VISION + VOICE

Volume 4 | Voices of Sustainable Building

VISION+VOICE4 Voices of Sustainable Building

Introduction

Combing through the inventory of the U.S. General Services Administration's Public Buildings Service is to witness the trajectory of sustainable design and construction in the United States. A full quarter of the agency's portfolio qualifies as landmarks, and many of the gracious old structures embody passive design principles like natural orientation, thermal mass, and daylighting. These fundamental strategies are being taught in architecture schools today.

GSA's midcentury buildings relied more heavily on mechanical systems for controlling interior climate, yet they also represent Great Society principles of civic engagement that were meant to ensure communities' long-term stewardship. Moreover, when active green technologies first hit the market in the 1970s, PBS was testing them—installing evacuated solar tubes on the rooftop of the Federal Building in Saginaw, Michigan, for example. In Manchester, New Hampshire, meanwhile, the Norris Cotton Federal Building integrated similar solar panels as well as cutting-edge ventilation and lighting, which promised tremendous energy conservation for all buildings.

Although thinking about sustainability has waxed, waned, and evolved over the years, consistently GSA has been at the forefront of design innovation and construction. In the 21st century the agency is again playing a standard-bearer role, as it employs sustainability to lower costs for its tenant agencies and achieve greater value for taxpayers. That fact can be credited to the founding of the Design Excellence Program in 1994.

Green and *sustainable* were not part of the lexicon when the Design Excellence Program launched, in tandem with an unprecedented initiative by the Judiciary to construct and update federal courthouses. Rather, the architects who won GSA commissions, and the private-sector peer reviewers who helped select and mentor those architects, had only one word in mind: *quality*. Quality manifests in a public building's symbolic meaning, its resonance as a community gathering place, its ability to stimulate economic development in its region, its functionality as a workplace for government employees, and its efficiency as a consumer of natural resources. When you define the word socially, culturally, and environmentally, *quality* sounds a lot like *sustainability*. The Design Excellence Program has never wavered from its commitment to making great places for the American people. What has changed is the vocabulary that describes that mission.

Since the formation of this program, the purview of Design Excellence has expanded to include land ports of entry, federal offices, and many other facilities. One could also argue that the Design Excellence Program paved the way for many laudable sustainability efforts that GSA oversees currently. They include the Smart Buildings and Green Proving Ground initiatives, and the rich and varied work of the Office of Federal High-Performance Green Buildings. While such important undertakings test, study, and disseminate new technologies or greener building operations, the Design Excellence Program guarantees that these innovations are part of a holistic vision of quality.

It is only fitting, then, that sustainability is the subject of this new volume of the *Vision+Voice* series. These interviews dive more deeply into GSA's history of reducing the federal footprint, they visualize the current state of the art, and they show where a greener GSA may be heading. *Vision+Voice4* captures the breadth of sustainability in public buildings, from their enduring social impact to their renewable energy production. In doing so, *Vision+Voice4* celebrates the remarkable work that GSA does, and it will inspire all readers to set the bar ever higher.

RANDOLPH **CROXTON**

NANCY **CZESAK**

MACK **SCOGIN**+
MERRILL **ELAM**

ROBERT **FRASCA**+
CHRIS **FLINT CHATTO**

ANDREW **TRIVERS**

Chapter 1

Historic Perspectives

In many respects, sustainable building is as old as the practice of architecture itself. Yet the profession's longstanding sensitivity to site and climate have interwoven with energy-performance and resource-consumption goals more explicitly in the last five decades. The following interviews chart this recent history in the design and construction fields. Several subjects also discuss heightening awareness of sustainability within GSA, and the various ways the agency and its Design Excellence Program have realized a greener vision for federal buildings.

RANDOLPH**CROXTON**

A PRESENTER AT THE UNITED NATIONS EARTH SUMMIT IN RIO DE JANEIRO IN 1992 AND AUTHOR OF ENVIRONMENTAL METRICS THAT WOULD INFORM THE U.S. GREEN BUILDING COUNCIL'S FIRST VERSION OF THE LEED RATING SYSTEM, ARCHITECT **RANDOLPH CROXTON** HELPED PIONEER THE CONTEMPORARY SUSTAINABLE DESIGN MOVEMENT. HIS NEW YORK–BASED DESIGN PRACTICE CROXTON COLLABORATIVE BEGAN MOVING TO THE FOREFRONT OF THE FIELD IN THE 1980S, WITH PROJECTS THAT INCLUDED OFFICES FOR THE NATURAL RESOURCES DEFENSE COUNCIL. IN THIS *VISION+VOICE* INTERVIEW, CROXTON RECOUNTS THE STATE OF THE ART BACK THEN, AND HE SURVEYS THE LATEST THINKING ON SUSTAINABILITY VIA A PROTOTYPING PROJECT HE JUST COMPLETED FOR NRDC. IN BOTH CASES HE IDENTIFIES RELATIONSHIPS BETWEEN SEEMINGLY UNRELATED SYSTEMS, SUCH AS ENERGY PERFORMANCE AND OCCUPANT HEALTH; BY PLACING THE ARCHITECT AT THE CENTER OF THESE ILLUSTRATIONS, CROXTON REJECTS A HISTORICAL STEREOTYPE OF DESIGN AS ESSENTIALLY AN AESTHETIC EXERCISE.

SINCE 2005, CROXTON COLLABORATIVE HAS OVERSEEN THE SUSTAINABLE DESIGN GUIDELINES AND REFERENCE MANUAL THAT IT AUTHORED FOR ALL PROJECTS AT THE WORLD TRADE CENTER. IN 2005 AND 2008 THE USGBC BESTOWED THE FIRM WITH NATIONAL LEADERSHIP AWARDS.

RANDOLPH CROXTON: A defining shift in our approach to architecture occurred in the mid-1980s, leading up to the Natural Resources Defense Council project. The thinking at that time was that environmental architecture means energy-efficient architecture. The thinking also went that saving energy meant cutting down on the amount of outside air which needed to be heated or cooled. Ironically, pursuing this brand of environmental quality was contributing to sick buildings. Contemporary materials were increasingly incorporating volatile organic materials in resins, caulks, glues, and so forth while the one-dimensional pursuit of energy efficiency was cutting off the beneficial and diluting effects of fresh air.

For NRDC, we looked at an integrated picture of design excellence and high performance to understand the ecology of architectural space. In that case, we increased the cubic feet per minute of outdoor air by 500 percent over the ASHRAE standard for offices—and still we were able, through design strategies, to prove a net reduction of 50 percent in energy consumption. That success was reflected in the subsequent increase in the ASHRAE standard by 300 percent and ultimately helped us get the commission for the EPA headquarters with Gruzen Samton. That really began our relationship with GSA.

Today, we're delighted to be revisiting NRDC at a completely different scale of endeavor, looking at sustainability enterprise-wide. That means reconsidering how they perform their mission. Like many others in America, it is a mission that is now being carried out with iPads and smartphones and virtual offices and remote working. How do you support that mission and identify sustainable opportunities in the amorphous reality of the new workplace? We're in the midst of that process.

NRDC plans to do a progressive, sequential reworking of space here in New York City and in national and international offices. In our work to date, striking opportunities for productivity, well-being of people, and resourcefulness have come to light. We've completed one floor as their prototype, and it increases the density of people on the floor plate, creates much more collaborative work environments, and gives NRDC greater flexibility to creatively densify for interns and guests on site.

We've completely moved away from the 1986 notion that all scientists and attorneys needed to have private offices of certain sizes. We also find that we don't have to build gigantic teleconference rooms either, because everything is breaking down to a more individual and mobile interface. Because the client includes a lot of scientists, we've studied and modeled the embodied-energy savings that result from this new design approach. We've demonstrated that we can get down to one twenty-fourth of the BTUs consumed in materials, compared to a typical six-office configuration.

As you move away from the isolation of the enclosed office and push up the density on the floor plate, you're automatically reducing initial costs in addition to environmental footprint—eliminating all the fixed drywall, as a lead example. When you design everything outside the core and the elevators for disassembly and need to adapt the workstation or team room for a new use, you don't bust up walls and contaminate the space; you disassemble parts and pieces and reconfigure.

However, the key to success in a dense, open collaborative office is not just how we design the individual workstation, but also understanding that we need to compensate for the smaller and more exposed workspace with an increase in private spaces that are more than just conference rooms. These unassigned team rooms can be internally reconfigured for an audit function, an intern function, or they can accommodate traveling and visiting scientists. You can pick up your phone call there or at a desk or at a workstation, so you can have a conversation that is as private as you choose. In this way, you begin to create a community of spaces that is much more efficient, collaborative, and flexible. It's not the advertising agency of 10 years ago, where everybody was wheeling around their chairs and desks, nor the all-glass workplaces of more recent vintage. These models simply did not offer enough acoustical or visual privacy, or sense of place. NRDC's individual workstations achieve a vertical order, and unobstructed views to the exterior connect everyone to nature's daily traverse. This balance of personal space, access to privacy, and a "commons" vista works beautifully—we're getting very encouraging results.

Going back to the EPA headquarters project: that was an 8-year undertaking with 12 phases over 1.8 million square feet. Each phase was an opportunity to advance our understanding of an environmentally informed approach to design, and demonstrate the superior performance of that approach. Energy was still pivotal in designing mechanical systems: heating, air-conditioning, and smart lighting systems; however, we also began to integrate qualitative metrics on materials performance. One of the most notable things we did was to develop, in collaboration with EPA, a protocol for testing materials and furniture for off-gassing of particulates and VOCs. That protocol ultimately was adopted as a national standard.

My feeling, going forward, is that while there are many sustainability avenues for GSA to pursue, none is in need of consideration more than the big-picture issue of where and how to grow. Locating within a dense context and near mass transit creates a massive ecological efficiency of our built environment, and we can amplify these benefits by consciously growing existing urban and near-suburban centers up to this efficiency while preserving more distant agricultural, rural, and open lands for their natural-systems capital. A long-term balance between built and natural systems is no less than a matter of national security and long-term viability. GSA has a massive real-world database in its inventory of buildings and can be a uniquely powerful advocate in this global scale consideration.

Smart development incentives can redirect future growth. Our current path of unfocused suburbanization, increasing the average commuter time and reducing the natural systems that clean water and absorb carbon dioxide, are threats to our long-term viability. There are some great models for breaking these self-destructive tendencies, such as creating urban growth areas where near-suburbs and cities are targeted for intensified development accomplished as a transfer of development rights from the purchase of a remote property that's left in a natural state in perpetuity. Over 10, 20, 30 years you'll move up to a density that will support mass transit while, at the same time, starting to create a stable bank of natural capital.

Historically, design has been stereotyped as the look of a building, the surface. To me architecture is profoundly more important. It is not adequate just to be able to do a proportional and interesting standalone building as an object. A deeper relationship exists between building, community, natural systems, client mission, and national objectives. We've begun to show that beautiful buildings can perform at very high levels of sustainable and environmental quality, but excellence means taking responsibility for all the consequences of a design. It means integrating built systems and natural systems in a deeply informed way. One might say it is the realization of architecture as the founders of the profession designated it: art and science.

NANCY**CZESAK**

AS VICE PRESIDENT AND PROJECT EXECUTIVE OF TISHMAN CONSTRUCTION, **NANCY CZESAK** HAS ASSUMED LEADERSHIP ROLES ON MAJOR PROJECTS IN THE NEW YORK METROPOLITAN AREA, SUCH AS CO-DIRECTOR OF THE CURRENT RENOVATION AND EXPANSION OF THE JACOB JAVITS CONVENTION CENTER AND PROJECT EXECUTIVE OF JUDY AND ARTHUR ZANKEL HALL AT CARNEGIE HALL. THE LATTER REQUIRED BEDROCK EXCAVATION TO TAKE PLACE WHILE THE FAMOUS CONCERT VENUE REMAINED IN OPERATION, AND THE JAVITS CENTER PROJECT INCLUDES INSTALLATION OF A 12-ACRE GREEN ROOF, ONE OF THE LARGEST IN THE UNITED STATES. SHE HAS WORKED FOR TISHMAN SINCE 1985.

MENTORSHIP PLAYS A LARGE ROLE IN CZESAK'S CAREER. AT THE NEW JERSEY INSTITUTE OF TECHNOLOGY, SHE SHARES HER EXPERIENCE AND MANAGEMENT PHILOSOPHIES WITH YOUNG WOMEN STUDYING ARCHITECTURE, CONSTRUCTION MANAGEMENT, AND RELATED DISCIPLINES. AND AS A MEMBER OF GSA'S NATIONAL REGISTRY OF PEER PROFESSIONALS SINCE 2010, SHE HAS BEEN CALLED UPON BY THE CONSTRUCTION EXCELLENCE PROGRAM TO HELP COMPLETE IMPORTANT CAPITAL INVESTMENTS. IN THIS *VISION+VOICE* INTERVIEW, CZESAK SAYS GSA EXEMPLIFIES THE SUSTAINABILITY THINKING THAT HAS PERMEATED CONSTRUCTION PROCESSES MORE GENERALLY. SHE ALSO FORECASTS IMPROVEMENTS TO DESIGN AND SUSTAINABILITY PRACTICES WITHIN THE FEDERAL CONTEXT.

NANCY CZESAK: I've seen a major change in the way contractors have embraced sustainability over the last decade. Prior to that, lofty design ideas for sustainability did not always translate into construction. Now contractors are proud of what they're doing and they're migrating the lessons learned from one project into their other projects.

In construction, the overall move to sustainability started more as an economic necessity. To procure federal and other government jobs, those entities were requiring contractors to file LEED paperwork or to recycle construction waste or to use certain types of materials. If companies wanted the work, they had to embrace all of the implementation requirements that went along with it. Contractors realized it wasn't so difficult; it just required thinking a little bit differently at the beginning.

And now you see waste recycling happening on every project, whether or not it's government work. Nobody would dream of just mixing all of their waste and sending it off to a landfill anymore. Another example may be the paperless site office.

It's not just the little things, either. The construction community is choosing sustainability in its long-term decision making, regarding the maintenance and the life cycle of the building. For example, the contractors are making suggestions about energy efficiency and life-cycle costs that are being adopted by the building managers, who play as important a role in the environmental performance of a building as the architects. When you involve the end user from the beginning of the design process, those users get invested in how the building is going to function later on. They're more likely to use equipment in the correct manner. They're more likely to replace that equipment appropriately.

Contractors want to make all of these things work in both the short and long term, because they want to show their next clients that they know how to do sustainability and that they're part of a green design process. I also think they realize the power of helping an architect realize a sustainable product—a building that took us to another level of performance or certification—since the architect is going after the next job, too. So I think we've seen a major shift in attitude among contractors as they try to be part of an entire team that delivers what an architect or designer had in mind to begin with.

I do believe that GSA has moved the market in sustainability. Effort has been really focused on the Design Excellence Program and on making better product in general; the Design Excellence Program paved the way for sustainability, because sustainability is one form of excellence; and GSA's multiple initiatives since then have really made it a catalyst for disseminating higher, greener standards among buildings in the public and private sectors. There were private developers who embraced sustainability previously, but I think GSA's insistence on sustainability made it something of a requirement for all developers.

When a big client like the federal government mandates sustainability, ultimately everyone will embrace it and realize its benefits.

As a Construction Excellence peer, one of the construction reviews I have been involved in was a design-build courthouse in Billings, Montana. That's an interesting project, because there's a commitment to sustainability in the field. The construction manager and the contractors are pursuing it more than I've seen elsewhere. They are trying to get the workers to read construction drawings only on computer. Their crews stretch and do tai chi before starting work. And they are incorporating quite a number of sustainability strategies in the building itself, like a green roof and many other elements. In other words, their commitment concerns waste, labor conditions, building performance—sustainabiilty in many senses of the term. And when that's coming from the entire team, you're going to have a more successful project.

From what I have seen, it seems that the design-build process is bringing around the more cohesive, top-to-bottom sustainable process, because given the way design-build teams come together and execute a project, everyone is involved. The design-build entity is hiring the contractor and the architect, who are hiring the consultants and the subconsultants in the field. There is a central vision and a tight choreography. And if the edict is sustainability, then the team has a real problem if it can't pull it off successfully. The marketplace may not give it the chance to try again.

Simply, design-build team members have a lot at stake. They must be able to pull all the entities together and make sure that sustainability is happening at every level of a project. Granted, there is a very delicate balance in design-build, because the lead designer isn't necessarily in charge of pulling all the strings.

So how do you achieve the top-to-bottom commitment to sustainability with a more traditional project delivery method, in which the architect has firmer control of design quality? I think it's attitudinal. The lead designer would have to embrace everybody at every level, and not just dictate to a team. Being part of the team and helping everybody work toward a goal can effect many of the same outcomes I see in projects such as the one in Billings. I have worked on [design-bid-build] projects in the private sector where that has happened, because the architect is willing to embrace everybody.

That also requires an architect to understand that sometimes compromises have to be made, or that occasionally somebody will have to rethink a concept. A willingness to work with a whole team means listening and responding to everyone's expertise. You can't just have a high-end designer who hands out edicts and drawings and doesn't cooperate.

I can envision a project delivery method that is a hybrid of design-build and design-bid-build. Although design-bid-build can be highly collaborative, you do not necessarily have a contractor participating from the very beginning of a project. Maybe a design-bid-build method can bring in a contractor at a pre-construction phase, like schematic design. That would then allow the lead designer to maintain creative license and to choreograph other voices, but also bring in other entities to contribute to the development process at a much earlier phase. I could also suggest that the ultimate client of a project, like GSA, should define sustainability goals at the very outset of a project and then measure them over the course of design and construction to make sure they're carried through.

A WILLINGNESS TO WORK WITH A WHOLE TEAM MEANS LISTENING AND RESPONDING TO EVERYONE'S EXPERTISE.

Sustainability goals need to be carried through the building's occupancy; the client must work to make sure the building is maintained to its standards. A building needs a sustainability program for its full life cycle. That can only happen if you have cooperation from the contractors and from the people working in the field—the end users and facility managers.

A building should not be the architect's forever. It is supposed to be the user's building in the end; from the conception of a building through occupancy and future maintenance, you should be defining and accommodating the end user of the building. When you phrase the conversation about the end user, the client and every member of a project team wins.

