

# How Optimizing Preconstruction Can Accelerate Project Completion

Learn how project success is determined  
before it's poured

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# 1 Introduction

It's always an exciting moment when you find out your bid has been accepted for a project. But, this is when it's important to take the steps to set your project up for success. Making smart decisions right out the gate can mean the difference between getting ahead of costly mistakes or getting bogged down at the jobsite.

With all the different project players and steps to complete in the project itself, making the time for a designated preconstruction process is essential for preventing problems at the construction site before the project starts, minimizing costs related to errors and miscalculations of concrete work.

When done correctly, this initial phase is key for effectively defining what's needed for the project, identifying potential points of concern and tackling any scheduling conflicts. Prioritizing these issues early-on ensures your project will flow smoothly during construction and that you—and your client—will be satisfied with the outcome.

The seeds of project failures and challenges get planted long before construction begins. Poorly-defined projects with unclear specifications won't get any clearer once construction starts, which is why proper planning and risk analysis are so important in getting your project successfully to the finish line.

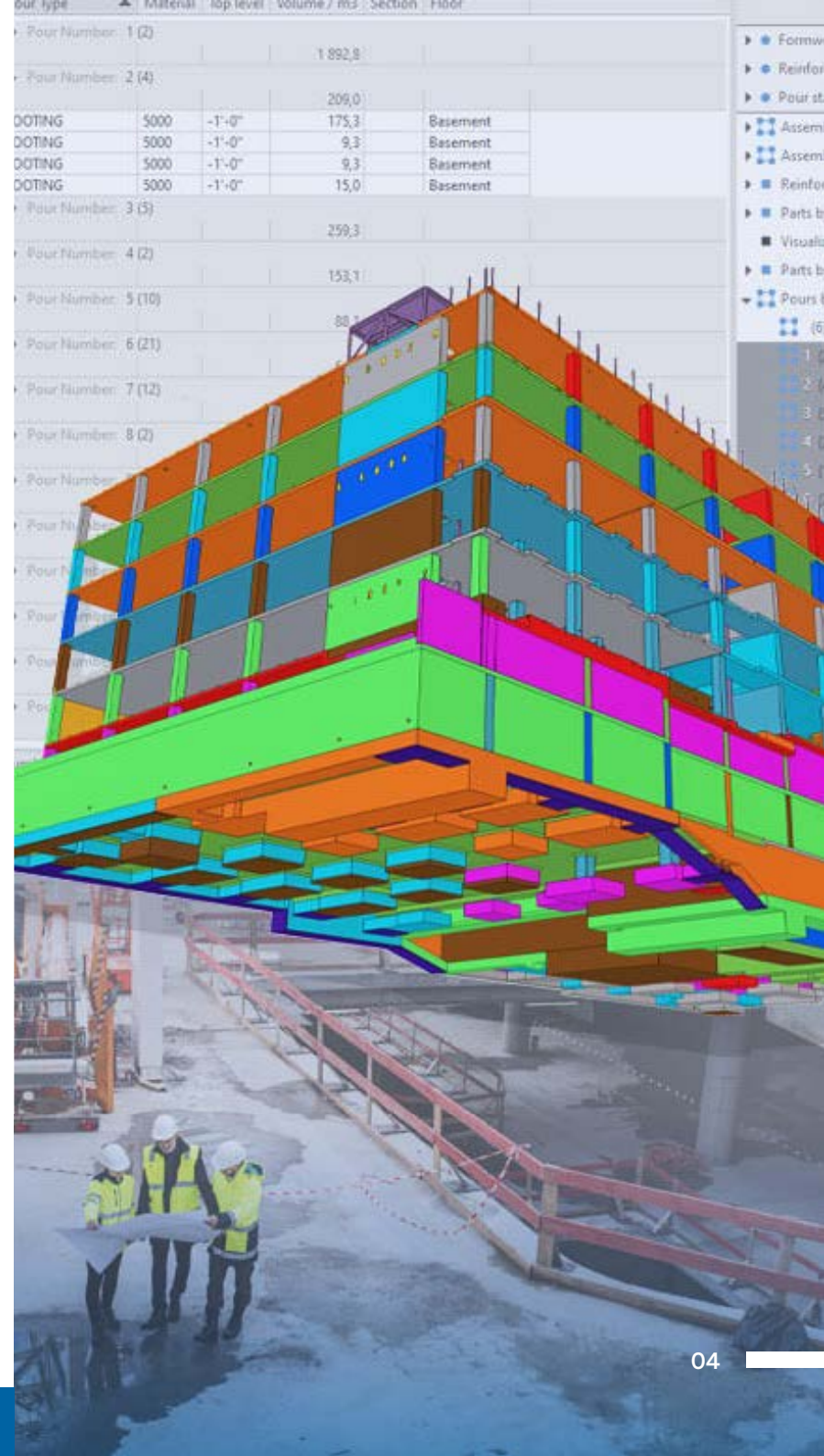
# Get Ready to Takeoff

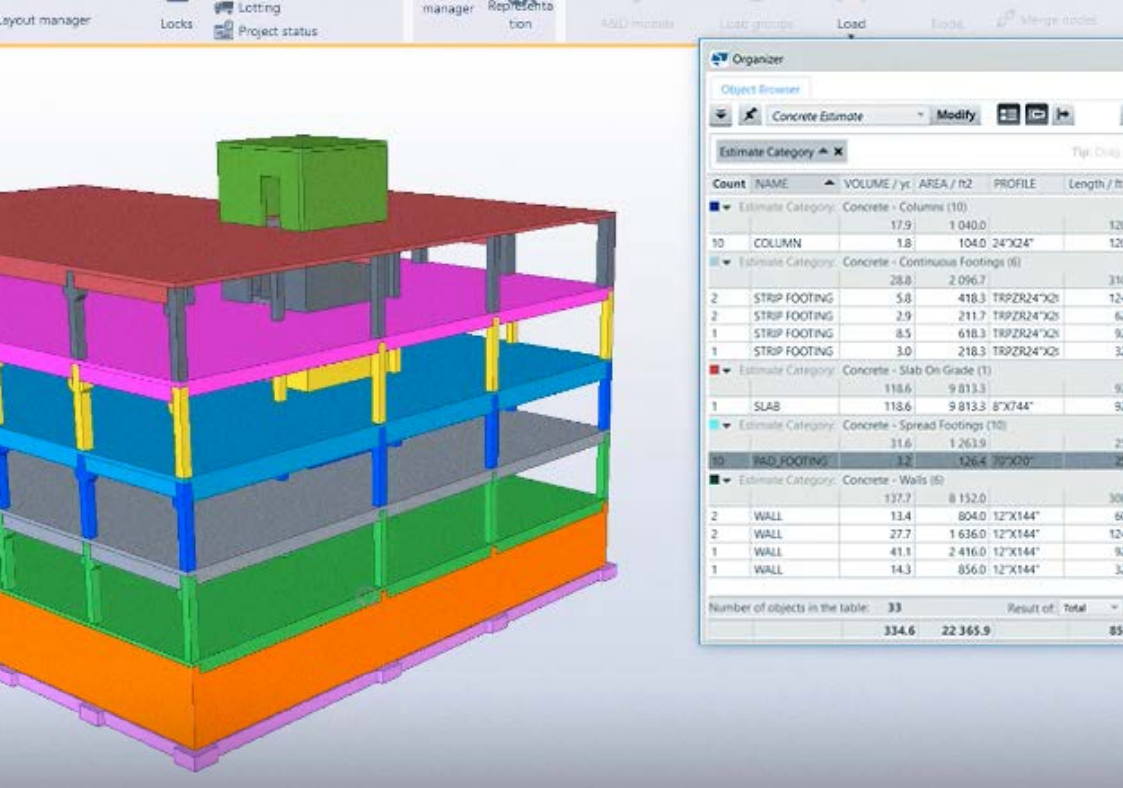
One of the first steps for any project is developing a detailed quantity takeoff. For many concrete contractors, traditional 2D methods might feel safe and comfortable, but the truth is manual quantity takeoff and 2D-based construction takeoff software leave projects open to errors and miscalculations.

