Lessons Learned Implementing Advance Steel Workflows

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Learning Objectives

- Discover best practices for training new Advance Steel users
- Discover how planning and resource dedication improves effectiveness of integrating new technologies
- Discover best practices for new technology implementation
- Discover how best to utilize the power of Advance Steel to process complicated details

Description

This will be a review of an initial Advance Steel software workflow implementation plan, and an analysis of what worked well and what needed to be changed. We will present descriptions of training plans, integration of Advance Steel software into actual production orders, and ways to balance project deadlines with the learning of new software on major projects. We will share best practices for training new employees with no previous 3D AutoCAD software experience. And we will discuss an update on integration of Advance Steel software with production equipment using both NC and XML output, as well as future workflow integration and next steps.

Your AU Experts

Graduate of Fanshawe College, Architectural Technology. Over 16 years’ experience in the Steel Building Industry as a Structural Steel Detailer and Checker, and Drafting Technical Coordinator.
Training Strategy

- Basic and Intermediate training was initially provided by Graitec Inc.
  - 1 week of basic training
  - Additional week for intermediate training after we used the software on real life projects
- Select a small group of technically competent staff as well as knowledgeable in Company standards to set-up software and test new workflows.
  - Allow for extra time to process initial projects using 3D workflows. It will take time to master the software and perfect new workflows.
  - Select a Technical Leader to manage the implementation.
- Once all company standards were setup in Advance Steel, we created Steelway specific training sessions on Basic and Intermediate detailing for the Drafting Department.
  - Keep it simple and straight forward
  - Create a library of training videos (short clips approximately 10 minutes long)

Planning of Software Setup and Integration

- Outsource drawing style editing base on marked-up project drawings until one or more team members can be trained using the Advance Steel Drawing Style Manager.
• Create and Organize a task list
• Incorporate company standards in Drawing Templates, Shop Drawing Detail Styles etc.
• Create a library of connections that include connections available in the Connection Vault in Advance Steel as well as creating custom connections.
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- Create a Detailing and Checking Manual describing all aspects of how to best detail.

Main Challenges

- No previous 3D AutoCAD software experience in the Drafting Department.
- Integrating in-house designed computer programs with Advance Steel
  - Shipping List Editor
  - Plate and Hot Rolled Cut Lists
  - Designate an IT associate to help with the integration of the software with all company software’s and shop machinery
- How to best use Advance Steel and its DSTV output capabilities (i.e. NC and dxf)
- How to integrate a new detailing tool in real production orders, during our busy season?
- Tradition – “We’ve been doing it this way for years!” “Why do we need to change are methods?”
**Advance Steel Implementation**

- Split up the implementation of the software in ‘easy to manage’ stages.
- A 5 stage implementation was chosen as the most effective way to get the Drafting Department to start using Advance Steel and for the owners to see early benefits in their software investment.
  - **Stage 1:** Detailing Cold Form Sections
  - **Stage 2:** Detailing Hot Rolled Sections
  - **Stage 3:** Detailing Tapered Beam Sections
  - **Stage 4:** Approval and Erection Drawing Sets
  - **Stage 5:** Estimating material Take-off
- Stage 1 was considered as a relatively easy transition for detailers to adapt to the change, from 2D to 3D.
  - Learn the basic rules of 3D modelling
  - Familiarizing in navigating around the software
- Stage 2 was considered a detailing process that did not pose much time to the setup and implementation.
- Stage 3 is considered the most difficult and will take time and additional resources to complete.
- Stage 4 will be worked on in conjunction with stages 2 and 3. The fine tuning and finalizing of procedure to be implemented after Stage 3.
- Stage 5 will be focused on training Estimators on using Advance Steel to effectively obtain material take-offs for accurate estimates.
Stage 1 integration – Questions to Ask

- What component is widely used and will be most affected when modelling in Advance Steel?
- What detailing process can provide a ‘Low Risk – High Gain’ condition?
- How can we integrate this 3D detailing stage with the rest of our 2D detailing process?

For Stage 1 at Steelway we chose to detail Cold Rolled Sections. Cold rolled sections are major components in the Pre-Eng Building Industry whereby they connect to the primary building structure and act as supports for roof and wall coverings. We needed to understand how to efficiently detail these components first in order to be successful in the later stages of implementation.