MACK**SCOGIN**+ MERRILL**ELAM**

MACK SCOGIN AND **MERRILL ELAM** (LEFT AND FAR LEFT, RESPECTIVELY) AND HAVE WORKED TOGETHER IN ARCHITECTURE FOR MORE THAN 40 YEARS. THEY FOUNDED MACK SCOGIN MERRILL ELAM ARCHITECTS IN 1984 AS PARKER AND SCOGIN, LATER AS SCOGIN ELAM AND BRAY; THEY COLLABORATED INITIALLY AT HEERY AND HEERY ARCHITECTS IN ATLANTA. THE PRINCIPALS ARE INTIMATELY INVOLVED IN EACH OF THE STUDIO'S COMMISSIONS, WHICH SPAN SINGLE-FAMILY RESIDENCES TO GSA'S NEWLY COMPLETED FEDERAL COURTHOUSE IN AUSTIN, TEXAS. IN PRESENTING SCOGIN AND ELAM WITH A 2012 NATIONAL DESIGN AWARD, THE COOPER-HEWITT, NATIONAL DESIGN MUSEUM STATED, "THE FIRM'S CLIENTS EXPECT INNOVATIVE DESIGN WITH A MATURE APPROACH TO THE PRACTICAL CONSTRAINTS OF ARCHITECTURE. THEY HAVE AN INNATE DESIRE FOR ARCHITECTURE THAT GOES BEYOND MERE PROBLEM SOLVING TO ARCHITECTURE THAT ADDRESSES THEIR CURIOSITY SURROUNDING THE ROLE OF ARCHITECTURE IN SOCIETY."

IN THE AUSTIN COURTHOUSE, SCOGIN AND ELAM'S CURIOSITY PRODUCED A SYMBOL OF DEMOCRATIC GOVERNANCE. YET THE ARCHITECTS ALSO STRUCK A CAREFUL BALANCE BETWEEN ENVIRONMENTAL PERFORMANCE AND RIGOROUS BUILDING SECURITY. HERE THEY NARRATE THEIR HISTORY WITH GSA, AND RECOUNT THE MAKING OF THE AUSTIN COURTHOUSE.

MACK SCOGIN: I was part of the first group appointed to the National Registry of Peer Professionals, because the timing of a new federal courthouse in Boston coincided with my chairmanship at Harvard. I think the position got me noticed; regardless, I got in on the ground floor of the Design Excellence concept. That exposed me to the program's aspirations, which I thought were just fantastic—and very timely for American architecture at that point. Not only did the program want architecture that inspired and challenged GSA, but also it initiated a lot of discourse. So my initial years of involvement in the Design Excellence Program made us really hungry to get a project that had all these expectations attached to it.

I also knew that they were interested in getting somebody at the table that they hadn't heard from before. Which was, again, not the norm. So we tried to go after a number of things and finally we felt like our best chance lay with projects that were going through a competitive process to award.

One of our first ideas for the courthouse in Austin was that the courtrooms would get a lot of natural light, because the light is really quite beautiful in Texas and, of course, it's year-round. When you've got one or even two courtrooms per floor, you can get light to them. In that concept, judges' chambers aren't blocking the light.

MERRILL ELAM: The judges were unequivocally committed to daylighting in the courtrooms, chambers, jury deliberation rooms, and all the important public spaces. This necessitated a reevaluation of the normal courthouse configuration, and how it was ultimately reconciled was like solving a Chinese tangram. The site that was selected for the courthouse was fabulous: it's a full block facing east onto what is called Republic Square Park in Austin. But because the site itself was square, it meant that we couldn't do a long linear building or some other configuration that might have made the planning of the courthouse easier. Instead, in response to the squareness, we placed courtrooms and adjacent chambers diagonally in the plan, with the core and the main public lobby bisecting those two quadrants.

That let us put all the courtrooms, all the jury deliberation rooms, and all the chamber spaces on the exterior wall, so everybody had windows and daylight. This diagonal scheme also let us put our courtrooms on alternating floors, so that the volume of each courtroom was actually two stories with the adjacent chambers stacking one on top of the other. It became a very efficient volumetric exercise.

MS: We spent months proving the efficiency and the economy of the plan, and eventually I think everybody came into agreement that it actually would work. It's interesting, because you have this kind of triple client in the Judiciary, GSA, and in the Austin community. Just the sheer process of designing and bringing everybody to a consensus—it was pretty satisfying.

A federal judge could not be a more passionate client. They understand the sincerity of a public building. And they understand the responsibility, even after so many years, to still sit at the table and get inspired by ideas, to still want to fight over the color of the carpet, and all that kind of stuff—that's inspirational for an architect. The architect has got to have that same kind of longevity and endurance.

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ME: The responsibility of an architect in public buildings, I believe, is to be the fiduciary for the public.

ME: By contract, we were to design to a LEED-Silver standard in Austin. And a local, really dynamic LEED consultant was on the team from the very start. We've really come to greatly appreciate our LEED consultant, which is Center for Maximum Potential Building Systems with Gail Vittori as lead consultant. So LEED was a baseline, and a checkpoint along the way. But I also think we've got a much longer, deeper commitment to sustainability than LEED implies.

MS: Before any LEED requirements, we had been doing energy-conservative buildings for a very long time. Back in the middle '70s, we did a corporate office for the Georgia Power Company in Atlanta. That was in the middle of the energy crisis and an economic downturn, so we were asked to do a headquarters that would be the most energy-efficient high-rise of its time—and not cost one penny more than a speculative office building. In other words, we could not invest in exotic systems to reach these lofty goals. Just practical things around orientation, basic reinvention of the workplace, open plan. We were able to do some experimenting. There were new lighting systems at the time; we had the largest commercial solar collective field ever built on top of a building.

That started us out on a whole line of buildings, from factories to hospitals, that all invested in the same strategies. And, of course, as time went by, the lighting systems and the glazing systems were becoming more advanced. So when judges start talking about natural light, that's music to our ears.

The biggest sustainability challenge with courthouses is not so much ensuring the presence of natural light, but the fact that everything is closed off and conditioned. There are no operable windows, so all the very practical things that we'd been deploying for years were not available to us. But I think that the courthouse should be an efficient building. It should be something that's very efficient, because you can gain efficiency with a good wall section; and with wall sections [associated with high-security courthouse buildings] so thick nowadays, they're very efficient inherently. I frankly don't think there's any big mystery about designing good, sustainable courthouses. It gets down to orientation, good insulation, basic principles.

ME: Very late in the game in Austin, a high-performance green building initiative kicked in, which added funds that afforded improvements to the chiller system and controls. Also, we were able to improve the window glazing and the wall section a little bit, and a number of other things. But I'm going to go back to the cube again. It's inherently sustainable, because if you remember your high-school geometry, the cube is the next most efficient enclosing form after the sphere. Inherent in the form of the building is this efficiency of skin.

And there's another aspect with the public spaces. Because they're centered on this diagonal line, they are deep in the body of the building—which means that we could have lots of glazing on the upper floors, as well as very broad overhangs to shield the interior and elevator lobbies from an onslaught of Texas sun. So it's interesting that the square and the cube keep recurring as a positive aspect to the overall design solution.

MS: I think an interesting question about sustainability is whether GSA should, even more than currently, advance an experimental or research-based position. Perhaps not with courthouses, but maybe with more general building types like offices. If GSA is not the leader, then who is? With so many buildings under its jurisdiction, it's hard to imagine that anyone else in the United States has that kind of responsibility.

BOB**FRASCA**+
CHRIS**FLINT CHATTO**

AS PARTNER-IN-CHARGE OF DESIGN, **BOB FRASCA** HAS BEEN INSTRUMENTAL IN TRANSFORMING ZGF FROM A REGIONAL OFFICE TO AN INTERNATIONAL DESIGN PRACTICE. HIS PURSUIT OF BUILDING DESIGNS THAT RESPOND TO PROGRAM, CLIMATE, AND PLACE WAS EVIDENT TO GSA FROM ZGF'S VERY FIRST PROJECT FOR THE AGENCY, THE BONNEVILLE POWER ADMINISTRATION HEADQUARTERS. THIRTY YEARS SINCE THE COMPLETION OF THAT BUILDING, ITS PASSIVE SUSTAINABILITY STRATEGIES AND INNOVATIVE MECHANICAL SYSTEMS SEEM MORE PRESCIENT THAN EVER. FOR THIS *VISION+VOICE* INTERVIEW, FRASCA IS JOINED BY **CHRIS FLINT CHATTO**, WHOM ZGF HIRED IN 2007 AS SUSTAINABLE DESIGN COORDINATOR OF THE COMPANY'S SEATTLE OFFICE. CHATTO IS RESPONSIBLE FOR ENSURING AN ENVIRONMENTAL OUTLOOK IN NEW DESIGNS FROM THE EARLIEST STAGES OF DEVELOPMENT AND, AS HE EXPLAINS HERE, DOCUMENTING AND MEASURING ZGF'S HISTORICALLY SUCCESSFUL GREEN TECHNIQUES—LIKE THOSE EMPLOYED AT BONNEVILLE.

GSA MAINTAINS A PRESENCE ON ZGF'S ROSTER. THE FIRM HAS PARTICIPATED IN THE TRANSFORMATION OF THE HISTORIC ST. ELIZABETHS CAMPUS INTO THE HEADQUARTERS OF THE DEPARTMENT OF HOMELAND SECURITY IN WASHINGTON, DC, AND IT IS WRAPPING UP CONSTRUCTION OF FEDERAL CENTER SOUTH IN SEATTLE, A FEDERAL INVESTMENT THAT HAS GRABBED HEADLINES FOR ITS UNIQUE SUSTAINABILITY INCENTIVE PROGRAM.

BOB FRASCA: The first building that we did for GSA, the Bonneville Power Administration headquarters, which was completed in 1983, had a goal of 50,000 BTUs per square foot per year. That was a big deal in those days. The power authority wanted to demonstrate that they were going to be very energy-efficient, and GSA helped them in that effort. So that's really where we started. That was really the first GSA building we ever did.

CHRIS FLINT CHATTO: Right now, sustainability is getting more ambitious, so we need to be integrating it from the very beginning of a design. We're also looking at building performance and tracking energy use in our portfolio as a whole: Research is an important aspect of sustainability, because, as goals evolve, we really do need to know how systems work and use those lessons learned. Looking back at the Bonneville project, you'll find there's an amazing number of innovative strategies that are still being used today, like underfloor access and dual ducting.

BF: It's not always the bells and whistles that are important. One of the things we did with Bonneville's curved exterior wall is that the windows are different sizes on this one facade as they go around from east to south, because we were informed by our mechanical engineer that that would really handle the different heat loads very efficiently. These types of things are basic to the design of the building; they don't necessarily have to do with the building systems. Sustainability is what the architecture is about fundamentally.

It was only in recent years that sustainability has become a real, widespread commitment, and I think GSA and the federal government have had a lot to do with the permanence of that commitment. It's important that today's leadership make it last—that it's not going to be a passing fancy, like it was in the middle '70s.

CFC: And I would like to add something to that. I think, as stewards of the American people's money and the owner of 50- or 100-year buildings, I think it's a responsible attitude for GSA to build sustainably. We have clients who, for various reasons, have a short-term investment horizon. It's not unusual in this industry to have projects that might have 3- or 5- or 10-year paybacks. But looking at the longer-term fiscal responsibility of this country, sustainability is a good investment.

BF: Buildings that are sustainable also tend to be very, very hospitable, and that's really one of the great benefits of looking at buildings in that way.

CFC: I'd say this issue needs to be looked at closely. One of the early studies we did for our Department of Homeland Security project was to look at a lot of factors: building width, window-to-wall ratio, floor-to-floor height. Prioritizing daylight and access to the exterior actually increased the overall energy use of the building, because there ended up being more envelope per square foot. If we take that approach to its logical extreme, then we'd be designing all underground bunkers. That wouldn't be a pleasant place to work and it would negatively affect people's productivity.

We need to figure out strategies that thread that needle. Which is why this idea of post-occupancy evaluation is something ZGF is interested in. Occupant satisfaction and sustainability do go together, but we need to be conscious that these strategies potentially require some tradeoffs.

BF: Metrics are fine, but you have to be careful. A building could be statistically immaculate, but there may be a whole bunch of other things about it that are wanting. Then you haven't succeeded, either. You can't get hung up on the metrics only. There are other ways of measuring.

CFC: Federal Center South is a great example of outcome-based performance requirements affecting the design. When we were in the competition for that project, there was a fixed budget, a fixed timeline, and finally there was a performance metric—30 percent better than ASHRAE 2007, which meant less than 30,000 BTUs per square foot per year.

Fed Center South is design-build. So, going in with our partners Sellen Construction and engineering firm WSP Flack+Kurtz's Built Ecology division, we knew we didn't just have to hit the budget and timeline to win; we also had to have a design that we felt confident was going to meet that metric. This may be one of the first GSA projects where that performance metric is actually going to be tested, and one half of one percent of the project's construction cost is being held in retainer until after a year of performance data show that we've met that target.

For me it was incredibly exciting, because while I often come into projects and get excited about integrating sustainability, this time the client was asking for it. And I feel like it was probably the most integrated design we've been able to do, because we had to ask ourselves with every move, Is this helping us get toward that goal?

We're going to see a lot more in the way of incentivized performance contracts like Fed Center South. And I think that necessarily requires a more integrated design approach, because it means that the design team is essentially going to be responsible for energy use. It means that our involvement with the building goes beyond turning over the keys. It will make post-occupancy evaluation more frequent, as well.

BF: The Design Excellence Program plays an important role in the sustainability of GSA buildings. When the program started in 1994, its mission was to determine quality relative to buildings' appropriateness to region. Peer reviews and other procedures were put into place to measure this quality. When the whole mission of sustainability became important, it was really interwoven into the Design Excellence Program. Sustainability is excellence. The Design Excellence Program and the sustainability movement have been working hand in hand. It's not fashion. It's important to human existence.

CFC: Federal buildings can continue having big impact on the community. One potential is to look at district systems—the idea that these buildings may be able to contribute waste heat to other buildings, or there might be ways of sharing wastewater. Oftentimes a private developer doesn't have the ability to do that, but it seems like an appropriate role for our government to consider.

One great example of a district system is our 12 West building. It's about 25 stories of apartments, and we have our offices in the lower five floors. That building uses a cooling system that is actually two blocks away, as part of the Brewery Blocks development. There was excess cooling capacity, so rather than have our own chillers and cooling towers, we actually take the thermal energy that is produced there.

BF: There are a lot of places that do that, such as L'Enfant Plaza. And when you get right down to it, we have to understand that, as a planet and as a nation, we have limited resources and we need to be able to use them more efficiently.

CFC: There are tools that I think will help us understand this better. It can start with submetering. We can split plug loads from lighting from HVAC, and you can go back and look at the history of lighting output per fixture through a web interface. Giving occupants feedback about how much energy they're using can help them develop better habits. As we become more knowledgeable about energy as a society, we'll see greater acceptance of that transparency.

BF: Sustainability is something that gives substance to change in architecture. Much of architecture, at least in the last 30 or 40 years, has had to do with fashion. And fashion is a very transitory goal. Sustainability is like the force of gravity—it is something that is measurable and something you have to respect. I think that buildings will be much more lasting for it—not only in terms of their physicality, but in terms of their importance and their relevance.

ANDREW**TRIVERS**

ANDREW TRIVERS'S ST. LOUIS–BASED STUDIO IS THE ARCHITECT RESPONSIBLE FOR THE RENOVATION OF THE HIPOLITO F. GARCIA FEDERAL BUILDING AND U.S. COURTHOUSE IN SAN ANTONIO, TEXAS. THE RECENTLY COMPLETED UPDATE OF THE 1937 COURTHOUSE EARNED LEED-PLATINUM CERTIFICATION THROUGH THE RATING SYSTEM'S NEW CONSTRUCTION PROGRAM, WHICH ALSO APPLIES TO MAJOR MODERNIZATIONS. THIS *VISION+VOICE* INTERVIEW EXAMINES HOW A SUSTAINABILITY MISSION WAS WOVEN THROUGH MODERNIZATION, WITH A HIGHLIGHT ON THE RECONCILIATION OF ACTIVE GREEN TECHNOLOGY AND PRESERVATION CONCERNS. TRIVERS ALSO CHAMPIONS PRESERVATION AS AN INHERENTLY SUSTAINABLE APPROACH TO PROPERTY DEVELOPMENT, ESPECIALLY IN THE CASE OF BEAUX-ARTS STRUCTURES LIKE THE SAN ANTONIO COURTHOUSE, WHICH ITSELF EMBODIES SEVERAL PRINCIPLES OF PASSIVE SUSTAINABLE DESIGN.

TRIVERS FOUNDED HIS FIRM IN 1982, AND HE HAS BEEN ACTIVELY INVOLVED IN PRESERVING HIS HOME CITY'S ARCHITECTURAL HERITAGE SINCE INCEPTION. FOR EXAMPLE, TRIVERS ASSOCIATES HANDLED THE RENOVATION OF THE OLD POST OFFICE IN DOWNTOWN ST. LOUIS; THE 1872 BUILDING IS THE ONLY REMAINING PROJECT OF THE POST CIVIL WAR REVITALIZATION AND REUNIFICATION ACT. THE COMPANY'S FIRST LEED-CERTIFIED PROJECT INVOLVED ANOTHER HISTORIC BUILDING, THE 1904 CITY HALL IN UNIVERSITY CITY, MISSOURI.

ANDREW TRIVERS: Historic preservation helps to identify and establish the uniqueness of our cities. It connects us to our past. Yet very few historic buildings can exist as mausoleums, so we have honed our skills to combine technologies and, now even more important, sustainable practices, into historic buildings. In that way, we will assure the future use of these assets for generations to come.

The GSA project in San Antonio, the Hipolito F. Garcia Courthouse and Federal Building, is a prime example. In many ways it culminates a lot of the skills that we have developed over 30 years.

Through the Design Excellence Program we were selected for the design and restoration of the San Antonio project. The program guides the selection process to focus primarily on the designer, because it's looking for creativity and innovation. Quite frankly, I think that's very important. Weaving in new systems and sustainability into a preservation design takes a lot of creativity to do well. And while the results may not necessarily break new theoretical ground, there's quite a bit of effort required to really bring out the best of our past.

The San Antonio project appealed to us for several reasons. It's a very significant historic building, designed by Ralph Cameron as the local architect and Paul Cret from Philadelphia as the design architect. Secondly, the building had become underutilized in an important location in San Antonio—a portion of which was essentially within the original walls of the Alamo. The front entrance, and access to extremely important Howard Cook frescos, had been closed off for more than 10 years for security reasons. The public could not take advantage of these and other historic features of the building. So every one of our ideas had to be thought about in terms of making the building available for the community's enjoyment without compromising historical integrity or security integrity.

Often, a historically sensitive renovation is about peeling away what has been done that compromised the historic character. You're letting the history of the building speak more loudly than anything we do as an intervention. In terms of working through the security process so that most people could enter from Alamo Plaza, controlling circulation took a fairly extensive effort. It was particularly difficult, since access and security are located at the lobby frescos. You want the least intervention possible. By using structurally supported glass in low partitions, we were able to organize the flow of the public through security while minimizing the impact on the historic murals.

