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Working with Clients and Consultants Who Don't Use the Autodesk® Revit® Format

Ed Hannabas - Avatech Solutions

SE114-2 Best practices for importing, linking, and exporting to various 2D and 3D file formats such as DWG, DGN, DXF, IFC, and CIS/2.

About the Speaker:

Ed is an Senior Application Expert who provides training and consulting services for a variety of products including AutoCAD, AutoCAD for Architects, AutoCAD MEP, Revit MEP, Revit Architecture and Revit Structure. His industry expertise has led him to focus on MEP and Structure while having a strong background in Architecture and Engineering and continuing to expand his expertise to provide these same services to the Building Design Industry.



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The growing trend of “Building Information Modeling” and its usage in the building industry has made such an impact to how we design today. However, many firms in the industry have not adapted to this type of parametric modeling. Collaboration with consultants, clients, and partners still requires the ability to view, query, and print design data in software applications that are not compatible with each other. This is one of fears of adopting new software design to how one will be able to share this data. Autodesk Revit Structure has many options to importing and exporting to various types of file formats to ease this process for the entire design teams.

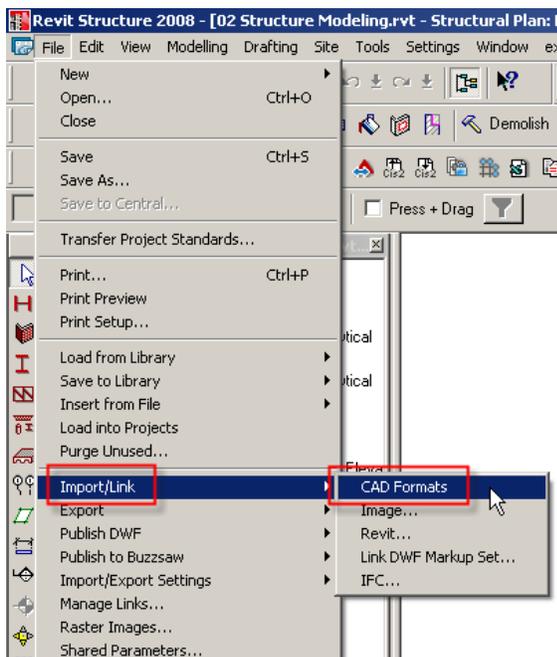
This class is geared toward explaining the various types of file formats which a Structural engineer/designer may have to coordinate within Revit Structure. Whether one gets an AutoCAD file, AutoCAD Architecture model, MicroStation® file, or even a DXF file, the engineer/designer can take their information and use it as a background to start the Revit Structure model. When the Structural model is created, the Structural Engineer can export their model information back to the client/consultant's requested standard file format. Lets first start with what file formats can be imported into Revit Structure and then what file formats can be exported.

IMPORTING/LINKING INFORMATION INTO REVIT STRUCTURE

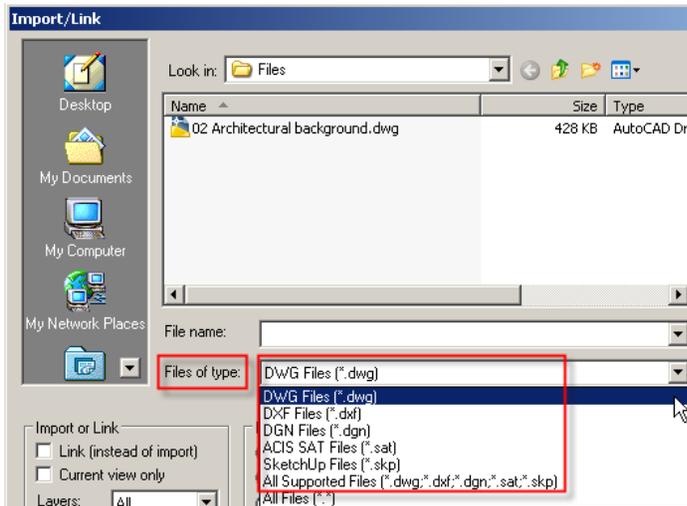
Revit Structure supports importing/linking to CAD (DWG and DXF), ACIS (SAT), and MicroStation® (DGN) file formats.

- DWG (drawing) format is supported by AutoCAD 2008 and other CAD applications.
- DXF (data transfer) is an open format that is supported by many CAD applications. A DXF file is a text file that describes a 2D drawing that is encoded or compressed, so the file sizes can be large.
- SAT is the format for ACIS, a solid modeling technology that is supported by many CAD applications.
- DGN is the file format supported by MicroStation of Bentley Systems, Inc.

1. FILE > IMPORT/LINK > CAD FORMATS



The “CAD Formats” Import/Link tool dialog box includes the following formats:

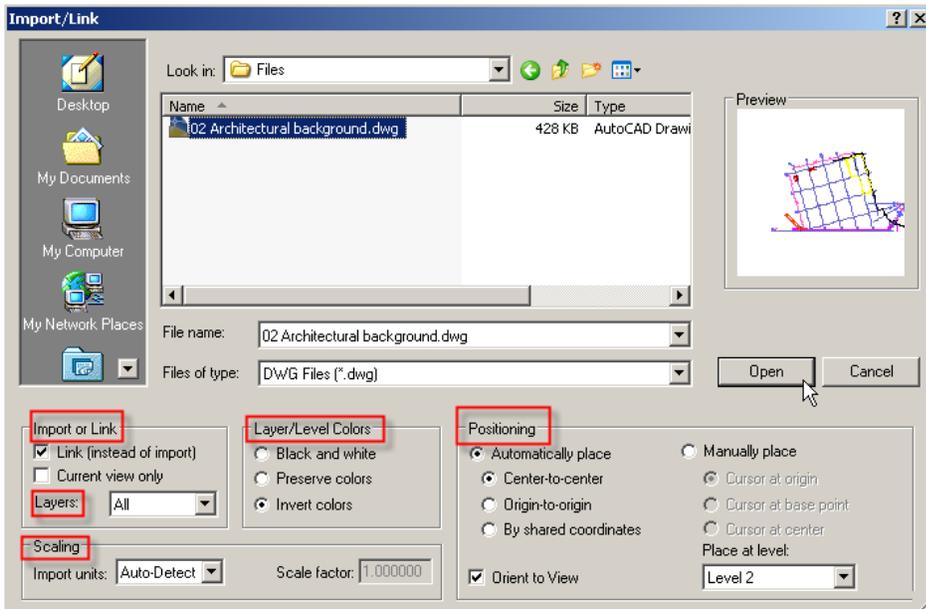


- a) DWG (AutoCAD - DraWinG)
- DXF (Autodesk Drawing eXchange Format)
- b) DGN (MicroStation® - DesiGN)
- c) SAT (Standard ACIS Text)
- d) SKP (SKetchuP)

In addition to using the Import/Link command, you can import CAD files using drag-and-drop from Windows® Explorer onto a view or one can use Autodesk i-drop® technology to drag-and-drop a file from an enabled web page. Revit Structure will then download the file and import it as if it were pulled from a local file.

a) DWG & DXF file formats:

Settings for Importing DWG & DXF files



Import or Link

From the Import/Link dialog box, these files can be imported or linked into all or just the current view.

Layers

The user can also specify to import all the layers, only the layers that are visible, or select the layers to bring into Revit Structure. .

Scaling

The Scaling feature sets the unit of measure for imported geometry. The values are Auto-Detect, feet, inch, meter, decimeter, centimeter, millimeter, and Custom. If you specify Auto-Detect for an AutoCAD 2008 file created in Imperial (English), then the file imports with feet and inches as the units. If the AutoCAD 2008 file was created in metric, then the file imports into Revit Structure with millimeters as the units. NOTE: If you import a file using "Auto-Detect" into a project with opposing units (for example, a metric file into an Imperial project), the units in the project file will have priority.

Layer/Level Colors

The object colors can be brought in Revit Structure as Black and White, the same colors they appear in the DWG or DXF file, or by inverting the colors. Since most CAD users set their background color to black, by inverting the colors the dark colors from the imported file becomes lighter, and light colors from the imported file becomes darker. This can improve readability when the file is imported into Revit Structure when the user has set White as the background color.

