Wayne N. Aspinall Federal Building & U.S. Courthouse
Overview

At A Glance

Project Wayne N. Aspinall Federal Building and U.S. Courthouse
Location Grand Junction, Colorado
Project Type Historic Renovation
Contract Design-Build
Owner U.S. General Services Administration – Rocky Mountain Region, Region 8
Design Architect Westlake Reed Leskosky
Arch. Of Record The Beck Group
Contractor The Beck Group
Project Start June 2010
Project Completion February 2013 (met schedule)
Project Size 41,562 GSF
Project Budget $15 M (met budget)
The modernization of the Wayne N. Aspinall Federal Building and U.S. Courthouse is a response to the federal government’s goal of achieving carbon-neutral buildings by 2030, creating a “green proving ground” that demonstrates how to make an existing historic building perform at net-zero energy—fifteen years ahead of schedule. The project involves the transformation of the original 1918 structure into an innovative, sustainable model and is the GSA’s first net-zero-energy building listed on the National Register of Historic Places. The building achieved LEED Platinum, the highest level of certification from the U.S. Green Building Council. Project-specific drivers of complexity included historic preservation entities that had regulatory power over the design. Tenant logistics for the occupied building also complicated the project with phasing and swing-space planning. The project started in June 2010; construction began in March 2011 and ended in February 2013, completing on time and on schedule. The project-schedule complexity was dictated by two factors: the building remained occupied during construction, and the design required a large number of reviews because of the building’s listing on the National Register of Historic Places.

The project team encountered a major challenge early in the process. Because the project involved renovating a historic structure, the design had to be approved by the State Historic Preservation Office (SHPO) before construction could begin. The design could not be submitted to the SHPO until after the GSA selected a winning proposal and awarded the contract to the design-build team. Thus, the project began with the design, schedule, and budget contingent on the SHPO’s approval.

The project site, in the relatively small community of Grand Junction, Colorado, was distant for the team members, who were also far removed from each other. Communication was sufficient, but team members noted a marked change in their ability to work effectively together when they relocated on-site. When work on the site began, team members spent many hours together in the building and in social settings. The strong site presence of most of the core team greatly facilitated communication and increased opportunities to build trust and culture. Although the design-build contract was relatively new to the GSA, team members had previous experience with this delivery type, which minimized the increased risk to the GSA for use of this delivery type.
Team Organization

Design-Build Team with Integrated Firms
Westlake Reed Leskosky (WRL) is an integrated firm of architects and engineers; the Beck Group is an integrated firm of architects and contractors. They had not previously worked together but quickly developed a strong working relationship. Most roles were handled within the primary team, with a limited number of specialized consultants.

Owner
U.S. General Services Administration – Rocky Mountain Region, Region 8

Design-Build Team
The Beck Group
Design-Build Contractor
Architect of Record

Westlake Reed Leskosky
Lead Design Architect
Engineering
Sustainable Design
Historic Preservation
Interior Design
Information Technology

Construction Management Assist
Jacobs Technology, Inc.

Commissioning Agent
M.E. Group

Consultants
Civil Engineer - Del-Mont Consultants
Blast Consultant - Weidlinger Associates
Fire Protection - Protection Engineering Group
High Performance

Energy Performance

To meet its lofty goals, including energy independence and energy efficiency (50% more efficient than current building-code requirements), Aspinall incorporated the following: building-physics analysis; a roof-canopy-mounted 123-kW photovoltaic (PV) array (generating enough electricity on-site to power fifteen average homes); spray-foam and rigid-insulation addition to the building shell; storm windows with solar-control film to reduce demand on the HVAC system; variable-refrigerant-flow heating-and-cooling systems; thirty-two-well passive geo-exchange system for heating and cooling; dedicated-ventilation units; wireless controls and state-of-the-art fluorescent- and LED-lighting upgrades; and post-occupancy monitoring of occupant comfort.

New mechanical, electrical, and life-safety systems were sensitively integrated to avoid disturbing the historic fabric. Due to the highly restricted site and historic significance of the building’s exterior, PV panels were placed atop a new, elevated canopy with a very thin profile—set back as far as possible from the principal south facade and carefully positioned relative to classical west and east facades.

