Be Connected with Steel Connections

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Class summary

This class is for structural engineers and steel detailers that are either using or intending on using Revit to model steel structures and are looking for opportunities to leverage steel connections information in their BIM models and get fabrication and erection deliverables with Advance Steel.

Key learning objectives

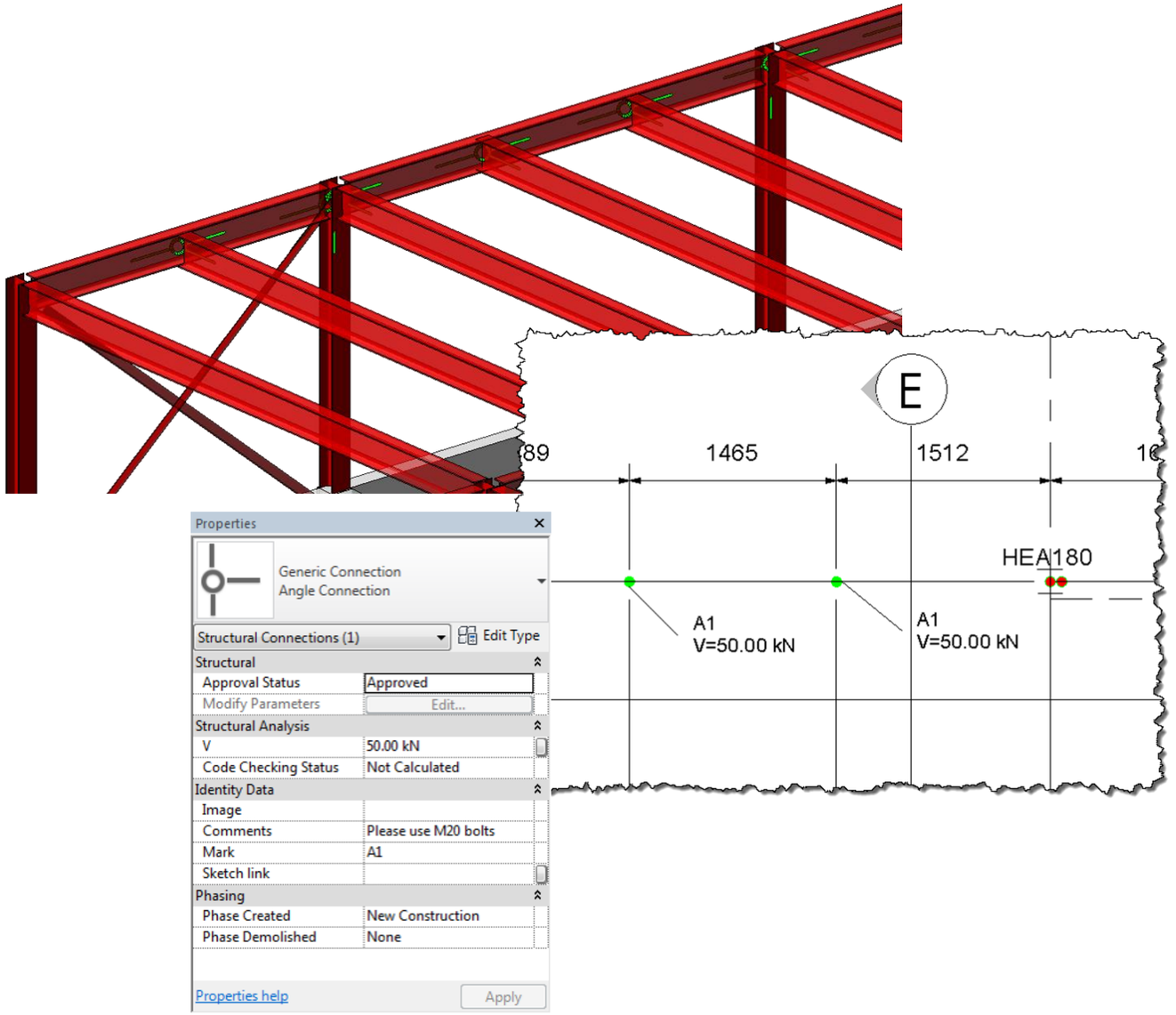
At the end of this class, you will be able to:

- Place fully parametric steel connections on structural sections in the Revit environment
- Synchronize not just the structure but also steel connections between Revit and Advance Steel
- Create shop drawings and NC files for fabrication, and erection drawings for installation
- Communicate more effectively your project containing steel connections with others

Place fully parametric steel connections on structural sections in the Revit environment

Generic connections

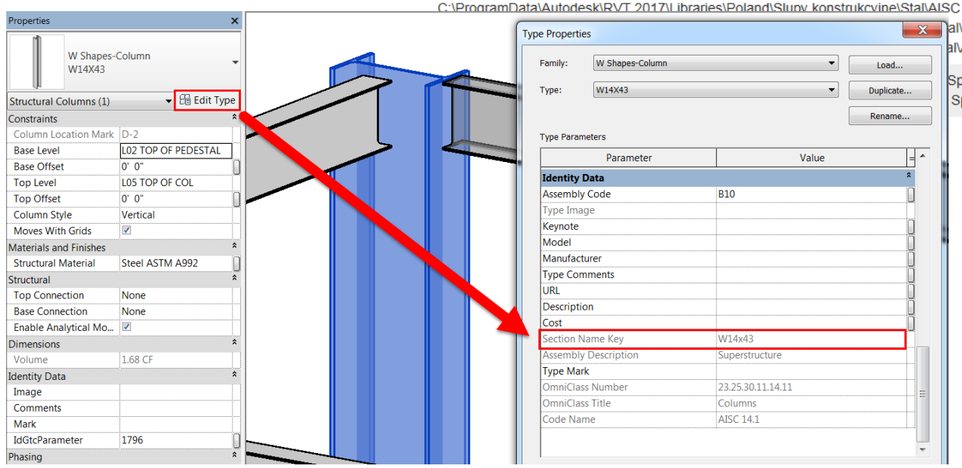
- Supply information about the desired connection
- Define the relation between the elements
- Attach a picture
- Link to further documentation
- Symbolic connectors can be shown on drawings



Certified families in Revit 2017

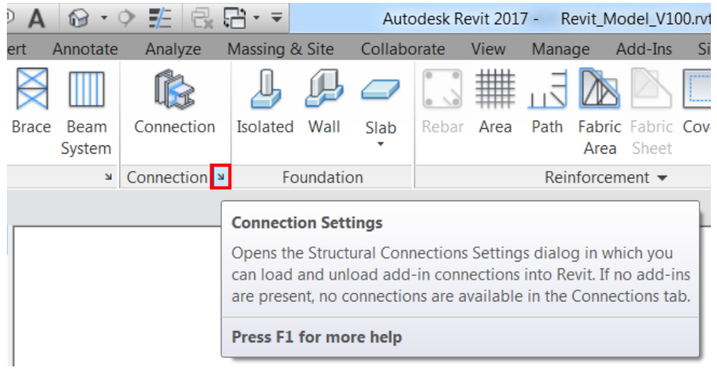
- New certified families for the following countries:
  - US (Imperial & Metric)
  - Canada
  - UK
  - Australia
  - Germany
  - France
  - Poland
  - India
- Complete list here
- Section Name Key parameter

