



STREAMLINING CONSTRUCTION WITH NVIDIA QUADRO

LAYTON
CONSTRUCTION
CASE STUDY

The construction industry continually faces the daunting task of managing and communicating sufficient design information so the general contractor, builder and client all understand the exact parameters and constraints of a project.

Employing NVIDIA graphics solutions helps to visually communicate design and construction intent.



For decades the construction industry has used two-dimensional plans to communicate important project information, however, these plans often did not provide enough detail or precision. As a result, estimating discrepancies as well as costly and time consuming change orders would often impact the overall profitability of the project for the builder. These issues, however, can simply be avoided by building the project virtually before construction begins in the field.

Layton Companies, a Salt Lake City, Utah based firm specializing in large scale projects, solved this problem by incorporating Virtual Design and Construction (VDC) technology to its design-build workflow. Working on projects ranging from neighborhood retail centers to large hospitals and sports arenas, Layton recognizes all these jobs have one thing in common: the need for construction visualization and prototype modeling. VDC is a way to communicate design and construction details using more effective 3D and even 4D technologies. By streamlining the design to construction process, the firm is equipped to control costs and compete more effectively. And to fuel their virtual construction process, Layton relies on NVIDIA Quadro professional graphics solutions and Autodesk software.

Company Built to Leverage Technology

Founded by Alan W. Layton, a decorated WW II Veteran in 1953, and now run by his son, Davis S. Layton, President and CEO, the construction management and general contracting firm has grown significantly over nearly six decades. With over 650 employees and offices in Utah, Arizona, Idaho, California, Nashville and Hawaii, Layton is ranked as the 66th largest commercial contractor in the United States. The firm constructs a wide range of facilities, ranging from office buildings and hotels, to shopping malls and sports venues.



Ever-changing Marketplace

The construction industry faces many challenges: current economic pressures, fluctuating product prices for materials such as concrete and steel, and the dilemma of what new technologies warrant investment. To best address these challenges, Layton employs the latest advances in Building Information Modeling (BIM) technology. BIM is the process of generating and managing building data during its life cycle using 3D, 4D, and real-time modeling to increase productivity in building design and construction. BIM encompasses building geometry, spatial relationships, geographic information as well as quantities and properties of building components.

As executive manager for virtual construction at Layton, Damon Socha is focused on leveraging BIM. Holding degrees in mathematics, chemistry and engineering as well as an MBA, Socha has spearheaded the purchase of needed technology in order for Layton to address its burgeoning needs. "Employing NVIDIA graphics solutions help us to visually communicate design and construction intent to a wide variety of audiences," Socha states. "Photorealistic renderings and 3D visualizations are the backbone of the Virtual Construction department and provide the communication bridge with our stakeholders," Socha says.

Bringing the Pieces Together

Layton's customers and stakeholders benefit significantly from the increased information Layton is able to provide with the NVIDIA and Autodesk solutions.

"Layton unites the individual pieces of a large project to get the job done right," states Socha. "By showing a complete design in a photorealistic way, we can more efficiently communicate with all individuals involved in the project. Plus we can arrive at solutions to complex issues faster," comments Socha. Building in today's environment, meeting codes, scheduling contractors and sourcing materials is all very intricate. Layton looks at the big picture to make sure everything fits together the right way, before it ever takes a shovel to the ground.

From the first bid sheet, through the design, construction and facilities management, Layton Construction relies on 3D modeling, design and visualization.

"We have multiple departments all armed with the latest NVIDIA Quadro hardware and Autodesk CAD software," comments Socha. "The performance and reliability of Quadro graphics help us with everything from a quick 3D model to include with a bid, to a complete prototype of an entire building," Socha continues.

Large Projects, Massive Data

As soon as Layton Construction is awarded a bid, the complex 3D work begins. "It takes a lot of professionals to design and build projects as large as the ones we are entrusted with. And so we work with a diverse team of highly skilled architects and subcontractors to pull together the entire building process," comments Socha.

In any large project, each architect and subcontractor has their own set of 3D models and construction plans

for their individual specialty. Each of these plans has a tremendous amount of data associated with them. When all the individual plans are combined, the complete building prototype files are massive. "This is where Quadro really shines, delivering real-time rendering and visualization of the entire project," comments Socha.

The portability of Quadro proves to be an important component of Layton's IT infrastructure.

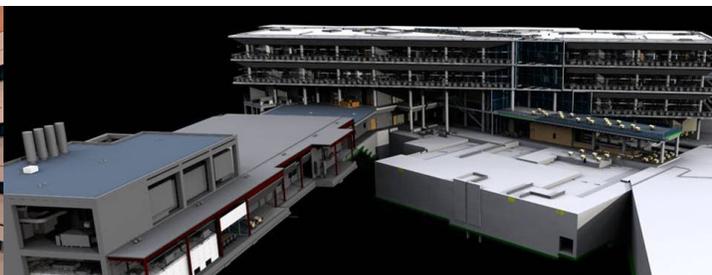
Working seamlessly together, the NVIDIA Quadro graphics processing units (GPUs) and the Autodesk products--including AutoCAD, Navisworks and Revit--enable Layton to view and modify projects in real-time. Layton also uses project schedule simulation and 4D photorealistic visualization to plan out every detail of each project.

In addition to the firm's desktop CAD workstations, mobile workstations featuring NVIDIA Quadro mobile graphics are often used by the teams in the field, who have the same high-end graphics and photorealistic visualization needs. Saving valuable time and money when used at the construction site or at a client's office, the portability of Quadro proves to be an important component of Layton's IT infrastructure.

Consistent Performance, Consistent Results

Layton relies on the consistent performance of the Quadro GPU to immediately render changes without any glitches or delays. "Having our AutoCAD models run smoothly when we change material, views or schedules is imperative to our communication success with our stakeholder. People have limited bandwidth and communicating photorealistically is imperative," Socha continues.

With the continued use of 3D design and visualization, Layton looks forward to its clients and stakeholders being able to grasp an even better understanding of the construction process from beginning to end. In addition, NVIDIA products allow Layton to fluidly migrate to next-generation software applications when released. The future of virtual construction will provide even faster and more realistic visualizations, and the ability to better communicate concerns and expectations with an even higher level of detail.



To learn more about NVIDIA Quadro, go to www.nvidia.com/quadro