Energy Performance Metrics
- Total net EUI: 0 kBtu/sf/year
- Total EUI: 14 kBtu/sf/year
- Reduction from national median building type EUI: 84%
- Lighting-power density: 0.33 W/sf

High-Performance Strategies and Systems
- 123-kW photovoltaic array
- Addition of spray foam and rigid insulation to building shell
- Addition of storm windows with solar-control film
- Variable-refrigerant-flow heating-and-cooling systems
- Thirty-two-well passive geo-exchange system for heating and cooling
- Dedicated-ventilation units

Daylight & IAQ

Daylight
Lighting was upgraded to efficient state-of-the-art fluorescent and LED technology, with wireless controls integrated with the HVAC system to achieve visually comfortable work environments. All perimeter zones include design features that allow for a balance of energy efficiency and visual comfort. Daylight sensors automatically dim ambient lighting to maintain the targeted 30 foot-candles of illumination on horizontal surfaces. Roller shades are available for occupant use to further control daylight and solar gain to match task needs. An original skylight that had been covered was reintroduced over the main Internal Revenue Service tenant space on the first floor to allow for deeper daylight penetration into the largest open-office area in the building. On the second and third floors, perimeter-ceiling zones are kept free of building services to allow maximum daylight penetration. Building services are installed in soffit zones immediately outboard of the double-loaded corridors.

Daylight Metrics
- 50% of occupied areas have daylighting levels that eliminate the need for artificial lighting during the day
- 92% of regularly occupied spaces have views to the outdoors
- 0% of regularly occupied areas are within fifteen feet of an operable window

Indoor Air Quality
A healthy environment is promoted through a green cleaning program. Ventilation of spaces is tracked through direct measurement at variable-air-volume (VAV) box zones, the use of the main dedicated-ventilation air unit, and by monitoring carbon-dioxide levels in occupied spaces. Natural ventilation was evaluated during concept design but was determined to be in conflict with the need for increased building security and the regulation of HVAC systems.
Water Cycle & Materials

Water Cycle
Prior to the modernization, the building operated with many of its inefficient original plumbing fixtures—toilet flush rates were greater than 3.5 gallons per flush (gpf). The design team researched methods for retaining existing fixtures (with new flush valves) but determined that performance would be compromised. The final design consists of low-flow fixtures, including one-pint-flush (0.125 gpf) urinals, 1.28 gpf toilets, 0.5 gallons per minute (gpm) metered faucets, and a 1.5 gpm shower. These figures are estimated to provide a 40% reduction from the LEED 2009 for New Construction baseline. Landscape irrigation existed on-site; no additional landscape-irrigation systems were installed as part of this project.

Water Cycle Metrics
- 40% reduction of regulated potable water
- No new landscape-irrigation system was installed as part of this project. However, landscape irrigation does exist at the building.

Materials
The project reuses and restores available existing materials (historic doors, wood floors, plaster moldings, walls, ceilings). Materials and finishes contain minimal amounts of volatile organic compounds (VOC)—compounds that are easily released into the atmosphere and can be irritating or harmful to occupants and installers. Segregated copy rooms and custodial areas, walk-off mats, and green housekeeping practices minimized exposure to chemicals and particulates.

Hygrothermal analysis helped ensure that the addition of new wall insulation would not adversely impact existing masonry. Thermographic imaging was also utilized prior to the renovation to help determine the appropriate extent of envelope renovation.

Commercial Strategies

RFP Development
The GSA’s procurement team made the important decision early on to use a design-build project-delivery method to renovate the historic building and meet the American Recovery and Reinvestment Act (ARRA)–mandated high-performance goals and project schedule. The procurement schedule was very compressed. The GSA procurement team received approval of their initial scope of work in January 2010 and was given five months to develop a final scope of work, solicit the work, and award the contract. The procurement team hired Jacobs Technology as the construction manager as advisor (CMA) to meet this deadline.

The GSA crafted the procurement process to integrate the clear high-performance goals within a structure that invited open dialogue with participating firms on how to best meet goals. The GSA project manager explained, “What we found to be incredibly helpful going through the procurement process was allowing the teams that were bidding on the project to provide innovative solutions, pushing this project in terms of its sustainability goals. We asked the teams: ‘You're saying it can make LEED Gold? Can you propose an option to make it LEED Platinum? What would it take to do that?’” This marks the emergence of clear goals around which the team could align. Nurturing a process for developing these goals became a positive leadership strategy throughout the project.

