

## Q&D Construction & Swinerton Builders Ritz Carlton Highlands Lodge, Resort and Spa



### AT A GLANCE



#### » Project

A new luxury resort community located in Lake Tahoe, California. The project includes a five-star hotel and high-end luxury condominiums; total gross floor area of 406,500 sq ft.

#### » Developer

QDS is a joint venture of Q&D Construction and Swinerton Builders. Both firms provide construction contracting and management services in the Western US for a variety of project types and sizes.

“By using Vico Software technology Swinerton is able to apply “lean engineering” concepts in ways not before possible to the complicated processes of construction projects.”

Daniel M. Gonzales, Corp. Mgr. Virtual Design & Construction, Swinerton Inc., USA

#### » Results

- Improved trades coordination
- Hundreds of spatial clashes identified
- Enhanced team communication
- Effective change management

Vico Software 5D products and services enable Q&D/Swinerton (QDS) to coordinate between different trades, conduct effective communication, and save time and costs by running detailed constructability analysis

The Highlands Lodge Resort and Spa project is a joint venture of Q&D Construction and Swinerton Builders, Inc. The team combines the large project experience of Swinerton Builders, San Francisco with the mountain construction experience of Reno’s premier contractor, Q&D Construction.

Ritz Carlton Highlands Lodge Resort and Spa is being built on a roughly 20 acre site at the Northstar-at-Tahoe Ski Resort in Northern California. The project consists of two main structures connected via an underground pedestrian tunnel. The main structure will house approximately 173 five-star hotel rooms, an attached four-level parking structure, a 19,000 sq. foot spa and commercial spaces. Seventeen luxury condominiums will occupy the hotel’s top floor. A future phase of the project will include 58 luxury condominiums with dedicated underground parking. The current phase of the resort will comprise 406,500 sq. foot build-

ing and will include six above-grade and four below-grade stories.

#### Challenges

This large-scale project involves numerous design firms and poses multiple coordination and communication challenges. Project leaders must bridge all parties to ensure efficient and cost-effective operation, and high quality results. In addition, the scope of this project requires cutting edge technology and constructability analysis to facilitate trades coordination both prior to and during field operations. As with any project of this size and complexity, managing budgets and costs is critical.

Due to the unusually heavy demands of this project, QDS was determined to find a sure-fire way to reduce errors, prevent delays, and minimize waste and expenses.



Communicating constructability using a section through the 3D Virtual Construction model

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### Solution

Vico Software's Construction Services team was brought in during the design development phase of the Ritz Carlton Highlands Hotel Project. Working closely with designers and subcontractors, the team created a detailed 3D model, which served as a medium for communication during preconstruction.

To obtain the most value from the 3D coordination process, MEPF subcontractors were brought in on a design-assist role. Each was required to create a trade-specific 3D model according to a unique coordination protocol which enabled a smooth integration with the master Architectural - Structural model. Because the design team worked in a traditional 2D process, Vico Constructor enabled QDS to provide an Architectural - Structural model based on 95% Construction Documents (CD) and to generate a model-based constructability report – a live document that can be constantly updated – which identified spatial clashes missing information and discrepancies in the CD documentation.

### Method

A Vico Services representative hosted bi-monthly, on-site coordination meetings with QDS, Mechanical, Electrical, Plumbing, and Fire Protection (MEPF) subcontractors. At each meeting an assigned 3D model location was integrated and analyzed for clashes. Clashes identified

during the previous meeting were reviewed and new clashes designated for resolution. With each meeting, the number of new clashes dropped indicating that the process had triggered profound noticeable changes in the efficiency of the construction team.

During the modeling process, the architect issued several updates and addenda to the documents set. With each release,

between Architectural - Structural and MEPF systems. By using the 3D model as a single communication point QDS and the design-assist subs were able to identify, document, and address each issue as a team.

Using Vico's integrated 5D software suite QDS is successfully coordinating designers and subcontractors, establishing an effective change management process,

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*Virtual Construction is not just about technology tools, working with the Vico Services team has helped us understand and change our work processes and work together as a team to come up with collaborative solutions.*”

Daniel M. Gonzales, Corp. Mgr. Virtual Design & Construction, Swinerton Inc., USA

Vico contracted a change order to identify changes, update the model, and re-check synchronization. Using Vico's Constructor suite, the team generated a 4D simulation to represent the sequence of construction. The simulation is used to identify inefficiencies in the schedule, improve communication and support decision-making by visually defining the construction sequence to subcontractors and field crews.

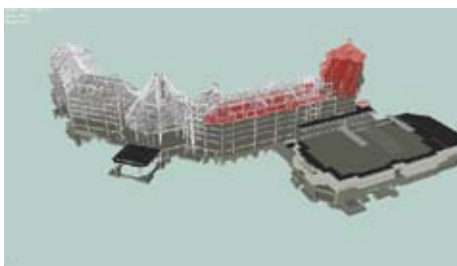
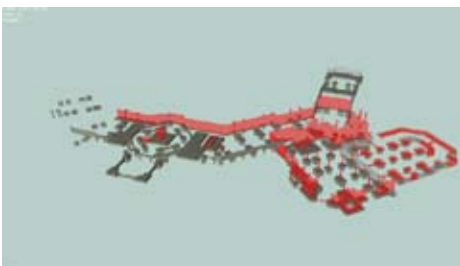
### Benefits

In the first analysis of the integrated Architectural - Structural - MEPF model Vico's 5D process identified more than 200 legitimate spatial clashes. Clashes were found among MEPF subsystems and

and facilitating better communication during pre-construction and on-site.

### Looking Ahead

During the project's next phase, QDS and Vico will perform a changes analysis and generate a report to document differences between the 95% CD and For Construction documents. This report will be used to update the 3D models to reflect targeted changes. A QDS project engineer will assume ownership of the 3D model and will use it onsite during construction. The engineer, trained by Vico experts to act as 3D Model Manager, will control the coordination process using the virtual construction model and Vico's Constructor suite.



4D sequence clearly illustrates the building process to field workers and subcontractors