

Digitization and Connected Construction

Volume Seven: Digitization and Connected Construction
with Tekla

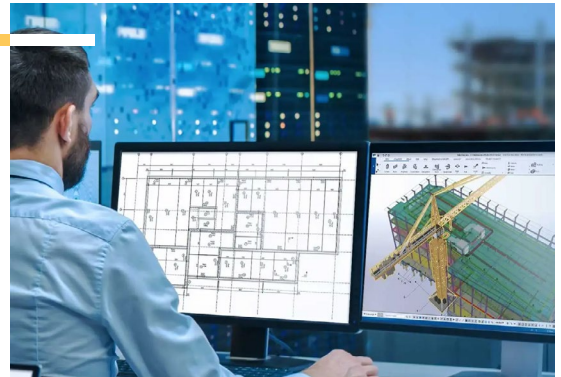


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What Is Tekla Structures?

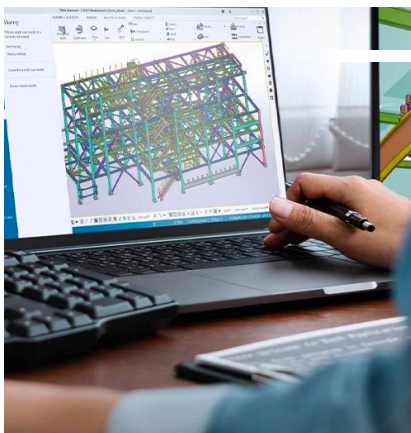
In today's competitive architecture, engineering and construction (AEC) environment, streamlining workflows is vital to delivering successful building projects. BuildingPoint offers **Trimble's Tekla Structures and Trimble Connect applications** to support the emerging vision of a single, constructible building information model (BIM).



Tekla Structures is a leading-edge BIM application enabling efficient structural modeling, multi-material support, quick and accurate drawing production and precise material takeoffs. Originally developed with a focus on steel detailing, Tekla Structures has expanded to enable a wide range of 3D modeling techniques for various project types, from complex steel detailing to rebar detailing and precast modeling.

Why Use Tekla Structures?

What sets Tekla Structures apart is Trimble's constructible model concept. This approach streamlines construction processes, enhances drawing production efficiency, ensures downstream compatibility, and delivers precise material takeoffs, while supporting more effective project management.



Tekla Structures can automatically create a range of construction documents. These documents replace traditional drawings with a view port into the 3D BIM model. Updates to the model automatically update the construction documents that Tekla Structures displays to users in all locations.

View ports also provide fabrication documents to represent objects in Tekla Structures' 3D BIM. These documents are highly customizable to provide the level of detail fabricators need to complete their work accurately and efficiently.

Users can also integrate construction planning information into the Tekla Structures model. The BIM application imports project schedules from Microsoft Project or P6 and then links tasks to modelled objects.

This supports troubleshooting and reduces confusion and delay. Tekla Structures also produces erection

plans, even providing animations to represent the tasks involved and the sequence in which to perform them. Pour planning is a patented Tekla Structures function. It enables onsite users to plan multiple concrete pours as individual objects in the model. Users can allow for pour breaks and also create volumetric take-offs directly from the 3D BIM.

Using out-of-the-box integration with PERI and doka applications, Tekla Structures can also facilitate formwork modeling and management. The customizable, open API solutions from the Tekla Warehouse site accommodate most popular form modeling software applications.

Tekla Warehouse also offers customized external plugins that support projects involving bridge modeling, enabling users to upload road layout files directly into the BIM. Tekla Structures easily produces material take-off reports automatically, saving time and eliminating repetitive tasks.

Tekla Structures includes an open-source application programming interface (API) to integrate structural analysis applications including RISA-3D, Bentley STAAD, S-Frame, SAP2000, SG STRUDL and SCia, among others.

Model It, Plan It, Pour It - All in Tekla Structures

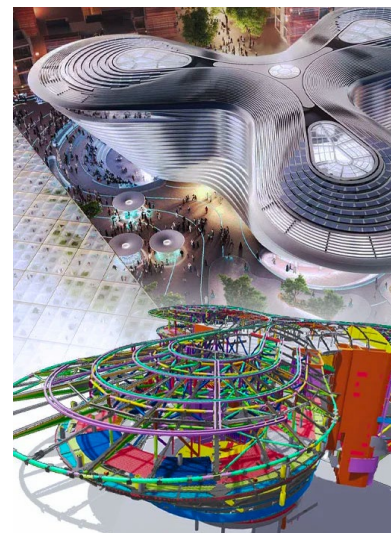
Trimble believes the greatest challenge facing the global concrete construction industry is the lack of quality, coordinated and timely information. Tekla products dramatically improve cast-in-place concrete project delivery by providing the most complete, constructible and collaborative information management solution on the market.

Tekla Structures is a tailored solution that bridges the concrete construction information gap. It's a unique, world-class BIM offering that's transforming the industry. By adopting Trimble's **"model it, plan it, pour it"** approach, Tekla Structures improves efficiency and accuracy in concrete construction project management.

Tekla Structures offers genuine constructibility for both modeling and real-world construction. Its concrete construction customers include structural engineers, rebar detailers, formwork builders, pre-cast producers and concrete planning and pouring contractors. It's a unique, world-class BIM offering that's driving industry change.

