

Exploit your AutoCAD investment with dedicated tools for structural steel detailing

Steel detailing organizations face a difficult business environment. With tight schedules, slim margins, and intense competition, you need a competitive edge to help grow your business. This paper explores how Autodesk® Advance Steel, a purpose-built steel detailing software solution based on AutoCAD® software, can give you that competitive edge and ease the transition from traditional 2D workflows to intelligent, model-based processes.

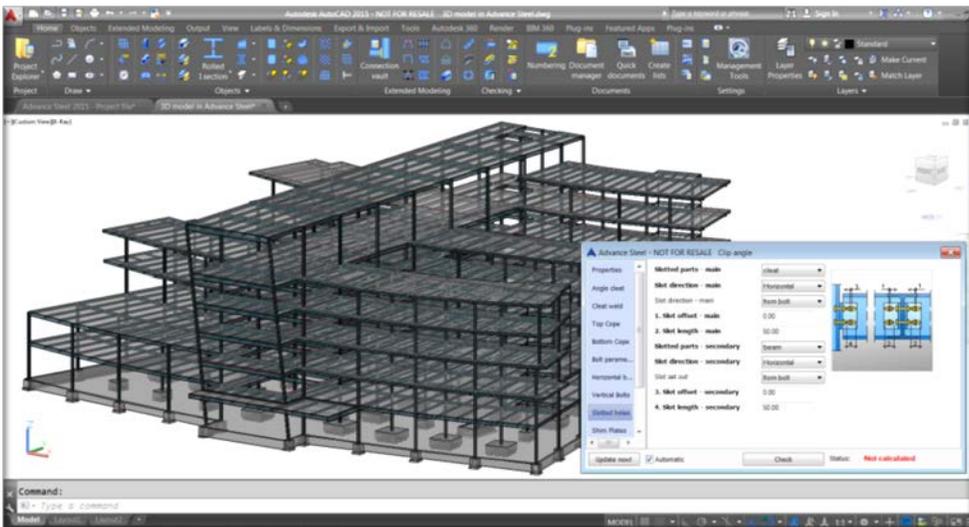


Figure 1: Built on the AutoCAD platform, Advance Steel detailing software provides intelligent 3D modeling tools that help you accelerate design and detailing, and automatically generate shop drawings and deliverables.

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Business challenges

Last decade's global financial crises and economic downturns resulted in fewer building projects, lower fee structures, and increased competitive pressure for steel detailing organizations. As the economy and the building industry slowly rebounds from that financial stress, many challenges remain. For example:

- Owners and clients are under pressure to deliver projects faster and cheaper. This results in compressed schedules and iterative design processes, where design changes must be accommodated through much of the steel detailing process.
- AEC project teams have become more geographically distributed, particularly with the increased offshoring of engineering services. To remain competitive, steel detailers need the ability to collaborate and exchange information with external team members.
- There is a chronic labor shortage of detailers in many areas. As a result, steel detailing organizations struggle to hire qualified staff with sufficient professional and software training.
- As more of the building industry migrates to Building Information Modeling (BIM), the use of information-rich 3D models for steel detailing is becoming an expected practice and sometimes a prerequisite for new business. But the initial investment costs of migrating to specialized model-based steel detailing software can be high, and be exacerbated by the need to retrain your staff on the new software—resulting in a prolonged return on investment.

Importance of BIM capability for project team selection	All BIM users
We require companies to be experienced in BIM.	28%
We encourage BIM expertise, but do not require it.	52%
BIM expertise does not affect our decisions.	19%

Source: McGraw Hill Construction, 2012

Figure 2: BIM capability is exerting a greater influence on evaluating companies for projects. For example, 81 percent of U.S. companies surveyed for the 2012 SmartMarket Report “The Business Value of BIM for North America” indicated that they consider BIM capabilities when making their selections for project teams.

Overcoming challenges with AutoCAD and Advance Steel detailing software

To help overcome these challenges and gain a competitive edge, successful steel detailing firms are turning to model-based detailing solutions like Advance Steel*. Built on the AutoCAD platform, Advance Steel helps improve efficiency by enabling you to generate workshop and general arrangement drawings, bills of materials, and CNC files automatically from a 3D steel model. These deliverables are linked to the underlying steel model, so the software *automatically updates* the deliverables whenever you update the model. This helps you improve both productivity and quality, particularly when reacting to numerous design changes.

