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Edith's Story

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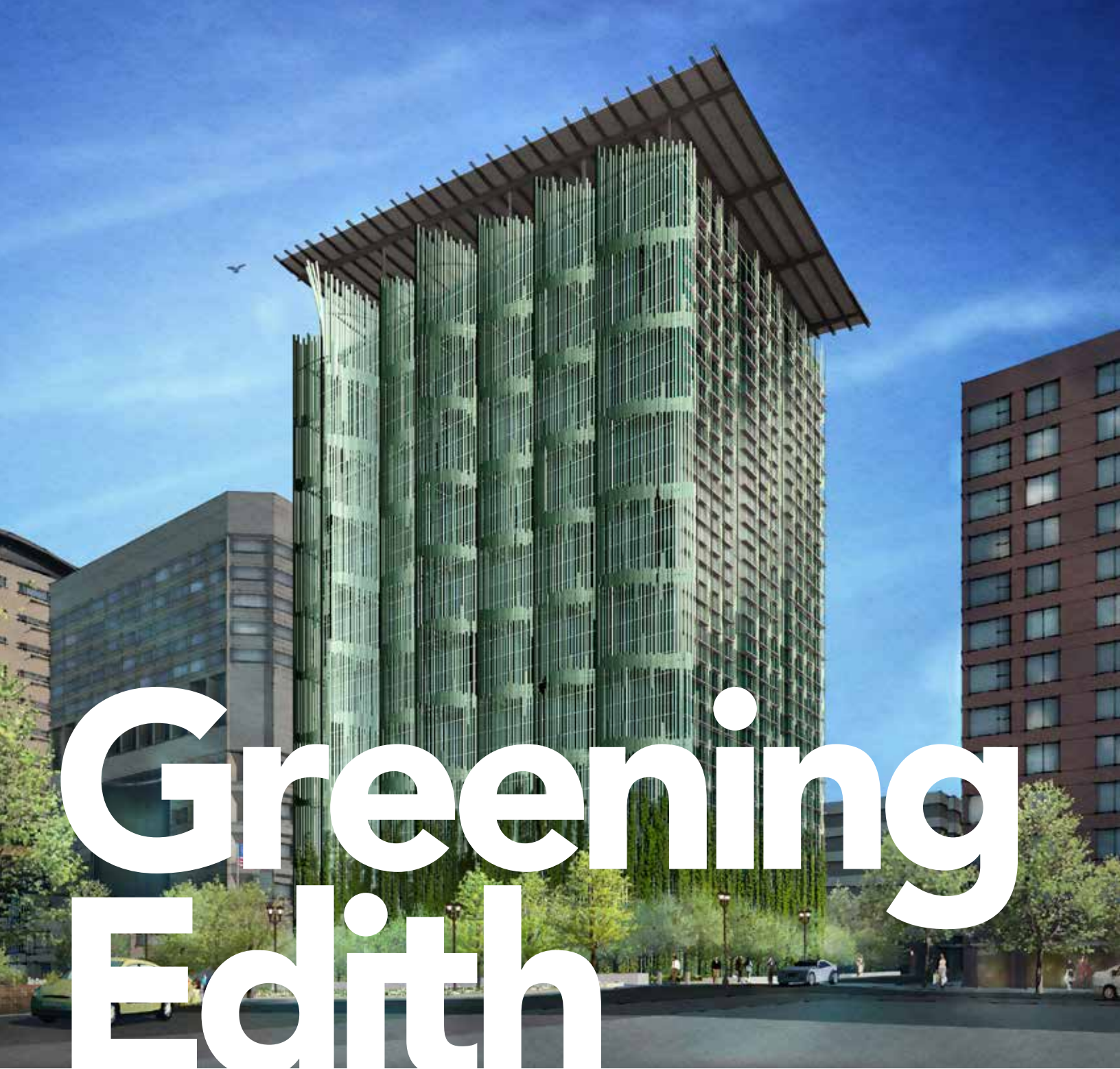
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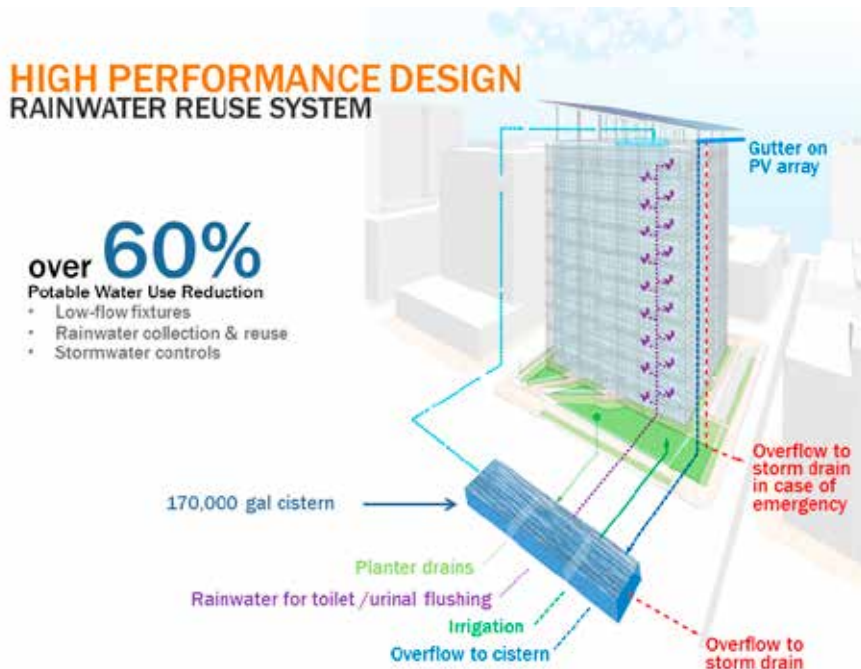
Greening Edith