Since the procurement process was intentionally designed to be interactive, the GSA team left open the possibility that the request for proposal (RFP) responses might improve their understanding of project scope as it was developed post-selection. The GSA review panel’s feedback to the competing teams during the procurement process was a form of peer review based on the proposal. A member of...
the design-build team noted, “With design-build, teams have to do a lot of work at the front end to even compete. Design-build teams that bring proposals to the GSA need to formulate a design that’s progressed far enough along in terms of infrastructure, architecture, and cost. The designs should, and did, receive feedback and challenges by a really excellent GSA source-selection board during the proposal process.”

### Team Selection

**Primary Team Selection**
The GSA implemented best-value-selection processes on all ARRA projects. The Best-Value process allows the GSA to select team members based on a combination of past performance, technical capacity, and qualification of key personnel. After selecting Jacobs Technology as the CMa, the GSA began the process of choosing a design-build team. The selection procedure was a two-step open-solicitation process. Step one was a request for qualifications from teams of architects, engineers, and contractors; and step two was a RFP. Two rounds of interviews were conducted with the short-listed firms.

High-performance goals and related guidelines were set by the GSA for all projects that received ARRA funding. These goals became a primary driver during the GSA’s selection process for this team. The design-build team of Beck and WRL demonstrated in their proposal how the project might exceed the mandated goals to reach net zero and LEED Platinum certification. The collaborative team’s proposal stood out, and the contract was awarded to the ambitious team.

**Consultant and Subcontractor Selections**
Since both firms integrated within their organizations a wide range of disciplines, the depth and breadth of expertise within the Beck/WRL team precluded the need for an extensive subcontractor-selection process. A small handful of highly specialized consultants were chosen for their specific areas of expertise and previous relationships with WRL. Subcontractors for Beck were selected using conventional means, with the exception of specialized trades with expertise in particular historic preservation or restoration techniques.

### Contract

The integrated team’s proposal became part of the contract. They proposed the pursuit of net-zero energy and LEED Platinum as part of their “innovative options” at time of bid, along with a path to achieve this. The Beck/WRL proposal gave the GSA the confidence to raise the already-aggressive energy goals for the project. The GSA contracting officer was able to incorporate into the final contract many aspects of the Beck/WRL proposal, including their proposed schedule, budget, and high-performance goal of net zero. In fact, the PowerPoint presentation delivered by the team in their interview later became a part of the construction documentation for the project. By developing the contract in such an interactive manner, the high-performance goals became more than just a contractual obligation, they served as positive drivers of success.

Perhaps due to the unusual nature of incorporating Beck’s documentation into the project scope, there were many gray areas—where responsibilities were not clear—that needed to be negotiated. Overall, the team felt that things balanced out, that some decisions created benefits or reduced risk for the owner and some for Beck. The team suggested these issues would have been mitigated if a 100% construction document could have been created as the new contract. The design-build contractor noted, “In hindsight, probably the drawings and specifications should have been the defining scope of the project at some point. I know we often had to go back to the statements of work, scopes of work, and program requirements. Parts were in the boilerplate of the contract, others in reference documents and standards. A goal could have been to create that comprehensive set of construction documents, drawings, and specifications that fully incorporated any/all of the scopes of the projects. Then, you would only have one place to go to understand the project scope.”
Verification

A post-occupancy phase was not originally included in the contract, but its value is clear. The post-occupancy energy evaluation focused on all aspects of the building. As part of the contract, the GSA expected Beck/WRL to work with them after substantial completion to ensure that all of the systems installed as part of the project operated as designed and that their consumption agreed with what was modeled. As the team discovered, some systems required significant adjustments to reconcile them with their estimated energy performance. The team referred to this post-construction phase as “performance assurance.”

WRL was contracted for additional services to perform careful plug-by-plug tracking, which revealed some necessary behavioral changes in the way tenants used their space and equipment. Trending data was also helpful in verifying assumptions built into the model with patterns of behavior over time. Since Beck/WRL has no influence over the GSA’s tenant agencies in the building, work with the agencies to make behavioral changes, IT changes, and plug-load reductions has been and will continue to be a focus of the GSA and the property-management team. The GSA project manager viewed the inclusion of a period of time after substantial completion for the team to evaluate the project as a performance assurance: “We are still navigating through how to do a net-zero building. How do we use monitoring, measurement, verification, and team collaboration to get the building to perform the way we want it to? We don’t anticipate early on—or even after substantial completion—the level of commitment that was going to be required of the team. Other projects looking to achieve the same goals or the same high level of performing outcomes, in terms of sustainability, should be aware of this.”

