



TEKLA® Structures



TEKLA STRUCTURES IN PRACTICE:

SOLARIS REDEVELOPMENT
VAIL, COLORADO, USA

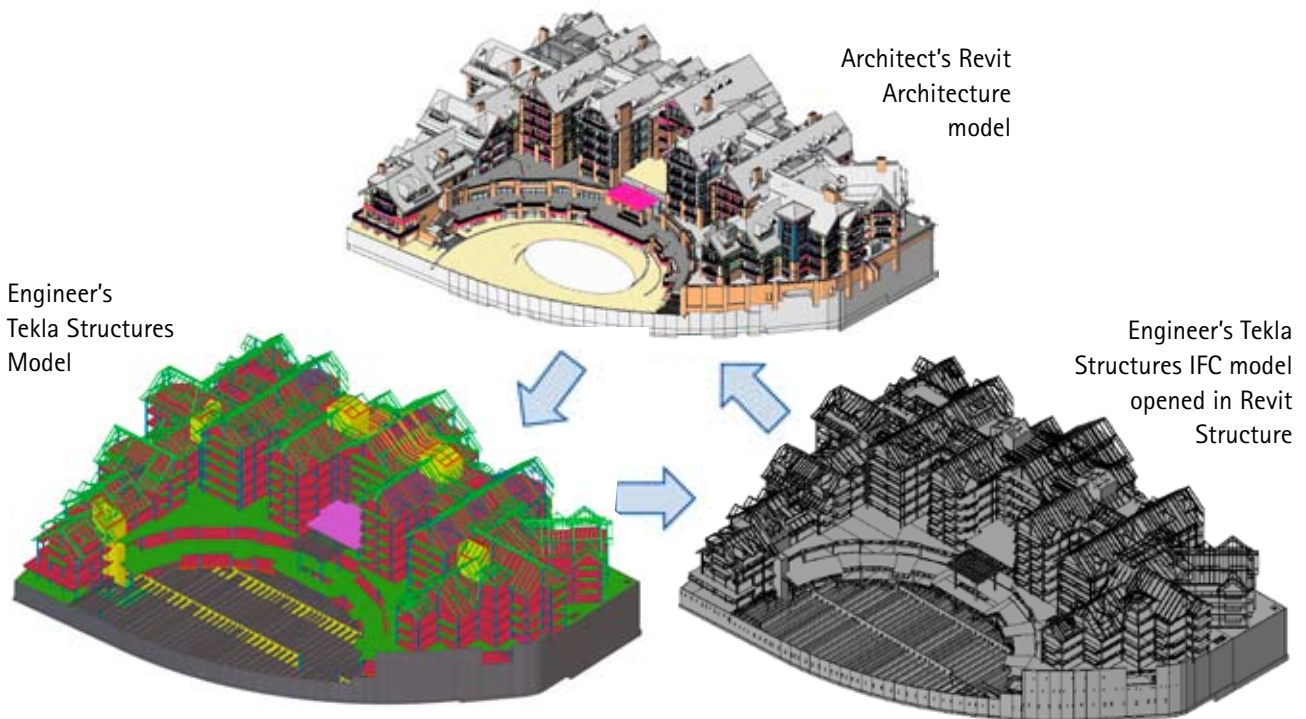


TEKLA Structures

SATISFYING

BOTH ARCHITECT AND CONSTRUCTION TEAM

> Nestled in the Rockies, the Solaris redevelopment project in Vail, Colorado, will replace structures built in the 1970s with over \$230 million of new construction. Efficient BIM (Building Information Modeling) collaboration of local engineering consultant Structural Consultants Inc. and Davis Partnership Architects enabled additional benefits to the owner in project delivery and construction.



The Solaris redevelopment project successfully used a highly collaborative work process to accelerate the project schedule. Image courtesy of Solaris, Vail, CO.

TWO BIRDS, ONE STONE

> Structural Consultants Inc. (SCI), established in 1977, is a full service structural engineering consulting firm with headquarters located in Denver, Colorado. Davis Partnership Architects (DPA), founded in 1967, is one of the largest multi-disciplinary architectural firms in the Rocky Mountain Region. Both companies have been leaders in their adoption and use of Building Information Modeling (BIM). Their recent collaboration on the Solaris project in Vail, Colorado, is with no exception. SCI and DPA effectively coordinated their designs using their own respective BIM software, Tekla Structures and Revit Architecture. By using Tekla Structures, the design team was able to offer additional benefits to the owner in project delivery and construction.