“ We do all of our quantity takeoff/ extraction from the preconstruction model to ensure the scope is correct...Modeling in Tekla allows for a streamlined workflow in all phases of the project. ”

Eric Lindquist, Adjustable Forms

3D model-based information management solutions help you plan out better quantity takeoffs by creating a model with accurate quantities that's easier to share and collaborate with than 2D on-screen digitizer software. Additionally, important information like cost codes and concrete mix components can be added to model objects as needed.





Taking the time to prepare a detailed quantity takeoff and using a 3D model to help clients visualize their project are key factors in developing the details of the construction job. The more detailed your quantity takeoff is, the less confusion there will be over deliverables, because it allows the client to see that there will be sufficient space for all of the components they want or need for the structure. What's more, quantities can be automatically organized according to preference, such as location, pour type and material, making information easy to manage and showcase to the client.

By using a 3D model for quantity takeoffs at the beginning of the preconstruction process, team members are able to look through the model and find things that jump out, issues that might cause delays onsite or missing information. This establishes the 3D model early-on as the single source of truth.

With a well-detailed quantity takeoff, you can be confident about the amounts you order from the concrete mixer, surface areas of formwork and the quantity of rebar and embeds, not to mention you'll have a constructible 3D model you can use as a starting point when you win the bid. This all starts with using the right BIM software.