Leadership Strategies

Team Building & Collaborative Culture

Collaborative Culture

This team placed emphasis on strong relationships and an open-minded approach to achieve a collaborative culture: “The tools to collaborate are personal tools. I don’t know if you can really mandate or dictate collaboration through contract language. You understand the shared goals, objectives, understand where you’re going to; and you move forward with the project as professionals.” Specific leadership strategies included using meetings to consistently celebrate success so that even minor progress served to build the team and collaborative culture.

Several factors helped establish the collaborative culture found on the Aspinall team. Both Beck and WRL are interdisciplinary firms with established cultures of working collaboratively between disciplines and under unified sets of enterprise goals. Although the firms had not worked together previously, their internal organizations were compatible and needed very little alignment. The level of accountability among team members was key to developing trust: team members noted that they believed that others would perform as promised and that each team member or organization would hold themselves responsible.

Another factor that contributed to the development of strong personal relationships that helped support collaboration was the isolated project location. In the beginning, the project team was required to collaborate remotely. Later in the project, core team members were located on-site, with others traveling to the site regularly. The remote location encouraged team members to engage with each other outside the job site: for example, team members frequented a local restaurant for dinners. The team noted that the increase in direct working relationships and the ability to get to know each other on a personal basis strengthened communication, trust, and respect among the core team members.
Right People
The GSA Region 8 ARRA coordinator emphasized attitude in addition to expertise. He defined the “right people” as those who are willing to dedicate themselves to the project: “[The Aspinall project team] has been one of the most engaged teams from all perspectives, and the commitment by everyone on the team internally and externally, I think, was a huge part of the success.”

Champion
The project team also identified the GSA project manager's leadership skills as an important aspect of the project's success. Specifically, the project manager spearheaded the collaboration throughout the project, supervised decision making, and almost single-handedly managed the complexities of the ARRA design guidelines, schedule, reporting procedures, and project-budget procedures so the project team could remain focused on design and construction.

Goals & Alignment
One of the first things the Beck/WRL design-build team did after being selected was to work with the GSA to confirm the program, scope, and cost. This was especially important because Aspinall's contract was different than originally outlined in the RFP and incorporated critical elements of the winning team's proposal, including its high-performance goals, schedule, and budget. The process of collaboratively revising the project scope laid the foundation for alignment of each team participant to the final project goals even before work began. The GSA project manager explained, “The project’s goals were finalized when we brought the Beck and WRL team on, and I think that was really the catalyst for the project. That was when, I think, everybody on the GSA side realized where the potential was and where we could take this project.”

Preserving the historic status of the building was the other project driver, a goal the team was obligated to achieve by the SHPO. The two sets of parameters were each very challenging, and the team additionally had to consider how the two sets interacted. A project team member noted, “Two filters for the job were sustainability and historic preservation and how those two [objectives] needed to work together.” The specific area where energy needs and preservation limits conflicted can be seen in the design of the rooftop PV array.

Tenant Engagement
The project team itself was aligned and motivated and had clear project drivers; however, the team members realized that they would need the building tenants to buy-in to goals and change their behaviors to actually achieve the performance metrics and succeed. The GSA project manager explained the disconnect between the project team's intense prioritization of energy goals and the tenants' low prioritization of their agency's energy needs: “If you look at the national standards that a lot of agencies have, they don't lend themselves to LEED Platinum or to net zero. The project team communicated what our goals were, and we worked together to bridge the gap between what they needed as tenants and what we wanted as a project team.” Communication was key to working with tenants, a team member noted. “When you're looking at some of the goals that we had set up…it was important to share that information and make sure that the tenants understood what the goals were and what would be their role in trying to achieve some of these goals.”

The project team also tried to understand actual tenant needs beyond what was written in early program documents. Project leaders realized that by adapting the entire project, they were able to customize tenant spaces to fit individual tenant needs. “[Projects] can have a broad brush approach to tenants. A project is awarded, and basically there is this kind of nebulousness within a contract that says, ‘Okay, we're going to do this type of programming. We need to meet the agency requirements, but we need to kind of shove that square into this round hole here to make it fit with the overarching project.’ This creates a potential risk.” The team addressed the risk by interviewing each tenant agency and creating a detailed program. The team developed mechanisms for connecting tenants to the project team, including partnering sessions with all tenants represented. Individual tenant groups also worked with the GSA project manager, and the project team developed and maintained a close working relationship with the facilities manager. As a team member noted, “The goals need to be communicated and understood outside of the team. Some of the goals that we set up were for the tenants: the use of the building after
we’re done and how that building is maintained. It involved a high level of sharing of that information to make sure that the tenants understood what the goals were and what their role would be in trying to achieve some of these goals.”

