

Modern Steel Construction

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Speed Sound-Off

BY PATRICK ENGEL

Steel detailers and erectors discuss their impact on speeding up steel construction and how other industry partners can help them.

PERHAPS THE MOST OBVIOUS PART of any initiative focused on building steel structures faster is, quite literally, building faster. Spending less time on the jobsite and erecting faster is an easy way to measure construction pace, and AISC's Need for Speed initiative had several steel erection-related research projects, such as SpeedCore and FastFloor. Several newer or improved products help ironworkers erect steel faster. (Read about all of them in the "Meeting the Need for Speed" article in the February issue at modernsteel.com/archives).

The less tangible parts of jobsite speed are also important. Thorough steel detailing and forward-thinking steel erectors can slash time spent constructing a frame. And to achieve the speed differences, engineers and fabricators have roles in helping detailers and erectors make a significant impact on the project. *Modern Steel Construction* spoke with several erectors and detailers for their perspective on how they contribute to speeding up steel construction and how to help them do it.

What can other companies in the steel supply chain do to help you perform your role more efficiently to speed up a steel project?

John Bettin, CEO, SteelTek Unlimited: From the perspective of a miscellaneous steel detailing company, efficiency and speed in steel projects rely heavily on the support of other companies in the supply chain. Providing clear and accurate design drawings, specifications, and material information ensures the detailing process starts on solid ground. Open communication and collaboration, supported by regular coordination and the use of compatible technology, streamline workflows and resolve issues

quickly. Timely approvals of shop drawings and RFIs help avoid bottlenecks, while accurate material data and availability updates prevent rework and delays. These actions enable smoother and faster project execution.

Andrew Dobbie, executive vice president, Dowco, A DeSimone Company: Detailers possess extensive knowledge of diverse project types, standards, and codes. They are an invaluable resource for informed decision-making throughout the project life cycle. Companies can optimize their impact on project progress by changing the way they think about detailing.

The conventional industry approach has been to engage detailers during the later stages of development. But detailers, especially in-house ones like DeSimone's detailing division (borne of DeSimone's 2023 acquisition of Dowco), offer a deep understanding of the entire construction process, which can prove pivotal in helping expedite a steel project by months, depending on the size of the project. Their perspective is worth leveraging.

DeSimone integrating its detailers into the design phase—along with its structural engineers—has fostered effective collaboration between stakeholders, reduced RFIs during fabrication, and increased the likelihood of expediting schedules and meeting or shaving budgets. Engaging detailers early enables them to better identify constructability issues and design conflicts that might otherwise delay a project. A proactive approach accelerates project timelines and minimizes costly rework and change orders.

Mark Hoffa, project executive, Stonebridge Inc.: On the steel erection side, the biggest boost comes when all parties consider how to make the erection process smooth long before it starts. When steel erection goes smoothly, safely, and efficiently, everyone

looks good. Stonebridge Inc. has erected many projects that have complex connections, complex rigging, and multiple safety concerns. Working with all parties to simplify those areas while maintaining quality and safety can be a big win for speed of completion.

Albert Marskamp, vice president of engineering and detailing, Walters Inc: We encourage engineers, architects and general contractors to embrace BIM to a fuller extent. Many are happy to use it for collaboration, but then revert to paper drawings as the basis of contract and for all submittals and approvals. If engineers could hand over a Revit model as the basis of contract rather than “only for reference, the drawings govern,” it would significantly speed up the start of a project and avoid many RFIs related to member size and geometry. Connection loads in the model provided as metadata would also increase speed and reduce RFIs.

Srinivas Pagudoji, associate vice president, quality assurance & training, Moldtek: As the bridge between design and fabrication, detailers transform architectural visions into precise, workable plans. However, the efficiency of a steel detailer is heavily reliant on the collaborative efforts of the entire steel supply chain. To expedite steel projects, various stakeholders must consider strategic enhancements.