“ We have confidence that our estimates are correct because we use a constructible, data-rich model to determine accurate quantities. ”

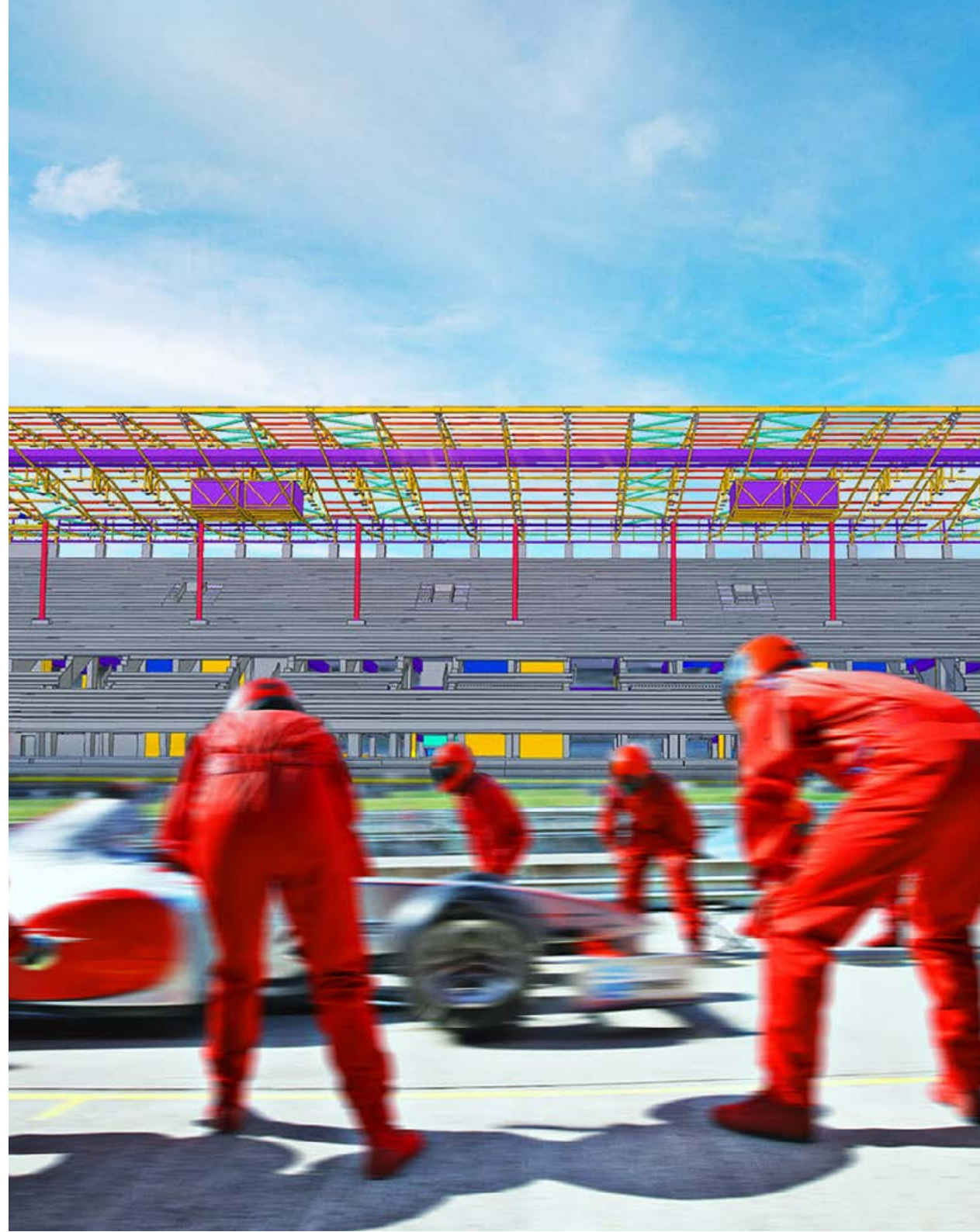
Jeff Barley, UCI Construction, Inc.

# Ensure Everyone is on the Right Track

“ The more people working to a single trusted model, the better. ”

Jason McFadden, Barton Malow

After developing a detailed quantity takeoff for your project, the next step of the pre-construction phase should be to ensure everyone on your construction team has the information they need to make the project a success. This process helps everyone, including your client, better understand the project before they commit to any work being done.





“ Our time was focused on moving the project forward using digital techniques, which allowed us to better communicate design and detail information for less cost and greater speed. ”

Jason McFadden, Barton Malow

That's why it's important to include a visual reference of the finished project along with its individual components. With building information modeling (BIM) software, the 3D model serves as a single source of truth with all the latest data, giving project stakeholders a better idea of the finished project than simply showing project blueprints.

This also gives you an opportunity to discuss the concrete and design specifications with all project stakeholders, so any discrepancies between the customer's specifications and the current BIM model can be addressed, as well as any changes made to the model.

