

AU Middle East 2019

Nabil Nougha & Sorin Bularca

Steel Structures from Design to Fabrication



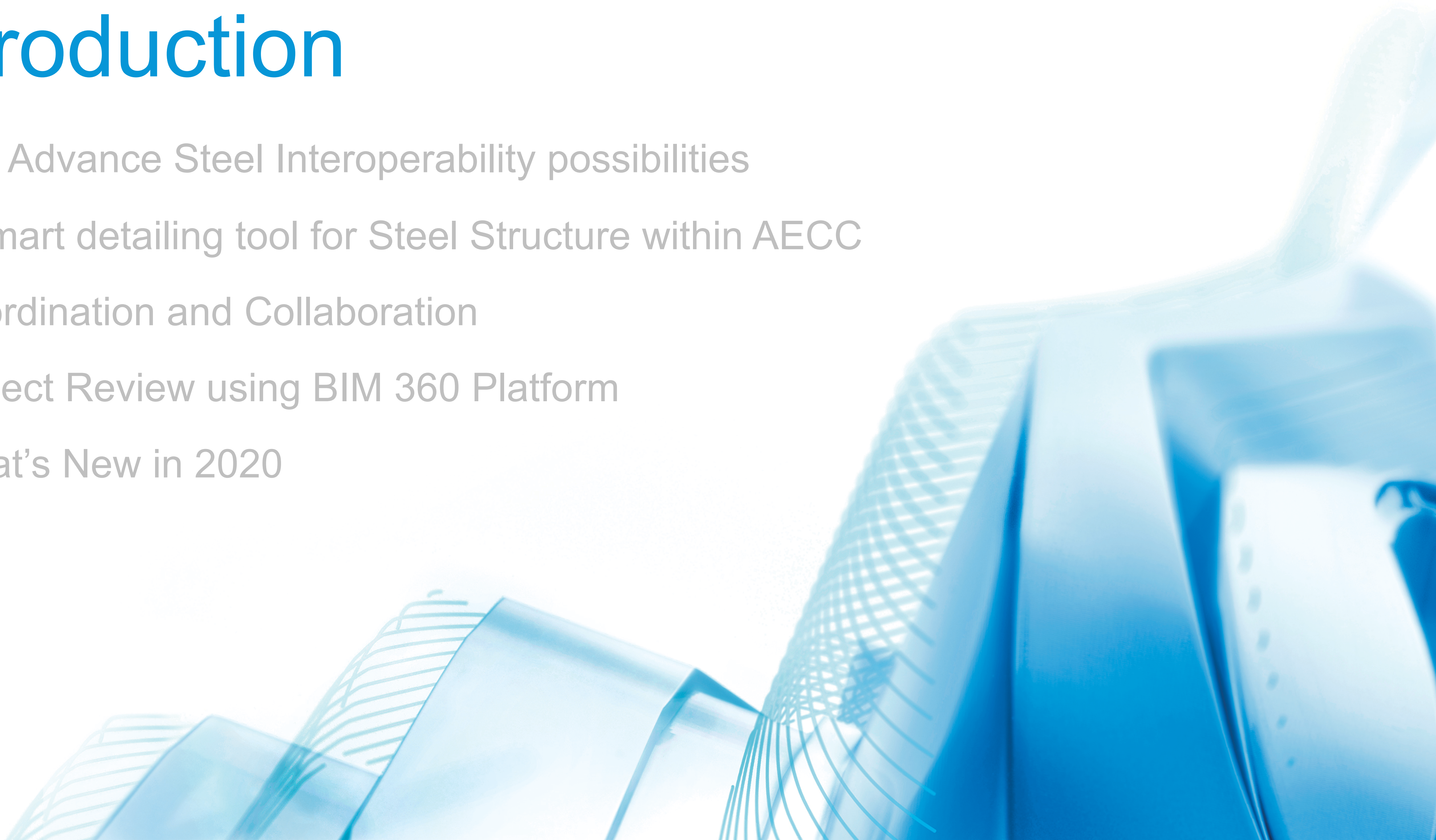
Agenda

- Introduction
- The Advance Steel Interoperability possibilities
- A smart detailing tool for Steel Structure within AECC
- Coordination & Collaboration
- Project Review using BIM 360 Platform
- What's New in 2020



Introduction

- The Advance Steel Interoperability possibilities
- A smart detailing tool for Steel Structure within AECC
- Coordination and Collaboration
- Project Review using BIM 360 Platform
- What's New in 2020





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Sorin Bularca

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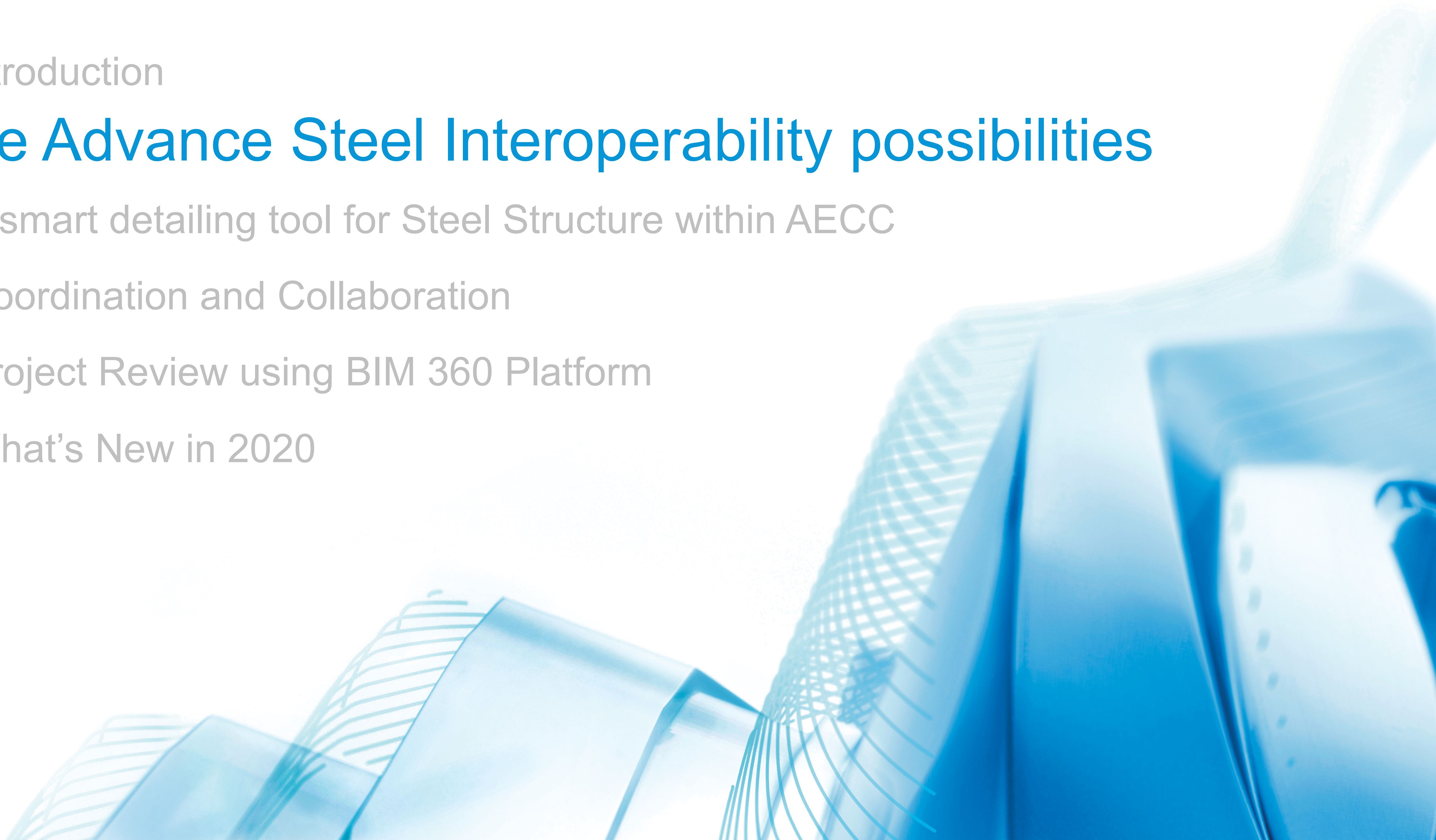
Autodesk Middle East

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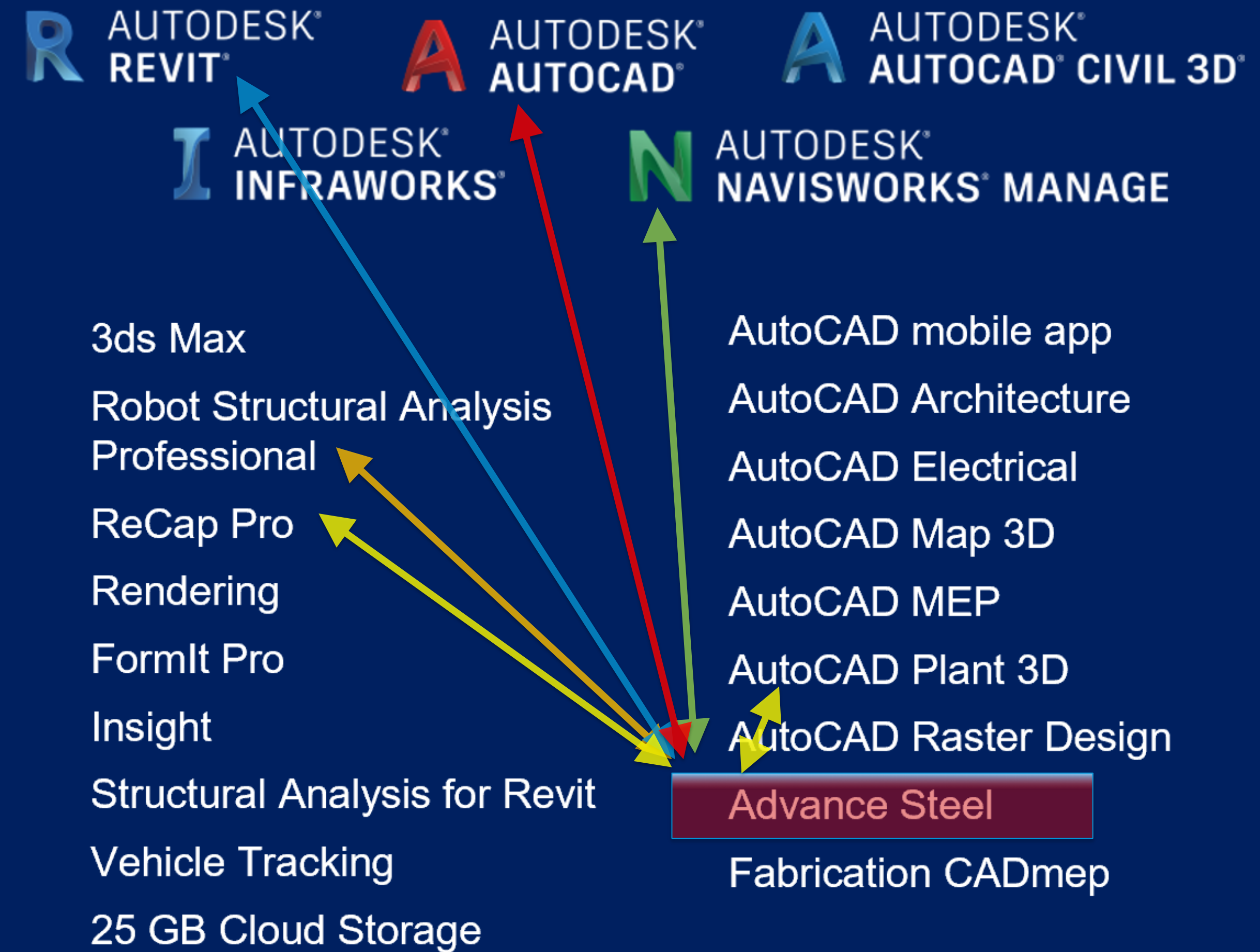
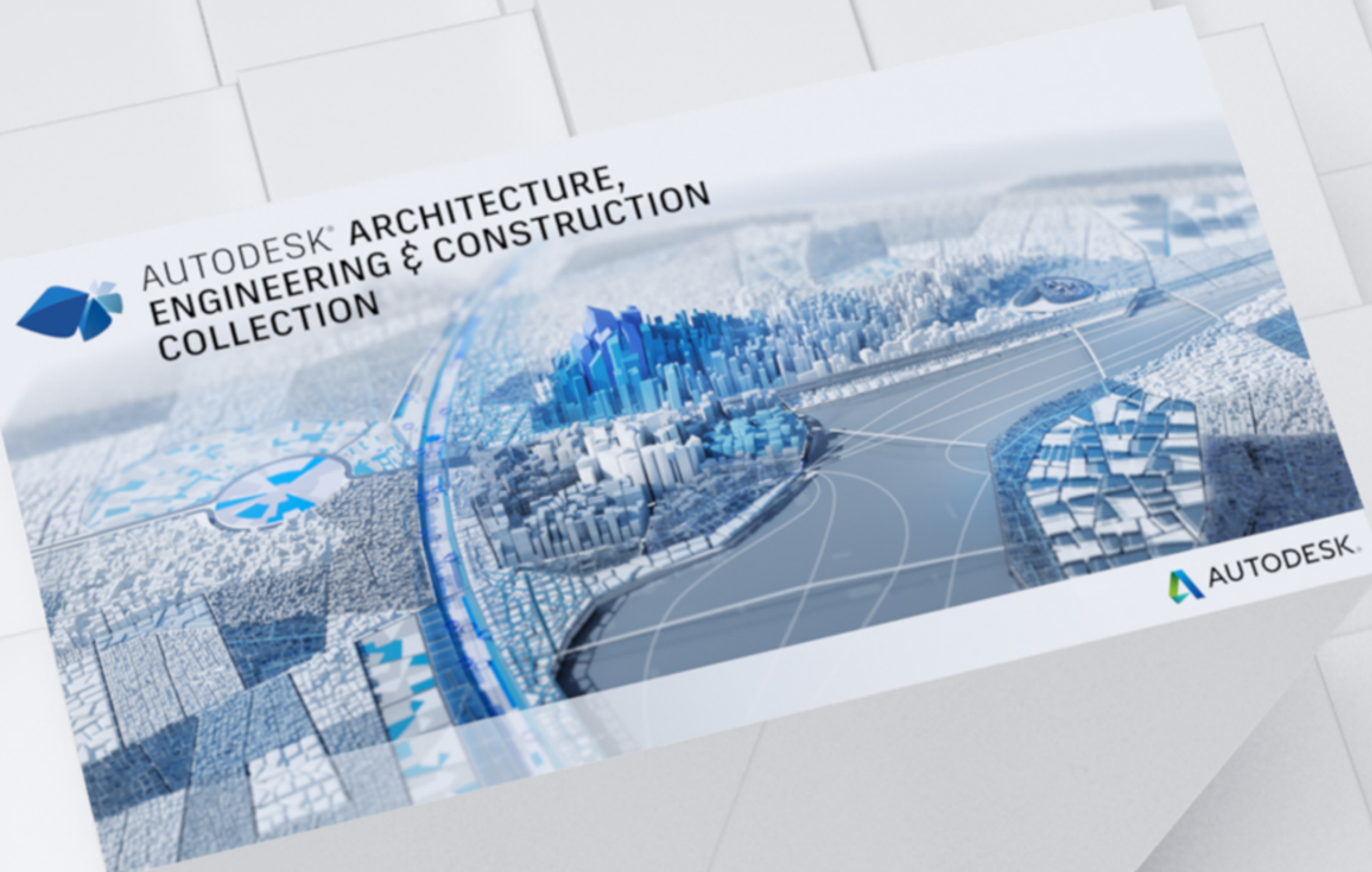
- Introduction

The Advance Steel Interoperability possibilities

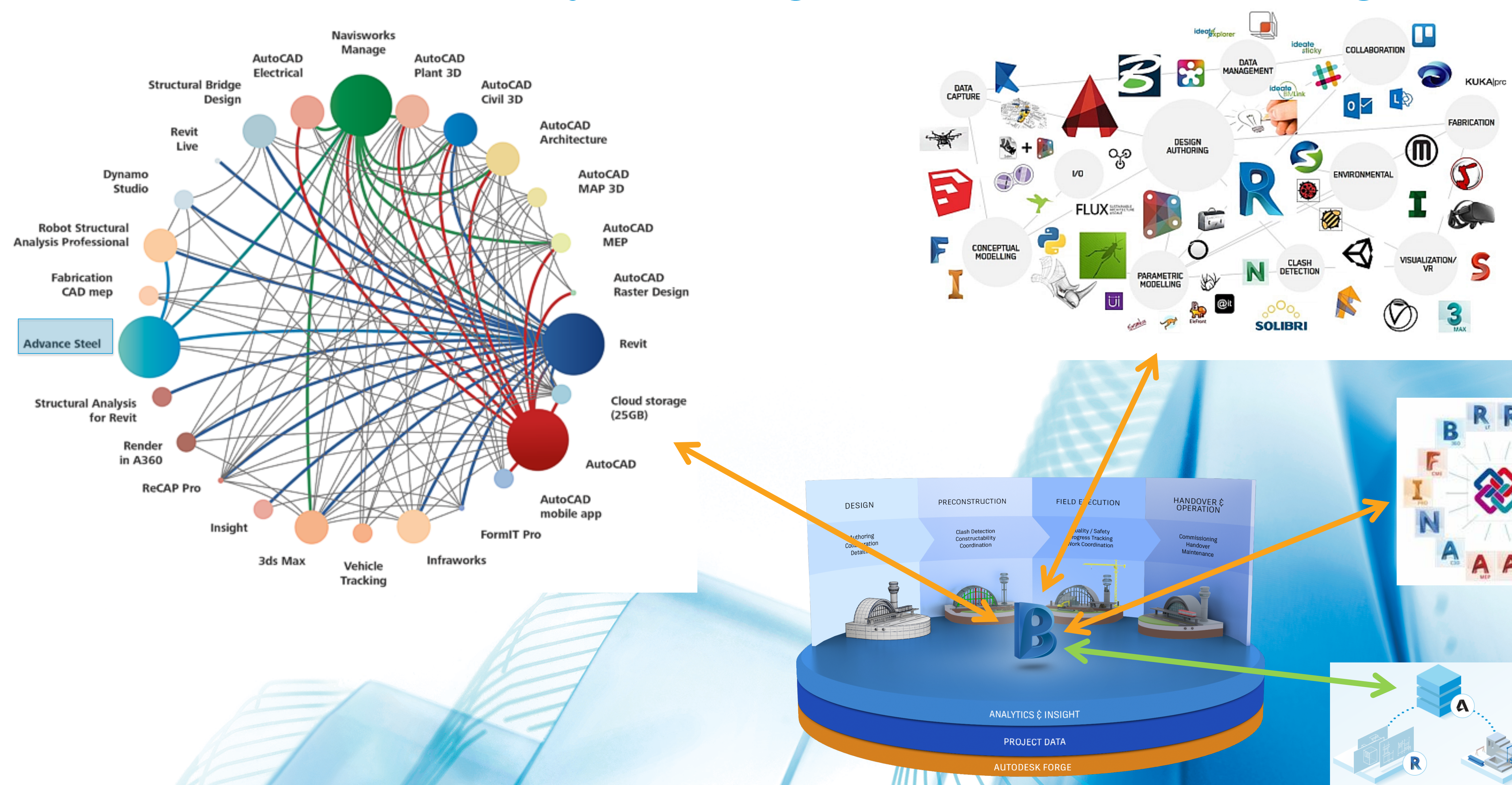
- A smart detailing tool for Steel Structure within AECC
- Coordination and Collaboration
- Project Review using BIM 360 Platform
- What's New in 2020



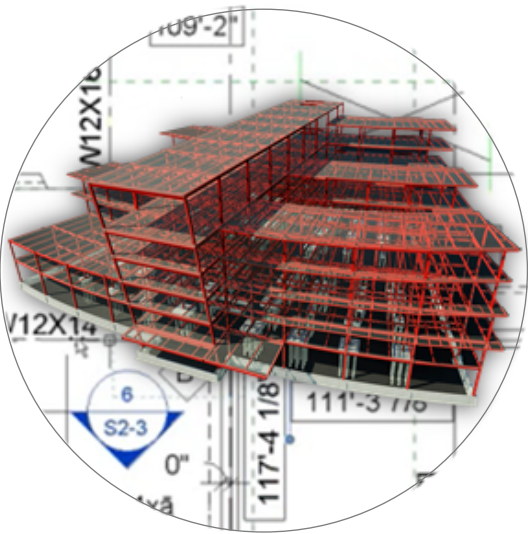
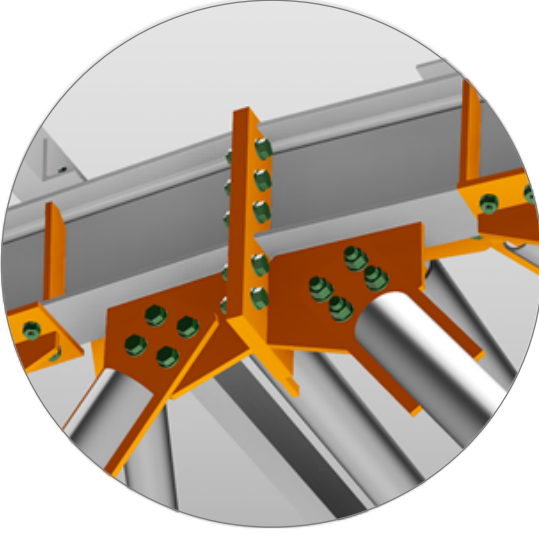


Collection Architecture, Engineering & Construction



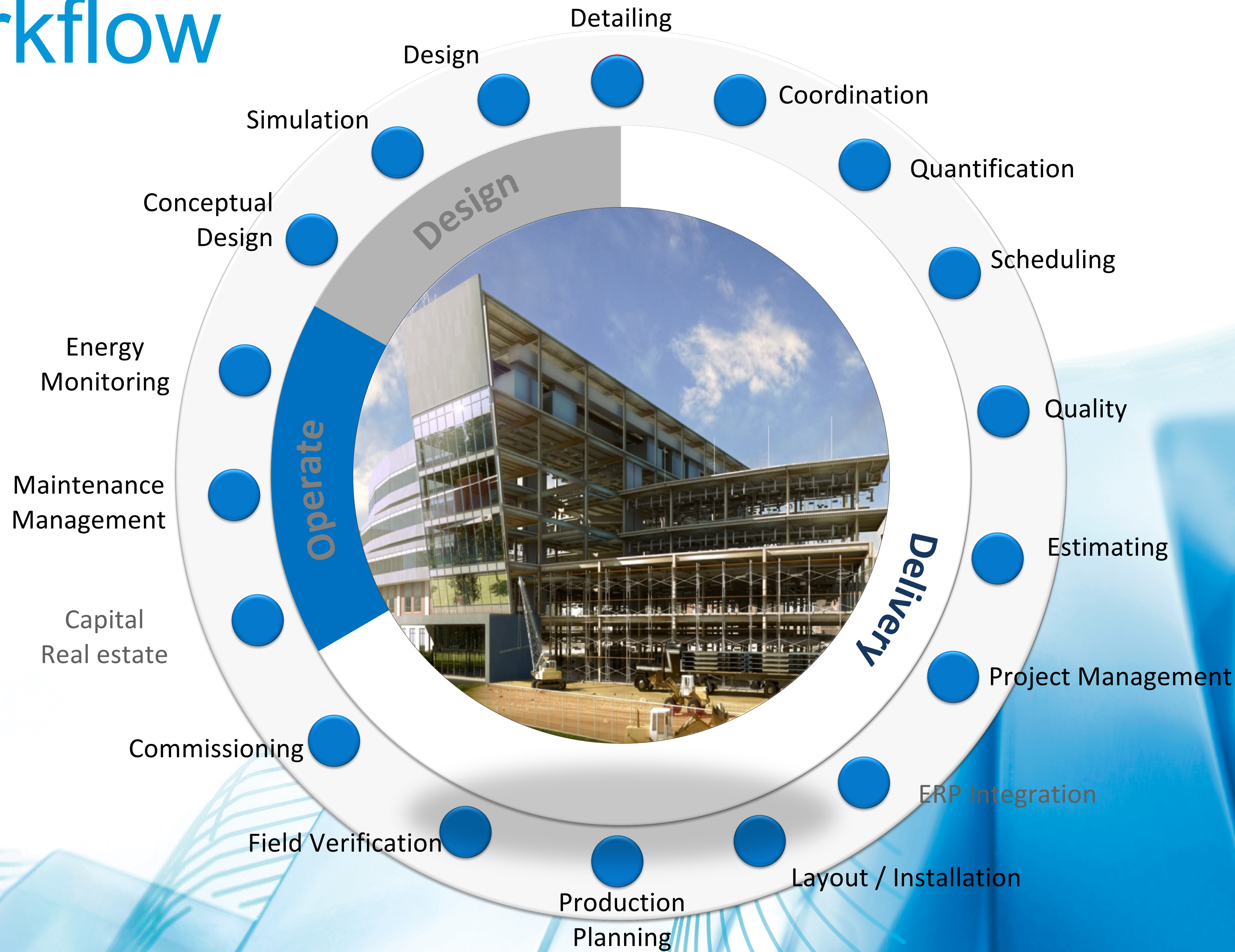
Adsk Interoperability offering > a unique advantage



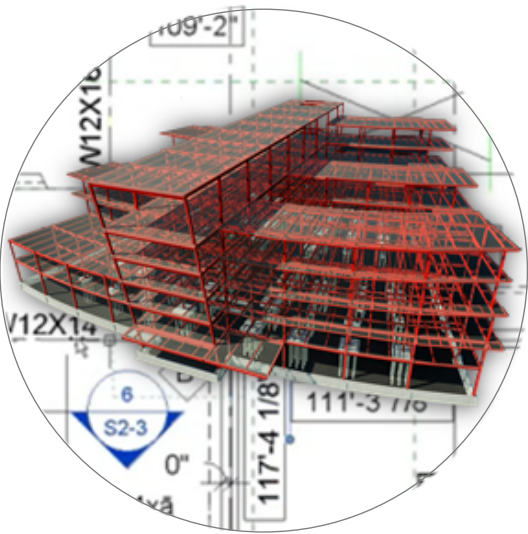
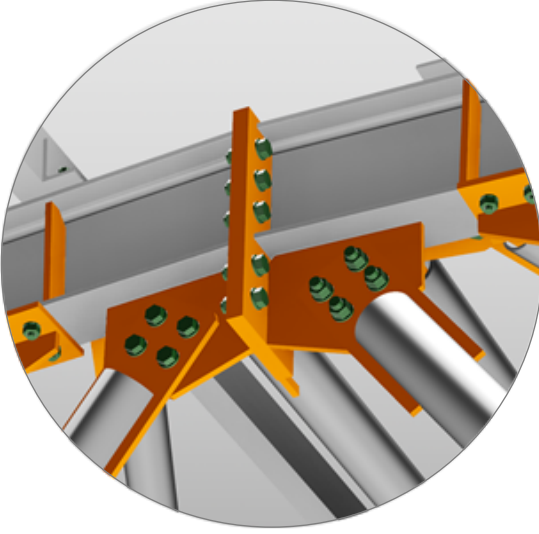


Steel construction workflows | Challenges & Cost impact

Structural Design	Detailing	Fabrication	Installation
			
<div>Not engaging early enough in design</div> <div>Fab & installation costs not considered in design</div> <div>Impact of poor design decisions</div>	<div>Accurate coordination</div> <div>Inaccurate bids due to lack of information</div>	<div>Material management and optimization</div> <div>Cost of material wastage & changes</div>	<div>Ensure quality field installation</div> <div>Poor coordination with other trades</div> <div>Owner receives incomplete as-built</div>
Structural Engineer	Detailer	Fabricator	Erector