Positioning

Automatically Place	Revit Structure automatically places the imported geometry.
Center-to-Center	Revit Structure places the center of the import at the center of the Revit Structure model. The center of a Revit Structure model is calculated by finding the center of a bounding box around the Revit Structure model.
Origin-to-Origin	Revit Structure places the import's world origin at the Revit Structure project's internal origin.
By shared coordinates	Revit Structure places the imported geometry according to its location with respect to the shared coordinates between the 2 files.
Orient to View	Revit Structure places the import at the same orientation as the current view.
Manually Place	You place the imported document using the cursor.
Cursor at origin	The imported document's origin is centered on the cursor.
Cursor at base point	The imported document's base point is centered on the cursor. Use this option only for AutoCAD 2008 files that have a defined base point.
Cursor at object center	Sets the cursor at the center of the imported geometry.
Place at Level	Select the level to place the origin/base point.

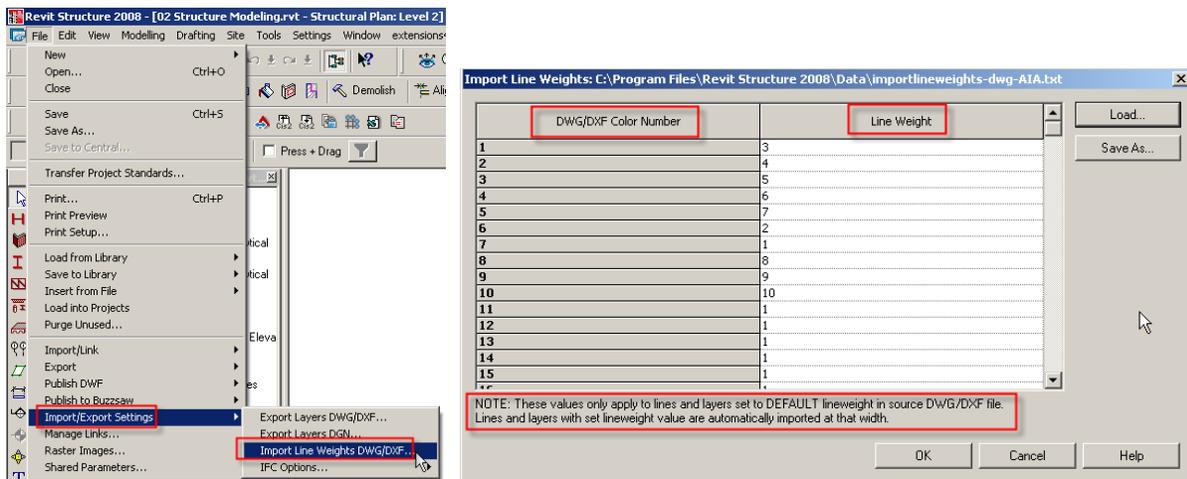
Regarding Importing Proxy Graphics Information

Proxy graphics can exist for many types of data in AutoCAD 2008. A custom object is a type of object created by an ObjectARX® (AutoCAD Run-Time Extension) application, which typically has more specialized capabilities than standard AutoCAD objects (non-intelligent objects). If you set the Proxygraphics command to 1 in AutoCAD 2008, Revit Structure can then import the ARX objects and AutoCAD Architecture objects (such as walls and floors) within the DWG or DXF file. If an AutoCAD drawing has ARX objects included and one imports the file with proxygraphics set to 0, those objects may not appear correctly in Revit Structure.

Mapping AutoCAD Colors with Revit Lineweights

Before importing an AutoCAD DWG file, one will need to verify the mapping file to make sure the colors from the AutoCAD file can correspond to the Lineweights established in Revit Structure. Revit Structure can import pen numbers from a DWG or DXF file. You can then save these mappings in a text file, and they become the set mappings for the project.

This will only be necessary if one plans on printing some of the AutoCAD information within Revit Structure. This txt file shown below is defaulting to map the colors from AutoCAD to the Lineweights in Revit Structure according to AIA Standards.



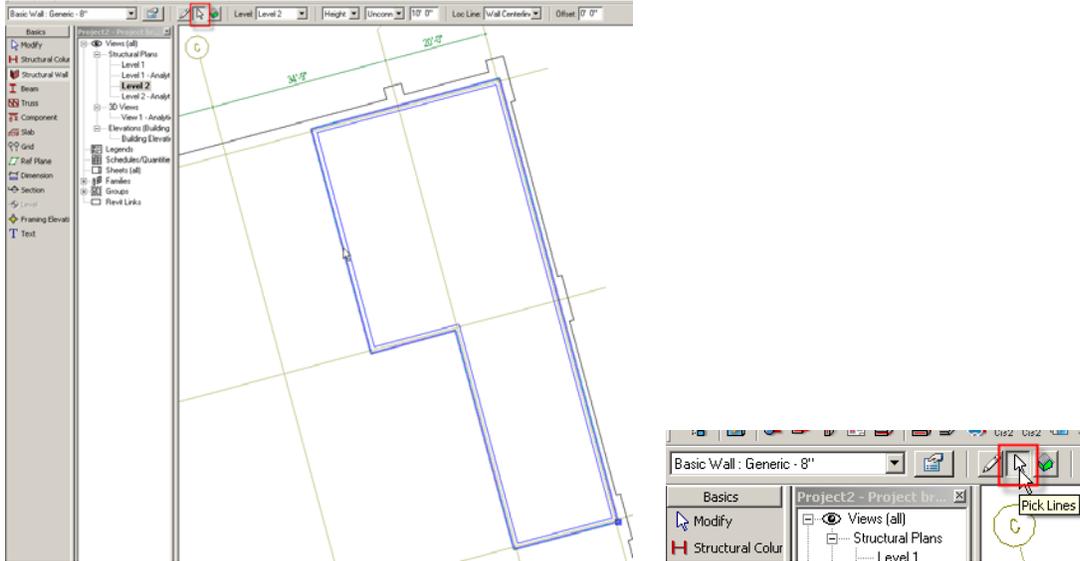
Revit Structure includes the following files with pen and line weight mappings:

- importlineweights-dwg-AIA.txt (American Institute of Architects CAD Standards)
- importlineweights-dwg-BS1192.txt (British Standard)
- importlineweights-dwg-ISO13657.txt (European International Standards Organization)
- importlineweights-dwg-CP83.txt (Singapore CAD layering standards)

These files reside in the Data folder of the Revit Structure installation directory.

Snapping to Imported Geometry

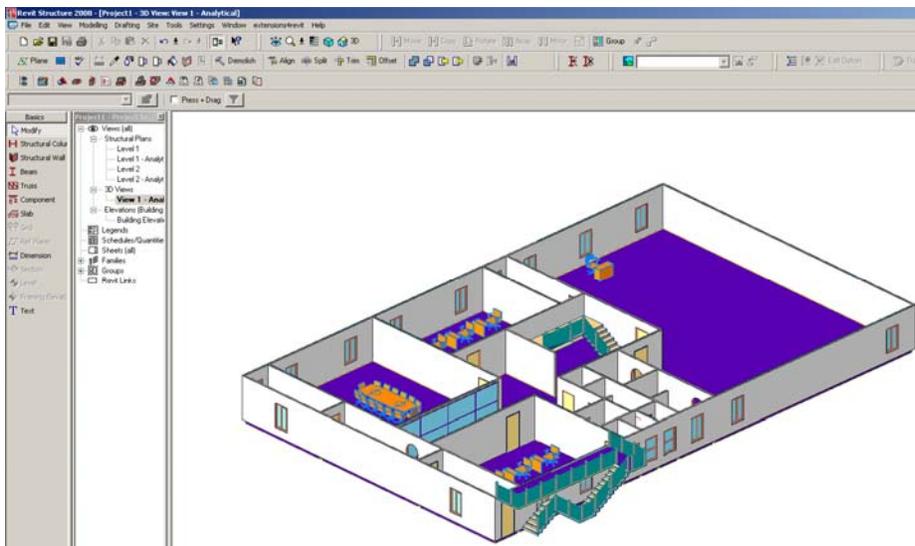
Suppose that you import an AutoCAD 2008® drawing into Revit Structure and then want to trace over walls in that drawing. As you place the cursor near the lines representing the walls, one can use the Revit object snaps to precisely place the Revit Structural wall. One could also use the pick tool from the wall command and select the lines from the AutoCAD file as shown below.



AutoCAD Architecture & AutoCAD MEP 2008 files

One can import an architectural model from AutoCAD Architecture or AutoCAD MEP and use it as reference for your structural design in Revit Structure. Columns, beams, braces, and grids in the imported model will be used as a reference for the user to retrace and recreate them directly in Revit Structure. You can then create the structural model and then export the structural data back to AutoCAD Architecture or AutoCAD MEP. The structural elements will be native to both applications and will collision check in AutoCAD MEP for any interferences between the structural and MEP elements.

