



PROJECT SUMMARY

Project: Nissan Americas Corporate or Residential Building

Organization: Gresham, Smith and Partners (GS&P)

Be-Awards Category: Innovation in Commercial and Residential Building

Project Objective: Plan and design its new 11-story, 550,000 square-foot office building with a demanding schedule

Software Used: Bentley® Structural and RAM™ Structural System

FAST FACTS

- GS&P was able to overcome time constraints for structural steel delivery by using its RAM Structural System analysis model as a delivery tool.
- The intra-operability features of RAM Structural System and TriForma® (now Bentley Structural) 3D software was utilized to automatically generate the structural steel framing plans for the entire building which saved time and reduced errors.
- The firm's process innovation delivery method enabled them to not only complete this project on time and on budget but also the facility opened four months earlier than scheduled with a cost savings of \$1.2 million.

Gresham, Smith and Partners Uses Process Innovation to Deliver Nissan America's New Corporate Facility Ahead of Schedule

Facility Open Four Months Early and Cost Savings Total \$1.2 Million

Before Nissan North America, Inc. moved its headquarters to Franklin, Tenn., it contacted Gresham, Smith and Partners (GS&P) to plan and design its new 11-story, 550,000-square-foot office building. The \$110 million facility sits on a 50-acre site and includes a 1,100-car parking garage.

GS&P's mission was to meet all of Nissan N.A.'s goals for the project, including the automaker's demanding schedule. Nissan relocated its operations from Gardena, Calif., to temporary office space near Nashville before project completion. It was incurring substantial rental costs while the new facility was being designed and constructed and, as a result, maintaining the tight two-and-half-year schedule was crucial to the success of the project. GS&P adopted a "no-excuses" commitment to deliver the project from design to ribbon cutting on time.

But the aggressive schedule wasn't the only challenge GS&P had to overcome. It also had to maintain the budget and procure a specific type of steel within a short window of opportunity. To meet its commitments, GS&P turned to project-delivery process innovations.

MAKING UP FOR LOST TIME

Early in the design phase, Nissan spent considerable time evaluating the employee population that its new facility needed to accommodate. Although Nissan used this time wisely, GS&P had to implement a strategy to recover those lost hours during the time remaining for design and construction.

Part of the time constraints included ensuring that the structural steel was delivered on time, which seemed unlikely at the start of the project. The challenge began when GS&P's six-member structural design team discovered that there was a very short window of opportunity to place its steel mill order. The challenge was compounded by the fact that the window would close well before conventional delivery methods would allow GS&P to have the information it needed to place the order. GS&P was able to overcome this challenge by using its RAM Structural System analysis and design model as a delivery tool.

Broadly stated, GS&P reached the desired occupancy date by releasing the design to the general contractor as the project proceeded and using various early-release packages. Hence, the innovative project delivery process powered by effective technological tools successfully overcame the obstacles.

DELIVERY PROCESS INNOVATIONS USING RAM STRUCTURAL SYSTEM AND TRIFORMA

To save time and reduce errors during design, GS&P used the intra-operability features of Bentley's RAM Structural System program and TriForma (now Bentley Structural) 3D software to automatically generate the structural steel framing plans for the entire building. The process also enabled GS&P to reuse the design information created in RAM Structural System, including reactions, camber, and member sizes, eliminating the need to regenerate that information.

GS&P used its RAM Structural System model to communicate with its structural steel detailer, who used the information to generate an advanced bill of materials (ABM). The ABM was used in conjunction with GS&P's hardcopy drawings to secure bids from steel fabricators. On an \$8 million



The Nissan Americas Corporate Facility, an 11-story, 550,000-square-foot office building in Franklin, Tennessee opened four months ahead of schedule with a cost savings of \$1.2 million.

