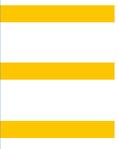




TEKLA SOFTWARE

in practice



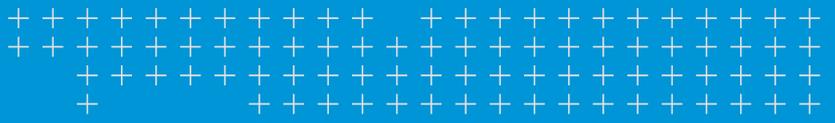
Midland Steel Reinforcement Supplies

Leading independent reinforcing steel fabricator, Midland Steel, has been using Tekla software to communicate its vast experience in business, across three main areas: detailing, fabricating and placing.

Solutions



Tekla Structures
Tekla BIMsight



overview

Building constructible models virtually before going to site in an effort to reduce risk, and using the software as a tool to facilitate this prefabrication approach to really complex projects.



Location
UK and Ireland

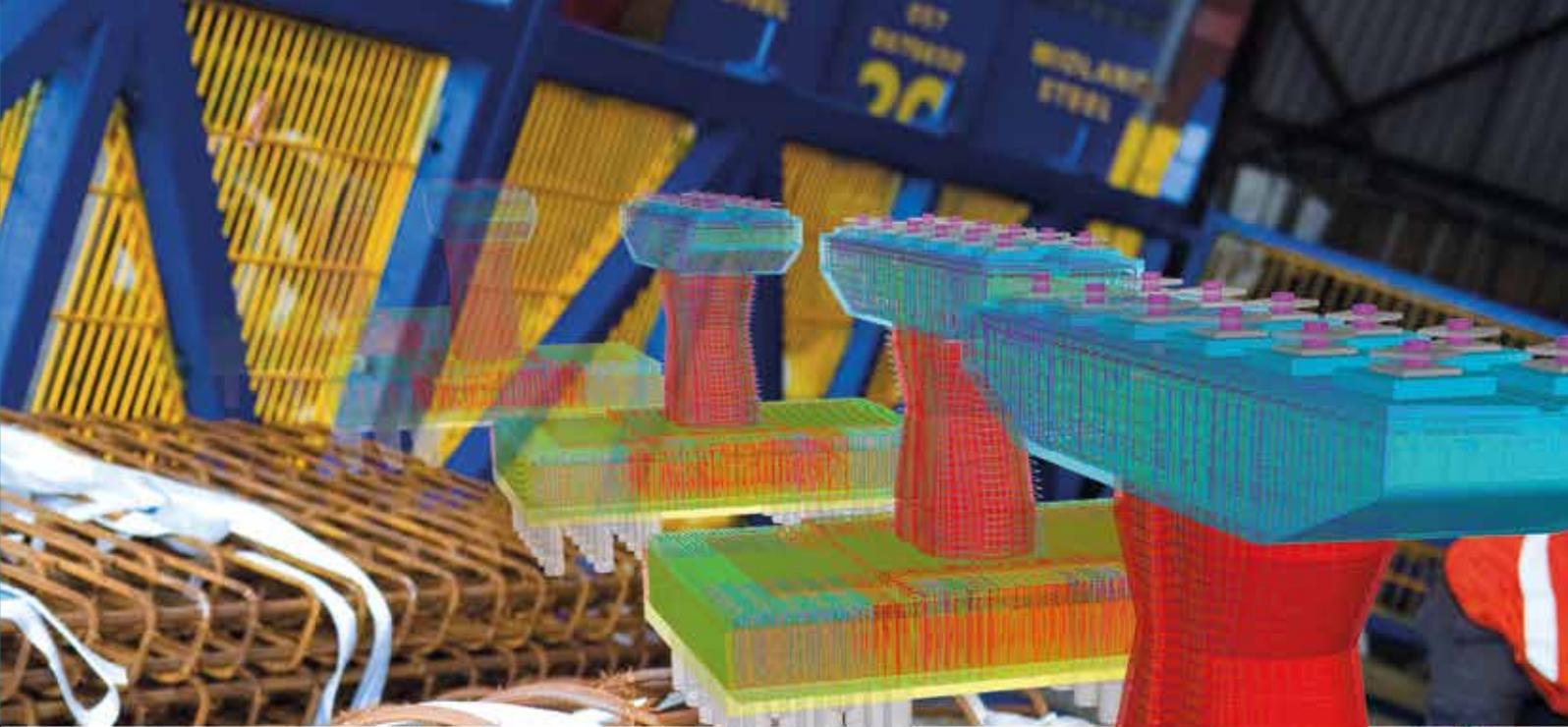


Midland Steel
Reinforcement Supplies