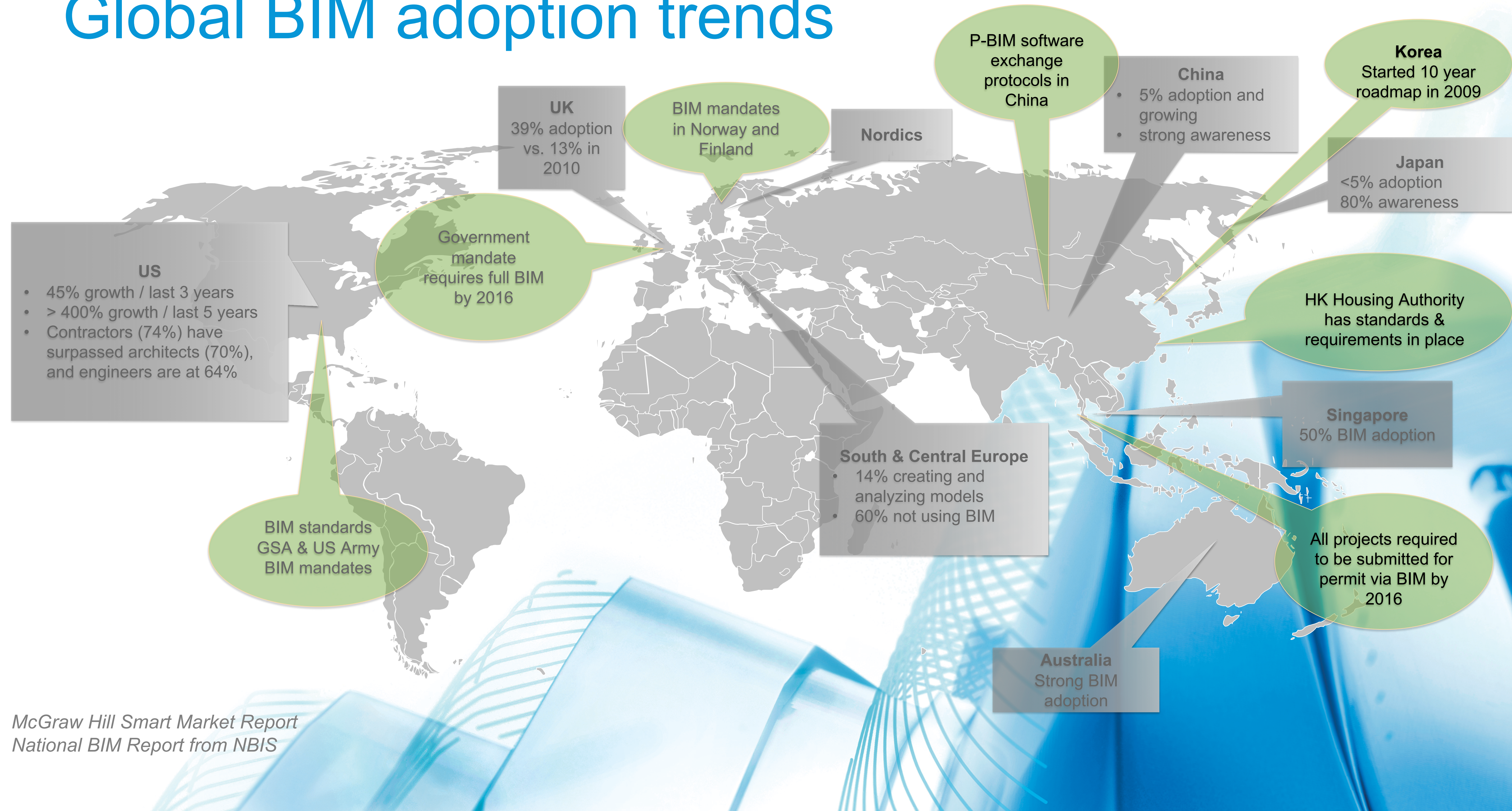
BIM Workflow



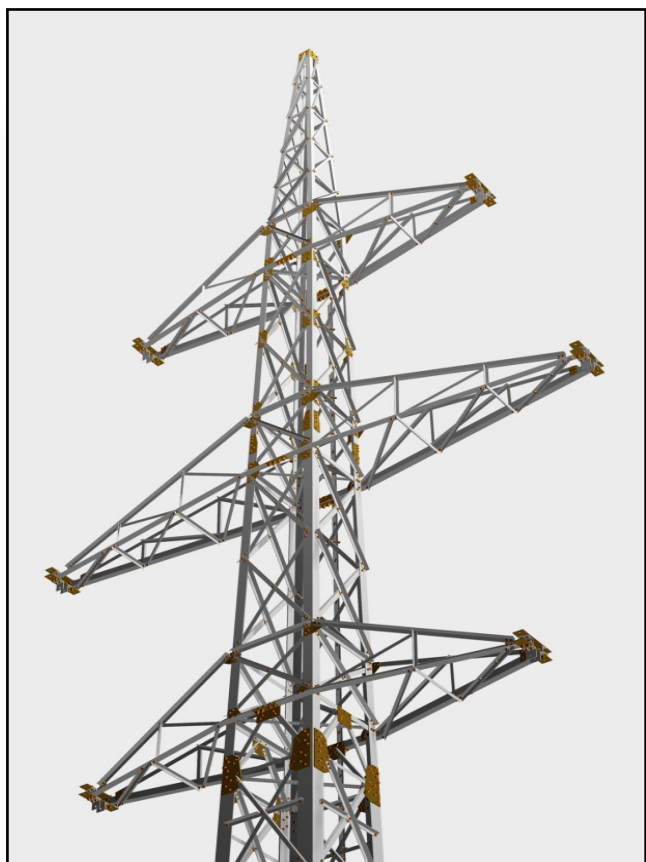
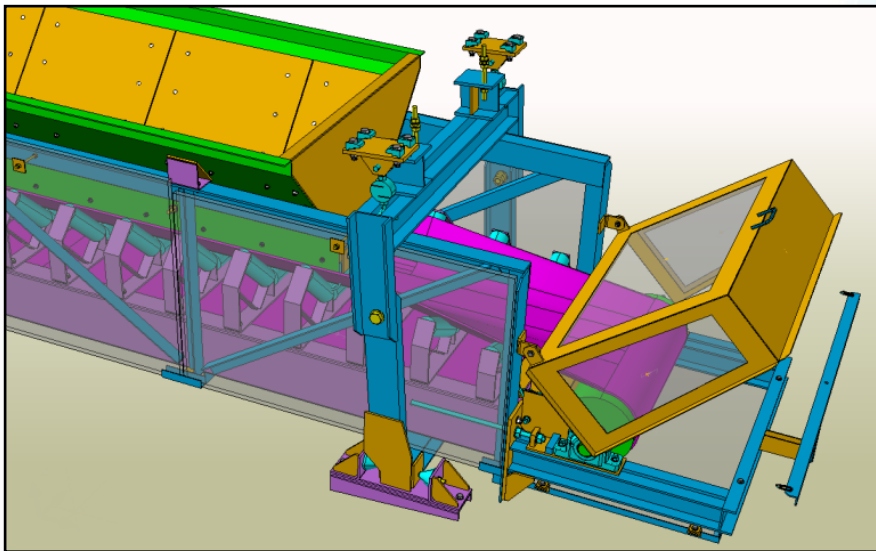
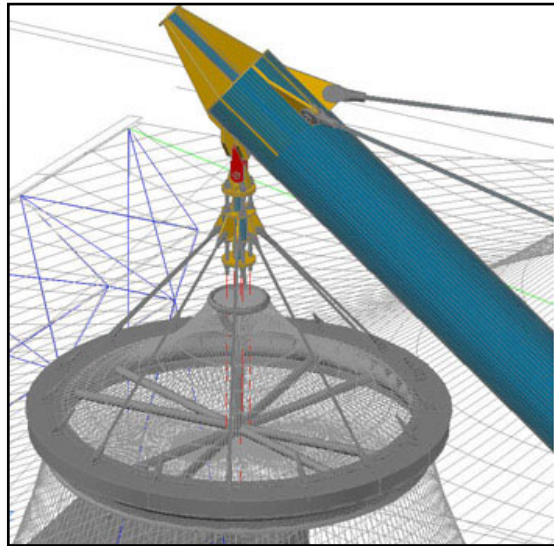
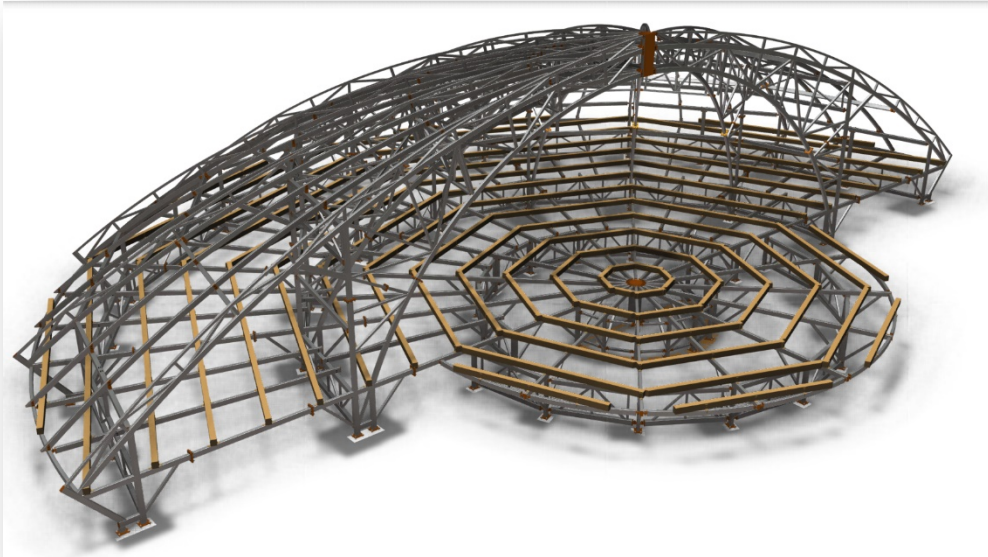
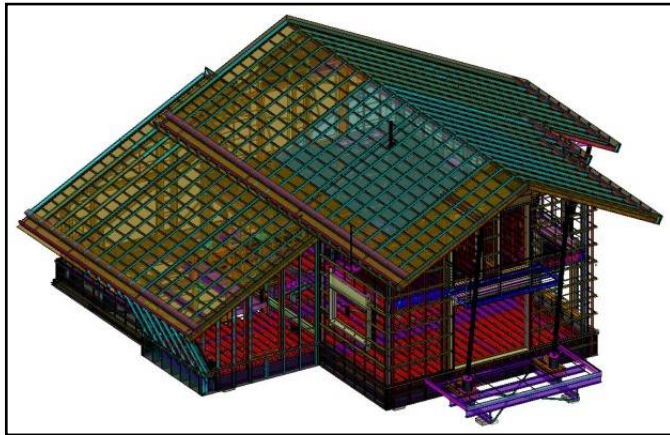
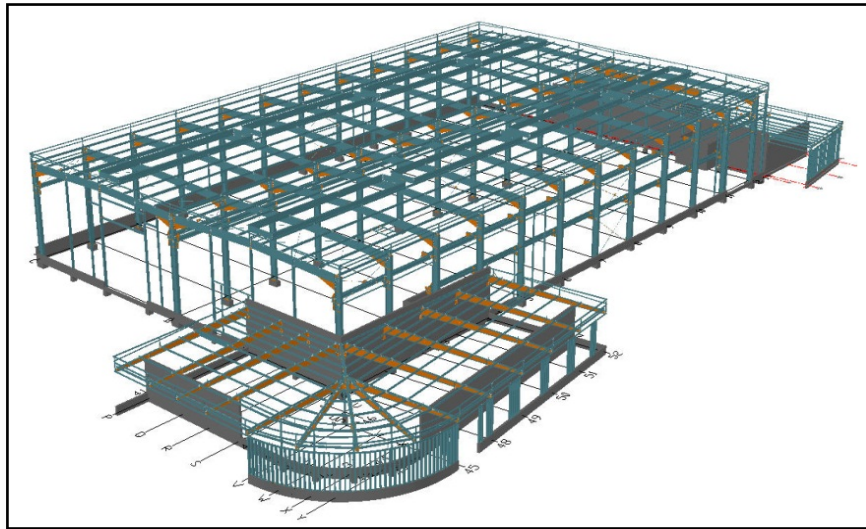
Steel construction workflows | BIM Benefits

Structural Design	Detailing	Fabrication	Installation
			
Collaborate in a dynamic environment			
		Reduce errors in shop fabrication	
		Extend fabrication to the field	
Structural Engineer	Detailer	Fabricator	Erector

Global BIM adoption trends



Customer Projects



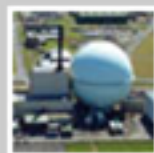
Oil & Gas
Delivering challenging and complex projects



Unconventional Oil & Gas
Provider of services to the industry



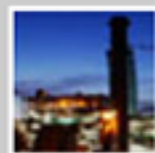
Mining
Expertise and delivery from concept to closure



Nuclear
Expertise spanning the entire lifecycle of complex nuclear assets



Renewables / Bioprocess
Experience supporting today's renewable energy



Power
Shaping the future of clean energy



Transmission & Distribution
Innovative and high value added solutions



Water
Global expertise in every aspect of water, from source to ocean



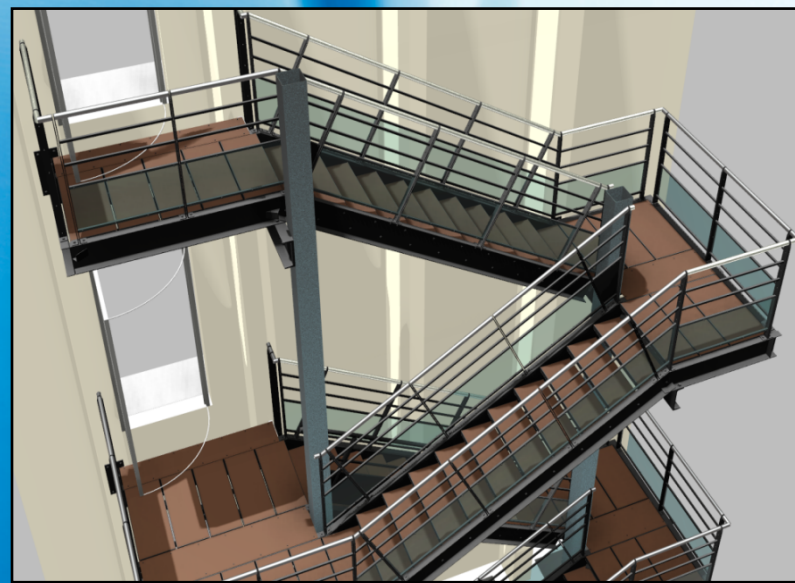
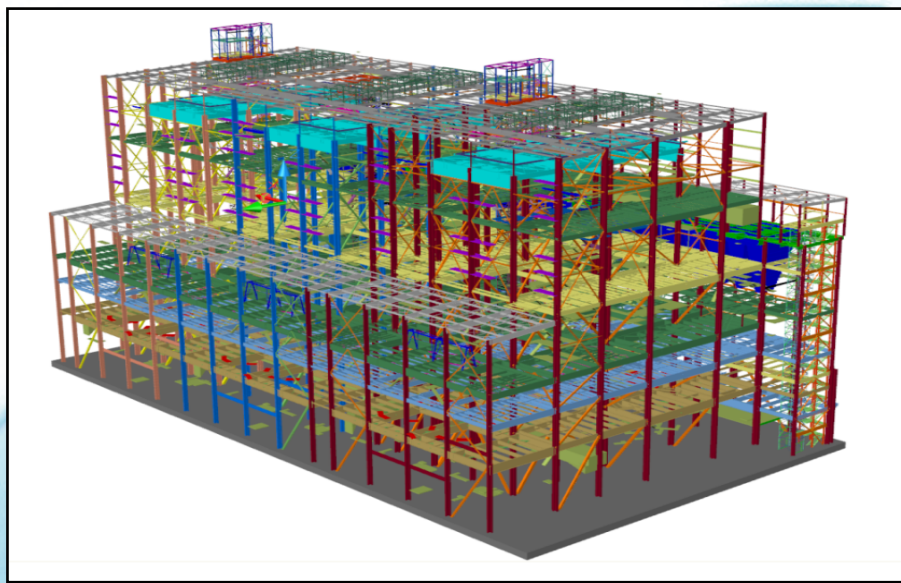
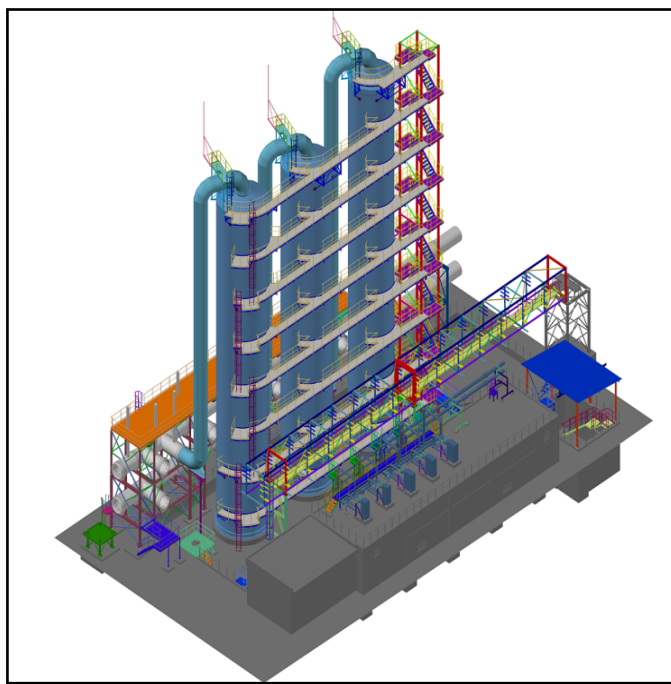
Transportation & Infrastructure
Innovative solutions for complex transportation needs



Government Services
Comprehensive engineering services and solutions



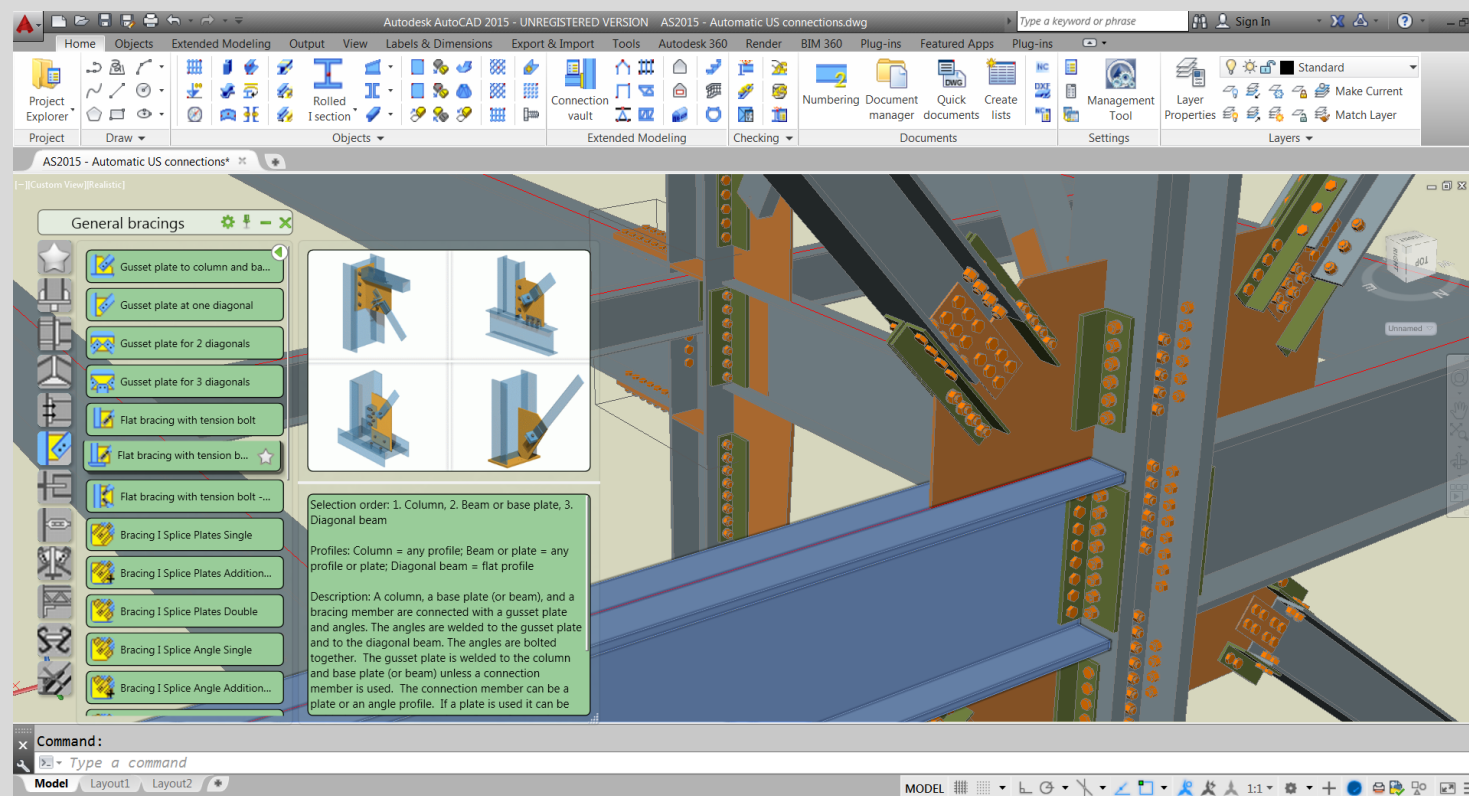
Industrial / Commercial
Offering a whole world of technical expertise



Tools for automating the 3D modeling phase

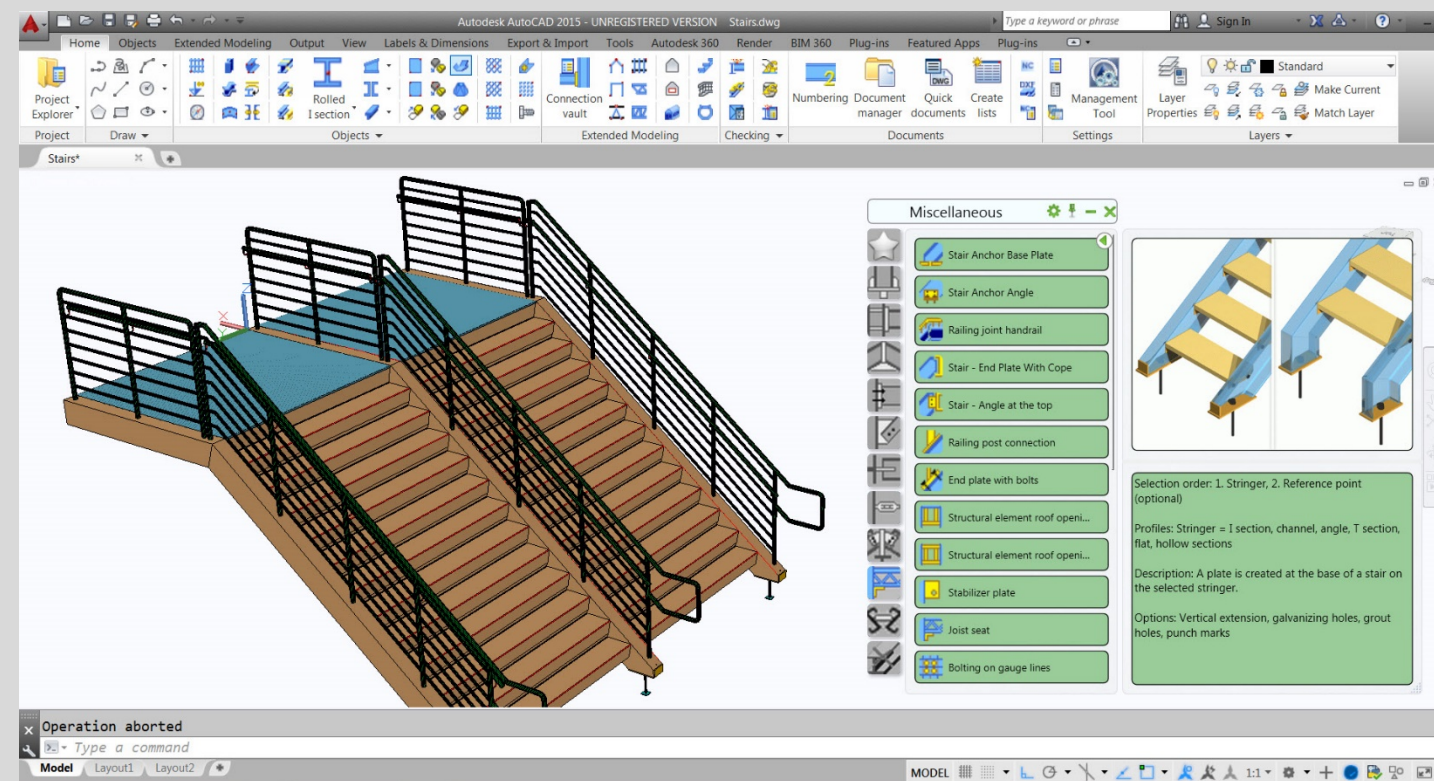
Detailed connections

Comprehensive library of parametric steel connections
Tools to create your own connections
Built-in steel connection design engine



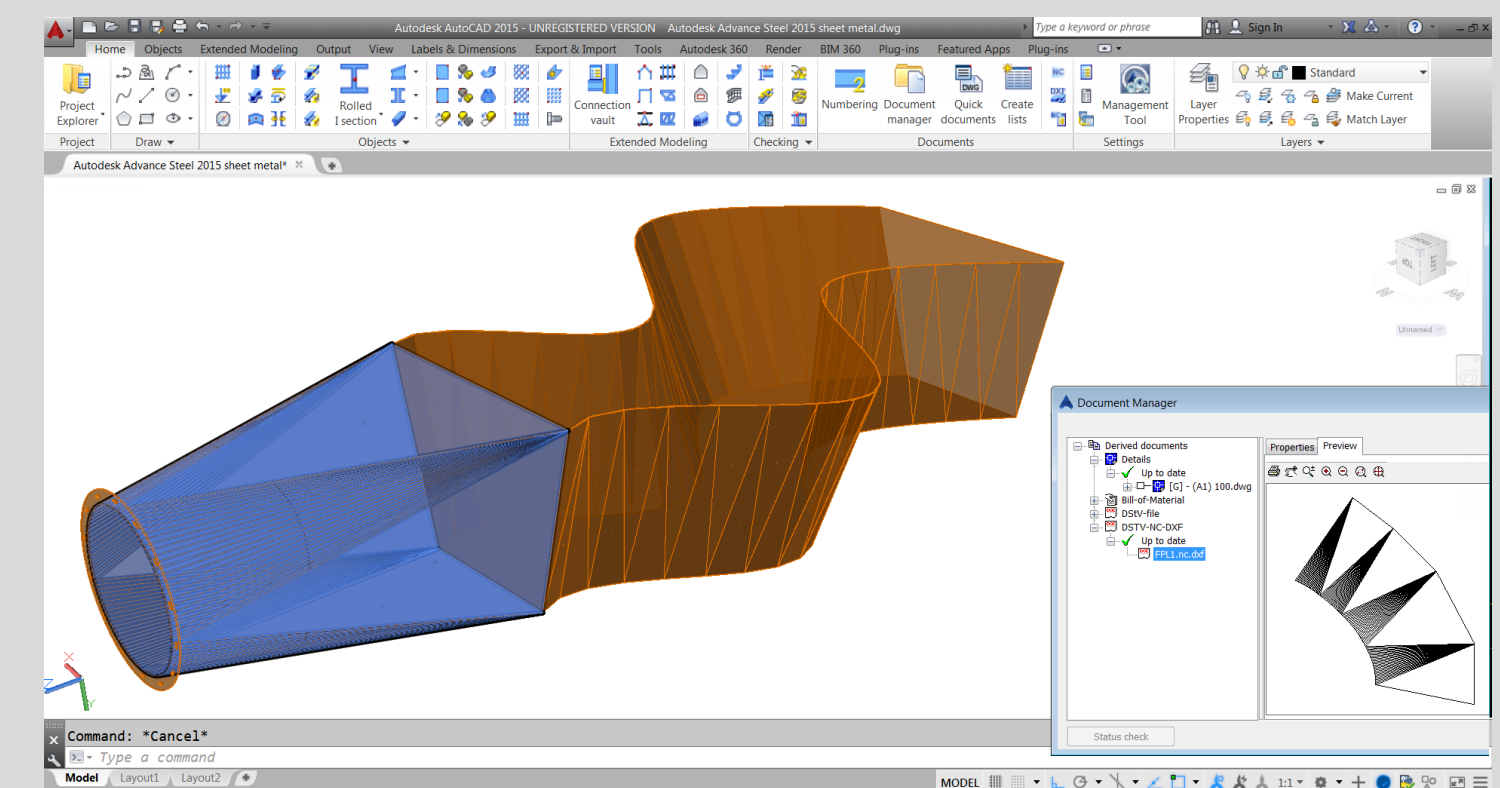
Miscellaneous steel

Macros for stairs, railings and cage ladders
Large library of stair tread types



Plateworks

Folded plates of any shape
Transitions such as round-square
Automatic unfolding



Steel Connections

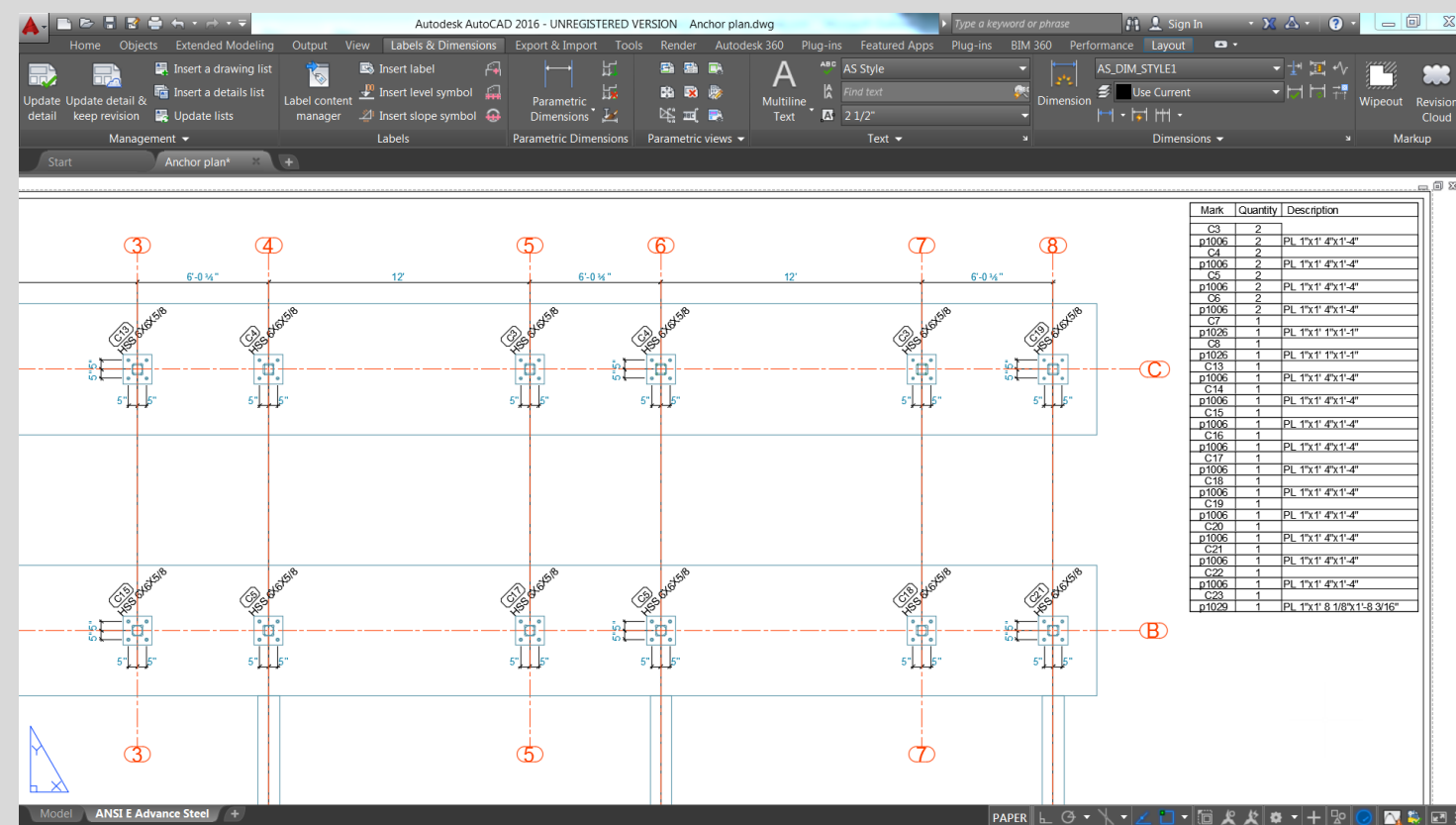
Stairs, railings & cage ladders

Plates & folded plates

Tools for different project documentation needs

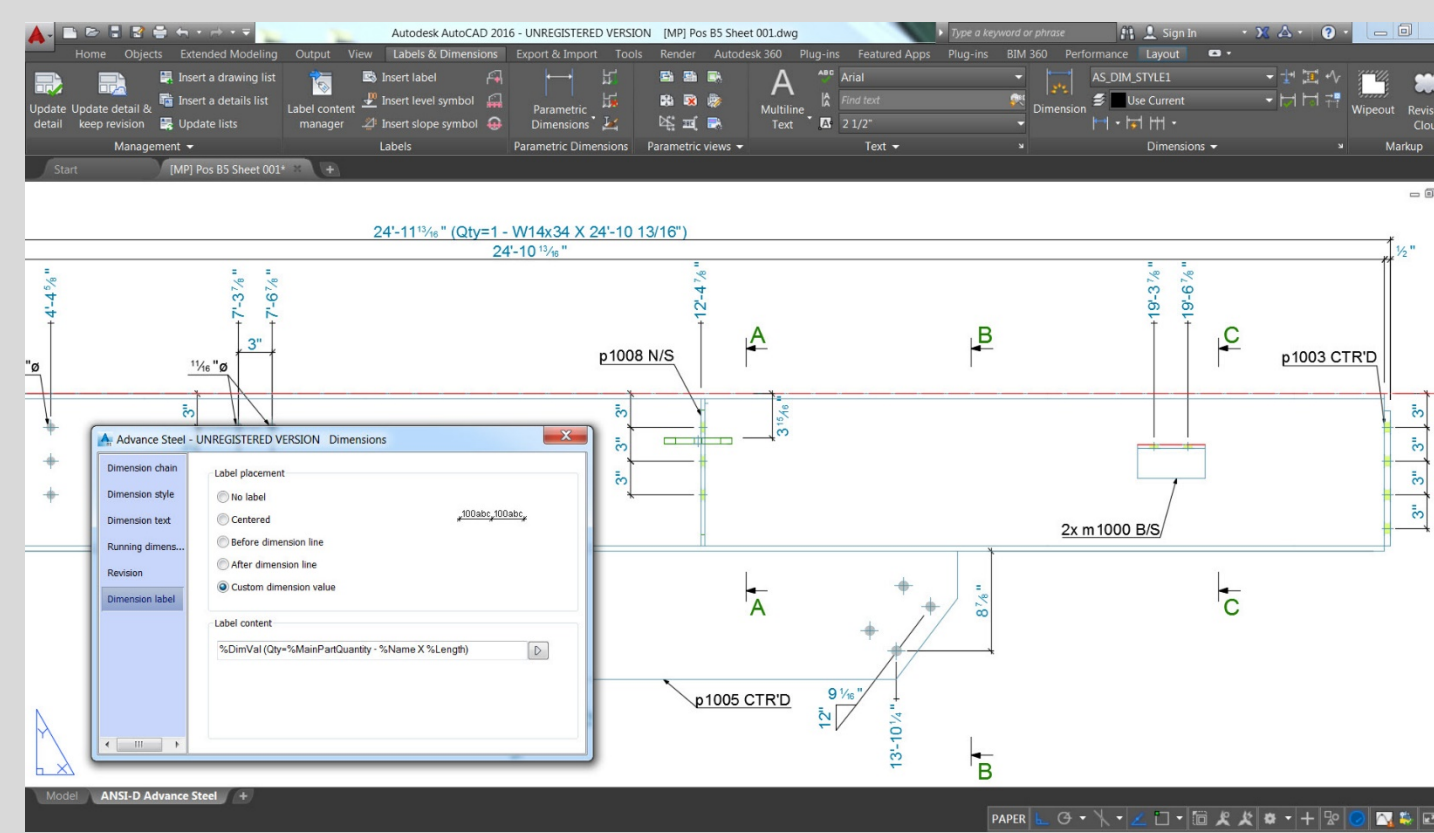
Specific drawing styles for greater drafting productivity

