How to handle large projects in Advance Steel

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Learning Objectives

• Know the meaning of 'large project' in Advance Steel and what to look for

• Choose the right method(s) to work on large 3D model (xRef, split, multi-user)

• How to approach detailing and finishing phase for large projects

• Know best practices and performance recommendations for working on large projects
About the speaker

Emy Nestor

Emy is working as Senior Technical Support Specialist, helping users and partners with their questions and issues with Autodesk products. He has an extensive experience with Advance Steel for more than 17 years, as part of the Development and Support teams, and as end user for wide range of projects. Emy enjoys sharing the Advance Steel knowledge and helping users to get the most of it. He led the “Build Your Advance Steel IQ” webinar series and the “Advance Steel – OnDemand” video series.

Emy has a MSc Structural Engineering degree from the Technical University of Construction Bucharest, Romania.
The meaning of “large” project in Advance Steel
Advance Steel projects

Great examples: Advance Steel Projects Gallery
“Large project” – what to (not) look for

It is *not* about Weight!

<table>
<thead>
<tr>
<th>Weight ratio</th>
<th>200</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Complexity” ratio</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
“Large project” – what to look for

I. 3D model → number of Advance Steel objects
   - Elements: profiles, plates, bolts etc.
   - Processing: holes, cuts, weld preparation etc.
   - Other objects: model views, nodes & loads, grids etc.

II. Output documentation → number and type
   - Detail drawings
   - External BOMs
   - NC / DXF files

III. Hardware
   - CPU, RAM, Graphical card
   - Storage type: HDD or SSD
   - Project location: local or shared network
Project size categories

- Main criteria: Number of Advance Steel objects

<table>
<thead>
<tr>
<th>No of objects</th>
<th>Project size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 25.000</td>
<td>Small</td>
</tr>
<tr>
<td>~ 50.000</td>
<td>Medium</td>
</tr>
<tr>
<td>100k-150k</td>
<td>Large model</td>
</tr>
<tr>
<td>250k</td>
<td>Very large model</td>
</tr>
</tbody>
</table>

- Project size ↔ Computer performance
“Large project” – Special mentions

• Special parts: complexity & number

• Compound beams

• Array of features
Methods to handle large projects in Advance Steel
1. External Reference (xRef)

- The AutoCAD feature allowing to attach (insert) a drawing as External reference to the current drawing.
  - When a referenced drawing changes, it will notify & update the drawing referencing it
  - Ability to cross-reference drawings
  - Ability to work on each drawing separately

- Useful resources:
  - About Attaching and Detaching Referenced Drawings (Xrefs)
  - About Improving Performance When Using Xrefs
  - AutoCAD Tips and Tricks to Improve Efficiency
External Reference (xRef) – for Advance Steel

- Complex projects → Separate models for each independent structure
- Each model is treated like a complete project:
  - Numbering
  - Detailing: shop drawings, erection drawings
  - BOMs, NC, DXF files
- Central model → combine all models using xRef
  - Main purpose: Coordination
  - Detailing: general arrangement drawings for the entire project
  - NOT for BOMs or any other documents
External Reference (xRef) – for Advance Steel
External Reference (xRef): Attention!

- Set up common reference for entire project, across all models
  - Grids, levels

- Avoid numbering overlapping between models
  - Set up “ranges” for SP & Assembly numbers for each model
  - Consider using specific numbering prefix for each model

- Verify proximity / interactions between models
  - Use cross-references between models
  - Plan how to treat possible connections between models
2.1 “Split” model

• Dividing a single large model (structure) into smaller parts
“Split” model – Two paths

Option 1: Separate “projects”
- Treat each part of the model as complete project for shop documentation
- Create central model using xRef for general arrangement drawings
  - Similar workflow and recommendation as for xRef projects
  - Special attention to connections between the elements from 2 different parts
    - Idea: keep the connected elements in both models.

Option 2: Combine parts back into 1 model
- Work on each part as further as possible
- Combine the 2 parts back into a single model / file
  - Most of modeling done in separate files
  - Then combine – Copy / Paste – the models into a new file. Finish the connections for entire model.
  - Then continue working like for any other project: numbering, detailing, BOMs, NC / DXF files
2.2 “Split” model - Nesting

- Divide a single model in components / modules, in a hierarchical structure
  - Create the complete model by combining the modules in levels, using nested xRefs (xRef in xRef in xRef ...)

- About Nesting and Overlaying Referenced Drawings
“Split” model – Nesting example
“Split” model - Nesting

• The workflow(s) and all recommendations from xRef are valid.
  o Additional attention to the common references between sub-modules

• Use the “project logic” to split it into different models / parts
  o By separate buildings; by phases; by functionality

• Plan ahead the project & sub-models folders structure and location
  o Special attention to “Relative” vs. “Absolute” path for xRef

• Suitable especially for complex projects
3. Multi-user tools in Advance Steel

- Multiple users connecting to a central model and working in parallel
- Each user works on a part of the central model
- Receive instant notification about parts modified by other user

**Workflow:**
- Each user creates a temporary model (empty);
- Connect to the central model;
- Check-out (get) elements;
- Work: edit, add, remove etc.;
- Check-in (publish) back into central model.

Multi-User Tools
Multi-user tools - Remarks

- “Multi-user” feature applies to 3D model / modeling phase only.

- No changes are allowed directly in the central DWG.

- Know (and use) the difference between “Complete check-out” and “Partial Check-out”

- Flexible in terms of number of check-out elements
  - But avoid testing limits 😊
Detailing and finishing phase for large projects
Detailing and finishing phase

- **Multiple users working on the project detail drawings**
  1. Project saved on a shared location (*mapped network drive)
  2. Each user opens any detail drawing directly from the shared location.
    - No need to open the model while working on detail!

- *** Map network drive**
  - [Advance Steel 2019 Implementation Guide](#)
    - Setting up a mapped network drive
    - Working with an Advance Steel project located on a network address

- **Consider generating details in separate folders**

- **Generate NC / DXF files “on-demand”**
Best practices & recommendations
Best practices & recommendations

• All users to have the same databases & configuration
  o Sharing databases
  o Have a system to transmit & update the configuration:
    ▪ BOM templates, prototypes, symbol DWGs, custom connections, standard parts etc.

• Consider use of “Settings profiles”
  o Especially useful for projects with very different requirements
    ▪ E.g.: Imperial / Metric projects

• Double-verify the model prior finishing phase
  o Numbering: up-to-date
  o Drawing Processes as verification tool
Best practices & recommendations

• Keep the project in good health
  o Purge + Audit + Model Check
  o Document Manager → “Up-to-date” documents

• Dedicated webinar about investigating projects:
  o 22. First Aid in Advance Steel - Investigate and Troubleshoot

• Dedicated article for performance recommendations:
  o Performance recommendations to consider when working with Advance Steel product
Thank you!

See you on our Q&A session!