Midland Steel is the fastest growing reinforcing steel fabricator in the United Kingdom (UK) and Ireland and offers a diverse range of reinforcing steel products and accessories, including cut and bent reinforcement, standard and special fabric, and prefabricated cages.

From accredited cut and bent reinforcement and standard and special mesh products, through to advance 3D detailing and prefabrication services, Midland Steel have the technical capability and capacity to supply any reinforced concrete project, regardless of complexity or size.

www.midlandsteelreinforcement.co.uk



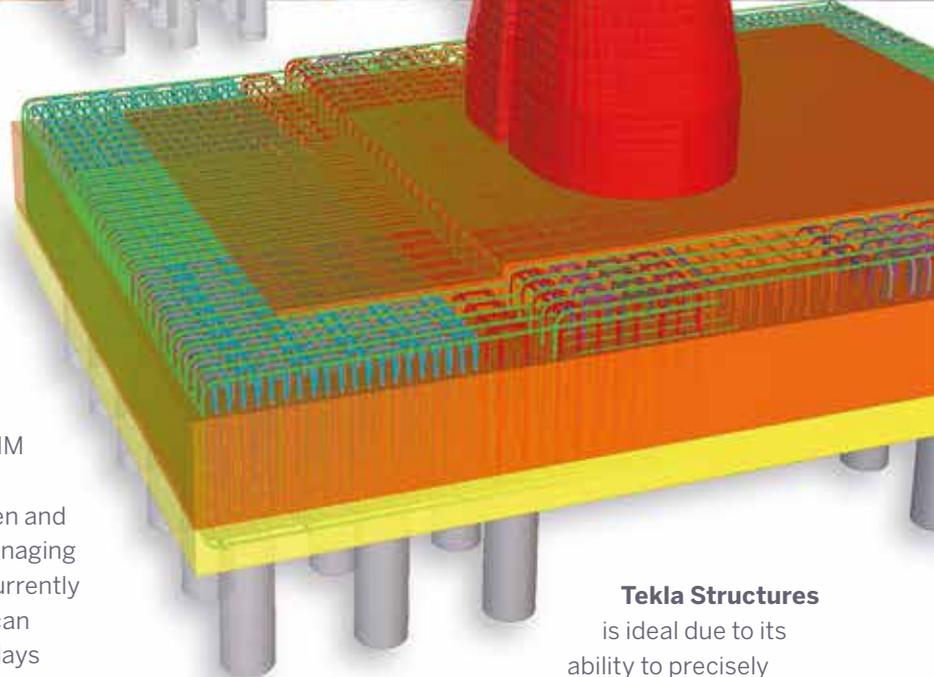
REBAR FABRICATING

In the top tier of independent fabricators in the UK and Ireland, Midland Steel's bent rebar fabricating operation centres on value engineering and rationalisation. As such, one of the key drivers to the business is to promote collaborative working within its industry.