We also made a significant effort with the windows, designing a low-e film to change the heating and cooling emissivity of the glass itself. We then placed interior storm sashes to make an extremely energy-efficient window system while still maintaining the existing windows. Even a restored window will not meet the energy requirements and sustainability that we were trying to achieve, so a lot of effort went into the most minute details, like the film. As a result, the historic character of the building speaks more loudly than any other component.

To the extent that we design new systems to be invisible, we have done a pretty good job of not obstructing the existing architecture and finishes. We were fortunate to run ductwork for a heat recovery system in an interior courtyard. We also had an opportunity to create a green roof in the interior, and to place solar hot water panels and photovoltaics on the roof. But none of this can be seen from the street or the surrounding exterior of the building, which is important.

With visible interventions, a key principle of renovating historic buildings is to not confuse the public about what is authentically historic and what is not. New interventions that mimic historic features like they are part of the original building is not the best approach. It's better to acknowledge what's new, because historic preservation in part is educational. People learn about our past, but they need to be able to discern what is authentically historic from what is new.

Active green technologies have had a huge impact on historic preservation in this respect. But one of the reasons that we have been committed to historic preservation is that it's inherently sustainable. These buildings embody many sustainable concepts, as well as the energy that created the original materials. It just doesn't make sense to cart materials to landfill and then recreate them in new construction. Sustainability and historic preservation really go hand in hand.

Certainly the original architects employed many of the techniques of fundamental sustainability here. The building is an unusual shape and it has a large interior courtyard, which permitted daylight into the interior spaces. We were able to take advantage of that, removing barriers to daylight penetration and incorporating light monitoring, occupancy sensors, and other building controls to accomplish a truly state-of-the-art sustainable building. We saved about 40 percent on the electric utility costs for the building, in combination with the solar hot water panels and photovoltaics we installed to reduce operating costs.

Nuisance water became apparent over the course of the project. A small stream existed at this site going way back, and there was quite a bit of water that had to be pumped out continually. So by taking the opportunity to collect that nuisance water, as well as runoff from roof structures, we were able to save significantly on water. All of that captured graywater now irrigates the green roof's landscape.

Some buildings lend themselves to being more sustainable than others, and we were fortunate here. But we really didn't know until we got into the analysis with GSA that we could make it a LEED-Platinum building. The potential revealed itself through the process of design and investigation. For example, we did thermography of the exterior walls; we knew where all the heat loss was; we knew where the heat gain was. We were able to take advantage of what is inherent in the building only through an investigation of a whole list of opportunities for sustainability. And we had far more opportunities than the ones we ultimately selected, but because there were budget concerns, we had to be selective with the sustainable feature. Even with this constraint, the building was able to achieve the highest level of LEED classification that exists. One of the reasons the project succeeded in this respect was the participation of all the team members.

Working with the Judiciary is an integral part of GSA projects where the courts are involved. Most of the judges that we've worked with were really excited to be able to have use of these extremely historic courtrooms. It fits their image of justice; they really relish the historic aspects.

Now when it comes to space, we have been able to create new courtrooms within historic buildings. In the case of San Antonio, we renovated the existing courtrooms, because the judges were generally satisfied with them. We did modify the courtrooms significantly to suit the judges' technology and infrastructure needs, particularly when it comes to A/V, security, acoustics, and lighting. It's not impossible to maintain historic integrity simultaneously.

I have always had a strong interest in working with GSA; the federal government has really been an advocate of retaining historic buildings and GSA in particular has been a proponent of preservation and adaptive reuse. I've also come to appreciate the philosophy of the Design Excellence Program, and the fact that it's now being applied to historic preservation: While I think it was initially intended to focus more on new construction, now there's no question that Design Excellence principles apply to historic preservation and sustainability and the way they go together.

For me, working with GSA represents service to the community, to the public. GSA's historic buildings represent our country's long-held ideals and aspirations for a greater society. And nowadays, historic preservation and sustainability count among those ideals.

WILLIAM **BROWNING**
VISHAAN **CHAKRABARTI**
LAURIE **OLIN**
SUSAN **RODRIGUEZ**
CRAIG **SCHWITTER**

Chapter 2

Defining Sustainability Expansively

A sustainable building is much more than one that uses energy efficiently. A recurring theme in the following interviews is social sustainability in design—that is, making places that work just as hard to earn the goodwill of users as they do to turn the electricity meter backward. A building may accomplish this task by celebrating a community's history, supporting local economic development, or even resonating with the qualities that make us fundamentally human. The result is enduringness. This chapter concludes with a discussion of how the social experience of a building may inform engineering innovations in turn.

BILL**BROWNING**

BILL BROWNING COFOUNDED TERRAPIN BRIGHT GREEN WITH ARCHITECTS RICK COOK, BOB FOX, AND CHRIS GARVIN IN 2006. THE NEW YORK– AND WASHINGTON, DC–BASED CONSULTANCY PURSUES, AS BROWNING PUTS IT, "INTEGRATED WHOLE-SYSTEM SOLUTIONS" TO SUSTAINABLE DESIGN CHALLENGES. TWO OF TERRAPIN'S BEST KNOWN APPROACHES TO SUSTAINABILITY ARE BIOMIMICRY, USING NATURE AS A SOURCE FOR INNOVATION, AND BIOPHILIA, CONNECTING PEOPLE WITH NATURE. AT THE TIME OF THIS *VISION+VOICE* INTERVIEW, GSA AND TERRAPIN WERE STUDYING IMPROVEMENTS TO HUMAN HEALTH AND PRODUCTIVITY IN BIOPHILIC ENVIRONMENTS.

AFTER TRAINING IN ENVIRONMENTAL DESIGN AND REAL ESTATE DEVELOPMENT, IN 1991 BROWNING ESTABLISHED GREEN DEVELOPMENT SERVICES AT THE ROCKY MOUNTAIN INSTITUTE, THROUGH WHICH HE PARTICIPATED IN MULTIPLE FEDERAL SUSTAINABILITY INITIATIVES. HE ALSO WAS A FOUNDING BOARD MEMBER OF THE U.S. GREEN BUILDING COUNCIL. INDEED, BROWNING IS CONSIDERED ONE OF THE MOST IMAGINATIVE VOICES IN SUSTAINABILITY TODAY. IN CONVERSATION HERE, BROWNING EXPLAINS THE PHILOSOPHY BEHIND HIS EXTENSIVE WORK FOR THE FEDERAL GOVERNMENT, WHICH RANGES FROM SUSTAINABLE SECURITY TO DISASTER RELIEF. HE ALSO DESCRIBES SEVERAL WAYS IN WHICH THE BIOMIMICRY AND BIOPHILIA CONCEPTS SUPPORT SUSTAINABLE DESIGN STRATEGIES, AND PROVIDES MORE DETAIL ON HIS ONGOING MEASUREMENTS OF BIOPHILIA AND PRODUCTIVITY WITH GSA.

BILL BROWNING: As a research field, biomimicry literally means asking, How does nature do that?

We're working on a 3-million-square-foot building in New York City, trying to figure out environmental reference standards for it. So, we used as our basis a project called Mannahatta, which maps Manhattan's ecosystems back to 1609. We asked, What was this ecosystem doing on this site?

One of the building's problems is that annually it uses millions of gallons more water than it should. In the lowest levels of the building we found a set of sump pumps that seemed to have been running continuously for 80 years. The water quality was phenomenal in there, so we assumed it was a stream. When we then looked at the Mannahatta map, it revealed that that stream is still flowing into the basement of the building. For 80 years it has been pumped out and put down the storm drain.

That 45 million gallons of water a year now can be used for cooling towers, for toilet flushing; it can be used in the fabric of the building rather than being thrown away. That's one example of [establishing environmental reference standards by] asking what the ecosystem was doing. And we've taken several steps further. The forest on this site was sequestering 3.7 tons of carbon on an annual basis, so now the question is how this building could potentially sequester 3.7 tons of carbon a year. Similarly, we're looking at putting substantial gardens on the roof as a mechanism for bringing back the biodiversity of this site.

This is moving beyond net-zero energy or LEED ratings. Saving 30 percent of the energy against some ASHRAE standard ultimately feels arbitrary, right?

It takes a creative client to think this way, but when we start digging in like this, several things happen. One is, you inherently wind up with a much higher LEED rating, because you're thinking in much more integrated, holistic terms. You also are thinking in terms of the services a place can provide.

Unfortunately, in many cases people look at LEED as a design tool as opposed to what it really is, which is a measuring tool. It doesn't tell you what to do; it gives you measurements to check your performance. One of the things we insist on doing with our clients is first stepping back and setting goals: What's important about energy usage? What's important about water? What's important about the experience of the occupants in the building?

The client's role in an integrated process is having a clear understanding of what they want, and that may take some back and forth with the design and construction team. A charrette is really just the beginning of that ongoing process. If you just do a charrette and leave, then it may or may not stick. It's really important that you've got the right stakeholders in the room, and that everybody's engaged.

I think of a number of reasons why the government should be involved in sustainability. The obvious one is resilience. We need durability in a government, particularly in terms of the military's disaster relief. The military is one of the few organizations that has the logistical capability, the equipment, and the manpower and knowledge base to be able to deliver humanitarian relief in a timeframe and scale that really makes a difference.

GSA can make a difference in several areas. One is helping set goals. Even though it's not a GSA project, take the new National Renewal Energy Laboratory building as an example. The project had a clearly articulated set of performance goals right up front, and the Department of Energy was willing to let the design team figure them out without massive intervention. That took place within the framework of the Federal Acquisition Regulation. They did not have to modify their policies and procedures to do it.

There are a number of groups within the federal government that have been key in leading innovation in green building. A lot of the technologies we use today came out of the Lawrence Berkeley National Laboratory or National Renewable Energy labs, like compact fluorescents and low-E windows. These were developed in federal labs and then put out in the mainstream.

GSA has been a key player in this conversation, in helping lead research on environmental performance and human performance not just for its own buildings but all federal buildings. That work is enormously helpful for the private sector, as well, because buildings research is one of the least funded areas of research in any industry. Yet the building industry is one of the biggest chunks of our economy.

Biophilia explores the innate need of humans to connect with nature. Terrapin is in year six of a multi-year experiment [with GSA environmental psychologist Judith Heerwagen, among others] that looks at a building that has biophilic design elements. We're tracking 4,000 people who moved into that building and another 3,000 people who did not. Looking at daylight, looking at views, looking at temperature, looking at indoor air quality, looking at ergonomics, looking at all of these different conditions, we are seeing real differences in people's productivity and health outcomes.

The measures of productivity that we're interested in are typically the ones that a company has already been tracking over time, such as absenteeism or rate of transactions. And the numbers are huge: In an office building, office workers' salaries are 90 times the energy cost per square foot, and yet so much of the conversation about green buildings has to do with energy. People are the real cost, so focusing on quality of the indoor environment and on giving people this connection to nature is really the way to enhance a building.

Now in biophilia research, we're getting into direct health impacts: this is the part of the brain that is processing an image when you're looking at a blank wall; you're getting a low opiate reaction; the brain's wandering around; it's trying to focus. Give people a view of beautiful nature or even just a tree with a leaf moving, even for a few seconds, and it captures your attention; the brain refocuses; it moves processing to the back of the visual cortex. You can see the endocrine cascade, the balance of cortisol and serotonin in the body, heart rate—all of those pieces come together. Simply, we're seeing that biophilic design effects profound physiological changes that impact human performance.

BIOPHILIC DESIGN IS NOT JUST ABOUT BRINGING PLANTS OR ANIMALS INTO A BUILDING. SOME RESEARCHERS HAVE BEEN DEVELOPING A PATTERN LANGUAGE BASED ON NEUROLOGICAL AND PHYSIOLOGICAL RESPONSES WE'RE MEASURING.

Biophilic design is not just about bringing plants or animals into a building. Some researchers have been developing a pattern language based on neurological and physiological responses we're measuring. One that is commonly understood is the concept of providing refuge spaces. Another spatial condition would be prospect, where you have a view out across an area; it may be slightly elevated, and even better if that view includes a nature scene. If you put prospect and refuge together in the same building, you elicit a very strong reaction from its occupants. There are classic examples of architecture in which those concepts are paired.

I'm very happy that GSA has been delving into the whole field of biophilia, because that's what sustainability is really about. It's not about a building, it's about how the connection between nature and the built environment supports people's health and well-being.

VISHAAN**CHAKRABARTI**

WHEN HE SAT ON THE JURY OF THE 2010 GSA DESIGN AWARDS, **VISHAAN CHAKRABARTI** HAD JUST LAUNCHED THE CENTER FOR URBAN REAL ESTATE AT THE GRADUATE SCHOOL OF ARCHITECTURE, PLANNING AND PRESERVATION AT COLUMBIA UNIVERSITY. THE INNOVATIVE NEW PROGRAM EXAMINES EMERGING AND EXPERIMENTAL DESIGNS OF SUSTAINABLE INFRASTRUCTURE AND AFFORDABLE HOUSING, AS WELL AS THE FINANCING AND POLICY MECHANISMS THAT PROMOTE MIXED-INCOME, GREEN DEVELOPMENT. BETWEEN 2005 AND 2009 CHAKRABARTI SERVED AS THE EXECUTIVE VICE PRESIDENT FOR DESIGN AND PLANNING FOR THE RELATED COMPANIES. PRIOR TO THAT HE DIRECTED THE MANHATTAN OFFICE OF THE NEW YORK CITY DEPARTMENT OF CITY PLANNING. IN 2012 *METROPOLIS* MAGAZINE FEATURED CHAKRABARTI IN ITS SPECIAL "GAME CHANGERS" ISSUE. HE IS A PARTNER OF SHOP ARCHITECTS AND AUTHOR OF THE JUST-PUBLISHED BOOK *A COUNTRY OF CITIES*.

FROM HIS OFFICE ON COLUMBIA'S UPPER MANHATTAN CAM-PUS, CHAKRABARTI DISCUSSES THE RELATIONSHIP BETWEEN GOVERNANCE STRUCTURE AND SUSTAINABLE DEVELOPMENT—NOTING, FOR EXAMPLE, THE DIFFICULT INTERAGENCY COLLABORATION REQUIRED OF PLANNING A GREENER AMERICAN MEGALOPOLIS. ZOOMING IN ON PROPERTY-SCALE DEVELOPMENT, CHAKRABARTI THEN ANALYZES THE RELATIONSHIP BETWEEN ENVIRONMENTAL PERFORMANCE AND OVERALL BUILDING QUALITY, FOCUSING ON BOTH SITE SELECTION AND ARCHITECTURAL STRATEGIES FOR ENSURING COMMUNITY USE.

VISHAAN CHAKRABARTI: The Center for Urban Real Estate's mission is to advocate and research sustainable communities. We're exploring how to build a more robust, mixed-income, and transit-oriented kind of density, in order to accommodate growth that we're seeing domestically and internationally.

We have many decades of real estate data about what customers want, and we have data about buildings' energy use. Our program also is involved in speculation—of whether the land that we have available to us is being used in the way that it really should be used. As a design school, we have the ability to think about futures that could unfold if we had different policies and attitudes regarding land use.

Mayors share our interest in exploring these issues of growth, because they impact every mayor as a manager. There's not the luxury of politicization. Mayors tend to be interested in the best uses of land and infrastructure—in how their cities can grow in a sustainable way while building the tax base.

Today about 70 percent of the American population lives in seven or eight mega-regions. Those regions tend to cross state lines, but they have common needs in terms of infrastructure, housing, and so forth. Our governing structure isn't ideal for serving this population, and that's why it's harder for state and federal agencies to deal with issues like high-speed rail, which we're seeing in other advanced countries.

I think we have a particularly acute set of challenges right now in terms of building the infrastructure we need. If you think back to the Eisenhower administration and the passing of the Federal Highway Act, there was clearly an understanding about why the government would actively try to spread out the population. Now we are in a reverse mode: people are moving into cities, and much of the landmass of the country is actually decanting population. And yet we don't have that same kind of Eisenhower-era imperative that says, If we're to compete in a global economy, then we should be building the infrastructure that supports densification. I'm not sure we have an overall governance structure that's really up to the challenge.

Even so, I'm seeing Secretary Donavan and Secretary LaHood working together much more. The White House has been trying to organize urban affairs under an umbrella, so agencies that impact cities and municipalities work across their departments. I'm very encouraged by those kinds of activities at the federal level.

Even if it does not have a direct hand in major infrastructure investments, I believe GSA could play a very significant role in this phenomenon. Daniel Patrick Moynihan believed in great civic architecture—of train stations, for instance, as a way to incentivize people to use mass transit. The experience of the public realm would have both dignity and efficiency, in that case.

For that reason, I was thrilled to be a juror [of the 2010 GSA Design Awards]. Some of the work was extremely impressive, the border stations especially. There's other work that was more pedestrian. But to me, the important thing is that there is this great effort to bring in an independent body of experts who can really look at and influence what the government is doing.

It's obvious to most people that if you live near a city, use mass transit, and live in smaller housing, then your costs are less. People vote with their wallets. Moreover, true environmentalists understand that the impact of living in a city is far, far less than living on a farm in Vermont. Even if that farm in Vermont has solar panels and windmills, it's a highly auto-dependent lifestyle and the structure itself is highly inefficient in terms of heating and cooling. We're going to see the American Dream change.

Choosing a location in the heart of a city, saying that the city matters, is one way of deploying federal building resources that strengthen our densifying cities. Then there's the making of those sites into inviting urban destinations. We should be building projects and selecting sites that are responding to population change and reinforcing our strengths. We also should be helping cities that are struggling more than the New Yorks and San Franciscos of the country. You're starting to see some life revive in places like Buffalo or Charlotte, for example.

I think site selection within a specific city is very important, too, because if you build a big courthouse somewhere that is necessary and situate that courthouse on its site properly, then it can start to support street-level retail. It can start to support a whole bunch of things around it just by the shear volume of its activity, its design, and its transparency.

I've always believed that the right relationship between government and its people should be that public-sector action inspires and motivates the right kind of private-sector reaction.

In architecture, as a field we've had a tendency to focus on the bells and whistles—green roof, solar panels, all that kind of stuff. But the fact of the matter is, if you take every possible sustainability measure you can think of and put it in a building and then put that building in a suburban location, then the carbon footprint of that building and its average worker is very poor compared to those of the workers commuting to a 1930s office in the heart of Manhattan.

The whole culture around an office park is systemically consumptive: the way people get to work, where they live in order to be near that office park, the heating and cooling they use along the way, the irrigation of lawns. Green mechanisms—the active sustainable technologies—are actually just at the margins of what we should really be pursuing in terms of carbon footprint.