Part of making sure everyone is on the same page before construction begins also entails performing a constructibility review to ensure there won't be any unnecessary roadblocks hindering the project's completion. Once this process has been completed, it's time to work out the schedule.

# 4 Avoid Scheduling Speedbumps

Fine-tuning the construction schedule is the next step in the preconstruction process. A 3D model can make this easier by providing you with a detailed document you can thoroughly review with those involved in the project, allowing you to pinpoint likely trouble spots and overcome schedule challenges.

One leading benefit for using Tekla Structures at this stage is when concrete elements such as beams and slabs are touching and share the same material, Tekla Structures has built-in intelligence to combine them into a single pour. This allows you to also eliminate overlapping concrete, automatically ensuring there is no double-counting of concrete quantities.

“ [BIM software] helped us determine the amount of materials we’d need for construction before we were in the field, which benefited the schedule and resulted in a much more coordinated, efficient project. ”

John Vaughan, Wayne Brothers

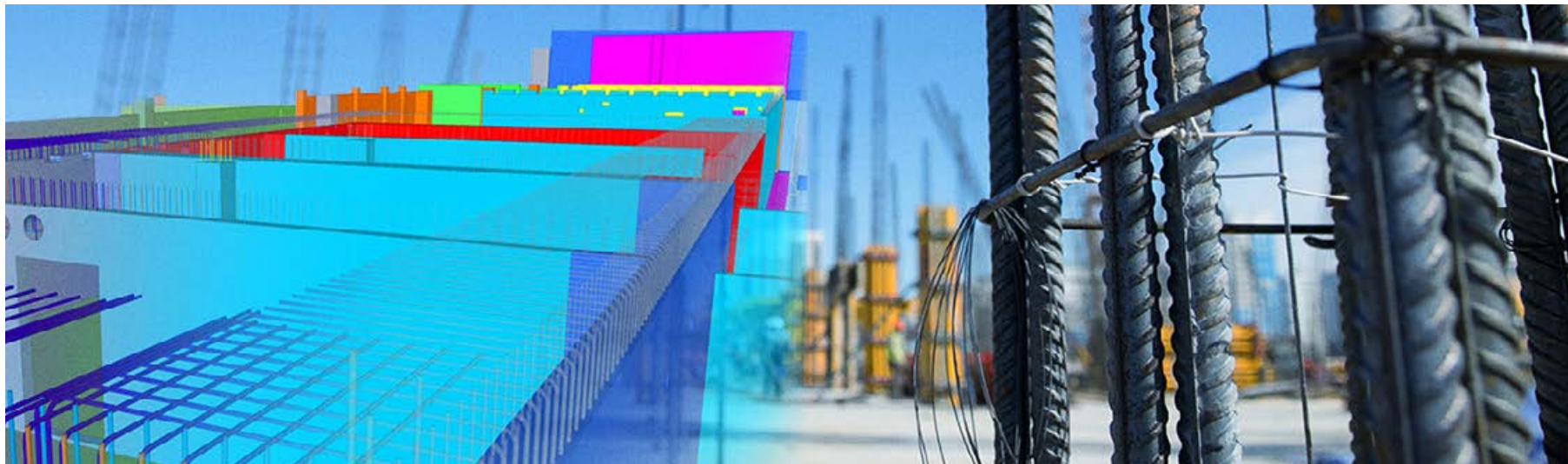


Additionally, 3D BIM technology gives you access to pour and concrete geometry in your model, along with interactive and automated tools, so you can create realistic formwork models for planning and optimizing the schedule of your formwork operations.

As final decisions for the project are made, this schedule will likely need to be changed or edited, but it gives your client and your team a better idea of the construction timeline while also ensuring you have the material you need before you're on the jobsite.

“ Tekla allowed us to plan exactly how the rebar should be placed, including the interface between the beams and the elevated slab steel...The 3D model enabled our field staff to see exactly where each piece of rebar should go. ”

Wesley Douglas, Wayne Brothers



# 5 Conclusion

“ This is a more efficient and accurate way to work and get the sequence at a very early stage of the process. ”

Scott Kahler, DPR Construction



Successful contractors recognize the importance of integrating technology into the preconstruction process to start projects off on the right track and provide guidance. By optimizing this process with BIM technology, you can provide a clear picture of what the project will look like with a 3D model, evaluate possible scenarios your team may run into and address any scheduling issues before construction begins, giving you the ability to streamline and expedite the project's completion.

Avoiding conflicts before the start of the project when the cost is relatively low allows you to simplify the rest of the construction process and reduce the risk of future on-site errors. When you utilize BIM software to assist in deciding the project's goals and needs during preconstruction, you give your entire team an accelerated and clear path to successful project delivery.

Click the button below to find out more about how the preconstruction process—combined with the right BIM software—can help you accelerate the development and completion of your projects.

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