

## Case study

# Ayers Saint Gross

## HP Z Workstations, NVIDIA® graphics streamline rendering



### Industry

Architecture

### Objective

Accelerate the design review and approval process for a new building with special attention to visual impact of materials, colors and interaction of light on the building design

### Approach

Ayers Saint Gross leverages its HP Z440 Workstations equipped with NVIDIA® Quadro® K6000 graphics and V-Ray RT rendering software\* to enable a rapid virtual review process

### IT matters

- HP Z440 Workstations equipped with NVIDIA® Quadro® K6000 professional graphics provides both stability and extreme graphics capabilities
- V-Ray RT used NVIDIA® GPUs to accelerate rendering

### Business matters

- Processing time for a set of images was reduced from a full day on average, to just minutes<sup>1</sup>
- Virtual design review enables visualization of more design options, while accelerating the project timeline



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– Andrew Watkins, AIA, associate principal and director of Digital Technologies, Ayers Saint Gross

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Ayers Saint Gross is the oldest architecture and design firm in Baltimore. The bulk of its practice is buildings and related services for higher education. When the firm was chosen to design a major new health building housing the Kentucky College of Optometry, it developed an all-new process for rapidly producing 3D architectural renderings, leveraging its HP Z440 Workstations and a new GPU-based rendering solution.

\*Sold separately

The University of Pikeville sits in the rural eastern part of Kentucky, squarely in the Appalachian Mountain range. It's an underprivileged area that has long been underserved by healthcare providers.

So as part of the university's strategic efforts to increase educational opportunities for students, stimulate economic development, and improve comprehensive healthcare delivery in central Appalachia, it developed a plan to build a new Health Professions Education Building. The building will house the new Kentucky College of Optometry, and support other healthcare education programs.

### 3D visualization supports virtual review process

Ayers Saint Gross of Baltimore, which specializes in buildings for higher education, was chosen to design the new structure in conjunction with Trivers Associates.

It quickly became clear to Ayers Saint Gross Associate Principal and Director of Digital Technologies, Andrew Watkins, AIA, that the inclusion of the optometry component would make visual aspects of the building's interior — including choice of materials, accent colors, and the interaction of natural light with the building itself — critically important. Gaining design approval from the University's project team would require review of many design choices.

"Visualization was critical with this particular client," says Tarek Saleh, senior design architect at Ayers Saint Gross. "They really wanted to see things in 3D, and how all the visual elements would work together."

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At the same time, Watkins knew that the building's schedule was already tight. "We were working with them on a very aggressive schedule. We had to make decisions fast," he recalls.

There simply wasn't time for an iterative process of design proposals, revisions, and new proposals that would stretch on for months. Instead, Watkins decided to handle much of the design approval using a virtual review process of 3D architectural renderings generated from Autodesk Revit and 3ds Max.

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At one point, the firm had three days to prepare a series of 15 different views, with different versions showing a selection of accent colors. The renderings also had to account for various angles of ambient sunlight, and interaction of light with everything from wood grain finishes to highly polished concrete and terrazzo floors.

In the past, deadlines were met by sending the work to an outside firm with a large rendering farm, which would incur thousands of dollars in additional costs. Watkins says outsourcing the work would have taken 12-15 hours.

### New workflow for rapid 3D rendering

Instead, Watkins' team turned to the same HP Z440 Workstations it used to manage the building model in Revit, each equipped with NVIDIA® K6000 graphics, for the rendering. It used V-Ray RT rendering software for 3ds Max to take advantage of GPU-based rendering.

"That workflow cut our rendering time from many hours to just minutes," says Watkins.

V-Ray RT uses GPU acceleration to render interactively. "Imagine someone wanting to change a color in a 3D model and having to wait six hours to see the result of that change," Saleh says. "With our new workflow, we could study that in a few minutes."



NVIDIA® Quadro® K6000 professional graphics cards

Watkins set up his HP Z440 Workstation with dual monitors — one showing the Revit model, and the other the output from V-Ray — so he could view the progress in near real time.

