Bentley

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6 Major Benefits of

Pre-construction Planning in 4D

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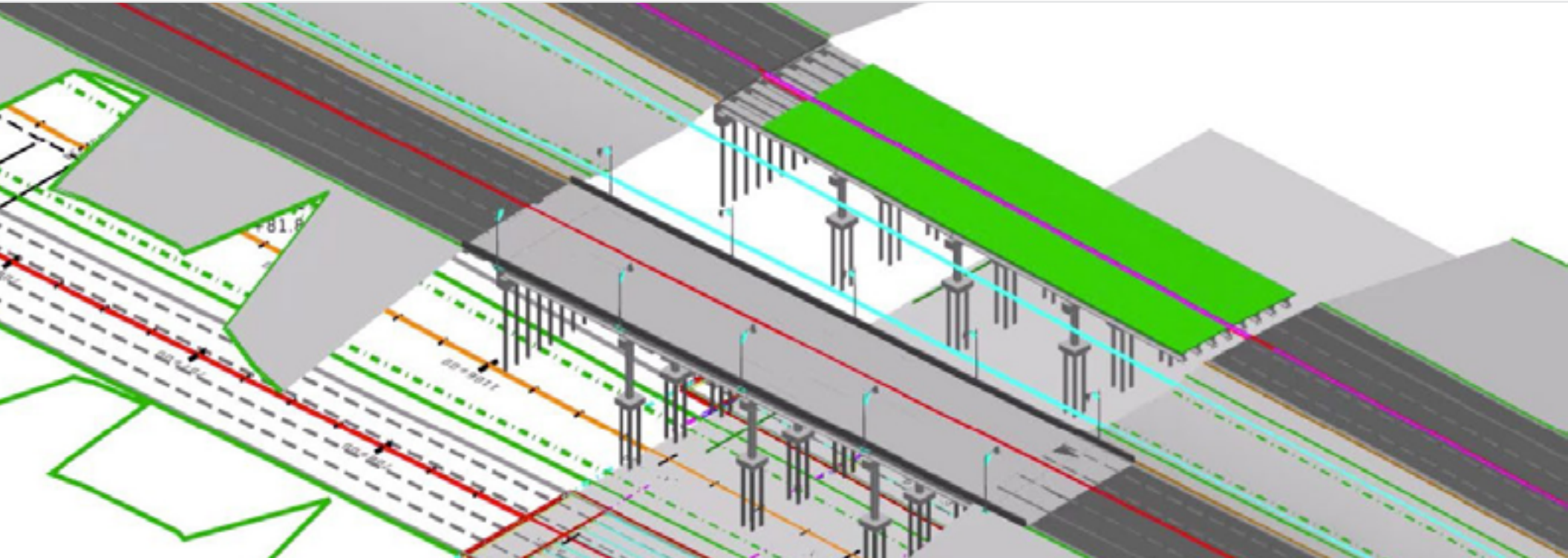
Simplify Your Communication with 4D Modeling

Construction projects, especially heavy civil ones, take considerable planning and work to be successfully executed. In the pre-construction phase, planners are challenged with choosing the right technology and methods, defining work tasks, and estimating activity durations and resource requirements. **4D modeling presents a new wave of possibilities and efficiency for pre-construction management and collaboration.**

To meet lofty demands, 4D modeling is being leveraged to visually plan, manage, and rehearse projects ahead of construction. Though Gantt charts are still widely used in construction, they come with several disadvantages, including being highly time consuming, complex, and rigid.

Simplify your communication with 4D modeling by animating every step of the schedule and demonstrating the necessary resources needed to execute each complicated or critical phase of the project.



1

Win Work in the Bidding Phase

Construction is competitive. Tendering for construction projects is costly, complex, and time consuming.

Problem...

To win tender bids, your team's project pitch is everything. Being able to demonstrate a clear vision of a project's execution within its environment is crucial. Unfortunately, teams that are not leveraging 4D modeling to validate project plans are falling behind and losing work to competitors.

Solution...

4D modeling offers the ability to deliver highly detailed sequences that demonstrate an accurate timeline of a project through its various phases—a great way to help clients visualize and engage with project plans. Planners can deliver more accurate project estimates, construction safety plans, and project schedules.

Benefit

4D scheduling and visualization ensure that planners can clearly communicate the project, costs, and the sequence of works to clients, reassuring them through transparent and visual plans. Delivering on this level of transparency and detail helps teams win more projects.

2

Optimize the Construction Schedule Visually

Virtual construction management is crucial to ensuring that the most efficient construction sequence will be executed, while avoiding potential mistakes in the schedule or during construction.

Problem...

Without a way to visually plan your project before construction begins, you increase the chance of risk, rework, workspace and logistic clashes, and commercial claims and extensions of time from subcontractors.

Solution...

Leveraging 4D modeling allows teams to validate and optimize the project plan with stakeholders before starting on site. Performing "what-if" scenarios helps reduce risk and delays by reviewing time-lapsed construction sequences. Say goodbye to the days of endlessly reviewing Gantt charts.

Benefit

With a 4D representation of your project, you can clearly see where there is room for improvement. You can also see issues before they occur, minimizing mistakes during construction, reducing risk, and limiting exposure to workspace and logistic clashes. Planners can also run baseline versus actual and different scenarios to visually optimize the schedule.