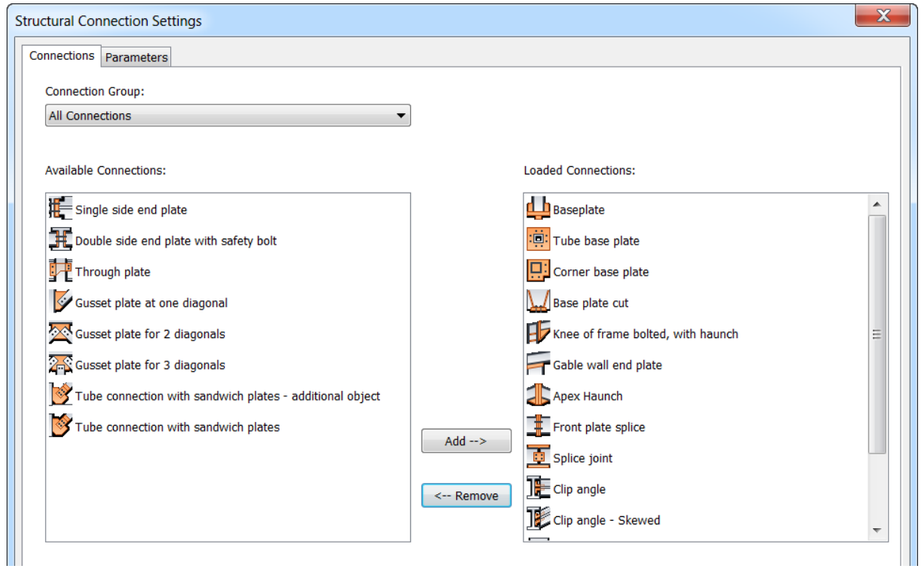
Family	Location
US Imperial	C:\ProgramData\Autodesk\RVT 2017\Libraries\US Imperial\Structural Framing\Steel\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\US Imperial\Structural Columns\Steel\AISC 14.1
US Metric	C:\ProgramData\Autodesk\RVT 2017\Libraries\US Metric\Structural Framing\Steel\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\US Metric\Structural Columns\Steel\AISC 14.1
Canada	C:\ProgramData\Autodesk\RVT 2017\Libraries\Canada\Structural Framing\Steel\CISC Shapes C:\ProgramData\Autodesk\RVT 2017\Libraries\Canada\Structural Framing\Steel\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\Canada\Structural Columns\Steel\CISC Shapes C:\ProgramData\Autodesk\RVT 2017\Libraries\Canada\Structural Columns\Steel\AISC 14.1
UK	C:\ProgramData\Autodesk\RVT 2017\Libraries\UK\Structural Framing\Steel\British Standard C:\ProgramData\Autodesk\RVT 2017\Libraries\UK\Structural Columns\Steel\British Standard
Australia	C:\ProgramData\Autodesk\RVT 2017\Libraries\Australia\Structural Framing\Steel\Australian Standard C:\ProgramData\Autodesk\RVT 2017\Libraries\Australia\Structural Columns\Steel\Australian Standard
Germany	C:\ProgramData\Autodesk\RVT 2017\Libraries\Germany\Tragwerk Träger\Stahl C:\ProgramData\Autodesk\RVT 2017\Libraries\Germany\Tragwerk Stützen\Stahl C:\ProgramData\Autodesk\RVT 2017\Libraries\German_INTL\Tragwerk Träger\Stahl\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\German_INTL\Tragwerk Stützen\Stahl\AISC 14.1
France	C:\ProgramData\Autodesk\RVT 2017\Libraries\France\Structure\Poteaux\Acier C:\ProgramData\Autodesk\RVT 2017\Libraries\France\Structure\Ossature\Acier C:\ProgramData\Autodesk\RVT 2017\Libraries\French_INTL\Poteaux porteurs\Acier\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\French_INTL\Ossature\Acier\AISC 14.1
Poland	C:\ProgramData\Autodesk\RVT 2017\Libraries\Poland\Rama konstrukcyjna\Stal\Char. dla j. pols C:\ProgramData\Autodesk\RVT 2017\Libraries\Poland\Rama konstrukcyjna\Stal\AISC 14.1 C:\ProgramData\Autodesk\RVT 2017\Libraries\Poland\Slupy konstrukcyjne\Stal\Char. dla j. pols C:\ProgramData\Autodesk\RVT 2017\Libraries\Poland\Slupy konstrukcyjne\Stal\AISC 14.1 al\AISC 14.1 al\AISC 14.1
	Specific Specific



Steel Connections for Revit 2017

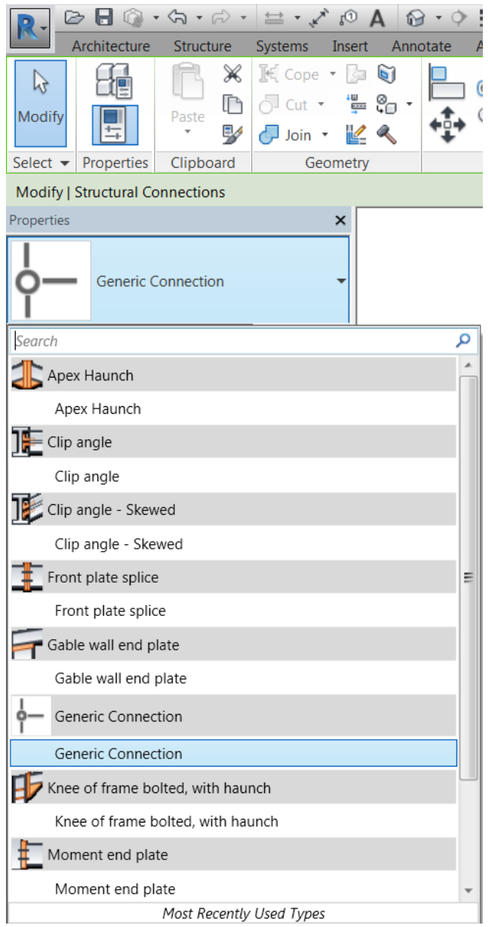
- Download & install it from your Autodesk account.
- Gives access to a variety of parametric steel connections
- Enables connections to be modeled with a higher level of detail
- Integrated joint design (AISC & EC3)

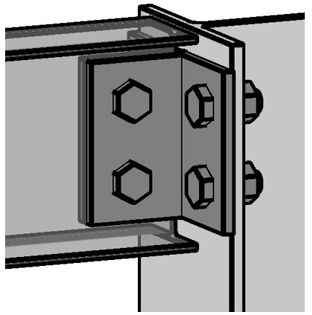


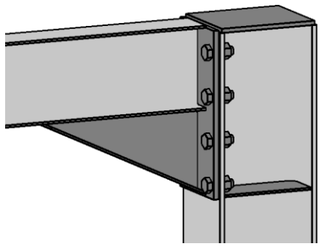


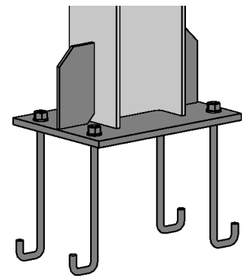
Inserting a Steel Connection in Revit 2017

- Select steel members
- Structure > Connection
- Go to the list of available connections for this type of situation
- Select a connection type
- The connection is automatically inserted!



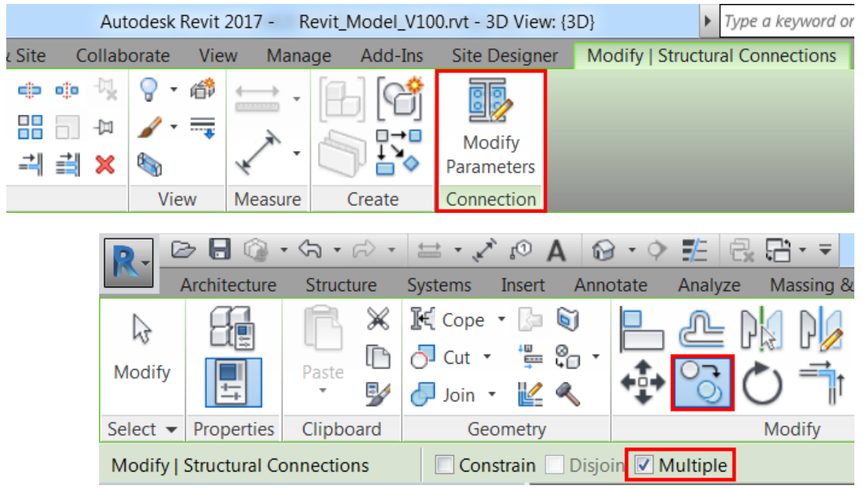


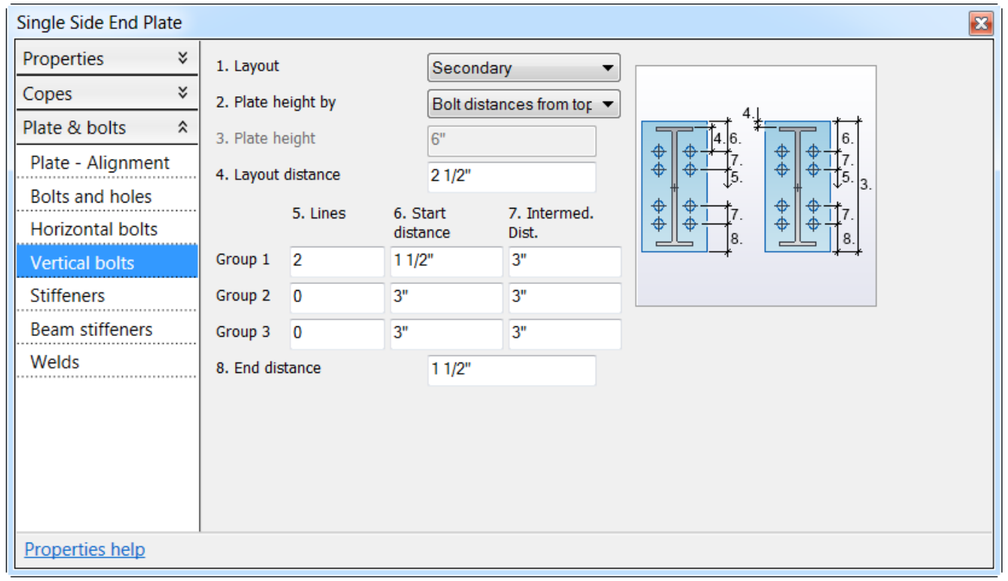




Modifying & copying a Steel Connection

- Pick one of the connection components
- Modify | Structural connections > Modify parameters
- Make changes in the properties dialog

