

Importing and Exporting Files

You can use Revit® Architecture to import and export various file types, including AutoCAD® and AutoCAD® Architecture DWG™ files to use as design aids. You can also export views, schedules, and other data to external application formats for clients or team members who use other CAD programs.

Objectives

After completing this chapter, you will be able to:

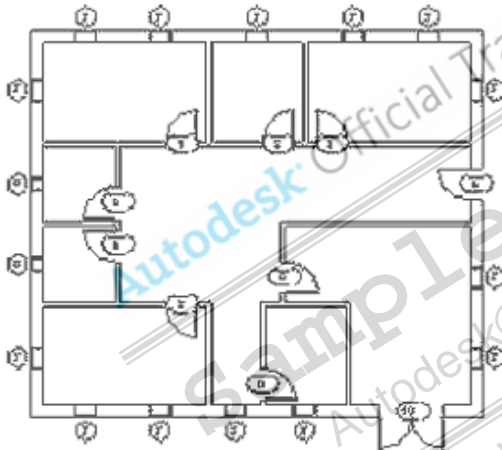
- Import and use external files in Revit Architecture.
- Export Revit Architecture files into various external file formats.

Lesson: Importing and Using External Files

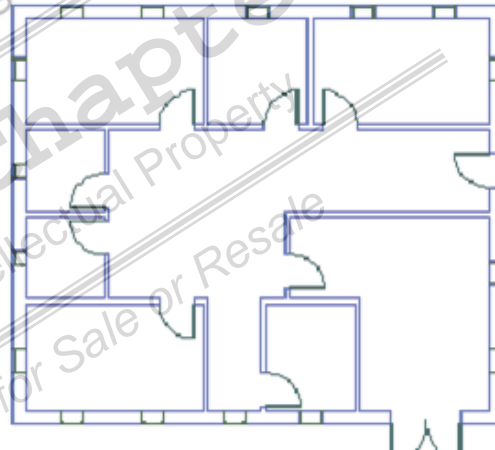
Overview

This lesson describes how to import and use external files in Revit Architecture. You begin the lesson by learning about importing vector data, 3D solids, and Google® SketchUp® files, and using positioning and scaling options. Next, you learn the steps to import raster data into a project and some recommended practices for importing and using external files. The lesson concludes with the exercises on importing and tracing vector data and importing a DWG detail.

You import files from an external source, such as AutoCAD, to reuse existing design data while completing a Revit Architecture project. This saves the effort and time of starting a project completely from scratch. The external files contain usable information in the form of vector and raster data, proxy graphics, and ACIS objects. After importing, you can modify the imported data, as required.



AutoCAD drawing



AutoCAD drawing imported into Revit Architecture

Objectives

After completing this lesson, you will be able to:

- Describe importing vector data.
- Describe importing 3D solids and Google SketchUp files.
- List the positioning and scaling options that can be defined for importing files.
- Import raster data into a project.
- State the recommended practices for importing and using external files.
- Import and trace vector data to create a building model.
- Import a DWG detail to a drafting view.

About Importing Vector Data

Vector data, which is line-based data, is produced in many Computer-Aided Design (CAD) applications. You import vector data into Revit Architecture as a single object that you can move, copy, snap to points on, and use as a reference to trace over. You can import 2D, 3D, and ACIS objects and proxy graphics as vector data. If required, you can explode imported vector data into Revit lines and text.

Definition of Importing

Importing is the process by which you use existing data, such as symbols or surfaces, and graphics available in files such as DWG, DXF™, Google SketchUp (SKP), and MicroStation® (DGN), in Revit Architecture projects.

You import vector data to:

- Use as a reference for creating a 3D building model.
- Generate a site toposurface.
- Use for 2D detailing.

Import Symbol

Imported vector data files are not recognized as Revit Architecture model objects. These imported vector data files contain elements such as lines, text, blocks, and possibly other referenced files. On import, all these elements become a single object called an import symbol. You explode the import symbol to edit it. When exploded, an import symbol is converted into model lines and text.

You manipulate an import symbol by moving or copying it as one piece. You can use information in the import symbol by tracing over import linework with Revit Architecture model objects to create building models. If required, you can dimension individual parts in the import symbol and align objects with them. For example, you can snap walls to the lines representing walls in the import symbol.

Linking Versus Importing

You can reuse vector data in a Revit Architecture project in the following two ways.

Ways to Reuse Data	Description
Linking	<p>When you link a file to a Revit Architecture project, the source file remains separate and Revit Architecture tracks the network path of the file. If a linked file changes, the link is updated when you reopen the Revit Architecture project. You can also reload links from within the project. To control the reload and unload of linked files, you use the Manage Links dialog box accessed using the File menu.</p> <p>You cannot explode a linked file. Therefore, you should link files if you collaborate with others who make changes to those files.</p>
Importing	<p>When you import a file, it is embedded into a Revit Architecture project. If the source file changes after import, it is not updated in the project. There is no unload or reload capability for imports. However, you can explode an imported file.</p>

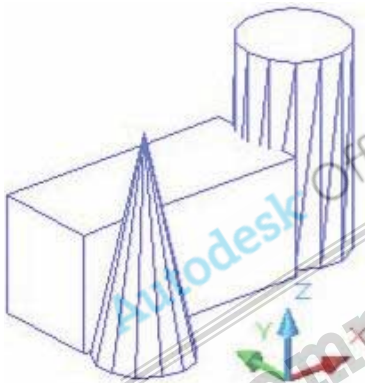
2D Objects

You can import all 2D objects of an AutoCAD drawing except rays and construction lines. An imported CAD file is called an import symbol in Revit Architecture and is considered as one object unless you explode it. You can explode the 2D import symbol into text, curves, lines, and filled regions.

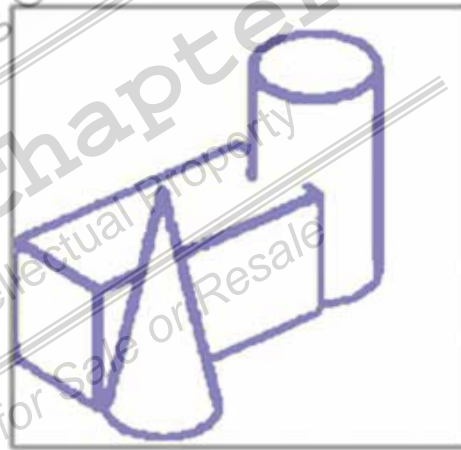
3D Objects

You can import 3D objects from AutoCAD Architecture, Mechanical Desktop, or ARX files. 3D solids, faces, surfaces, and regions are imported as 3D import symbols that have limited snapping. Although you can explode a 3D import symbol, it is not possible to explode all 3D objects of the import symbol into 2D lines. If an object cannot be imported or exploded, you receive a warning message.

The following illustration shows 3D solid objects such as box, cone, and cylinder displayed in AutoCAD in hidden-line view mode. The same 3D solid objects after being imported into Revit Architecture and converted into a 3D import symbol are also shown.



3D solids in AutoCAD in hidden-line view



3D import symbol in hidden-line view

ACIS Objects

You can import ACIS objects from DWG, DXF, and SAT files. ACIS objects describe solids or trimmed surfaces. You can also import smart solids, except B-spline surfaces, from MicroStation.