The base project included the reblocking of tenants in the building to achieve two goals. The first was to consolidate the agencies already in the building. Prior to the renovation, one agency had taken spaces as it became available, and its staff was dispersed throughout the building. The second goal was to free up the space along the south facade of the first floor to preserve the original lobby.

The extent of what was considered in scope as part of the agency’s tenant improvements was an area not clearly defined in the original scope of work. The GSA worked with Beck/WRL to determine a scope within the contract that would be equitable. Items that fell outside of that scope required funding by the agency to cover the unanticipated costs. This was difficult to manage and required that the team quickly identify out-of-scope items so that the agency could either budget for it or consider descoping that work.

There were times when tenant requirements did not align with GSA energy goals or LEED goals. For example, the GSA proposed consolidating copy rooms and server rooms to reduce the energy load on the building, but the tenants preferred to keep dedicated areas within their own spaces. To resolve the differences, the team worked closely with agency representatives. In the case of the copy rooms, the GSA was successful in making a persuasive case that a single area would benefit all of the agencies. The consolidation of the servers was more difficult due to the varied information-technology and security needs and was eventually abandoned.

The Aspinall project team had a recommendation for future projects to help increase stakeholder buy-in: use more mock-ups. The team found that mock-ups were an efficient way to communicate design intent to the GSA and tenant-agency stakeholders. The project team plans to apply this process to tenant mock-ups in the future. “Being able to engage with tenants was critical,” said one team member. “We will look into doing a better job of mocking up interior aspects of the project relating to finishes. The idea behind the mock-ups is for everybody to review and understand the idea, as opposed to taking it directly out of the specs and installing it.”

Role Definition & Accountability

The definition of roles in the Aspinall project team was heavily influenced by the integrated structure of the two primary firms on the design-build project team, Beck and WRL. Beck is a design-and-construction firm, and WRL is a design-and-engineering and technology-design firm. Employees of these two firms filled most of the project roles, with limited outside consultants. Therefore, the internal structures of the two firms strongly guided the way roles were defined on the project team.

The majority of the project team was drawn from Beck and WRL, which had well-established methods of integration. Although WRL and Beck had not previously collaborated, the result of their union was a highly functioning project team that was self-accountable. Individual team members were already well versed in cross-disciplinary collaboration within their own firms. Project team leaders leveraged this experience to create a project team that collaborated well between firms. According to the GSA project manager: “I think everybody knew what they needed to do on this project. I don’t think there was a need for me to hold team members accountable, as I think each individual took that responsibility on themselves.”

Role definition between the two primary firms focused on defining the responsibilities of WRL as lead design architect and Beck as architect of record. At the beginning of the project, the team created a matrix of project responsibilities that would have traditionally been assigned to these two roles. The team then assigned each responsibility to the firm best equipped to meet it. The project team believed that this process helped build a collaborative attitude between WRL and Beck, as each firm came to understand and leverage the strengths of the other. WRL used their integrated team of architects, engineers, and historic preservation and sustainability consultants to play a larger role during the beginning of the project to define the design. Responsibility shifted to Beck during the second half of the project during the execution of the design. However, both firms held responsibilities and actively contributed and collaborated throughout the project.
Logistical & Process Tactics

Managing Schedule & Budget

Schedule
Managing the schedule and keeping the project on track was a challenge given the complexity added by the need to keep the building operational for the tenants and the uncertainties about the historic-review process.

To manage the building operation and the tenants during construction, the team expanded on a strategy Beck presented during the original interview. Beck had presented a digital model that demonstrated the expected phases. That model was further developed with input from the whole team. A WRL team member noted that from the beginning, Beck “realized that the approach to phasing in an occupied building was going to drive the construction-method approach and was critical to the design—so everything flowed from that.” The project team used building information modeling (BIM) to help attach the 3-D phasing model to the schedule, scope of work, and tenant-move plan and then to illustrate each phase’s schedule, scope of work, tenant-move plans, and construction documentation. This process supported the team and the tenants to make decisions efficiently and effectively. The Aspinall project team also constructed flex spaces to temporarily support displaced tenant agencies while their portions of the building were under construction.