AutoCAD Architecture model imported into Revit Structure shown below.



Importing AutoCAD Architecture and AutoCAD MEP Layers

In AutoCAD Architecture and AutoCAD MEP, object components are placed on layers. A wall, for example, can be placed on layer *A-Wall*, whereas a door in the wall would be placed on layer *A-Door*. When an AutoCAD Architecture or AutoCAD MEP drawing is imported into Revit Structure, the layer information of the imported objects is retained. Revit Structure does not use layers internally, but it can map layers to object categories. When an imported drawing is exported back to AutoCAD Architecture or AutoCAD MEP, the layer settings of exported objects are exported with the objects. Revit Structure objects that were added get a layer assigned based on the mapping of the object categories to layers in the layer mapping file

Exploding Imported Objects

When one imports an AutoCAD Architecture or AutoCAD MEP drawing into Revit Structure, the complete drawing is imported or linked as an Import Symbol. One can work more efficiently with the imported data by performing a partial explode on the imported drawing. This is the only way in which you can access the AutoCAD Architecture or AutoCAD MEP properties of individual objects. A partial explode breaks up the imported drawing into individual object blocks, but not into Revit Structure lines and text elements.

NOTE: When you import a drawing into Revit Structure, you are importing all the elements, such as blocks and xrefs.

You can also explode the import symbol immediately into Revit Structure text, curves, lines, and filled regions. This is a full explode.

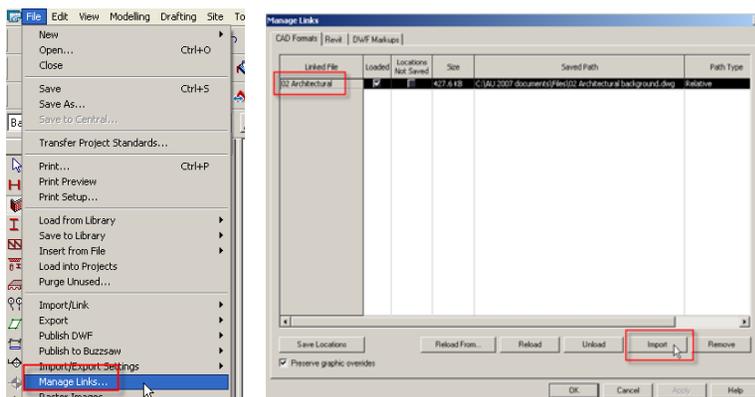
NOTE: You cannot explode linked files or an import symbol with more than 10,000 elements.

To explode imported geometry:

1. Select the import symbol on the Options Bar, click Full Explode or Partial Explode.
2. Select the import symbol and right-click to see these commands.

Resulting partial explode import symbols can be exploded again by selecting them and clicking Partial Explode. You can continue to do this until all import symbols are converted to Revit Structure elements.

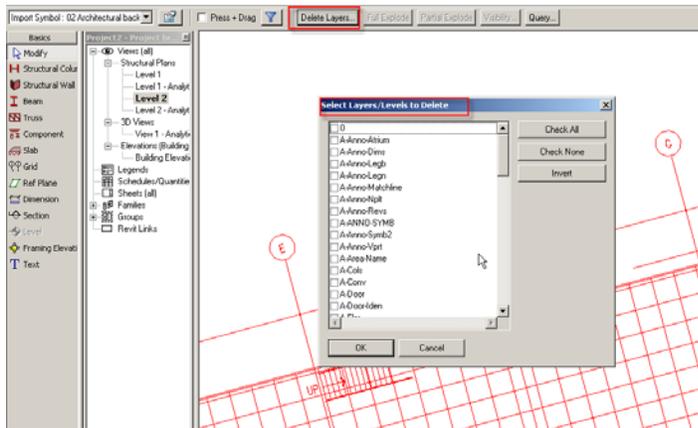
One can not explode or partially explode a linked imported drawing file, however, one can convert a linked file to an imported file as shown below.



Removing Imported Objects from Revit Structure

After you have imported structural members from AutoCAD Architecture or AutoCAD MEP and created corresponding Revit Structure objects from them, you can keep the imported objects in the drawing or remove them in one of the following ways:

- *Delete.* If you have no further use for the imported objects, you can delete them from the Revit Structure file.
- *Unload.* If you have linked to the AutoCAD Architecture or AutoCAD MEP drawing instead of importing it, you can unload the link in Revit Structure. The imported drawing will no longer appear, but it can always be reloaded if needed.
- *Delete individual layers.* When an AutoCAD Architecture or AutoCAD MEP drawing is imported into Revit Structure, the information about its drawing layers are listed. As a result, you can selectively delete individual layers and the objects contained on them as shown below.



Importing a Toposurface from Imported 3D Data

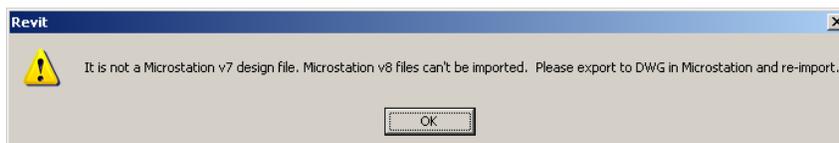
You can automatically generate a toposurface based on 3D contour data imported in **DWG**, **DXF**, or **DGN** formats. Revit Structure analyzes the 3D contour data and places a series of elevation points along the contour lines. One must import the 3D contour data before creating the surface.

NOTE: When you import data with the Current View Only option selected, you cannot use the data to create a toposurface.

b) DGN files

One can draw on imported 2D files to create Revit Structure parametric model geometry. Revit Structure also supports importing most DGN surfaces and solids with the exceptions of cones and B-Spline surfaces. You can also import smart solids from MicroStation® into Revit Structure for viewing purposes.

The DGN file format supports MicroStation version 7. If you are using a later version, the Microstation user will need to export to DWG format first before importing the file into Revit Structure. The following message will appear when trying to import a MicroStation V8 file.



c) SAT files

These files have an open format so that external applications, even those not based on ACIS, can have access to the ACIS geometric model. These files can also be viewed with a simple text editor. Revit Structure imports ACIS solids from SAT files. SAT file versions later than 7.0 do not import into Revit Structure. You should note which version your solid modeling program is creating. Some solid modeling products like form-Z® create SAT file versions later than 7.0 by default.

Revit Structure supports the following types of surfaces when importing ACIS objects:

- plane
- sphere
- torus
- cylinder
- cone
- elliptical cylinder
- elliptical cone
- extruded surface
- revolved surface
- NURB surfaces

d) SKP files

SketchUp (SKP) files can be imported directly into a Revit Structure as a mass or in-place family.

When importing SketchUp files, consider the following:

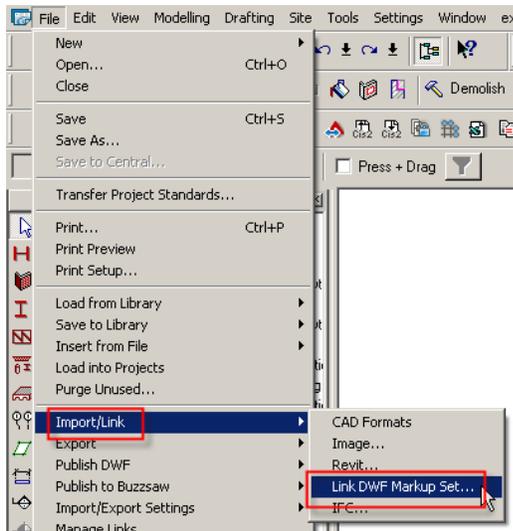
- *Two-sided surfaces*: If a material or color is assigned to only one side of a surface in SketchUp, Revit Structure applies the material or color to both sides of the surface by default.
- *SketchUp properties*: The following SketchUp properties are currently not supported in Revit Structure import: Texture Image Maps, Transparency, "Smooth" Curved Surfaces, Text and Dimensions, Raster Images, and saved "Pages".
- *Cut planes*: Imports cannot be cut by a cut plane unless imported into a family category.
- *SketchUp and Massing*: Not all SketchUp imports are appropriate to massing.
- *Scaling*: Groups or components that have been scaled in their entirety with the SketchUp Scaling tool may be incorrectly scaled when imported to Revit Structure. Exploded SketchUp models should import at the correct scale.

