

# Questions and Answers

Revit® Structure software uses a single, intelligent model to coordinate all the tasks structural engineers and drafters need to complete during the building design process—from preliminary and schematic design to structural design and analysis to final construction documentation.

Revit Structure software works the way structural engineering firms work. A multimaterial physical model integrated with an independently editable analytical model delivers efficient, accurate, and flexible analysis, design, and documentation. Improve coordination by reusing crucial information from architectural files, whether it is from industry-standard 2D format or AutoCAD® Architecture or Revit® Architecture software files. Manage changes through bidirectional linking to popular structural analysis software, while parametric change management technology coordinates updates across the model and documentation. Use a complete set of drafting tools to create your documentation in Revit Structure. And import and export design data through widely used industry-standard formats for efficient collaboration.

## 1. General Product Information

### 1.1 What is Revit Structure 2009?

Revit Structure 2009 is a multimaterial structural modeling and drafting software system that provides concurrent physical and analytical modeling for design, coordination, and documentation. Bidirectional linking with industry-leading analysis applications is also another important capability of Revit Structure.

Revit Structure software integrates a physical model—for layout, coordination, and documentation—with an independently editable analytical model for multiple analyses. You can model from scratch or over 2D CAD files from the architect. Or, for even more powerful coordination, you can link directly to intelligent 3D architectural models from the AutoCAD Architecture or Revit Architecture software products. Bidirectional linking to industry-leading analysis software means analysis results update your Revit Structure model, while proven parametric change management technology coordinates those updates everywhere in your design and documentation. The bottom line: integrated modeling increases efficiency, improves accuracy, and streamlines coordination with your design team.

## **1.2 What is building information modeling, and how does it apply to Revit Structure?**

Building information modeling (BIM) is an innovative building design and documentation methodology that relies on the creation and collection of interrelated computable information about a building project. BIM makes reliable, coordinated, and internally consistent digital representations of the building available for design decision making, production of high-quality construction documents, construction planning, and predicting performance in various ways.

The ability to keep this information up-to-date and accessible in an integrated digital environment gives engineers, architects, builders, and owners a clear overall vision of their projects and contributes to the ability to make better decisions faster—for higher quality, more profitable projects.

Revit is Autodesk's platform for building information modeling. Applications such as Revit Structure (built on the Revit® platform) are complete, discipline-specific structural engineering, design, and documentation systems supporting all phases of structural modeling, analysis (with third-party software), and construction documentation.

For more information about building information modeling and Autodesk's strategy for the application of information technology to the building industry, see the white papers and other information available at [www.autodesk.com/bim](http://www.autodesk.com/bim).

## **1.3 What is the Revit platform?**

The Revit platform is Autodesk's software platform for building information modeling. From preliminary design through the most detailed construction drawings and schedules, applications built on Revit help provide immediate competitive advantage, as well as better coordination and accuracy, and can contribute to greater profitability for structural engineering firms and the rest of the building team.

At the heart of the Revit platform is the Revit parametric change engine, which automatically coordinates changes made anywhere: model views or drawing sheets, schedules, sections, plans—you name it.

## **1.4 What is AutoCAD Revit Structure Suite 2009?**

AutoCAD® Revit® Structure Suite 2009 is a software bundle including the Revit Structure 2009 and AutoCAD® 2009 software applications (shipped on two separate DVDs). A single serial number and single activation code permits use of both products nonconcurrently.

With AutoCAD Revit Structure Suite 2009, you get a powerful parametric structural modeler (in Revit Structure) plus four popular and widely-used drafting software: AutoCAD. This bundle enables companies to adopt building information modeling at their own pace, while getting the most value from their investment in AutoCAD by migrating their company standards and detail libraries to Revit Structure.

## 2. Technology

### 2.1 What are the primary features of Revit Structure?

The most important features include the following:

- Multiple structural materials can be used: steel, precast concrete, cast-in-place concrete, masonry, and wood—all within the same building model.
- Create your required construction documentation using one standard application.
- A state-of-the-art analytical model is created simultaneously and coordinated with the physical model.
- Create one model and bidirectionally link it with multiple analysis programs.
- Bidirectional associativity between the model, views, drawing sheets, details, and schedules helps create consistent construction documents.
- Multiple design options can be maintained within the same model.
- Multiple users can work on the model simultaneously.
- Import and export DWG™, DXF™, DGN, IFC, SAT, and CIS/2 files.
- Export and import 3D intelligent building objects for structural elements native to AutoCAD Architecture and AutoCAD® MEP software products.
- Full interoperability with Revit Architecture (from interference checking to coordination monitoring) and Revit® MEP software helps maintain coordinated and consistent designs with the project team .
- Smart relationships are created between structural members; these adjust when conditions between structural elements are modified. For example, if a column is moved, the beams framing into that column adjust automatically.
- Use standard templates to generate specific structural families using the family editor.