The SHPO historic-review process was a risk to the design and schedule as the project team awaited approval. To help manage the risk and uncertainty of the SHPO’s review process, the team reached out and developed a strategy with the SHPO to phase their review process. The project team focused on resolving their demolition plans with the SHPO first. After receiving approval the team began demolition while the rest of the project was still under review. The design team then focused their efforts on the next phase of the building and worked to incorporate feedback from the SHPO. The team was able to use this process to keep the project moving forward and manage the risks associated with the SHPO review.

Budget
The project team benefited from working within a firm fixed price budget set early in the process. Within the project team, budget decisions were considered integrally with schedule and scope. The GSA project manager noted that the fixed price was a clear motivator for the team, “we didn’t ever have to ask for more money….one of my personal goals and I think one of Beck’s goals was that we didn’t want to go back and ask for more money. We had a team that was very good identifying what we could do to make things cost effective.” Negotiation with tenants occurred in situations where responsibility for project scope was not completely clear (see goals and alignment for more information on tenant engagement).

Information Management
The Aspinall project team used a variety of information-management tools, including Webex. The team also considered BIM and the energy model as information-management tools, since all design decisions were made while using them and final decisions were incorporated into them.

The project team reported that, in the future, they would like to work toward an information-management best practice in which the final construction documents and specifications would come to define the project scope. On a complex project like Aspinall, different types of information are continuously shared in a range of forms. Although existing information-management tools help track, sort, and recall this information, the team saw an opportunity to increase efficiency in the process by transitioning the contractual scope of work from the initial contract, work scope, and program documents to the finalized construction documents. A team member explained, “After thorough reviews [of the design] by the CMs, the GSA, and other organizations, [the updated design documents] should have, at some point, really defined the scope of what
was in and not in the project.” While the management of information was effective, team members noted the project documentation required referencing several documents to obtain information, which was inefficient. Ideally, the team would have adapted the contract to include a single source of information.

### BIM & Design Documentation

#### BIM

BIM was utilized throughout design and construction to manage project complexities, assist in design decisions related to the high-performance goals, and facilitate communication to a project site that was remote to the team members. The project team developed a BIM-execution document at the beginning of the project to help standardize how information was modeled, shared, and updated and to determine who would be responsible for each action. The team based their use of the model on best practices that Beck had developed during the last decade. Phasing and sharing of the model followed their standard practices, with the addition of extensive coordination with the many WRL energy models. The team frequently used BIM mock-ups to identify issues early on and to reduce risk. These mock-ups were also used to coordinate with the GSA and with team members and consultants who were not located nearby.

The BIM model was linked to an energy model early in the project, for which the team created a protocol. Changes to the envelope’s R-value, glazing, roof construction, and other important project aspects in the BIM model would be fed into the energy model to determine the potential impact on energy use. The output would then inform design decisions.

The Aspinall project team identified an area of BIM management that needs further study—attaining accurate data from product manufacturers. As BIM and energy modeling are increasingly used to predict the impact of design decisions, they require more detailed and accurate information about what is being modeled. The WRL engineers identified that for some building components, such as variable-refrigerant-flow systems, predicted efficiency does not exactly match real-world performance. Considerable time was spent working with manufacturers to delve into product performance to maximize the accuracy of the energy model. WRL has continued to conduct research in this area and has started a website, http://www.recool.com, to share their findings.

#### Design Documentation

The project team does not believe that the design-build project-delivery method will result in the creation of less design documentation than a traditional design-bid-build delivery project. A team member noted that regardless of the delivery type, “Within the project team, we still have to communicate the information scope out to the subcontractors. That information can be related in different ways, but the content still needs to be developed to a level that somebody outside the team can understand.”

The GSA project manager agreed that design-build delivery on GSA projects would not reduce the amount of design documentation created. “The GSA still requires the same number of reviews that they would require in any type of traditional design-bid-build project. The GSA employed defined milestones in each phase of the design process during which they review the project documents.”

### Meetings & Workplace Environment

#### Meetings

The Aspinall project team scheduled structured meetings at regular intervals and also encouraged informal meetings to directly address issues as they occurred. Structured meetings occurred once a week during design and twice a week during construction. Once construction started, one meeting was dedicated to resolving design issues and another to construction matters. Key team members from the GSA, Beck, WRL, and Jacobs Technology attended all structured meetings.

Over the course of the project, team leaders fell into a pattern of starting every structured meeting by discussing the complexity of the project and identifying a recent success, such as the completion of the demolition phase or an approval by the SHPO. The GSA project manager came to believe that beginning the meetings in this way helped individuals engage and created a positive atmosphere for collaboration. The meeting format was “a fantastic
recommendation…. You always want to identify success and thank people for their work. I tried to do that as much as possible, and I think the Beck Group did a good job of it as well.” Affirmation during meetings was a leadership strategy that served to support team building and collaborative culture.