**Reinventing project delivery to
create the high performance
Edith Green-Wendell Wyatt
Federal Building**

By Jennifer Taylor

When completed in 2013, the \$139 million modernization of the Edith Green-Wendell Wyatt Federal Building (EGWW) in downtown Portland, Ore., will become an operationally and economically efficient high-performance building.

In addition to the many forward-thinking design solutions employed, EGWW provides significant value as a demonstration of the results of an integrated, collaborative delivery process.



The Federal employees working in the building and visitors to the newly renovated facility will notice its custom-designed façade shading devices, tilted rooftop photovoltaic panels, and many other efficient sustainable and innovative technologies. The building went from a 512,400-square-foot, 18-story, 1974-vintage office building to a LEED Platinum cornerstone of the General Services Administration's (GSA's) green building portfolio.

But for the GSA Region 10 project staff, as well as the entire design and construction team, the project illustrates much more than the transformation of a single outdated federal building. The project's innovative delivery method exemplifies the federal government's renewed focus on finding creative and affordable solutions.

The Big Picture

In 1996, GSA already was studying the outdated building's deficiencies. In 2003, it contracted design work to begin for re-

pairs and alterations to the aging facility. But that effort was put on hold in 2006 due to lack of federal funding. After the 2009 passage of the American Recovery and Reinvestment Act (ARRA), EGWW was identified as one of a handful of projects that was shovel-ready.

The team was tasked to significantly compress the project schedule from the GSA Standard (P-100) of 21 to 24 months for design, to only 14 months for design. In addition, EGWW's construction team was asked to complete the entire modernization within 30 months, rather than the previously estimated 54 months.

From a budget perspective, the team knew early in the process that EGWW's budget would provide additional challenges, as the 2005 budget was based on

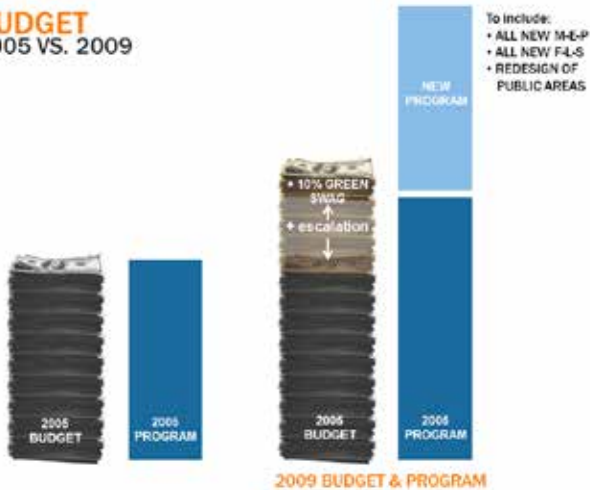
a much smaller scope than the forward-thinking goals envisioned for the 2009 scope. After applying a factor to escalate the 2005 original \$110 million budget, they added 10 percent for new sustainable and green solutions. The 2009 project was estimated to cost \$150 million. GSA's budget was underfunded by approximately \$25 million.