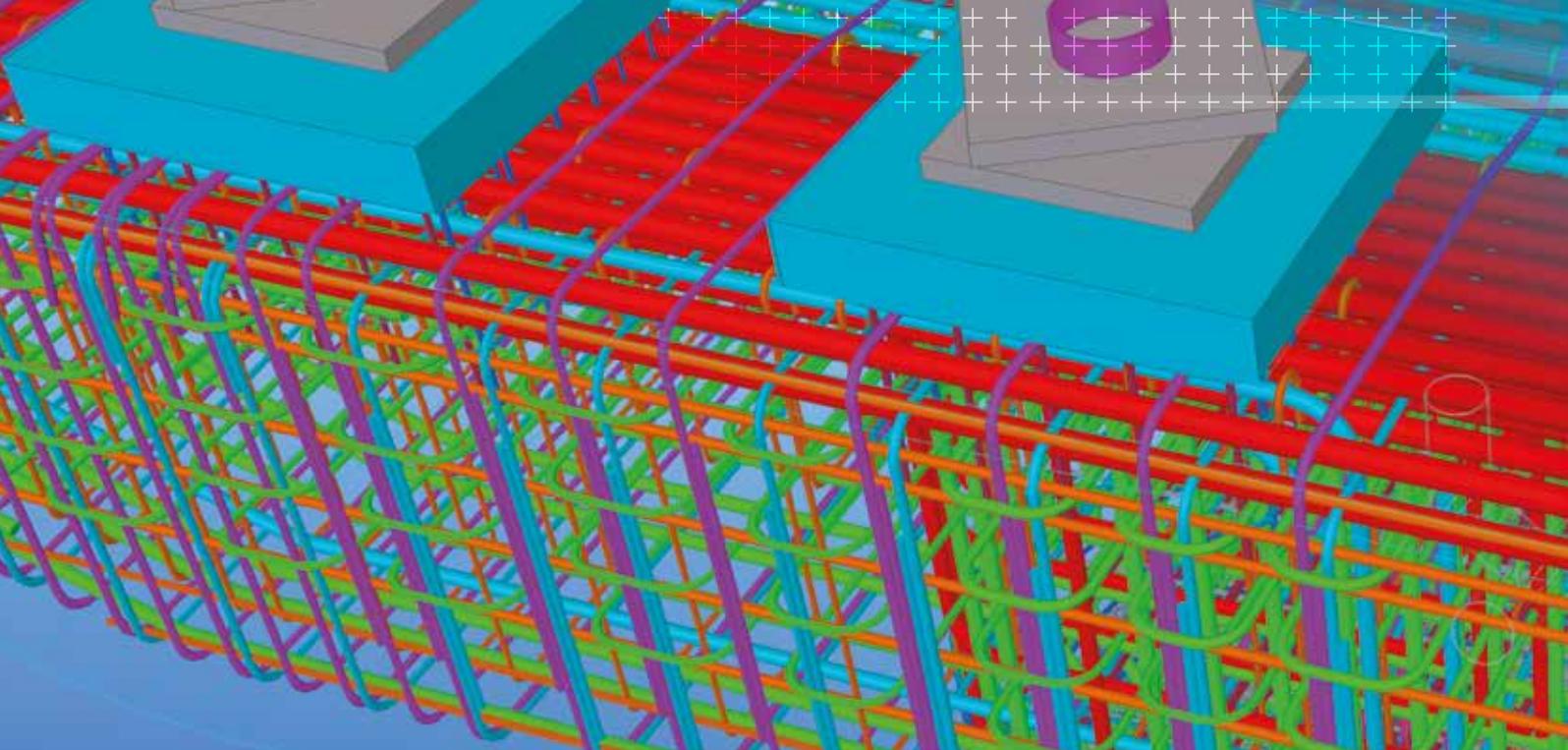
"From our experience within the construction industry and working on projects that include a BIM process, we have discovered that there are many business benefits that come with adopting an open and joint approach to a project," said Tony Woods, Managing Director at Midland Steel. "For example, we are currently trying to get to a stage in the business where we can collaboratively work with everybody to reduce delays and costs. The benefits of everyone involved in a project using 3D modelling are huge as it provides a greater understanding of how the building works during the construction - which ultimately results in a smooth process all round."

"We want to take Tekla software to all of our concrete customers and use it to maximum benefit"

- Tony Woods, Managing Director at Midland Steel



Tekla Structures is ideal due to its ability to precisely build constructible models to visualise larger quantities of material and produce accurate schedules and drawings from the model. Tony explains further: "By using Tekla Structures, we are able to help contractors make cost savings as it provides a full package: beginning with a model, rebar detailing and a collaborative discussion with the contractor regarding his program of works, through to the delivery sequence and finally, the elements delivered on site. The investment in the software is recognised the minute you start working with it, as you can instantly start reducing costs and time on projects. The software is fantastic and we're using it because we believe it is the best in the market."