Energy performance is very important, but it needs to come in conjunction with a holistic look at our buildings and communities to really understand the overall carbon footprint. So, when I think about measuring the success of a building, I think we should be evaluating it in terms of energy, in terms of urbanism, in terms of innovation, even in terms of cultural critique. Those are important aspects of what good architecture should be doing, in addition to energy performance.

CHOOSING A LOCATION IN THE HEART OF A CITY, SAYING THAT THE CITY MATTERS, IS ONE WAY OF DEPLOYING FEDERAL BUILDING RESOURCES THAT STRENGTHEN OUR DENSIFYING CITIES.

The city is the silver bullet. The question is how to respond to that. Obviously, the federal government has a responsibility to serve the entire population, including populations that may live very far from the city, so this argument is not going to pertain to every case. But I think you are seeing the potential, even in small gestures, to support the move to a denser, more city-centered world. Maybe support comes in the form of putting a parking lot in back of a building and figuring out how to get people to relate more to the sidewalk. Whatever the example, ideas about dignity in the urban environment can have impact. And that starts to impact not just energy usage, but also issues like public health and obesity, or economic prosperity in the surrounding community.

LAURIE**OLIN**

MASTER PLANNER OF LONDON'S CANARY WHARF, DESIGNER OF THE WASHINGTON MONUMENT GROUNDS, AND RESPONSIBLE FOR THE REVITALIZATION OF BRYANT PARK IN NEW YORK CITY, LANDSCAPE ARCHITECT **LAURIE OLIN** HAS CREATED SOME OF THE MOST ENDURING CONTEMPORARY PUBLIC SPACES AROUND THE WORLD. HIS INDEPENDENT CAREER BEGAN IN 1976, WHEN HENRY COBB OF I.M. PEI & PARTNERS INVITED HIM TO JOIN THE DESIGN TEAM OF THE JOHNSON & JOHNSON BABY PRODUCTS CORPORATE CENTER. THAT SAME YEAR HE AND THE LATE ROBERT HANNA ESTABLISHED THE STUDIO HANNA/OLIN, WHICH TODAY IS KNOWN AS OLIN. ANOTHER ONE OF THE COMPANY'S EARLY PROJECTS IS THE 16TH STREET TRANSITWAY IN DENVER, AND OLIN LIKENS THE TRANSITWAY'S COMMUNITY GOODWILL TO "SUSTAINABILITY[, WHICH] IS NOT JUST BUILDING WELL. IT'S GETTING CULTURAL BUY-IN FOR SOMETHING SO THAT IT GETS TAKEN CARE OF."

OLIN SERVED ON THE DESIGN TEAM OF THE JOHN JOSEPH MOAKLEY UNITED STATES COURTHOUSE, A SEMINAL PROJECT FOR GSA'S DESIGN EXCELLENCE PROGRAM THAT WAS LED BY PEI COBB FREED & PARTNERS. MANY OF THE LANDSCAPE STRATEGIES EMPLOYED FOR THE BOSTON COURTHOUSE'S SITE, SUCH AS THE STORMWATER FILTRATION AND REGIONAL MATERIAL SOURCING ALSO DESCRIBED IN THIS *VISION+VOICE* INTERVIEW, ARE STILL FOUNDATIONAL SUSTAINABILITY SOLUTIONS FOR THE PROFESSION.

LAURIE OLIN: One of the problems with sustainability is there are so many ways to define it. It could be about materials and life-cycle costs, for example. When we did the Denver Transit Mall 26 years ago, I proposed 12 blocks of polychromatic granite pavement. People were just horrified, because they thought it should be asphalt or concrete. And I had several reasons for saying no. One was, having lived in Europe for quite a few years, I had thought we wanted to build something that people would love and that would endure. Granite would endure.

Well, that is one aspect of sustainability. Two years ago, when a community business group in Denver wanted to refresh the mall and make some repairs, I made proposals to change some things and the preservation community came out of the woodwork and prevented us from doing it. They wanted it the way it was; it's theirs; it's a tourist attraction; it is beautiful; they love it. So sustainability is not just building well. It's getting cultural buy-in for something so that it gets taken care of.

That is an aspect that is rarely talked about—getting the citizenry devoted to the public realm and wanting to keep it, maintain it, share it, repair it. Many years ago J.B. Jackson wrote a wonderful essay, in which he said he felt that every American was entitled to a landscape that was ecologically healthy, socially just, and spiritually rewarding. How about that? Well built, ecologically sound and healthy, socially just—it's for everyone and it's open and it's accessible and it is affordable, and it makes you feel good about being alive alongside your fellow citizens and participating in the future of the community. I mean, those are fabulous ideas. And I believe it and our firm believes it. Sustainability means financially sustainable, ecologically sustainable, culturally sustainable, and physically sustainable.

The Moakley courthouse was a nice project in lots of ways, partly because I saw it as a chance to give a piece of the waterfront back to the citizens of Boston and to help make the Fan Pier development take off. The courthouse was turning itself open to the city, and we wanted to do the park so well that it would set a standard for what came afterward. I wanted it to be open, I wanted it to be a nice place to sit and to stroll through, and I wanted it to say, Come here, this is for you. And despite the security problems, it turned out to be a really nice and simple project.

THAT IS AN ASPECT [OF SUSTAINABILITY] THAT IS RARELY TALKED ABOUT—GETTING THE CITIZENRY DEVOTED TO THE PUBLIC REALM AND WANTING TO KEEP IT, MAINTAIN IT, SHARE IT, REPAIR IT.

I wanted to use all native plants from the region, which we did, and I wanted to have stuff that could take on winter conditions on the Boston Harbor. That gets you to thinking about New England very deeply. I wanted it to be made of granite from Maine. We wanted to be able to have the snow and ice go right into the ground or into the harbor without any pollution.

If you want to talk about sustainability, you're not talking about short-term gain. You are talking about the long haul. And that means you need to plan well, build well, and maintain things. And those are habits that we lost somewhere along the line. Returning to them shouldn't be painful, it should be a joy. But it is taking awhile to get everybody back onto that page.

I want to build things preservationists would fight to preserve. I want to build things that are that good. I want them to be beautiful, I want them to be socially accessible, and I want them to be productive.

I think the federal government has a great opportunity to show leadership in the creation of public spaces. And by that I mean it doesn't have to be the most avant-garde, but it sure shouldn't be rear garde. It should be doing work that is the state of the art of its moment. Because it makes places outdoors and indoors for American citizens to use to govern ourselves, the federal government therefore needs to make places that are welcoming, gracious, well built, and have character and have some spirit of where they are.

A lot of people, when they go to places like courthouses or interact with government in general, are under stress. They are worried; they think something might happen to them; they are dealing with authority. So to be welcoming, to be reassuring, to be solid, to not be frivolous and silly, but also not to be grim and hostile, is one of the principal roles of public space in a federal facility.

A public space wants to be functional and have ease of use, but it also should be generous in its spirit. It's for Americans, it's for citizens, it's for the workers who pass through it and use it everyday. I think it's important that those be good places. To cheap out on that is to hate yourself. To dislike our government is to hate oneself. I like to think we're a generous nation. If you're going to make a mistake, then err on the side of generosity.

In our practice we have had numerous public projects where attempts at community outreach are made. It's hard for a designer—unless it's a town that you have lived in for awhile and really know—to come to a city and quickly get the vibration of what is going on on the ground, in the neighborhoods and in the business community and the government.

And so you need help. Quite often it's the savvy client who organizes a community and designer to meet one another. They will immediately hold a getting-to-know-you session where the public is introduced to a project and to us. We say a little bit about ourselves and then solicit the public for their feelings, thoughts, and ideas from the very beginning. So you start out asking before you start telling, which is always a good idea.

The best community outreach allows citizens to take our measure. But it also allows us to try to elevate them. We expose them to things from around the world that we're aware of, and that we'd like them to know.

Landscapes are what we share. Buildings are not necessarily shared by everybody. In fact, they are private. And we think of what goes on in most buildings, except for some civic buildings, as private. So, if I build something out in front of my building, even if it's private property, you probably see it and it probably affects you. Landscape has this public quality; the bad air on my project doesn't stop at the property line, it may drift over to you.

So when we do public parks or city streets or university campuses, we are thinking about and caring about a vast array of people with different needs even more so. Whether the project is public or private, this approach is not some kind of crazy utopian thinking. For me, citizenry is not a myth; citizens are my client.

SUSAN**RODRIGUEZ**

AS A FOUNDING PARTNER AND DESIGN PRINCIPAL IN ENNEAD ARCHITECTS, **SUSAN RODRIGUEZ** DESIGNS BUILDINGS FOR CULTURAL, EDUCATIONAL, AND CIVIC INSTITUTIONS INCLUDING GSA'S FORTHCOMING FEDERAL COURTHOUSE IN HARRISBURG, PENNSYLVANIA. SHE HAS BEEN RECOGNIZED FOR INNOVATIVE DESIGNS FOR CITIES AND CAMPUSES AROUND THE COUNTRY, AND FOR BROADENING SUSTAINABILITY TO INCLUDE SOCIAL EQUITY. HERE SHE DISCUSSES THAT CONCEPT IN LIGHT OF THE HARRISBURG COURTHOUSE, ARGUING THAT DESIGNING FOR "RECIPROCITY" WITH A COMMUNITY—IN THIS CASE, TRANSLATING THE CITY'S UNIQUE LANDSCAPE FEATURES AND HISTORY INTO ARCHITECTURAL DESIGN—INCREASES A BUILDING'S CHANCES OF LONG-TERM SUSTAINABILITY.

ENNEAD WAS KNOWN AS POLSHEK PARTNERSHIP ARCHITECTS UNTIL 2010; RODRIGUEZ HAS BEEN WITH THE FIRM SINCE 1985 AND A PARTNER SINCE 1998. AMONG HER AWARD-WINNING PROJECTS ARE THE LYCEE FRANCAIS DE NEW YORK, FRANK SINATRA SCHOOL OF THE ARTS, NEW YORK BOTANICAL GARDEN INTERNATIONAL PLANT STUDY CENTER AND PFIZER PLANT RESEARCH LABORATORY, WESTCHESTER COMMUNITY COLLEGE GATEWAY CENTER, AND A NEW COURTHOUSE, ON STATEN ISLAND, FOR NEW YORK STATE CIVIL AND CRIMINAL SUPREME COURTS AND RICHMOND COUNTY CRIMINAL COURTS. RODRIGUEZ ALSO ACTIVELY PROMOTES DESIGN IN THE PUBLIC REALM, LECTURING ON HER WORK AND SERVING ON MULTIPLE BOARDS AND GSA'S NATIONAL REGISTRY OF PEER PROFESSIONALS.

SUSAN RODRIGUEZ: Our practice is founded on designing buildings in the public realm, which by their very nature demand engaging with people; connecting with place and connecting with community are essential. Our design process is collaborative by nature, based on research into a project's unique physical, social, economic, and historical issues, which inform our thinking and our decision making. Every project is a first: a unique solution to a unique overlay of circumstances. One needs to have a deep curiosity about a place to make an important, lasting building.

Public works are very complex endeavors that require collaboration with our clients, which are often public agencies or cultural or educational institutions; with our engineers and other special consultants; with the specific community; and among ourselves. Creating a federal courthouse with GSA means shaping an environment that is infused with symbolic gravitas and serves diverse users' functional requirements. All of my projects require a commitment to the potential of bringing life to a community. When charged very explicitly with creating public space, you must really capture people's imaginations: you are creating a bit of magic that enlivens daily experiences. Public space takes on a life of its own, after all. Defining the relationship between a building and its surroundings—revealing or concealing the program within—is meaningful to me. Articulating that relationship greatly affects the public's understanding of the building's purpose, and its physical and symbolic place in the city landscape.

WHEN CHARGED VERY EXPLICITLY WITH CREATING PUBLIC SPACE, YOU MUST REALLY CAPTURE PEOPLE'S IMAGINATIONS: YOU ARE CREATING A BIT OF MAGIC THAT ENLIVENS DAILY EXPERIENCE.

For example, recently I designed the Frank Sinatra High School of the Arts in Astoria, Queens. We conceived of the building as an urban stage to highlight the talent and creativity of the students. The transparency of the principal facade provides an exciting transition between urban life and student activity within the building, showcasing performing students to passersby as well as framing views of the city for the students.

Here and in all my public buildings, my goal is to heighten anticipation: to get a person feeling engaged and curious enough to walk in the front door and find out more. While modern-day security may not allow someone actually to pass through the front door, transparency suggests the reciprocity of inside and outside and ensures an understanding of the purpose and experience of a building.

Building performance must be part of an overarching vision for a project. Sustainability is quite broad as a topic; it encompasses not only quantifiable and robust systems, technology, and metrics, but also the health of a community. A building that makes a great symbolic and civic contribution and becomes a focal point for the community stands the test of time in a variety of ways, qualifying it as sustainable—lasting and enduring.

Some of the best buildings raise consciousness of where you are physically and temporally, whether through contrast or complementarity. A building is a chess piece in a whole network of activity, and it can be a catalyst for change. It can revitalize a neighborhood that is failing. Insightful consideration of the place is key. How do you integrate a very large building into an intimate context? What if a building's program is completely antithetical to its place—can it engage its context? These have been among the central factors we have considered in the design of the Harrisburg courthouse.

GSA's commitment to preliminary analysis has been an especially exciting aspect of working on the project and essential in answering these questions. We had a very healthy period to look at the history of the city, the impact of this building on its immediate context and the larger Susquehanna River watershed, and to look at local material procurement. Moving in and through the Harrisburg courthouse will make one conscious of where you are in the world; there will be breathtaking views of the city and the Susquehanna River. This consciousness is crucial, because the building signals support for the local economy and for the natural environment at an important intersection of river and topography. We are also considering reestablishing an ecosystem on the rooftops and engaging them as public spaces that are truly integrated into the usage of the building, and rethinking the typical parking lot as a tool for improving the watershed and the local ecosystem.

In terms of urban design, that the site for the courthouse is not part of the city's urban center is a challenge in Harrisburg. Its immediate context is defined by public housing and a mission to the south, with abandoned houses and low-scale development to the north and west. Even so, it provides opportunities to extend the city north and reconnect with views to the surrounding landscape while underscoring the importance of the federal judicial system. So we have conceived this building as a means to enhance public experience and form a northern gateway.

For the massing of the building, we had to reconcile the grandeur and dignity of the federal courts with the low scale of surrounding buildings. Vestiges of the rows of townhouses and dense residential fabric that once defined the site remain in evidence. It also was important to locate the taller portion of the courthouse to limit shadows on the neighborhood and newly created landscape—to integrate the local and federal presence at this intersection. Connecting with place and connecting with community to create a more accessible condition is very important in today's society.

Every place has a past. In Harrisburg, our site is removed from downtown. So how do you extend downtown into another part of the city, especially when the city historically has trended toward less density? Part of our process has been to understand Harrisburg: We have thought long and hard about the significant architectural and cultural spaces within Harrisburg. Arriving by train in the central terminal is one of those memorable experiences. Closer to our site is a magnificent late-19th-century market. It's beautifully expressive of its structure, and people love it. We also looked at the Capitol building, which is grand and monumental and a real expression of its time and purpose. These precedents inspired our design and have visibly informed a 21st-century federal courthouse. In addition to the architectural is the historical context. The Harrisburg site is located on what seems to be an undistinguished avenue, but it once was a primary artery: the high point of the city and the ridge that split the watershed. It was the main thoroughfare that ran from the reservoir to the Capitol. Our research also brought to light that train tracks adjacent to our site were part of a historic network that elevated Harrisburg's prominence as a city and facilitated the largest miliary encampment during the Civil War. Later, in the 1940s, the neighborhood marked the center of jazz culture in the region. All told, through our design we are trying to illuminate the city's assets and attributes, to reveal its unique history to the public, and to provide for an optimistic future.

CRAIG**SCHWITTER**

CRAIG SCHWITTER JOINED THE BATH, UNITED KINGDOM, OFFICE OF BURO HAPPOLD IN 1992 AND HE FOUNDED THE ENGINEERING FIRM'S NORTH AMERICAN PRACTICE IN NEW YORK IN 1999. THAT OPERATION NOW ENCOMPASSES MULTIPLE ENGINEERING DISCIPLINES, AS WELL AS LIGHTING DESIGN AND SUSTAINABLE CONSULTING AND MASTER PLANNING. IT ALSO HAS GROWN TO OVER 200 STAFF BASED IN BOSTON, CHICAGO, SAN FRANCISCO, AND, FINALLY, LOS ANGELES—WHERE A TEAM WORKED ON THE GREEN MODERNIZATION OF GSA'S PRINCE JONAH KUHIO KALANIANAOLE FEDERAL BUILDING IN HONOLULU. HERE, SCHWITTER EXPLAINS THAT THE PJKK PROJECT'S ENVIRONMENTAL PERFORMANCE RELIED PRECISELY ON SYNERGIES BETWEEN SPACE PLANNING, WORK CULTURE, THE BUILDING ENVELOPE, AND MECHANICAL SYSTEMS, WHICH ENGINEERS AND DESIGNERS IDENTIFIED COLLABORATIVELY.

FURTHER DEMONSTRATING SCHWITTER'S HOLISTIC APPROACH TO SUSTAINABILITY, HE HAS LED BURO HAPPOLD'S LAUNCH OF THE ADAPTIVE BUILDING INITIATIVE AND G. WORKS. PARTNERSHIPS WITH HOBERMAN AND HR&A ADVISORS, RESPECTIVELY, THE ENTITIES DEVELOP CUTTING-EDGE ACTIVE GREEN TECHNOLOGIES, ENERGY EFFICIENCY RETROFIT PLANS, AND OTHER EFFORTS TO LOWER THE CARBON FOOTPRINTS OF BUILDINGS. GLIMPSING SUSTAINABILITY INVENTIONS IN THE PIPELINE, SCHWITTER EMPHASIZES THAT BOTH PHYSICAL AND SOCIAL SCIENCES WILL BE RESPONSIBLE FOR THE NEXT GENERATION OF ENVIRONMENTAL GAINS.

CRAIG SCHWITTER: The engineer's role in a building project has changed very much over the last 20 years—evolving from one where we're very concentrated on structural engineering to one, today, that's more about performance. We've shifted away from tactile issues.

I think the PJKK project is an interesting example here. It's a large, midcentury federal office building and courthouse, and the federal office component was very inefficient. The project really started with performance, first in analyzing how people work today. Engineers in our Los Angeles office worked hand in hand with the architects to re-plan the space. We also found that we could take away mechanical equipment—we didn't need as much ventilation, as old standards for workplaces led to overcooling. We were able to create an atrium in the building and not lose square footage for working. And that's great, because that yielded a better interior for the end user.