Beck, as architect of record and the design-build contractor, held their own internal meetings after the structured construction meetings that involved the entire project team. This enabled them to distill and disseminate information from the project team out to their subcontractors in the field.

Co-location
The Aspinall project team identified co-location as an effective process tactic that supports collaboration. The project team was located in several different states during the design phase. Once construction began in March 2011, critical project team members moved to offices located in the basement of the Aspinall building. This included the GSA project manager, the GSA building manager, Beck (as design-build contractor), and Jacobs Technology (as construction-management assist). Team members from WRL did not co-locate as the majority of their work occurred during the design phase, but they still spent considerable time on-site.

The team believed that co-location helped support communication, collaboration, and efficient management of project issues.” [Co-location] fostered the opportunity to communicate a lot more than you would if you were trying to coordinate and schedule calls. I think it drove accountability: you couldn't dodge each other. You would go knock on somebody's door—in most cases we just kept our doors open—and you kind of floated among the offices if you needed to talk to somebody. It broke down formal barriers and made it easy to communicate, collaborate, and work through project issues. Stuff comes up every single day on a fully occupied building renovation.” The GSA project manager concurred that frequent informal interactions were “very helpful in addressing issues early, as opposed to waiting until the next time we were able to all get together.”

GSA Peer Reviews & Expertise
GSA Peer Reviews
The GSA peer reviews are mandatory design reviews conducted periodically by GSA design and construction experts during a project’s design process. In a typical design-build process, teams bidding on design-build projects have to develop robust designs—structural concepts and budgets in addition to architectural concepts—to compete for the job during the procurement phase. By the time the contract is awarded, the team has already invested more in design development than a traditional design-bid-build project. The shift in time investment means that for design-build delivery, the first GSA peer review is ideally held shortly after the team is selected, before too many decisions have been finalized.

The first official GSA peer review of the Aspinall project occurred two weeks after the design-build team was awarded the contract. The project team identified this as a critical moment for the design. The GSA project manager explained, “The original design was, for lack of a better term, controversial in how we were going to approach this historic building, especially with the power-producing element, the PV canopy, which was placed above the building.” It was essential for the project team to present the original design during the first GSA peer review in a way that would lead to a constructive dialogue with the reviewers. The project team developed a strategy that explained the bold design in terms of the project’s sustainability and historic preservation goals: “The Beck Group and WRL did a really great job of presenting this somewhat controversial design to the peer reviewers. They explained the need [for the PV canopy] and also how it complied with the Secretary of the Interior’s overall standards for preservation.”

The Aspinall project team also hosted the first GSA peer review on-site. They led the peer reviewers on a full-building walk-through at the start of the session, which enabled everyone to explore the existing condition of the building and the surrounding context. This not only gave the reviewers a better understanding of the project, it also laid the groundwork for a collaborative working relationship between the two groups before the design was officially presented.
After the walk-through, Beck and WRL led the peer reviewers through the original design. They organized the daylong meeting into sessions that focused on specific building elements and allowed time for both presentations and discussions. The project team also structured interlude periods at the meeting during which they would step back and allow the GSA peer reviewers to meet, digest, and react to what they had just seen. Peer reviewers could then present their thoughts to the project team. The GSA peer reviewers conducted a more in-depth review of the design after the meeting, but because the kick-off meeting was structured to allow for real-time discussion, the design team was able to prepare in advance many of the critical items that would need to be addressed. The GSA project manager explained, “I thought there was very clear direction throughout the [initial GSA peer review] meeting. Beck and WRL were able to come up with responses to their comments quite quickly; that kept the project on track. I just think it was beautifully organized, and the timing of it was really essential to a successful process.”

The Aspinall project team took a unique approach to the GSA peer reviewers by continuing to engage with them after the mandated peer reviews ended. They recognized that the GSA had a lot of in-house expertise that could be beneficial to the project. A Beck team member explained, “The GSA has an army of expertise from roofing and waterproofing to elevators and fire and life safety and on down the line, and that’s pretty rare for how we interact with our clients. Clients are typically a little flatter in their organization, and there is one or two people making virtually all of the decisions as they relate to the project.”