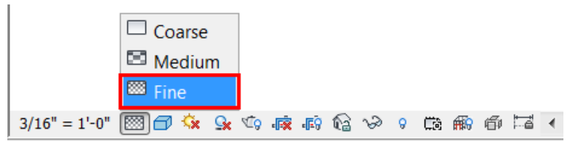


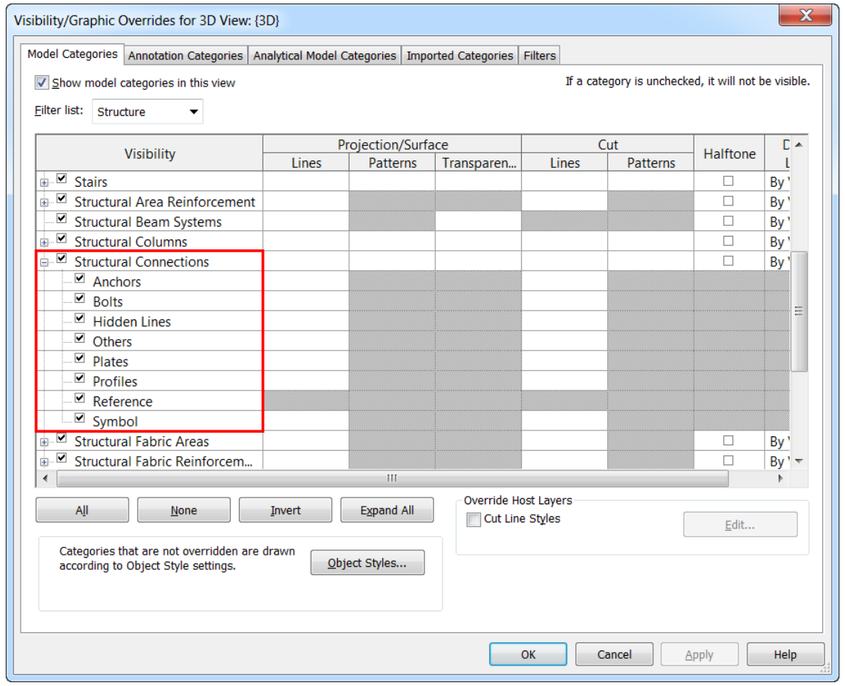


- Pick one of the connection components
- Copy
- Select Multiple if needed

Display Steel Connections in Revit 2017

- Detail Level
  - Coarse
  - Medium
  - Fine
- Visibility / Graphic Overrides
  - Structural Connections branch
  - Control the visibility of specific elements such as anchors, bolts, plates, profiles …

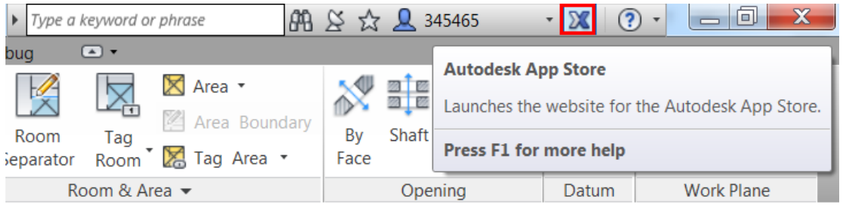


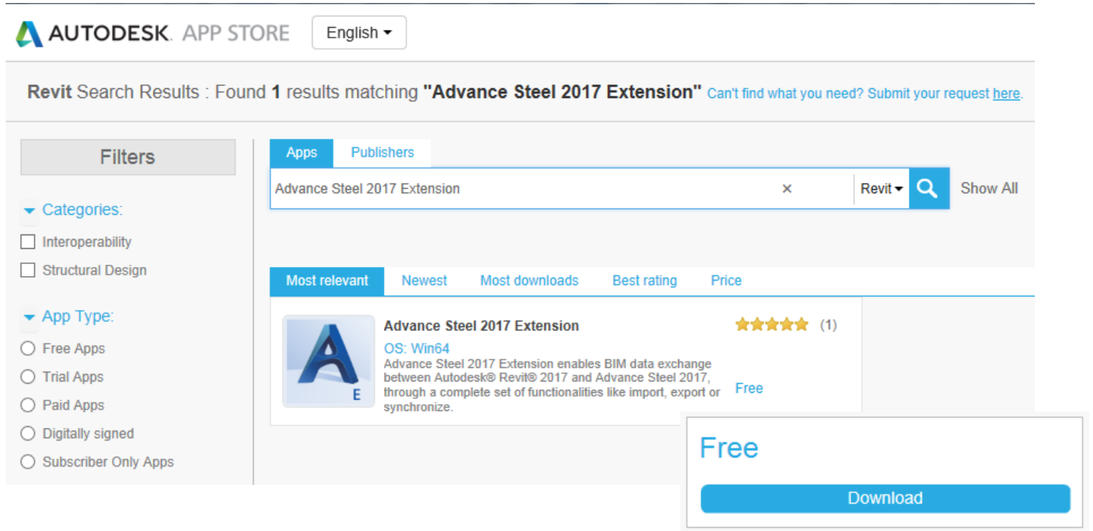


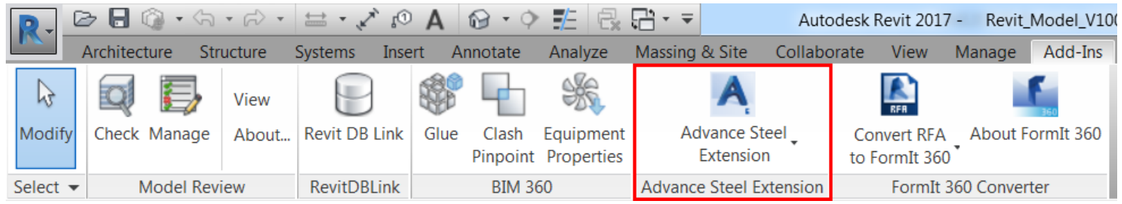
Synchronize not just the structure but also steel connections between Revit and Advance Steel

Advance Steel Extension for Revit

- Autodesk App Store
  - Icon on top-right in Revit
  - https://apps.Autodesk.com
  - Provides access to add-ins
- Download & install the Advance Steel 2017 Extension
- Available under Add-Ins tab
- Offers the possibility to import/export/synchronize a Revit model with Advance Steel