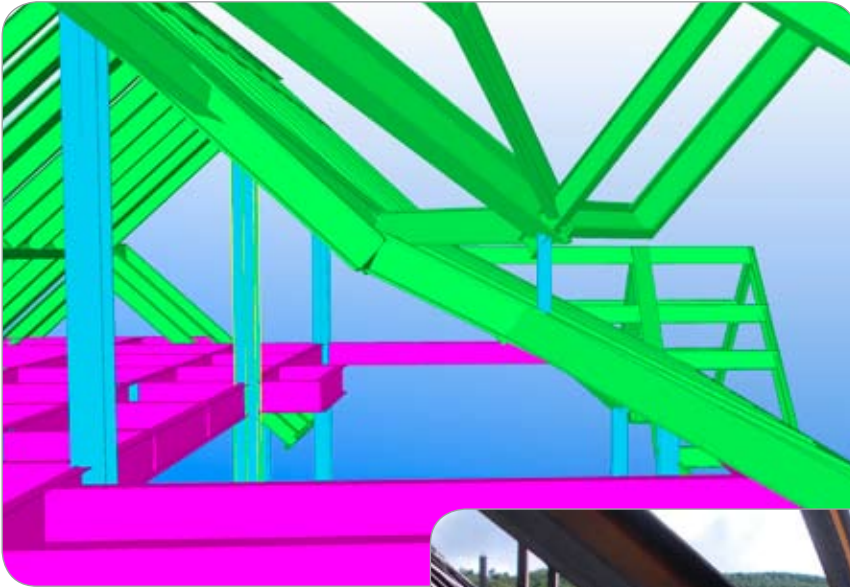


**STRUCTURAL
CONSULTANTS
INCORPORATED**



The Solaris redevelopment project in Vail, Colorado, will be comprised of 77 residential condominiums, 60,000 sq. ft. of retail/restaurant space, a new half-acre public plaza with winter ice skating, underground parking, three high-end stadium seating movie theaters and a 10-lane bowling alley, arcade and a sports bar.

Brian J. Patty, AIA, LEED AP, Project Architect with Davis Partnership Architects, effectively collaborated with SCI's design team through the sharing of IFC building information models. The architect utilized the structural engineer's building information model for various production activities including Track Changes using copy/monitoring tools that linked to the structural model, referencing structural objects into architectural drawings, and coordinating high levels of structural detail when needed.



The project team effectively shared building information models to work out the details of the complex roof structure. Image courtesy of Structural Consultants, Inc.

BENEFITS TO THE DESIGN TEAM

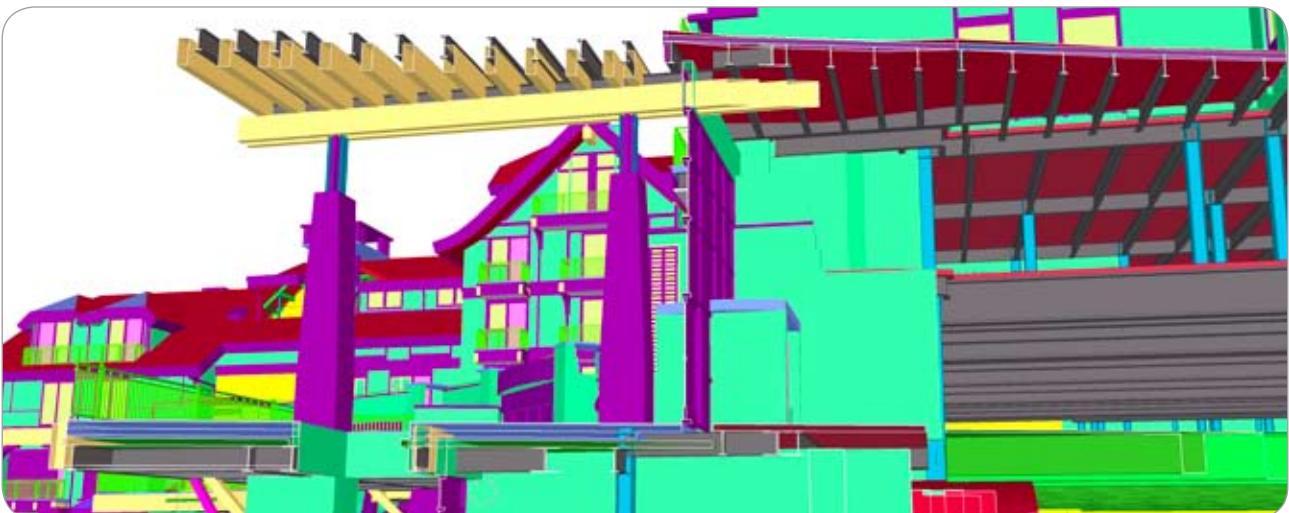
> The biggest point Mr. Patty notes is that structural engineers really need to be using BIM to be an effective contributor to the project team. "The fact that SCI, the structural engineer, and Dowco, the steel detailer, both used Tekla Structures allowed for solutions to come later in the process than ever before while still allowing for an extremely aggressive shop drawing production, review and fabrication schedule. Standard 2D drawings could not have produced the same building in the same time frame without lots of rework based on in-field realizations. I personally would not hesitate to work with a structural engineer using Tekla, as I saw great benefit from its use."

