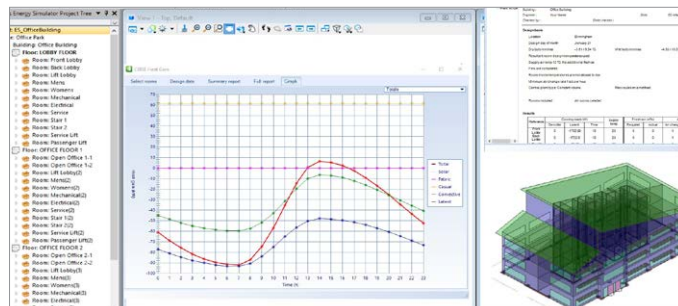# OpenBuildings® Designer

Design in Reality Context

OpenBuildings Designer is a multidiscipline building design application that enables you to use BIM workflows to create information-rich models for designing, analyzing, and simulating buildings and related structures, as well as for producing related documentation. The application incorporates 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 your 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 models of any size simultaneously across distributed geographies, leading to improved productivity and on-time project delivery.

DEVELOPED WITH YOUR BUSINESS NEEDS IN MIND

OpenBuildings Designer is a single application that handles a wide variety of complex design tasks with capabilities for architectural, structural, mechanical, and electrical disciplines. The available companion features—OpenBuildings GenerativeComponents®, OpenBuildings Station Designer, and Descartes™— as well as LumenRT™, deliver functionalities that you can use to work on all types of projects. These functionalities reduce the costs of application deployment, learning, and administration, leading to improved return on investment. The application allows you to collaborate efficiently in a project environment through a dataset that distributes a shared library of building components and production standards. With Bentley's federated data approach, you can work on and share models and drawings across geographically distributed teams while retaining discipline and responsibility. By using a connected data
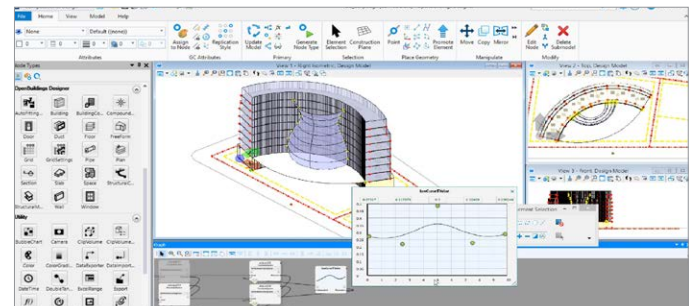
environment based on ProjectWise®, users can establish multidiscipline design coordination, produce multidiscipline deliverables, and reuse information across the asset lifecycle from any open application.

CONFIGURABLE TO YOUR PROJECT WORKFLOWS

OpenBuildings Designer is configurable to your existing project delivery workflows, ensuring that you can meet client contract deliverable requirements and enhance client satisfaction. Integration with ProjectWise enables project delivery based on ISO 19650 standards and promotes enhanced collaboration and information management for the whole asset lifecycle. The application provides you with the necessary workflows, toolsets, and flexibility to address real-life design scenarios on all types of building and infrastructure projects. Using OpenBuildings Designer, design alternatives can be efficiently explored by embedding design intent with expressions and constraint-driven geometry. This approach minimizes repetitive modeling work and improves design quality by allowing engineers and architects to evaluate design alternatives. The energy analysis module simulates the performance of building assets over time, aiding in sustainability and carbon offset decision-making. You can perform solar exposure studies and shadow analysis by using built-in visualization capabilities. Photorealistic rendering outputs in the form of images and movies can be produced by assigning advanced materials and textures to design elements, communicating the design to project stakeholders. Integration with LumenRT provides users with a real-time, immersive digital visualization experience, simulated with atmosphere, seasons, landscape, surroundings, people, and vehicles during various project stages.

Simulate and evaluate real-world building systems.

Efficiently explore design alternatives and address real-life design scenarios.

OpenBuildings Designer At-A-Glance

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, including IFC, COBie, RealDWG™, Revit Family RFA, and SketchUp SKP
- Incorporate project documents, media, web links, and other data with hypermodeling
- Easily manage data with bidirectional editing in Microsoft Excel
- Share project information using the iTwin® Platform
- Enforce production standards within a ProjectWise-managed environment
- Accelerate skillsets with access to personalized learning
- Automate coordinated drawings by controlling drafting styles and annotations
- Coordinate specification documents with construction models and drawings using the NBS Chorus plugin
- Publish component catalogs or component part libraries in Components Center and use them in projects
- Integrate real-time online GIS data seamlessly into the design context, eliminating the need for manual updates and file replacements

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 curtain wall configurations
- Create space layouts and space design options, then validate them
- Create openings automatically and accurately using buit-in auto penetration tool

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
- Exchange structural models and analysis using iTwin Analytical Synchronizer workflows
- Execute steel detailing for plate-based connections
- Synchronize, manage, and review structural information with Bentley's digital twins or with third-party desktop applications using the iTwin Analytical Synchronizer
- Exchange data with detailing applications using industry standards including CIS/2 and SDNF

MECHANICAL

- Parametrically model HVAC, piping, and plumbing systems
- Define components, paths, and angles to be modeled automatically when completing connections in HVAC and piping systems
- Create custom mechanical components with parametric connections that are added to the regular placement workflow
- Dynamically route single and multipipe 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 mechanical component data for fabrication workflows

ELECTRICAL

- Streamline lighting design using smart symbol arrangement features and bidirectional exchange with Relux for lighting analysis
- Design electrical circuits and route wiring through cable trays, baskets, and conduits connecting with lighting, power, or fire protection panels
- Automatically label components, produce drawings and schedules with user-definable labeling formats for switch designation, circuit numbers, and device IDs

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, define mathematical statements to control geometry, and manage dependencies to orchestrate behaviors 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 incrementally reverse the design script to visualize the design intent and behaviors of design relationships

ENERGY SERVICES

- Perform whole building energy analysis with analytical space models and conceptual mass models using EnergyPlus
- Calculate design and satisfy building regulation requirements using industry-standard building load calculations such as CIBSE Maxi Gain
- Reference a catalog of predefined standard HVAC system templates
- Calculate daylight factors using the 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 carbon dioxide emissions
- Evaluate factors like air and radiant temperature, air velocity, and clothing insulation, leveraging CIBSE TM52's thermal comfort analysis to assess and improve thermal comfort in nondomestic buildings

Bentley
Advancing Infrastructure

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