Firstly, accurate and timely communication is essential. Architectural and engineering firms should ensure that design drawings are comprehensive and clear. Ambiguities or errors in initial plans can lead to delays, as detailers spend valuable time seeking clarifications. Providing a well-documented design intent helps detailers create precise shop drawings with fewer revisions.

The fabricator and general contractor can help by adopting advanced technologies. Implementing BIM to review structural, mechanical, electrical, plumbing, deck, joist, concrete, wood, and all other trade models together helps identify conflicts between the trades. Other digital tools can facilitate seamless information exchange. When other trades share 3D models and digital data, detailers can integrate these directly into their detailing software, reducing manual entry errors and speeding up the drawing process.

Establishing standardized protocols across the supply chain can significantly enhance efficiency. Consistent standards in documentation, file formats, and communication channels ensure all parties are on the same page. Harmonization minimizes discrepancies and streamlines the workflow, allowing detailers to focus on precision, not problem-solving.

Additionally, fostering a collaborative culture is vital. Regular coordination meetings and feedback loops between detailers, architects, engineers, and fabricators can preemptively address potential issues. Early identification of design conflicts enables proactive solutions, thus preventing project delays.

Delays in the supply chain disrupt the steel detailing process by causing a lack of necessary materials like steel sections, fasteners, custom components, special coating or galvanizing delays, and shipping and logistics issues. They force detailers to make revisions, adjust schedules, and potentially redo drawings, impacting project timelines and efficiency. Reliable material delivery is crucial to keep detailing on track and prevent costly delays.

Greg Riccio, project manager, Danny's Construction Company: Early communication on any project is a critical part of driving structural steel erection success. As a steel erector, the opportunity to communicate with the steel fabricators before drawings are detailed and during connection design allows for early constructability feedback. Depending on the project, certain connections are preferred over others because they would allow for a faster structural framing installation. There are also many times where we would prefer gusset plates, angles, or other miscellaneous items to be delivered to the jobsite in a certain manner, such as loose or bolt to ship. Those preferences build efficiencies during the erection process that speed up the installation.

Another early engagement benefit is establishing strong communication and the development relationships among not only the steel fabricator and erector, but also the general contractor, engineering team, and other trade partners on the jobsite. Good communication, or lack thereof, can alter the flow between all the trades and impact the overall schedule.

Clifford Young, CEO, Anatomic Iron Steel Detailing: The best way to speed up any steel project is to use the design detailing process and start the steel detailing when the structural design is only 50% complete. Further, allowing the steel detailer to communicate directly with the design team permits the detailer to find and help resolve issues that could become RFIs. With weekly meetings, the detailer and the design team can resolve those issues in real time and integrate them immediately into the design. This process and the early start in detailing can combine to accelerate a project by three to six months.