To use ACIS imports for face-based host commands, you import geometry into an in-place family of the Mass or Generic Model category. Face-based commands work best on ACIS solids. For example, if you create walls by face on a cube, the walls join and miter correctly. If you create a curtain system by face on a solid, you can add corner mullions onto the joins between faces of the curtain system.

AutoCAD Xrefs

AutoCAD files can contain externally referenced files called xrefs, which can be unloaded, reloaded, and updated inside AutoCAD. Xrefs can also be nested; you can reference a file containing an xref into another file.

You can import AutoCAD drawings with xrefs into a Revit Architecture project. Nested xrefs in AutoCAD are visible in a Revit Architecture project only if you include them as an attachment in AutoCAD.

Proxy Graphics

You can import proxy graphics from AutoCAD files. Intelligent AutoCAD Architecture objects can be represented with proxy graphics when opening a file in other applications. Proxy graphics do not have intelligence. If you set the Proxy Graphics command to 1 in AutoCAD, you can import both ARX objects and AutoCAD Architecture objects, such as walls and floors, as proxy graphics.

Line Weights

CAD applications use color assignments to determine line weight when printing. You import colors from a DWG or DXF file and map them to a Revit line weight by using the Import Line Weights DWG/DXF option under Import/Export Settings on the File menu. Each layer in the file is assigned a line weight based on color. Standard line weight mappings that follow AIA, BS1192, ISO13657, or CP83 standards are provided in advance for a Revit Architecture project. You can also create personalized line weight mappings and save them as named files that can be used across projects.

Colors

You can display the linework of imported files in the original colors. If required, you can invert colors so that light colors, which display well on the black screen of most CAD applications, are visible on the white screen of Revit Architecture, or you can map colors to black lines. These options are available in the Colors list in the Import/Link CAD Formats dialog box, as shown.



Scaling

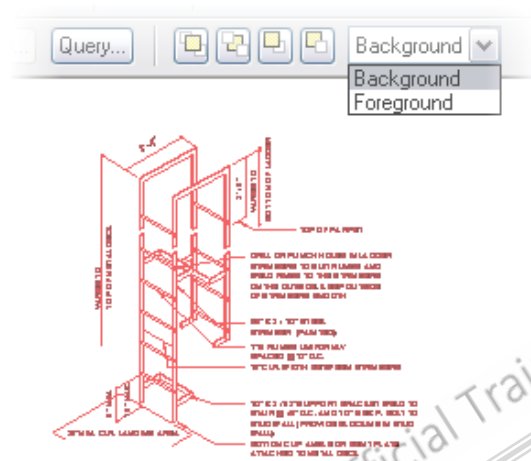
You can determine the scale factor of imported DWG or DXF files in a project from the import units and scale factor properties of the import symbol. If you change the import units, the scale factor is also updated. If required, you can also specify a different scale factor. If you open Revit Architecture files saved in previous versions, the values for the import units and scale factor parameters are not displayed. You must either reload the link or re-import the files into the current version to verify the values.

Positioning Imported 3D Geometry

If you import CAD drawings with the Current View Only check box cleared, the imported drawing appears in all views. If you import geometry into all views, you can set a base level for the geometry and specify a height offset from that level. To do this, you select the imported geometry and access its properties. Then, you set the Base Level and Base Offset instance parameters. You can also select the geometry in an elevation view and move it to adjust the base offset value.

Any imported geometry has draw order properties. This means that you can move the import symbol between the foreground and the background of a view with respect to model elements in the view. By default, the import symbol is set to display in the background, behind the model components. If the import symbol is set to display in the foreground of the view, it appears in front of model elements although it is still behind any detail components and annotations you add to the view.

The following illustration shows how to place an imported CAD drawing in the background of a view.



Snapping to Imported Geometry

When you import an AutoCAD drawing, such as a floor plan, you can trace the walls in the drawing to add Revit Architecture elements, snap to the geometry in the drawing, and use the geometry to align elements. Revit Architecture recognizes wall faces and the wall centerlines in the import symbol.

Exploding Imported Geometry

When you import or link a drawing, all its contents, including blocks and xrefs are contained in an import symbol. You can partially disassemble or explode an import symbol to take advantage of these blocks or xrefs that are called nested import symbols. You can also completely explode an import symbol into text, curves, lines, and filled regions. You can query linked files and delete layers from them but you cannot explode linked files. You can also import a linked CAD file using the Manage Links dialog box.

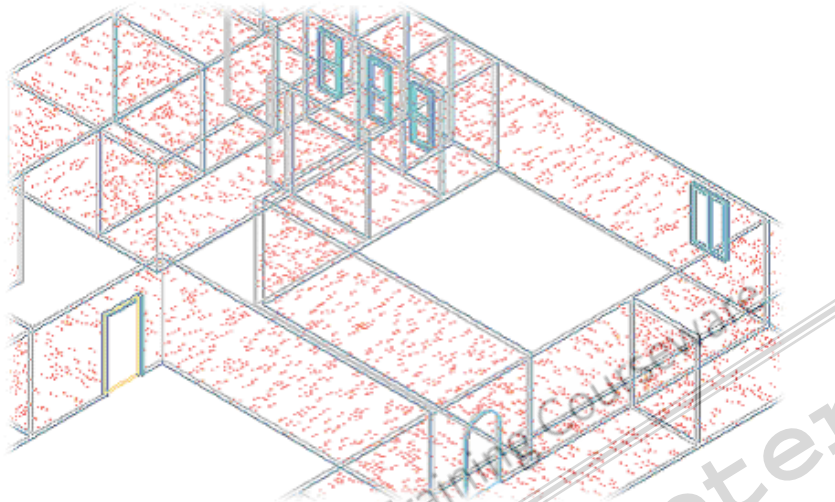
The 2D import symbols created when 2D drawings are imported can be exploded into 2D model lines. These 2D model lines can then be manipulated like any other model line. However, 3D solids, faces, surfaces, and regions cannot be exploded; in fact, they are deleted if the import symbol is exploded.



You cannot explode an import symbol that yields more than 10,000 elements.

Example of Importing Vector Data

The following illustration shows an example of 3D vector data imported into Revit Architecture.

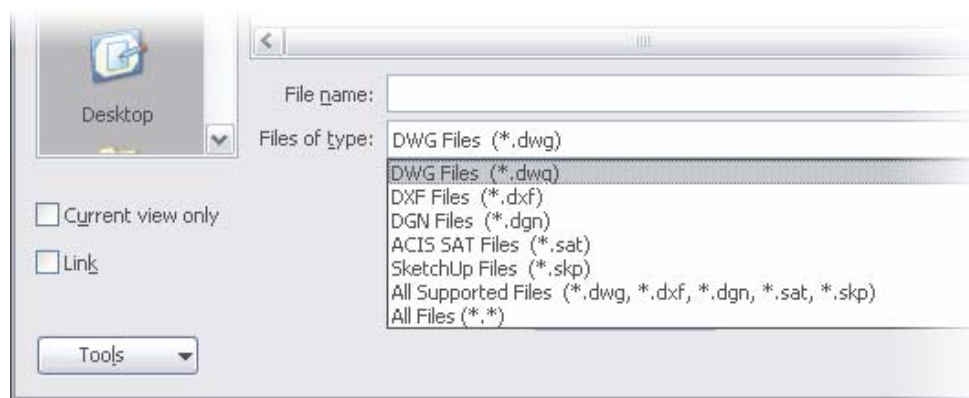


About Importing 3D Solids and Google SketchUp Files

When you design a building model in Revit Architecture, you use 3D solids and sketches of building elements. If these 3D solids and sketches already exist in another software application, you import them instead of recreating the objects in Revit Architecture. For example, you can import 3D solids from AutoCAD and Google SketchUp files, and reuse them to design a Revit Architecture model.