Another major aspect of the building that we looked at was the facade. The facade leaked, which also led to a lot of overcooling in the building. You might ask why an MEP engineer is looking at the facade? But that's exactly why building projects nowadays are aimed at performance, because the facade is responsible for so much of a building's energy consumption. By working with the design team, we were able to improve the envelope performance so that the mechanical systems didn't have to work as hard. Integrated design is necessary to tackle those problems.

When you talk about integration, you must see all kinds of different inputs and pressures and design drivers in the process. Data-driven design, evidence-based design, is becoming more relevant as we can measure data and we can understand how those data affect outcomes for the final building.

We used to be able to only do models to verify a building's design, like with computational fluid dynamic software. Today we're able to do it in real time: We are able to give ourselves real data during the design process. And today we can turn these around iteratively within a design process. That's a big change for design. It's a combination of that evidence-based approach, plus a political, formal, and economic approach that really ties everything together.

If it weren't for the amount of data that we are collecting, minute by minute, second by second, we wouldn't be able to do this. It drives us as engineers. There's a desire to uncover evidence and make decisions based not purely on formal means, but by tying it to things we can measure.

Going back to PJKK, I would say what is most exciting about it is this is achievable. It is not bleeding edge, it's achievable. By putting together a series of practical ideas, we can really change the footprint of energy use, and we can accomplish it on a much wider scale than one building. I don't think anybody is pushing back on what we're talking about. We need more examples of what good looks like and we need to make sure we keep pushing efficiency and quality as part of the future of GSA.

In terms of systems themselves, lighting control is something in the range of 15 to 20 percent of the energy performance of a building. And the shift from incandescent to LED is not quite understood yet in terms of building design, but it will have a significant impact.

I also see a lot of development in facades in the future. Much of a building's energy profile is controlled by the quality of facade selection and the quality of facade control. It's the logical and likely point to start with. That means better shading, better performance. This idea of iterative design—the ability to process data very quickly—is having a lot of effect on envelope designs.

Active facades, which change over the course of a day, are going to become real, too. These allow transparency at times to let light in, and then become opaque to keep heat out.

Facades are already evolving, but I think this is an area where we're going to see a lot of progress over the next 10 years.

Adaptation in facade systems is one thing we're working on, as part of our Adaptive Building Initiative. We have a series of ideas about how facades can change with respect to their environmental criteria—how you can actually shape light and shape thermal transfer through a facade system actively. This is a very important concept, and it treats the facade not as one giant piece, but as pixilated. So your window or your wall almost has a mind of its own: It can become transparent for you when views or sunlight enhances your productivity, and at times it can become opaque when you either need privacy or you need a thermal buffer.

The next real area for improvement is not building systems. It's the behavior of the building's occupants, because designing something does not necessarily mean it's performing the way you anticipated. And this actually puts a lot of pressure on a building owner, because the building owner can't just get a design and not operate it efficiently. The operation of the building is just as important as the design.

Now, how does that affect a building owner? How does that affect a facilities manager? Well, the facilities manager might understand that opening windows at certain times actually decreases the energy performance of a building; maybe they want to have times where the building needs to be more sealed, which isn't something that you would necessarily think of.

The technologies for gathering these data are rapidly reducing in price. A strong data and measurement and verification program can map those aspects of a building and allow a client to tune a building around the performance needs of the inhabitants.

There's a lot of experience to say that individual occupant behavior can change very rapidly in buildings. The idea that your office has to be 70 or 71 degrees every day, every minute, is starting to erode. Moving forward, we'll have to change occupants' perspective and behavior about how they can control the environment—where you get data and process data and then you comment on the data through your handheld device, through your computer. When I'm on my way to my office, for example, do I turn on my computer or heating system when I know I am 20 minutes away? Those are aspects of tying yourself into a workplace that are going to make behavior play an important role in improving the energy performance of offices in the future.

WE ARE ABLE TO GIVE OURSELVES REAL DATA DURING THE DESIGN PROCESS. AND TODAY WE CAN TURN THESE AROUND ITERATIVELY WITHIN A DESIGN PROCESS. THERE'S A DESIRE TO UNCOVER EVIDENCE AND MAKE DECISIONS BASED NOT PURELY ON FORMAL MEANS, BUT BY TYING IT TO THINGS WE CAN MEASURE.

How onerous is it for you to check your iPhone or your Blackberry for a news story? We've made that part of our everyday lives. Now we have to integrate the process of tuning a building's performance to the everyday life of building ownership and habitation. To somebody that understands the benefit, it is not onerous at all.

BRUCE **FOWLE**

ROBERT **FOX**

SEAN **QUINN**+
BRANDON **HARWICK**

SUSAN **SZENASY**

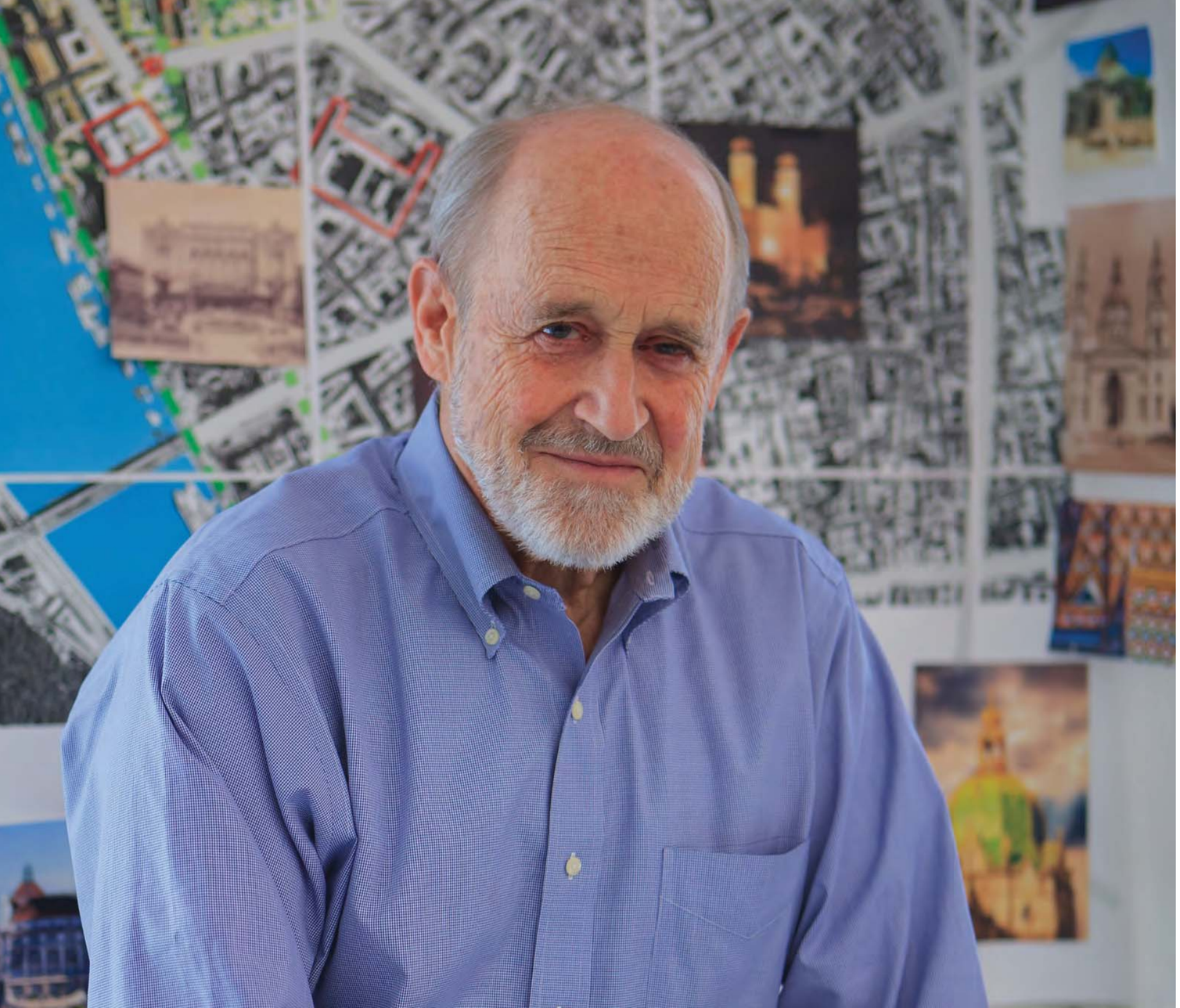
JAMES **TIMBERLAKE**+
STEPHEN **KIERAN**

KEN **WILSON**

Chapter 3

Achievement Through Integrated Design

The participants in *Vision+Voice 4* consistently supported integrated design as the best method by which to design, construct, and operate a sustainable building. Because the term is still gaining acceptance, this chapter serves to better define integration. Speakers refer to past projects that visualize stakeholder involvement and orchestration; included among these case studies is an ideas competition that the Design Excellence Program conducted with *Metropolis* magazine. Interestingly, almost all of these interviews also underscore the importance of research in sustainability, suggesting that an integrated process improves the chances for innovation to come to life.



BRUCE**FOWLE**

ARCHITECT **BRUCE FOWLE** CO-FOUNDED FXFOWLE IN 1978 (THEN KNOWN AS FOX & FOWLE ARCHITECTS), AND HE HAS BEEN PRACTICING SUSTAINABLE ARCHITECTURE SINCE HIS EARLIEST RESIDENTIAL WORK. DESIGNING FOR RESOURCE CONSERVATION GAINED A NEW LEVEL OF NOTORIETY IN 2000 WITH FOX & FOWLE'S COMPLETION OF 4 TIMES SQUARE, THE FIRST GREEN SKYSCRAPER IN THE UNITED STATES—AND CREDITED WITH HELPING LAUNCH THE LEED RATING SYSTEM. TO DATE FXFOWLE'S PORTFOLIO INCLUDES 15 MILLION SQUARE FEET OF LEED-REGISTERED OR LEED-CERTIFIED SPACE, AND OTHER MAJOR PROJECTS INCLUDE THE FIRST CARBON-NEUTRAL MUSEUM IN AMERICA. WITH RENZO PIANO BUILDING WORKSHOP, FXFOWLE ALSO RECENTLY COMPLETED THE NEW YORK TIMES BUILDING. FOR *VISION+VOICE*, FOWLE DISCUSSES THE UNIQUE SUSTAINABILITY OPPORTUNITIES OF URBAN REAL ESTATE, AND RECOUNTS THE TIMES SKYSCRAPER TO ILLUSTRATE RISK MITIGATION OF GREEN TECHNOLOGIES.

FXFOWLE IS STRUCTURED AROUND THREE DESIGN STUDIOS, WHOSE SPECIALTIES RANGE FROM ARCHITECTURE AND INTERIORS TO PLANNING AND URBAN DESIGN. ALL OF THESE GROUPS ENGAGE IN OPEN AND COLLABORATIVE DESIGN, A PROCESS WHICH FOWLE ALSO DESCRIBES HERE AS A DELIBERATE ORCHESTRATION OF DESIGNERS, CLIENT, AND CONSTRUCTION AND FACILITIES PROFESSIONALS; HE PRAISES THE LEED PROGRAM FOR PROVIDING ALL STAKEHOLDERS WITH A COMMON VOCABULARY. FOWLE IS A MEMBER OF GSA'S NATIONAL REGISTRY OF PEER PROFESSIONALS.

BRUCE FOWLE: Sustainable design is a thread that runs through our whole office. It's part of the culture, which really comes from leadership. The main idea is to make it part of the lexicon. It's taking advantage of every opportunity to make something greener and push the envelope.

There is no one-size-fits-all sustainability solution. That's why it's so important that sustainability is deeply embedded in a firm like ours—so that every opportunity gets taken. There are thousands of decisions that go into the design of any project or any plan.

I was not in favor of Leadership in Energy and Environmental Design initially, because I saw it as something that would limit creativity, but LEED has proven to be a very important instrument to move everything forward, because it is a common language that architects and clients and the public could share.

The client has to be committed to sustainability from the top of the pecking order. If it comes from a lower level, you might get a little ways into it, but by the time all the scheduling and costing are evaluated, everybody gets talked out of it. So there really has to be a commitment. Recently, we did a headquarters for the software company SAP, outside Philadelphia. The budget was tight as a tick, but the CEO was committed to doing a LEED-Platinum building. That was one requirement they never relinquished. So everything that was necessary to make it LEED-Platinum stayed, and that was wonderful.

To make these sophisticated buildings, the number of specialists is growing all the time. The real challenge, then, is for the architect to be the leader of the design process. In tandem with the owner, we need to decide who is going to be on that team, and then it's like leading an orchestra. We have to call on the instruments when we need them. And that's an art form in itself. Part of the creative process is figuring out that timing, and making sure everybody is working efficiently.

THE CLIENT HAS TO BE COMMITTED TO SUSTAINABILITY FROM THE TOP OF THE PECKING ORDER. IF IT COMES FROM A LOWER LEVEL, BY THE TIME ALL THE SCHEDULING AND COSTING ARE EVALUATED, EVERYBODY GETS TALKED OUT OF IT.

The old-fashioned way of bidding with general contractors doesn't really work well, given the complexities of buildings today. A building's systems get integrated most effectively when there is a really integrated design process. Obviously, the commitment of the client is extremely important. And having the contractor or construction manager on board early is important, so that they are part of the learning process, they can contribute, they can do cost analyses—also so that, when the construction crew moves forward, everybody knows the rules and objectives. The same goes for the operations professionals.

The problem we've had on almost all buildings is the way they operate, and getting performance information out of them. We're also finding that designs and energy analyses are overly optimistic. They are ideal. They are taking a year's worth of climate conditions and analyzing all of that in ways that are assuming everything is running perfectly: that the maintenance crew knows exactly when to turn this on and turn that off, or when to flush this out, or whatever the case may be. And that's proving to not be the case. We definitely need regulations for buildings to perform the way they are designed. Payback and cost savings shouldn't be the only incentives.

There are huge differences in how you approach a green building, depending on its scale, type of use, and location. Location alone is extremely critical, because if you're in a high-density urban area where there are zoning constraints, you've got to fill up that envelope. Zoning regulation has nothing to do with green. So sustainability in this case is mostly internal, in the systems. To be sure, any high-density urban building is much greener than one that is in the suburbs, thanks to mass transit and many other things. The greenest thing we can do is to create urban environments that have good quality of life.

For the New York Times Building, one of the wonderful things about collaborating with Renzo Piano was that he brought all kinds of European technology and new ideas to America. The American mentality is that if we haven't done it before, we're going to charge twice as much for it.

With the ceramic tubing and the intricacies of the Times facade, for example, we were getting [cost estimates] that were off the wall. But because it's a shading device, it was extremely important to the building from an environmental point of view. If we took it off, we'd have to change the whole design of the building, and it certainly wouldn't be as green as it is now.

This was where collaboration with the client was extremely important, because the client was determined to make this work and they were willing to put money up front. So we collectively developed the idea that we could pay a stipend to four different curtain-wall manufacturers. Each did the engineering and shop drawings for a 2-story-high section, which they submitted to us. We reviewed them and then they built mockups in their own shops.

We traveled among the mockups to kick the tires and see what we liked and what we didn't like, what worked and what didn't work. And then we put it out to bid and we brought it under the budget, which basically saved the job and saved the sustainability of the building. It took away the fear factor, because we had gone through this process and the contractors knew what they were dealing with. By the time we were all said and done, we saved millions. This was instant, hard-cost payback.

The private sector is being influenced by sustainability. From a marketing point of view, it's become unacceptable to not do a green office building. And if corporate leadership is not concerned about it, the staff is putting on the pressure. I think employees are more concerned about health than they are about climate change, but that varies. And now it's catching hold in the residential marketplace, because the public is more aware and concerned about these health aspects of green building.

I think the federal presence has been extremely important [to the private sector's acceptance of sustainability]. GSA owns more buildings than anybody else in the country; that offers a huge opportunity to make things happen. There's no greater place to make an impact on climate change than in buildings.

Whether it's a courthouse or federal office building or a land port of entry or whatever else it may be building, it is extremely important that GSA continues to pursue sustainability. It demonstrates the smart thinking of the government and it respects the intelligence of the people it serves.

Sustainability in federal buildings could have to do with site selection—the whole question of density and accessibility, and how that impacts one's quality of life. Or it could mean demonstrating a building's relationship to its region—that you're not doing the same thing everywhere, because that would be the cheapest way to do it; respecting a region means respecting its people. If you have the highest esteem for the country and you want to raise everybody's expectations, then you have to really set a standard that makes people think and makes people know there's a difference.

BOB**FOX**

OVER THE COURSE OF HIS CAREER, **BOB FOX** HAS EARNED A REPUTATION AS A DEAN OF SUSTAINABLE HIGH-RISES. FOX & FOWLE ARCHITECTS, OF WHICH HE WAS A FOUNDING PARTNER, DESIGNED THE PIONEERING SKYSCRAPER 4 TIMES SQUARE, AND IN 2003, FOX AND RICHARD COOK FORMED COOK+FOX ARCHITECTS IN DIRECT RESPONSE TO THE COMMISSION TO DESIGN THE BANK OF AMERICA TOWER AT ONE BRYANT PARK. THAT 2.2-MILLION-SQUARE-FOOT PROJECT BECAME THE FIRST COMMERCIAL SKYSCRAPER TO EARN LEED-PLATINUM CERTIFICATION. SINCE 2006 FOX HAS ALSO OVERSEEN TERRAPIN BRIGHT GREEN, THE CONSULTANCY HE COFOUNDED WITH COOK, BILL BROWNING, AND CHRIS GARVIN.

IN ADDITION TO PRACTICE, TODAY FOX ADVISES THE HARVARD MEDICAL SCHOOL'S CENTER FOR HEALTH AND THE GLOBAL ENVIRONMENT, THE USGBC'S URBAN GREEN COUNCIL AND CENTER FOR GREEN SCHOOLS, AND THE RAY C. ANDERSON FOUNDATION. HE IS A MEMBER OF MAYOR MICHAEL BLOOMBERG'S ADVISORY COUNCIL FOR THE OFFICE OF LONG-TERM PLANNING AND SUSTAINABILITY AND OF THE NATIONAL REGISTRY OF PEER PROFESSIONALS, WHICH GSA MAINTAINS THROUGH THE DESIGN EXCELLENCE PROGRAM; IN 2011, GSA ALSO TAPPED HIM TO CHAIR ITS GREEN BUILDING ADVISORY COMMITTEE. IN THIS *VISION+VOICE* CONVERSATION, FOX DISCUSSES CLIENTS' WILLINGNESS TO EMBRACE SUSTAINABILITY INNOVATIONS, AND DESCRIBES HOW HE MAXIMIZES BUILDING PERFORMANCE BY BRINGING TOGETHER ALL OF A PROJECT'S STAKEHOLDERS FROM THE EARLIEST PHASES OF DESIGN.