Ready-to-use templates for elevation view, top view, anchor plan, isometric view.
Automatically labeled & dimensioned



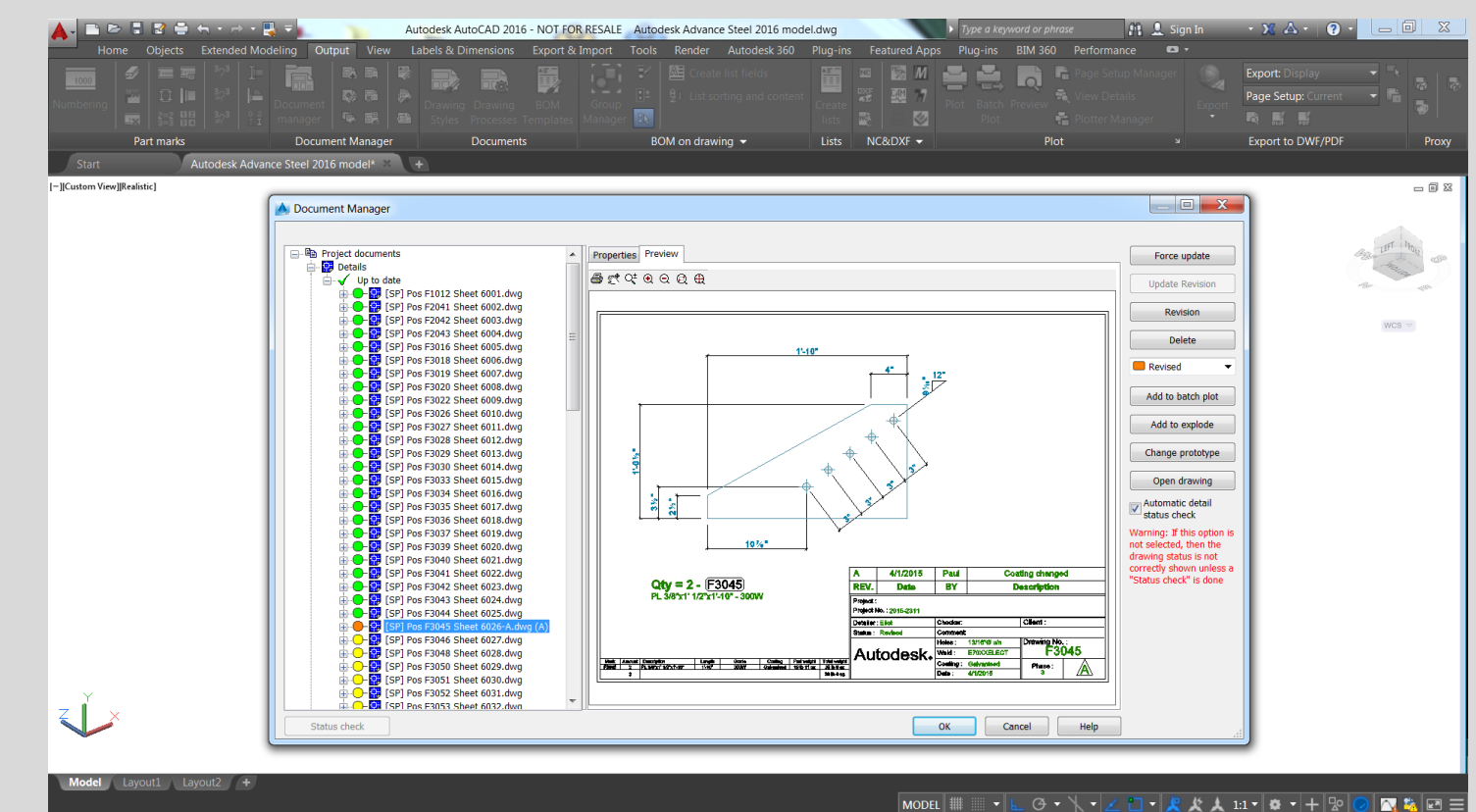
Deliverables for the fabrication

Single part and assembly drawings
Bills-of-materials
DSTV & DXF & KISS files



More coordinated, consistent documentation

Automatic update of drawings, BOMs and CN data
Revision clouds on drawings
Drawing-approval based workflow



General Arrangement Drawings

Shop drawings & BOMs & CNC data

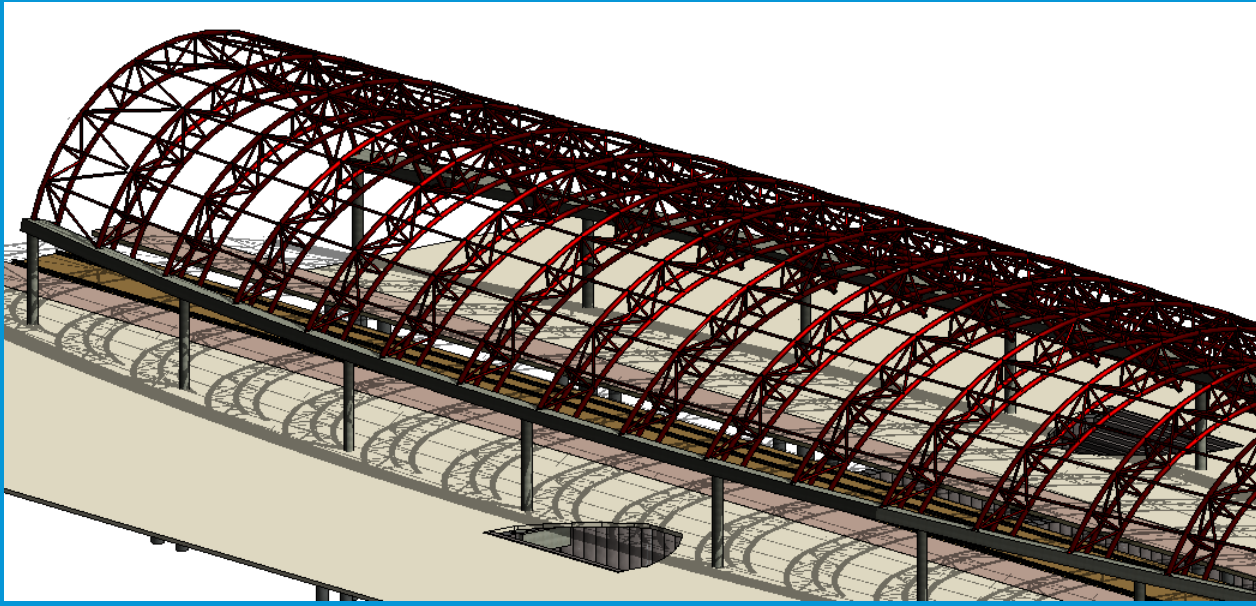
Document Manager

Advance Steel | Value Proposition

Engineering

Design Better Structures

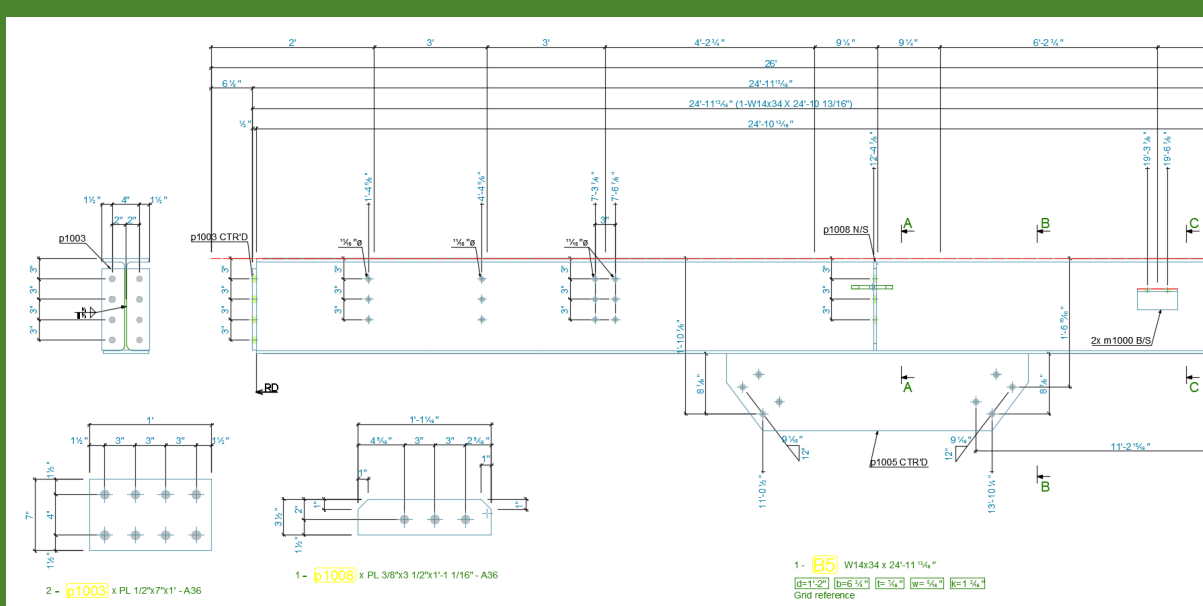
- Studying more design options
- Search for the optimal solution
- Better communication
- Support collaboration in a multi-user 3D model environment
- More freedom in design process
- Integrates with Autodesk® Revit®
- Extend power of Autodesk® Revit®
- Produce more accurate general arrangement drawings
- Get bill-of-materials with quantities & lengths & weights



Steel Detailers

Help improve accuracy of deliverables

- From a single 3D model to multiple deliverables
- Deliver high-quality drawings with more accurate dimensions & annotations
- Refining drawings faster
- Provide bill-of-materials for the shop & the field
- Minimize shop errors by producing NC & CNC files directly from the 3D model
- Automatic update of the documentation in case of modifications in the model



Fabricators

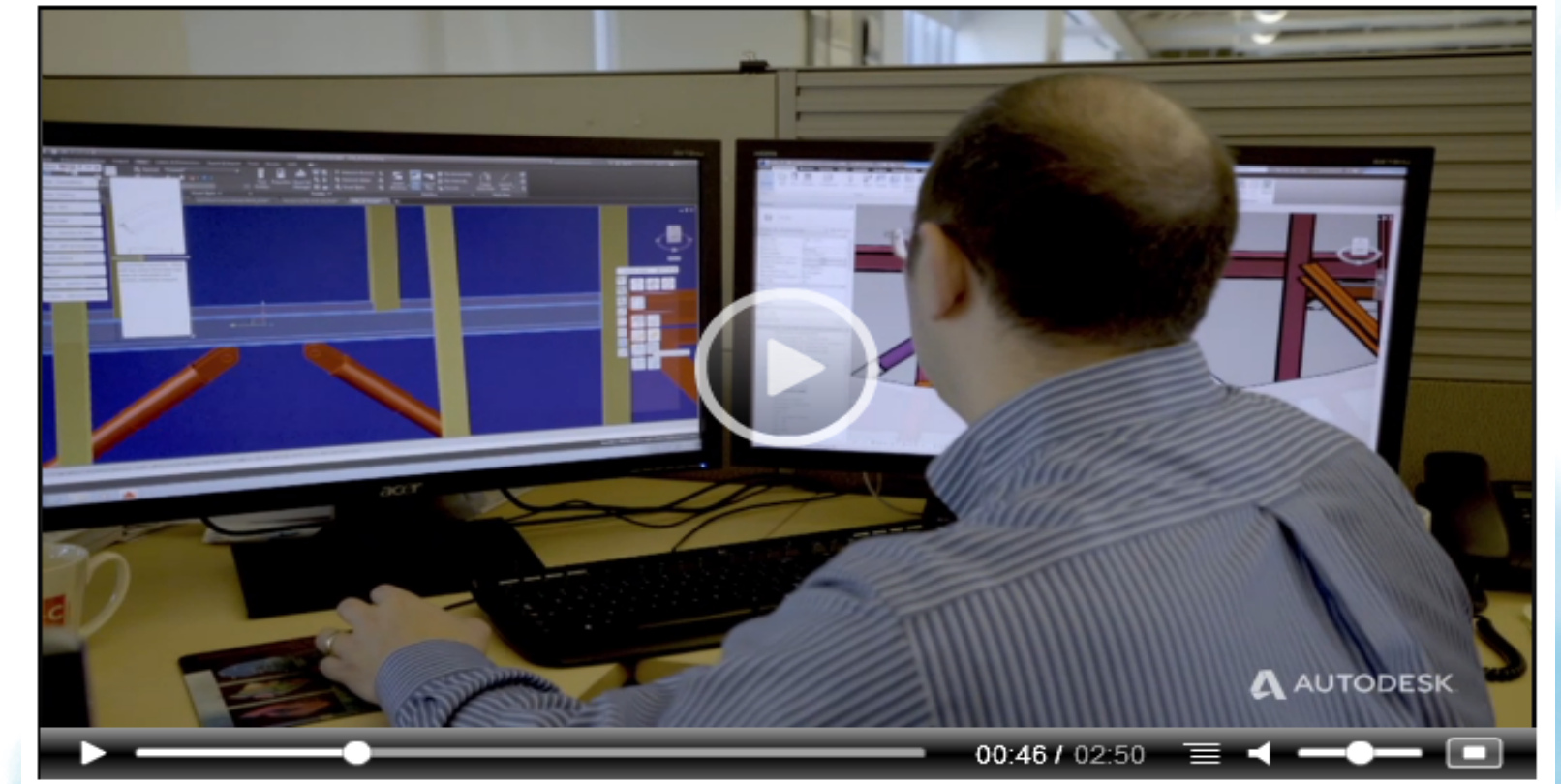
Fabricate better Structures

- Help minimize errors in the fabrication process
- Optimize the fabrication process
- Interface with the CNC machinery
- Customize outputs to better suite the CNC cutting and welding machines
- Welding robots usage
- More effectively coordinate with steel detailers
- Manage the fabrication & the status at workshop with MIS Software



Key features & benefits

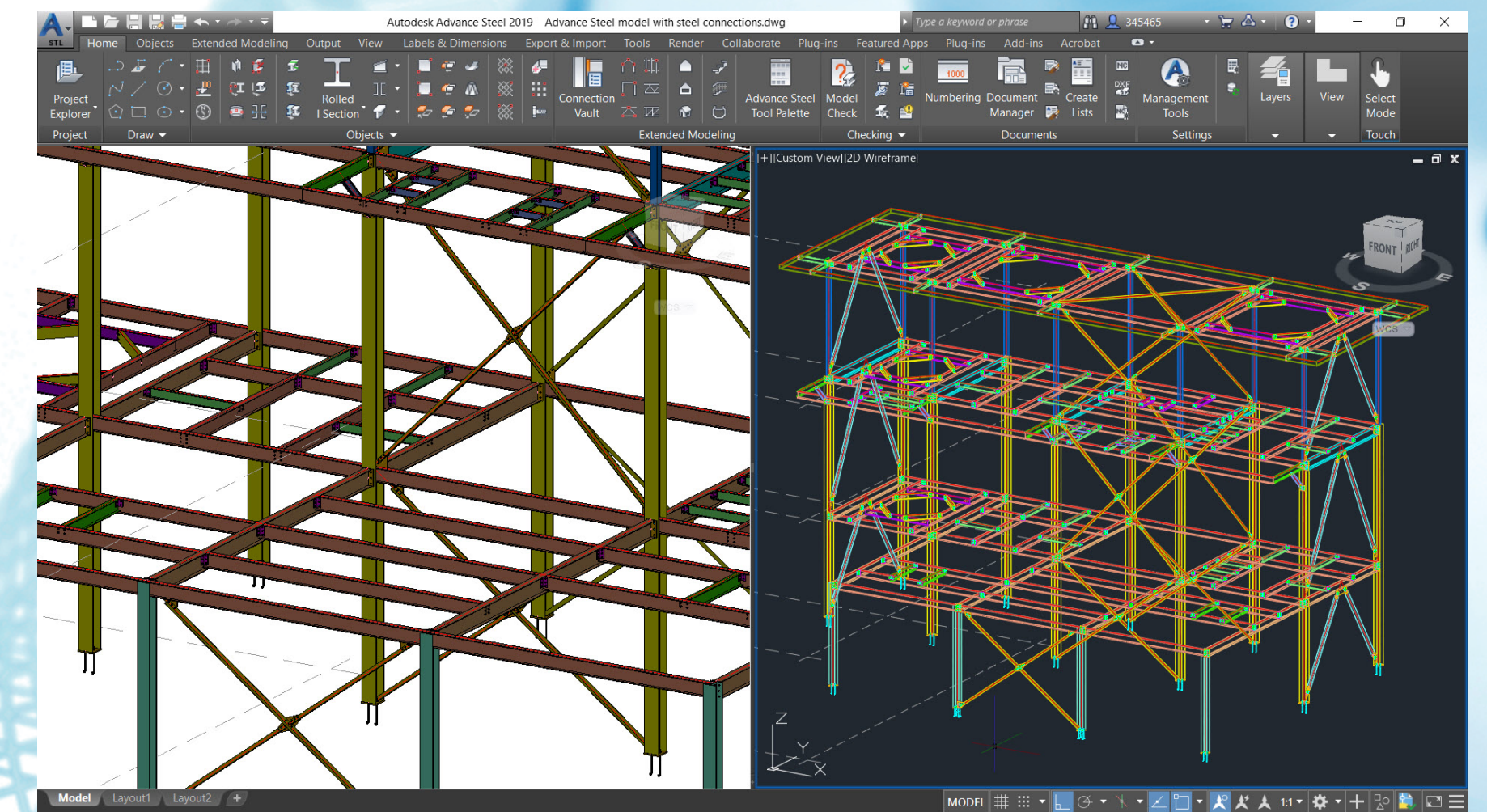
- ❑ Smoother workflow from design to fabrication
- ❑ Based on the familiar AutoCAD® technology
- ❑ Minimize errors and omissions with deliverables
- ❑ Direct interface with CNC machines
- ❑ Direct connection with other Autodesk software



3D Printing Houses

Top Features in Advance Steel

- ❑ Comprehensive library of parametric steel connections
- ❑ Miscellaneous steel
- ❑ Sheet & Plate metal work
- ❑ Automatic numbering
- ❑ Automated shop drawings creation
- ❑ NC-DSTV files & Bills of Materials
- ❑ Document management with revision clouds
- ❑ Built on the AutoCAD platform

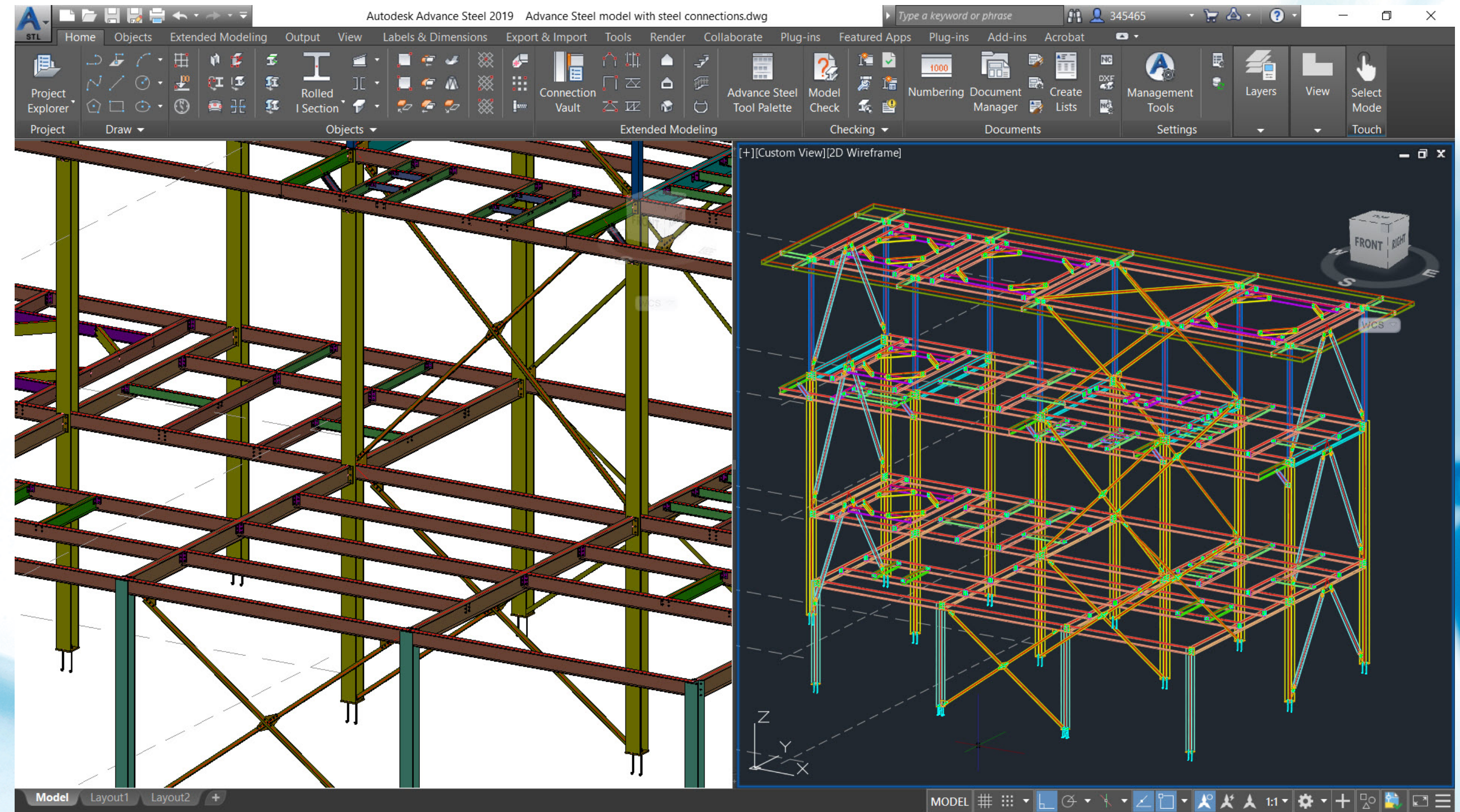


Export/Import/Sync the Steel Model from Revit



Work with the Imported the Revit model into Advance Steel

- Reduce rework through BIM
- Advance Steel Extension
 - Settings
 - SMLX file format
 - Export / Import / Synchronize
- Export / import the design model from Revit to Advance Steel
- Transfers steel members & steel connections



Autodesk Advance Steel 2019

Structural steel model.dwg

Type a keyword or phrase

345465

STL

Home

Objects

Extended Modeling

Output

View

Labels & Dimensions

Export & Import

Tools

Render

Collaborate

Plug-ins

Featured Apps

Plug-ins

Add-ins

Acrobat

Project Explorer

Project

Draw

Objects

Connection Vault

Extended Modeling

Checking

Documents

Settings

Layers

View

Select Mode

Touch

Rolled I Section

Advance Steel Tool Palette

Model Check

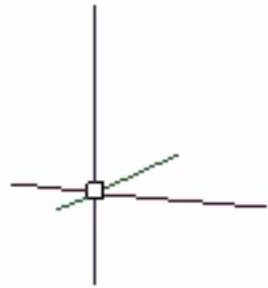
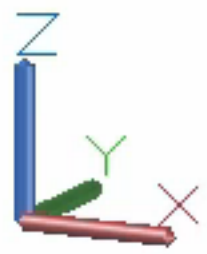
Numbering

Document Manager

Create Lists

Management Tools

[–][OLE1][Realistic]



WCS

Model

Layout1

Layout2

+

MODEL

Grid

Isometric

Orthographic

3D View

1:1

Settings

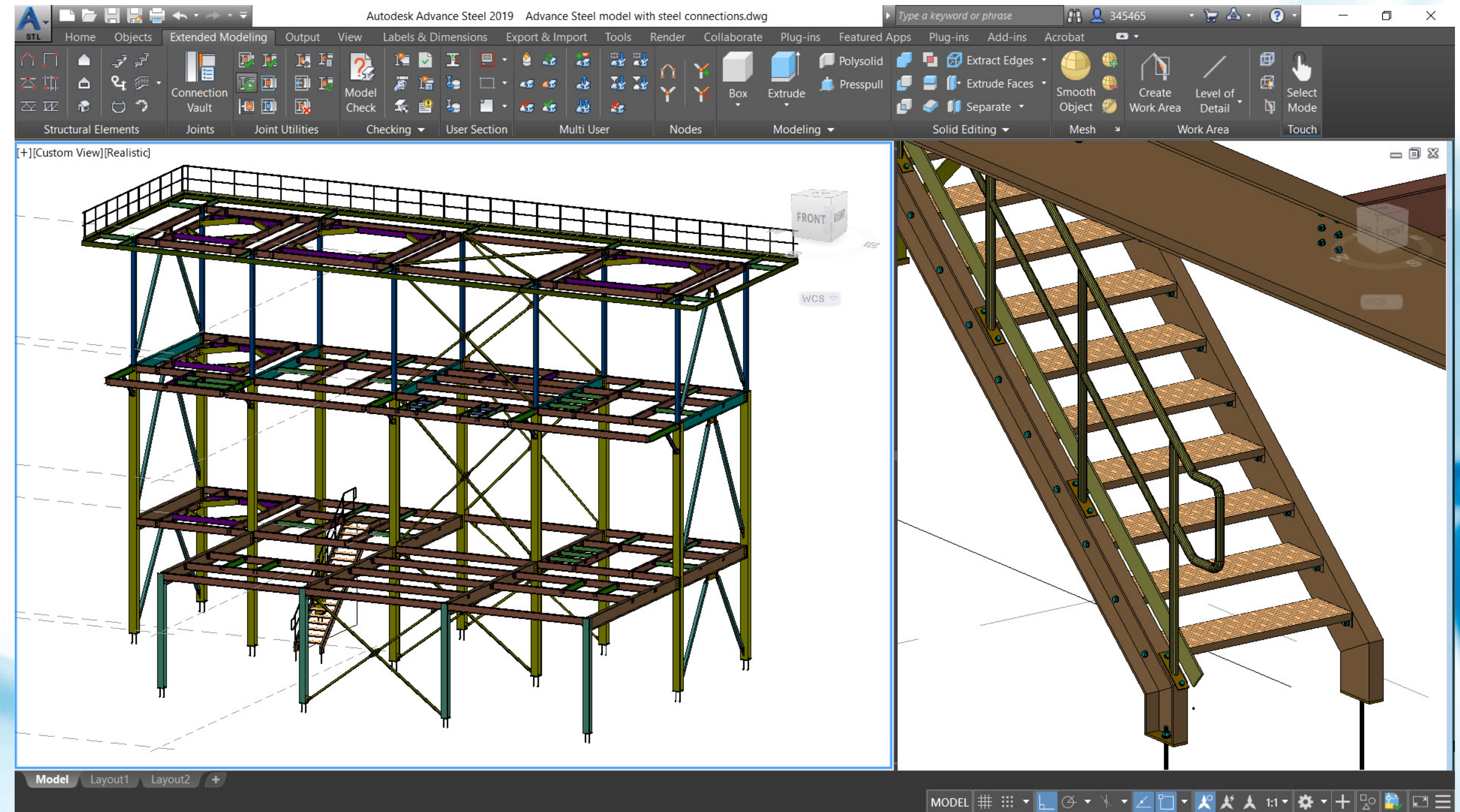
Zoom

Navigation

Help

Miscellaneous steel

- Model miscellaneous steelwork more quickly
- Dedicated parametric macros
 - Straight stairs
 - Spiral stairs
 - Straight railing
 - Curved railing
 - Railing with balls
 - Cage ladder
- Dedicated connections
- Save in library



- Introduction
- The Advance Steel Interoperability possibilities

A smart detailing tool for Steel Structure within AEC

- Coordination and Collaboration
- Project Review using BIM 360 Platform
- Whats New in 2020