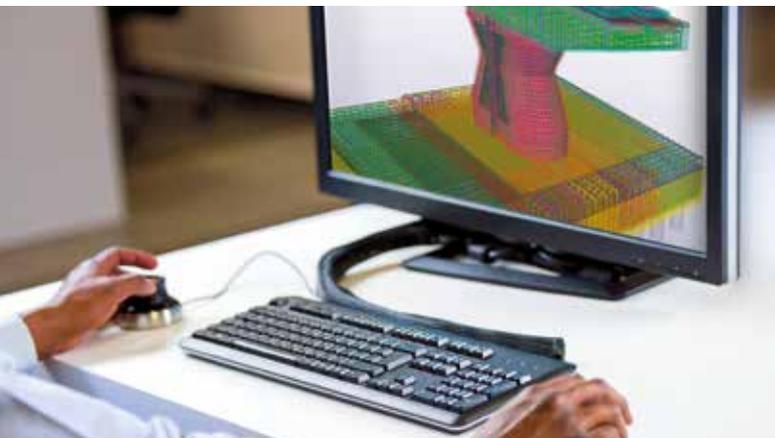
FROM 2D DRAWINGS TO 3D MODEL AND MANUFACTURE

In the initial stages of a project, Midland Steel reviews an engineer's 2D drawings before converting them into a 3D model using Tekla Structures, to detail every element against the design brief. The constructible model is then submitted back to the engineers and the contractor for review.

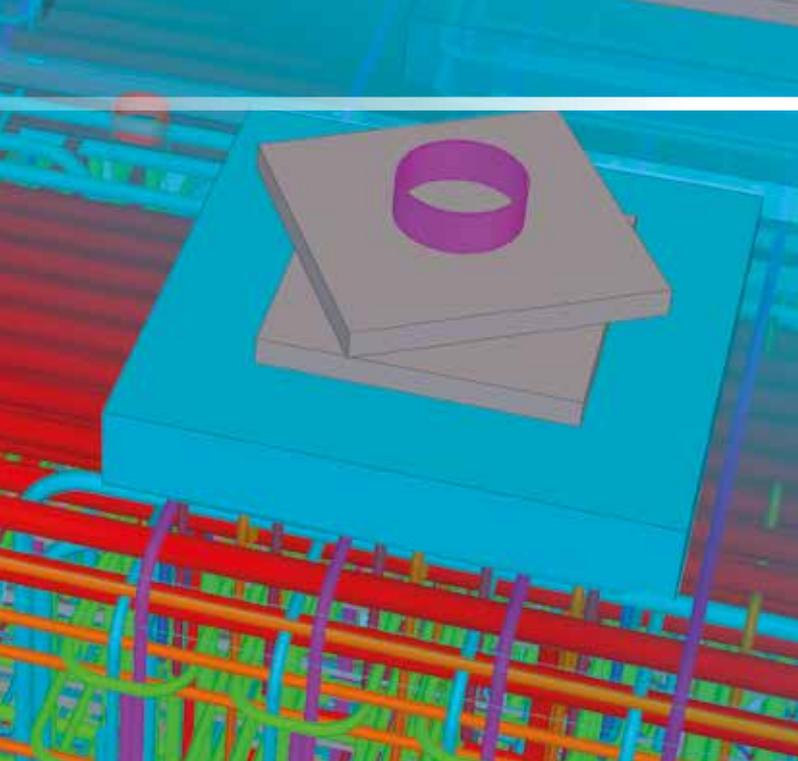
"At this stage, we've involved the contractor and the engineer, and as such, everybody is in agreement as to what they can physically see in 3D so there are no questions later saying, 'I never saw that in the drawing.' We then plan with the contractor the delivery sequence," clarifies Tony. "That's the most important thing to take from this: that contractor involvement with the engineer and ourselves, collaboratively, is the only way it will work, pre-planning is

pre-succession and no planning is planning no future." Midland Steel creates all the essential building information in the Tekla 3D model and because of this, it is infinitely more dynamic than traditional drawings, easier to adapt to design changes, find and fix errors and plan to avoid any potential difficulties in the build.