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ABOUT BENTLEY

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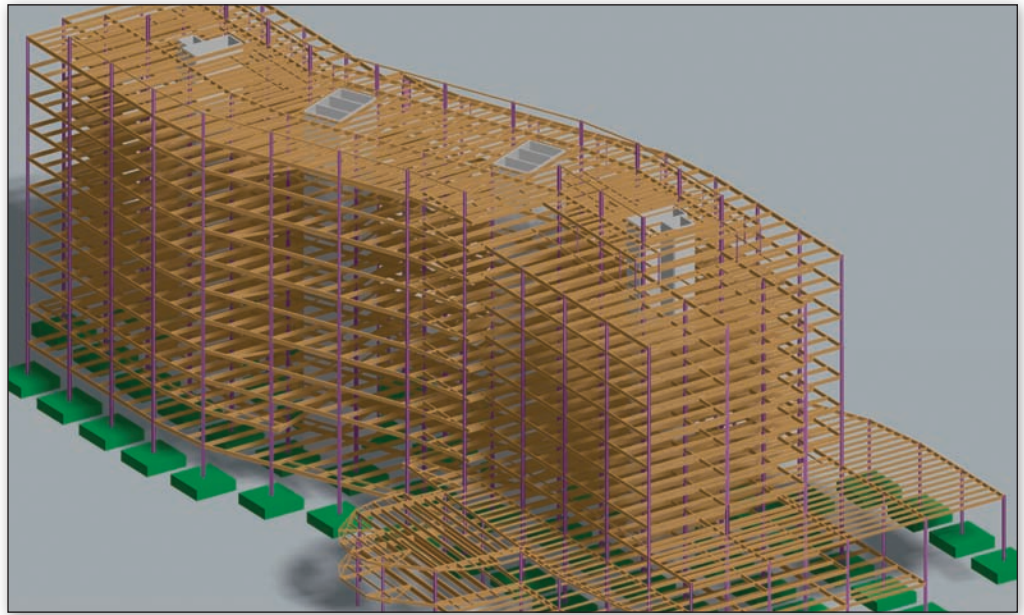
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3D rendering of analysis and design model

portion of the work, all four bids submitted had less than 1.5 percent variance. By using the ABM and the hardcopy of GS&P's preliminary drawings, GS&P didn't have to wait for the completed early-release drawings in order to start the bidding process for the main structural steel. Without this process innovation, the selection of a steel fabricator would have been delayed by at least four weeks.

GS&P also used its RAM Structural System model, with the assistance of the structural steel detailer, to place an order for critical heavy structural column shapes before selecting the fabricator, avoiding a three-month delay. In studying the RAM Structural System model, the project team discovered several column shapes that were not available domestically. As a result, the team resequenced the structural steel erection of the building to allow for the extended delivery time of those columns.

The RAM Structural System analysis and design model was refined and passed on to the steel detailer to begin the structural steel shop drawings. When the shop drawings were completed and approved, 98 percent of the steel members' specifications were exactly the same as those in the original analytical model.

OVERCOMING THE BUDGET CHALLENGE

Given the volatility of today's commodity/building material environment, cost protection can be an important element in project budgets. At times, it can result in preemptive project de-scoping to guard against cost unknowns, such as the price of steel. By practicing an aggressive method of project

delivery, GS&P substantially reduced the budget risk of the superstructure. This gave Nissan the flexibility to add features to its new facility or retain some that might otherwise have been eliminated.

Using this method gave Nissan the option to shift a portion of the project budget allocated to the risk associated with cost escalation to fund additional sustainable-design features – features that would improve occupant comfort and reduce the building's environmental impact. Specifically, Nissan used the steel cost savings to better preserve the site's existing wetlands by featuring them as green space for the local area.

"Building Information Modeling is a very popular term among builders. However, only when we are able to consistently couple this advanced technology with new delivery methods, such as integrated project delivery, will we be able to transform our industry," said Rusty Jones, CAD manager, GS&P. "We utilized aspects of integrated project delivery in securing the services of a structural steel detailer prior to awarding the fabrication contract on this project. We then communicated with that valuable team member using appropriate technology to eliminate the need for unnecessary information recreation."

The process innovation delivery method used by GS&P was the key to meeting all of Nissan N.A.'s requirements. The firm's upfront commitment to completing this project on time and on budget was realized in July 2008 when the facility opened four months earlier than scheduled with a cost savings of \$1.2 million.

2008 BE AWARD NOMINEE

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