EGWW's significant schedule and budget challenges have broader implications in that they represent not only this singular project, but provide insight into what the future holds for GSA," says Patrick Brunner, supervisory project executive, Design and Construction Division, GSA Public Buildings Service, Northwest/Arctic Region 10. "We anticipate that the next few years will see dramatic decreases in federal budgets for GSA. Business as usual will no longer be affordable."

i-DELIVERY

From client, to architect and contractor, EGWW's entire team embraced the opportunity to create a new project delivery

BUDGET 2005 VS. 2009



From client, to architect and contractor, EGWW's entire team embraced the opportunity to create a new project delivery type to establish GSA as a proving ground for innovative green building techniques

type to establish GSA as a proving ground for innovative green building techniques – and to meet the challenging schedule and budget.

SERA Architects (SERA) previously had explored the concept of integrated project delivery, which showed promise to reduce overall project cost by 5 percent to 20 percent, while beginning to measure the increased benefits of tenant satisfaction and innovative sustainable solutions. While traditional project delivery methods are fundamentally sequential, the proposed process – dubbed “i-DELIVERY” – was to be concurrent and compressed.

In December 2009, GSA selected a contractor to serve as “construction manager as constructor” (CMc). The project team quickly expanded to include the CMc’s top five critical subcontractors.

On the differences between i-DELIVERY and a traditional contractor selection process, Brunner says the AE contract was started before the builder was selected. “Once the builder was on board, the owner decided to slow everyone down, in part, to get everybody on the same page. That decision frustrated both the AE and build team, rightfully so, given the extreme schedule compression the project faced.

“That said, in time, both have come to appreciate the value that the orientation phase was intended to provide along with

the benefits that eventually flowed to the project,” Brunner adds. “Learning through that frustration demonstrated the value of learning/reinventing, on a daily basis, and each member of the team adopting learning as a project objective.”

The owner, GSA, the design team led by SERA, and the contractor, Howard S. Wright, embraced the dynamic new process based on these project principles:

- Everyone is a co-owner
- Continuously improve, innovate, reinvent, learn
- Optimize Building Information Modeling (BIM) – technologies, skills and talents
- Employ open book, transparent processes
- Capture biggest bang for the buck

Because i-DELIVERY is atypical to standard federal delivery methods, EGWW required several exemptions to federal rules – something accomplished by gaining approval from GSA’s Administrator for deviations and waivers from the standard Federal Acquisition Regulation (FAR). “FAR’s intent is not to be entirely prescriptive, it is actually written to advocate for innovative business solutions such as our approach to the EGWW challenges,” Brunner says. “Our overall goal was to create new

The Technology Factor

In soliciting the design contract, the General Services Administration (GSA) made it clear it was willing to invest in BIM tools—and that they expected the investment to provide significant project benefits, including:

- A design with lower overall costs than estimated
- Better sharing and collaboration of information
- Enhanced quality control
- Validation of contractor take-offs
- More and clearer information for tenant agencies and project stakeholders
- Reduction in redundancy in modeled information
- Models as collaborative tools for problem solving
- Accelerated learning by team members

The EGWW team used Autodesk BIM software for the architectural, structural and MEP disciplines. All members of the design team worked on a co-located model environment utilizing a shared server in the Information Room (iRoom). This framework increased team collaboration, reduced latency and improved problem solving across disciplines.

The team employed numerous Autodesk BIM tools to study small sections of the building and determine their impact on the overall building's energy and water use. Ultimately, the true innovation for EGWW was in the integrated nature of using BIM tools to allow the design to meet High Performance Building criteria without adversely impacting the project schedule or budget.

Engineering consultants were required to work in BIM and were linked to the primary Autodesk Revit architectural design models. First-tier subcontractors also were co-located in the iRoom, helping them to become familiar with the design and allowing them to provide constructability reviews in real time to the design team and continuous cost feedback.