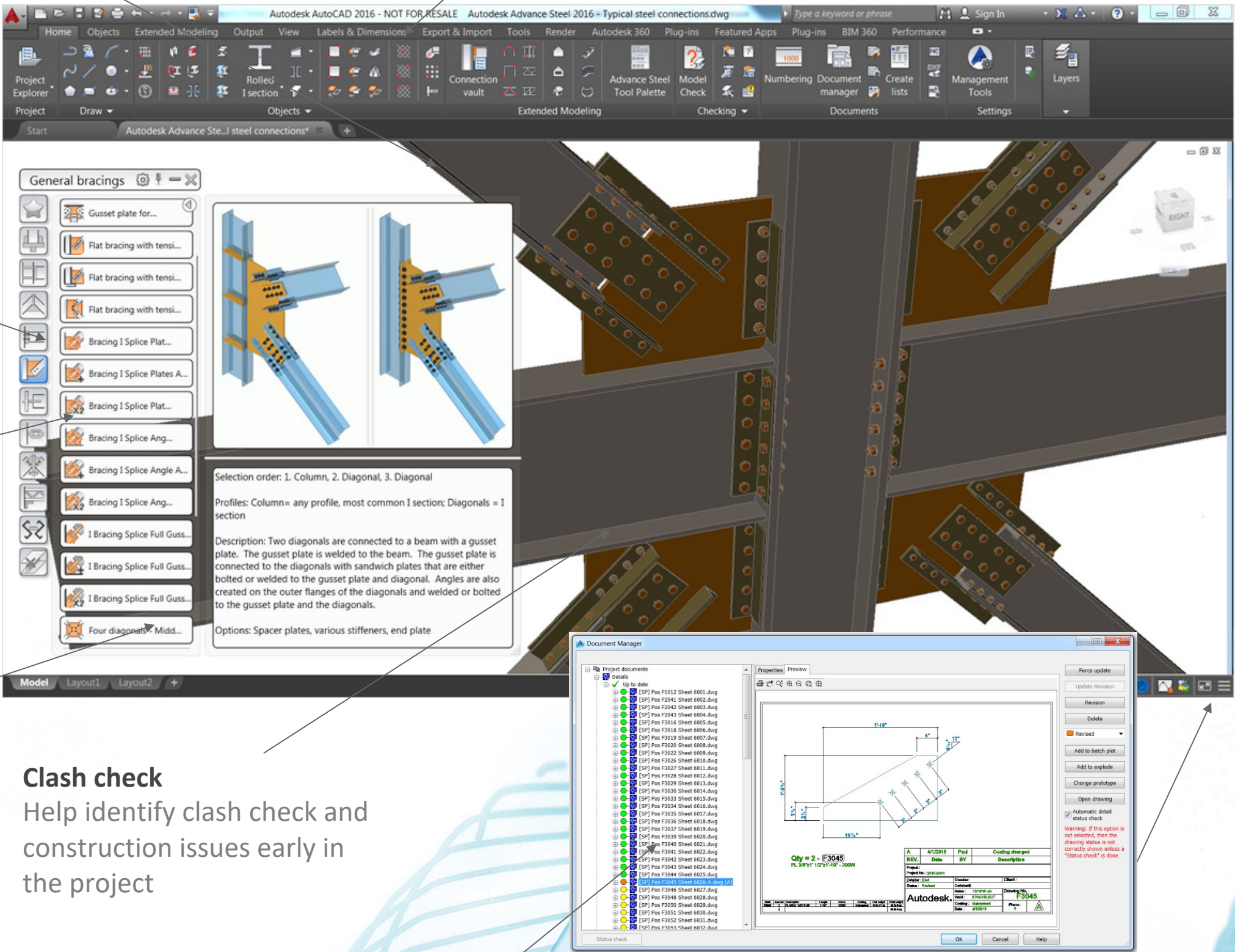
Advance Steel for steel detailing and fabrication

Dynamic modeling
Three-dimensional
Real-time
User friendly visualization

AutoCAD®-based application
Powerful platform
Familiar commands
Easy-to-use & easy-to-learn

Intelligent model
Building geometry
Spatial relationships
Quantities & properties
of building components

Steel connections
Comprehensive library
From simple to complex
connections available
Integrated Joint Design

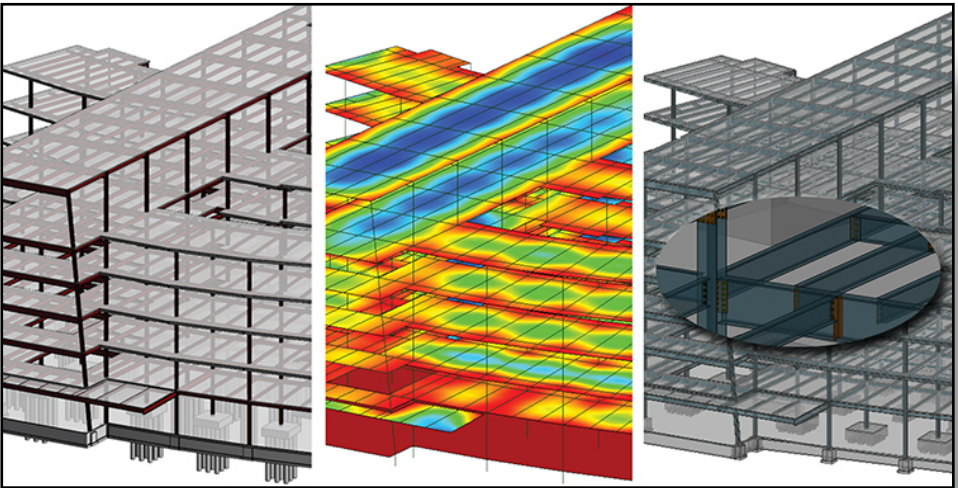


Effective marketing presentation
Realistic 3D view
Usage of different materials
Background, lights, shadows
Walk and fly tools

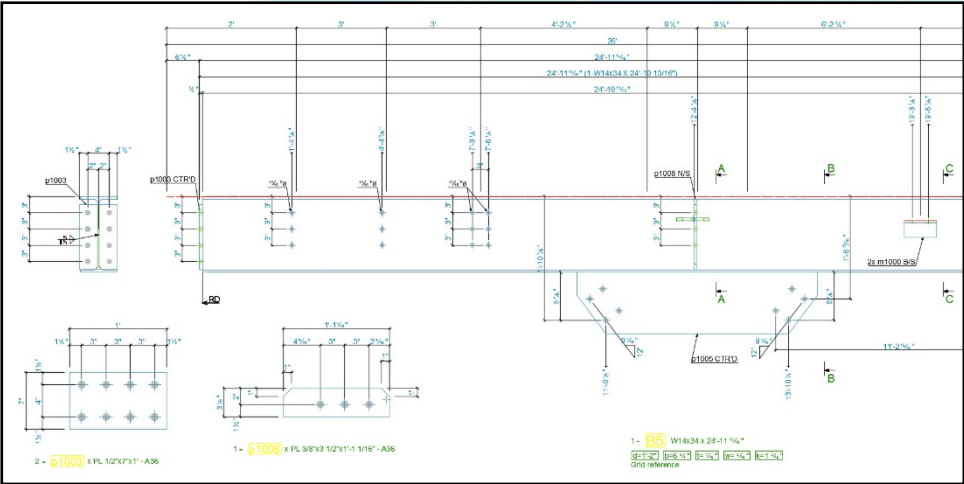
Clash check
Help identify clash check and
construction issues early in
the project

Changes are made in the 3D model and are automatically updated to BIM
Better coordination of construction documents
Integrated revision control

Multi-user or single-user mode
Models shared between team members
Better productivity
More secure solution



BIM workflows
Communicates with others (Revit, Robot, Navisworks, Autodesk® BIM 360™ Glue®, Autodesk® Recap™, Autodesk® AutoCAD® Plant 3D, ...)
File format standards (IFC, CIS/2, SDNF)
Integrated workflow benefit
Better productivity, quality



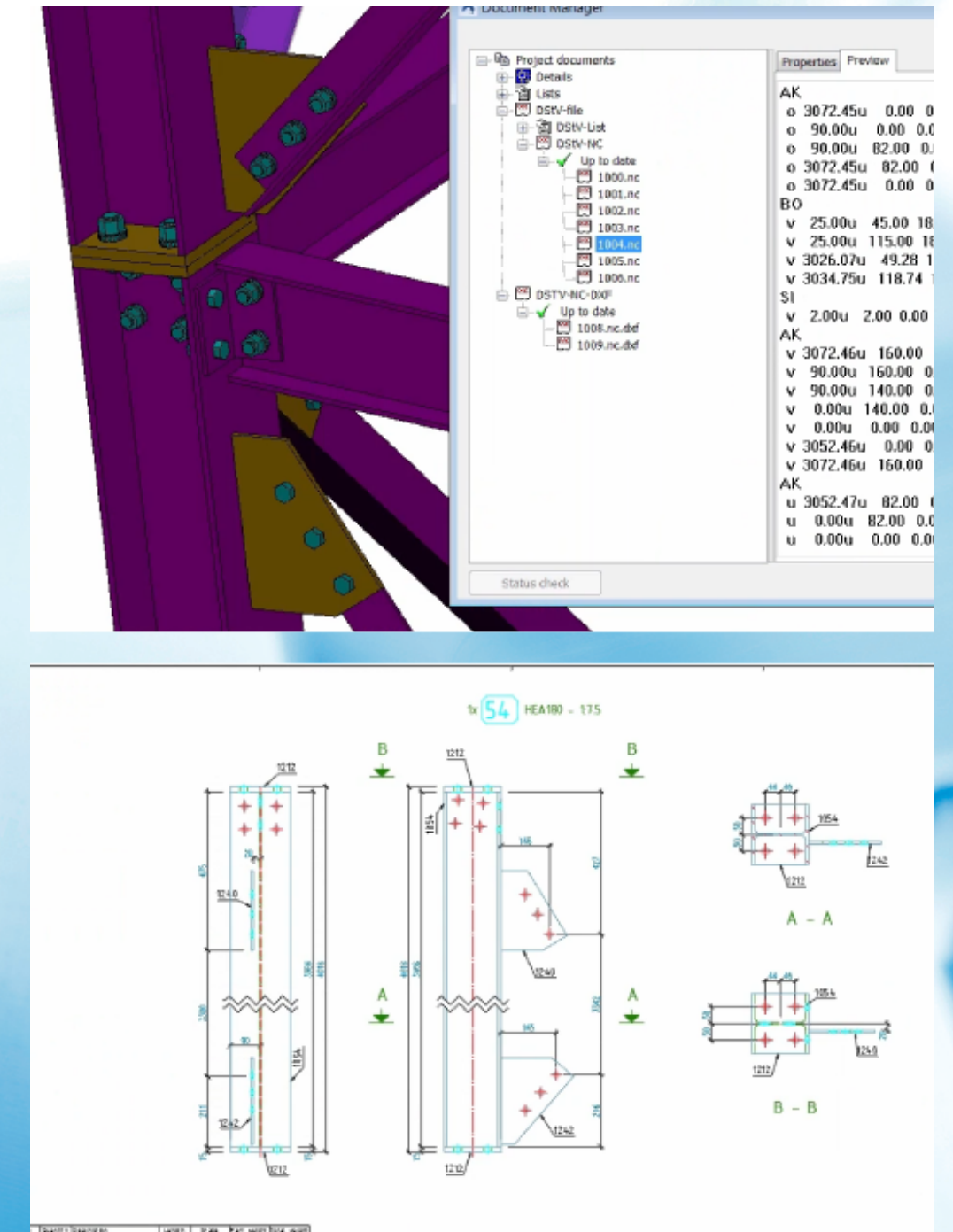
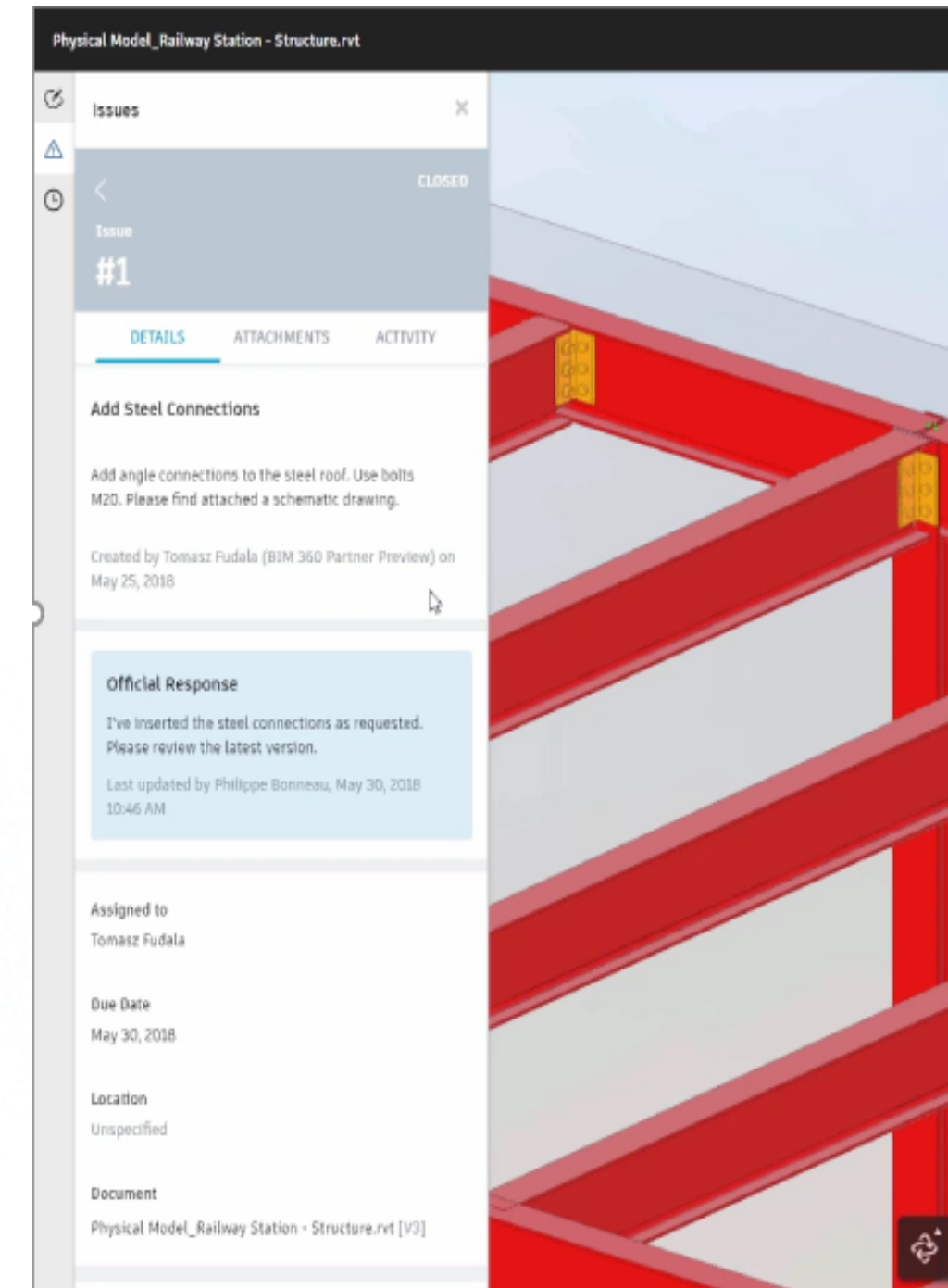
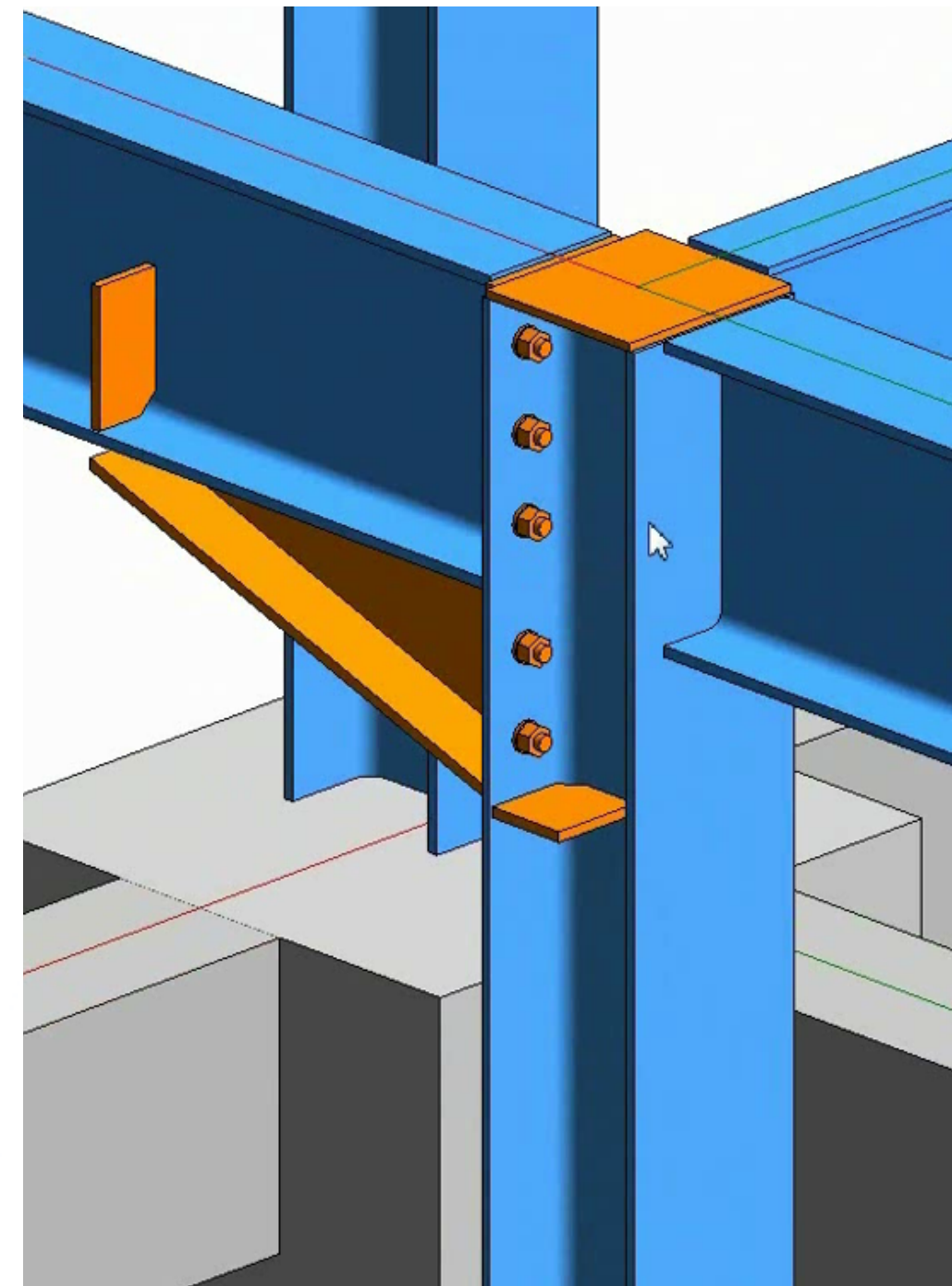
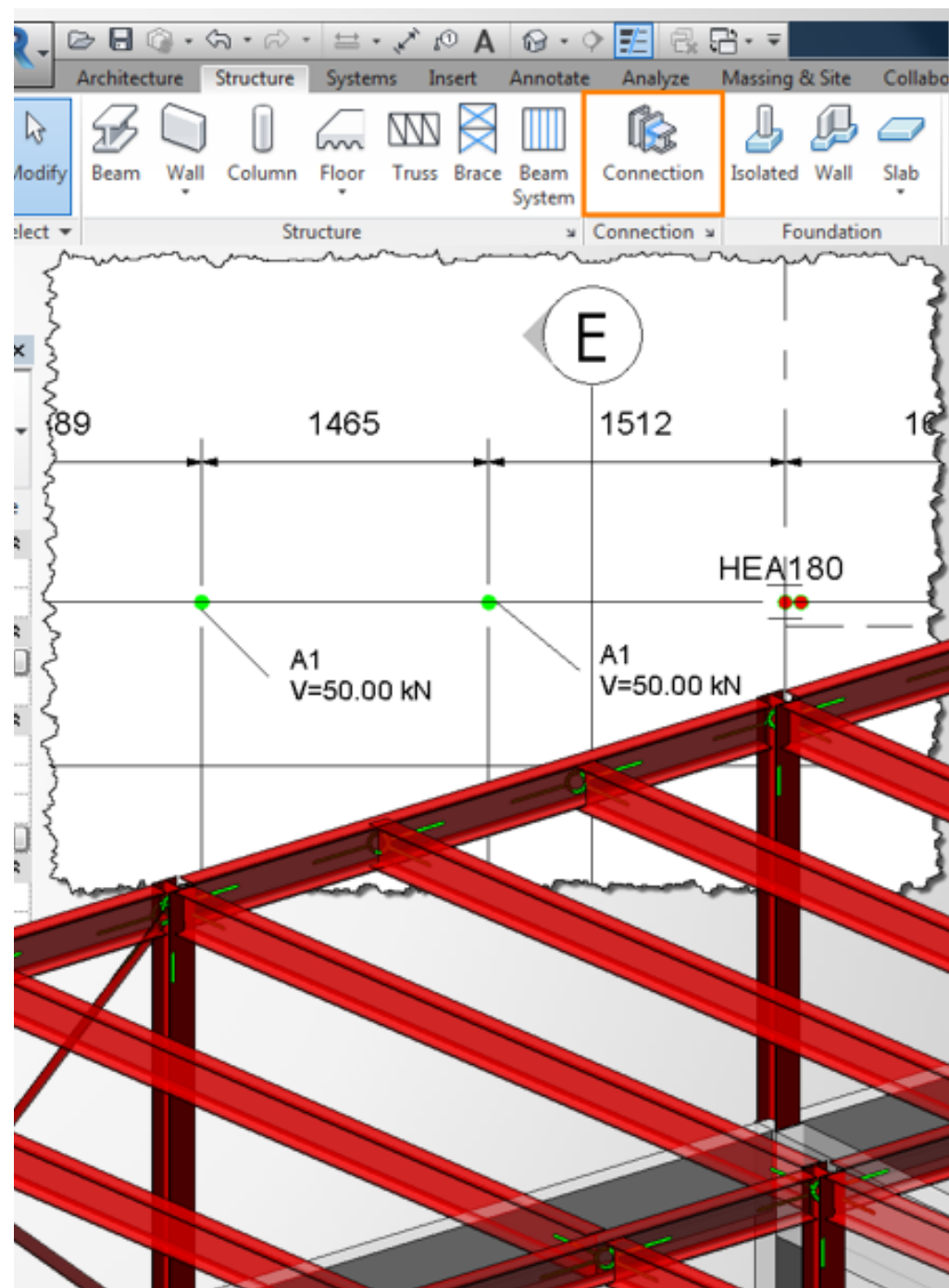
Automatic drawings creation
From one single model to multiple drawings
Ready-to-use templates for shop and GA drawings creation
DWG file format
Automatic update



Automatic BOM creation
More accurate quantities to order, to fabricate and to send at site...
Exportable to PDF, XLS
Automatic update

Automatic CNC data creation
NC-DSTV files
NC-DXF files
MIS software interoperability
Automatic update

Connect Design to Fabrication



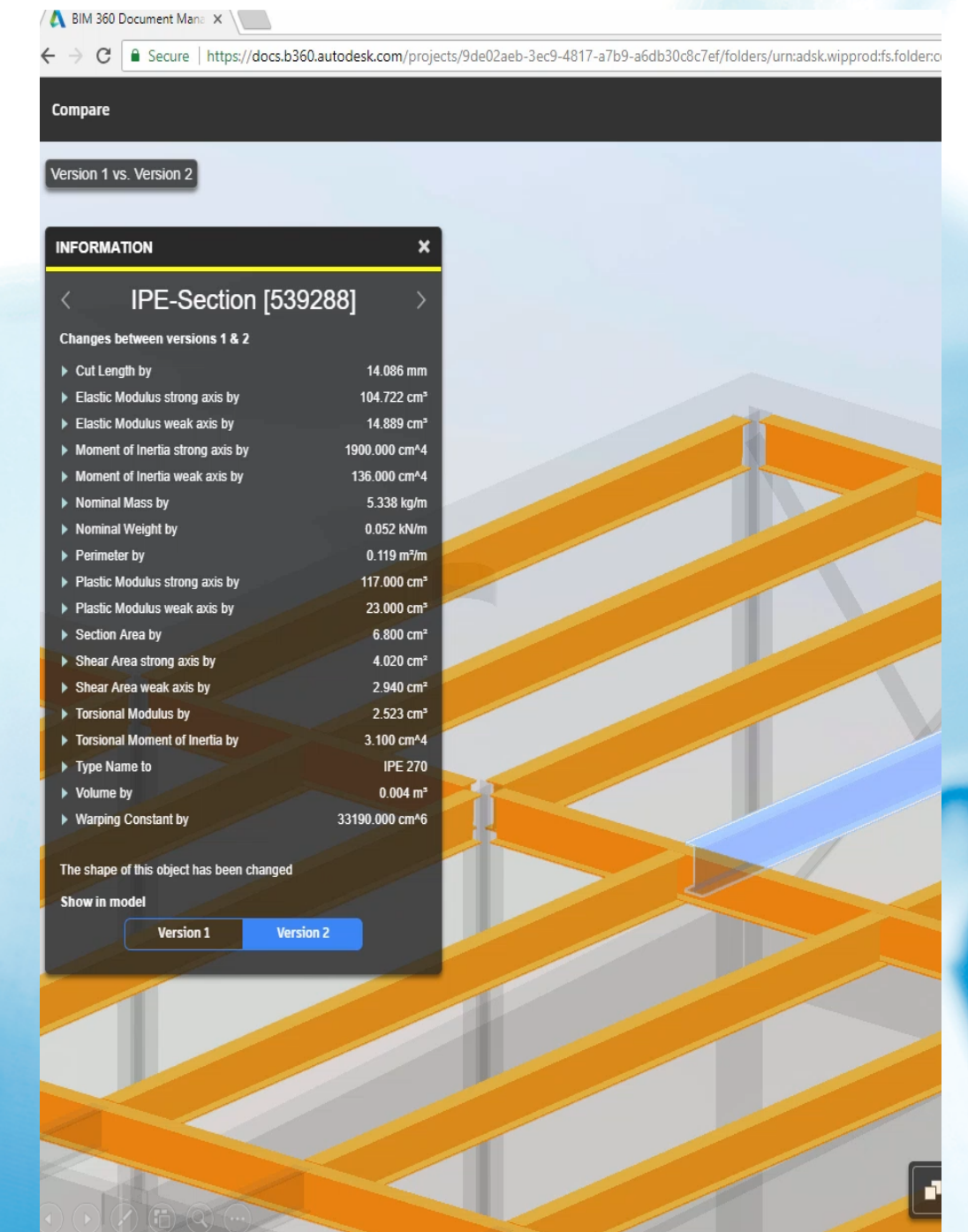
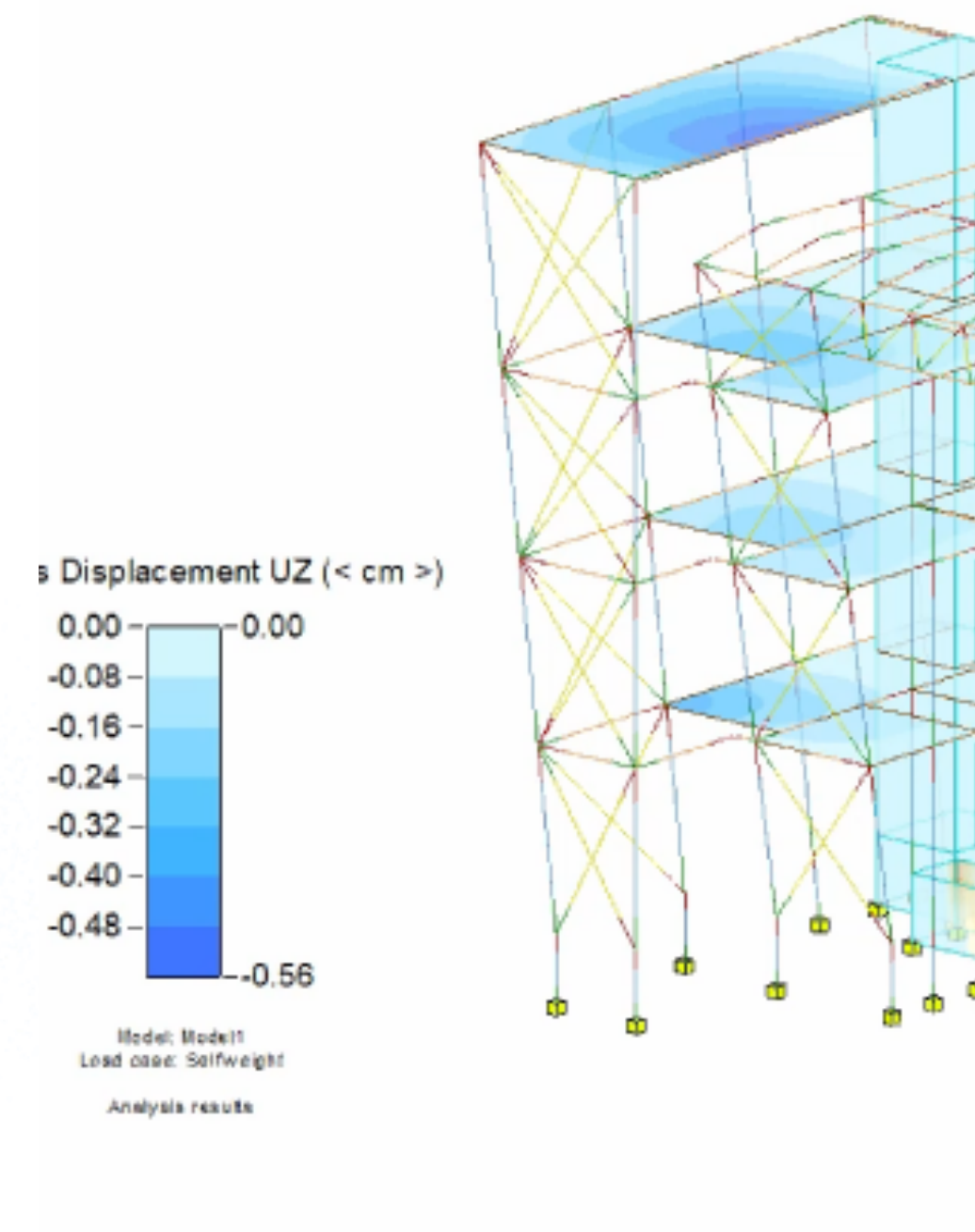
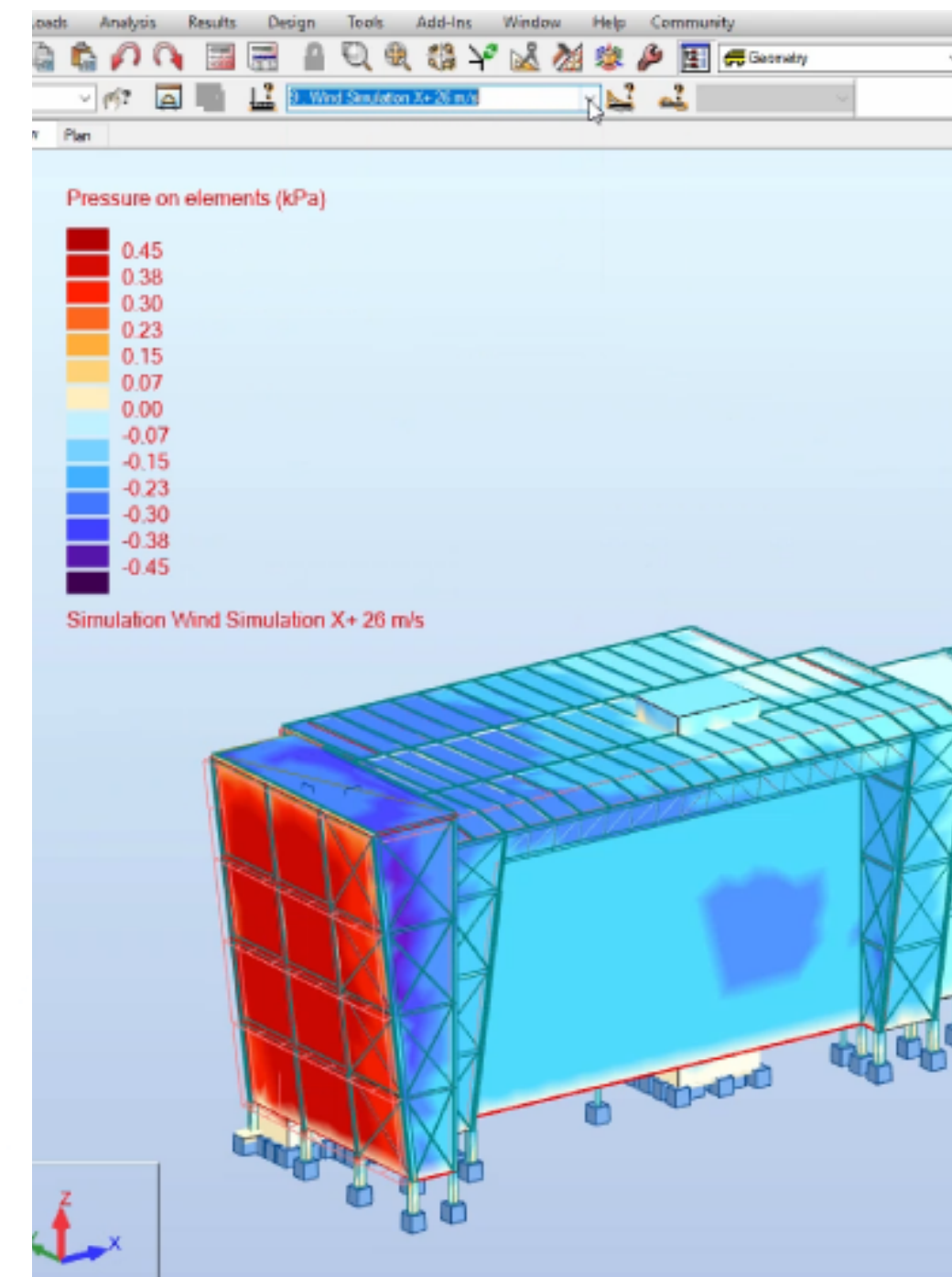
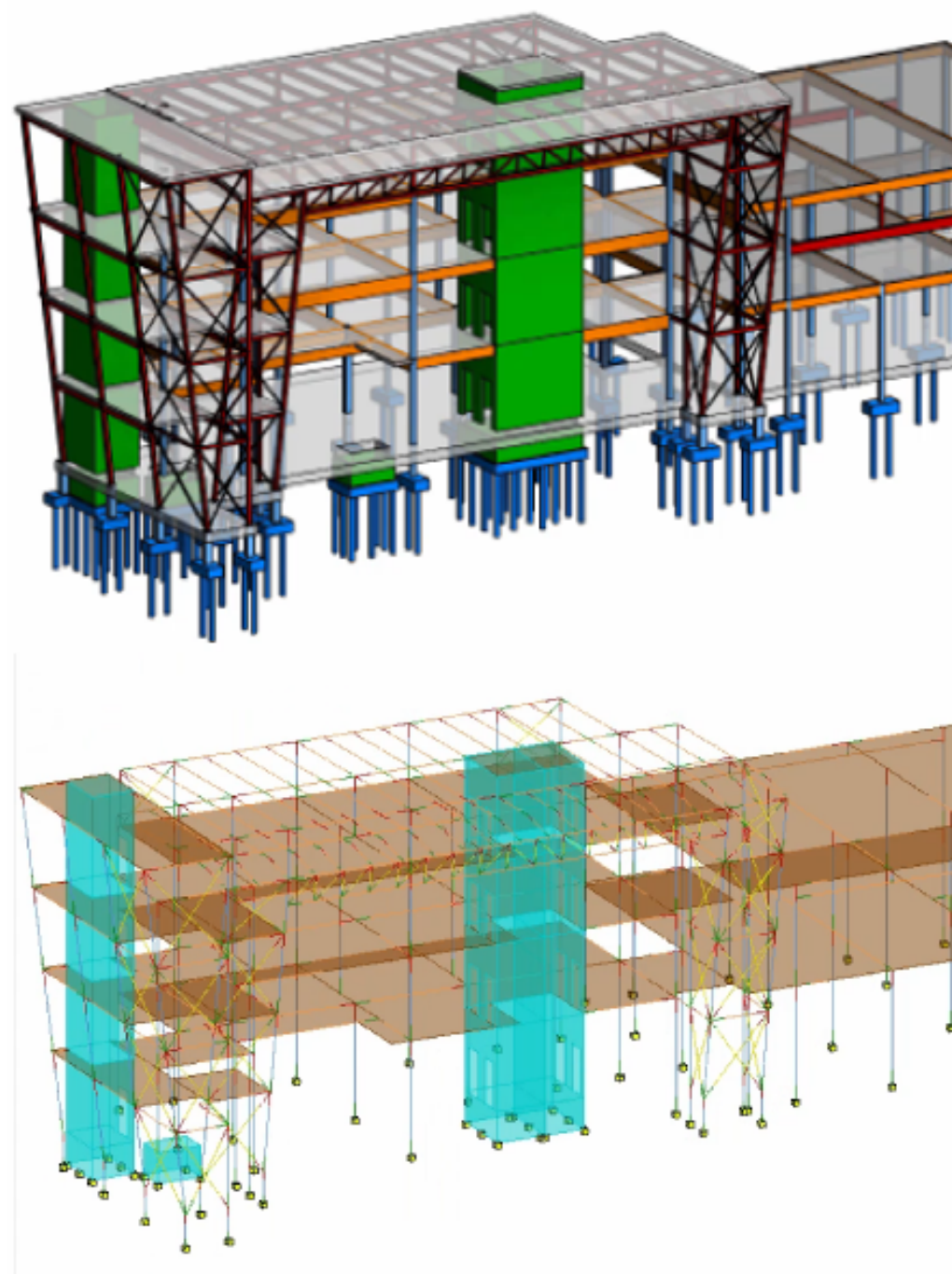
■ Steel Connection Design Intent