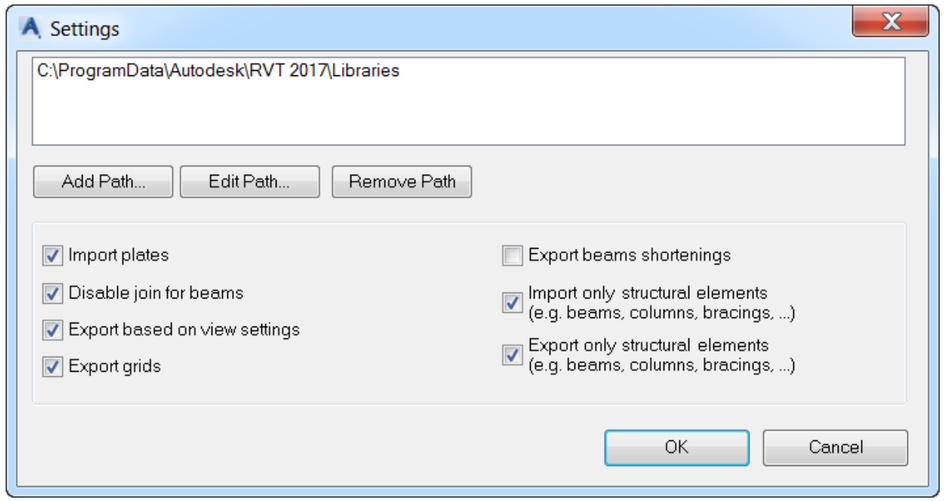




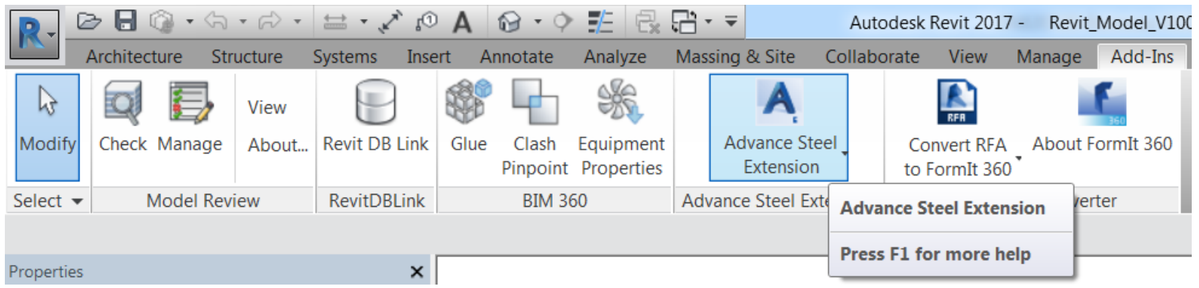


Settings & online help

- Settings dialog
  - Import plates
  - Export based on view settings
  - Export grids
  - Export beams shortening

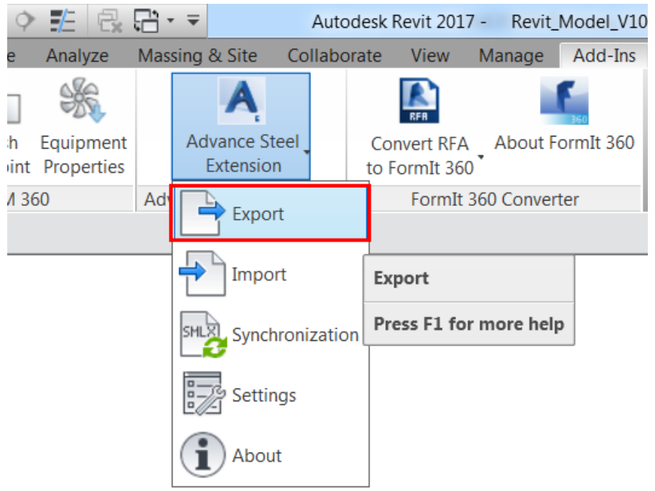


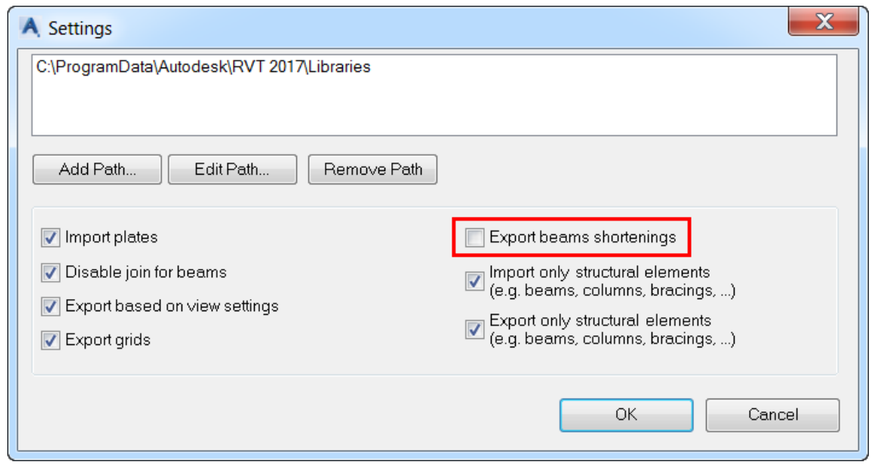
- Online help:
  - Move the cursor over the Advance Steel Extension
  - Press F1



Exporting the Revit model to Advance Steel

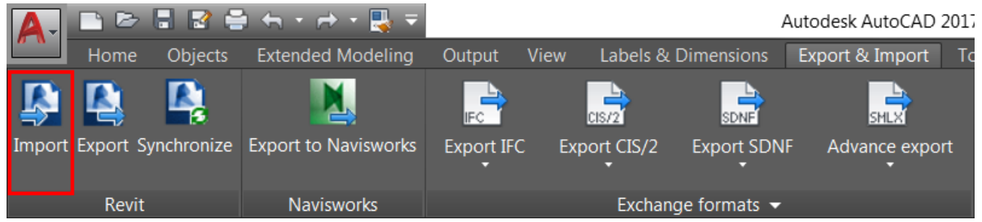
- Advance Steel Extension
  - Settings (e.g. it is recommended not to select the “Export beam shortenings” option)
- Advance Steel Extension
  - Export button
- SMLX file automatically generated

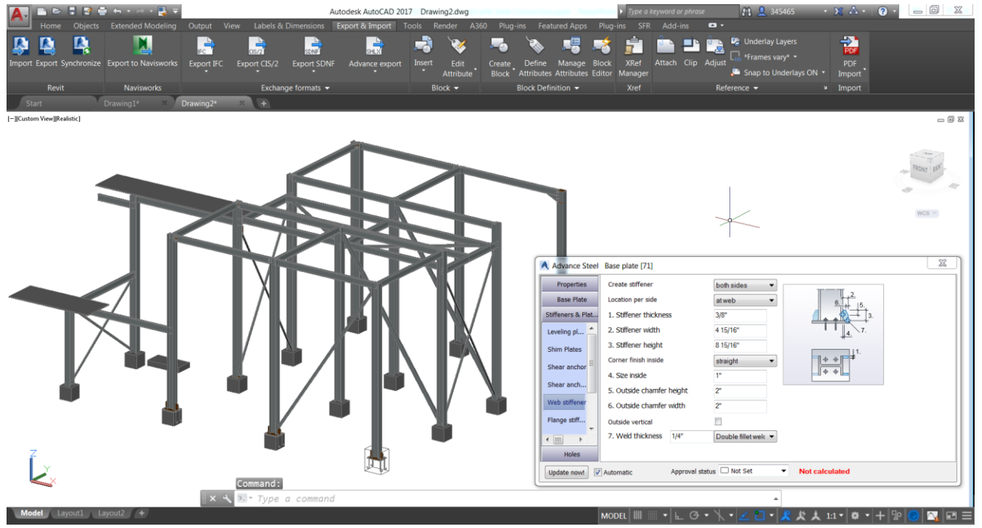




Importing the Revit model into Advance Steel

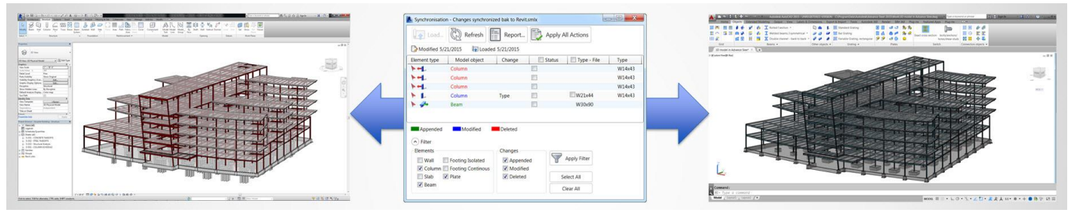
- Export & Import tab
  - Revit > Import
  - Import the SMLX file
- Mapping
  - done for certified families in Revit 2017
  - done for materials in the AEC Materials library in Revit 2017
  - needs to be done for other families or materials
- Non-structural members imported as special parts