The result of this closely collaborative work environment and ready access to design information was a highly coordinated building design that has resulted in fewer RFIs and change orders than a typical linear process, while maintaining the project schedule and budget.

methods, tools and techniques to optimize the team and achieve best value, which we defined as an overall outcome rather than a source selection method.”

EGWW's team committed to four critical performance standards:

- Satisfy customer in terms of quality, price and delivery
- Treat contractors with equity and candor
- Fulfill public policy
- Reduce administrative cost

The project team met the compressed design schedule, and construction is on track for occupancy in 2013. The revitalized building will be exceptionally energy efficient, modeled to save 65 percent of the energy used by a conventional building



and to reduce the water used by up to 65 percent versus Oregon code. Key sustainable features include: energy efficient hydronic distribution system using radiant ceiling panels for heating and cooling; new façade shading system of exterior aluminum rods to minimize solar heat gain; rainwater collected on the building's canopy roof and stored in a 170,000-gallon tank in the basement for reuse in toilet flushing, irrigation and cooling

tower makeup water; rooftop array of photovoltaic panels (PV) expected to produce 200,000 kWh of energy annually; and demand dispatch/regenerative elevators.

6 key components to EGWW's i-DELIVERY approach

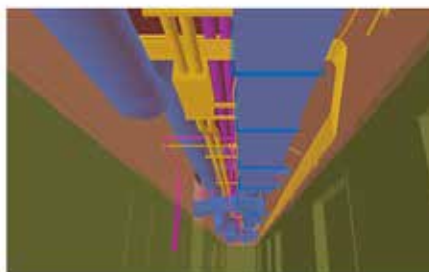
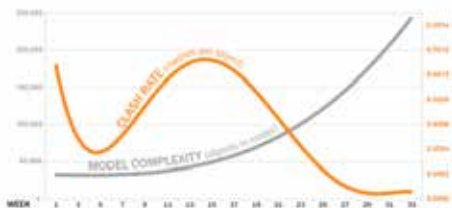
- 1. Collocated team:** All members of the team worked together in a single location to facilitate real time coordination and instant answers.
- 2. Optimized technology:** The team used Autodesk Revit design and documentation software for the architectural, structural and MEP disciplines. When combined with the collocated working environment, the design team was able to leverage the model information to help accelerate the schedule. Cloud-based solutions were utilized for data and document storage, collaboration efforts and knowledge capture.
- 3. Non-standard workflow:** The team spent five months focused on determining the optimal engineering before the Design Excellence Architect, Jim Cutler of Cutler Anderson Architects, save shape to the high performance engineering components, synthesizing them into a visually poetic public building.

- 4. Project labor agreement:** Helped negotiate a project labor agreement that recognized the challenges emerging small businesses face as well as criticisms voiced by non-union contractors
- 5. Cost accounting standards:** Waived government requirements, recognizing industry practice/standards more appropriate for construction efforts.
- 6. Shared lessons learned:** The team not only shared lessons learned with each other, but also worked with two local schools to augment educational curriculum through student tours and hands-on assignments. GSA's Region 10 is packaging the lessons learned from EGWW with other innovative examples in the region to help the Office of Federal Procurement policy rethink its approach to large capital projects.

BIM CLASH DETECTION

DESIGN-SIDE CLASH ANALYSIS

CONTINUOUS IMPROVEMENT: As model complexity increases, number of clashes decreases



Basement corridor model



Basement corridor installed

In addition to the many forward-thinking design solutions employed, EGWW provides significant value as a demonstration of the results of an integrated, collaborative delivery process. “For integrated delivery to be successful, everyone needs to take an ownership stake,” Brunner says. “I periodically ask team members what their role is on EGWW and I sometimes get a blank stare or a very long pause. However, SERA’s Principal in Charge, Don Eggleston, consistently provides the answer I’m looking for by enthusiastically and sincerely responding, ‘I am a co-owner.’” ■



Jennifer Taylor is a senior project manager at SERA Architects in Portland, Ore. She collocated with the EGWW Team through design and construction, and she has been deeply involved in co-creating the i-DELIVERY process. You can reach her at 503-445-7372 or via email at jennifert@serapdx.com. For more information on SERA Architects, visit www.serapdx.com.