Later in the project, Watkins' team became the first in the world to use V-Ray RT for Revit, eliminating the need to export 3D models to 3ds Max for rendering. Not only did that save additional time, but it also eliminated any discrepancy between the camera view available in Revit and the camera view in 3ds Max.

## Leveraging BIM on HP Z Workstations

For Watkins, a self-professed Building Information Management (BIM) “evangelist” who has been using BIM on building projects since 2004, the new workflow confirmed a long-held personal belief about technology.

“I’ve felt that if we can remove the constraints of technology from our process, and concentrate solely on the design, we can do our jobs that much better. And having our HP Z Workstations equipped with NVIDIA® Quadro® professional graphics cards for the rendering, the technology barrier all but disappeared,” he says.

“Imagine someone wanting to change a color in a 3D model and having to wait six hours to see that change. With our new workflow using HP Z Workstations, we could do that in a few minutes.”

– Tarek Saleh, AIA, senior design architect, Ayers Saint Gross

He explains that the new rendering workflow will change the way his team prepares for client presentations. “It will save us from having to send rendering outside the firm, and keep the project in the designers’ hands throughout the process.”

Ayers Saint Gross is well equipped for the new process. All told, the firm has 110 HP Z420 and Z440 Workstations. Watkins says Ayers Saint Gross has been using HP Workstations since

before he joined the firm some 15 years ago, and sticks with HP because of the Z Workstations’ stability, reliability and support, along with the ease of access to internal componentry.

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–Andrew Watkins, AIA, associate principal and director of Digital Technologies, Ayers Saint Gross

The HP Z440 Workstations, he says, are a “sweet spot,” balancing price and performance. “They are a very good fit for our high-end production needs,” he says.

While some firm members like having a mobile device for travel, there are a lot of performance issues when you try to run Revit or 3ds Max on a standard notebook,” he says. “It’s important to us that people have the right piece of equipment to do their job; that’s why we’ve standardized on HP Z Workstations.”

The firm made a commitment to BIM, and Autodesk Revit specifically, many years ago. “We made a conscious decision more than a decade ago because we wanted to be at the forefront,” Watkins says. “We knew that interoperability with all the stakeholders in a project would be increasingly important.”

## Virtual review supports dispersed project team

The value of a virtual review process is particularly important as the scope of a project increases. In the case of the University of Pikeville building, the firm engaged a partner architect, Trivers Associates, to do drawings of the exterior envelope of the building. Watkins’ team coordinated the exterior model with Trivers, along with federated models of the various building systems, all in Revit. “We have a nationwide group of consultants that we can engage on projects like this,” Watkins explains. “It’s important to be able to visualize the project in 3D models because you can’t always meet in a conference room to discuss things.

## Customer at a glance

### Hardware

- HP Z420 Workstations
- HP Z440 Workstations
- NVIDIA® Quadro® K6000 graphics cards

### Software

- Autodesk Building Design Suite
  - Revit
  - 3ds Max
- V-Ray RT for Revit
- V-Ray RT for 3ds Max

Looking ahead, Watkins expects 3D renderings will soon be replaced in virtual reviews by virtual reality presentations. He also expects to use BIM technology to close the gaps between design, construction, and building management.

“At some point we will use technology not just to model a building, but also to virtually

construct it to identify coordination errors, and manage it for systems delivery, and eventually help the building’s owner manage it better over time.”

### Learn more at

[hp.com/go/zworkstations](http://hp.com/go/zworkstations)

[hp.com/go/BIM](http://hp.com/go/BIM)

<sup>1</sup>Based on use of HP Z440 Workstations equipped with NVIDIA® Quadro® K6000 graphics and V-Ray rendering software for Autodesk 3ds Max to take advantage of GPU-based rendering. NVIDIA® Quadro® K6000 is available as an upgrade from HP. Autodesk and V-Ray RT are sold separately.

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