Perini Building Company
Maximizes Technology to Construct CityCenter

CityCenter is the Largest Project in the History of Las Vegas to Implement Building Information Modeling (BIM) and Three-Dimensional Modeling for Construction Coordination

CityCenter is a project of firsts. It is the largest private development, the largest green development and is now one of the most technically savvy projects in the nation. With literally thousands of activities happening hourly on the 18-million square foot project, Perini utilized an array of project management and construction-modeling software tools to manage millions of pieces of information, including tracking and updating budgets, orchestrating around-the-clock construction logistics, and coordinating over 10,000 construction craftspeople working onsite.

Perini used Primavera P6 Enterprise Project Portfolio Management software for scheduling and logistics and Prolog Construction Project Management software at CityCenter.

In addition to project management software, Perini and its major subcontractors collaborated closely to streamline daily construction logistics using AutoCAD 2009, Revit 2009 and NavisWorks 2009. Perini employed AutoCAD 2D software for ongoing daily logistics for coordinating steel, concrete, crane layout, site plan layout, emergency access, and an evacuation plan. In conjunction, AutoCAD 3D models were used to draw structural elements that impacted mechanical, electrical and pumping (MEP) coordination, including walls, concrete slabs, exteriors, and structural steel.

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To augment AutoCAD 3D, NavisWorks 2009 was employed for mechanical, electrical and plumbing coordination. The company selected Navisworks based on its compatibly with different 3D software used by subcontractors. NavisWorks 3D software allowed Perini and MEP subcontractors the ability to navigate in real-time through detailed technical building models. Viewing the placement of complex mechanical, electrical and plumbing systems in a 3-D model resulted in solving a range of problems in advance of construction. Perini’s AutoCAD department was responsible for inputting and updating all of the models.

Perini and the project architects implemented Revit for 3-D modeling at CityCenter. Multiple users shared Revit’s file database enabling project personnel the ability to use interconnected plans, sections, elevations, legends, and schedules. As changes were incorporated, other views were automatically updated.

The most extensive use of 3-D modeling and BIM implemented at CityCenter was on Crystals, a 500,000 square foot retail and dining facility. Designed by Studio Daniel Libeskind, the complexity of the design dictated the use of advanced technology (BIM and 3D rendering and coordination). Built of structural steel, the project consists of thousands of leaning columns, curving trusses and straight members that don’t line up with any other piece of steel. Perini, Schuff Steel Company, BDS Steel Detailers, and Halcrow Yolles, the structural engineer, spent 12 months strategically planning the project using advanced BIM technology. In total, 16,455 pieces of steel were inputted into Tekla Structures software, a steel detailing program. Tekla Structures interfaces with other programs such as Revit and AutoCad that created BIM models for all of the trades and consultants working on Crystals.

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Tracking and verifying completed construction activities during the final phase of the CityCenter was a massive undertaking. To streamline operations, Perini created a custom “punch list” program to document activities. The application software utilizes a Palm hand-held mobile device and a desktop PC. Punch list data was collected using the hand-held device and uploaded into the PC for tracking and reporting. As work activities were updated in the field, information was synchronized with the PC. The application helped to maintain the completion schedule.

Accessing a server with enough capacity to support Perini’s role at CityCenter was critical. Perini Building Company, through its parent corporation Tutor Perini Corporation, deployed the Cisco® Unified Computing System on the project. The Cisco Unified Computing System platform unites network, computational, storage access and virtualization into a single cohesive system. The Unified Computing System implementation at Tutor Perini marks the first deployment of Cisco’s new computing platform.