Google™ SketchUp® is a general purpose modeling and visualization tool. Revit Structure uses building information modeling (BIM), in which building elements understand their relationship to each other. When working on a design project, you can use both products to leverage the unique strengths of each. The applications can work in parallel depending on what needs to be accomplished between design iteration and design resolution.

When you import the SKP file, the Link option is not available. As a result, if you update the design in SketchUp, you cannot easily update the corresponding design in Revit Structure. Furthermore, because SketchUp is a faceted modeler, an imported 3D design will consist of faceted forms, which is not generally desirable nor easy to work with in Revit Structure. Import a SKP file only if you are finished using SketchUp for design work (and do not plan to perform any further work in SketchUp) *and* the design can be manipulated in Revit Structure in spite of its faceted forms.

Import or link a DWG file exported by SketchUp. Revit Structure can import or link to a DWG file that was exported from SketchUp. This option provides more flexibility and functionality in Revit Structure. When you link to the DWG, you can update the design in Revit Structure after refining it in SketchUp. This is the recommended workflow.

2. Link DWF Markup Set...

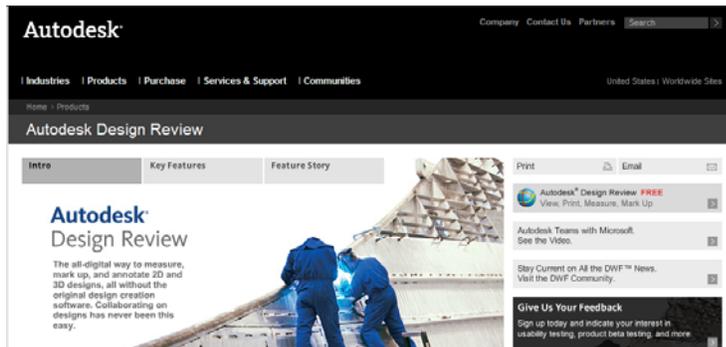


DWF Markup files

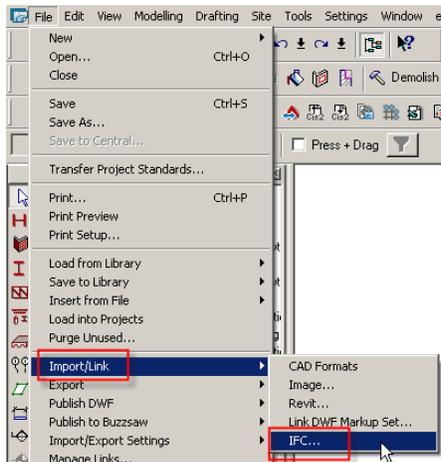
When creating construction documents, a typical workflow is to print out a sheet, have it reviewed and marked up by the project architect or other professional, and then return it to the originator of the sheet to have the requested changes made.

Revit Structure enhances this process by allowing you to publish sheet views as DWF files. The DWF files can be marked up electronically using a program such as Autodesk® Design Review. Then the markups can be linked back into Revit Structure to see the desired changes. Because they are linked, the Revit Structure file and the DWF file remain synchronized with regard to the markups.

Autodesk® Design Review is available for download from <http://www.autodesk.com/designreview>.



3. IFC...



The Industry Foundation Classes (IFC) file format was developed by the International Alliance of Interoperability (IAI). IFC provides an interoperability solution between different software applications. The format has established, international standards to import and export building objects and their properties.

It reduces the loss of information during transmission from one application to another, with established standards for common objects in the building industry.

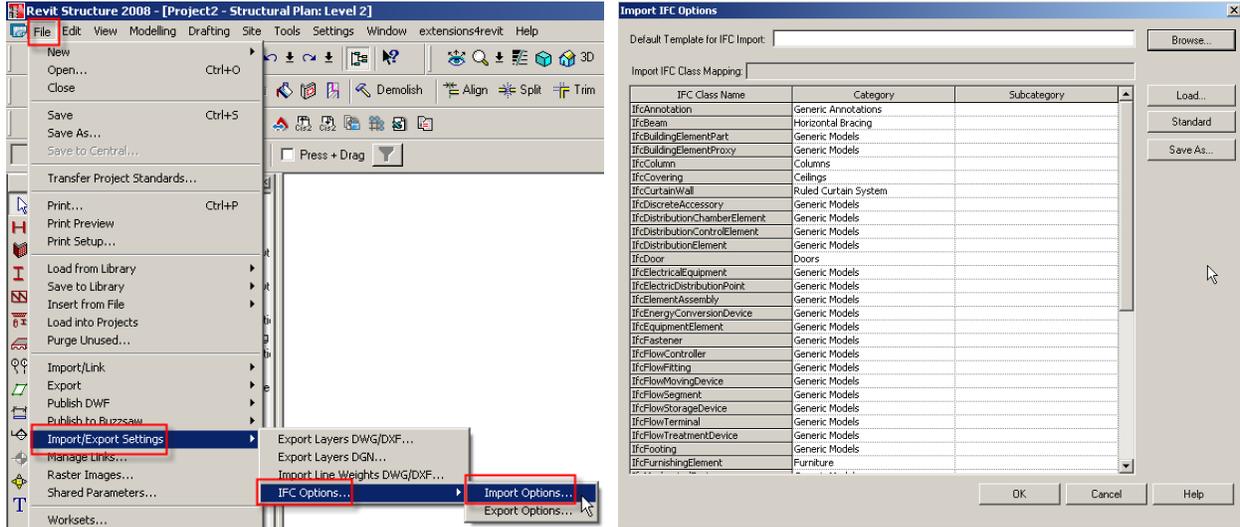
When you export a Revit Structure building information model to IFC format, the information can be used directly by other building specialists, such as structural and building services engineers.

For example, building information models developed with Revit Structure are saved to the RVT file format. You can export the building model using the IFC format to an IFC-certified application that does not use the RVT file format. The drawing can be opened and worked on in the non-native application. Similarly, in Revit Structure you can import an IFC file, create a RVT file, and work on the building model in Revit Structure.

IFC uses architecturally meaningful containers to describe real-world building objects. Those containers include parameters that have meaningful values. Many standard Revit Structure elements have corresponding IFC containers. These do not require any specific user action to export them. (For example, Revit walls export as IFCwalls.) Other Revit Structure families (such as escalators) require that you map them to IFC containers before exporting.

For more information about the IFC file format, visit <http://www.iai-international.org>.





Revit Structure provides IFC import based on the latest IAI IFC 2x3 data exchange standard. (If you import a file that uses an earlier standard [IFC 2x or 2x2], Revit Structure supports the format and imports it properly.)

When you import an IFC file, Revit Structure creates a new file based on the default template. You can load your own IFC class mapping files and override the categories and subcategories for imported IFC objects.

IFC supports the following other design/structural applications:

- Full DGN/DWG compatibility
- Bentley Architecture and Bentley Structure
- 3D PDF and Google Earth support
- import/export tools for the main 'general purpose' industry standards, such as STEP, STL,
- IGES, DXF, SKP (SketchUp) etc.,
- import/export tools for many 'dedicated' industry standards, like CIS/2 and SDNF
- Direct integration with many structural analysis applications, such as GT STRUDL, ROBOT, MIDAS/GENw, SFRAME, STAAD Pro, & RAM International

4. CIS/2 Import

CIS/2 files (.stp extensions) - The CIMSteel Integration Standards (CIS/2) is the product model and electronic data exchange file format for structural steel project information. CIS/2 is intended to create a seamless and integrated flow of information among the construction of steel framed structures. It has been adopted by the American Institute of Steel Construction as their format for Electronic Data Interchange (EDI). CIMSteel stands for the Computer Integrated Manufacturing of Constructional Steelwork.

CIS/2 has been implemented as a file import or export capability by many steel design, analysis, engineering, fabrication, and construction software packages.

CIS/2 itself is not a software package that you buy. The user will see it as file format, just like DXF is a file format, that is imported or exported in a steel related CAD software.

The CIS/2 standard covers everything from nuts and bolts to materials and loads to frames and assemblies. Structures can be represented as analysis, design, or manufacturing (detailed) models. There is a logical relationship between the different types of models. For example, a beam in an analysis model that has to be subdivided for analysis is logically only one beam in the detailed model.