Also, the unmatched model performance and small file size of the highly detailed Tekla models proved beneficial to all project team members. On the Solaris project, it allowed the project team to collaborate effectively in 3D: "Solaris is a very complex building. It would have challenged the design team even if the financial and schedule pressures had not been present. The use of BIMs allowed the design team and the owner to more accurately understand the geometry of the structure."



- Track changes using copy/monitoring tools that link to the structural model
- Reference in structural objects into architectural drawings
- Coordination of high-level structural details when needed

> "IFC ALLOWS DESIGNERS, CONTRACTORS, BUILDERS AND OWNERS TO USE THEIR BIM SOLUTION OF CHOICE TO MEET THEIR PROJECT NEEDS AND YET COLLABORATE EFFECTIVELY WITH PROJECT TEAM MEMBERS."

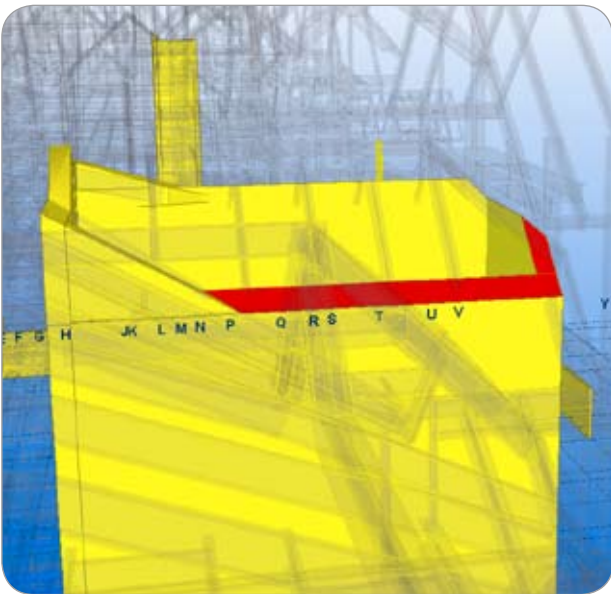
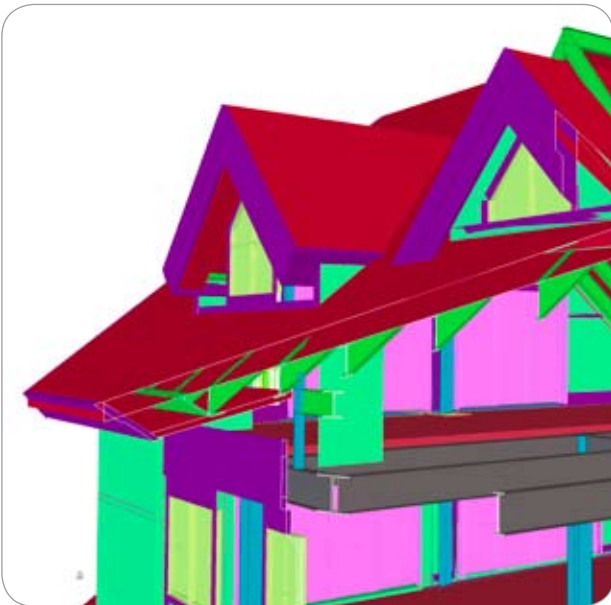


➤ "THE USE OF BIMS ALLOWED THE DESIGN TEAM AND THE OWNER TO MORE ACCURATELY UNDERSTAND THE GEOMETRY OF THE STRUCTURE."

BENEFITS TO THE OWNER

➤ The Solaris project implemented a highly collaborative work process where SCI modeled the structural steelwork frame in Tekla Structures during the design phase of the project for the purposes of design coordination, constructability review, and the pre-contract detailing of the frame for the successful steelwork contractor. A structural steel model was then passed onto the steel detailers who used the model to generate the detailing model on Tekla Structures. This process brought many benefits to the owner, including Accelerated construction schedules, Cost savings with tighter bids from subcontractors and a more construction-friendly design having fewer field fixes.