Traditionally, building projects followed a linear workflow that included planning, design, estimating, construction, ownership and management phases, all generating reams of documents. When designers began using 3D models, they continued to produce familiar 2D plans and documents for other stakeholders to use.

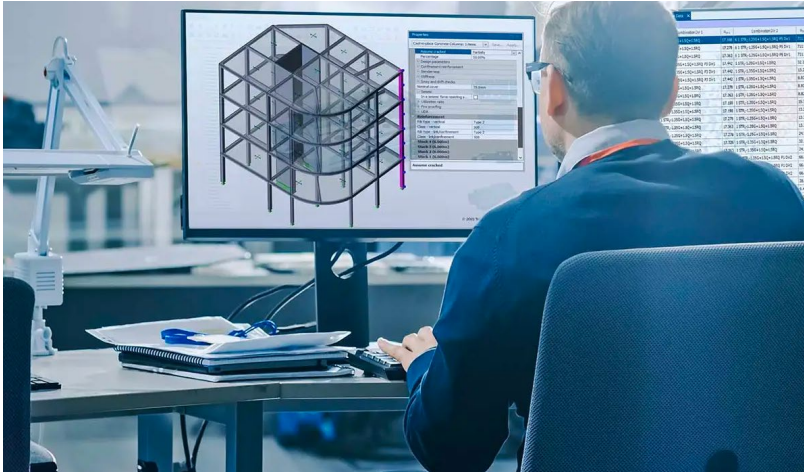
This left project team members struggling to make sense of a 3D structure from 2D paper plans. Fabricators



and contractors might also use separate and incompatible, 3D modeling software of their own. This lack of integration meant lost time and effort at every step in the process.

Constructible Model Provides Single Source of Truth

Trimble's constructible model provides a single source of truth for all phases of construction projects. For cast-in-place concrete structures, Tekla Structures enables all stakeholders at all levels to quickly and easily create, access and update accurate, constructible models.



Project teams use the 3D model to get organized, create estimates and efficiently prepare to pour. Onsite crews use the same, up-to-date model to guide concrete pouring and erect structures. Using document linking, field staff can view construction documents onscreen with their mobile devices.

Tekla Structures also supports quantity takeoffs, scheduling and logistics. It also facilitates:

- Pour planning and documentation
- Formwork planning and detailing
- Reinforcement coordination and detailing
- Anchor bolt embedding
- Trade coordination
- Construction layout
- 3D scanning.

Through its project status management, Trimble Connect can track whether model objects are complete or incomplete.

Tekla Structures goes beyond traditional **conceptual** models to provide a feasible, truly **constructible** model. This includes concrete geometries, pour planning, embeds and anchor bolts, reinforcement, formwork and other temporary structures, layout points, profiles, bolts and welds, mechanical, electrical, plumbing and other trades.

What's more, Tekla Structures seamlessly integrates with structural analysis tools through its open API, including RISA-3D, Bentley STAAD, and others.

Trimble Connect

Enhancing Collaboration with Trimble Connect

Trimble Connect is an open collaboration tool that connects the right people to the right data at the right time. Versions include:

- Windows application to for high performance 3D graphics and workflow
- Web browser for project creation and administration, 2D and 3D viewing
- Mobile application with optimized user interface for touch-screen operation by field users
- HoloLens application to support Trimble’s market leading XR10 augmented reality solution.

Trimble Connect’s desktop Sync tool enables offline access and peer-to-peer synchronization, providing team members with the information they need, even when offline, wherever they are in the world.



Trimble Connect also integrates BIM and concrete information model (CIM) viewing. The application brings multiple 3D models together, supporting formats such as IFC, RVT, SKP, DWG, DXF, DGN, STEP, IGES and others. It then overlays multiple models in a single view.

Trimble Connect can also import, manage and view point cloud scans that field crews capture onsite. Project teams use those point clouds to compare as-built conditions to design models, identify discrepancies, and make more informed project management decisions.

Powerful Synthesis of Project Information

Taken together, these capabilities deliver a powerful synthesis of 2D and 3D project information. Trimble Connect brings 3D building information models, 2D drawings, vector models and documents, markups, to-do lists, releases, and 3D point clouds together in one accessible place for all project stakeholders.



Trimble Connect's status sharing features enable field workers to mark objects completed, at which point the software updates the model for everyone. Using the content browser and data table, construction professionals can generate instant reports and inquiries based on any object selection.

Trimble Connect provides customizable templates where users can highlight source objects from the model and colour-code them based on their properties. Using Trimble Connect's intuitive user interface, staff at all levels can create hierarchical reports with intermediate sums, create breakdown structures based on that hierarchy, and export them to Excel for sharing or further analysis.

Trimble Connect transforms project decision making. Trimble Connect is an open collaboration tool connecting the right people to the right data at the right time.

BuildingPoint Can Help

The fundamental advantage of the Tekla Structures and Trimble Connect constructible process is enhanced communication and stakeholder collaboration. The result is streamlined construction processes, more efficient drawing and report production, downstream system compatibility, more accurate material takeoffs, and more effective overall project management. Teams complete projects on-time, within budget, and with higher quality.

Whether your business is an architectural practice, an engineering firm, a pre-fabricator, a general contractor or a sub-contractor, BuildingPoint is committed to a BIM process that all stakeholders can use at any phase of the design, build and operate lifecycle of any structure.

Why not contact BuildingPoint today to discuss how the Trimble solutions we offer can help your business deliver construction projects more accurately, efficiently and profitably?



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