For more information about the CIS/2 and IFC format, visit <http://cic.nist.gov>



CIS/2 and IFC - Product Data Standards for Structural Steel

Go to section: [IFC VRML Models](#) [X3D Models](#)

What do the acronyms stand for: CIS/2 - CIMsteel Integration Standards, IFC - Industry Foundation Classes, VRML - Virtual Reality Modeling Language, X3D - Extensible 3D Graphics

CIS/2 to VRML and IFC Translator (aka CIS/2 Viewer)

- Download the Windows version
Translator information: [Presentation](#), [CIS/2-IFC issues](#), [Screenshot](#), [Sample summary report](#)
- Run the Online version (VRML output only)

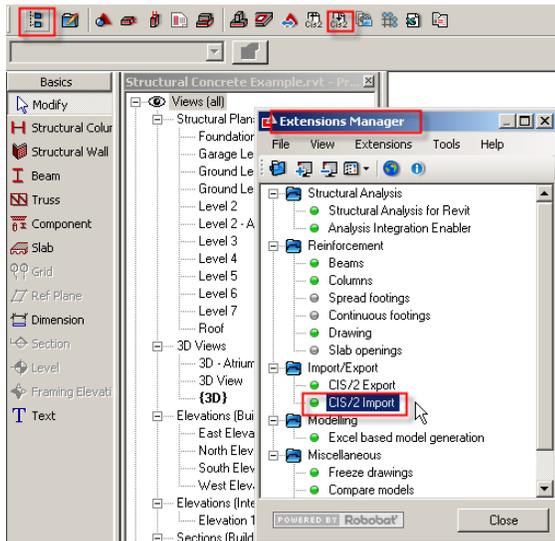
A CIS/2 file can be translated into a VRML or IFC file and indirectly (via IFC) to a DWG or DXF file. The VRML files can be viewed with a VRML plugin or other software. CIS/1 and DSTV files can also be translated into VRML models.

The IFC files can be imported into many IFC viewers and CAD programs. The IFC file can be converted to a DWG file with the DOS IFC Viewer and imported into AutoCAD or Google SketchUp. The IFC file can also be converted to a Google Earth KM2 file with the Nemetschek IFC Viewer.

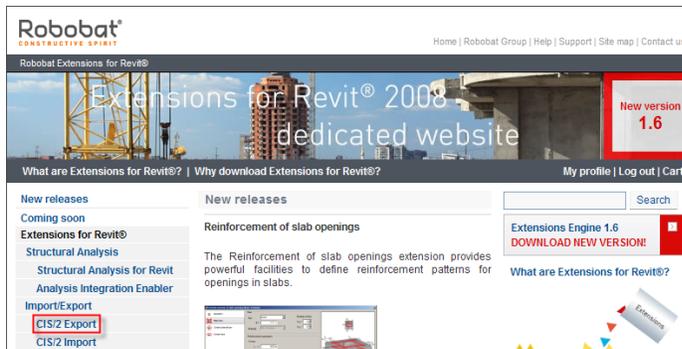
What's New!

- RISA 3D models
- CIS/2 model in Google SketchUp
- PDF files with embedded 3D models
- CIS/2 models in Google Earth
- Revit Structure models
- Ironworkers training structure
- AISC Steel Sculpture
- Erection sequence animation

The import to CIS/2 is an add-on from Robobat the creators of Robot Millennium.

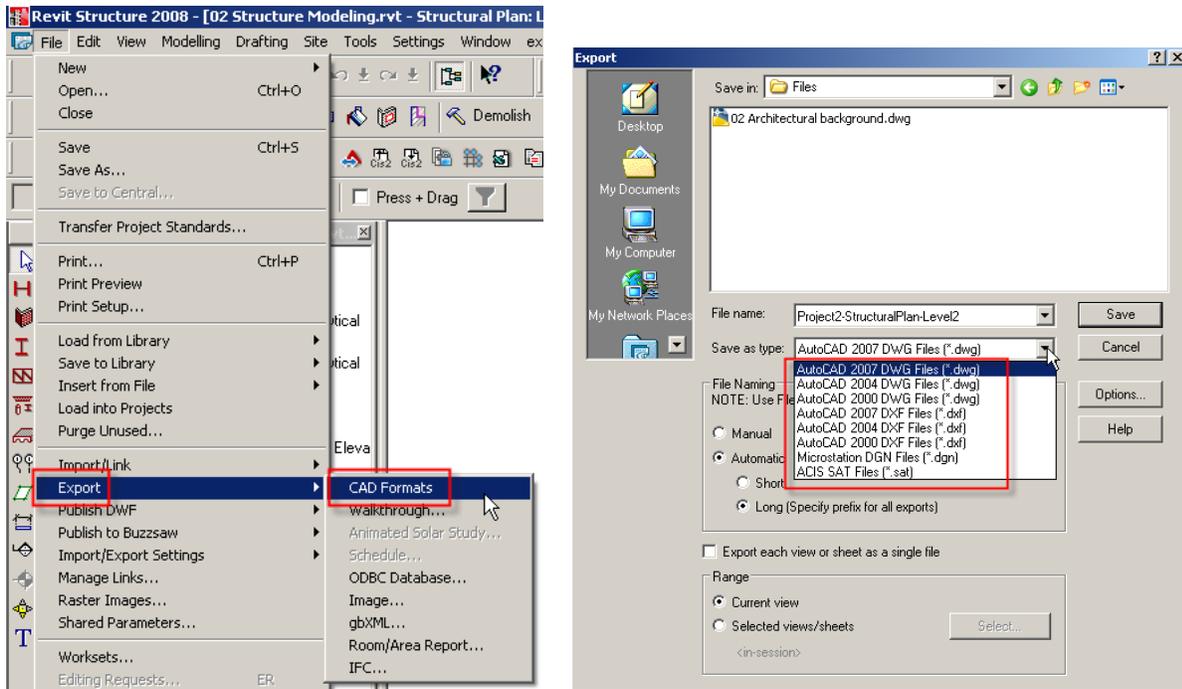


To download the Extensions for Exporting to CIS/2 format, visit <http://www.extensions4revit.com>