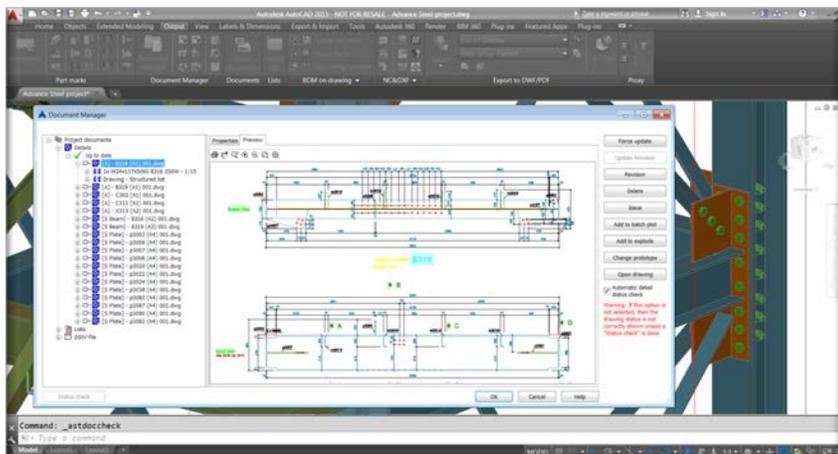


Figure 3: Drawings, bills of materials, and CNC files are automatically generated from and linked to the 3D Advance Steel model.

Information-rich model-based workflows provide several other significant benefits. For example, Advance Steel helps you streamline fabrication because model data can be directly exported to CNC files for fabrication. Model-based steel detailing capabilities can help your organization compete for and win projects that require BIM, which is a growing prerequisite for bidding on new work. In addition, Advance Steel provides interoperability with design and construction solutions like Autodesk® Revit® and Autodesk® Navisworks® software products, which help you collaborate more easily with designers and other contractors who are also using model-based BIM processes.

Advance Steel gives you access to familiar AutoCAD functionality plus tools built specifically for steel detailing, which can help provide a shorter learning curve for moving to new software as well as migrating from 2D to 3D workflows. For new staff, professional training needs can be partially offset by hiring candidates from the large AutoCAD user base.

In addition, a license to Advance Steel can also be purchased in a bundle with a license to AutoCAD¹, requiring less investment in software and implementation costs than certain other stand-alone proprietary steel detailing solutions. As a result, your firm can more quickly recoup software and training costs and realize a positive return on investment quicker.

Dedicated tools for structural steel modeling and detailing

Advance Steel includes comprehensive libraries of materials, sections, and bolts based on different steel codes and standards from around the world to suit your particular project needs. The software also includes design functions and a large library for faster and more efficient modeling of:

- common frames, bracings, purlins, side rails, and roofs
- steelwork such as stairs, railings, and ladders
- complex folded plates
- welded, tapered and curved beams

Advance Steel features customizable parametric steel connections that intelligently snap in place and instantly adapt to model changes. When creating a connection, the software analyzes the model to find if a similar situation has occurred in the past and (while considering structural integrity) suggests a more optimal connection. A wizard also helps you design connections, including the correct type and quantity of bolts, plate thickness, and so forth.

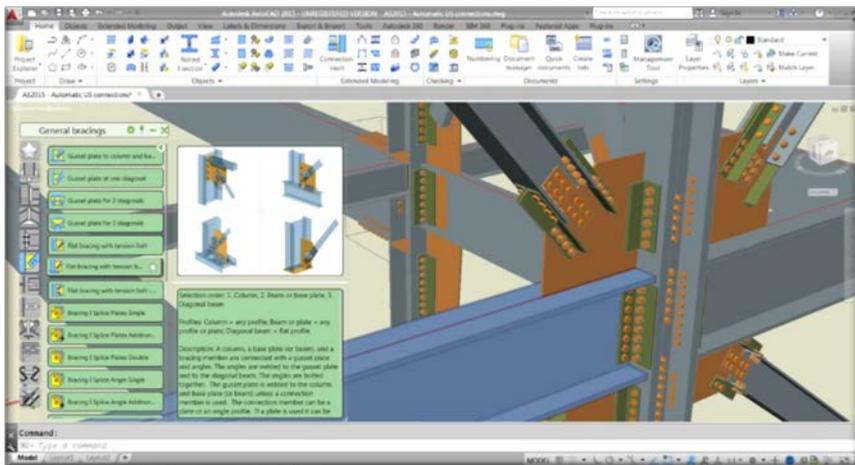


Figure 4: Advance Steel helps improve productivity by providing a parametric library of steel connections.