John
Bettin



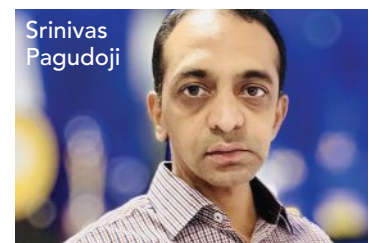
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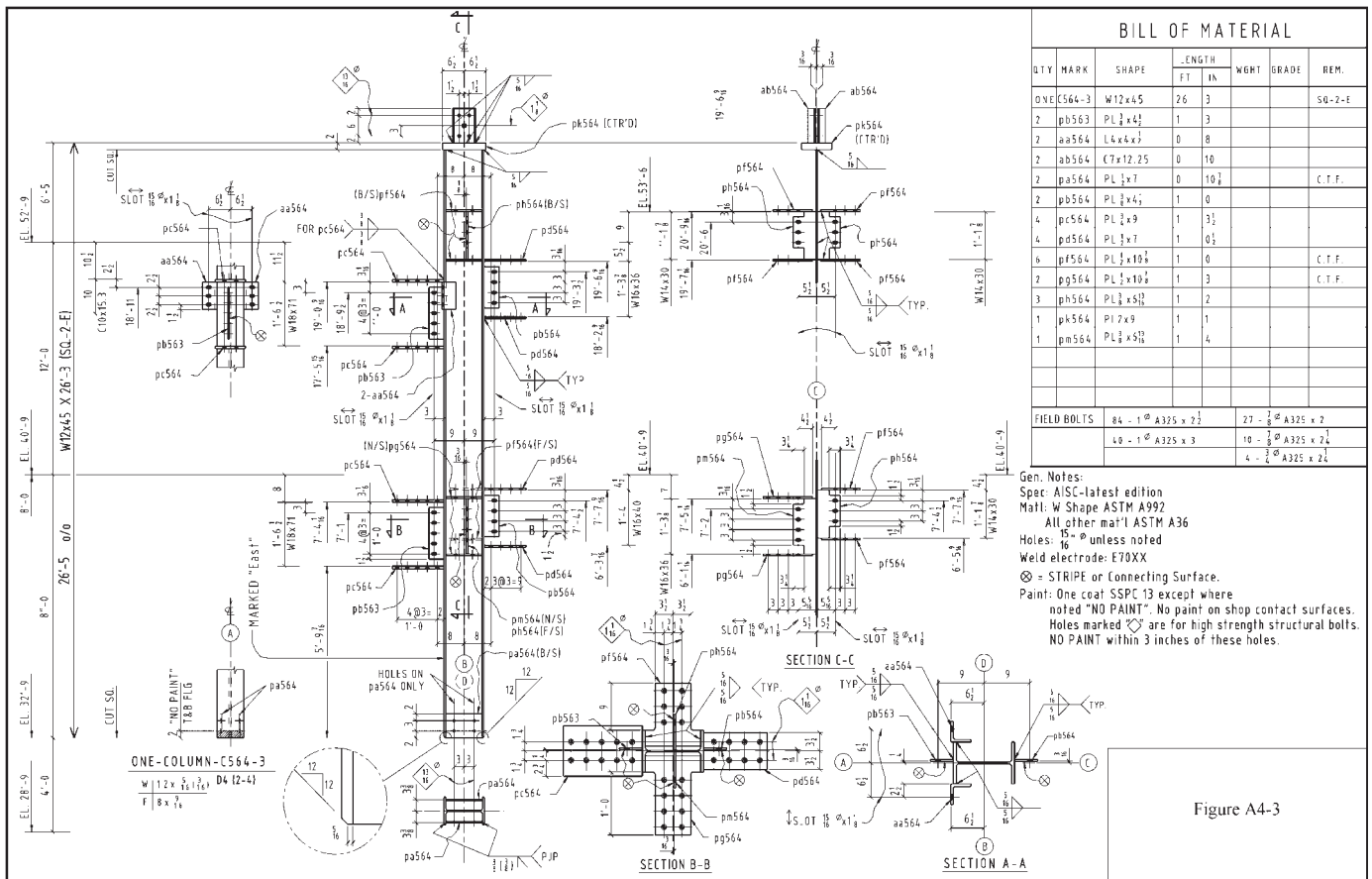


Figure A4-3

Provide an example of how your company helped accelerate a steel project.

Bettin: SteelTek Unlimited recently helped accelerate a large-scale structural steel project by providing custom BIM solutions that streamlined modeling workflows and reduced manual input, leading to faster project completion. Our team developed specialized plug-ins tailored to automate recurring tasks within Tekla, customized export features for seamless integration, and created intuitive issue management tools to track and resolve design challenges in real time.

By training the client's modelers on our software development kit and providing them with ready-to-use templates, we maintained consistent standards across the project that improved productivity and accuracy. The proactive support ultimately helped our client meet project deadlines with fewer revisions, achieving a smooth handover to their customer.

Dobbie: This year, DeSimone Consulting Engineering played a pivotal role in fast-tracking a large casino and hotel project, completing the journey from schematic design to onsite steel erection in just six months. Through a highly effective collaboration between our detailers and structural engineers (as engineer or record) from the outset, our integrated design and detailing team successfully mitigated potential issues early.