In its factories, Midland Steel utilises production software to manage fabrication of its 'Cut And Bend Rebar'. Due to Tekla's ability to link accurate model data with different industry software solutions, Midland Steel can send data to production directly from the constructible model. Easy to understand 3D model information then helps the fixers to produce prefabricated cages effectively and without errors. Tony continues: "We are now able to take information from the model directly into the software at the factory and export the schedule. We've no data entry from our side then in the office, so it helps us there, whilst errors are also eliminated at that point."



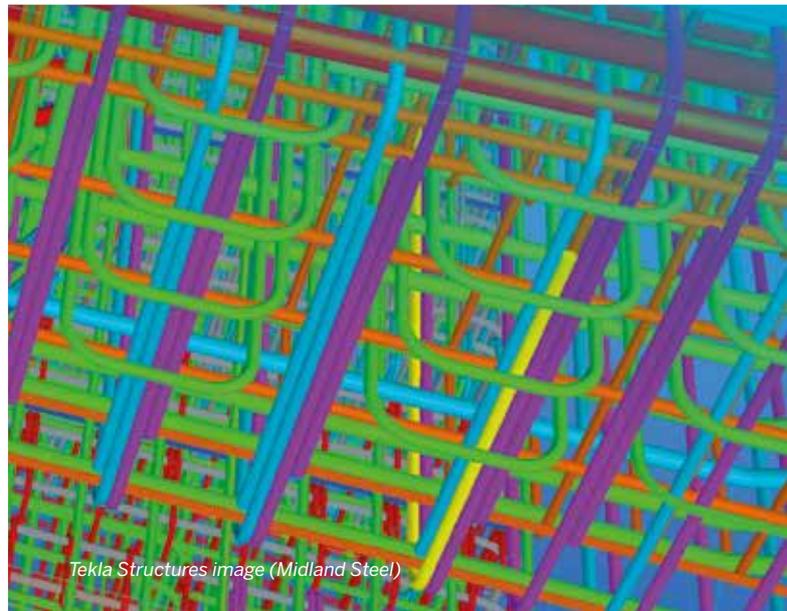
"The 3D images and the 3D model on the **Tekla BIMsight** viewer are being used by all our production staff - and in prefabrication, we are using the model more than 2D drawings that we produce from the model, to actually fix the steel. Because the information that is on the schedules generated from the model is that detailed, we can actually fix the steel from the model now. It's an enormous advantage to the fixers."



CONSTRUCTIBLE MODELS AID COLLABORATION

By using Tekla BIMsight collaboration software, all project participants can review, comment and make suggestions about the model and design. This open collaboration has significant benefits for all elements of the supply chain throughout the entire design and build stages. With Tekla software and Midland Steel undertaking the detailing, the rebar fabricator is in control of the programme of the deliveries of the schedules. Whereas contractors are able to extract from a model what they have made or lost against a budget on daily basis, thanks to quantities that can be extracted from Tekla Structures. The initial and on-going collaboration from the start of a project with the contractor will help them to keep the project on track and monitor changes. Indeed working with a contractor to create a concrete programme will benefit the entire project and remove the hand to mouth culture.

Tony goes on to explain the efficiencies of using BIM for 3D visualisation: "With BIM, there is a big difference in looking at a 2D drawing and looking at a 3D model. 3D visualisation actually allows you to pre-empt and identify problems. Before we even meet the project timeline, we've identified probably 95% of the issues that will arise in the project prior to ever happening. So if you BIM design process your project, you see your cost line is probably about 20% lower than it is against the traditional process today. It's a big step change for some, but using BIM helps you to save money by identifying any problems prior to build."



"The investment in Tekla Structures is recognised the minute you start working with it, as you can instantly start reducing costs and time on projects."

- Tony Woods, Managing Director at Midland Steel



London Bridge Pier (Midland Steel)

ACCURATE INFORMATION DRIVES VALUE ENGINEERING

For Midland Steel the use of Tekla software is in an effort to become more knowledgeable in all areas of its operations; live information, prioritising and organising itself as a company and also organising concrete contractors and main contractors on site. The company's focus in the future is therefore to reduce the labour cost on site, which is the most expensive part of reinforcing in global terms.

Looking at *Fig 1*. Formwork makes up approximately 50% - 60% of the total volume of cost on a project, concrete materials about 18%, the labour on concrete totals about 5% to 6%, while the formwork materials makes up about 6%. The balance of reinforcement supply, prefabricated, and reinforcement labour costs are spread equally at around 9%.