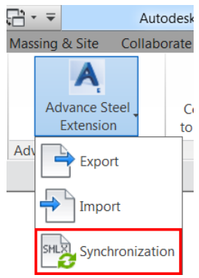


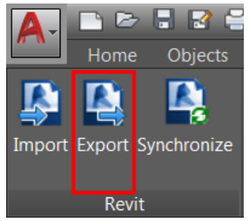


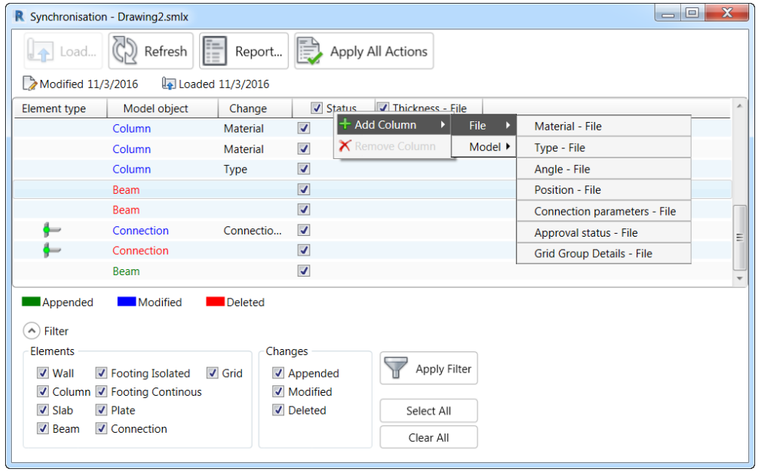
Synchronizing back the changes into Revit

- In Advance Steel:
  - Export & Import tab
  - Revit > Export
  - Creates a SMLX file
- In Revit:
  - Advance Steel Extension
  - Synchronization > Load the SMLX file
- Synchronization dialog
  - Color per type of modification
  - Filter



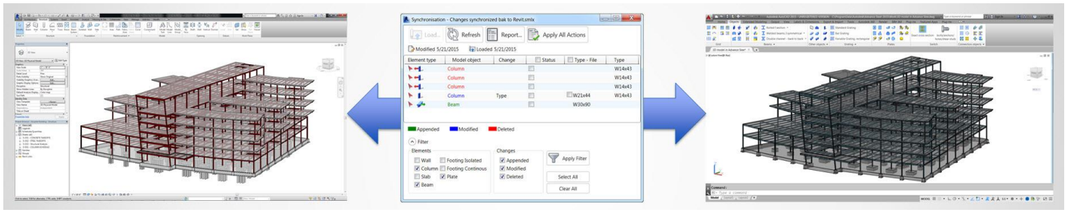


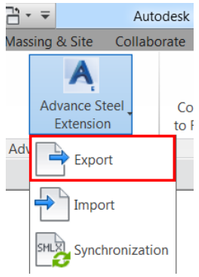


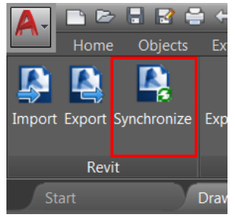


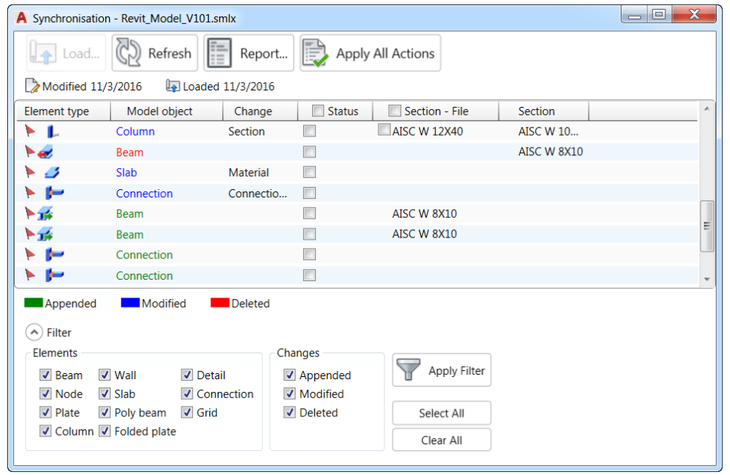
Synchronizing back changes into Advance Steel

- In Revit:
  - Advance Steel Extension
  - Export
  - Creates a SMLX file
- In Advance Steel:
  - Export & Import tab
  - Revit > Synchronize
  - Open the SMLX file
- Synchronization dialog
  - Color per type of modification
  - Filter









Special cases with steel connections

- Connections which are not part of the Steel Connections for Revit
- Plates (and their features) are transferred to Revit
- Currently not transferred from Advance Steel to Revit:
  - Bolts
  - Anchor bolts
  - Shear studs
  - Special parts
  - Welds

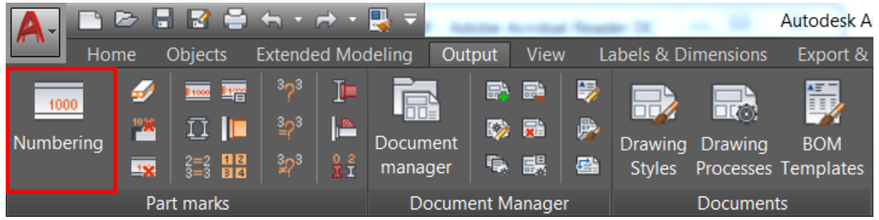
Here is a matrix showing which object types can be transferred from Advance Steel to Revit:

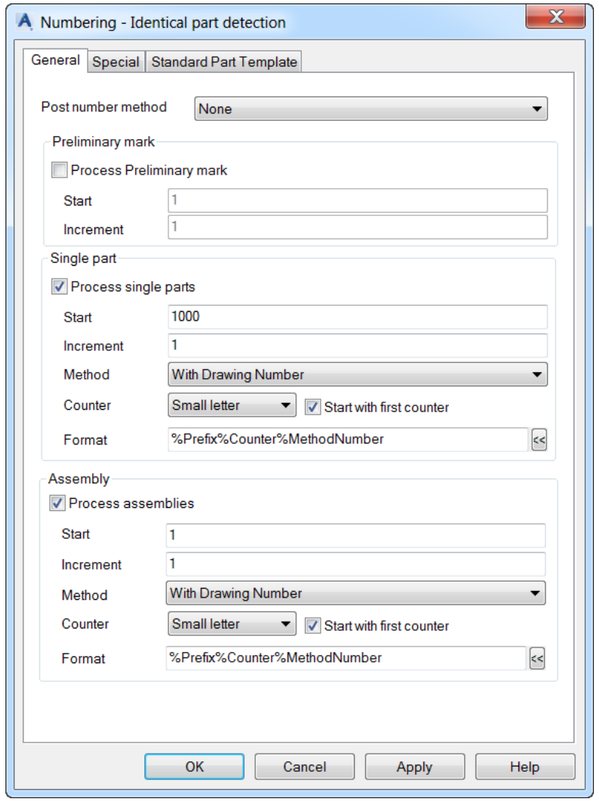
Advance Steel objects	Revit objects
Level	Level
Grid	x
Beam	Structural framing
Column	Structural column
Wall	Basic wall
Slab	Floor
Isolated footing	Structural fundation
Continuous footing	Structural framing
Plate	Generic model
Grating	Generic model
Folded plate	Generic model (individual elements)
Twisted folded plate	Generic model (individual elements)
Folded beam	Generic model
Special part	x
Bolts	x
Anchors	x
Holes	Holes (on plate only)
Shear studs	x
Welds	x

Create shop drawing and NC files for fabrication, and erection drawings for installation

Run the Numbering

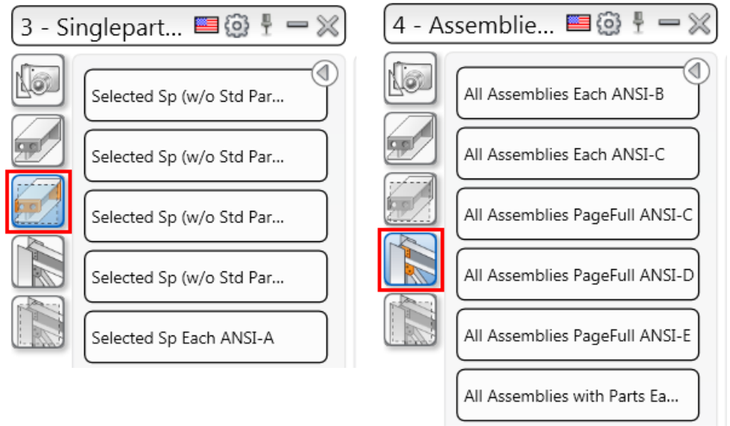
- Model must be numbered …
- … before any documentation is created.
- Numbering command assigns:
  - Preliminary marks (optional)
  - Single part marks
  - Assembly marks
- Result available in object properties
- Search tool to find part mark(s)