Definition of 3D Solids and Google SketchUp Files

A 3D solid is a 3D object created in an AutoCAD application. You can extrude, sweep, and use other techniques to create 3D solids. A Google SketchUp (SKP) file is a 2D or 3D sketch of a building model object created in Google SketchUp. You import Google SketchUp files and 3D solids from AutoCAD files by using the Import/Link CAD Formats dialog box in Revit Architecture. This dialog box provides the same import options for both types of files.



Import options in the Import/Link CAD Formats dialog box

Importing 3D Solids

You can specify the view, the layers and layer colors, the position in the view window, and the scale of a 3D solid when you import it from AutoCAD into a Revit Architecture project. You can specify whether to import a CAD file containing a 3D solid into the current view or into all views. You can also specify the layers to import from the CAD file: all the layers, only the visible layers, or only selected layers.

Importing Google SketchUp Files

You import Google SketchUp files directly into a Revit Architecture project. Similar to importing 3D solids, you can specify the layers of the Google SketchUp file that you want to import into the Revit Architecture project. You can also specify the views in which the Google SketchUp file will appear.

Example of Importing 3D Solids and Google SketchUp Files

The following illustration shows an example of a 3D solid of an elevated path and a Google SketchUp file of a decorative street light imported into Revit Architecture.

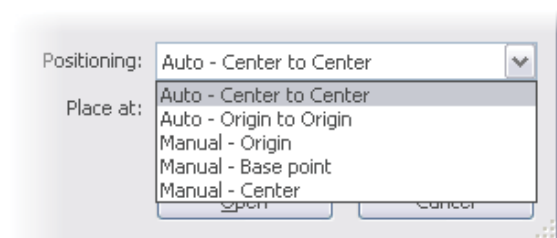


Positioning and Scaling Options

After you import an object, you position and scale it to suit project requirements using the positioning and scaling options available in the Import/Link CAD Formats dialog box.

Positioning Options

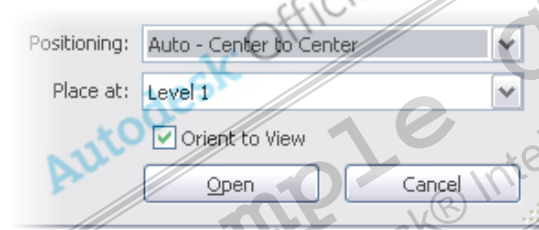
You can choose whether to place the imported objects automatically or manually using the various positioning options as shown below.



The following table describes the options you can select from the Positioning list in the Import/Link CAD Formats dialog box.

Options	Description
Auto - Center to Center	Places the center of the imported object automatically at the center of the Revit Architecture model.
Auto - Origin to Origin	Aligns the User Coordinate System (UCS) of the imported object automatically with the internal origin of the Revit Architecture project.
Manual - Origin	Positions the origin of the imported object on the cursor in the view window.
Manual - Base Point	Positions the base point of the imported object on the cursor. You use this option only for AutoCAD files that have a base point set.
Manual - Center	Sets the cursor at the center of the imported object.

The Import/Link CAD Formats dialog box provides some additional positioning options as shown below.

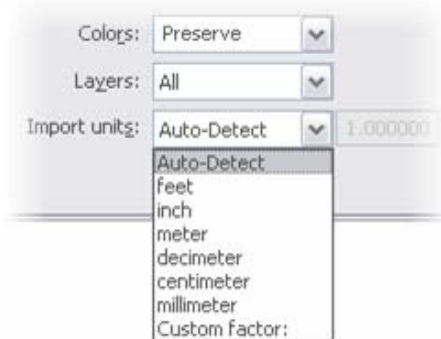


The following table describes the additional positioning options in the Import/Link CAD Formats dialog box.

Options	Description
Orient to View	Select this check box to place the imported object at the same orientation as the current view. This check box is active only for imports that are not view-specific.
Level 1	Select this option from the Place At list to select a level on which to place the origin or the base point of the imported object.

Scaling Options

You can scale an imported object by selecting the appropriate import units for the imported file in the Import/Link CAD Formats dialog box, as shown.



The Import Units list provides options to set the scaling unit for the imported file. You can specify auto-detection, feet, inches, meters, decimeters, centimeters, or millimeters as the scaling unit. When you set Import Units to Custom Factor, the scale field opens for editing.



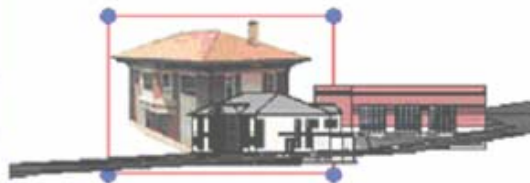
When you import an AutoCAD file created in imperial English with the Auto-Detect option activated, feet and inches are set as the default units. If an AutoCAD file is created in metric, it is imported into Revit Architecture with millimeters set as the default unit.

Importing Raster Data

Computer images consist of grids of pixels with specific color value. This is known as raster data or bitmap. You can import bitmap images to use as background images in a project or as visual aids when you create a building model. You can also import them to use as logos in a titleblock family. While imported bitmap images are displayed behind the building model, the annotation symbols are displayed in the draw order. If you want the image to appear on a model element, use the Decal command on the Modelling menu.

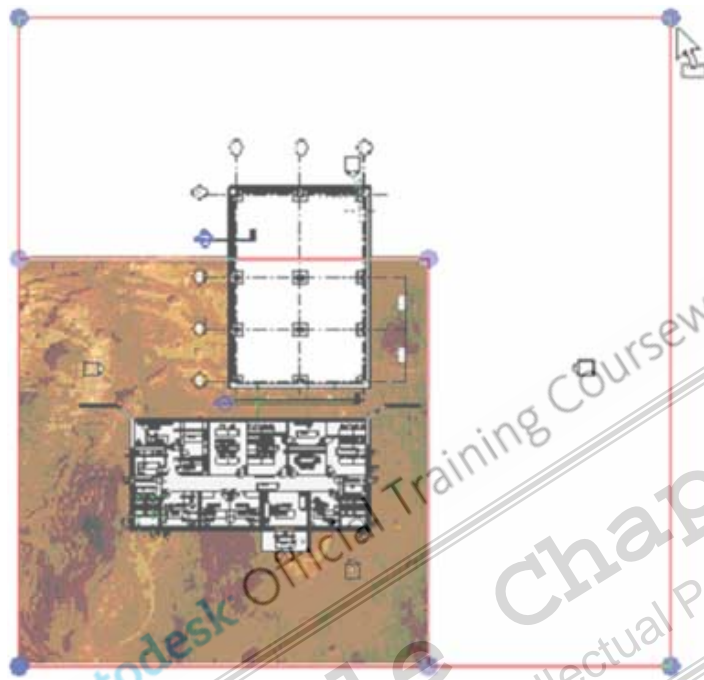
Usually, you import bitmap images into 2D views. They can be imported into 3D views, but they are always displayed on and behind the building model even when the view is rotated.