¹ The product name of this bundle is [Autodesk AutoCAD with Advance Steel](#).

Advance Steel includes tools for element collisions, physical access (for constructability), and consistency of part marks (for fabrication, delivery and assembly). The software also has specific tools and libraries for creating standard structures, stairs, railings, cage ladders, and spiral staircases.

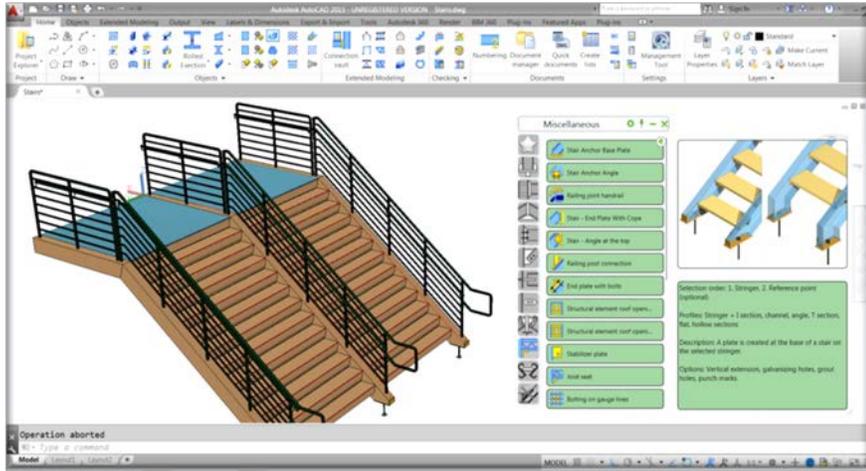


Figure 5: Advance Steel provides dedicated tools for stairs, railings and cage ladders.

Automates detailing documentation

Advance Steel enables you to automatically produce shop drawings and general arrangement drawings—complete with isometric, floor, elevation, and anchor plans. Since the software is built on the AutoCAD platform, there may be no need to recreate your firm's drawing standards. Single part and assembly drawings can be generated according to your needs as the drawing styles are easily customizable.

Using dialog boxes, you can define the numbering prefix, method, starting number, and increment of part marks. And with Advance Steel, material lists are automatically generated using templates that extract information directly from the data within the 3D model, helping to reduce creation time and supporting a higher degree of accuracy.

One of the most important features of Advance Steel is the ability to accommodate design changes during the steel detailing process. The software's model-based steel detailing approach means that when design changes occur, you just update the model and all affected deliverables are updated automatically, from shop drawings to CNC data. The software also includes an integrated revision control feature that creates revision clouds on updated drawings automatically.

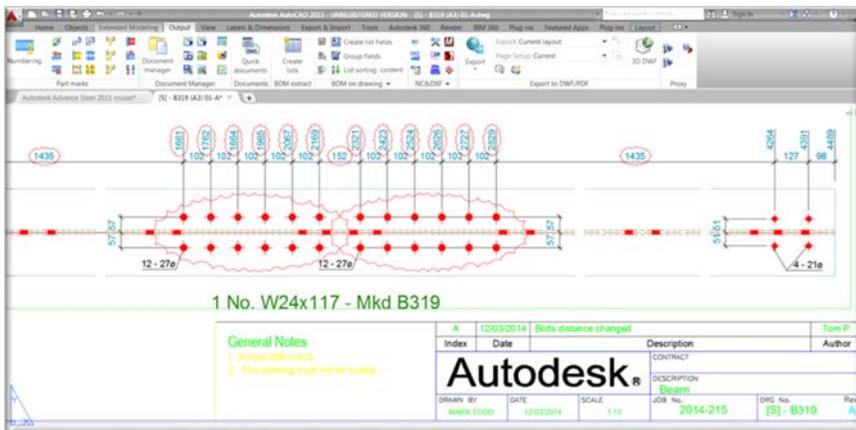


Figure 6: One of the most important features of Advance Steel is the ability to accommodate design changes throughout the steel detailing process more easily.