BOB FOX: At the time we were making it, 4 Times Square was the greenest high-rise building in the country. We put in variable speed drives and solar panels on the facade—having no idea whether they were going to work. We had terrific engineers on the project who never said no. We put two fuel cells in the building, which was unheard of for a Manhattan office. We learned a lot, and if you ask [developer] Douglas Durst whether he had any regrets on that project, he would say, "Nobody copied us."

To try and sell a client on something that hasn't been tested is very difficult. Generally, the scale at which we build is $100 million for an exterior wall: not an investment in which somebody wants to take a risk. That's why companies are testing new things very rigorously before they even get to the market. We like to push the envelope, but with stuff for which there are data.

I absolutely think that the federal government has an opportunity to test new technologies, but it's not going to do something that hasn't been fairly proven. The government also needs backup plans in case of failure. You can't make critical building systems vulnerable. It's not prudent to spend a lot of resources, whether they're natural or financial, that way.

I think the public sector offers greater opportunity for sustainability leadership. GSA can set high standards and compel teams of architects and engineers to meet them; if you're working in the private sector, budgets come into play more and there's time pressure. GSA should continue stepping back and saying, Wait a second, we're tired of doing regular old buildings.

I can use the Bank of America Tower at One Bryant Park as an example of the leadership and teamwork it takes to get there. From the first design meeting, we had the people who are now running the building sitting in. The Dursts were smart enough to have facilities people be part of the decision making, because they were going to live with it.

Facilities professionals need to inform the architects and engineers of what will work and won't work. And the architects and engineers need to propose to them the systems that will move the needle from okay to better. It is the owner's responsibility, I think, to bring in an educated team of people who are going to run the building.

On all of our projects, we like to start with as complete a team as we can. We do a charrette[, an intense collaborative meeting for brainstorming concepts and guiding principles]. We urge that that team includes the builder, because without the builder, it doesn't make a lot of sense for us to be talking about how we're going to execute things. This way, you're thinking about building at the same time you're thinking about designing. That allows for more creative design, because a builder is then incentivized to really collaborate and make a beautiful building, as well as change the way construction is done.

Besides the builder, and of course the client, our charrettes include the mechanical engineer, the structural engineer, landscape architects if landscaping is a key component of the project, and the people who are actually going to run the building. Sometimes clients think they're too important to be part of these meetings. That's not our deal. We want everybody and we try and do it off site, so there are no Blackberries or cellphones.

It's best to conduct another charrette when you pass from the early design phases into design development and then documentation and construction. You do a number of these just to reorient everybody to make sure there is good communication on the team. It's very important.

The whole notion of performance metrics—whether we're ensuring the success of a sustainable building, or using metrics to guide a charrette—is fairly new. In the early days with 4 Times Square, simply commissioning the building was a new idea. A lot of people would have been pleased with that, and not cared to continually measure whether the building really worked.

Also, the tools that were available 10 years ago were nowhere near as sophisticated as they are today. Now a lot of data can be taken simultaneously, such as the day's weather and exactly how many people are in the building. The real trick in running these buildings is understanding and predicting weather so that one can turn on refrigeration systems in a logical order, and to keep the occupants happy while using the least amount of energy or making the least amount of impact on the grid.

To do that is a little bit of science, a little bit of seat-of-the-pants art, but there are a lot more helpful tools today than we've ever had. So I think there's another great opportunity for GSA. Installing sophisticated controls on a building, if they're not that expensive, is a great way to be a sustainability pioneer while controlling risk. If they really don't work as someone predicted, then you can take them off. You don't want to be doing that with the curtain wall of a building.

We want to set a totally different standard for sustainability. To do so, we can start looking beyond resource consumption. We get the energy side. We're also really good at saving water, capturing rainwater, and reusing graywater and even blackwater. These should all be normal architectural practices at this point. Now, how do you create the best indoor environment in your buildings? That's next.

Let's look at the Bank of America project again. The cost savings of energy efficiency is about $3 million per year. Yes, that's huge. But there are thousands of people going to work in this building. And if we increase productivity by one percent for those 5,000 Bank of America employees, based on their salary and benefits, that's $10 million. An extra five minutes of productivity daily equals $10 million. So, where would a corporation or federal agency put its money? Of course, decision makers at that level are not going to do an energy-inefficient building. But they may not be sufficiently focused on making the best environment for workers and visitors. Do these buildings feel good on the inside? How do people in the buildings relate directly to nature? Can they even see outside, or are you still doing cubicles with 7-foot-high partitions?

FACILITIES PROFESSIONALS NEED TO INFORM THE ARCHITECTS AND ENGINEERS OF WHAT WILL WORK AND WON'T WORK. AND THE ARCHITECTS AND ENGINEERS NEED TO PROPOSE TO THEM THE SYSTEMS THAT WILL MOVE THE NEEDLE FROM OKAY TO BETTER.

Another issue on the horizon is that we will have to make our cities resilient to climate change, especially as more people move to cities. If we have a big storm surge, a big hurricane, or a sea level rise, what's going to happen to New York or DC's subway systems, for example? Does that mean we should be looking at light rail? We have the capability of designing a beautiful, safe, quiet system above grade, whether it's rails on the street bed or it's elevated.

There's really bad stuff happening and we are going to have to adapt. We will see sea levels rise; despite the naysayers, we've already seen it, in fact. Ask the people in Joplin, Missouri, about climate change. We just don't fully understand what that all means yet

BRANDON**HARWICK**+ SEAN**QUINN**

THE METROPOLIS NEXT GENERATION COMPETITION IS AN ANNUAL IDEAS COMPETITION HELD BY *METROPOLIS* MAGAZINE AND OPEN TO ARCHITECTS AND OTHER BUILDING PROFESSIONALS WHO HAVE BEEN PRACTICING FOR 10 YEARS OR LESS. IN 2011, INSPIRED BY GSA'S COMMITMENT TO SUSTAINABILITY, EDITOR-IN-CHIEF SUSAN SZENASY ASKED THE AGENCY TO PROVIDE A CONTEST THEME AND A SUBJECT BUILDING WITH WHICH ENTRANTS COULD VISUALIZE THEIR PROPOSALS. IN THIS FIRST SUCH PARTNERSHIP IN THE MAGAZINE'S HISTORY, THE COMPETITION FOCUSED ON A 1965 FEDERAL OFFICE BUILDING IN DOWNTOWN LOS ANGELES.

THE WINNING SUBMITTAL, CALLED PROCESS ZERO: RETROFIT RESOLUTION, WAS CREATED BY A TEAM OF 11 HOK DESIGNERS AND FOUR ENGINEERS FROM VANDERWEIL, BOTH BASED IN WASHINGTON, DC. **BRANDON HARWICK** AND **SEAN QUINN** LED THE INTEGRATED GROUP, AND HERE THEY DISCUSS HOW THEY ENVISIONED REDUCING THE GSA-OWNED BUILDING'S ENERGY USE BY NEARLY 85 PERCENT AND MEETING REMAINING NEED THROUGH ON-SITE POWER GENERATION. SINCE THE CONCLUSION OF THE "GET THE FEDS TO ZERO" CYCLE OF THE METROPOLIS NEXT GENERATION COMPETITION, PROJECT MANAGER AND LEAD ARCHITECT QUINN HAS RELOCATED TO HONG KONG TO HEAD SUSTAINABILITY FOR THE COMPANY 10 DESIGN. IN ADDITION, HARWICK, PROCESS ZERO'S LEAD ENGINEER, HAS ESTABLISHED A BOUTIQUE ENGINEERING CONSULTANCY IN WASHINGTON, DC, CALLED ENGENIUM GROUP.

BRANDON HARWICK: The *Metropolis* competition was based on 300 North Los Angeles, a 1.2-million-square-foot office building that GSA owns. The goal of the competition was to get that building to net zero, in part with technologies that GSA could use to improve its existing building stock. GSA wasn't asking for a design to actually build; this was an ideas competition.

SEAN QUINN: At HOK we'd actually been working on feasibility studies to retrofit HUD headquarters. One of the principals in charge on that project had found out about the competition from Les Shepherd, the chief architect of GSA, and passed it on to me. I sent out a mass email that attracted about 10 people from HOK, and four engineers from Vanderweil's Alexandria and Boston offices. For me, taking on the project manager role arose out of the sense that sustainability has to branch into architecture, interiors, and engineering.

We set up a rule that nothing could be just beautiful, and nothing could just function exceptionally well without being experienced. That way, everyone interacting with the building could understand that they were part of the solution.

SQ: One of our first impressions of 300 North Los Angeles had to do with footprint. Every floor's about 100,000 square feet with a double-H corridor on the inside, which means that it takes roughly five minutes to walk from one end of the building to the other. And then a very select few people work next to a window.

BH: We wanted to reorganize the office into open layouts and introduce more daylight into them by punctuating the building with a series of atria. Eight small atria surround the major fire staircases, and there are three large atria that curve as they come through the building to better track the sun trajectory over the building. That way they introduce daylight not just to the top two floors, but all the way down.

SQ: When we then looked at how to develop the interior scheme, we wanted to pull away the private offices from the outside edge and closer to these atria. They also create wonderful public gatherings, so we have breakout spaces where people from different departments can cross-communicate. But it was really about organizing the building around daylight.

BH: From the engineering perspective we also use atria to drive natural ventilation. The perimeter wall and the atria are located within 60 feet of one another, which allowed us to open the windows and draw air through the occupied portions of the building and out through the atria. Leeward-facing openings at the top of the atria and hot-plate collectors help draw more air through the building.

SQ: If we were going to hit net zero, then we needed to generate a lot of energy on this site. We wanted to look at both solar and geothermal, but nixed the idea of wind power. Algae was introduced as a way to do something with biomass, and actually ended up solving a lot of other problems.

Algae constantly grows around us. It occupies both urban and rural environments, water as well as air. It thrives on carbon dioxide and grows faster in dirtier environments. Now it's being engineered in small tubes, and when we started looking at ideas for how to apply that to the exterior of a building, we thought about the New York Times Building, which has these ceramic baguettes that line the building that help diffuse light. All of a sudden we had our a-ha moment: We could use biomass to generate energy, filter daylight into the space to reduce glare, and to clean dirty air and water.

The algae concept functions out of a central bioreactor located in the basement of the building. 300 North Los Angeles is located along the Santa Ana Freeway, so we've actually placed intake ducts facing the highway, to pull in as much nasty air as possible. The algae absorbs that and really starts thriving. It also thrives on the graywater and blackwater

ALGAE WAS INTRODUCED [FOR] BIOMASS, AND ACTUALLY ENDED UP SOLVING A LOT OF OTHER PROBLEMS.

that we provide it through a Living Machine water recycling system. We then circulate the algae to the top of the building and through gravity it begins flowing down the exterior in a series of pipes.

As sunlight hits those algae tubes, photosynthesis starts. The algae is consuming the carbon, which it turns into a biomass or lipid. When it reaches the end of that gravity stream, it comes back into the central generation plant. We have excess levels of oxygen that we can exhaust into the building plaza, which is otherwise overcome by fumes from the Santa Ana Freeway. From the public's standpoint, there's only one major reason to come to this building: the U.S. Bankruptcy Court is here. And then you wait on the street for a half hour of security while you're breathing in the smog. So now we can reintroduce oxygen, getting the building to act like a tree.

Finally, we process the leftover lipids in a centrifuge that allows them to be converted to biomass for heating and cooling systems or lighting. Obviously, as you burn anything, you release carbon dioxide. But in this case we like it, because we can recapture it and feed it right back into the algae system. You end up with a totally positive loop: generating clean energy; reducing energy load through shading; exporting clean water; cleaning the air. We don't necessarily put a price on all these benefits now, but it will become more important as cities become denser and more polluted.

SQ: A lot of the ideas that we introduced in this net-zero proposal came out of our HUD feasibility studies, and now we have the opportunity of actually executing about 55,000 square feet within HUD headquarters. In partnership with Vanderweil, HOK is going to explore some of those opportunities that we had detailed in the *Metropolis* competition.

Also as a result of this competition, we're trying to institute energy modeling on as many projects as possible. HOK has been minimizing the formality of handoffs between our partnering engineers and specialty consultants; we want to be more freely able to exchange ideas, so that we can really consider all possible schemes and technologies before working out full calculations. Now we're doing conceptual-level energy benchmarking and basic climate analysis, like the interdisciplinary process we employed in the competition.

BH: For me the competition was eye-opening. Before I started working on this project, a lot of my work was based in LEED management and policy guidelines—trying to enact long-term operational change within our clients. What changed with this project was that engineers exerted real influence on the envelope, massing, and orientation: Environmental and energy analysis began as high-level discussion and, as we moved forward, the engineer could build out a whole-building energy model that allowed us to understand long-term operational costs and environmental impact.

This inspired me to go off and start my own firm. Engenium Group really focuses on getting owners involved early, and getting architects more engaged throughout the process, and talking with all stakeholders about different systems and new technologies. That helps to identify and implement the most appropriate sustainability strategies for a project.

SQ: What we really hope to see is that architects are not the only ones defining architecture. We want to have mathematicians who are able to parametrically design a single atrium to optimize natural daylight every day of the year. We want to bring biologists into our work. Style isn't just going to be driven by architects anymore.

SUSAN S. **SZENASY**

SUSAN S. SZENASY HAS BEEN EDITOR-IN-CHIEF OF *METROPOLIS* SINCE 1986. THE NEW YORK–BASED MAGAZINE COVERING ARCHITECTURE, CULTURE, AND INDUSTRIAL DESIGN HAS BEEN SHORTLISTED FOR HONORS BY THE AMERICAN SOCIETY OF MAGAZINE EDITORS AND THE COOPER-HEWITT, NATIONAL DESIGN MUSEUM, AND IT HAS RECEIVED MULTIPLE AWARDS FROM THE SOCIETY OF PUBLICATION DESIGNERS AND TYPE DIRECTORS CLUB. A *METROPOLIS* SIGNATURE IS ITS ANNUAL METROPOLIS NEXT GENERATION COMPETITION. IN 2011 SZENASY, PARTNERING WITH THE DESIGN EXCELLENCE PROGRAM, MADE A MIDCENTURY GSA PROPERTY THE SUBJECT OF THAT YEAR'S CONTEST, AND CHALLENGED PARTICIPANTS TO PROPOSE HIGH-PERFORMANCE MODERNIZATIONS FOR IT. FOR *VISION+VOICE*, SHE DESCRIBES THE ORIGINS OF THE COMPETITION, AS WELL AS POTENTIALS FOR UPGRADING THE SUSTAINABILITY PROFILE OF GREAT SOCIETY–ERA BUILDINGS.

SZENASY IS INTERNATIONALLY RECOGNIZED AS AN AUTHORITY ON SUSTAINABILITY AND DESIGN. IN 2008 SHE RECEIVED THE AMERICAN SOCIETY OF INTERIOR DESIGNERS PATRON'S PRIZE AND PRESIDENTIAL COMMENDATION AS WELL AS THE MEDALLION OF HONOR FROM THE SOCIETY OF AMERICAN REGISTERED ARCHITECTS NEW YORK COUNCIL. IN 2011 SHE WON THE GENE BURD URBAN JOURNALISM AWARD AND WAS NAMED A SENIOR FELLOW BY THE DESIGN FUTURES COUNCIL.

SUSAN S. SZENASY: In American cities there's an enormously important cultural heritage in the buildings and streets and infrastructure. The federal presence in these cities is very palpable. Courthouses and other buildings are usually bigger and they're usually centrally located. I'm not sure the federal government itself has always understood or valued its importance to the culture of American cities. There's an enormous input of energy and ideas and art and design and power that is hidden in these buildings, which we should celebrate and think about more.

Under President Johnson's expansion, the federal government was hiring interesting architects. And just like Great Society programs, the buildings were socially involved and interested in serving the common citizen. Unfortunately, those buildings also were built at the time when we ignored nature, when we ignored greenery, when we built highways, so they were highly flawed buildings. But there are many of them in number, and it seems like there might be an opportunity to make them into something that the 21st century would be proud of.

To me, existing inventory is an essential resource. We have already spent the money on creating these buildings—there is energy embodied in these buildings—so we cannot throw them away. But the reality is that a lot of these buildings are leaking at every pore. We cannot afford to maintain and pay the energy bills on these buildings, and they're not healthy. So we have to do something with the existing physical environment in order to make it healthier, to perform better, and to adapt to the needs and phenomena of the 21st century, like cloud computing. I think that that's a good opportunity for architects and for clients like the federal government to come up with some really important new ideas.

Partnering with GSA for the Metropolis Next Generation Competition actually started with me reading a Denver newspaper article about a Department of Energy building that was built to produce its own energy and not take from the grid. As I was reading this, I decided to send a note to the chief architect [Les Shepherd] that said, Well, if the Department of Energy is doing this, is GSA doing it too? Because I've been really interested in how GSA is taking the lead with some larger ideas about sustainability and new ways of building.

So I asked whether GSA would like to be involved in our Next Generation Competition, which engages new, young design talent—students and designers and architects in practice for 10 years or less. They're not set in their ways and they're still navigating how to set up their businesses and even their thinking about design and architecture. They're also the creative minds who are technically savvy and environmentally aware, urban-oriented, and culturally connected to each other and to the rest of the world. I wanted to bring that energy to GSA, and at least give GSA some ideas about how it could make net-zero-energy buildings.

[Design Excellence Program Director] Casey Jones and Les Shepherd chose a 1960s Great Society building as the subject of the competition. I loved the idea of a real building. Then we rewrote the competition brief to fit the needs of that building. So we challenged young designers to think about how they would upgrade a specific building that had a lot of problems like a lot of government and other buildings from the 1960s. These buildings have huge footprints, and daylight doesn't get all the way into the offices, for example.

We'd been running this competition for nine years, and before, it was always young offices entering. This time, because the project was so specific and so sophisticated and so nuanced, it was the big offices who let their young members work on this challenge. They used it as a research project, which is very smart of them, because as architecture offices they have to get to the next level of their game. And they also know that in order to keep the young architects involved and interested in their offices, they're going to have to innovate. So this was what happened in most of the cases: the entries were from young groups of architects within larger, more established offices. The winner was a group from HOK's Washington, DC, office, which collaborated with an engineering firm called Vanderweil, which has offices in Washington and Boston. It was long- and short-distance communication and collaboration, yet they worked as a very tight research group to make this thing happen.

In speaking with the designers, it was clear they used all their talents. They used their engineering power to measure the environmental performance of every design move as it was being made. It wasn't like one person designs it and then somebody else measures how it performs; the design was actually informed by performance modeling in real time. The competition was not only interesting for generating ideas for GSA, but it also proposed how to put together a new office.

A team like this is very interesting to watch and every firm does it differently. In the case of the winners, there's a young man, a sustainability expert at HOK—this contest was his baby. What happened in this case is that when the engineer needs to step to the forefront, then the engineer is the star. But there's always a coordinator, somebody who keeps it targeted.

