unique architectural elements, drawings, and schedules.	Click Here

4.3 Structural Track

SN	Topic	Description	Link
1	QuickStart for OpenBuildings Designer: Structural BIM Modeler Accreditation	In this Learning Path you will learn how to use OpenBuildings Designer to model structural BIM models. You will create a structural model for a small commercial building using modeling tools for beams, columns, foundations, bracing, etc. In addition, you will generate drawing views and schedules from the BIM model. Once you have completed the BIM QuickStart Structural Live Bundle, you will have the opportunity to become a Bentley Accredited BIM Modeler by completing the required coursework.	Click Here
2	Training for OpenBuildings Designer Structural BIM Professional Track	In this Learning Path you will learn how to use OpenBuildings Designer to model structural BIM models. You will set up new files, learn how to reference sub-models into master models, optimizing the federated model. You will model a variety of structural members using the modeling tools; Beams, Columns, Foundations, Walls, Bracing, etc. and create structural drawings and reports from the model. You will work on horizontal, Vertical and inclined planes.	Click Here

4.4 Mechanical Track

SN	Topic	Description	Link
1	QuickStart for OpenBuildings Designer: Mechanical BIM Modeler Accreditation	In this Learning Path you will learn how to use OpenBuildings Designer to model mechanical BIM models. You will learn how to create an HVAC model of a small commercial building using modeling tools for air handling units, ductwork, duct fittings, air terminals, and connections. In addition, you will generate drawing views from the BIM model. Once you have completed the BIM QuickStart Mechanical Live Bundle, you will have the opportunity to become a Bentley Accredited BIM Modeler by completing the required coursework.	Click Here
2	Training for OpenBuildings Designer Mechanical BIM Professional Track	In this Learning Path you will learn how to use OpenBuildings Designer for professional project delivery. Courses on HVAC design including custom air-handling units, single-line duct modeling, 3D duct modeling, HVAC analysis and drawing and report generation are included	Click Here

4.5 Electrical Track

SN	Topic	Description	Link
1	QuickStart for OpenBuildings Designer: Electrical BIM Modeler Accreditation	In this Learning Path you will learn how to use OpenBuildings Designer to model an electrical BIM model. You will learn how to set up an electrical project and create an electrical model of a small commercial building using modeling tools for panels, receptacles, switches, smoke detectors and lighting fixtures. In addition, you will generate drawing views and reports from the BIM model. Once you have completed the BIM QuickStart Electrical Live Bundle, you will have the opportunity to become a Bentley Accredited BIM Modeler by completing the required coursework.	Click Here

5. OpenBuildings – Energy Simulator

Upon completion, resource should have a preliminary overview:

- How OpenBuildings Energy Simulator can be used to create an energy model and then run steady state calculations from the energy model.

5.1 Welcome to OpenBuildings Energy Simulator

SL	Topic	Description	
1	QuickStart for OpenBuildings Energy Simulator	In this Learning Path you will learn how to use OpenBuildings Energy Simulator. The courses will take you through the OpenBuildings Energy Simulator software interface and show you how to create an Energy model using the Modeling tools and the Data Managers. Finally, you will learn to run a variety of steady state calculations based on the energy model.	Click Here

6. OpenBuildings - GenerativeComponents

Upon completion, resource should have a preliminary overview:

- How to use OpenBuildings GenerativeComponents to explore, understand, evaluate, adjust and scale your design in minutes rather than hours or days.

6.1 Welcome to OpenBuildings GenerativeComponents

SL	Topic	Description	
1	Building – QuickStart for GenerativeComponents: Computation Design Modeler Accreditation	This Learning Path is for Open Buildings Designer users who have the companion GenerativeComponents installed. This Learning Path contains courses that teach architects and engineers how to explore a broad range of "what-if" alternatives for even the most complex buildings, quickly and easily, and spend little time working on edits, deletions and re-modeling changes that will slow down the design cycle. Working in Bentley's Generative Components, focus is shifted away from ordinary 3D and BIM modeling. Instead, you focus on defining and capturing the concept of the design. Once the concept is defined, with its internal behavior and its external appearance, you may explore, understand, evaluate, adjust and scale your design in minutes rather than hours or days. This directs creativity to deliver just the right building, optimized on sustainability, appearance, and cost.	Click Here
2	Infrastructure QuickStart for GenerativeComponents CONNECT Edition	This Learning Path contains courses that teach architects and engineers how to explore a broad range of "what-if" alternatives for infrastructure projects, such as tunnels, quickly and easily, and spend little time working on edits, deletions and re-modeling changes that will slow down the design cycle. Working in Bentley's Generative Components, focus is shifted away from ordinary 3D and BIM modeling. Instead, you focus on defining and capturing the concept of the design. Once the concept is defined, with its internal behavior and its external appearance, you may explore, understand, evaluate, adjust and scale your design in minutes rather than hours or days. This directs creativity to deliver just the right building, optimized on sustainability, appearance, and cost.	Click Here

7. OpenBuildings - Legion

Upon completion, resource should have a preliminary overview:

- How Legion is used to simulate pedestrian movement and how to analyse pedestrian movement.

7.1 Welcome to Open Buildings - Legion

SL	Topic	Description	
1	QuickStart for Crowd Simulation with Legion	In this Learning Path, you will learn how to build, simulate and analyse a model of a tube station from scratch. You can import or create all the necessary information to build a model. Once the model is created, you can export a file that can be used in the LEGION Simulator to generate and route entities toward their destinations. And finally, how to use Legion Analyser to answer common evacuation study questions.	Click Here
2	Advanced Crowd Simulation with Legion	In this advanced Learning Path you will learn how to create the data templates, pedestrianize a CAD file, understand entity movements, and create stairs and escalators.	Click Here

8. Online Resources for OpenBuildings Designer

SL	Resource Detail	Description	Link
1	File a new Service request	Use this link to create a new Service Request regarding product issues, problems & any questions. Note: Bentley user login and password required.	Click Here Example: Log a Service Request
2	Product Downloads	Use this link to download latest builds Note: Bentley user login and password required.	Click Here
3	OpenBuildings Designer Youtube Channel	Various channels on Youtube.com for various workflows & steps by step videos. Please subscribe to these channels to get new workflows & videos	Bentley OpenBuildings Bentley Institute
4	Bentley Communities & Forums	This is the place to access the information and expert's advice on different topics for Building products. You can also post your issue or query related to modelling, analysis and design of Buildings.	Click Here
5	Guide for License Activation	How to activate products under Subscription Entitlement Service	Click Here
6	User Projects Example	Project examples using OpenBuildings Designer	Click Here