"If you take out your labour cost, break it down and can improve on it, automatically you're going to improve the concrete frame program. You're going to improve the prelims on the project. You're going to improve the program time achieved. If we can prefabricate material, which is our main focus for the future, we believe as a company, prefabrication is probably the way to go to improve our business. We have proved it on a few occasions with Tekla that by having knowledge prior to actually producing an element, there is an enormous advantage – for example, approximately £250,000 to £300,000 was saved just on one project alone," comments Tony.

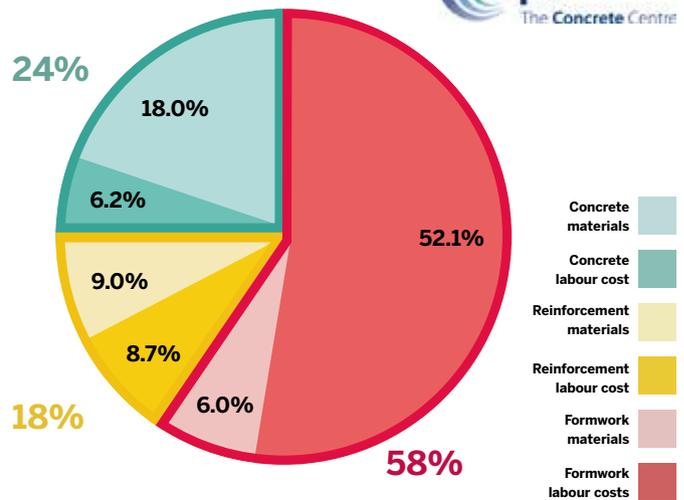
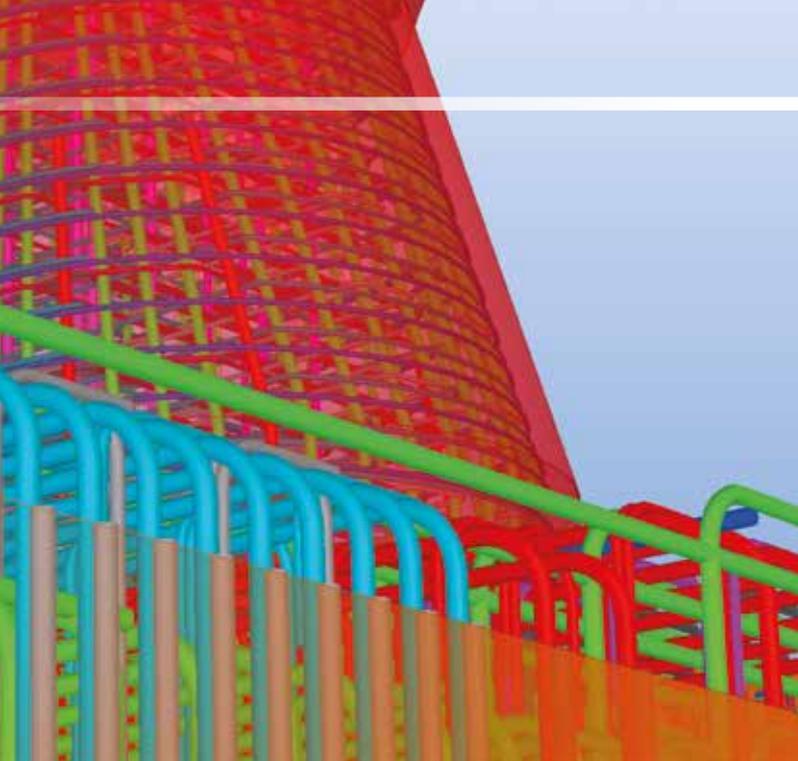


Fig 1. Labour and Material (Peri)

Labour intensive processes such as formwork and reinforcement, can be addressed, planned and subsequently improved using the 3D model created in Tekla Structures.

By effectively using the 3D Tekla model, Midland Steel has proven to reduce formwork labour cost by 20%, efficiency on rebar fixing on site 60% and costs overall by 25%. Tony explains: "In the past, you can have a fixer foreman who spends 85% of their time inside an office; reading the drawings and relaying that information - they are just directing 15% of their time into actual physical labour.