Drives fabrication

Model-based Advance Steel helps you reduce errors and waste in the shop and field because the drawings and CNC data are all derived from a common, coordinated steel model. The software automatically outputs CNC files via DSTV format for a wide variety of machines, as well as XML DSTV files for controlling welding robots. And as mentioned earlier, when the underlying steel detailing model changes, the CNC files update automatically.

Better interoperability

Model-based detailing processes helps you engage in BIM workflows more easily—using and sharing 3D models to help you collaborate with designers and contractors. Digital sharing of model data also improves your quality and productivity, because there is no manual recreation of data, and therefore no risk of input errors when sharing model data in this manner.

With Advance Steel, you can import 3D design models from the structural engineer as the starting point for your detailing effort. And you can export your steel fabrication model to the general contractor for project coordination with the other building disciplines. To facilitate more seamless data exchanges, Advance Steel supports major industry file formats including IFC, CIS/2, SDNF, and KISS. As an AutoCAD application, Advance Steel provides smooth file exchange between other AutoCAD project partners using the DWG format.

Furthermore, an important factor for steel detailing profitability is the ability to minimize rework due to changes from the design team. The interoperability of Advance Steel with design and construction software like Autodesk® Revit® Structure software and Autodesk® Navisworks® software products makes it easier for detailers and fabricators to collaborate and manage project changes with architects, engineers, and contractors, and become an integrated part of the BIM process. This requires more than just sharing a model once at the beginning of the detailing process. It requires iterating through several changes and sharing the final fabricated product model back to the design and construction teams for review, construction planning, and future lifecycle management activities.

Advance Steel features bidirectional integration and model synchronization with Autodesk Revit design software. This level of interoperability allows you to compare original and updated models and be alerted (for example) to new, changed, or deleted structural members. This helps reduce the risk of potential errors when design changes occur.

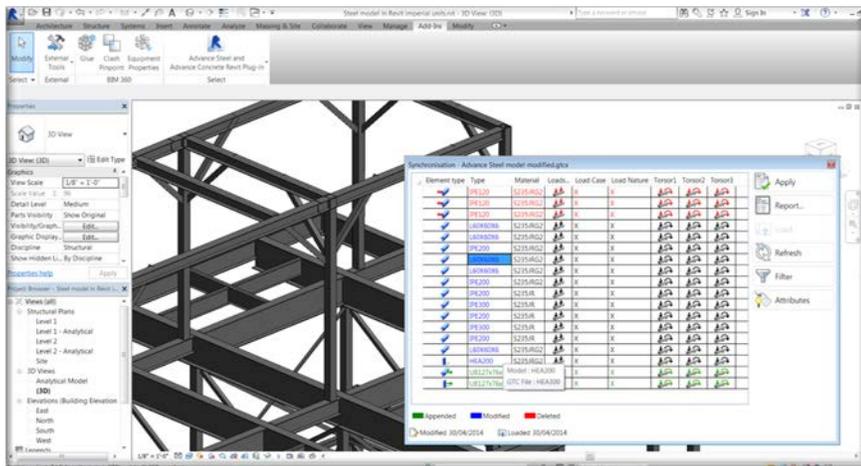


Figure 7: A dialog box highlights color-coded differences when synchronizing Advance Steel and Revit models.

In addition, sharing data with your project stakeholders can be streamlined by using cloud storage. Autodesk® Maintenance Subscription for Advance Steel includes the use of Autodesk® 360 cloud services, where you can store design and fabrication models and documentation in a central location that other team members in other organizations can access.

Conclusion

Information-rich, 3D model-based detailing processes have many inherent benefits over 2D, as evidenced by the transition of organizations around the world to 3D steel detailing environments. As the adoption of BIM by building teams and contractors continues to grow, so too will the demand for 3D modeling processes to enhance design and collaboration on complex projects.

Advance Steel gives you that 3D capability, providing a flexible modeling environment and powerful tools for connection design. Because it is built on the AutoCAD platform, Advance Steel can help to provide ease of adoption with a faster return on investment. The software's user interface is intuitive for existing steel detailers, and existing AutoCAD users. Furthermore, Advance Steel is priced very competitively compared to certain other 3D steel detailing software.

Advance Steel helps gives you the competitive edge you will need to grow your business and win more projects. For more information, visit www.autodesk.com/advancesteel.

**Use of a license to Autodesk Advance Steel 2015 requires a license to AutoCAD 2015.*

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