Challenges encountered in Stage 1

- Not all of our cold rolled shapes were available in Advance Steel.
  - Include all shapes by manipulating the database file AstorProfiles
- Creating and testing of our custom connections
- Determining best method of generating the purlins and girts – Automatic versus manual insertion
  - Used Graitec’s Powerpack for Advance Steel to help import a building model direct from our steel building design program.
• Continue our Cold Rolled Detailing Process where no shop drawings are produced.
  o Interpreting the ‘NC’ output
  o Ensuring that the Roll Forming Mill was able to read the ‘NC’ output correctly regardless of how the section was modelled (i.e. ‘left to right or ‘right to left’)

Successes achieved in Stage 1
• Using the ‘NC’ output function provides unlimited hole locations on cold form sections.
• Significantly reduced having to create custom clips and connections, in our most unique building designs.
• Reduced the number of our standard stock clips.
• Able to detail complicated connections with ease.
• Utilized the ‘xml’ output feature to import the cold form sections into our Shipping List Program.
• Reduced detailing and checking time for our Heritage Building Product.

Unanticipated challenges in Stage 1
• Difficult to check if all holes were applied to a section
  o Created a check list to help identify potential errors in the model.
• Improper modelling techniques = poor output
  o Created training videos to help correct improper methods.
• Not enough checkers to check the 3D models
  o The number of checkers will increase as users become more comfortable with the software.
• Machine Capabilities: theoretical versus actual
  o Test out all possible scenarios with test pieces to physically measure and to help make adjustments to calculations.
Stage 2 Integration – Questions to Ask

- How can we use what we learned from Stage 1 and apply it to Stage 2?
- Will this stage be an easy transition for everyone to handle?
  - Answer should be ‘Yes’. If not, move this integration to a later stage.
- How can we integrate this stage in 3D detailing with the rest of our 2D detailing process?

For Stage 2 we chose to detail Hot Rolled Sections. Since detailing Hot Rolled Sections is what Advance Steel specializes in, introducing this stage to our Drafting Department will be an easy transition.

Challenges encountered in Stage 2

- Creating and testing our standard connections – using both the Connection Vault and Custom Connection tools
- Automatic generation of the beams versus manual insertion
- Setup and testing for using the ‘NC’ files with our FICEP/Saw Line machine.
  - Outdated Ficep/Saw Line controller

Successes achieved in Stage 2

- Reduced detailing and checking time in our most unique building designs.
- Able to produce visually effective erection details of complicated connection designs.
  - This will help to finalize procedures in Stage 4.
- Able to detail complicated assemblies and produce shop drawings with ease.
- Utilized the ‘xml’ output feature to import the hot rolled sections into our Shipping List Program and Cut Lists Editor Program.
- Utilized the ‘DSTV’ output files (i.e. NC and dxf) to assist our Production Programming Department

Unanticipated challenges in Stage 2:

- Lack of room on a shop drawing to display all parts for complex assemblies
  - Opportunity to reduce what information is displayed
  - Opportunity for our Manufacturing facility to use tablets on the shop floor.
- Our Programming department quickly became a bottleneck in getting work to our manufacturing facility.
  - Recognition that the ‘DSTV’ output files are necessary and importing to help improve efficiency.
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Stage 3 Integration – Questions to Ask

• Do we have enough resources to help with the integration of this stage?
• How can we use what we learned from all previous stages?

For Stage 3 we chose to implement and detail Tapered Beam Sections. This will be the most difficult stage to implement due to the complexity of modelling these shapes and the many different manufacturing processes involved to fabricate a Tapered Beam.

Potential Challenges for Stage 3

• The Tapered Beam feature is fairly new in Advance Steel
• Setup and testing for ‘DSTV’ and Weld files that will be used by our manufacturing equipment.

Early successes in Stage 3

• Able to quickly produce accurate shop drawings.
• Using Graitec’s Advance Powerpack to help import an xml file direct from our steel building design program provides an accurate and parametric 3D representation of the building design.

Stage 4 Integration

• Creating Approval and Erection (General Arrangement) drawings using cameras
• Developed a LISP routine to help place cameras around the model semi-automatically.
• Develop automated modelling routines using Advance Steel’s API.
• Develop a change management process

Stage 5 Integration

• Train Estimating Department on how to produce 3D models to help estimate high complex projects.
  o Models can then be used by Engineering and Drafting.