■ Steel Connection Detailing

■ Communication of Design Intent

Fabrication Deliverables

Connect Design to Analysis



■ Structural Model

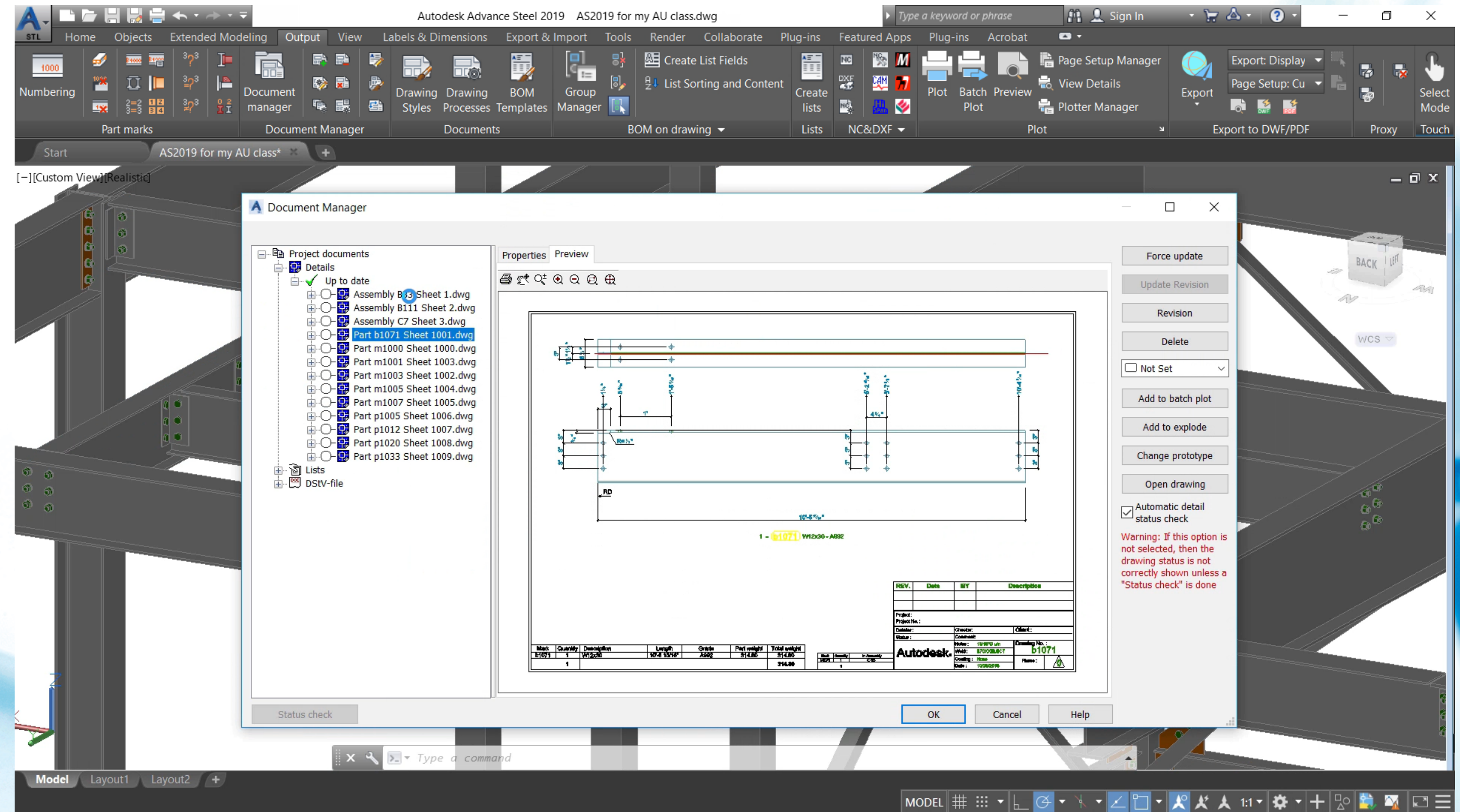
■ Structural Analysis

■ Review Final
Engineering Model

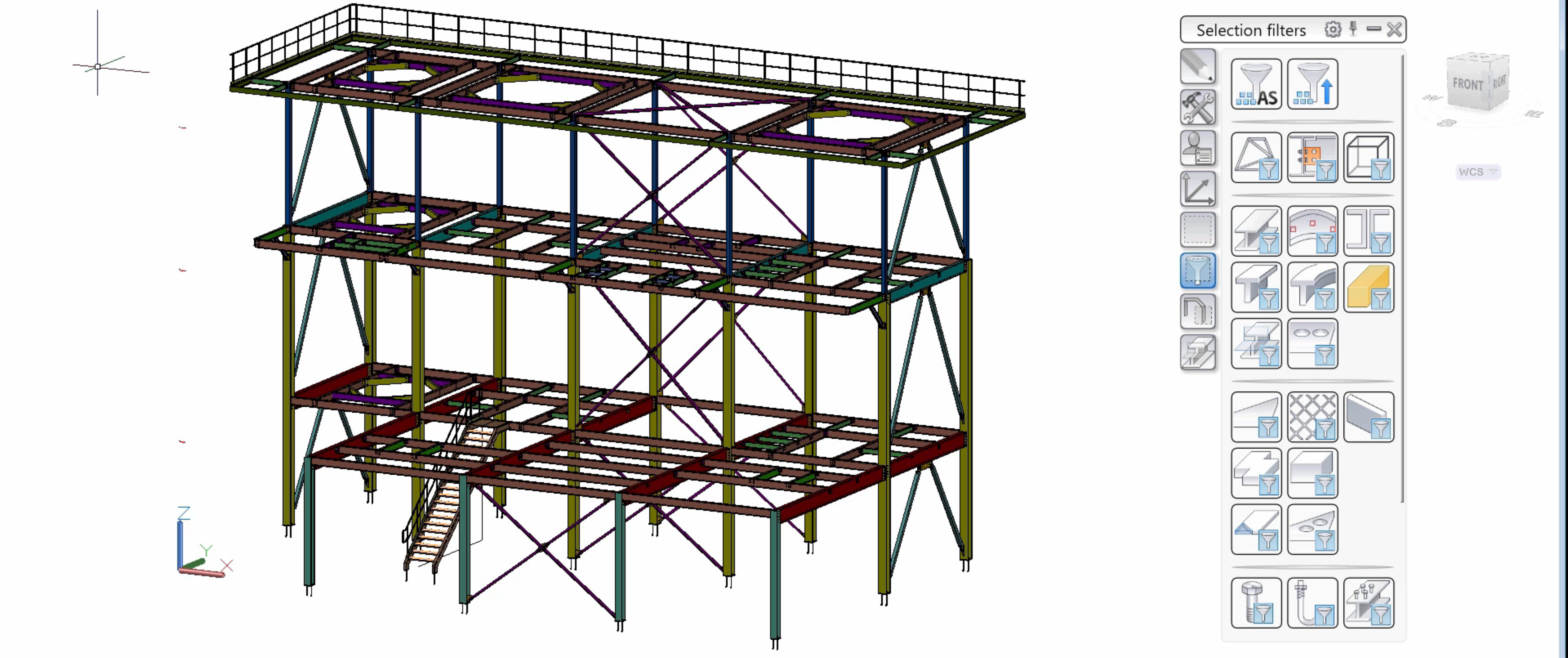
Compare Changes

Shop drawings creation

- Generate accurate documentation for fabrication
- Dedicated templates available out-of-the-box
 - Drawing styles
 - Drawing processes
- Separate DWG files
 - Single part drawings
 - Assembly drawings
- Drawing styles manager
 - Customizable styles



[-][Custom View][Realistic] - □ ×



BOMs and NC files creation

- Generate data for CNC machines at the workshop
- Dedicated templates available out-of-the-box for BOMs
- NC data
 - NC-DSTV files
 - NC-DXF files
- Link with MIS (Management Information System) solutions
- Export to Nesting Utility for automatic plate nesting

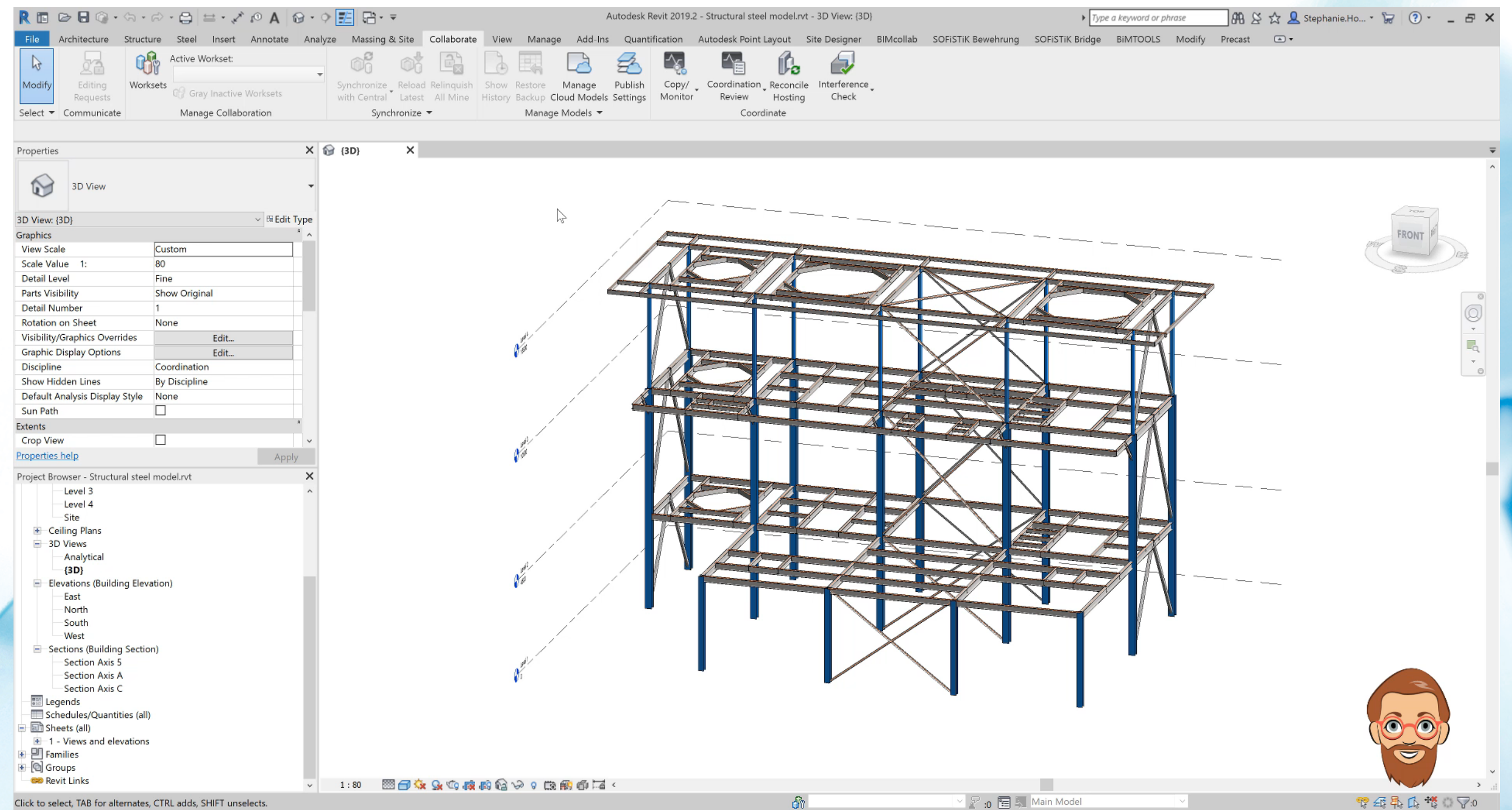
The screenshot displays the Autodesk Advance Steel 2019 software interface. The main window shows a 3D model of a structural steel frame. Overlaid on this is a 'Preview selected template' window, which contains a detailed Bill of Materials (BOM) table. The table lists various steel components, their quantities, marks, descriptions, lengths, costs, weights, and surface areas. A 'Document Manager' window is also open, showing a tree view of project documents, including DSTV files and NC files. The interface includes a ribbon with various toolsets like Home, Objects, Extended Modeling, Output, View, Labels & Dimensions, Export & Import, Tools, Render, Collaborate, Plug-ins, Featured Apps, Plug-ins, Add-ins, Acrobat, and Export.

Quantity	Mark	Description	Length (mm)	Costing Grade	Part weight (kg)	Total weight (kg)	Part surface (m²)	Total surface (m²)
1	61	HEA260	4,500					
1	1097	HEA260	4,480	S235	305.5	305.5	6.63	6.63
1	1202	PL 20x270x280	280	S355JR	11.9	11.9	0.17	0.17
TOTAL						317.4		6.8
1	62	HEA300	15,500					
1	1098	HEA300	10,460	S235	923.6	923.6	17.99	17.99
1	1009	RHS150x5	4,992	S235	112.8	112.8	2.93	2.93
2	1181	PL 10x145x200	200	S355JR	2.3	4.6	0.06	0.13
2	1188	PL 10x130x145	145	S355JR	1.5	3	0.04	0.09
1	1189	PL 15x290x300	300	S355JR	10.2	10.2	0.19	0.19
1	1191	PL 25x310x320	320	S355JR	19.5	19.5	0.23	0.23
1	1192	PL 8x150x150	150	S355JR	1.4	1.4	0.05	0.05
1	1199	PL 10x230.72x360.19	360	S355JR	4.5	4.5	0.12	0.12
1	1200	PL 10x235.94x364.37	364	S355JR	4.4	4.4	0.12	0.12
1	1201	PL 10x238.56x366.33	366	S355JR	4.4	4.4	0.12	0.12
TOTAL						1,088.3		21.98
1	63	HEA300	15,500					
1	1050	HEA300	10,460	S235	923.6	923.6	17.99	17.99
1	1009	RHS150x5	4,992	S235	112.8	112.8	2.93	2.93
2	1181	PL 10x145x200	200	S355JR	2.3	4.6	0.06	0.13
2	1188	PL 10x130x145	145	S355JR	1.5	3	0.04	0.09
1	1189	PL 15x290x300	300	S355JR	10.2	10.2	0.19	0.19
1	1191	PL 25x310x320	320	S355JR	19.5	19.5	0.23	0.23
1	1192	PL 8x150x150	150	S355JR	1.4	1.4	0.05	0.05
1	1199	PL 10x230.72x360.19	360	S355JR	4.5	4.5	0.12	0.12
1	1200	PL 10x235.94x364.37	364	S355JR	4.4	4.4	0.12	0.12



Use the power of BIM 360

- “Cloud Models for Revit” – A simple solution for individual users
- Update & publish cloud models
- Access full BIM 360 capabilities
 - View Steel connections & engineering drawings
 - Control versions
 - Change analysis 2D & 3D
 - Mark-ups and Issues
 - Transmittals
 - Approval workflows



Autodesk Revit 2019.2 - Structural steel model.rvt - 3D View: {3D}

Type a keyword or phrase

File Architecture Structure Steel Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Quantification Autodesk Point Layout Site Designer BIMcollab SOFiSTIK Bewehrung SOFiSTIK Bridge BiMTOOLS Modify Precast

Modify Select Communicate Worksets Active Workset: Gray Inactive Worksets Manage Collaboration Synchronize with Central Reload Latest Relinquish All Mine Synchronize Show History Restore Backup Manage Cloud Models Publish Settings Manage Models Copy/Monitor Coordination Review Reconcile Hosting Interference Check Coordinate

Properties {3D}

3D View

3D View: {3D} Edit Type

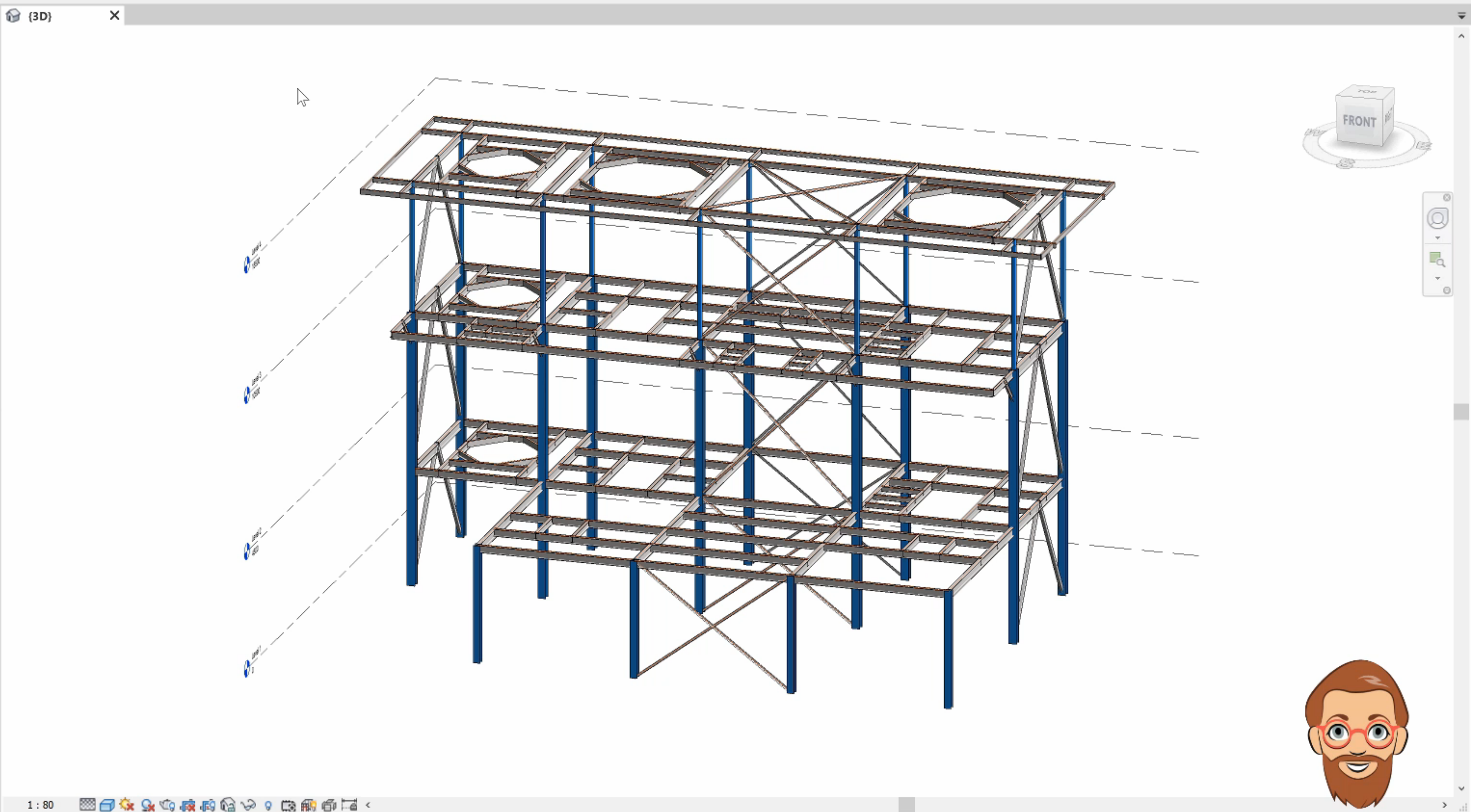
Graphics	
View Scale	Custom
Scale Value 1:	80
Detail Level	Fine
Parts Visibility	Show Original
Detail Number	1
Rotation on Sheet	None
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Discipline	Coordination
Show Hidden Lines	By Discipline
Default Analysis Display Style	None
Sun Path	<input type="checkbox"/>

Extents	
Crop View	<input type="checkbox"/>

Properties help Apply

Project Browser - Structural steel model.rvt

- Level 3
- Level 4
- Site
- Ceiling Plans
- 3D Views
 - Analytical
 - {3D}
- Elevations (Building Elevation)
 - East
 - North
 - South
 - West
- Sections (Building Section)
 - Section Axis 5
 - Section Axis A
 - Section Axis C
- Legends
- Schedules/Quantities (all)
- Sheets (all)
- 1 - Views and elevations
- Families
- Groups
- Revit Links

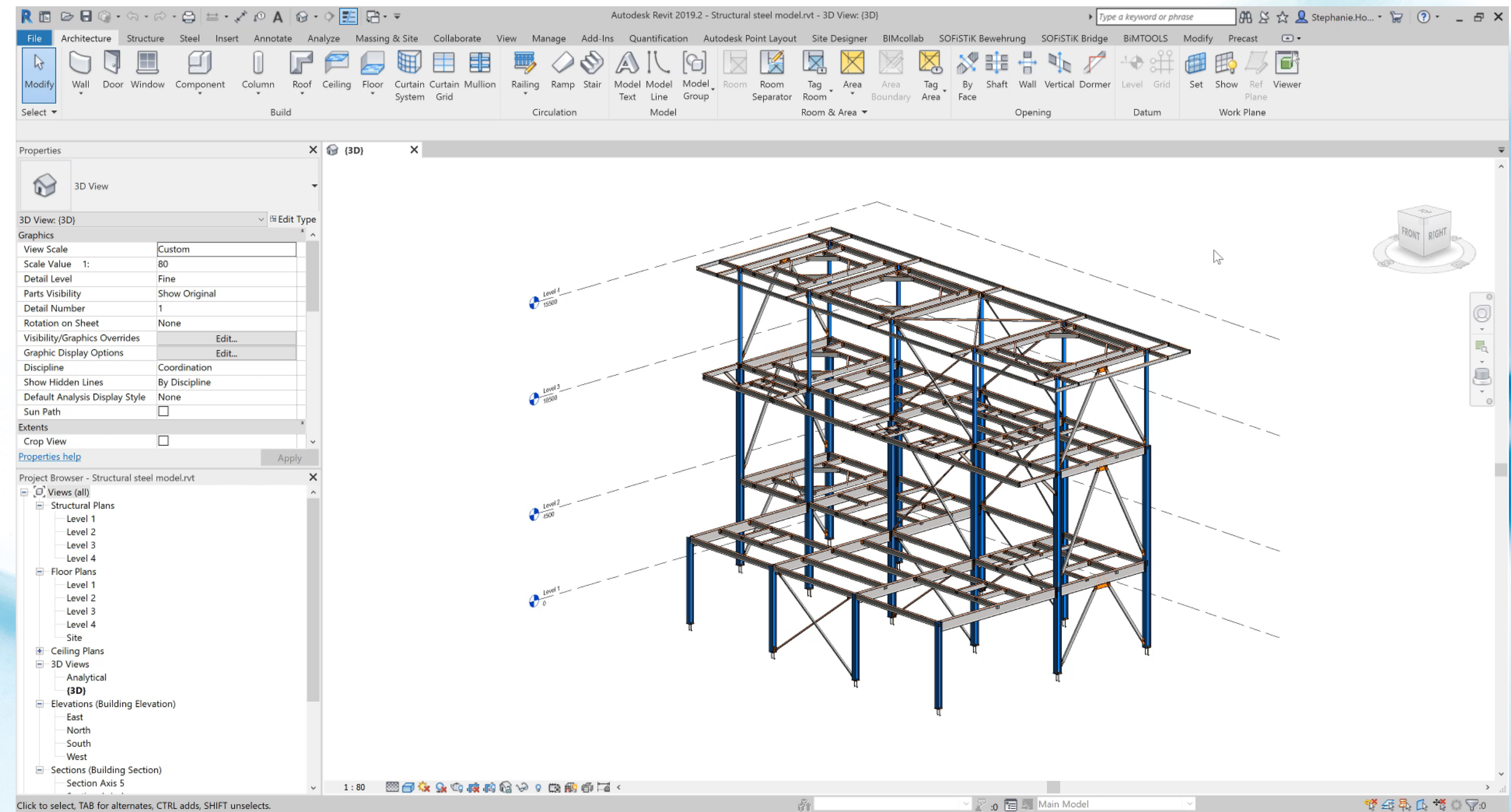


Share information on BIM 360

- Use Common Data Environment to hand-over files

- Access full BIM 360 capabilities

- Share files
- Transmittals



Autodesk Revit 2019.2 - Structural steel model.rvt - 3D View: {3D}

Type a keyword or phrase

Stephanie.Ho...