The following illustration shows a building model with a toposurface and a 2D raster image in the background.



Raster Image Management

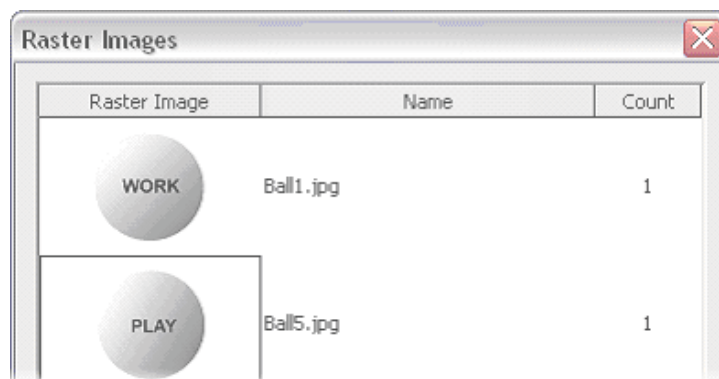
You can resize and reposition imported raster or bitmap images by selecting them and dragging their grips, as shown.



Although the aspect ratio of the image is maintained by default, you can change this parameter for the image in the Element Properties dialog box.

Raster Images Dialog Box

The Raster Images dialog box lists all bitmap images in the project, including any rendered images that you captured. You can delete an image from the project by using this dialog box. Deleting an image from a view or a sheet of the project removes only the instance of the image.



Procedure: Importing a Raster Image

The following steps describe how to import a raster image.

1. Click File menu > Import/Link > Image.
2. In the Open dialog box, select the file to be imported.
3. Click in the view window to place the image.
4. Modify the imported image by scaling and moving it to a new position.
5. On the Options Bar, click Lock Proportions to keep width and height settings of the imported image proportional while scaling.
6. On the Options Bar, click Element Properties.
7. In the Element Properties dialog box, under Instance Parameters, set the values for height and width of the image.
8. On the Edit toolbar, click Rotate.
9. Rotate the image in the view window, as required.

Guidelines for Importing and Using External Files

The following recommended practices help you when importing and using external files in Revit Architecture.

- Import 2D details into drafting views of Revit Architecture projects to efficiently leverage previously created CAD information. Most companies have extensive libraries of CAD details that can be reused by importing them. This saves time in the documentation phase.
- Set up line weight mapping in advance when importing 2D files. This ensures that the files look and print as intended. To aid this, you can have multiple line weight mapping files, one for each CAD file source. This saves time and improves workflow.
- Import 2D files, such as floor plans, into a single view only unless you want to see the CAD file in other views. For example, you may want to see an imported CAD floor plan under Revit walls in a 3D view. If you import a 2D file into more than one view, you should manage the visibility of the imported 2D CAD floor plan in elevation and section views. This helps prevent any inadvertent deletions or modifications.
- Import geometry into an in-place family of the Mass or Generic Model category to use ACIS imports for face-based host commands. For example, you can use Roof By Face to generate a roof from a curving surface created in SketchUp or AutoCAD. This leverages the design information created using other applications when developing a building model in Revit Architecture.

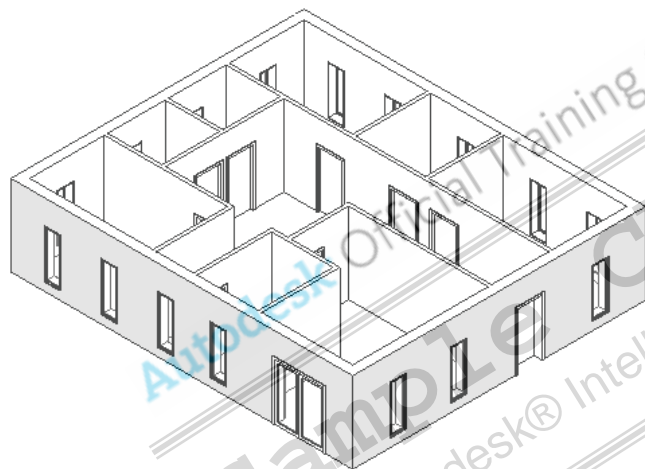
Exercise: Import and Trace Vector Data

In this exercise, you import an AutoCAD drawing into a Revit Architecture project and then trace the imported drawing to create a building model.

You have received a building floor plan that was created in AutoCAD. You import it into Revit Architecture and use the CAD linework to create the building model in Revit Architecture.

You do the following:

- Import a 2D DWG file.
- Trace the DWG file.



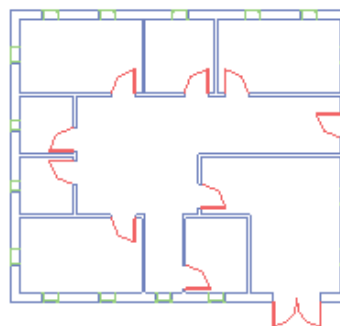
The completed exercise



Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Importing and Exporting Files*. Click *Exercise: Import and Trace Vector Data*.

3. In the Import/Link CAD Formats dialog box:
 - Navigate to the folder where you installed the courseware datasets.
 - Select the file *i_floorplan.dwg* or *m_floorplan.dwg*.
 - Ensure that Preserve is selected from the Colors list to display the linework of the DWG file in original colors.
4. To specify other import options:
 - Ensure that the Link check box is cleared so that you import and not link the DWG file into Revit Architecture.
 - Ensure that the Current View Only check box is selected to display the imported DWG file only in the Level 1 floor plan view and not in other views.
 - Verify that All is selected in the Layers list so that you can view and work with all the layers of the DWG file.
5. In the Import/Link CAD Formats dialog box, click Open. The DWG file is displayed in the Level 1 floor plan view.



Import a 2D DWG File

1. Open *i_importing.rvt* or *m_importing.rvt*. The file opens in the Level 1 floor plan view.
NOTE: The illustrations for the metric dataset will be slightly different from those shown here.
2. Click File menu > Import/Link > CAD Formats.

Trace the DWG File

1. On the View toolbar, click Zoom In.
2. In the view window, zoom in to the import symbol to use it for sketching walls.
3. On the Design Bar, Basics tab, click Wall to sketch exterior walls using the import symbol.

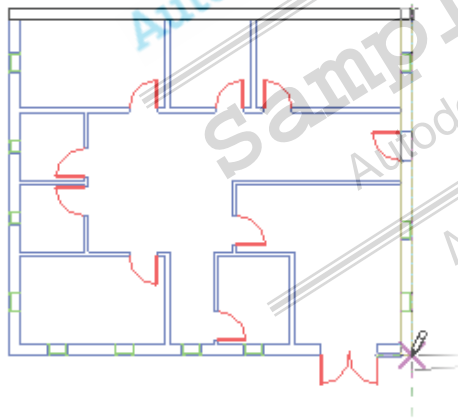
4. Select Basic Wall : Exterior - Brick on Mtl. Stud from the Type Selector list.