During the design phase, we generated nearly 300 proactive RFIs, resolving critical design and constructability concerns before they could impact downstream stages. Our comprehensive pre-construction coordination resulted in a smooth transition to fabrication, with RFIs dropping to just 50 during production, most due to unanticipated, last-minute owner or architect changes.

Ultimately, early collaboration ensured that the project stayed on schedule, with fewer disruptions than a typical process and a seamless path from design to construction. The measurable impact on project and cost highlights the value of early detailer involvement and how enhanced communication enabled by the close, in-house partnership between our detailers and structural engineers can accelerate project delivery and ensure high-quality outcomes.

Hoffa: The Buffalo Bills new stadium—which began steel erection last spring—has a canopy comprised of sloped painted rakers with infill tube steel matching the raker slope. Standard rigging methods would have been slow and unsafe, but OTH Rigging's remote-controlled load release for the infill tube steel eliminated the manual unhooking, drastically reducing lift times and enhancing worker safety through fail-safe technology.

Marskamp: For the past six years, Walters has encouraged a "Model to Truck" mindset with clients, engineers, and architects. The Model to Truck vision is a model-based digital workflow. It starts with the engineer's and architect's models as the basis of contract. The detailers build on the model to add in the steel connections and coordination items, then send the LOD 400 model back for review in lieu of paper or PDF drawings. The 3D model review process is faster and gives the design team much better insight into the final product, because the 3D model is a digital twin of the final product.

We have had many successes with teams who tried the Model to Truck mindset, but it continues to be an uphill battle in a paper-based industry. It requires the general contractor, engineer, and architect to be on board. If even one objects, the process defaults back to paper.

Pagudoji: Moldtek significantly accelerated a high-profile industrial battery plant project involving 47,000 tons of steel and a 3.1 million sq. ft area. With an aggressive timeline, we managed the complex scope, including over 700 trusses, seismic-resistant frameworks, heavy spliced trusses, and extensive miscellaneous steel components. By using advanced 3D modeling software and automated tools, we divided the project into seven 3D models with three teams working simultaneously, enabling precise detailing and early conflict detection. We maintained clear communication through weekly meetings with stakeholders, addressing over 600 RFIs and resolving issues promptly.

Moldtek's rigorous quality assurance and quality control review process ensured high-quality deliverables, reducing errors and speeding up fabrication and erection. The proactive approach allowed the client to meet the tight schedule, demonstrating our capability to enhance project timelines and client satisfaction.

Riccio: We helped accelerate a steel data center project in suburban Chicago. The data center was a retrofit of a partially functioning facility that added a structural steel platform on the roof as a dunnage platform for large cooling units. The platform covered the entire building and had structural framing installed at a radius of 280 ft at its furthest point. The logistics and parameters the crane operated within were tight; the existing building was on one side of the crane, a frontage road was on the other, and the job-site was near a major airport. The crane had a minimum radius to avoid interfering with airport operations. The crane needed to be reconfigured to reduce the amount of luffing jib to operate within those parameters throughout the structural steel installation.

As planning progressed, we engaged with the general contractor and mechanical subcontractor to sequence the project so steel could be erected from the furthest point away from the crane and so the mechanical subcontractor could use the crane before reconfiguring the luffing jib. The mechanical contractor set heavy cooling units immediately following framing installation and detailing. Once those were set, the luffing jib was reconfigured, and erection could progress on the dunnage platform. Setting the cooling units continued as the framing was installed and detailed.

A Manitowoc MLC 300 crane with 98 ft of main boom and 255 ft of luffing jib was selected because it could accommodate steel erection and the mechanical contractor's work. The two parties' close coordination allowed for smooth framing and cooling unit installation. It also accelerated the schedule for the mechanical contractor and other trades, because the cooling units were set earlier than anticipated.