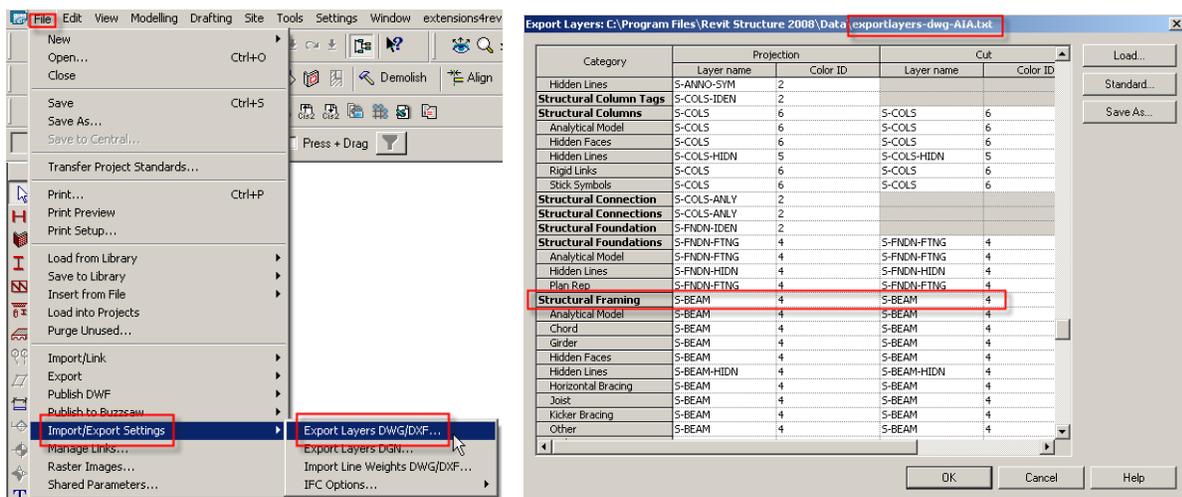


EXPORTING INFORMATION INTO REVIT STRUCTURE

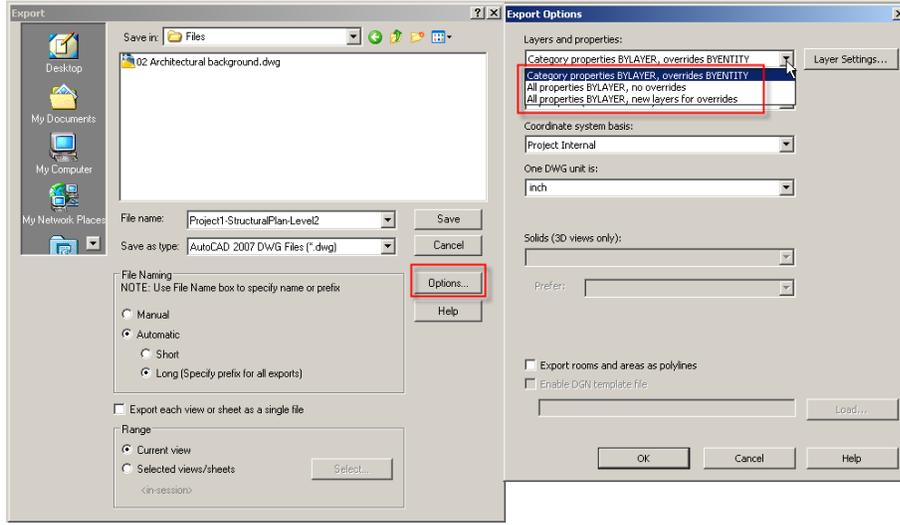
1. 2D CAD Formats



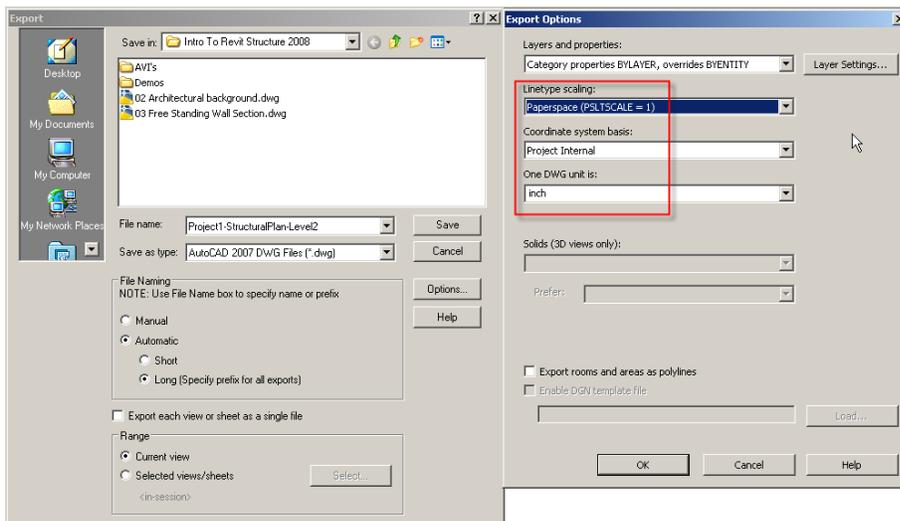
a) **DWG & DXF files** – Before exporting views, one must map the Categories and Sub-categories within Revit Structure to specific layers. The layer mapping file is a text file that maps each Revit Structure category or subcategory to a preconfigured layer name for the CAD software. For example, a Revit Structure beam object automatically maps to S-BEAM layer in AutoCAD 2008. the one listed below is according to AIA standard but one can also create their own txt file.



Also before exporting the 2D views, one will need to check the options settings to make sure the layers and properties are set.



- **Category properties BYLAYER, overrides BYENTITY.** When a Revit element is assigned with overrides within a view, AutoCAD 2008 recognizes those (overrides and are applied to the individual entity. So within AutoCAD, the object is set to the assigned layer with the property overrides.
- **All properties BYLAYER, no overrides.** When a Revit element is assigned with view overrides, AutoCAD 2008 ignores those differences (overrides). This option forces all entities to follow visual properties as defined by their layer.
- **All properties BYLAYER, new layers for overrides.** When a Revit element is assigned with view overrides, in AutoCAD 2008 the entity is placed on its own layer. This option provides by-layer control over the exported DWG file; however, it will increase the number of layers in the exported DWG file.

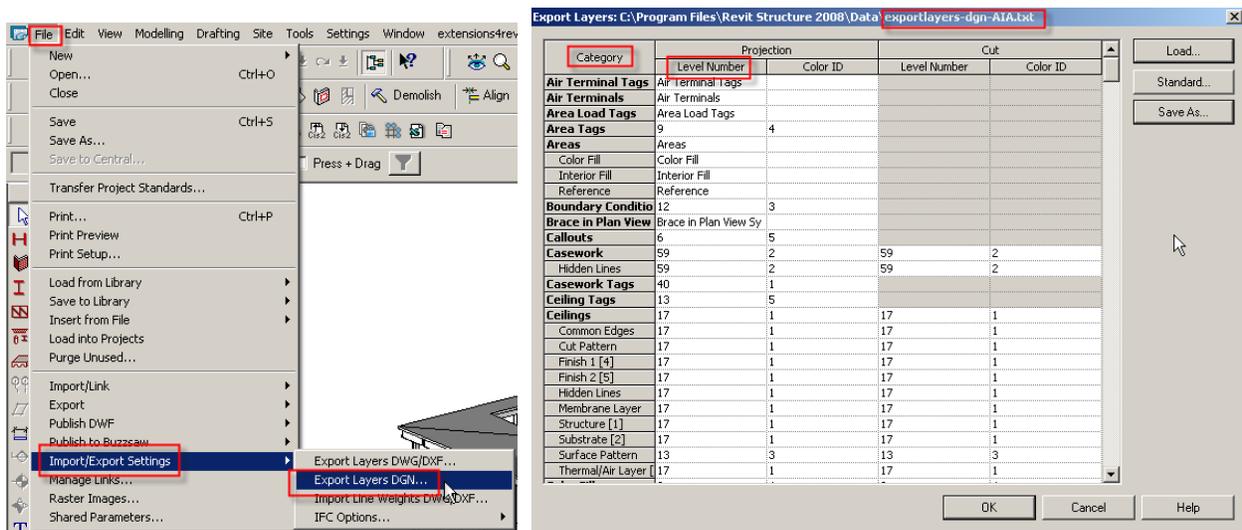


As shown above, also listed on the Export Options dialog box is the Linetype scaling. This feature allows one to set the linetype scale within the AutoCAD file to model space or paperspace. The Coordinate system basis can be set by Project or Shared Coordinates stated in Revit Structure. For the Drawing Units measurement, the One DWG unit setting can be set by foot, inch, meter, millimeter, and centimeter.

When you export a 2D view to a DWG file, lines are treated as follows:

- If 2 lines overlap in the drawing, the thicker of the lines is retained. The thinner line is shortened or removed.
- If a thick line is completely inside a thin line, no action occurs.
- If 2 collinear lines with the same visual parameters overlap, they are merged into one.

b) DGN files - before exporting the DGN file one can map a specific DWG level number and color when exporting a view so nothing in the exported DGN file ends up on the wrong level.



2. 3D CAD Formats

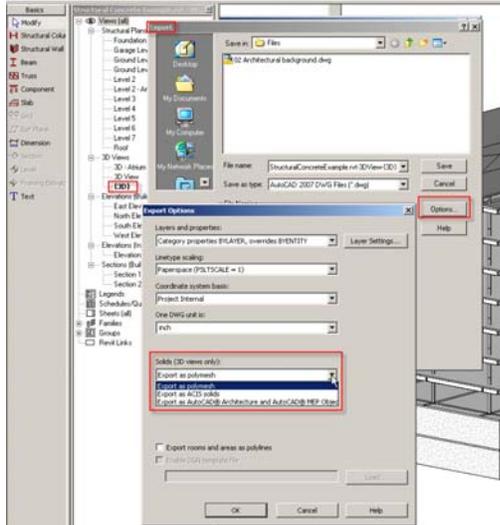
3D Export - If you use the Export command while in a 3D view, Revit Structure exports the actual 3D model, not a 2D representation of the model. Exporting in 3D ignores all view settings, including hidden line mode. To export a 2D representation of the 3D model, add the 3D view to a sheet and export the sheet view. You can then open a 2D version of the view in AutoCAD 2008.

For Solids (3D Views Only) in the Export Options dialog, indicate how solid geometry is to be exported. This option is available only when you are exporting a 3D view.

NOTE: You can define Solids (3D Views Only) when exporting to **DXF** or **DWG**. When exporting to **SAT**, geometry always exports as ACIS solids. When exporting to **DGN**, geometry always exports as polymeshes.

Modeling programs generally represent 3D shapes using either of the following technologies: polymesh or ACIS solids.