- Accelerated construction schedules
- Cost savings with tighter bids from subcontractors
- More construction-friendly design with fewer field fixes



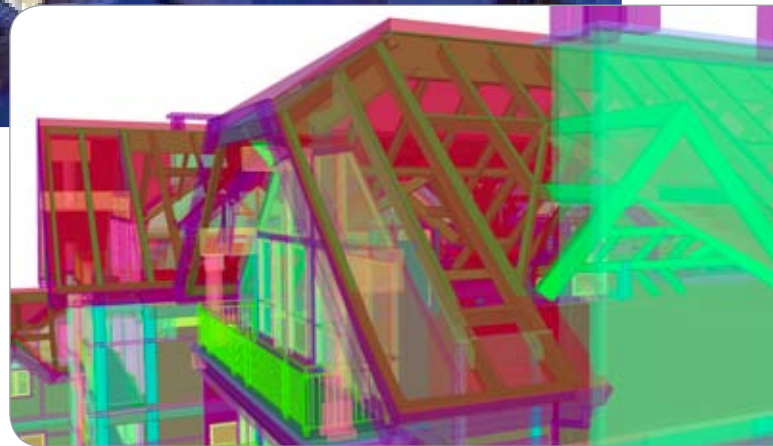
SCI delivered a highly detailed, constructable model that was used downstream in detailing and construction. Images courtesy of Structural Consultants, Inc.

HOW COLLABORATION WAS A SUCCESS

> Each week, SCI and DPA exchanged 3D design models between their respective software, Tekla Structures and Revit Architecture. Project data was shared using the IFC (Industry Foundation Classes) data exchange standard. IFC, supported by the international organization buildingSMART, comprises interdisciplinary building information as used throughout its lifecycle. IFC allows designers, contractors, builders and owners to use their BIM solution of choice to meet their project needs and yet collaborate effectively with project team members.

SCI shared their Tekla model by exporting an IFC model into Revit Structure, which they then shared with the architect as an .rvt model. This way, the architect could link directly with the structural model just as if SCI was using Revit Structure. Information such as geometry, section and material properties was transferred into Revit Structure. In addition, Global Unique IDs (GUIDs) were included in the exchange so that changes and updates to the structural model could be tracked within the architect's Revit model using the copy and monitoring tools.

The Solaris project was a winner in the 2009 Tekla North America Model Competition.

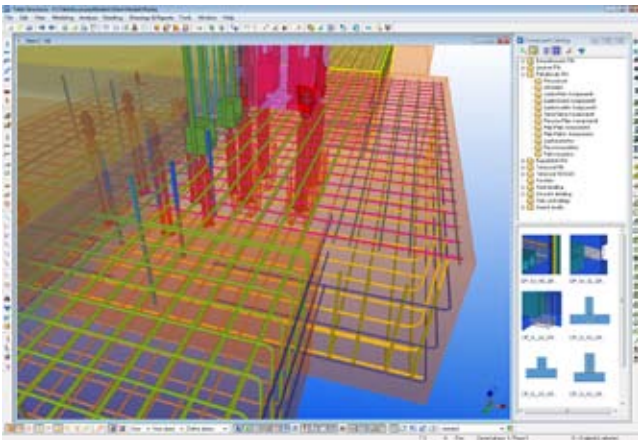


TEKLA STRUCTURES – INTELLIGENT 3D MODELING



> Tekla's model-based software products make customers' core processes more effective in building and construction and infrastructure management. Tekla Corporation has area offices and partner organizations worldwide. International operations account for more than 80% of net sales. Founded in 1966, Tekla is one of the longest operating software companies.

> Tekla's technology creates new opportunities for the construction industry. **Tekla Structures**, the most advanced BIM (Building Information Modeling) software on the market, provides an accurate, dynamic, and data-rich 3D environment that can be shared by contractors, structural engineers, steel detailers and fabricators, as well as concrete detailers and manufacturers. The highly detailed as-built structural models created in Tekla Structures enable the highest level of constructability and production control. Centralizing model and non-model based data into the model allows for more collaborative and integrated project management and delivery. This translates into increased productivity, elimination of waste, and an enhanced value for structural modeling.



Tekla is an anti-piracy member of BSA (Business Software Alliance) in the EMEA, APAC and Latin America.

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