5. On the Options Bar:

- Verify that Draw is selected.
- Select Level 2 from the Height list.
- Select Finish Face: Exterior from the Loc Line list to trace exterior walls using the outer edges of the import symbol.
- Ensure that the Chain check box is selected to create a chain of independent wall segments.

6. In the view window, starting from the upper-left corner of the building, trace the four exterior walls clockwise over the import symbol, as shown.

NOTE: While tracing the exterior walls, draw corner to corner so that you trace over the windows and doors also. You will place these windows and doors in later steps.



7. On the Design Bar, Basics tab, click Modify to finish drawing the exterior walls.

8. On the Design Bar, Basics tab, click Wall to draw interior walls using the import symbol.

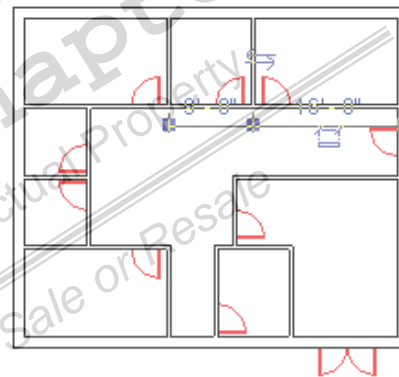
9. Select Basic Wall : Interior - 5" Partition (2-hr) (Basic Wall : Interior - 135mm Partition (2-hr)) from the Type Selector list.

10. On the Options Bar:

- Verify that the value in the Loc Line list is set to Wall Centerline to place interior walls using the wall centerlines in the import symbol.
- Clear the Chain check box to create a chain of independent wall segments.

11. In the view window, trace all the interior walls by selecting the centerlines of the walls. While tracing, ensure that you sketch the interior walls one segment at a time by clicking to specify the start and end points for each wall. You should sketch the walls as if the doors do not exist.

TIP: You can zoom in to sketch the walls easily.

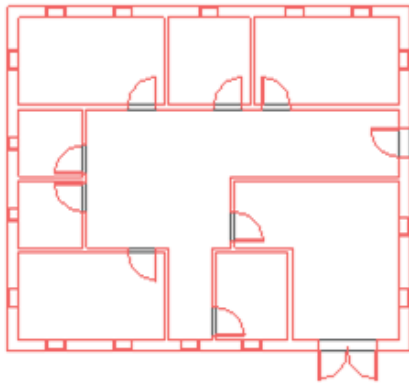


12. On the Design Bar, Basics tab, click Modify to finish drawing the interior walls.

13. In the view window:

- Place the cursor over a door. The import symbol highlights and a tooltip `i_floorplan.dwg : Import Symbol : location < Not Shared>` (`m_floorplan.dwg : Import Symbol : location < Not Shared>`) is displayed.
- Click to select the import symbol.

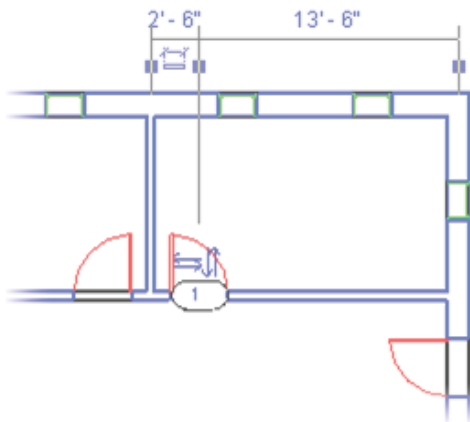
14. On the Options Bar, select Foreground from the Background/Foreground list to bring the import symbol to the front in the view window.



You can now view windows and door jambs that will help locate doors in the subsequent steps more easily and precisely.

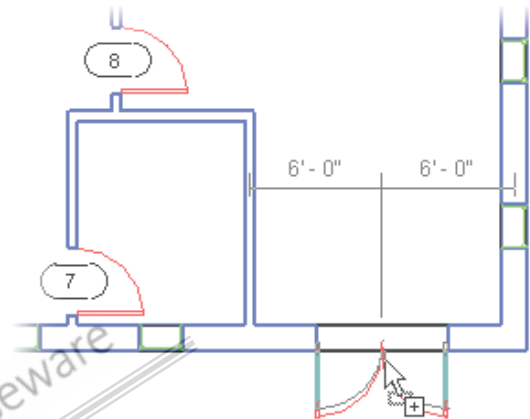
15. On the Design Bar, Basics tab, click Door to place doors in the import symbol.
16. Select Single-Flush : 36" x 84" (M_Single-Flush : 0915 x 2134mm) from the Type Selector list.
17. In the view window, click to place a door over each single door in the import symbol. The import symbol is for your reference only. The exact position of the doors is not critical to complete this exercise.

TIP: Press SPACEBAR, if necessary, to flip the hinge side of the door before placing it.



18. Select Double-Glass 1 : 72" x 84" (M_Double-Glass 1 : 1830 x 2134mm) from the Type Selector list.

19. In the view window, click to place a door over the double door in the import symbol.

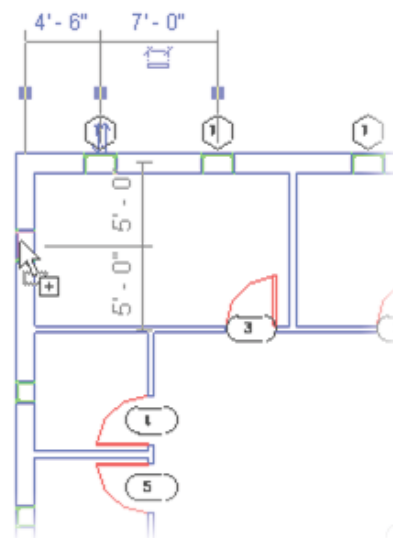


20. On the Design Bar, Basics Tab, click Window to place windows in the import symbol.

21. Ensure that Fixed : 24" x 72" (M_Fixed : 0610 x 1830mm) is selected in the Type Selector list.

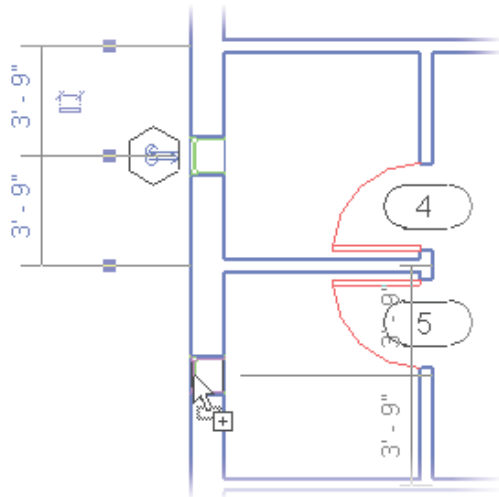
22. In the view window, click over each window to place all the windows along the exterior walls except the two middle windows on the west side. Place the windows such that the window tags are positioned outside the exterior wall.

TIP: You can zoom in to place the windows easily.



23. Select Fixed : 16" x 72" (M_Fixed : 0406 x 1830mm) from the Type Selector list to select a type for the two middle windows on the west side.