This coordinator is identifiable first by a passion for the project, secondly by skills, and thirdly but not least important the ability to get everybody excited about working together. The leader also relies on people being independent; people for whom the end game overall is much more important than the potential squabbles that can happen.

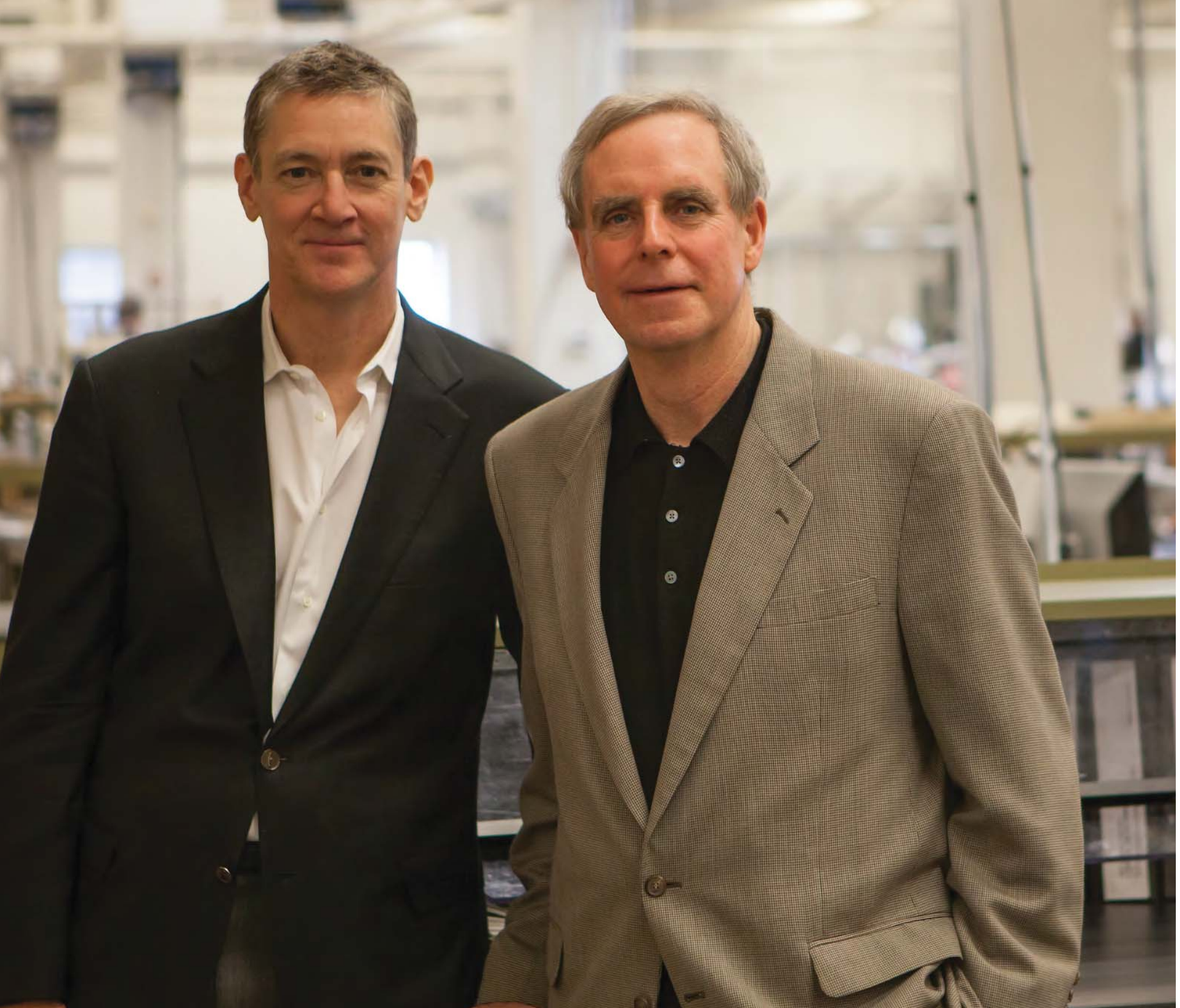
Trust comes up all the time, too. With HOK/Vanderweil, it was really interesting to watch how team members were able to get out of each other's way and were able to accommodate each other's expertise and listen to each other and question each other without being threatening. You can't attribute a project like theirs to one mind, because it's so nuanced, it's so full of information, it's so full of statistical probabilities.

Collaboration is key to getting something really complex done. Because we are asking very complex questions about architecture and design and planning, you need the complex structure of a team to produce answers. Right now, a lot of firms are learning this new choreography. I think it feels natural for the younger groups, just because they feel more connected through their social media experience.

Overall, the winning team needed to figure out how to get the building to the point where almost all of its energy was being produced by renewable resources. So every aspect had to perform. They modeled every skylight, and each one twists through the building differently, according to how the sun moves across that part of the roof. Somebody had to understand that the sun did that. Somebody had to understand what kind of light it would bring to the interior. Somebody had to model the actual structure. This is where collaboration is key.

That also meant breaking up the monotonous facade to help daylight penetration; integrating solar energy on a green roof that also absorbed rainwater; using geothermal. One of the most innovative things they decided was to install tubes of algae on the facade to purify the air around the building. This building is at an intersection of a highway, and algae thrives on carbon dioxide output. So the algae tubes not only clean the air, but also produce biofuel as a small part of the energy picture.

Much of this technology already exists, what happens right now is to make it better. The federal government really is the pacesetter. And I'm hoping for the next generation of architects and engineers and landscape architects and interior designers and product designers to work together more on the same problem, so we can have whole sustainable systems instead of piecemeal fixes.



JAMES**TIMBERLAKE**+ STEPHEN**KIERAN**

JAMES TIMBERLAKE AND **STEPHEN KIERAN** ESTABLISHED KIERANTIMBERLAKE IN PHILADELPHIA IN 1984. SINCE THEN THE FIRM'S PORTFOLIO HAS EXPANDED TO INCLUDE PROGRAMMING, PLANNING, AND DESIGN OF NEW AND EXISTING STRUCTURES IN MULTIPLE BUILDING TYPES. ONE OF THE PARTNERS' FOUNDING INTERESTS—IN THE EXPRESSIONISTIC POTENTIAL OF A BUILDING'S STRUCTURAL AND MECHANICAL SYSTEMS—ALSO HAS GROWN TO ENCOMPASS MULTIPLE KINDS OF SUSTAINABILITY RESEARCH. THAT RESEARCH AND ITS MANY APPLICATIONS HAVE ESTABLISHED KIERANTIMBERLAKE AS ONE OF TODAY'S MOST PROGRESSIVE DESIGN STUDIOS. THIS *VISION+VOICE* CONVERSATION EXAMINES THE INCREASING IMPORTANCE OF RESEARCH PROFESSION-WIDE, AND DESCRIBES SEVERAL SUBJECTS CURRENTLY UNDER REVIEW INTERNALLY.

ACKNOWLEDGING THAT BUILDINGS ARE COMPLEX NETWORKS OF SYSTEMS UNDERLIES THE FIRM'S OVERALL APPROACH TO DESIGN, AS A PROCESS OF FINDING SINGLE SOLUTIONS TO MULTIPLE PROBLEMS. HERE, TIMBERLAKE AND KIERAN ILLUSTRATE THE DIFFICULTIES OF AN INTEGRATED PROCESS, IN PARTICULAR THAT ACCESS TO KNOWLEDGE MAY BE BARRED. USING THEIR WORK ON AN NEW SECURITY PAVILION FOR THE EISENHOWER EXECUTIVE OFFICE BUILDING AS AN EXAMPLE, THE PARTNERS SAY THAT GSA IS EXPEDITING CONTACT BETWEEN THE DESIGN TEAM AND THE FORTHCOMING PAVILION'S MOST INSIGHTFUL USERS.

STEPHEN KIERAN: We were founded on the idea of technology in design—looking at how systems impacted the form of a building, if you thought of the two in a really integrated way. A steel building with a self-bearing masonry skin. A cast-in-place concrete building with a panelized skin. We were exploring different systems' impact on architecture holistically, as opposed to forming ideas about the buildings and then just jamming the systems into them.

In order to get better at our self-questioning and questioning of the profession at large, we decided about a dozen years ago or so that we needed a more rigorous approach and more dedicated resources. So we founded a research group, initially just a couple of people with James and me. It has now grown to several people, and it undertakes really rigorous inquiries that come out of the making of our buildings and get applied to those buildings. The research also is general to the profession at large and to the development of products and processes and systems for the profession at large.

JAMES TIMBERLAKE: Designing with the environment has always underpinned our practice, as we started it in 1984, right after the oil crisis. And it has evolved over time. In the middle of the 1990s, we did a project for a middle school, the Shipley School, which looked very deeply at materials that were local and not toxic. It became a project that was seminal for work going forward. It began with an awareness about materials, their properties, and their relationships to one another, and about their effect on design and construction. Now we have moved more toward life-cycle analyses. But going back to Steve's use of the term holistic, this is one part of a toolkit we bring to any project.

SK: It's a term we use constantly here, because quality is not about any one single thing or system; it's about the integration of all of them, synergistically, in a way that the whole of a building resonates way, way beyond any individual part. And that is a principle that applies mightily to an environmental aesthetic: that, if you pay attention to all of the problems a design is trying to solve, you can generate really extraordinary things. It makes for a more articulated, rich, and detailed building that people can look at and see what it's doing for them and how architecture relates to the world.

So we welcome constraints. We look at constraints as positive impetuses to innovation, to invention, to better integration—as ways to move buildings forward as responsible citizens in the world.

JT: It's a process delivery method, not a solutions delivery method. And I think one of the ways that architects have veered off track over the last 10 or 20 years is they focus on solutions first and then ally a process to this preconceived notion.

SK: Another aspect of the toolkit is measuring environment inside and outside buildings.

We have our own packages of instruments. We can do it remotely now—and get actual data on places before we begin design, and get actual data on our designs after they are built. And you can compare your predictive modeling to what actually happens and you can reflect on the differences, in order to potentially tune the performance of a building. You also find out what works or what doesn't work and modify systems designs and methods of integrating systems to get better results the next time around.

JT: I think another tool we use is simply gaining feedback from our consultants, our clients, and others in the delivery process. The critical thing then is to take that feedback, both the best practices and the failures, and improve your design the next time. No matter the typology of the building.

SK: What the profession needs is not just research, but discourse about that research. We need to share it to the extent that intellectual property interests and clients' concerns allow. We need to share it with each other, in order to provoke each other and broaden the base of research.

Most architects work in small entities across the world. One of the advantages of that is that we're nimble, and can move quickly in search of research topics that have merit. But the only way we're going to add up to something larger than a collection of small entities is through sharing and communication. That's the way we can advance ourselves as an industry, despite the atomized scale of individual organizations. There's tremendous opportunity there.

JT: An example of expanding our knowledge and then sharing it with architects: We found a disturbing environmental circumstance of at least one of our buildings where birds were hitting the glass walls. And we wanted to understand why those bird strikes were happening and what we could do to mitigate it. One of our research team members did a white paper on this, published it widely on the Internet, and it has been shared with the profession at large. I think it has also mitigated circumstances on several other glass buildings that we have gone forward with.

SK: The client has to be a willing participant in all this. It requires them sharing things that didn't work as well as they could have. In order for them to contribute to making better architecture, they too need to be self-reflective and open and willing to engage in making a building work better.

JT: That's the operative word: engagement. The clients who are engaged get better buildings, get a deeper commitment from all the participants that they are bringing to the table. I think our best buildings are those where the clients have been incredibly and deeply engaged.

SK: Through that engagement, they can actually improve their long-term cost of ownership, which is a far more important component of the total cost of a building than the initial cost.

JT: We won a border patrol station in northern Vermont that never came to fruition; about the same time we became peer reviewers in the Design Excellence Program. We then applied for additional work and continue to do so, because we think it's a building-delivery and agency form that we think we can get great success with.

I think GSA's peer review process has been intriguing and successful, in terms of an open, constructively critical process that engages GSA, the architects, and other project participants in an open conversation about improving the architecture that comes from the federal government.

Certainly, I think we don't treat the peer review process any differently from how we would expect to be treated—certainly in terms of how we go about designing holistically, looking at a project quite widely, and trying to help our peers move their buildings forward and to consider things that they might not have considered. In the case of the Eisenhower Executive Office Building project that we are doing—a screening facility and new entrance for the EEOB—we expect that in turn from our peer reviewers and our client group.

SK: We applied for the Eisenhower Executive Office Building, because there was a real important design problem inherent in that project. Over the last two-plus decades, security concerns have dominated some of our architectural responses to government buildings here in the U.S. and all over the world.

There have been two end results. One is, and I'll use the term perhaps dangerously, security blight has been retrofitted onto buildings that deserve better. The consequence is

that it becomes a very important part of the urban realm, particularly in a place like Washington, DC, where there are so many public buildings that have undergone security modifications. It's a different city now than it was a quarter of a century ago. So the design problem on the EEOB was a chance to address the security concern in a way that it could be thought through—in an integrated way, over time.

To us it's a huge issue, because it starts to change the way we perceive our government. It's a very profound and difficult design problem of our time, and we thought there was just an unbelievable opportunity with the EEOB to take it on, and to address how to retain the extraordinary quality of that extraordinary building.

JT: We were shortlisted to a very small group of architects as a defined limited competition, and we were selected from that group principally, I think, because we understood the constraints of the site, and we understood that security requirements are ever-changing. And, as Steve said, it's a prominent building that has great meaning, right next to the White House.

So, how do you design something that feels both welcoming and safe, while also enabling new security requirements to be incorporated into it without demanding changes to the entry sequence or the landscape? In this particular case, the design suppressed any structure by identifying the plaza in front as the potential for a building beneath it, essentially integrating it into the landscape below grade—but with abundant natural light coming into the building, to graciously get people in from the sidewalk. In an extensive, ongoing design process, that has proven to be a robust idea with GSA and the Secret Service and others.

It's been an iterative process working on the EEOB. We've had two peer reviews, we've had meetings in front of the U.S. Commission of Fine Arts. We've had a variety of meetings with our client groups. We're working with sometimes competing requirements, addressing the needs of the client group as well as the design mandates of external circumstances like a federal commission.

It has been a unique process—one in which you receive feedback that you then need to be open and iterative and collaborative about, in terms of getting to the solution that is going to address all the requirements. They aren't necessarily insurmountable. Just like anything else that we do, working holistically, you can solve them quite graciously and creatively. But it takes multiple conversations, and it takes people remaining open to possibility.

As facilitators and managers, GSA and the Design Excellence Program have made the client available to us. Security is quite different now than when we first got the brief. And by conversing about it and by allowing us to show them multiple solutions, the Secret Service can come to the agreement about what they need directly with us. The facilitation of that has been absolutely critical. I think the very, very best Design Excellence projects have been successful because of that deep engagement with end users.

SK: Setting up a collaborative framework for a project fundamentally allows excellence at the end of the day. Sometimes, you can't get to the people that actually use the building and know it; there isn't the collaboration that provides access to the client's extraordinary intelligence about how activities function—how they come to be, how they come to pass—into a building. The Design Excellence Program does a good job in facilitating true interaction.

JT: The Design Excellence Program has deeply improved the relationship between architects and the federal government. It has resulted in projects on time and on budget, and it has resulted in more robust federal buildings that will serve the federal government for a very, very long time, and which are recognized worldwide as exemplars in architecture.

SK: The day a building opens, its embodied energy—the energy that went into all of those materials that make up the building, as well as the transportation and movement of those materials—is already substantial. It's about equal to 40 percent of the cost of operating the building over 40 years.

So, knowing that, one of the questions we are starting to ask is, If you have already expended half of a 40-year life cycle of energy on the day a building opens, then what are you putting into the building in the first place? How can we select materials that have lower embodied energy in the first place? How can we develop systems and integrated components that have less energy on opening day? How can we continue to lower that energy as the building operates?

That is deep knowledge the design profession is not thinking much about at this point. We're trying to understand decision making from the perspective of not just operating energy, but embodied energy. That's an example of an area where GSA could lead if it chose to.

MOST ARCHITECTS WORK IN SMALL ENTITIES ACROSS THE WORLD. ONE OF THE ADVANTAGES OF THAT IS THAT WE'RE NIMBLE, AND CAN MOVE QUICKLY IN SEARCH OF RESEARCH TOPICS THAT HAVE MERIT. BUT THE ONLY WAY WE'RE GOING TO ADD UP TO SOMETHING LARGER THAN A COLLECTION OF SMALL ENTITIES IS THROUGH SHARING AND COMMUNICATION.

JT: One of the federal government's roles is to lead. And a private-sector economy tends to follow federal mandates and guidelines in a variety of ways. By leading in arenas of invention, innovation, and exemplary design, the federal government can bring the private sector into the 21st century.

SK: If you really believe that the energy we put into a building is of value, then the next question is, What happens to that value as a building starts to change? What happens to that value when the building is in the wrong place or of the wrong program and character?

Starting to think about ethical responsibility toward a building across time, not just at the time of conception, starts to change the way our buildings look. If you think about how to put something together and how it might come apart so that the energy that went into it could be reclaimed—that starts to change the way a building looks. Joints become more important again and exposed again, for example, because you are assuming responsibility for the origin and potential disposal of a building.

JT: You and I buy automobiles. The moment we drive that automobile off the lot, its value is immediately halved. When the federal government creates buildings, the building can't be worth half of its value the moment the first occupants walk into it.

SK: We see lots of clients who will accept the artistic novelty of architecture without ever questioning its performance. There are other clients that care almost wholly about performance and not a whit for the lasting artistic value of a building.

GSA has great balance. There is an insistence that the architecture of the United States both performs and has meaning. That's probably the thing we value most, this belief that you can't give a free pass either way. You have got to have both.

KEN**WILSON**

KEN WILSON WAS THE FOUNDER OF ENVISION, A DESIGN PRACTICE THAT PURSUED ENVIRONMENTAL RESPONSIBILITY IN ARCHITECTURE, INTERIORS, GRAPHICS, AND PRODUCTS. THE STUDIO RECENTLY JOINED PERKINS+WILL, AND WILSON NOW SERVES AS A PRINCIPAL IN THAT FIRM'S WASHINGTON, DC, OFFICE. AT ENVISION, WILSON WORKED WITH LEADING ORGANIZATIONS IN THE SUSTAINABILITY MOVEMENT, INCLUDING THE ENVIRONMENTAL DEFENSE FUND, GREENPEACE, AND U.S. GREEN BUILDING COUNCIL; THE COMPANY ALSO COMPLETED HEADQUARTERS FOR THE INTERNATIONAL INTERIOR DESIGN ASSOCIATION AND OFFICES FOR AL GORE IN NASHVILLE AND IN NEW YORK. SERVING ON THE USGBC'S LEED COMMERCIAL INTERIORS AND LEED CORE & SHELL NATIONAL COMMITTEES, WILSON PLAYED A KEY ROLE IN DEVELOPING THE LEED RATING SYSTEM, AND HE FOUNDED THE IIDA'S SUSTAINABILITY ADVISORY COUNCIL.