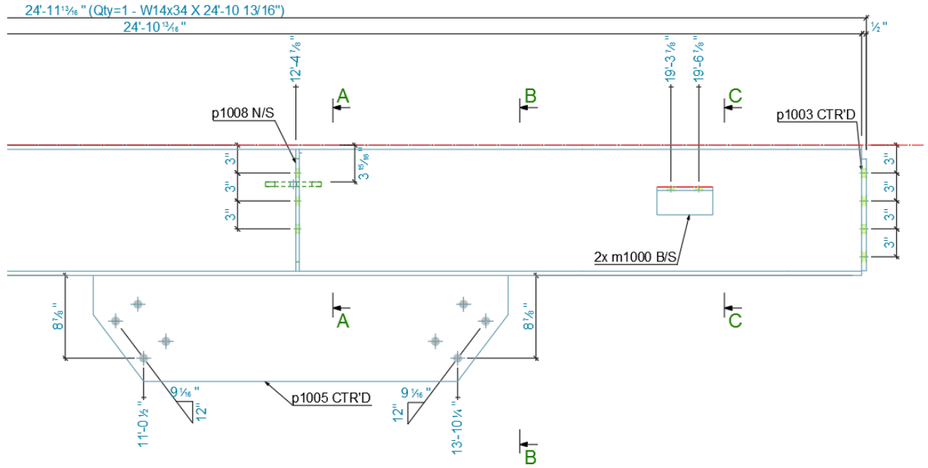




Creating shop drawings

- Drawing Processes palette
- Single part & assembly drawings
- Single sheets or multi-drawings
- Automatically labelled & dimensioned
- Can contain a BOM
- Defaults to control the behavior of main parts & standalone parts

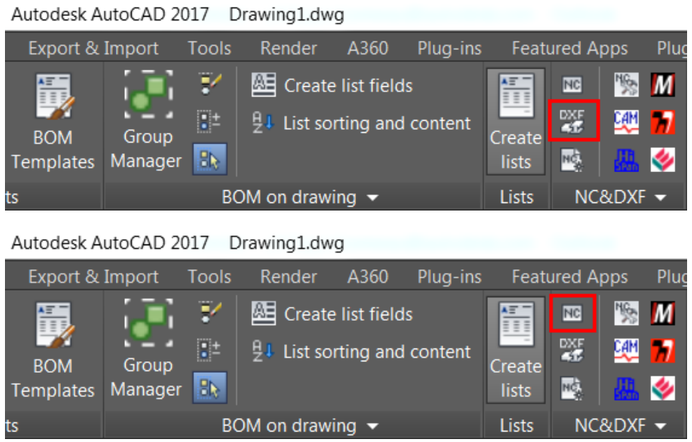


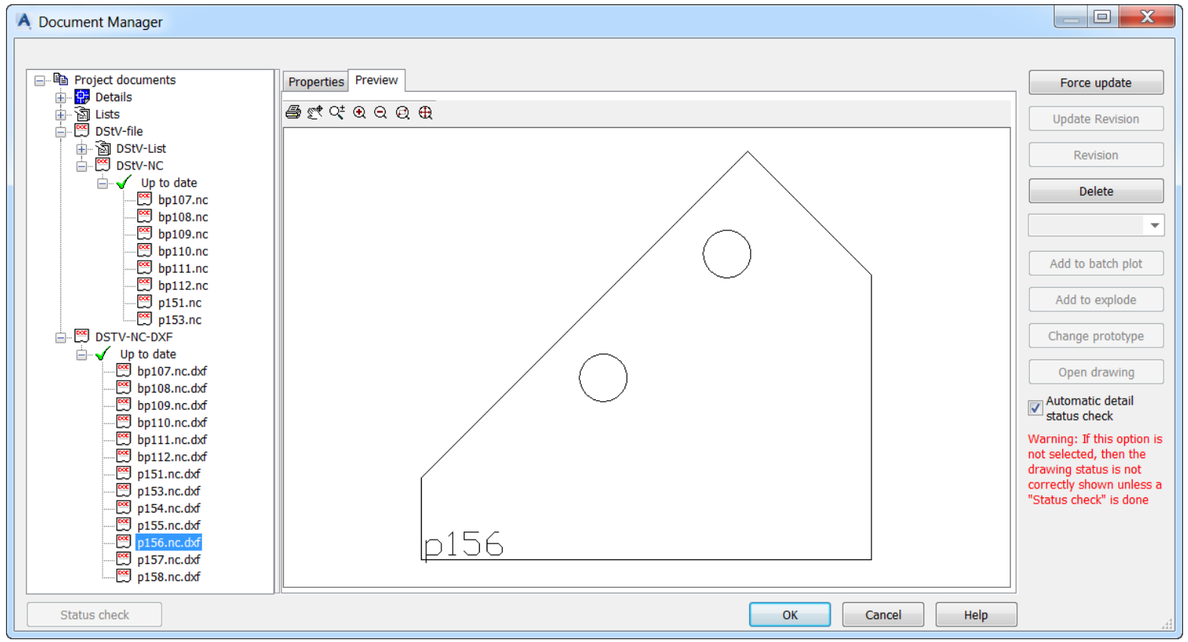


Property Name	Property Value
Behavior for Main Part beams on shop drawings	Create only MP detail
Behavior for Main Part plates on shop drawings	Create only MP detail
Behavior for standalone parts on shop drawings for beams	Create both MP and SP details
Behavior for standalone parts on shop drawings for plates	Create both MP and SP details

Creating NC files

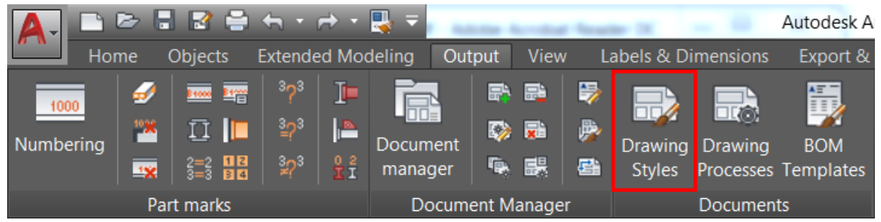
- Automatic creation of:
  - NC-DSTV files
  - NC-DXF files
- Configurable:
  - NC Settings dialog
  - Defaults available in the Management Tools
- Can be read by CNC machines at workshop & MIS software