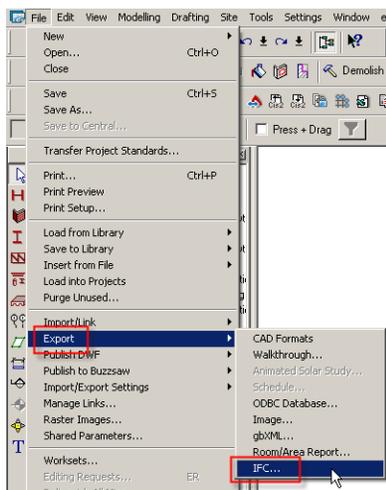
As shown below, there are three ways to export your 3D Revit Structure Model:



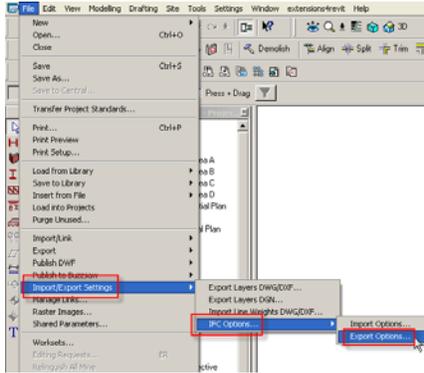
- **Export as polymesh** - This option exports all visible Revit Structure geometry as polymeshes. A polymesh is a 3D shape consisting of multiple polygons that are meshed (joined) together. For example, a polymesh cube consists of 6 square surfaces that are joined together to form the cube shape. This is referred to as face-based geometry.
- **Export as ACIS solids** - This option exports all visible Revit Structure geometry as ACIS 3D solids. Any elements that are already polymeshes remain as polymeshes, such as toposurfaces and import symbols that contain polymeshes. ACIS is a solid modeling technology. For example, ACIS represents a cube as a single object or shape with 6 sides.
- **Export as AutoCAD Architectural and AutoCAD MEP objects** – This option can export beams, braces, columns, and grids from Revit Structure to AutoCAD Architecture, where they are converted automatically to native AutoCAD Architecture structural elements. Structural walls, slabs, footings, in-place families, and other Revit Structure objects can also be exported to AutoCAD Architecture, where they are converted to AutoCAD Architecture mass elements.

IMPORTANT: You can export only Revit Structure 3D views as AutoCAD Architecture/MEP objects.

3. Export IFC...

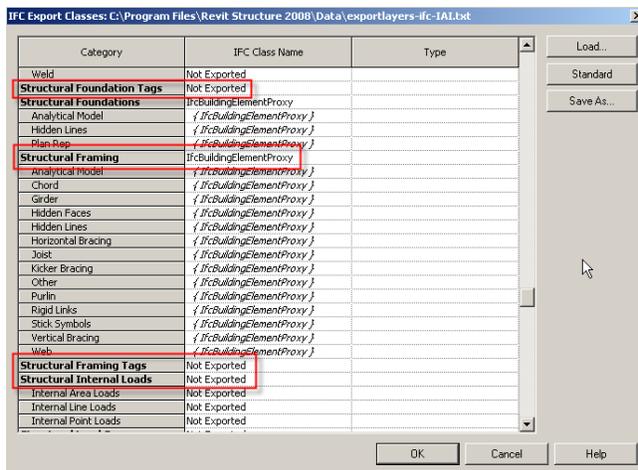


Before exporting a Revit Structure project to IFC, you may need to map generic family instances to IFC containers (element types). You do this by creating a new IFC mapping file or editing an existing one. Also, use the following procedure to load the desired IFC mapping file before exporting a Revit Structure project to IFC.



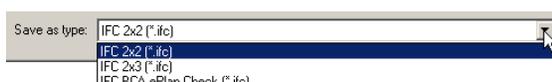
In the IFC Export Classes dialog, each row represents an element category or subcategory. For standard building elements, an assigned class name appears in the IFC Export Class Name column. For building elements that do not have automatic mapping to IFC export classes, "Not Exported" appears in the IFC Export Class Name column.

As you can see from below, the Structural Foundation tags or framing tags are not exported for they are not model entities as compared to the structural framing elements which will be exported to the IFC file.

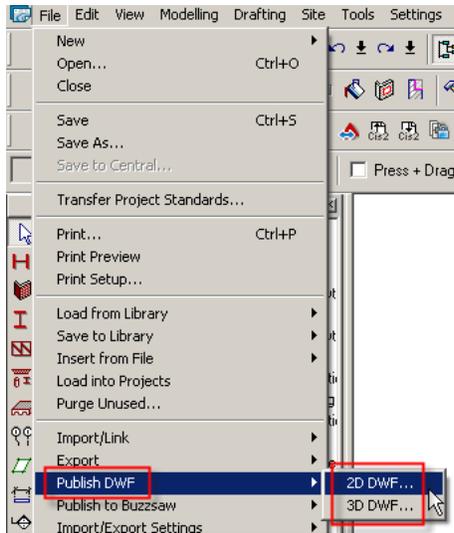


IFC is strongly being utilized to facilitate data exchange for U.S. federal government projects. Revit Structure can export IFC version 2X2, 2X3, and the BCA ePlan Check view (as required by the Singapore government cold checking initiative). For the U.S. GSA (General Services Administration) IFC export requirements, 2X2 is the minimum.

Within the Export to IFC dialog box, to set the correct IFC version, change the "Save as type:" as shown below.



4. Publish to 2D and 3D DWF...



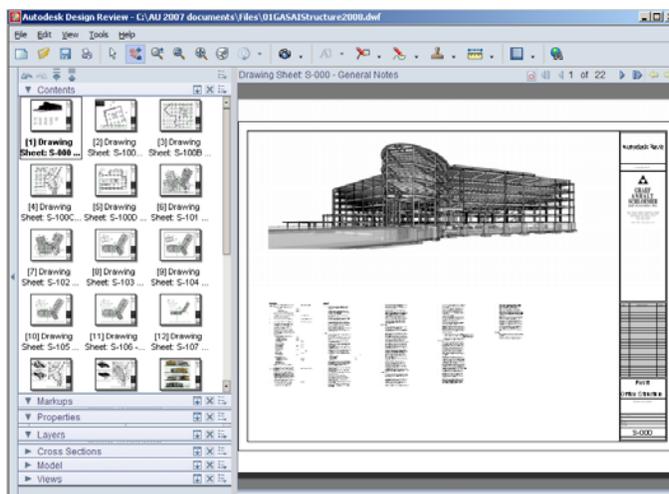
The Design Web Format™ (DWF™) is the Autodesk method of publishing design data. It offers an alternative to publishing to PDF (Portable Document Format).

DWF files allow you to share design information securely and easily. Using the DWF format, you can avoid unintended changes to project files, and you can share project files with clients and others who do not have Revit Structure. DWF files are significantly smaller than the original RVT files, making them easy to send by electronic mail or post to a web site.

DWF files can be viewed by recipients using Autodesk DWF Viewer, which is available for free download from <http://www.autodesk.com/dwf>.

a) 2D DWF Files

Below shows all the sheets for the project in one given DWF file.



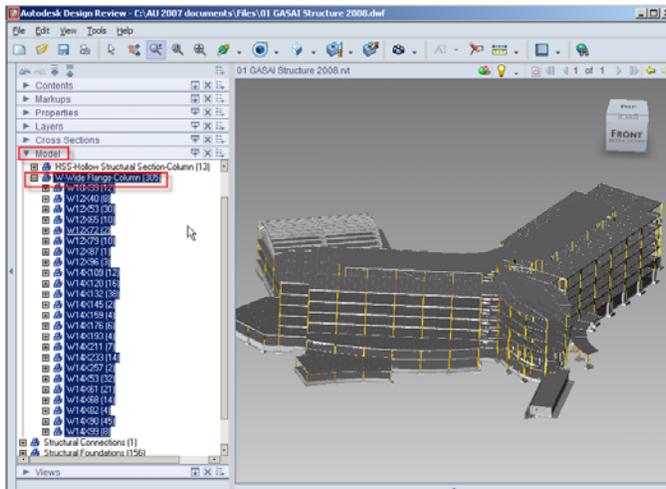
You can publish all Revit Structure views or sheets to 2D DWF files. If you publish multiple views in a project to one DWF, in Autodesk DWF Viewer you can click a link to jump to a related view.

If you publish a 3D view to a 2D DWF file, the resulting image is a 2D representation of the 3D view, like a snapshot. You cannot manipulate the image as you can when you publish the 3D view to 3D DWF.