24. In the view window, click the two middle windows to place them on the west side.

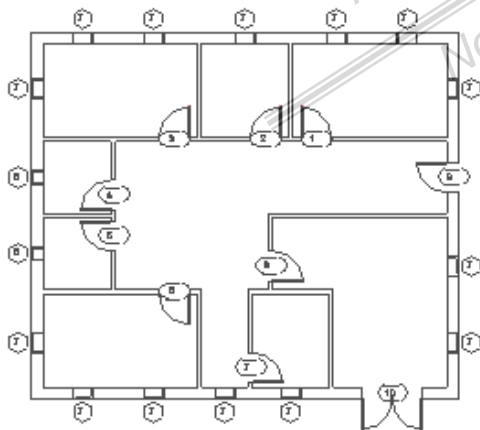


25. On the Design Bar, Basics Tab, click Modify to finish placing the windows.

26. In the view window:

- Place the cursor over an exterior wall.
- Press TAB until the import symbol is highlighted.
- Select the import symbol.

27. On the Options Bar, select Background from the Background/Foreground list.

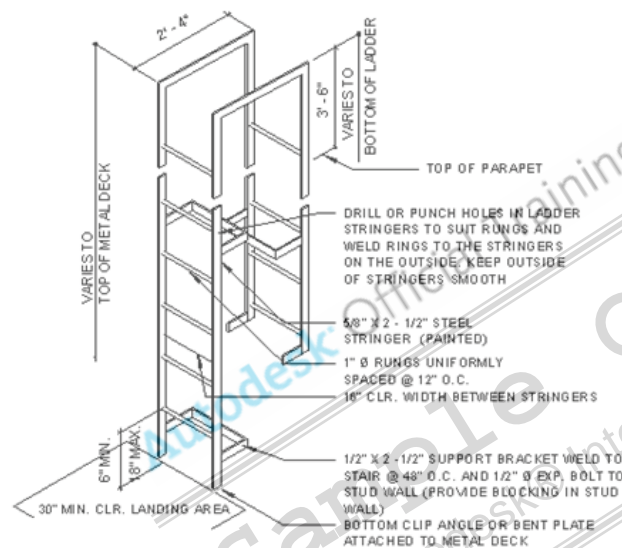


28. On the View toolbar, click Default 3D View.
29. Close the file without saving.

Exercise: Import a DWG Detail

In this exercise, you import a DWG detail into a Revit Architecture project.

You are creating a building model design. You have an existing DWG file that you want to use as a detail in the building model documentation. To use the file, you create a drafting view in the Revit Architecture project. You then import the DWG file into the drafting view. Finally, you explode the import symbol and modify it.



The completed exercise

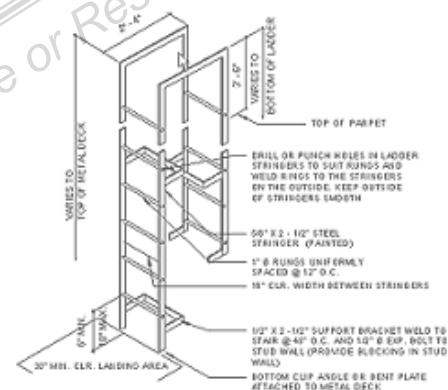


Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Importing and Exporting Files*. Click *Exercise: Import a DWG Detail*.

1. Open *i_importing_detail.rvt* or *m_importing_detail.rvt*. The file opens in the 3D view.
2. On the Design Bar, View tab, click Drafting View to create a new drafting view.

3. In the New Drafting View dialog box:
 - For Name, enter **LADDER DETAIL**.
 - Select 1/2" = 1'-0" (1 : 20) from the Scale list.
 - Click OK.
4. Click File menu > Import/Link > CAD Formats.
5. In the Import/Link CAD Formats dialog box:
 - Navigate to the folder where you installed the courseware datasets.
 - Select *ladder_detail.dwg* from the displayed list of files.
 - Select Black and White from the Colors list to map colored lines of the DWG file to black lines in Revit Architecture.
 - Click Open.
6. Press **ZF** to zoom out to view the import symbol.



7. In the view window, select the import symbol.
8. On the Options Bar, click Full Explode to convert the import symbol to lines and text.

9. To edit the text in the import symbol, in the view window:
 - Select the upper-right text note TOP OF PARPET.
 - Click the text in the selected text note.



DRILL OR PUNCH HOLES IN

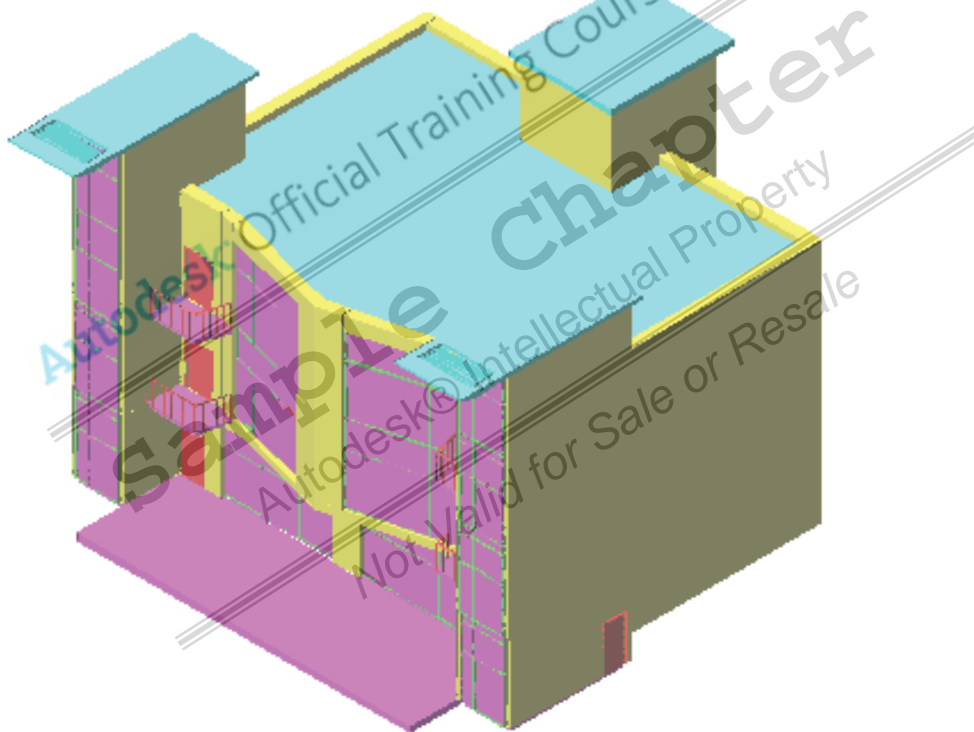
- In the text box, enter **TOP OF PARAPET** to correct the spelling of parapet.
- NOTE:** You can continue to make any modifications to the imported detail.
10. Click two times in the view window to cancel the selection of the text note.
 11. Close the file without saving.

Lesson: Exporting to External Files

Overview

This lesson describes how to export Revit Architecture files into various external file formats. You begin the lesson by learning about exporting and some recommended practices for it. The lesson concludes with an exercise on exporting views to AutoCAD.

When you design structures for a building model, you may need to send views, schedules, and other data to clients or team members who use CAD programs. Using Revit Architecture, you can export views and sheets to CAD programs.



3D view after exporting to AutoCAD

Objectives

After completing this lesson, you will be able to:

- Describe exporting.
- State the recommended practices for exporting.
- Export views to AutoCAD.