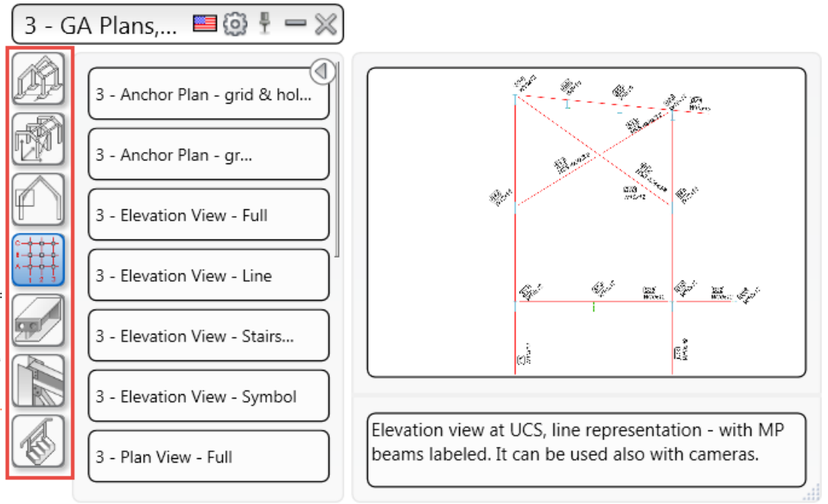


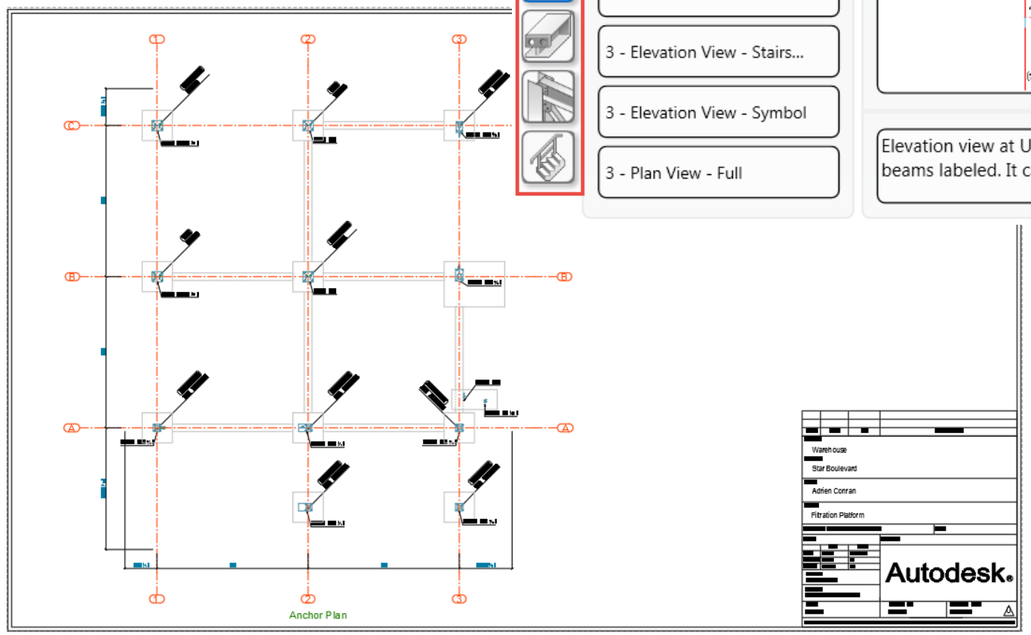


Creating erection drawings

- Drawing Styles Palette
- Ready-to-use presentations
- Engineering drawings
- Anchor plan drawing
- Erection drawings
- 2D & 3D views
- Can contain a BOM

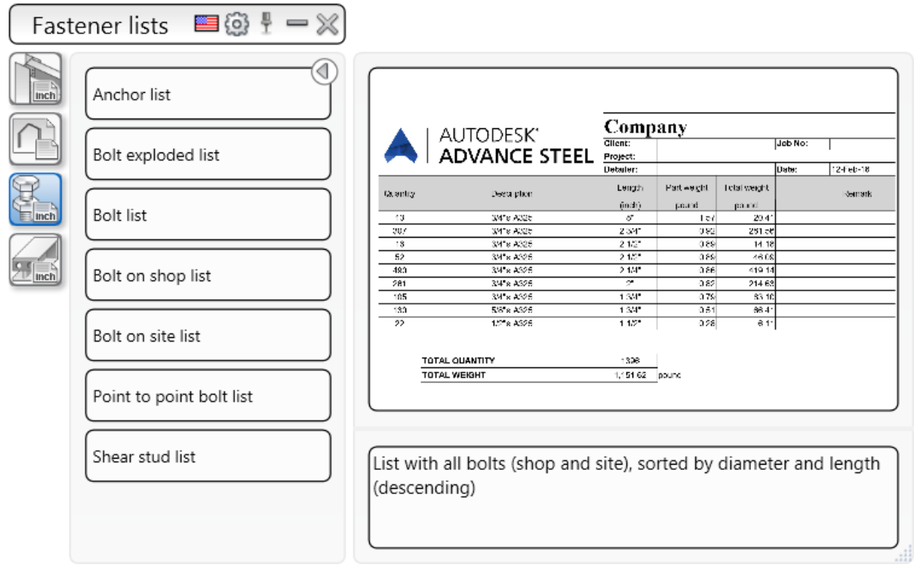


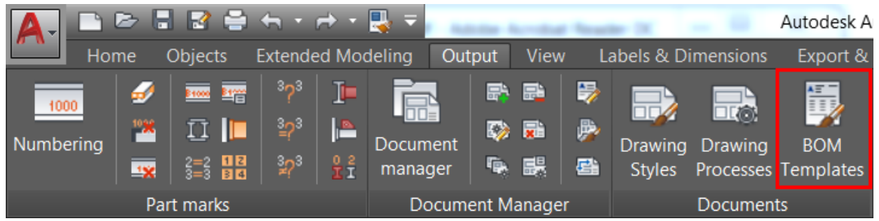


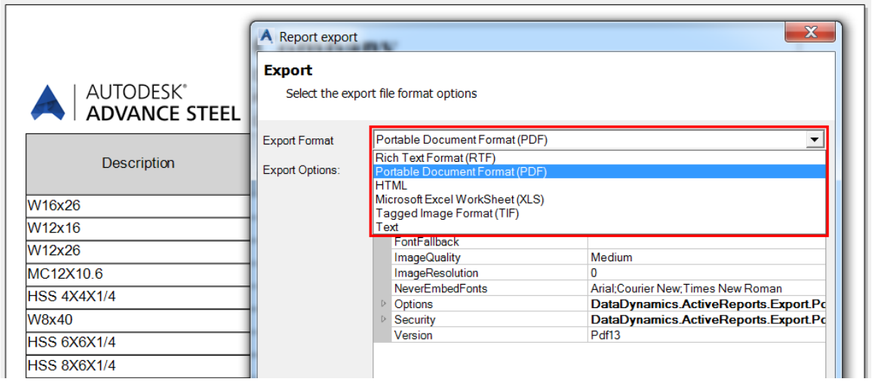


Creating BOMs

- BOM Templates palette
- Ready-to-use templates
- Various type of lists
- Saw cut list with explicit pictures
- Export it to various file formats
  - Microsoft Excel
  - PDF



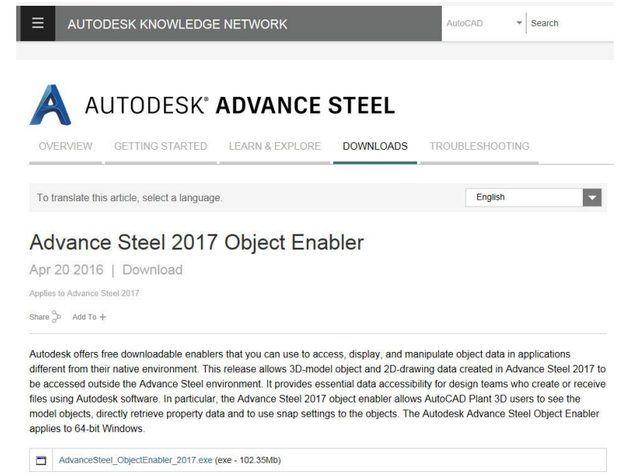




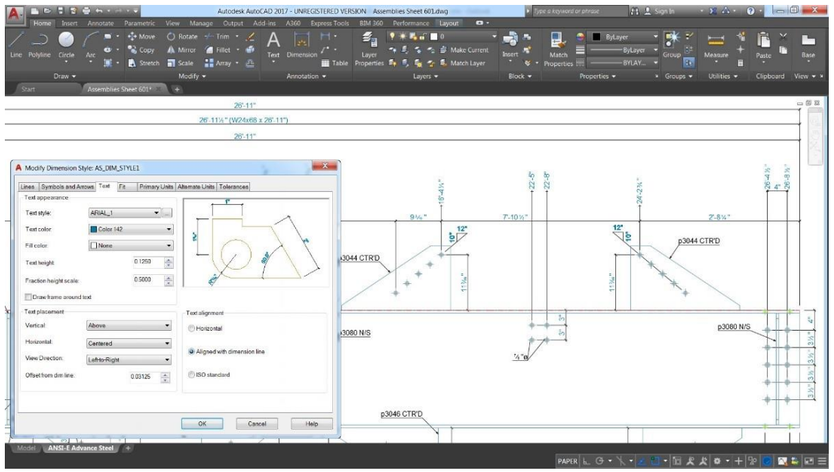
Communicate more effectively your project containing steel connections with others

Open Advance Steel drawings in plain AutoCAD

- Advance Steel 2017 object enabler
  - Available on AKN
  - To be installed on the top of AutoCAD 2017



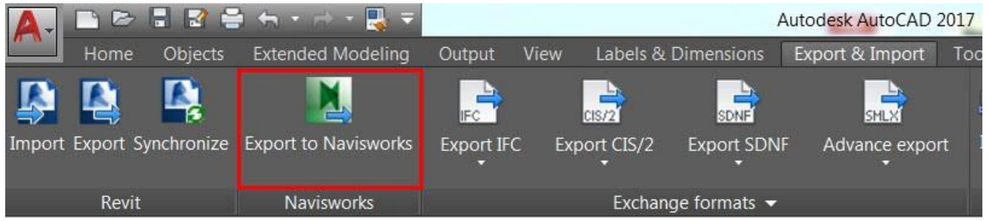
- Open native Advance Steel 2D drawings
  - In plain AutoCAD 2017
  - Or AutoCAD LT 2017