Now by using 3D model information from Tekla, they are able to move around the site with an iPad and read the elements they are about to fix, therefore becoming significantly more productive. The progression of using Tekla 3D imagery, scheduling internally, fabricating internally, and dropping prefab elements on the site has improved overall efficiency on site by approximately 50-60%.”

Modelling and visualising the concrete in Tekla software enables accurate assessments of the area of formwork required. Having this knowledge allows for the precise ordering of materials, as well as the exact planning of where formwork can be reused and scheduled – this is value engineering deriving from having the accurate quantities and dimensions of the concrete modelled in Tekla. In addition, the 3D model reduces the likelihood of unforeseen errors onsite, preventing the requirement for additional labour to rectify mistakes.

INDUSTRIAL ADVANTAGES

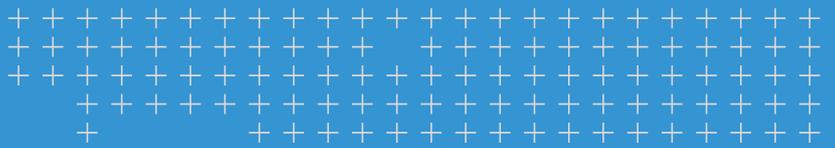
Tony concluded: “The advantages of using Tekla as a rebar modelling system is that it entails very accurate information. Compared to other leading software systems we’ve trialled for 3D and BIM, we were very confident that Tekla software would best demonstrate our business. From the most intricate jobs to the easiest projects, it enables you to save money on a daily basis: in prefabrication, waste, design engineering and in adding value. Additionally, the schedules are very prescriptive, extremely easy to read and input.”

KEY BUSINESS BENEFITS

- **Eliminates approximately 60% of onsite time for installing steel reinforcement**
- **Approximately £250,000 to £300,000 was saved just on one project, equivalent to approximately 40% of steel by weight**
- Delivers specialised solutions and configurations for: main contractors, structural engineers, Midland Steel’s dedicated Building Information Modelling (BIM) team and model innovation
- Midland Steel is able to help contractors make cost savings as Tekla Structures provides a full information package for collaboration, from constructible model through to delivery on site.
- Produces highly detailed as-built Building Information Models; provides the ability to visualise a constructible model of a project and identify problems immediately, allowing them to be solved at that point rather than later on site

“The software is fantastic and we’re using it because we believe it is the best.”

- Tony Woods, Managing Director at Midland Steel



Together we are shaping a smarter future for construction

TEKLA SOFTWARE BY TRIMBLE

Trimble is a technology company with a vision of transforming the way the world works. Trimble's construction offering ranges from total stations to advanced software, giving the industry tools to transform planning, design, construction and operation of buildings. The company also has products for trades like logistics and agriculture.

TRIMBLE BUILDINGS

In addition to Tekla, Trimble Buildings brands include names like SketchUp and Manhattan Software, targeting architects, engineers, fabricators, MEP contractors, general contractors and construction managers, and building owners. The software solutions promote constructible models and collaboration. Trimble Buildings offering blend groundbreaking innovations and practical features, helping the industry achieve transformative results.

TEKLA SOLUTIONS

Tekla software is at the heart of the design and construction workflow, building on the free flow of information, constructible models and collaboration. It is the people who make the difference, while Tekla gives tools for realizing projects around the world from housing and bridges to factories and skyscrapers. Good communication and elimination of waste make the industry more sustainable and cost effective, improve your projects and in the end your customers' satisfaction.

- **Tekla Structures** is the most developed Building Information Modelling software on the market. It makes accurate, constructible modelling of any structure possible.
- **Tekla Structural Designer** gives engineers the power to analyze and design buildings efficiently and profitably.
- **Tekla Tedds** automates repetitive structural calculations.
- **Tekla BIMsight** is a free professional tool for construction project collaboration allowing anyone combine models, check for clashes and share information.
- **Tekla Field3D** is an easy-to-use 3D tool for utilizing Building Information Models on mobile devices.
- **Tekla Civil** is a comprehensive, model-based solution for heavy civil engineering design needs.



CUSTOMER EXPERIENCE | SEPT 2016

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