About Exporting

You can export Revit Architecture views and sheets to the DXF and DWG CAD file formats and to the MicroStation DGN file format. While exporting, you can control the visibility of exported files and map the files to specific layers that are available in CAD programs.



You can also export views to IFC files. These files are in a nonproprietary file format that building disciplines and related CAD programs use.

Definition of Exporting

Exporting is a method by which you save content from one software application into different formats that can be used in other applications. In Revit Architecture, you can save files in different formats that are supported by CAD programs.

Exporting Types of Views

You can export to CAD file formats the currently active view; specific views, such as plan, elevation, section, and 3D; sheets; or schedules. Views and sheets are exported as a drawing, whereas schedules are exported as a text file only. To export schedules as drawings, add them to a sheet and export the sheet.

When you export sheets to AutoCAD, the sheet becomes the Paper Space layout tab, the Revit Architecture viewports become AutoCAD viewports, and the Revit Architecture views are placed in model space. There is also an option for converting Revit views into individual external reference files.

Exporting 3D Views

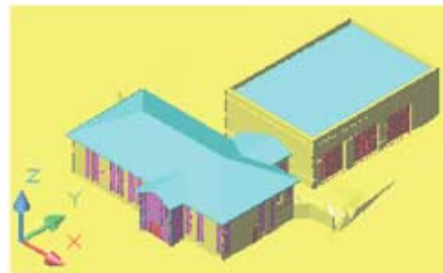
When you export a 3D view, the actual 3D model is exported instead of the 2D representation of the 3D model. To export a 2D representation of the 3D model, you add the 3D view to a sheet and export the sheet view. You can then open the 2D version of the view in other CAD programs.

While exporting a 2D or 3D view, you can set the model graphics style to a desired setting, such as Wireframe, in the file to be exported.

The following illustrations show 3D views before and after exporting to AutoCAD.



3D model set to Shading with Edges



3D model set to Shading with Edges when exported to AutoCAD



3D model set to Hidden Line



3D model set to Hidden Line when exported to AutoCAD



You can export 3D views in FBX format to 3ds Max for rendering. In such a situation, the exported file retains the materials and render settings.

Visibility Property of Exported Views

You can control the visibility settings of a view before and after exporting it using the Visibility/Graphic Overrides dialog box in Revit Architecture and the Layer Manager in a CAD application, respectively. For example, if you do not want to export the hatch pattern of a floor or the door tags, you can turn them off in the Visibility/Graphic Overrides dialog box. After you export the file, you can control the display in the CAD application by managing the exported layers. If you turn off a layer, the objects on that layer are not displayed.

File Naming for Exported Views

When you export a single view, you have the option to set the file name either manually or automatically. When you export multiple views, the exported files are named automatically.

Layer Mapping

When you export a Revit Architecture view to a CAD program, element categories and subcategories, such as the model and annotation objects, are mapped automatically to preconfigured layer names. However, you can control this mapping by specifying any of the following mapping standards in the Export Layers Standard dialog box:

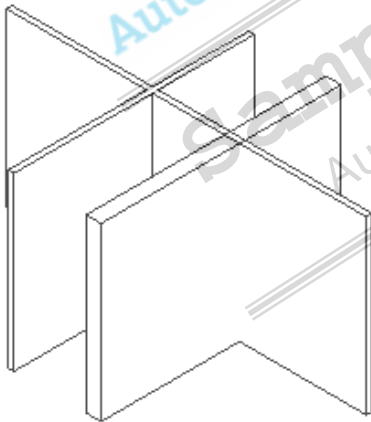
- American Institute of Architects (AIA)
- ISO standard 13567
- Singapore standard 83
- British standard 1192

Based on the mapping standard, a layer mapping text file is created in the Data folder under the Revit installation folder. You can edit this file by changing the layer mappings to suit your project requirements.

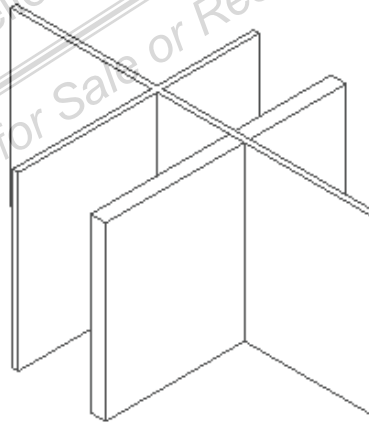
Exporting Intersecting Geometry

Views are exported exactly as displayed in Revit Architecture. However, if a building model includes intersecting geometry, new edges are not created along the lines of intersection. To display all visible lines, you either create an opening in one surface before that surface passes through another surface, or you join the geometry to create an edge.

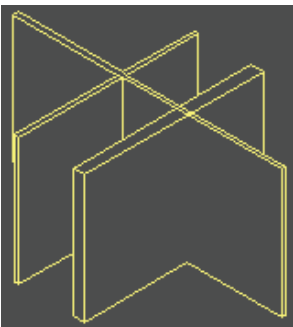
The following illustrations show intersecting walls and an extrusion in hidden line display mode before and after exporting to AutoCAD.



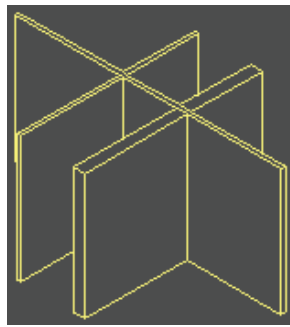
Wall and extrusion not joined



Wall and extrusion joined



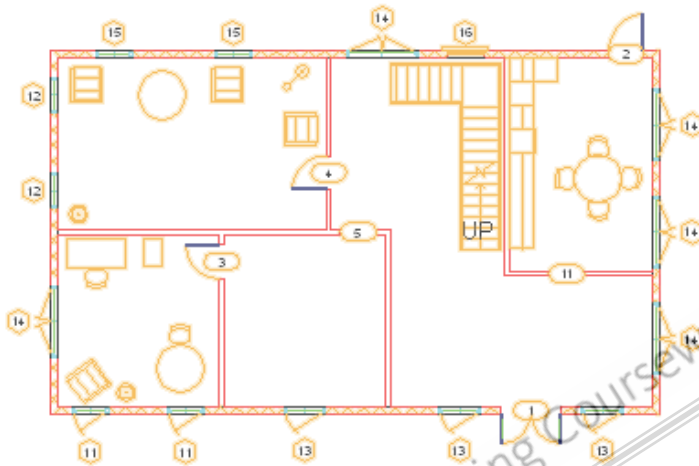
Wall and extrusion not joined
when exported to AutoCAD



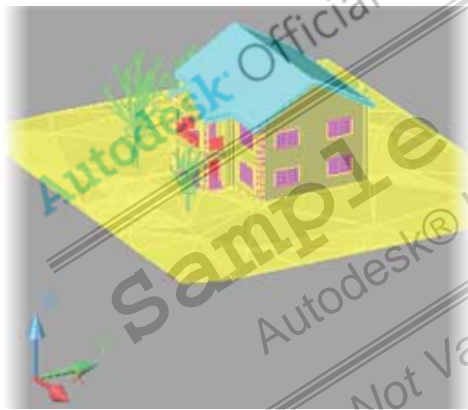
Wall and extrusion joined when
exported to AutoCAD

Example of Exporting

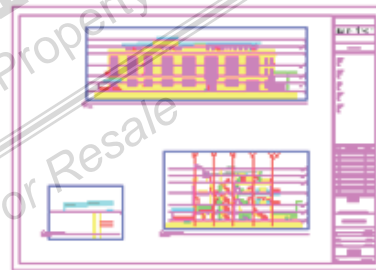
The following illustrations show various views exported to AutoCAD.