Young: Anatomic Iron Steel Detailing accelerated the steel fabrication and erection of a university building in Montana with fabricator TrueNorth Steel by using the design detailing process. We communicated directly with the design team to resolve steel issues that would become RFIs under the normal detailing model. With model-based communication and direct collaboration with the design team and TrueNorth Steel, we resolved all issues as they arose, pushing the design and the detailing process forward. The result was TrueNorth Steel having columns already fabricated and erected in the field when the design team approved 100% issued-for-construction drawings.

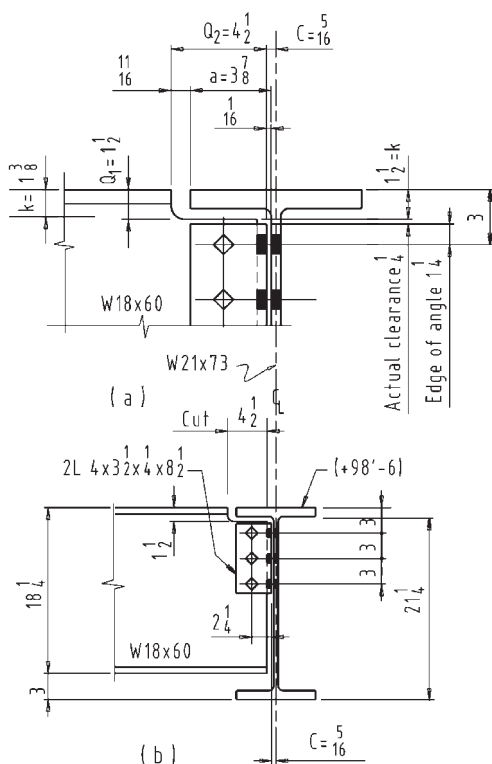


Figure 7-32. Cope, block or cut.



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Remote-controlled lifting hooks significantly sped up erection of a steel canopy in the Buffalo Bills' new stadium.



Setting airport hangar roof trusses as two assemblies and conducting a mid-air splice eliminated a crane and shoring.



Provide a brief example of how an erection technique, sequence or plan helped make a steel project go faster.

Hoffa: OTH Rigging remote-controlled lifting hooks significantly sped up the erection of the new Buffalo Bills stadium's steel canopy by allowing rigging teams to unhook loads remotely and efficiently. With their fail-safe design and remote-controlled functionality, the hooks eliminated the need for workers to climb structures to manually detach rigging, enhancing safety and reducing time. Their versatility in handling choker, basket, and direct setups made them ideal for adjusting to varying load types and positions required for the canopy installation. These features reduced downtime and improved productivity during the construction.

Riccio: In 2017, we mobilized onsite at a hangar replacement project at Chicago O'Hare International Airport. The initial project plan incorporated four crawler cranes for installing the door trusses and roof trusses. Two Manitowoc 999 cranes were used for each respective door truss (north and south truss). A Manitowoc 2250 installed the roof trusses, and a Manitowoc 12000 would be used for roof truss pre-assembly in stanchions.

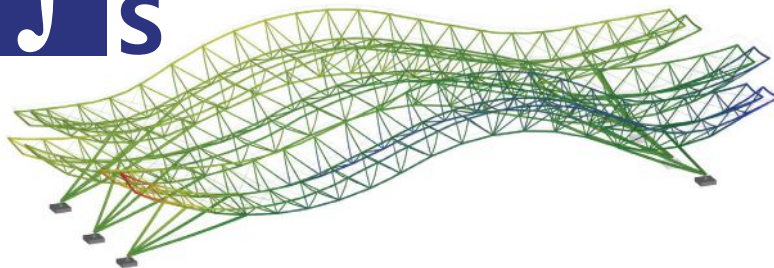
As the planning leading up to mobilization progressed, it was found that the project could be sequenced to allow the two Manitowoc 999's to set the roof trusses as two assemblies and conduct a mid-air splice to eliminate the Manitowoc 2250 and subsequent shoring that was needed to set the trusses as one assembly. The adjustment allowed for a more streamlined installation and eliminated substantial additional work needed for the shoring towers that would have supported the roof trusses in a temporary condition. ■



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