3

Visually Align Site Plans, Logistics, and Equipment

Gantt charts can often be difficult for teams to understand. 4D planning and visualizations increase team engagement by visually communicating a plan that is clear, consistent, and can be referenced throughout progress and look-ahead meetings.

Problem...

Site access, logistics, equipment placement, and material storage planning cannot be done with Gantt charts.

Solution...

Since the 4D modeling incorporates the extra element of time—the project schedule—into a 3D model, it serves as an important tool to drive virtual risk analysis and get a deeper understanding and evaluation of site conditions against safety standards.

Benefit

4D modeling empowers teams with visual representations that are linked to project sequencing and scheduling, allowing stakeholders to plan for safety considerations, get a better idea of where materials will be stored, and gain a greater understanding of the entire construction framework. 4D modeling aligns site plans, status information, and risk-mitigation frameworks that lead to improved safety and construction management.

4

Leverage Model-based QTO

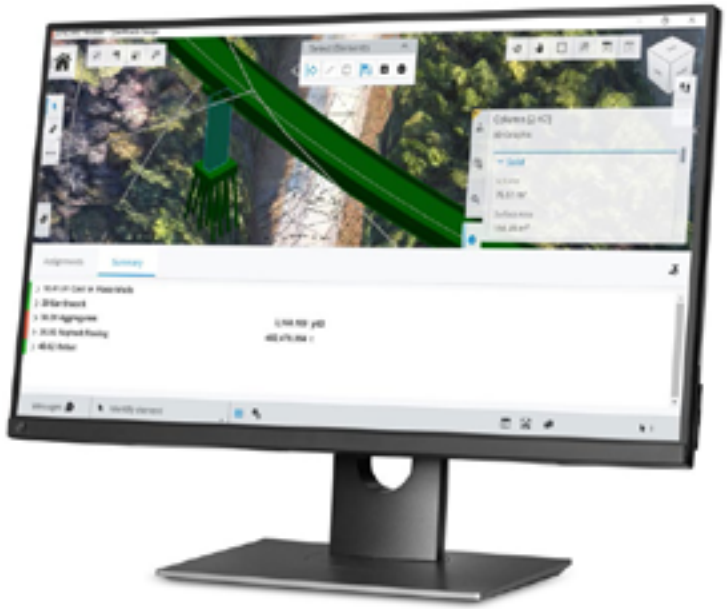
A big part of pre-construction planning is defining, as accurately as possible, cost estimations for the project.

Problem...

The traditional QTO process is manual, repetitive, time consuming, and often error prone. One small mistake can have cascading effects and can be the difference between winning and losing a bid and profit margins.

Solution...

4D modeling offers model-based QTO, allowing you to split a model into manageable constructible components and automatically estimate what you need in terms of labor and material to construct your project. Now, you can create a more accurate representation of the construction process, as well as associated costs. This practice informs logistics and materials planning so that you do not end up with endless stockpiles.



Benefit

A faster QTO process means less time needed to estimate projects, hyper-accurate bids, more work, and increased profits.

5

Slice Elements into Constructible Components

Design models are often not suitable for construction. Planning to the right level of detail requires you to prepare design models for the distinct purpose of construction.

Problem...

In a traditional BIM model, components of construction are broken down into objects for use in work packages. Unfortunately, this process is not the same for horizontal projects like a freeway project. Work packages are not broken down by components, making it challenging to create an accurate plan for quantities and schedule.

Solution...

4D modeling allows you to break projects into constructible components with auto-calculated quantities and use them to build a construction schedule against, for example, how many people are needed and when they are needed.

Benefit

By breaking down your model into constructible components, you gain accurate quantities, therefore benefiting from a more accurate duration of each activity based on productivity while understanding what resources are needed. It provides the ability to optimize your planning and sequencing. The result is improved efficiency and maximized project profitability.

6

Share 4D Sequence to Increase Collaboration and Mitigate Risk

4D modeling centers project teams around a single source of project truth.

Problem...

Project updates and communications are often reliant on sending emails back and forth between teams, leading to inaccurate data, poor decisions, and costly project delays.

Solution...

Sharing your web-based 4D sequence and enabling playback automations to better understand construction sequences aligns teams around one source of project truth.

Benefit

Everyone on the project can share and access project data and information, increasing collaboration to mitigate risks and make more informed data-driven decisions. Visual communication means improved situational awareness, which improves every aspect of project delivery.

SYNCHRO | Get time on your side™

To successfully leverage 4D modeling to bid, plan, optimize, and execute construction projects, teams need to be empowered with the right digital solutions.

SYNCHRO is a complete construction management platform—from the office to the field—that enables teams to:

- Plan, manage, construct, track, and review construction projects in 4D, providing the entire project team with real-time progress updates and 360-degree situational awareness.
- Understand what they are building before they build it, as well as validate and optimize the plan, to avoid the potential risks involved.
- Review, validate, and communicate in one complete digital and interactive visual environment that includes documents, forms, and models from the entire enterprise.

With SYNCHRO, you can seamlessly connect your workflows and plan, optimize, and track projects in a single visual.

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