File Architecture Structure Steel Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Quantification Autodesk Point Layout Site Designer BIMcollab SOFiSTIK Bewehrung SOFiSTIK Bridge BiMTOOLS Modify Precast

Modify Select Wall Door Window Component Column Roof Ceiling Floor Curtain System Curtain Mullion Grid Railing Ramp Stair Model Text Model Line Model Group Room Room Separator Tag Room Area Area Boundary Tag Area By Face Shaft Wall Vertical Dormer Level Grid Set Show Ref Viewer Work Plane

Properties {3D}

3D View

3D View: {3D} Edit Type

Graphics

View Scale	Custom
Scale Value 1:	80
Detail Level	Fine
Parts Visibility	Show Original
Detail Number	1
Rotation on Sheet	None
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Discipline	Coordination
Show Hidden Lines	By Discipline
Default Analysis Display Style	None
Sun Path	<input type="checkbox"/>

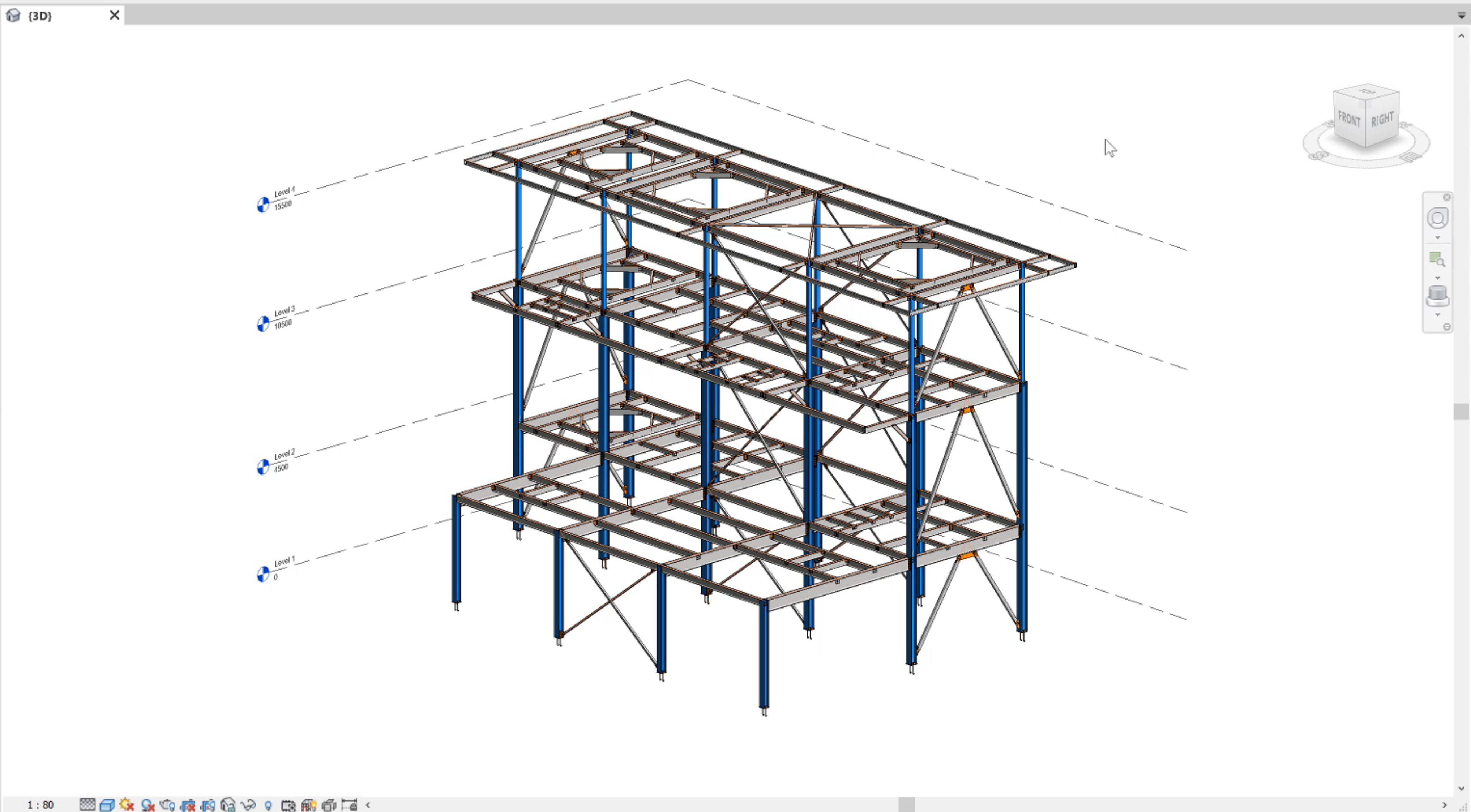
Extents

Crop View ☐

Properties help Apply

Project Browser - Structural steel model.rvt

- Views (all)
 - Structural Plans
 - Level 1
 - Level 2
 - Level 3
 - Level 4
 - Floor Plans
 - Level 1
 - Level 2
 - Level 3
 - Level 4
 - Site
 - Ceiling Plans
 - 3D Views
 - Analytical
 - {3D}**
 - Elevations (Building Elevation)
 - East
 - North
 - South
 - West
 - Sections (Building Section)
 - Section Axis 5



Key benefits and business values

- **Win more work**

By differentiating your firm from competition with extended service offerings.

- **Better coordinate**

Manage design changes including detailed steel connections

- **Minimize errors and fabrication waste at workshop**

Use NC files that automate the production lines

- **Automate the creation of fab and construction deliverables**

Get access to easy-to-use but powerful tools which automate the creation of deliverables directly from the 3D model

- **Better coordination in the field**

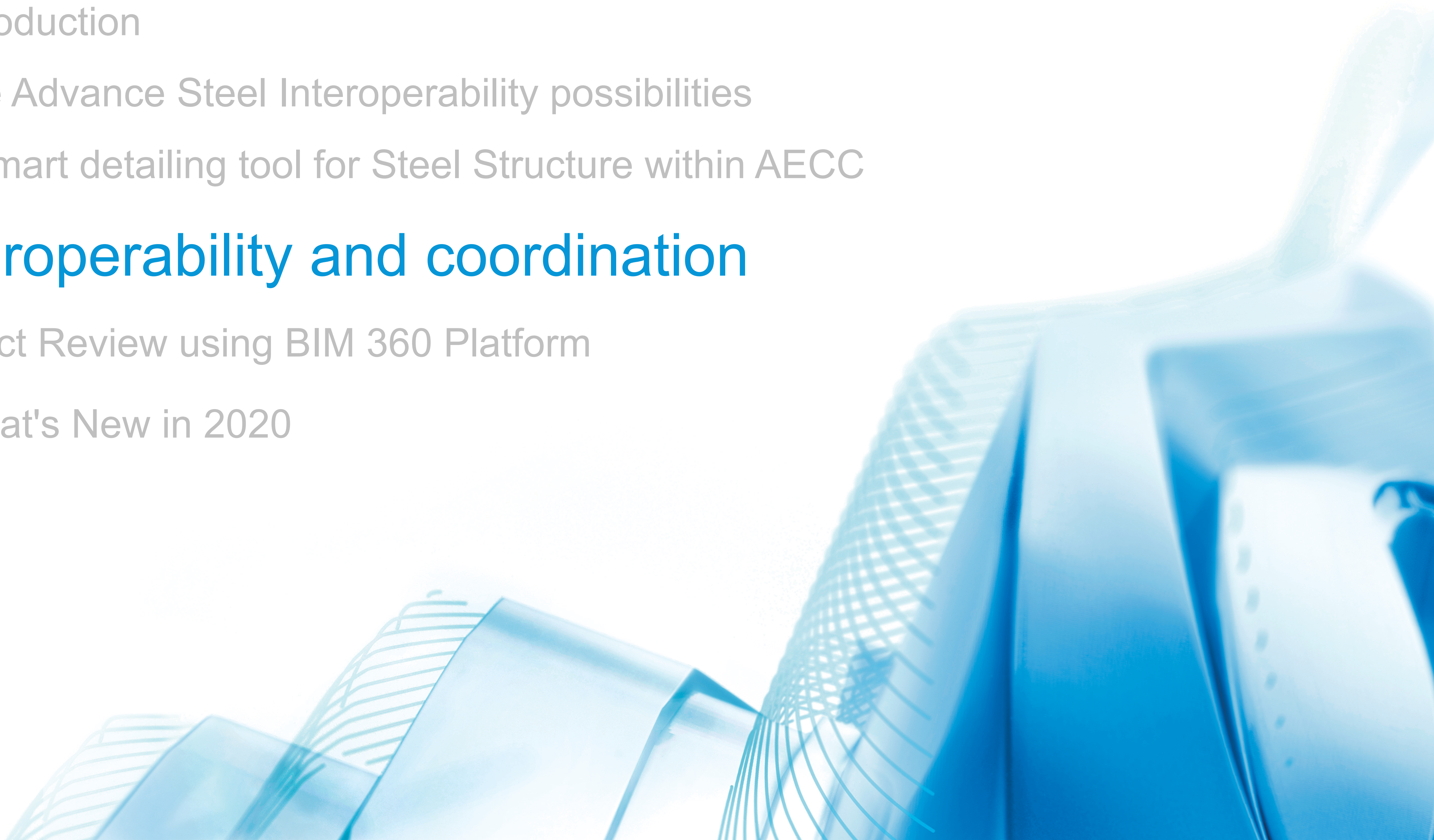
Plan, track and coordinate steel installation on the jobsite

- Introduction
- The Advance Steel Interoperability possibilities
- A smart detailing tool for Steel Structure within AECC

Interoperability and coordination

Project Review using BIM 360 Platform

- What's New in 2020



Structural workflows - Plant

A | AUTODESK® AUTOCAD® PLANT 3D

A | AUTODESK® ADVANCE STEEL

N | AUTODESK® NAVISWORKS®

Primary
Steel

Structural
Design &
Detailing

Construction
Planning

Design
Verification

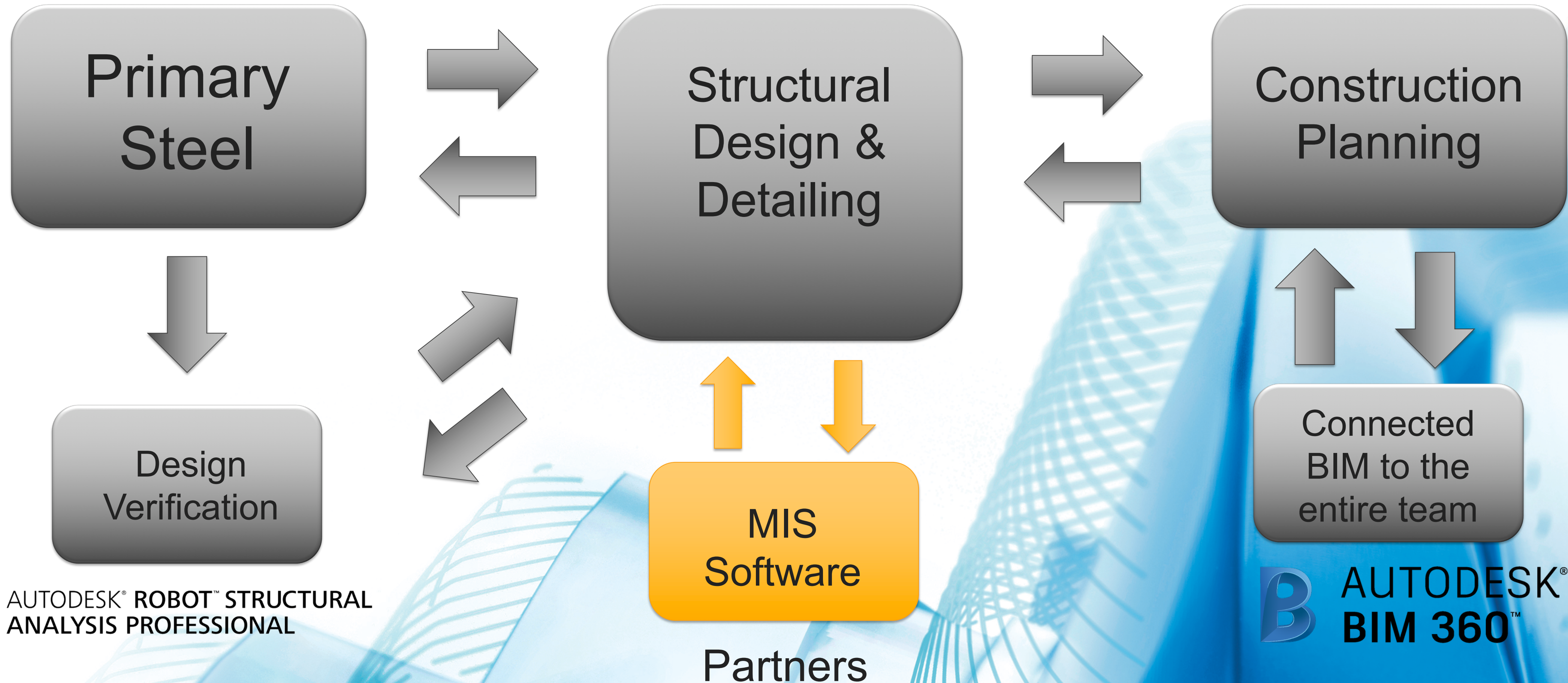
MIS
Software

Connected
BIM to the
entire team

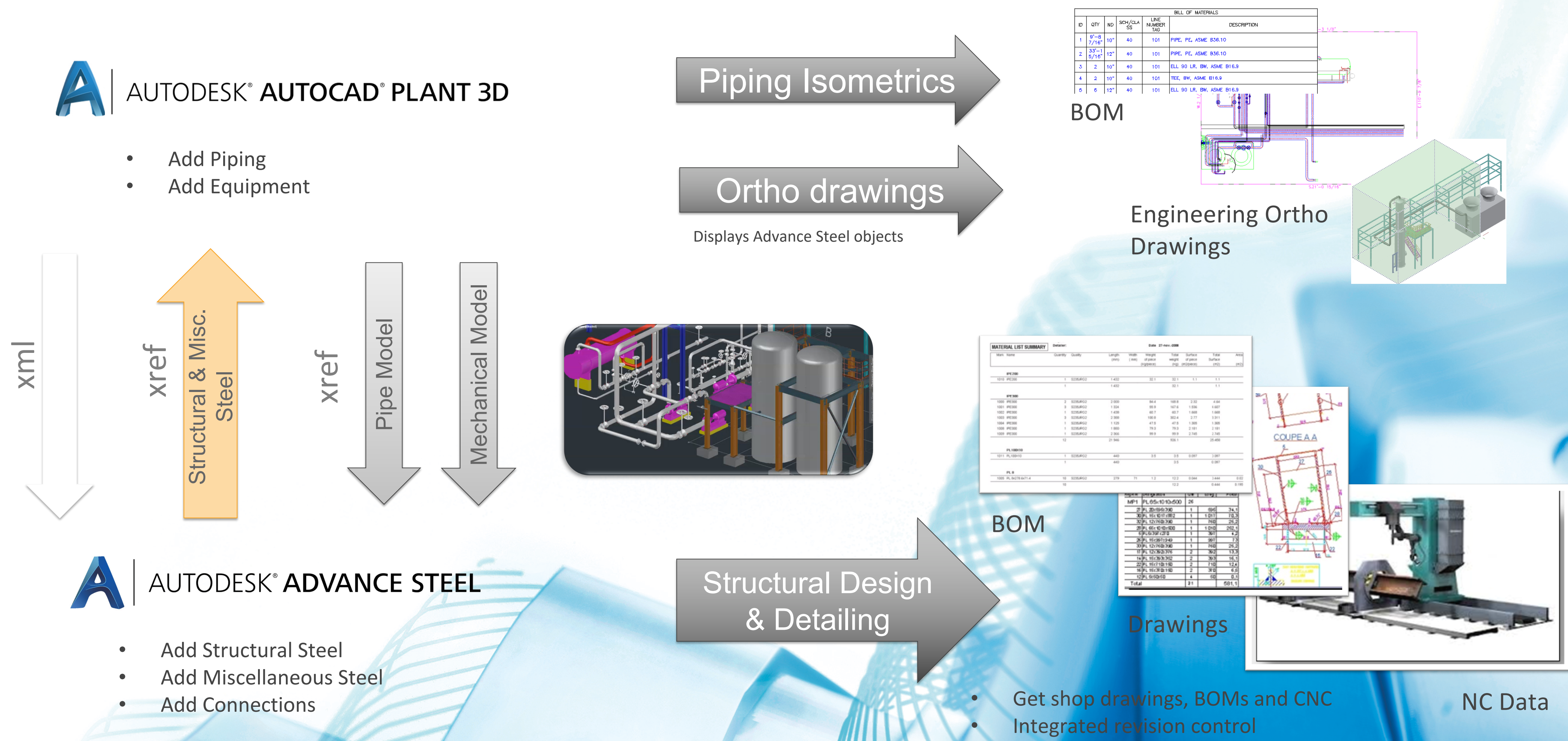
R | AUTODESK® ROBOT™ STRUCTURAL
ANALYSIS PROFESSIONAL

B | AUTODESK®
BIM 360™

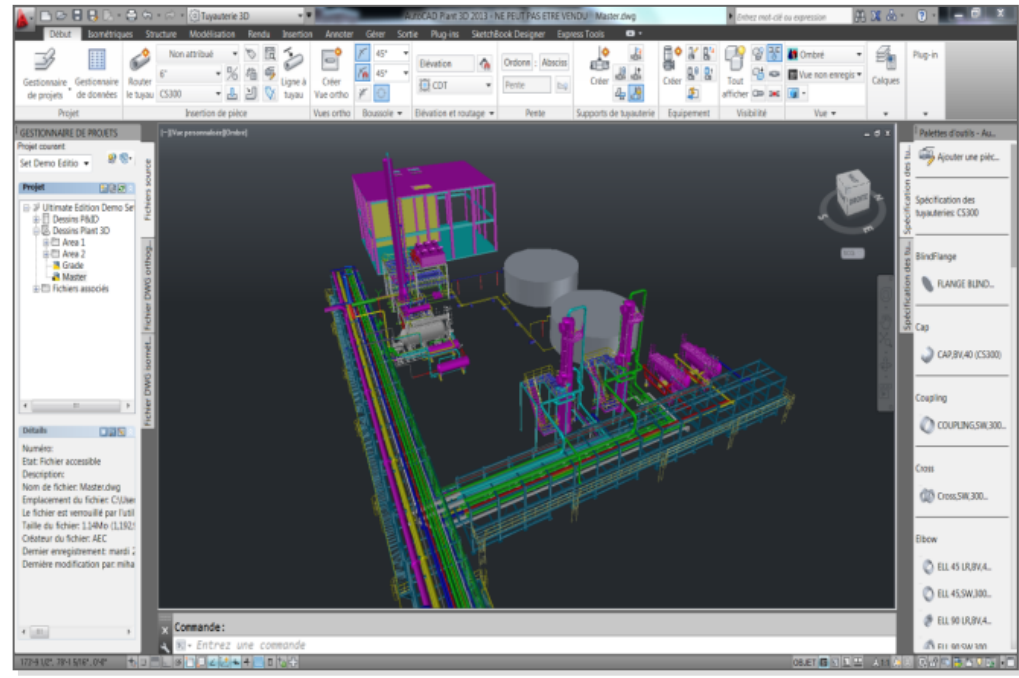
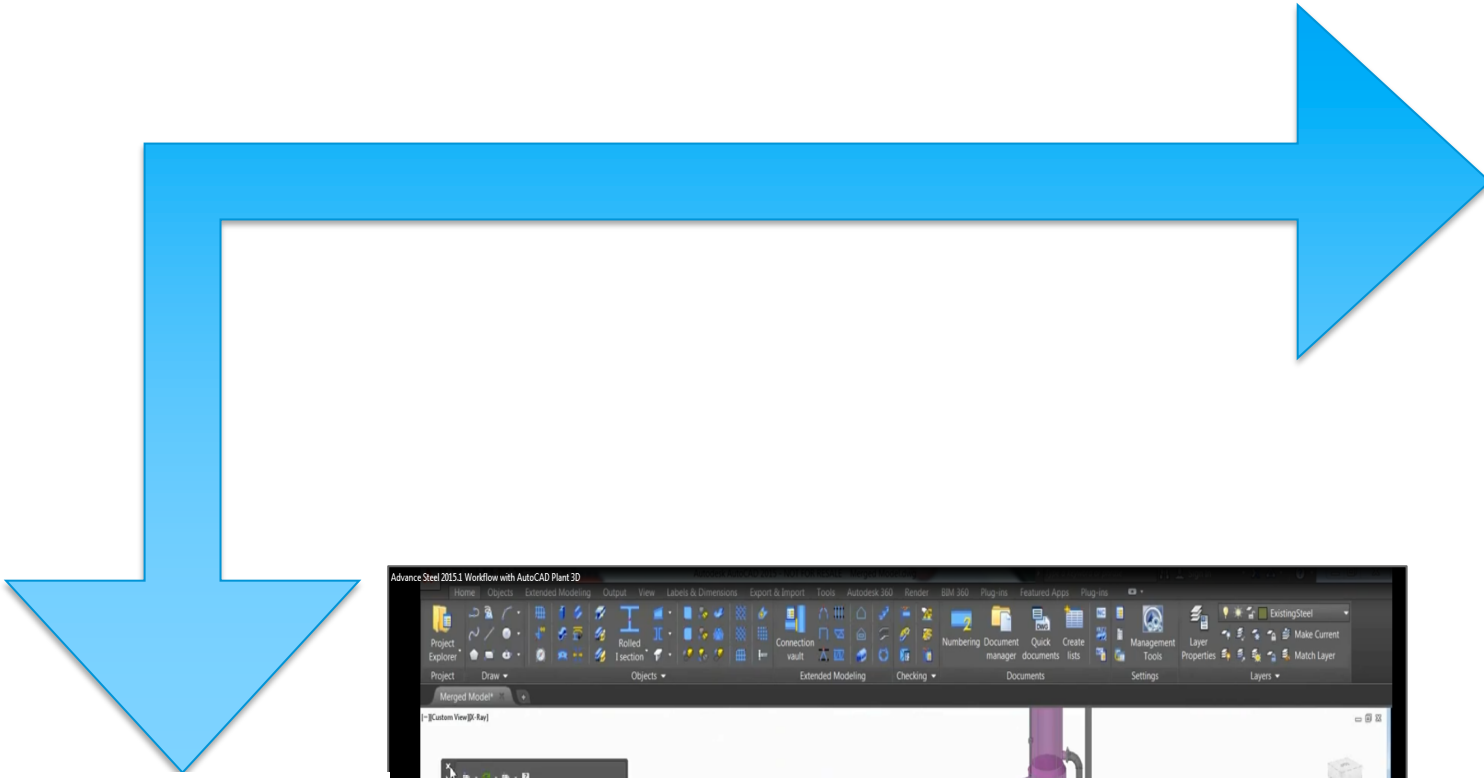
Partners



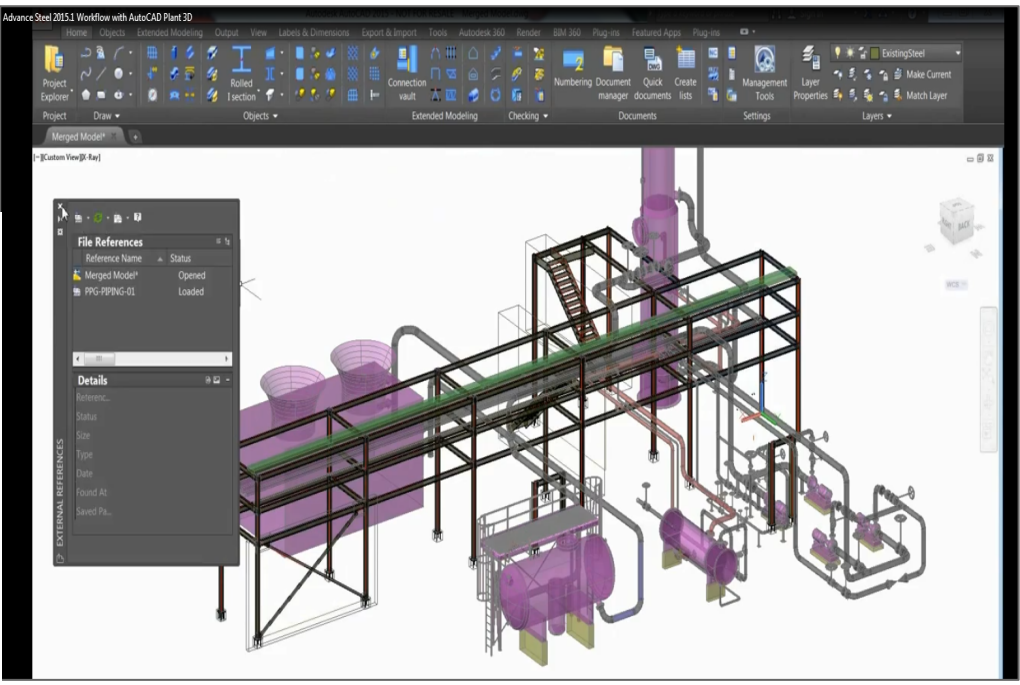
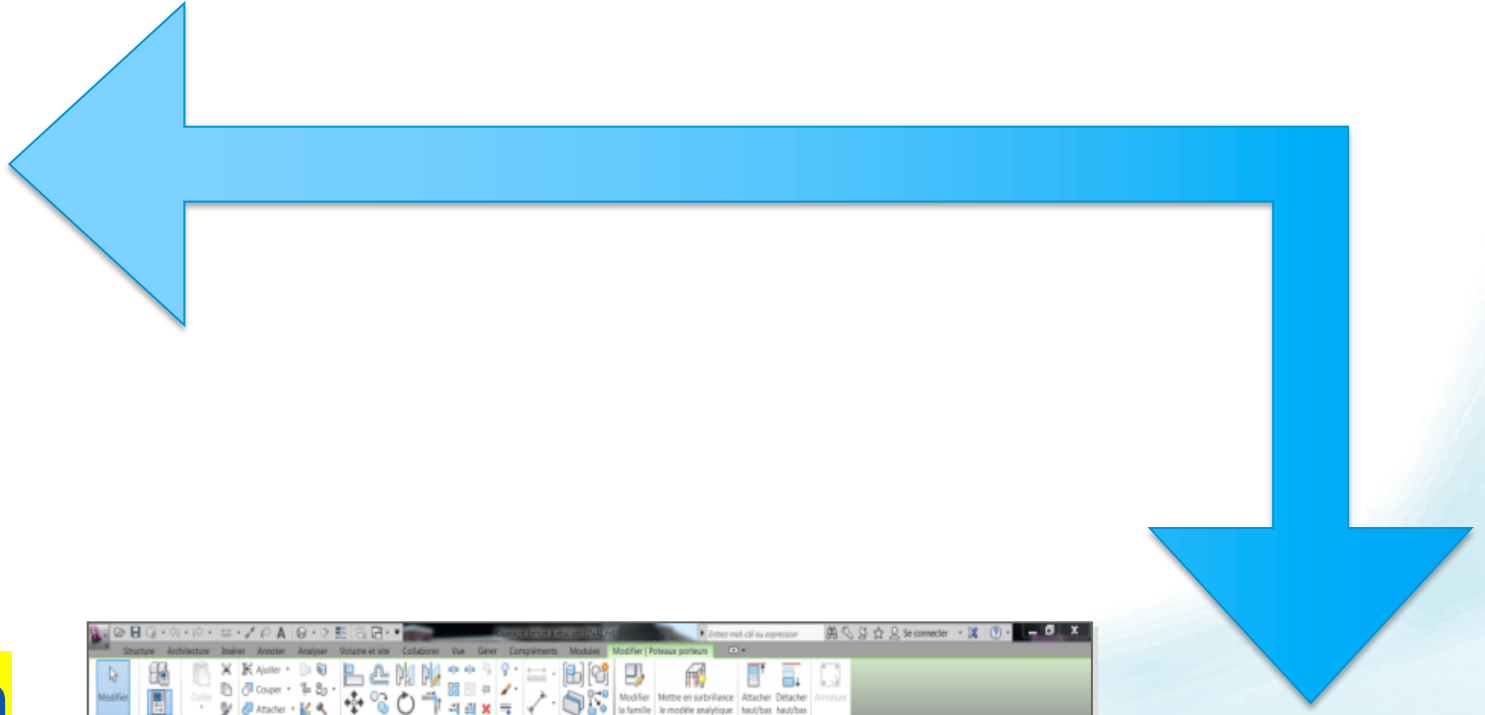
Structural workflows - Plant



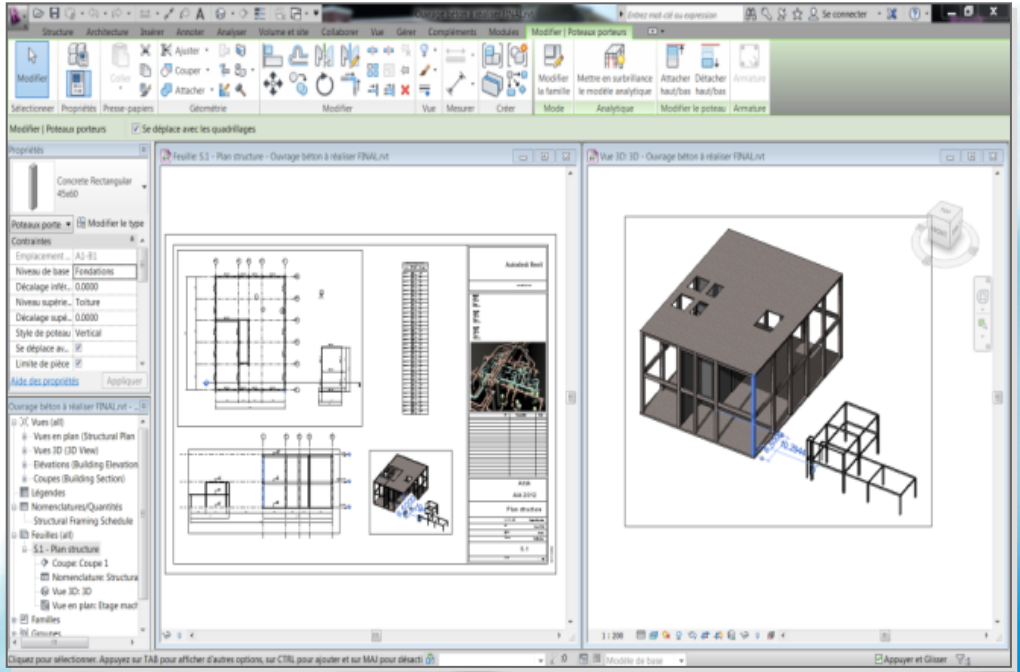
Structure workflows → Very flexible within the AECC