The Aspinall project team actively engaged the GSA’s internal experts in major project decisions. The contractor explained, “The GSA experts were looked at much more as resources and extended parts of the team than someone just checking what the team is doing. That opened up a level of collaboration and understanding that I found to be different than other [GSA] jobs that I’ve worked on.”

This team was very successful in navigating the additional reporting requirements for the ARRA. The GSA project manager used a strategy to shield the team by selecting one person per issue to be his partner in developing or tracking the specific information needed.

The majority of the project-team roles were assumed by Beck and WRL, including those usually filled by outside consultants. WRL had in-house engineers, historic preservation consultants, and sustainability consultants on the project team, enabling a tight integration of expertise into the core team. Including key consultants in the team also increased decision-making efficiency by reducing the time and effort traditionally spent on coordinating with external consultants.

Building Innovations

Resizing the Solar Array

The example described below provides an illustration of a high-performing team that was able to work effectively together to resolve competing demands.

A WRL team leader commented, “The project demonstrated that high-performance-building design is consonant, not competitive, with historic preservation.” The Aspinall project demonstrated a ‘both-and’ rather than an ‘either-or’ relationship of preservation and high-performance innovation and application. He considers Aspinall as an important model for future projects since so many buildings in older downtown areas are of similar vintage. He went on to say, “We wanted to dispel attitudes or preconceptions held by building owners and designers that historic structures preclude or limit high-performance designs and that, in fact, there are virtues of historic structures that may leverage opportunities to achieve significant energy efficiency.”

Compared to a typical historic preservation project, the unique combination of Aspinall’s design-build delivery method, project schedule, and procurement process increased the risk and stress of the historic-review process. The procurement phase of the design-build project incentivized prospective teams to submit well-developed...
designs. The winning design-build team’s proposal was employed, resulting in an initial design that had already undergone considerable development. The historic-review began at the start of the project and had the potential to challenge many of the design decisions that had already been made—which could negatively affect the project schedule and even alter the approach entirely.

The most controversial design element was the project’s roof-mounted PV array. The SHPO’s initial review critiqued the visual presence of the array as too prominent in the view of the building’s front facade, ruling that it would significantly alter the building’s historic qualities. Yet the PV array in the original form was critical to meeting the net-zero-energy goals, so reducing the visual impact by making the array smaller would have a large impact on energy issues. Through a process that leverages many of the team’s strengths, they eventually revised the design to create a PV-array design that met both SHPO standards and the project’s energy goals.

Clear objectives helped the team successfully communicate the importance of the PV array and convey to the SHPO the project’s dual goals: historic preservation and sustainability. The team’s collaborative structure set the foundation for a working relationship with the SHPO that resulted in the redesigning of the PV array rather than simply removing it. BIM facilitated the discussion by making clear connections between design changes and energy-performance impact.

The project team remembered the PV-redesign process as an incredibly collaborative time: “You’re quickly trying to identify and throw ideas out. ‘What if we put some more insulation in the walls?’ Okay, let me start working on the SHPO piece of that. ‘What does that do to our energy model? How much energy does that save us?’ A lot of people were throwing ideas out, and other people were picking them up and running with them.” Team members described a fluid process in which ideas would be generated by any team member, regardless of expertise, and others would volunteer to study the aspect of the idea that related to their area of expertise and then bring it back to the group. To reduce the size of the PV array, the team increased the R-value of the walls and roof. Careful coordination was required to test each proposed alternative so that the wall thickness (and thereby the window-trim details) would not change the critical elements that helped define the historically preserved building. Another team member characterized the series of decisions as a “complex, interwoven matrix of opportunities to save energy and determine what we were relying on. Doing more of this or less of that: what’s the value trade-off, what’s the cost trade-off, what’s the aesthetic trade-off?”

Concurrent with the study of increased efficiency in the building envelope, the team pursued increasing the energy produced by the geothermal system. The project manager recalled how his negotiation skills were called into play to support the revised energy model in which “we wanted thirty-two geothermal wells, but we didn’t have enough room on the site to do that. I had to quickly run across the street to the city and start schmoozing about that request.” He recalled that there was not much discussion about his role in this particular issue: “In our approach to roles and responsibilities, we never really had to sit down and say that’s you or why don’t you do this. There was a lot of pride on this project to pick things up and run with them.”

Through this iterative process, the team was able to use multiple means to lower the energy use of the building and, working with the SHPO, finalized a smaller PV array with an acceptable visual impact. The resulting project is the first net-zero historically preserved building in the country, demonstrating that high-level energy goals and stringent preservation restrictions can be compatible.