Floor plan view



3D shaded view



Sheet view

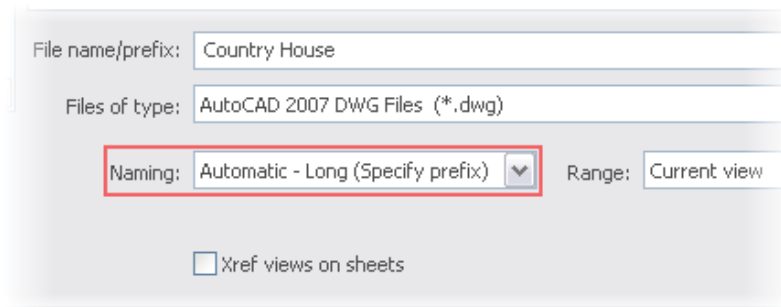
Guidelines for Exporting

The following recommended practices help you export views and sheets effectively.

- Add a prefix to the file name while exporting multiple views. Files are automatically named when you export multiple views. This practice helps you identify the exported file easily. For example, if you are exporting the Level 1 floor plan and north elevation views of the country house project to DWG files, you can add country house as a prefix to each view. The exported files are then named *country house floor plan level 1.dwg* and *country house elevation north.dwg*.
- Place a schedule on a sheet to export it because you cannot export schedules as views to CAD programs.
- Set up a batch export when you need to export more than one view or sheet using a sheet/view list so that you can export floor plans or elevations with a single click. This practice helps you save time.

Example

The following illustration shows the use of the Naming option to add a prefix to the file name of a view.



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Sample Chapter

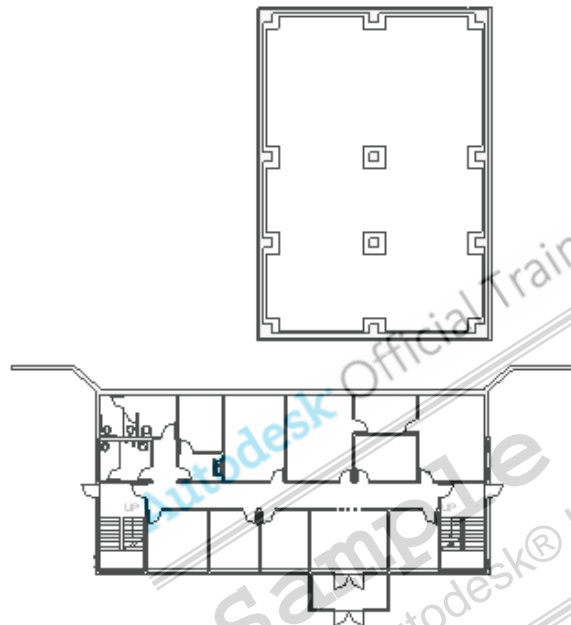
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Exercise: Export Views to AutoCAD

In this exercise, you export a file containing views to AutoCAD.

You have created a file containing a fire station building model using Revit Architecture. You want to export this file to send it to a colleague who needs to work with the ground floor plan in AutoCAD. To do this, you export the file views to AutoCAD.



The completed exercise



Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Importing and Exporting Files*. Click *Exercise: Export Views to AutoCAD*.

1. Open *i_export_CAD.rvt* or *m_export_CAD.rvt*. The file opens in the Ground Floor plan view.

NOTE: The illustrations for the metric dataset will be slightly different from those shown here.

2. In the Project Browser, under Views (All), Floor Plans, right-click Ground Floor. Click Duplicate View > Duplicate.

Notice that a new view named Copy of Ground Floor is displayed in the Project Browser.
3. In the Project Browser, under Views (All), Floor Plans, right-click Copy of Ground Floor. Click Rename.
4. In the Rename View dialog box:
 - For Name, enter **Ground Floor CAD Export**.
 - Click OK.
5. In the view window, click anywhere to activate the Ground Floor CAD Export view.
6. Enter **VG** to open the Visibility/Graphic Overrides dialog box.
7. In the Visibility/Graphic Overrides dialog box, Model Categories tab:
 - Under Visibility, clear the Furniture check box to hide the furniture components in the view.
 - Under Projection/Surface, for Floors, click the Patterns field.
 - In the Patterns field, click Override.
8. In the Fill Pattern Graphics dialog box:
 - Clear the Visible check box to hide the pattern of the floors in the exported file.
 - Click OK.
9. In the Visibility/Graphic Overrides dialog box, Annotation Categories tab:
 - Clear the Show Annotation Categories in this View check box to hide all annotation symbols in the view window.
 - Click OK.
10. Click File menu > Import/Export Settings > Export Layers DWG/DXF to start specifying the export settings.

11. In the Export Layers dialog box, click Standard to specify the standard to be used for mapping Revit elements to corresponding AutoCAD layers.
12. In the Export Layers Standard dialog box:
 - Select ISO13567 - ISO Standard 13567.
 - Click OK.
13. Click OK to close the Export Layers dialog box.
14. Click File menu > Export > CAD Formats to export the Ground Floor CAD Export plan view to AutoCAD.
15. In the Export CAD Formats dialog box:
 - Ensure that AutoCAD 2007 DWG Files (*.dwg) is selected in the Files of Type list.
 - Click Options.
16. In the Export Options dialog box, click Layer Settings to view the settings in the layer mapping file.
17. In the Export Layers dialog box:
 - Ensure that the name of the layer mapping file *exportlayers-dwg-ISO13567.txt* is displayed on the title bar.
 - Notice the settings that are displayed.
 - Click OK.
18. Click OK to close the Export Options dialog box.
19. In the Export CAD Formats dialog box:
 - Select Desktop from the Save In list.
 - Ensure that Automatic - Short is selected in the Naming list to use an automatically generated name for the exported file.
 - Ensure that Current View is selected in the Range list.
 - Click Save. The files *Floor Plan - Ground Floor CAD Export.dwg* and *Floor Plan - Ground Floor CAD Export.pcp* are saved on the Desktop.
20. If AutoCAD is installed on the computer, open *Floor Plan - Ground Floor CAD Export.dwg*.
21. Click Layer Properties and notice the layers that were created in the exported drawing.

NOTE: You can compare the exported AutoCAD drawing to the Revit Architecture floor plan. If required, you can change the properties of the CAD layers after exporting.
22. Close AutoCAD.
23. Close the file without saving.

NOTE: The DWG file is the exported content of the plan view of Revit Architecture. The PCP file is an AutoCAD legacy plotter control file that has the exported line colors and weights.

Chapter Summary

Now that you have learned to use Revit Architecture to import and export various file types, you can effectively reuse existing design data and send views, schedules, and other data to clients or team members who use CAD programs.

Having completed this chapter, you can:

- Import and use external files in Revit Architecture.
- Export Revit Architecture files into various external file formats.

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