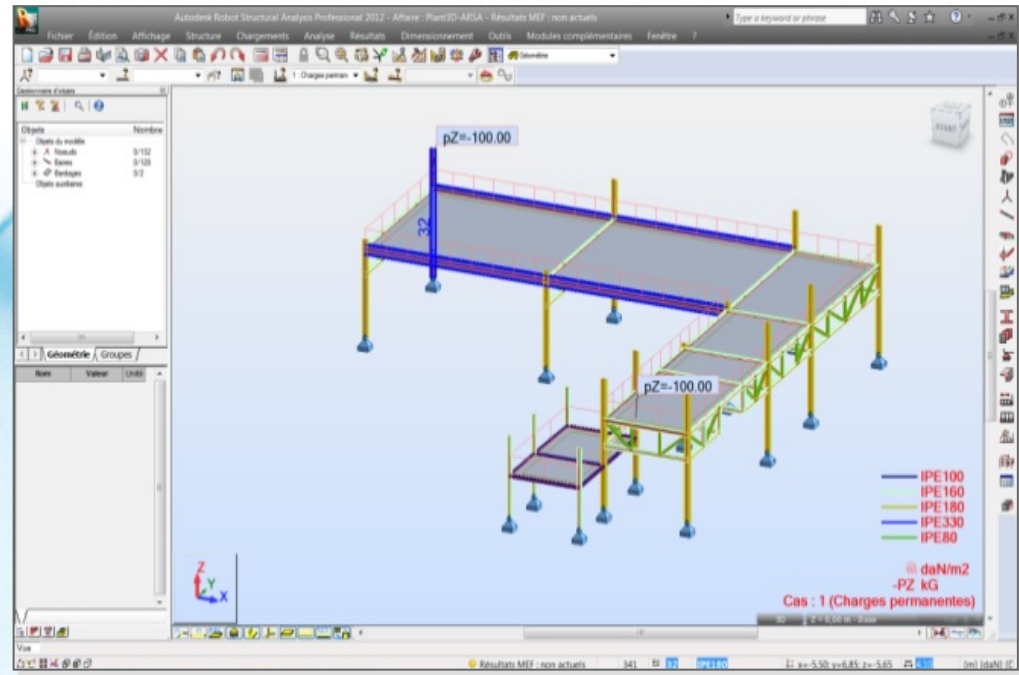
AutoCAD® Plant 3D > Early Stages Design



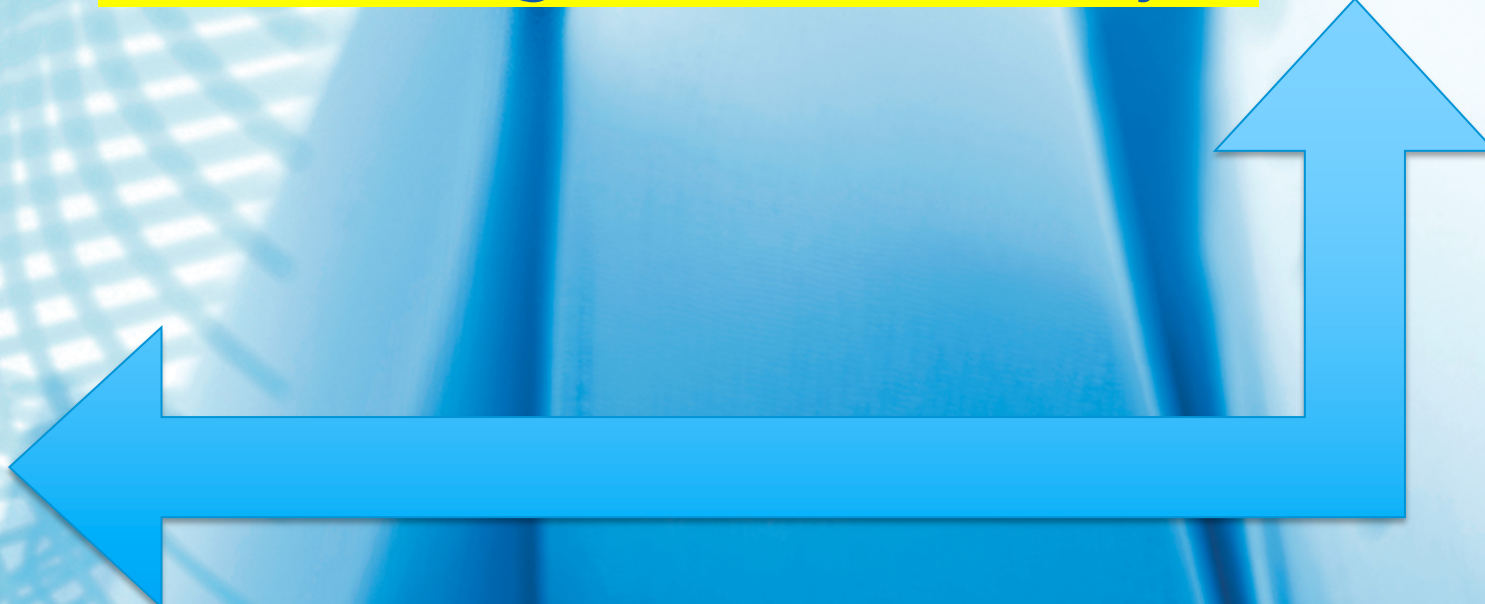
Advance Steel > Detailed Steel Design



Revit > Design and basic analysis



Robot™ Structural Analysis > Code check



Advance Steel & AutoCAD Plant 3D interoperability video



- Introduction
- The Advance Steel Interoperability possibilities
- A smart detailing tool for Steel Structure within AECC
- Coordination and Collaboration
- Project Review using BIM 360 Platform

What's New in 2020



New & enhanced features in Autodesk® Advance Steel 2020

- High DPI display support
- Better display in dialog boxes with sidebar
- Propagation of steel connections
- Dynamo Extension for Advance Steel 2020
- Enhanced labels placement on drawings
- More control on hole labels
- Cut views enhancements
- Enhanced interoperability with Revit 2020
- Installation in Czech language
- More local content for US English



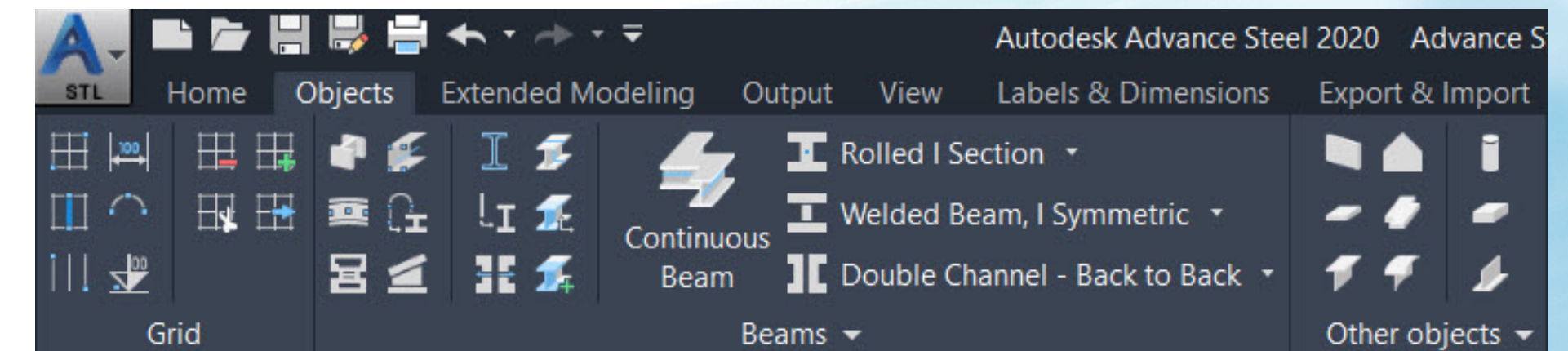
Includes all new features and enhancements in Advance Steel 2019 Hotfix 1

Usability



High DPI Display Support

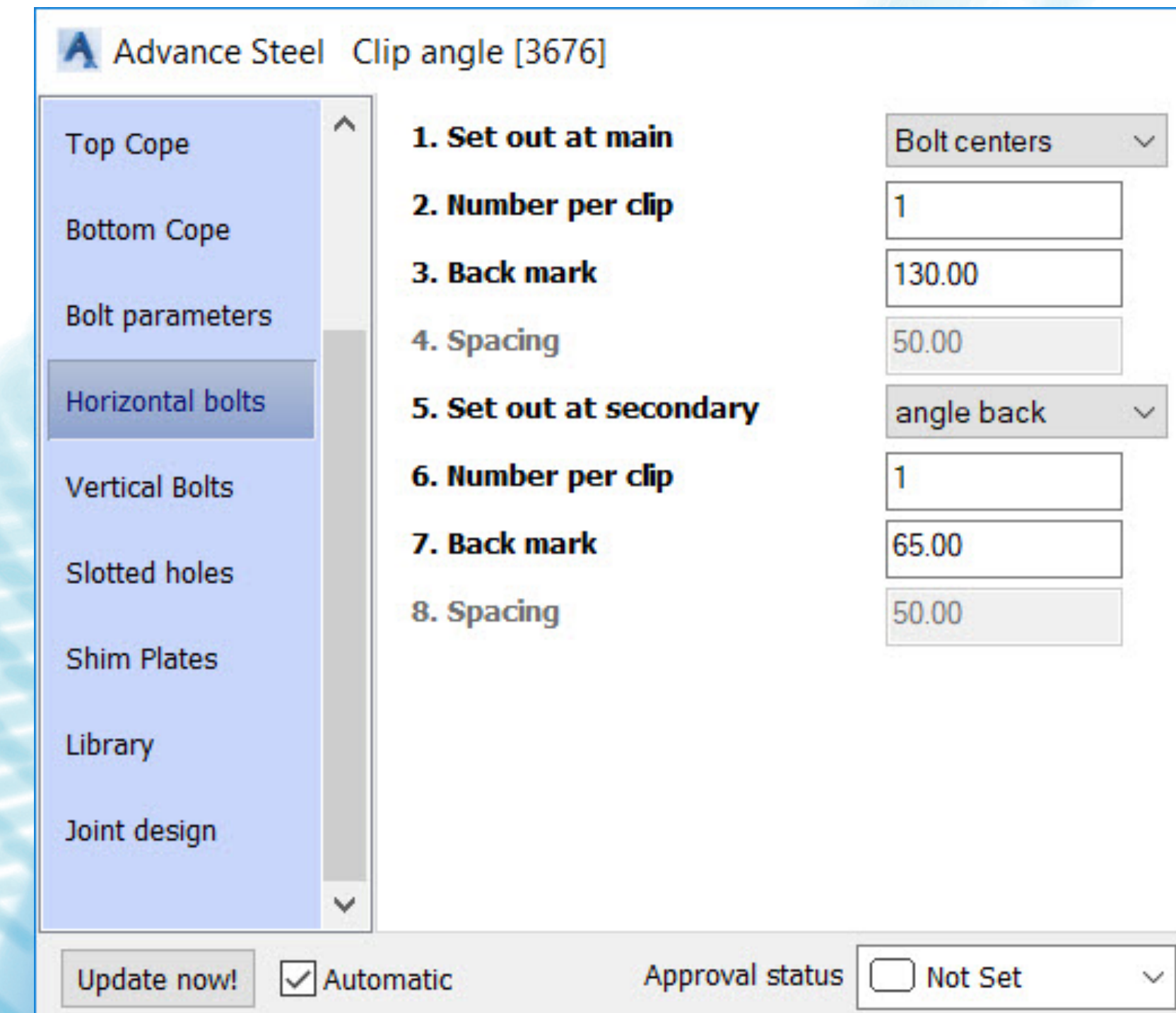
- Support high-resolution monitors
- Ribbon icons size correctly on high DPI scaling
- Dialog boxes enhancements
 - Automatic scaling to correctly show text and buttons



Improved display for the Advance Steel user interface

Dialog Boxes Display Enhancement

- Dynamically adjustable sidebars size
 - Width automatically adjusted
 - Based on the longest text to display
- Valid for all dialog boxes with a sidebar
 - Object properties
 - Steel connections
 - Search tool



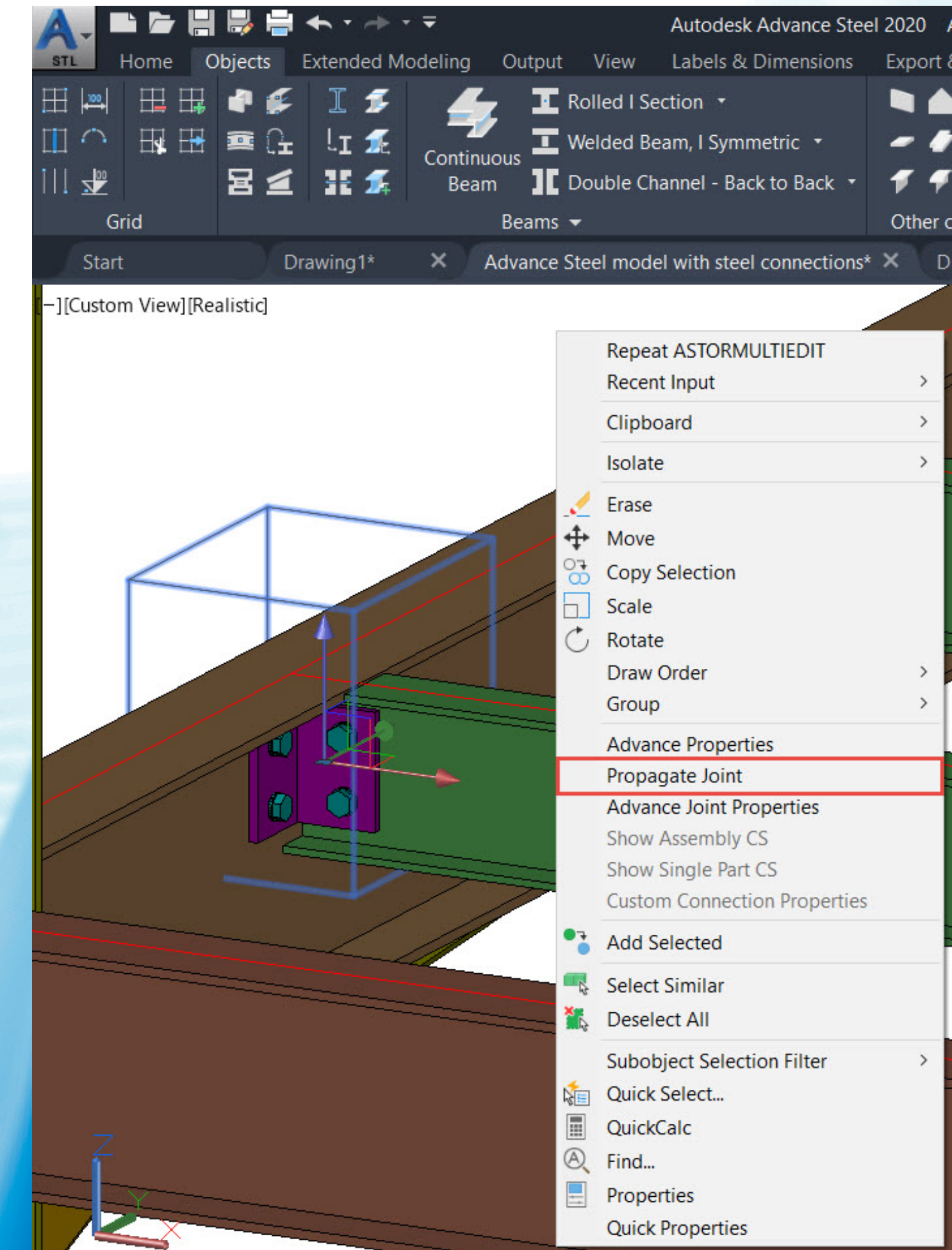
Get a better user experience when reading long texts in the sidebar

New & enhanced modeling tools



Propagation of Steel Connections

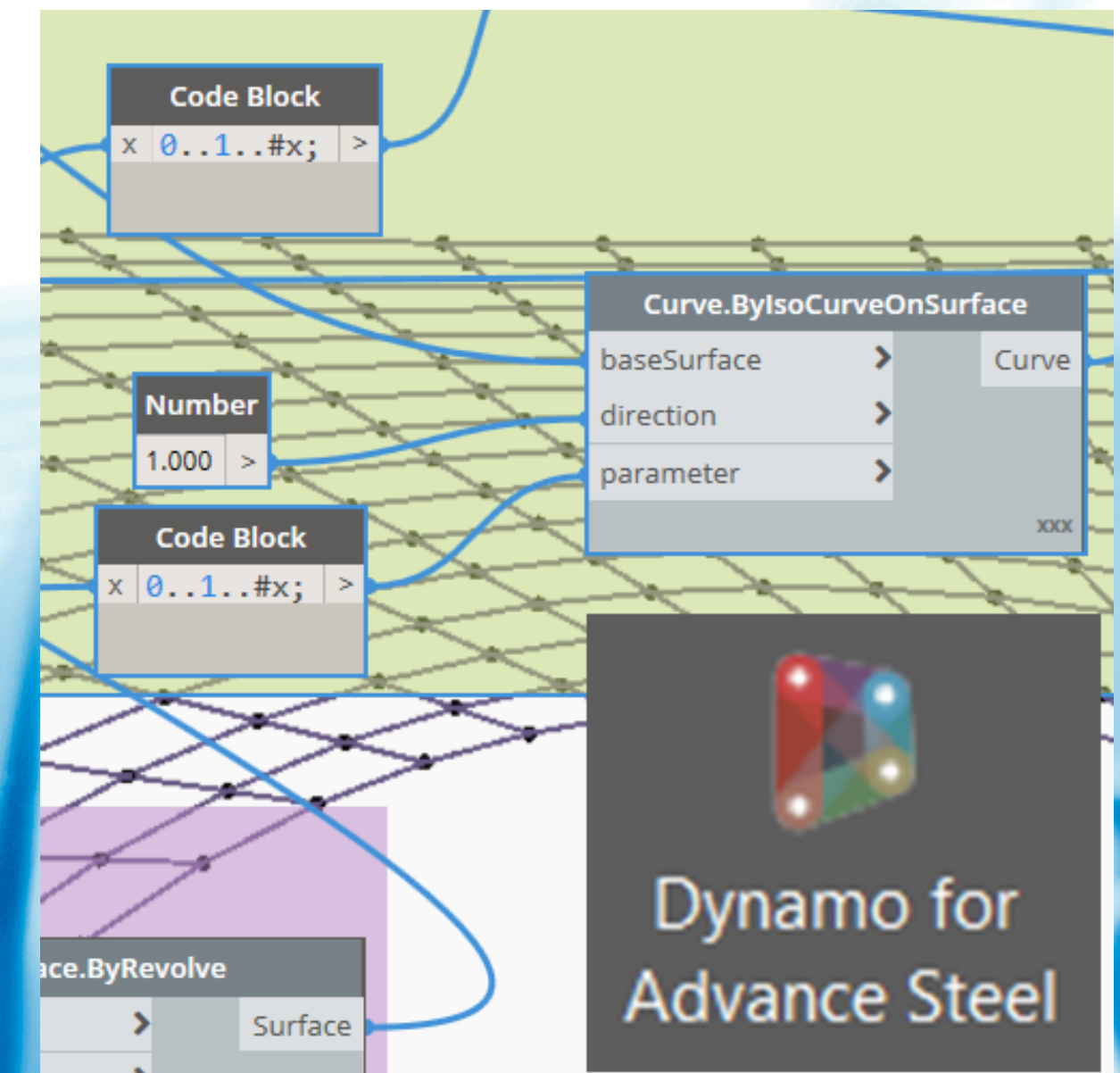
- New option in the contextual menu
- Available for any steel connections out-of-the-box
- Same framing conditions required



Quickly place the same steel connections in your project

Dynamo Extension for Advance Steel 2020

- Quickly generate complex structures using Advance Steel beams & plates
- Available for current subscribers in the Autodesk Desktop App



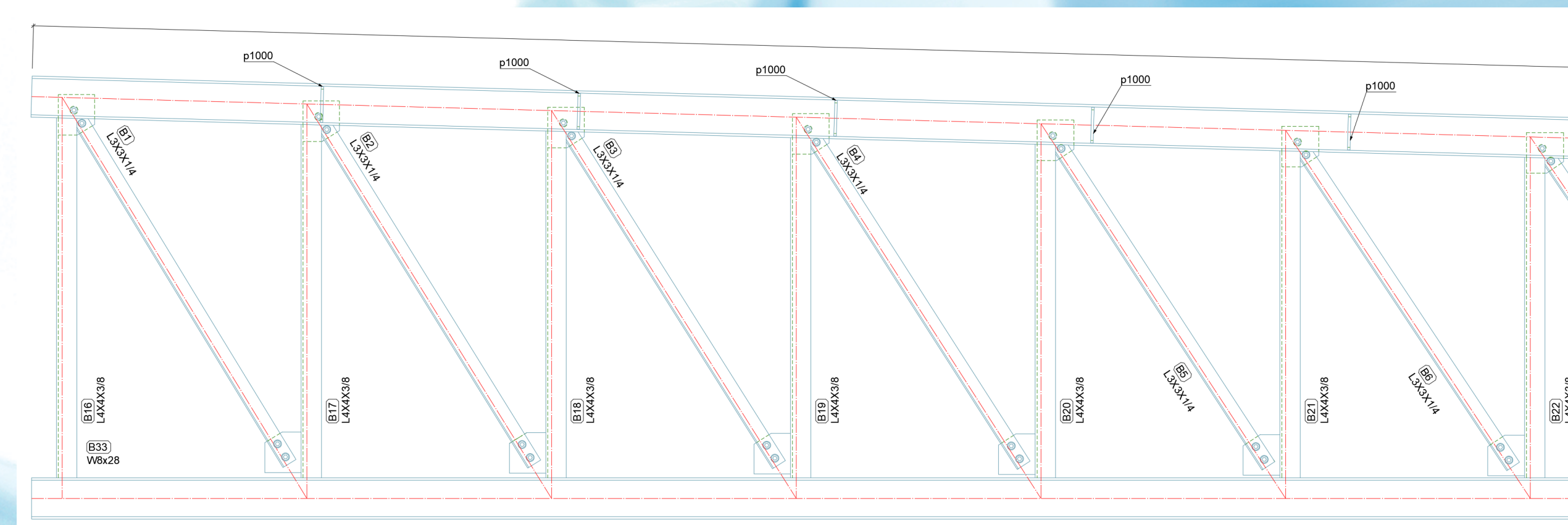
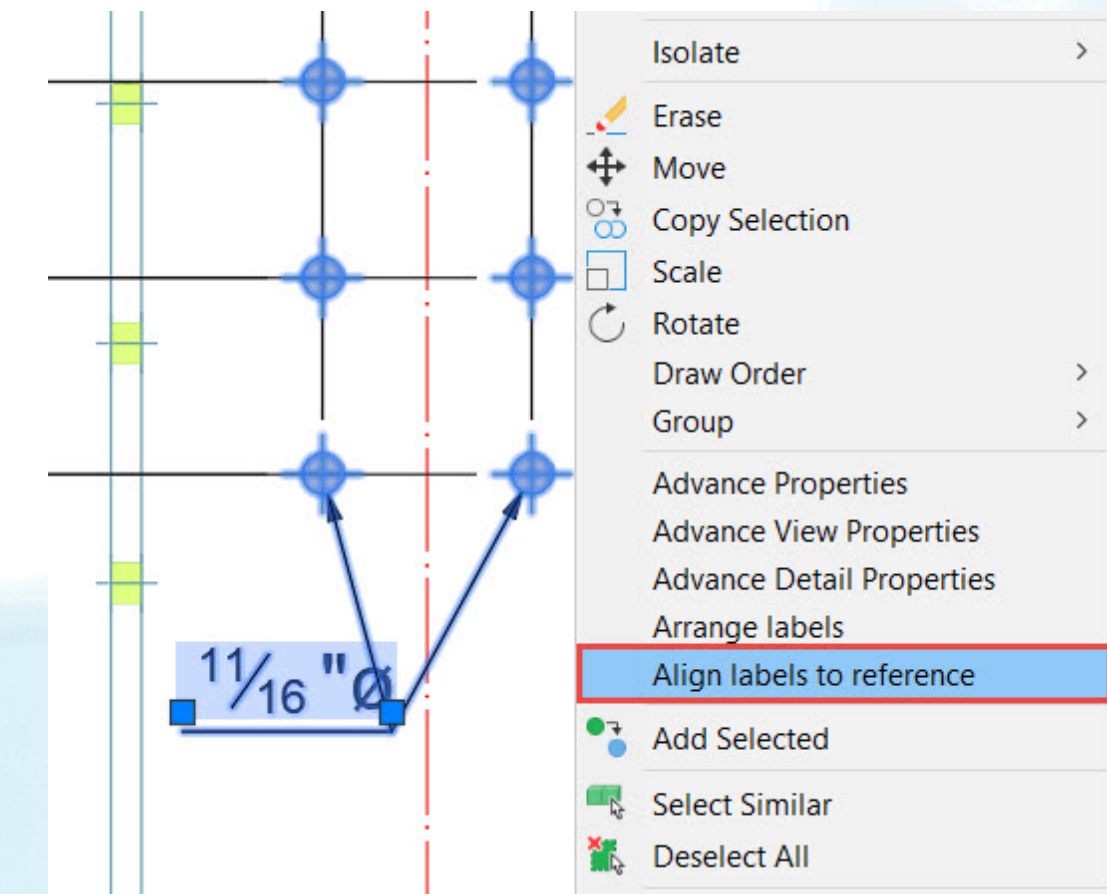
Minimize the number of steps required for modeling complex structures

Documentation improvements



Enhanced labels placement on drawings

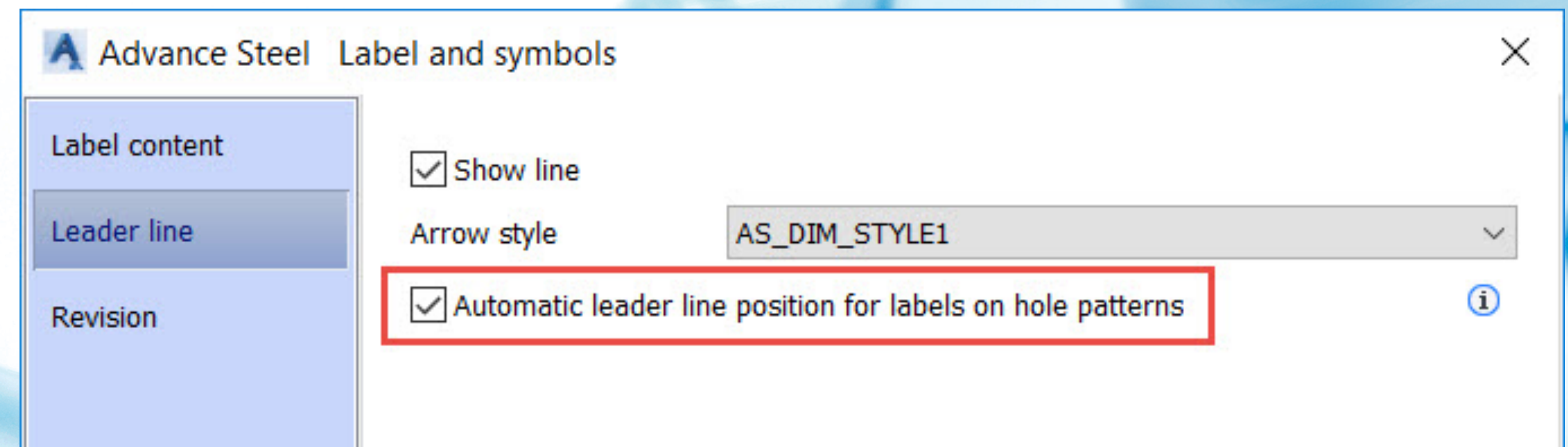
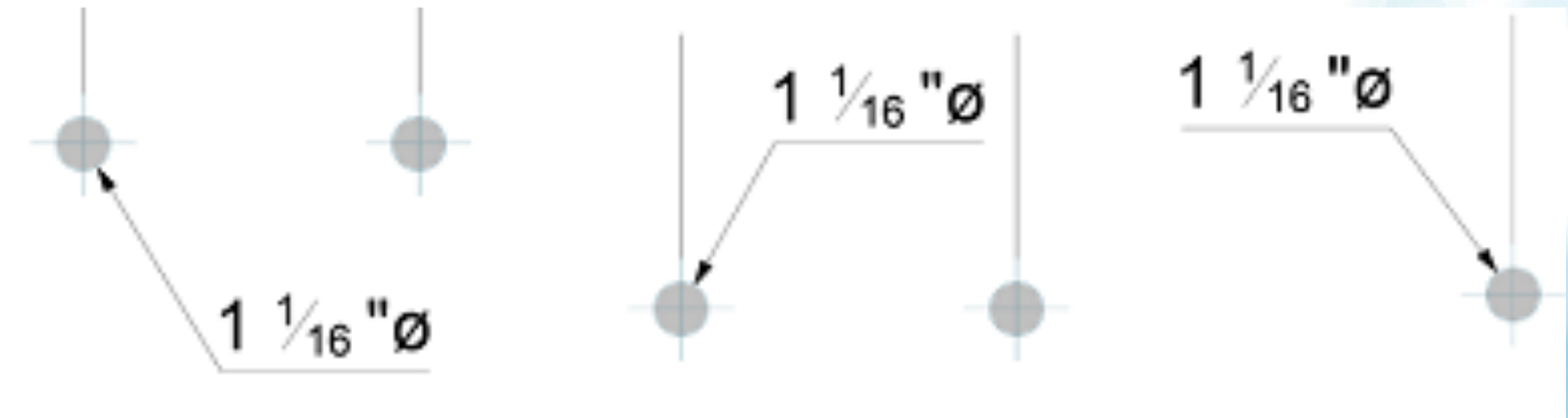
- Automatic label placement
- New command to align labels
 - Quickly align labels
 - Based on user preferences
 - Along a selected object
 - Horizontally or vertically
 - Along an AutoCAD line