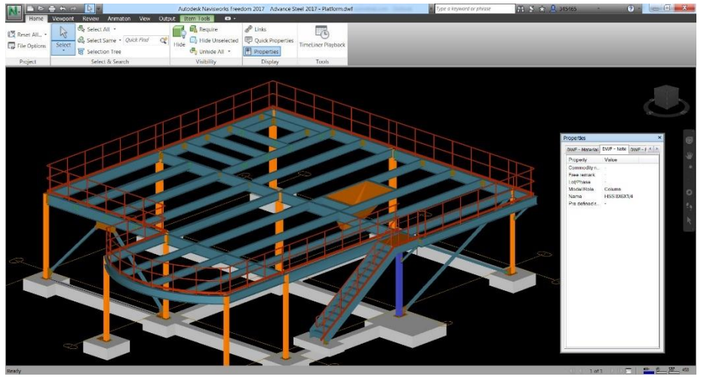


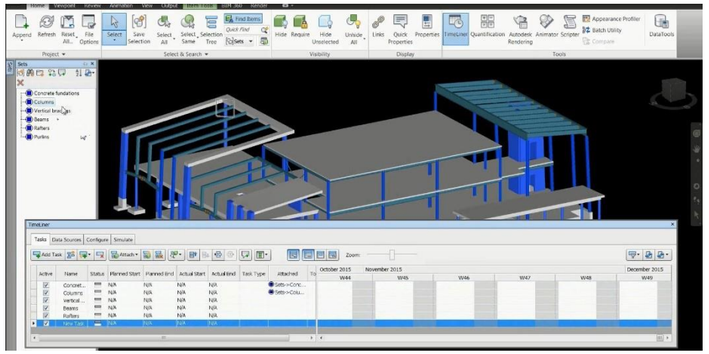
Export your Advance Steel model to Navisworks

- Export the Advance Steel model
  - Export to Navisworks icon
  - Creates a 3D DWF file
  - Automatically launchs Navisworks

- Result in Navisworks
  - File includes Advance Steel object properties
  - Assign scheduling tasks & rules to Advance Steel objects to perform a 4D simulation

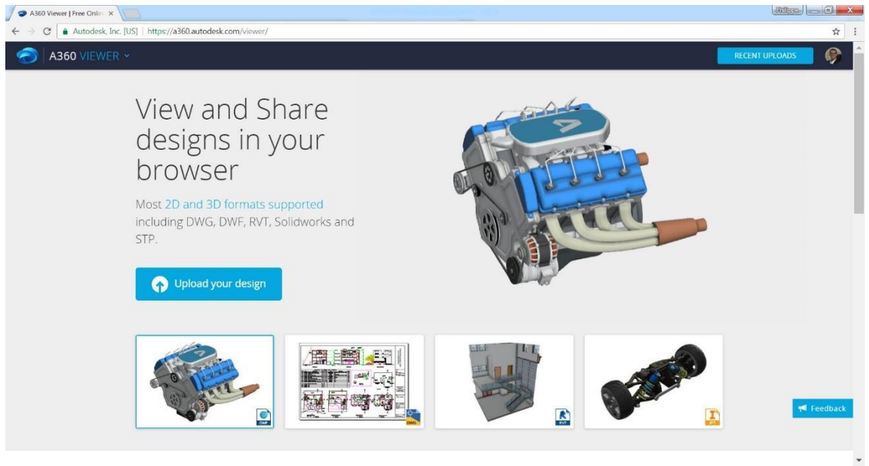




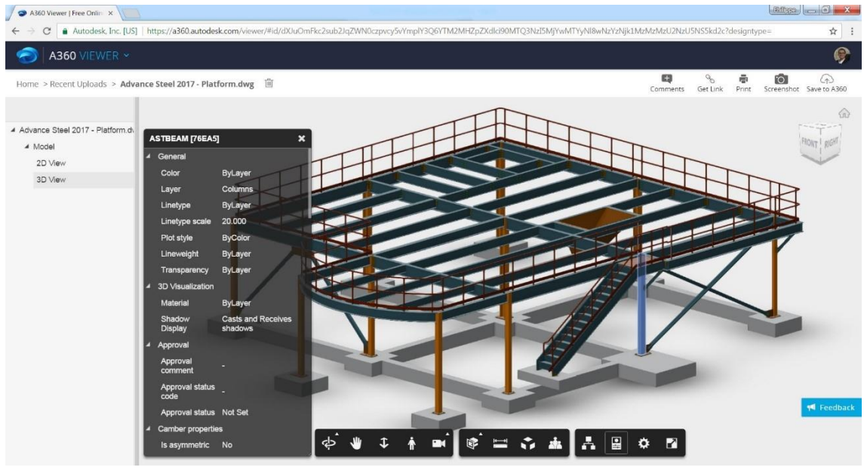


Share an Advance Steel model on A360 Viewer

- A360 Viewer
  - Free online viewer
  - View designs in more than 50 file formats
  - 3D viewing & navigation tools
  - Work together more easily in an online workspace
  - https://a360.Autodesk.com/viewer

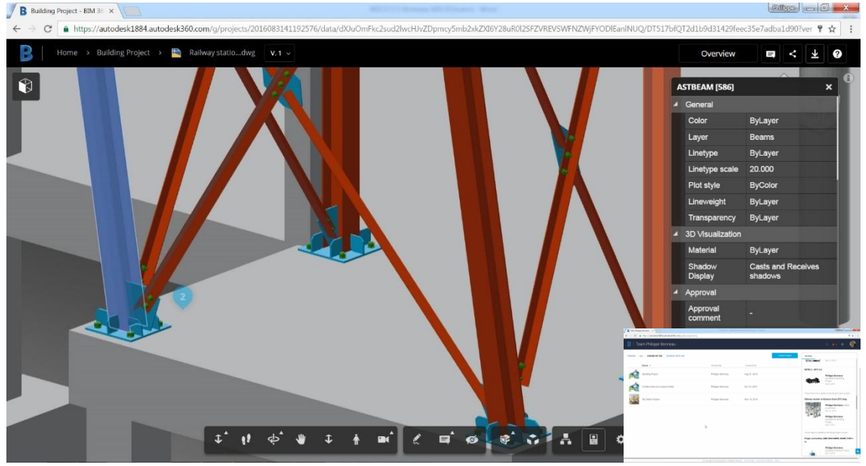


- Share an Advance Steel model
  - Upload the native DWG file
  - Structural properties available

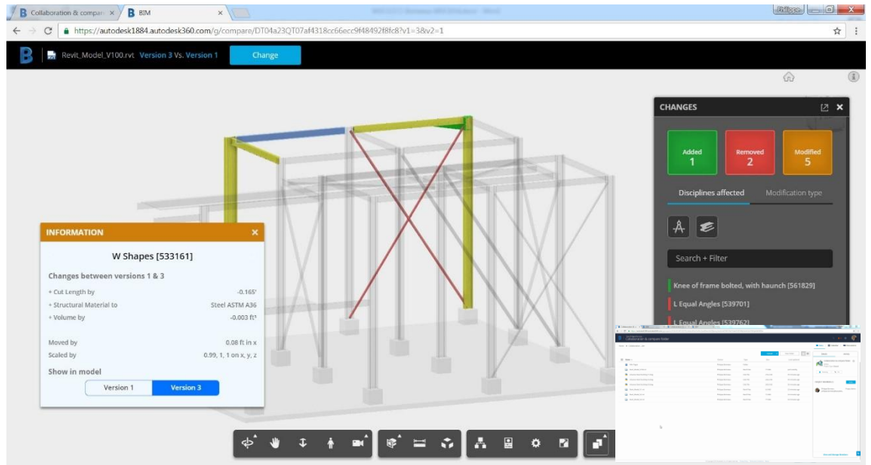


Share an Advance Steel model on BIM 360 Team

- BIM 360 Team
  - Cloud-based platform for communication, file sharing and design reviews
  - View, comments and markup features
  - Web and Mobile access to BIM models
  - https://team.bim360.com



- Share an Advance Steel model
  - Upload the native DWG file(s)
    - 3D model and/or 2D drawings
  - Structural properties available
  - Compare tool (NEW): changes between different versions of the same model



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- Give feedback after each session.
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