### 2.2 Who builds the model in Revit Structure: engineers or drafters?

Revit Structure supports different ways of working. Structural designers and drafters may create the model, and engineers then complete it with loads and load combinations, release conditions, and material properties before performing analyses. Or structural engineers may build the physical model themselves and then continue the analysis process while the drafters complete the construction documents. Revit Structure simplifies the creation of structural drawings by automatically generating drawings and schedules directly from the physical model. This enables drafters to focus on detail views, annotations, and the other particulars required for construction.

### 2.3 Can I use Revit Structure just for drafting?

You can work entirely in Revit Structure to generate your construction documentation. AutoCAD software is not required. Revit Structure includes all necessary drafting tools to complete drawings, structural details, and schedules, including dimensions, annotations, symbols, detail components, detail lines, and revision tools. You can also reuse existing typical details from AutoCAD by importing DWG files. All construction documents created in Revit Structure can be exported to DWG format for other consultants to use.

### 2.4 What types of structural elements are supported out of the box?

Libraries of all standard walls, columns, foundations, beams, floor systems, braces, trusses, and open web joists are provided. Special foundations, precast concrete elements, and other useful structural libraries, such as castellated beams, steel connections, stiffeners, and concrete reinforcement, are also supported. Structural boundary conditions, load cases, and load types are included and can be exported to analysis and design software along with the other structural elements.

**2.5 What are the advantages of modeling in Revit Structure instead of in an analysis program?**

Research has shown that structural engineers use an average of three different analysis/design programs. Revit Structure can be used as a common structural modeling tool to link with the analysis software. Working this way, structural engineers can spend more time engineering and less time learning multiple modeling tools.

Another advantage of Revit Structure is the engineering insight available during the modeling process. For example, Revit Structure automatically detects unsupported structural elements, global and local instabilities, and framing anomalies before sending the model to analysis software.

Revit Structure models can also be created externally using models from certain analysis programs. This enables you to create, view, and use Revit Structure models of projects that have been started in an analysis program or projects that have already been constructed.

## 4. Compatibility and Interoperability

**4.1 How does Revit Structure 2009 link with third-party structural analysis and design programs?**

Revit Structure 2009 ships with a structural API development toolkit. Software partners use the API toolkit to develop links between their software applications and Revit Structure. Structural analysis and design partners that have done so currently include the following:

<u>Autodesk</u> <ul style="list-style-type: none"> <li>• ROBOT Millennium</li> </ul>	<u>Oasys (Arup)</u> <ul style="list-style-type: none"> <li>• GSA</li> </ul>
<u>ADAPT Corporation</u> <ul style="list-style-type: none"> <li>• ADAPT Builder™</li> </ul>	<u>RISA Technologies</u> <ul style="list-style-type: none"> <li>• RISAFloor</li> <li>• RISA-3D</li> </ul>
<u>Bentley Systems, Inc.</u> <ul style="list-style-type: none"> <li>• RAM Structural System</li> </ul>	<u>SOFiSTiK AG</u> <ul style="list-style-type: none"> <li>• SOFiSTiK</li> </ul>
<u>Computers and Structures, Inc.</u> <ul style="list-style-type: none"> <li>• ETABS</li> </ul>	<u>SOFTEK Services Ltd.</u> <ul style="list-style-type: none"> <li>• S-Frame®</li> </ul>
<u>CSC (UK) Ltd.</u> <ul style="list-style-type: none"> <li>• Fastrak Building Designer</li> <li>• Orion™</li> </ul>	<u>Space Gass</u> <ul style="list-style-type: none"> <li>• Space Gass</li> </ul>
<u>Midas</u> <ul style="list-style-type: none"> <li>• Midas/Gen</li> </ul>	

For more information about Revit Structure third-party structural analysis and design partners, visit [www.autodesk.com/revitstructure-partners](http://www.autodesk.com/revitstructure-partners).

**4.2 How does Revit Structure 2009 work with Revit Architecture and Revit MEP software?**

Revit Structure 2009 is built on the same Revit technology platform as Revit Architecture and Revit MEP. If the structural engineer, MEP engineer and architect are using Revit applications but are in separate organizations, they can exchange and cross-link RVT format files so each has access to the other's information as they work. Working on the same Revit platform enables engineers and architects to perform interference checks between structural and architectural elements. It also provides automatic coordination monitoring tools so that each discipline can get an electronic notification each time the other makes a change.

**4.3 How does Revit Structure 2009 work with AutoCAD or other 2D software?**

Revit Structure 2009 provides industry-leading DWG compatibility for data import and export. It supports the process most engineering firms use with their clients by producing consistent and layered DWG files using user-defined layering standards. Revit Structure 2009 enables imported or linked DWG files from clients or consultants to be used for coordination as reference geometry or as the starting point for a new design. Any CAD system that supports the DWG or DXF file format can work effectively with Revit Structure 2009.

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