More control on labels placement on drawings

More control on hole labels on drawings

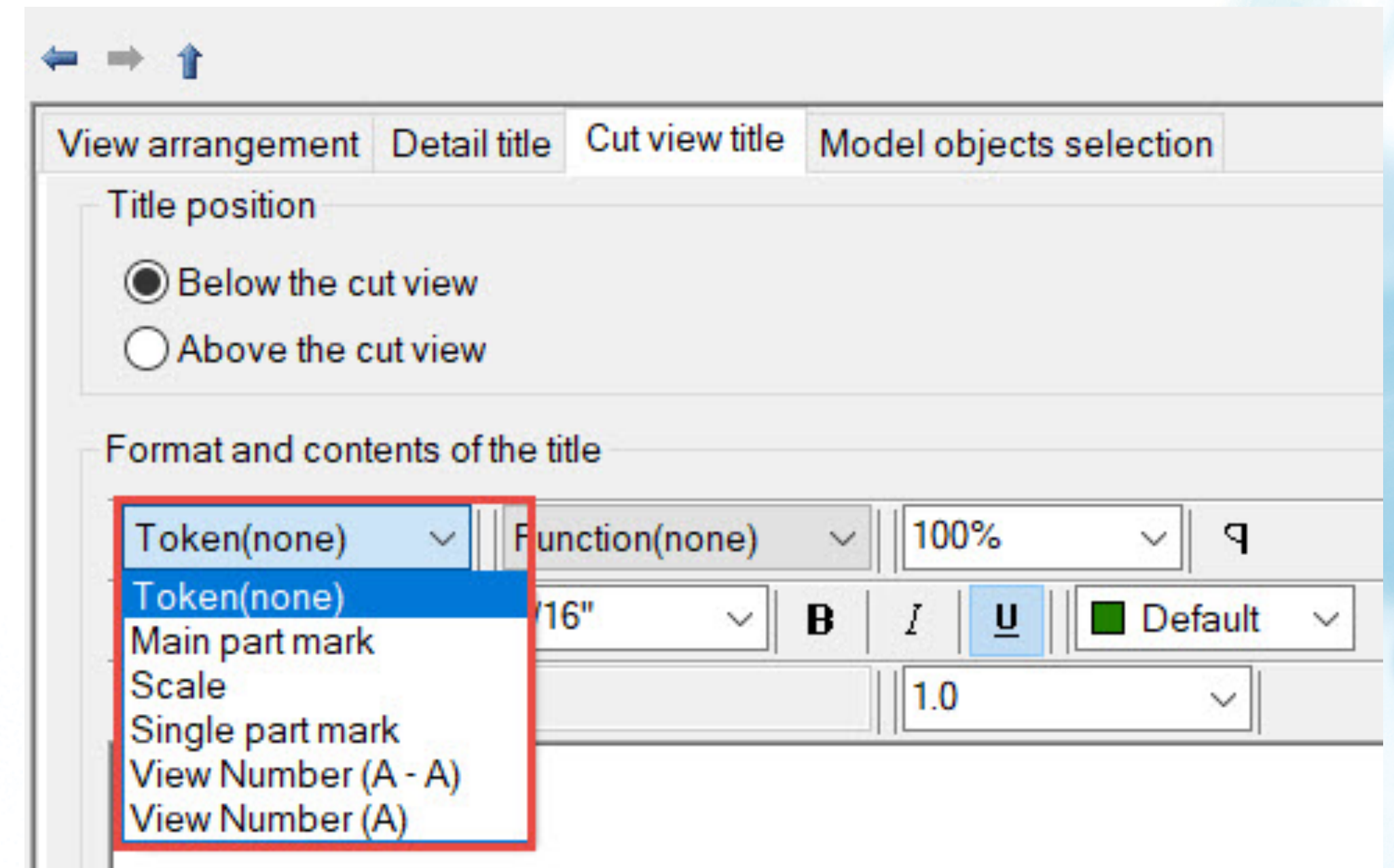
- Enhanced leader line behavior
 - Uses the center of the hole as a reference
 - Moving the label points to the same labeled hole
- Two labelling modes
(automatic & manual detection)



Create more readable documentation with greater control on label content

Cut views enhancements 1/3

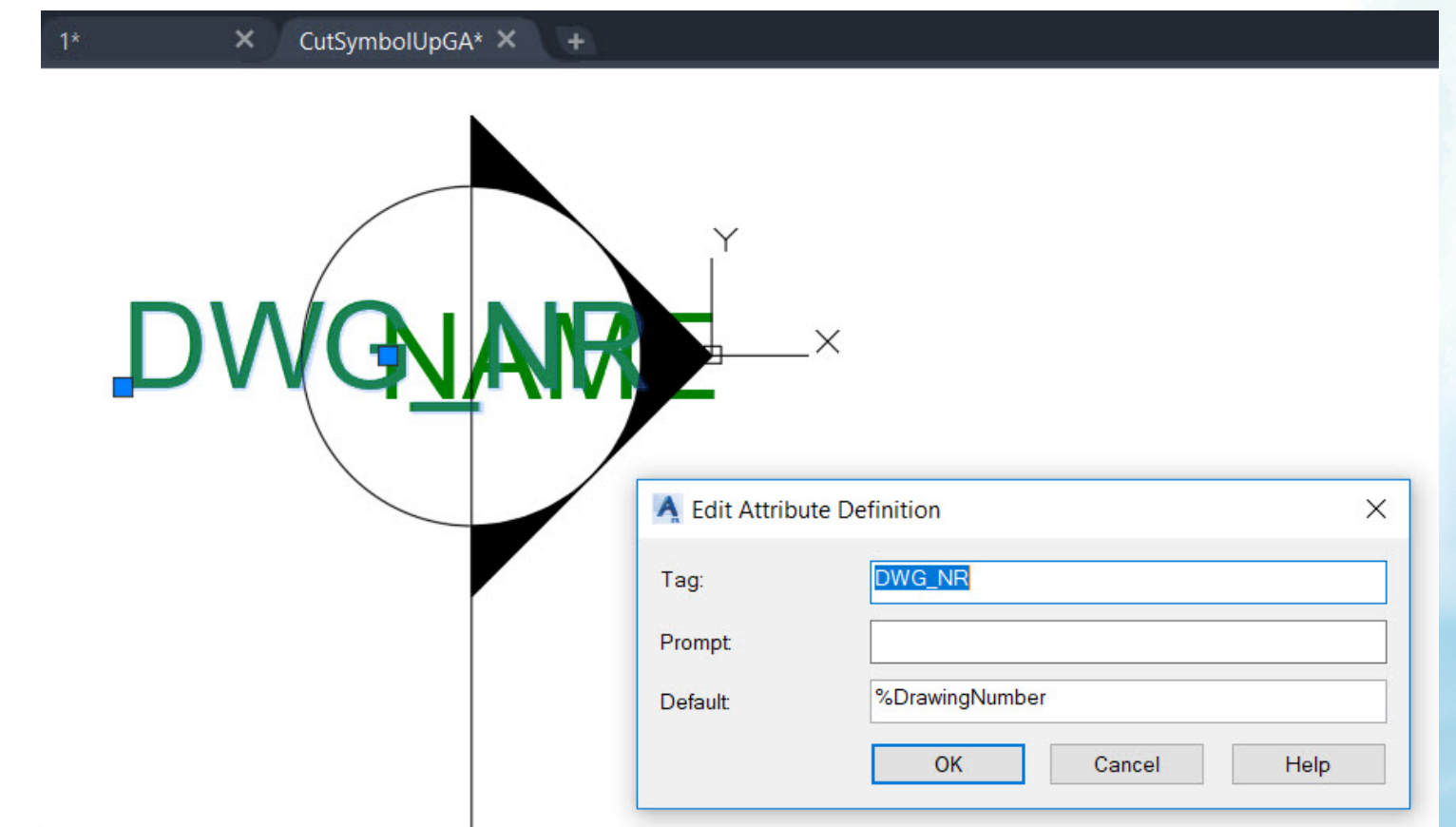
- Cut view title name
 - New tokens available
 - Scale
 - View number (e.g. A-A)
 - View number (e.g. A)
- Customizable within the Drawing Styles Manager



Get more information within the cut view titles on drawings

Cut views enhancements 2/3

- Cut symbol customization
 - Defined in DWG files
 - Upper and lower cut symbols
- Defaults available in the MT
 - General arrangement drawings
 - Shop drawings
 - Weld preparation detail



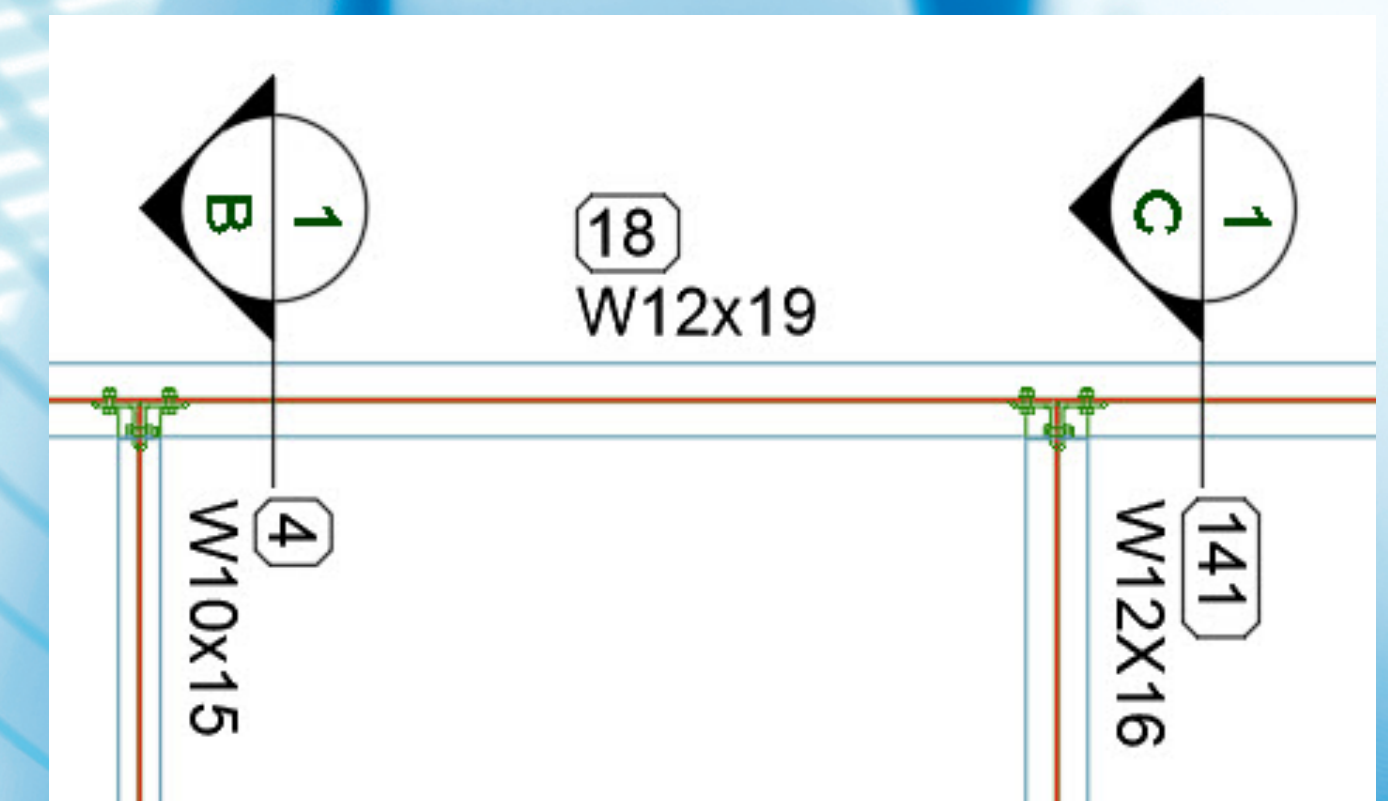
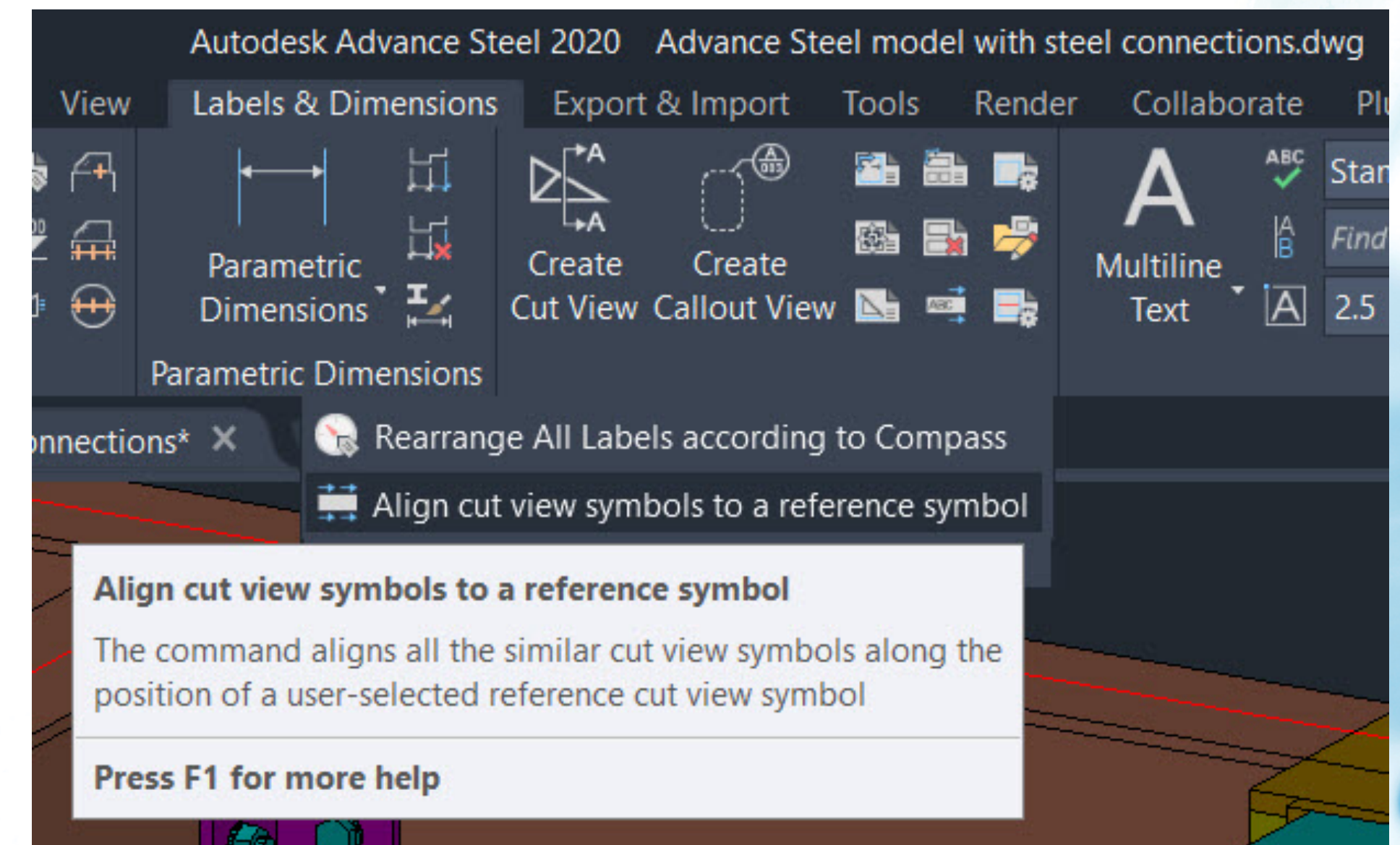
ADVANCE STEEL MANAGEMENT TOOLS		
AdvanceSteel		
Drawing-Labeling General Text	Property Name	Property Value
	Cut symbol down dwg file for General Arrangement cuts	CutSymbolDownGA.dwg
Drawing-Presentation General	Cut symbol down dwg file for shop drawings cuts	CutSymbolDown.dwg
	Cut symbol down dwg file name for weld preparation cuts	CutSymbolDown.dwg
	Cut symbol up dwg file for General Arrangement cuts	CutSymbolUpGA.dwg
	Cut symbol up dwg file for shop drawings cuts	CutSymbolUp.dwg
	Cut symbol up dwg file name for weld preparation cuts	CutSymbolUp.dwg
	Distance between cut symbols and objects	0' 0 1/4"

More control on cut view content on drawings

Cut views enhancements 3/3

- Cut view symbols alignment
 - New command in the ribbon
 - Based on a user-selected reference
- Cut view titles manual placement retained during a drawing update

More control on cut view content on drawings

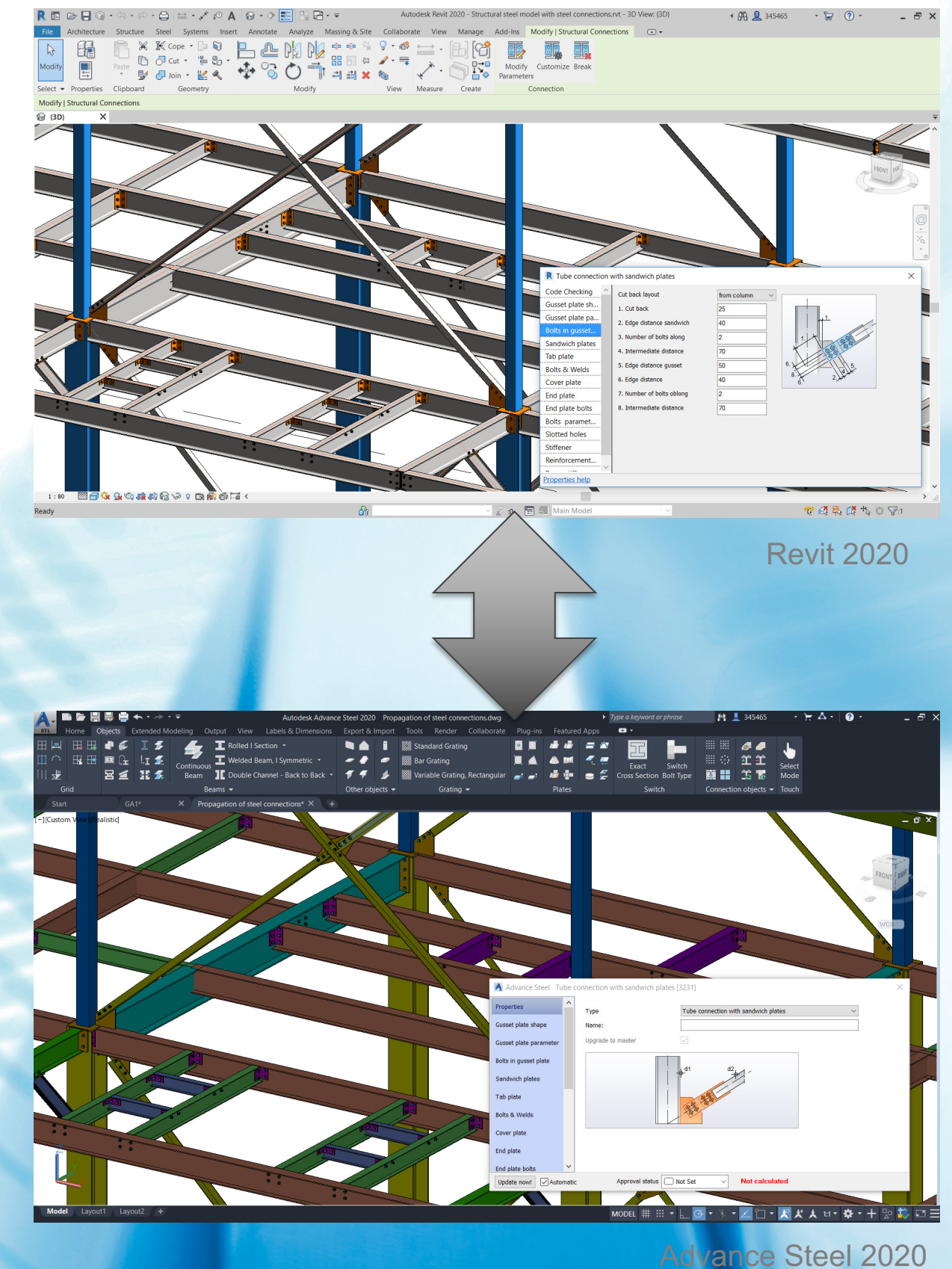


Interoperability



Enhanced interoperability with Autodesk® Revit® 2020

- Advance Steel 2020 Extension
- One mapping system only:
 - Rule-based transfer (with GTCMapping databases)
 - Easier management by the user
- Option added in Settings dialog to ignore beam shortenings

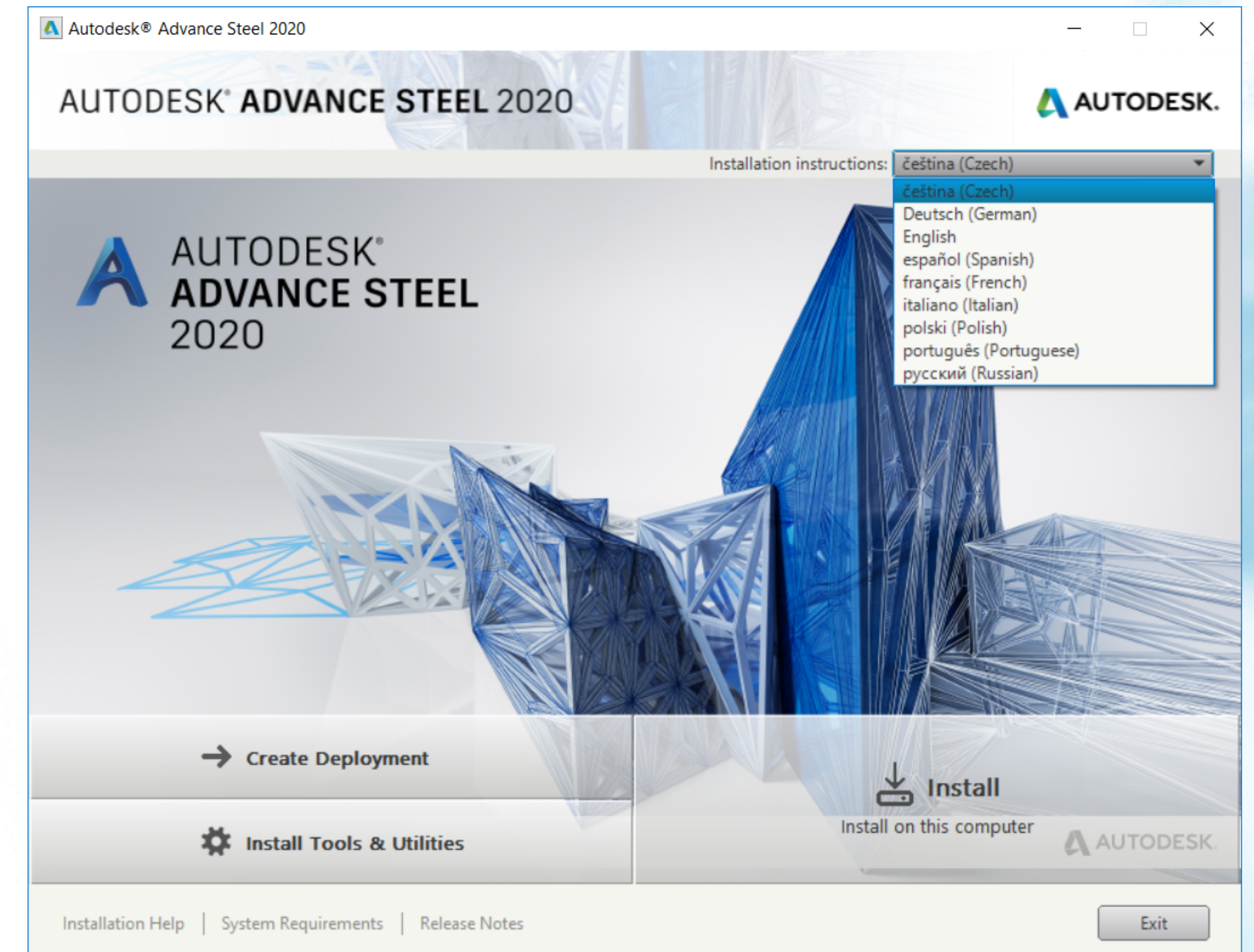


Connect design and fabrication & share LOD350 model information

“Advance Steel 2020 Extension” is a separate extension downloadable from the Autodesk Desktop App, should be available in Q2 2019”

Installation in Czech language

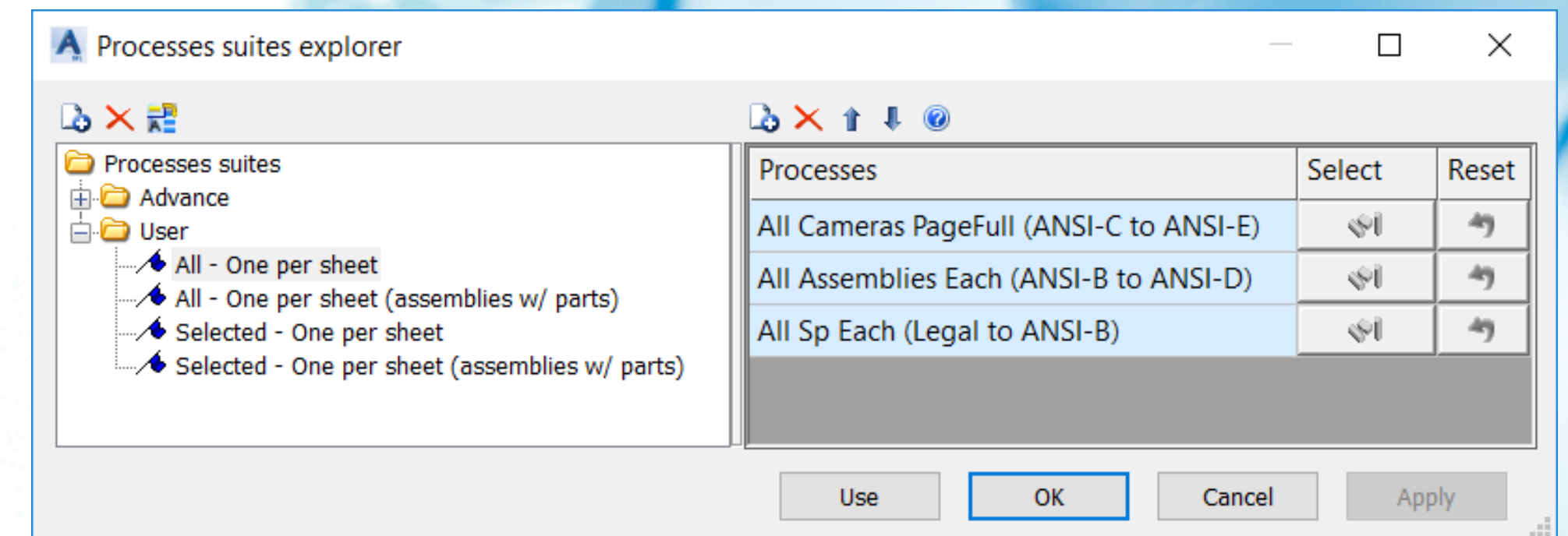
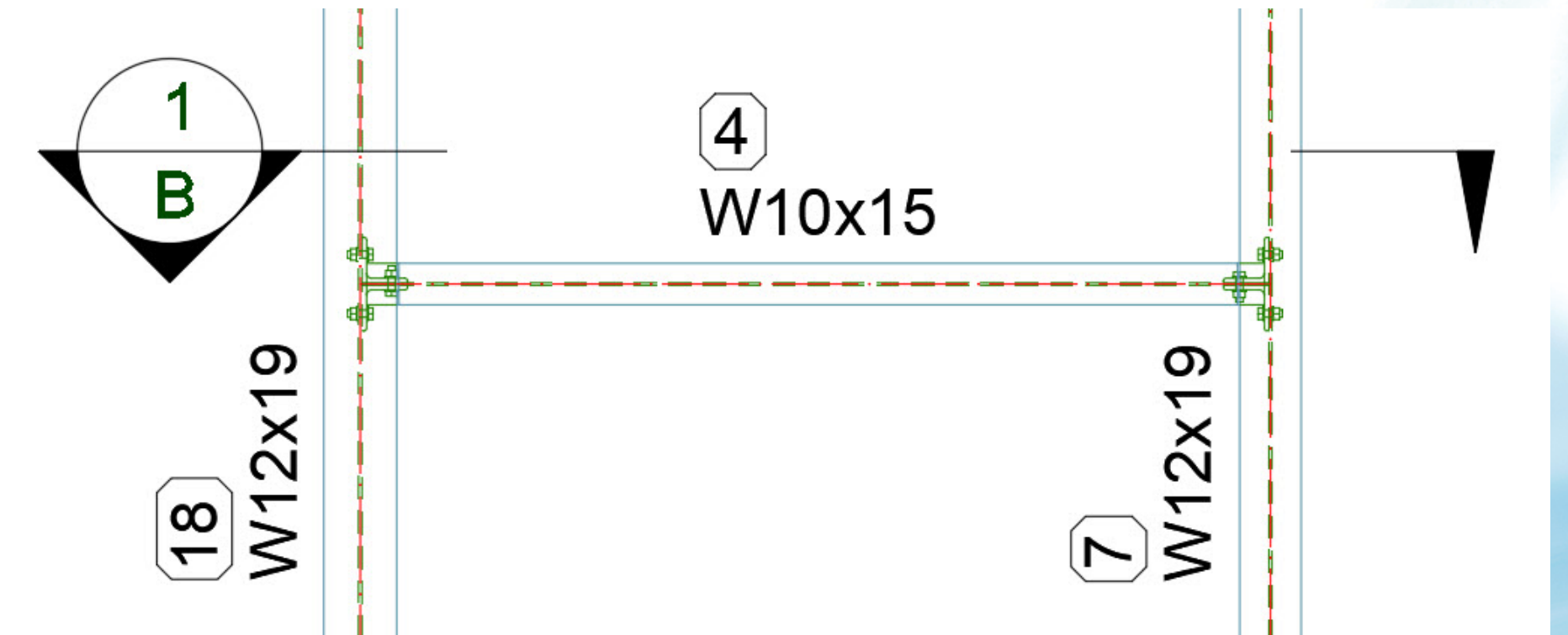
- User Interface translated in Czech language
- Ready-to-use dedicated templates available:
 - Shop drawings drawing styles
 - General arrangement styles
 - Bill-of-material templates



Help Czech end-users to use Advance Steel in their native language

Local content for US English

- New cut symbol added for General Arrangement drawings
- New process suites added to speed up shop drawings creation



Support productivity with better drawings obtained out of the box

Learn more

What's New in Advance Steel 2020 playlist on YouTube

<http://autode.sk/AS2020>

Product Center

www.autodesk.com/advancesteel

Advance Steel in action videos

<http://autode.sk/AdvanceSteelVideos>





Obrigado

감사합니다

Gracias

Merci

شكرا لك

Thank you

Ευχαριστώ

Danke

謝謝

شكرا لك

موتو

موتو





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Make anything™

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