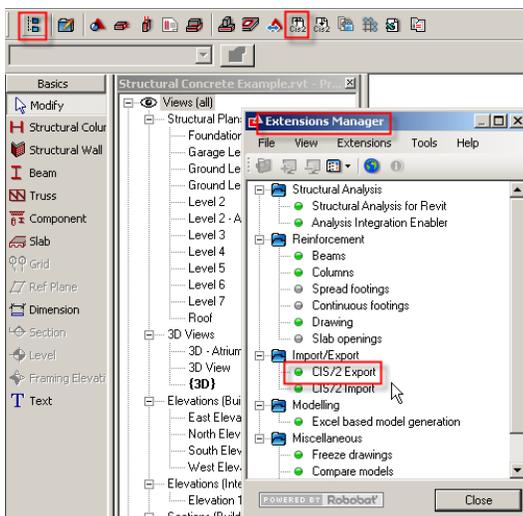
b) 3D DWF Files

You can publish 3D views to 3D DWF files. Using Autodesk® DWF Viewer, you can open a 3D DWF file and manipulate the 3D representation of the building. You can rotate the building, zoom in on a portion of it, select an element (such as a roof), and make it transparent to see what is beneath or behind it, and so on.

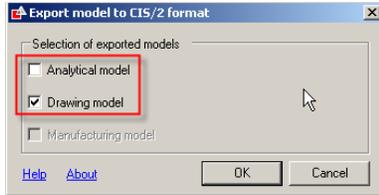
Below all of the W-Wide Flange columns within the model are selected therefore appearing in orange within the structural model.



5. CIS/2 Export



The export to CIS/2 format allows the user to select which model to export: the Analytical model or the Physical model. Other exporting tools would export both models making it difficult to use the file.



A CIS/2 file exported by an analysis or design program could be imported into a detailing program to detail the connections. From website <http://cic.nist.gov>, I downloaded the CIS/2 to VRML and IFC Translator (CIS/2 Viewer) Windows version to output the steel material list.



CIS/2 and IFC - Product Data Standards for Structural Steel

Go to section: [IFC](#) [VRML Models](#) [X3D Models](#)

What do the acronyms stand for: CIS/2 - CIMsteel Integration Standards, IFC - Industry Foundation Classes, VRML - Virtual Reality Modeling Language, X3D - Extensible 3D Graphics

CIS/2 to VRML and IFC Translator (aka CIS/2 Viewer)

- [Download the Windows version](#)
Translator information: [Presentation](#), [CIS/2 - IFC issues](#), [Screenshot](#), [Sample summary report](#)
- [Run the Online version](#) (VRML output only)

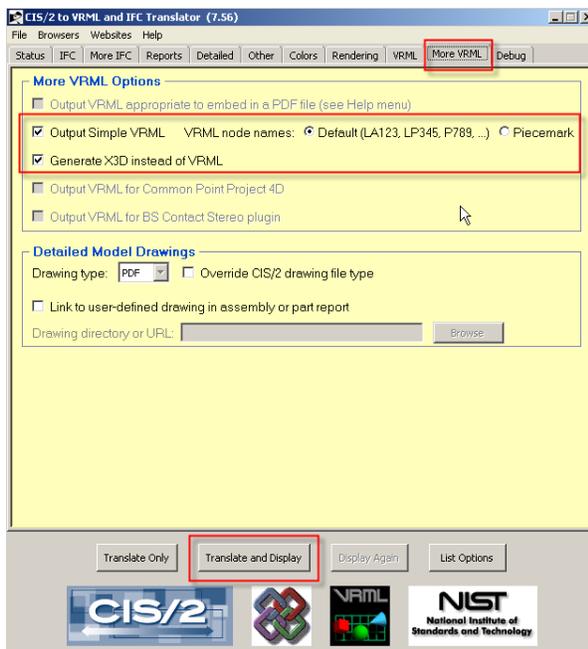
A CIS/2 file can be translated into a VRML or IFC file and indirectly (via IFC) to a DWG or DXF file. The VRML files can be viewed with a [VRML plugin](#) or other software. CIS/1 and DSTV files can also be translated into VRML models.

The IFC files can be imported into many IFC viewers and CAD programs. The IFC file can be converted to a DWG file with the [DDS IFC Viewer](#) and imported into AutoCAD or Google SketchUp. The IFC file can also be converted to a Google Earth KMZ file with the [Nemetschek IFC Viewer](#).

What's New!

- [RISA 3D models](#)
- [CIS/2 model in Google SketchUp](#)
- [IFC files with embedded 3D models](#)
- [CIS/2 models in Google Earth](#)
- [Real Structure models](#)
- [Homeworkers training structure](#)
- [AISC Steel Sculpture](#)
- [Erection sequence animation](#)

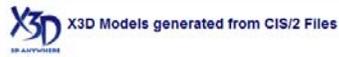
To output the material list and the 3D model, in the CIS/2 to VRML and IFC Translator application, under the "More VRML" tab check the boxes listed below and then select the "Translate and Display" button.



Material List (Top)						
	Size	Grade	Total Length (Feet)	Total Weight* (Lbs)	Pieces	Color
1	CSX11.5	n/a	12.42	143	2	Red
2	C8X13.7	n/a	28.8	395	4	Purple
3	HSS7X5X.250	n/a	804.07	15277	39	DarkRed
4	HSS8X8X.250	n/a	156.59	4040	4	Blue
5	HSS8X8X.375	n/a	2011.28	75624	123	Red
6	HSS8X8X.3125	n/a	150.93	4800	8	Red
7	HSS10X10X.375	n/a	46.15	2206	1	DarkRed
8	HSS12X12X.25	n/a	825.39	32520	22	Magenta
9	HSS12X12X.375	n/a	868.92	50397	25	Blue
10	HSS16X8X.3125	n/a	109.35	5336	3	Purple
11	HSS16X16X.375	n/a	117.35	9200	4	Magenta
12	W8X10	n/a	2509.21	25092	239	DarkYellow
13	W8X18	n/a	56	1008	4	Yellow
14	W8X58	n/a	117.64	6823	5	Cyan
15	W10X12	n/a	654.86	7858	37	DarkGreen
16	W10X39	n/a	339.5	13241	12	Green
17	W12X14	n/a	1681.56	23542	105	DarkGreen
18	W12X16	n/a	694.97	11120	30	Cyan
19	W12X19	n/a	1211.16	23012	44	Green
20	W12X40	n/a	753.42	30137	29	Green
21	W12X53	n/a	584.63	30985	30	Green
22	W12X65	n/a	323	20995	10	Yellow
23	W12X72	n/a	30.67	2208	2	Yellow
24	W12X79	n/a	267.21	21109	10	Cyan
25	W12X87	n/a	15.29	1330	1	Green
26	W12X96	n/a	87.88	8436	3	DarkYellow
27	W14X22	n/a	5218.28	114802	210	DarkGreen
28	W14X26	n/a	36.29	944	1	DarkYellow

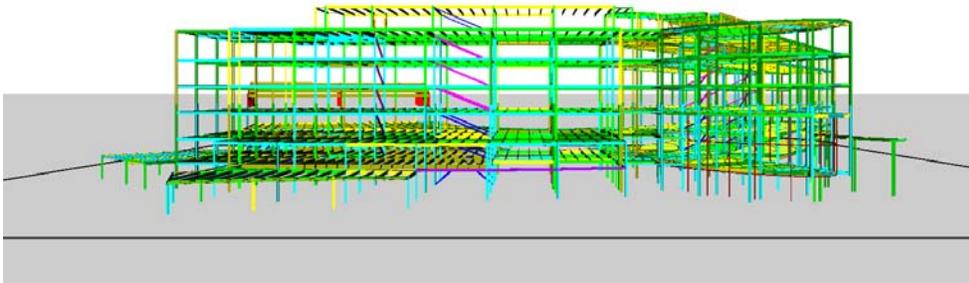


To generate the 3D model, I downloaded the Octaga Player for the same website.



The following X3D models can be displayed with X3D plugin and software such as [Flux Player](#), [Octaga Player](#), or [InstantPlayer](#). The corresponding VRML models can be found [above](#). The X3D models without PROTOs were created by [translating the VRML to X3D](#).
X3D Models (without PROTOs): [AISC_Sculpture.x3d](#), [Bentley1.x3d](#), [CADstudio.x3d](#), [DAM.x3d](#), [GoldenGate.x3d](#), [NIST_ECS.x3d](#), [RAM4.x3d](#), [TrammingStructure.x3d](#)
X3D Models (with X3D PROTOs): [manufacture.x3d](#), [ramcos2.x3d](#)

Revit Structure Design model



Note: Portions of this document were obtained from Revit Structure 2008 User's Guide and various websites.