WILSON EXPLAINS THAT GOOD DESIGN AND SUSTAINABLE DESIGN ARE MUTUALLY INCLUSIVE, AND THAT ACHIEVING THIS OVERALL QUALITY REQUIRES DIALOGUE BETWEEN MULTIPLE EXPERTS. HERE, HE PINPOINTS EFFECTIVE METHODS FOR DISCUSSING DESIGN WITH THE MOST ESSENTIAL STAKEHOLDER OF THAT GROUP—THE CLIENT. AS A MEMBER OF GSA'S NATIONAL REGISTRY OF PEER PROFESSIONALS, WILSON ALSO REFLECTS ON SUSTAINABILITY IN THE CONTEXT OF LONG-TERM FEDERAL OWNERSHIP OF BUILDINGS. HE ADVOCATES FOR VERSATILITY TO ACCOMMODATE OBSOLESCENCE AND OTHER CHANGES IN GOVERNMENT SERVICES.

KEN WILSON: Integrated design is the way of the future. Previously the process was much more linear, in that an architect would come up with a design they were satisfied with and then they would kick it over to an engineer to figure out how to heat and cool it. Nowadays buildings are much more complicated, especially with multiple sustainable strategies and high technology, and you have to bring a much bigger group of people to the table in order to get the best outcome; you need to bring all of those people together very early and talk about the design holistically. I love to get input from our structural engineer, mechanical engineer, and any other consultants as early on as possible. The process is still led by the architect, but you have to be open-minded to accept that good ideas can come from anywhere.

Also, getting buy-in from this group is very important because it avoids misunderstandings down the road. Once a projects starts construction, it takes on a life of its own and things can happen that are unanticipated. With an integrated approach there's no finger pointing; the group bands together and solves any problems that arise.

We like to set up clear vision statements and guidelines for a project early on, so with every decision down the road we can circle back to those statements and make sure what we're designing is supporting the original goals of the project. That's one way to help ensure a better outcome, certainly. For me personally, I like to see design that's driven by the functional requirements that were the genesis of the project. I like to let the aesthetic arise out of this process of pragmatic problem solving. I believe the most beautiful designs are those that are driven by their functional requirements, like an airplane. In order to accomplish the amazing task of picking 150 people off the ground and landing them safely a thousand miles away, the entire design

I LIKE TO SEE DESIGN THAT'S DRIVEN BY THE PROJECT'S ORIGINAL FUNCTIONAL REQUIREMENTS, AND LET THE AESTHETIC ARISE OUT OF THIS PRAGMATIC PROBLEM SOLVING.

of the airplane has to be completely functional, and the end result is really quite beautiful. As an architect, it can be challenging to convince a client of something purely from an aesthetic standpoint. I've found that clients respond much more positively if you say, Here are your problems, here's how I'm solving the problems, and here's what that looks like. I remember people looking at projects that we had done that were kind of edgy and asking how I got our clients to go there. It always ended up being a case where we solved a problem in an unusual way. Either the problem was a functional problem or a budget problem or something else—something other than an aesthetic problem. When you can show a client that something really works and helps their business, then they're much more open to what that could look like.

I have not yet gotten a client that says cost doesn't matter. With sustainable design, there's real potential for return on investment, so you can argue for a better quality design that, in fact, will pay off over time. In this country, we're obsessed with first costs, and that's really been a struggle. But you can take a client aside and say, Look, over the life of this project you're going to save money. Energy is the easiest to point at, certainly. We can increase productivity, too, though that's a little subjective in how you measure it. Reducing the energy required for lighting is the low-hanging fruit. Right now lighting code is, pretty much everywhere, one watt per square foot. We're designing projects that get down to half a watt a square foot. What does that do to your cost? It's significant. When we designed the USGBC headquarters here in Washington, we cut out half the light fixtures, which ended up paying for a lot of the "added" sustainability strategy—occupancy sensors, dimming systems, upgraded mechanical equipment. Just by reducing the light fixtures, you can get an immediate payback. We recently did a study of the USGBC's energy use based on the 2011 calendar year. They are saving $93,500 a year in energy alone, based on the Energy Star Target Finder baseline. So, it's pretty incredible.

Net zero is a much more aggressive goal, and I think for certain types of buildings it will be difficult to achieve, especially in urban environments where there's not enough roof space for solar panels or wind generators. You also don't always have direct exposure to sun because of the shadows cast by other buildings. The first thing to solve in this process is how to reduce energy use, and then you think about how to create energy with renewables to make up the rest.

Sustainability also means designing with flexibility for future uses. For example, I would imagine in the future there'll be large parts of the federal government that will merge, disappear, or otherwise change. I'm not sure in 10 years whether we're going to have a postal service like the one we have right now. As the federal government moves forward, an appreciation of this will likely drive the way buildings are thought about and they won't be so single purpose–driven. The idea of tearing down buildings doesn't always make sense either, especially in urban environments. But I would also say that having a building of historic significance should not be an excuse for bad performance. As the owner and user of public buildings, the federal government is going to maintain its properties; they are not developing properties for sale at a later date. Presumably, they will control whatever they develop in perpetuity. So avoiding the teardown is important. The materials and technology you need for a highly efficient green building is available. The technology is not really state-of-the-art, it is state-of-the-shelf and it is available to anybody. For example, an automated shade system that can maximize daylighting and save energy is not a particularly innovative technology. It's just not in common practice, and more important, these technologies haven't necessarily been put together in a way that maximizes their efficiency synergistically. Architects are just starting to experiment with that.

You can't consider a project or a building to be an excellent design if it doesn't consider sustainability. We definitely can no longer accept designing with products or materials that are harmful to the environment or to people, and we can't knowingly design projects that are energy hogs. Sustainability is important to design excellence overall.

EDDIE **JONES**

ROBERT **SIEGEL**

JULIE **SNOW**+
SHANE **COEN**

Chapter 4

Land Ports of Entry and Sustainability

Due to the uniqueness of some federal services, GSA has been in a position to invent all-new building types to house those programs. The land port of entry exemplifies this privilege. Straddling the borders that the United States shares with Canada and Mexico, land ports are highly secure and often remotely located. The teams hired by GSA to create new border facilities have collaborated intensely to make them sustainable, too. The following interviews recount the most visible of these efforts. Collectively, they also illustrate that, to minimize a building s environmental footprint, sustainability strategies must be deployed on a highly individual and site-specific basis.

EDDIE**JONES**

SINCE RESETTLING FROM HIS NATIVE OKLAHOMA TO PHOENIX, ARCHITECT **EDDIE JONES** HAS BECOME SYNONYMOUS WITH THE AMERICAN SOUTHWEST. HIS BUILDINGS ARE WIDELY PRAISED FOR THEIR DEFERENCE TO THE LANDSCAPE, THE INTRICACIES OF WHICH HE BECAME HIGHLY AWARE DURING HIS FIRST YEARS IN ARIZONA. HERE HE EXPLAINS THAT HIS SENSITIVE APPROACH TO SITE NOT ONLY AIMS FOR AN INTERESTING FORMAL COMPOSITION, BUT ALSO CELEBRATES HISTORICAL APPROACHES TO SUSTAINABILITY AS WELL AS MATERIALS THAT BEAUTIFY IN PUNISHING CLIMATES. JONES SERVED AS FACULTY AT TALIESIN EAST AND WEST SCHOOL OF ARCHITECTURE, AND HE WAS THE BRUCE GOFF CHAIR OF CREATIVE ARCHITECTURE AT THE UNIVERSITY OF OKLAHOMA, COLLEGE OF ARCHITECTURE. HE RUNS JONES STUDIO WITH HIS BROTHER NEAL.

ANOTHER ACCOLADE FOR JONES STUDIO WAS THE SCOTTSDALE MUSEUM OF ART'S INVITATION TO THE FIRM TO RELOCATE TO ITS GALLERY AND OPERATE IN PUBLIC VIEW. IT WAS DURING THIS FOUR-MONTH PERIOD IN 2006 THAT THE COMPANY WON THE COMMISSION TO DESIGN THE EXPANSION AND MODERNIZATION OF THE MARIPOSA LAND PORT OF ENTRY IN NOGALES, ARIZONA, THROUGH GSA'S DESIGN EXCELLENCE PROGRAM. DURING THIS *VISION+VOICE* INTERVIEW, JONES EXPLAINS HOW THAT PROJECT ON THE U.S.–MEXICO BORDER CULMINATES A CAREER OF THINKING DEEPLY ABOUT THE DESERT REGION.

EDDIE JONES: Back in 1973, when I first arrived in Arizona, I was one year out of college and not well traveled. I go to work for the oldest architectural firm in town, which had just been bought by a firm out of Omaha that specialized in Housing and Urban Development's program for Native American housing. This firm sent me to all four corners of Arizona taking photographs. I was in very remote places, very historic places. I saw how the pueblo was built. I saw how the Apaches built. Those fundamental lessons I still carry with me. Architects have remarkable technology available to us today, and that is wonderful and futuristic. But without the fundamentals of passive design, technology becomes diluted.

I'll never forget the first time I saw a ramada. The four columns are typically palo verde tree trunks. The shade structure that it supports is made of the skeleton of the saguaro cactus, with ocotillo branches running in the opposite direction to knit it all together. All natural materials. All biodegradable. Beautiful shade. Naturally ventilated. It had it all, and one could find refuge from the excessive desert temperatures there.

If you look at great buildings throughout history, they were responsible buildings. They knew about conservation, and about human comfort. They didn't have the benefit of technology. Because we occupy the same planet, those early lessons are still valid and applicable.

When I'm speaking with a client or a design committee or user group, I talk about where the sun comes up and where the sun goes down, where a view might be, where one side of a building might be windy and another side might be warm. Then I demonstrate how design decisions are a result of these natural forces. They're inarguable. Nobody is going to deny the obvious. And so I've been very successful in "selling" my designs, because I ground them in fundamentals. If you are building in the Sonoran Desert and forget that fact, then the desert will destroy you.

Regionalism and sustainability work in tandem. There is the responsiveness to climate. There is the responsible use of materials—but they have to be beautiful materials, because beauty motivates stewardship. You know, we think buildings can be sustained all by themselves. But they have to inspire us. They have to enrich our lives. Otherwise, we'll throw them away, regardless of how much energy they're saving.

Our first public project was a tiny visitor's center north of Winslow on the edge of the Hopi reservation, in Homolovi State Park. I felt it necessary to celebrate the ancient stone ruins there; it seemed very appropriate that this building also be made of stone. The fact that it was a public building really meant a lot to me. I felt an even higher sense of responsibility to do a really good job. It was on the edge of a historical place, and it was in a landscape that had been protected and honored. So there was strong motivation to be very respectful and to create an architecture that was appropriate and sensitive. I want a community to be better because of the building we put there.

My first assignment as a member of the National Registry of Peer Professionals was to review a land port of entry in McAllen, Texas. We met in Dallas. There, I started to learn about land ports of entry, and I began to meet wonderful people like [GSA chief architect] Les Shepherd and other peers. You can't help but be better for having those experiences. The fact that we're there to collaborate with the participating architects, and to help projects get better, is a wonderful experience.

Later, when I read about the Mariposa land port of entry RFQ, I told my brother and business partner that we would go after this. It's great when you're naïve, because there's no fear. My brother says, "We have no experience in this. This is huge." I go, "You know, Neal, I think we do have a chance. This is our community, this is our home." So we submitted.

The most important consultant that we needed to identify, in order to have any credibility in competing for the Mariposa port, was a civil engineer. This is a 54-acre site, and obviously traffic patterns are very important. Although we had never worked with Stantec Engineering, we knew we needed them and GSA needed them. They were very, very qualified engineers. Their company founder was one of the first in line in the sustainability movement, and we hit it off.

The Mariposa port was originally built in 1973. On my first trip there, I could see it was completely inadequate for the commerce that had evolved in the intervening decades. And it was brutal. It was hot and it was dusty, there were exhaust fumes. I also was really impressed by the officers' professionalism. They care about law enforcement, but they care about people too. They deserved a safe and high-quality work environment.

Because it was such a harsh environment, it was easy to think, Wouldn't it be wonderful if the experience of crossing from Mexico into the United States were like passing through a garden? It's a little ironic that we also thought of a 19th-century railroad switching yard as a method of handling a linear transportation system in a 21st-century land port of entry. But there are a lot of similarities between the two. So we have that organizing scheme combined with treating people with respect by giving them a pleasant garden experience.

Maybe you've sensed a disparity between the shade and the sound of water with the fact that Customs and Border Protection is doing serious law enforcement. And it is the most contentious border in the United States. So you have these competing situations, and they have to be overlaid and balanced somehow. What a great and important challenge to be charged with resolving.

There needs to be leadership, especially early on. The Design Excellence Program made sure that happened. I wasn't directed to collect a certain amount of rainwater on site; it was never that prescriptive. I had the encouragement of GSA's Public Buildings Service to not be intimidated by the scale of these decisions, and that was wonderful. The architecture is about recognizing forces that are at work on this site, both natural forces and the experience of crossing the border and being inspected.

Take the infrequency of rain. When it does rain, it should be captured and stored. The scale of this is huge. There is a 1-million-gallon underground storage tank to harvest all that rainwater and irrigate 54 acres of very harsh desert. In addition, we designed the inspection stations to have these huge cantilevered ramadas. With the ramadas we're metering down the light levels, and we're creating shade. And it's far more comfortable to sit under the shade of a sun-filtering device than it is to wait in the sun for your turn to be asked intimidating questions. There's a gentleness to that process, and you're also seeing this beautiful landscaping. I think that helps relieve anxiety, and extends a gesture of welcome to the United States.

Design decisions have to work on at least two levels. One level has to do with aesthetics; the other level has to do with function. If something functions and it's not beautiful, it's not good enough. If it's only beautiful and it doesn't function, it's not good enough. So you have to satisfy and balance the two extremes. Even better is a design that can do multiple things—a sun filter that becomes a security overlook and captures rainwater at the same time, for example. We try to make our design decisions do a lot of jobs.

Sustainability, in a sentence, is giving more than you take. It's as simple as that. It's an ethical position.

ROBERT**SIEGEL**

GSA HAS PLAYED AN ESSENTIAL ROLE IN THE DEVELOPMENT OF **ROBERT SIEGEL**'S NEW YORK—BASED PRACTICE, WHICH TODAY IS KNOWN FOR MODERN BUILDINGS AND INTERIORS THROUGHOUT THE UNITED STATES AND ASIA. SIEGEL BEGAN APPLYING FOR COMMISSIONS THROUGH THE AGENCY'S DESIGN EXCELLENCE PROGRAM IN 1995, JUST FOUR YEARS AFTER THE ESTABLISHMENT OF ROBERT SIEGEL ARCHITECTS. FOR GSA, HE HAS SINCE COMPLETED A HIGH-PERFORMANCE FACADE RENOVATION IN PIERRE, SOUTH DAKOTA, AS WELL AS LAND PORTS OF ENTRY THAT INCLUDE THE LARGEST LEED GOLD—CERTIFIED BUILDING OF ITS TYPE ON THE NORTHERN BORDER, IN CALAIS, MAINE. PERHAPS MORE NOTEWORTHY, PRINCIPLES OF FEDERAL BUILDING INVESTMENT INFORM THE ENTIRE OUTLOOK OF ROBERT SIEGEL ARCHITECTS. THE FIRM'S PHILOSOPHY READS IN PART, "A PUBLIC BUILDING SHOULD SERVE AS A POTENT VISUAL AFFIRMATION OF AMERICA'S COMMITMENT TO CONSERVE RESOURCES TODAY AND TO LEAVE THE WORLD A BETTER PLACE FOR OUR CHILDREN TOMORROW."

SIEGEL'S INVOLVEMENT WITH GSA BEGAN WITH WINNING A NATIONWIDE IDIQ CONTRACT FOR THE DESIGN OF LAND PORTS. FOR *VISION+VOICE* HE DESCRIBES THE INSIGHTS HE HAS GAINED INTO THIS NEW BUILDING TYPE OVER THE COURSE OF FIVE PROJECTS AND TWO COMPETITIONS. HE ALSO EXPLAINS THE SUSTAINABILITY APPLICATIONS UNIQUE TO THIS THRESHOLD CONDITION.

ROBERT SIEGEL: I started submitting my qualifications to GSA through the Design Excellence Program in 1995. In 2002 we won a project, and since then we've designed land ports of entry and other federal buildings. We've done a land port in Calais, Maine; public entrance courtyard for the Ribicoff Federal Building and Courthouse in Hartford; a program development study for another land port in Otay Mesa East, California; and we're executive architect for a land port in Van Buren, Maine, whose concept was led by Julie Snow Architects. We've completed feasibility studies, we just finished bridging documents for a CBP [U.S. Customs and Border Protection] housing project in Presidio, Texas, and we're almost finished with the replacement of existing building skin with a new, high-performance curtain wall on a federal building in Pierre, South Dakota.

We entered GSA at an interesting, transitional time, when the Public Buildings Service was refocusing its attention on both federal courthouses and land ports of entry. While the courthouse is an awesome building type for its history and for its important role in communities, the land port of entry is great, too, because there's almost no precedent for it. It's a new type. And with security constantly evolving, combine that with sustainability goals and we have very fertile ground for doing work that is innovative while serving the very, very important needs of CBP. I think one of the reasons that GSA shortlisted us when it did is because no one had experience; selection was all about how architects could reconceive a building perceived as uninteresting into a safe and secure work of architecture.

A land port of entry, more than anything, is a process. It's not a building or landscape—we build enclosed space and landscape around movement. It also must provide the first image of America to people crossing the border. It is a great opportunity to test ideas, and CBP is very open-minded about experimentation and about tweaking processes to improve efficiency and security.

For land ports of entry, sustainability makes a lot of sense. These are remote facilities for which survivability is a criterion of CBP's. Achieving net-zero energy or going off the grid completely would make sense in locations where the power supply is not reliable.

Also, GSA, as a public agency responsible for a huge real estate portfolio, has a mandate to reduce these buildings' energy consumption. We need these buildings to be extremely efficient and high-performing. And that doesn't just mean following the LEED checklist, but also minimizing the energy to construct these buildings, recycling old buildings whenever possible, and making new buildings easily adaptable to other uses over time. I think GSA is stepping up in all those respects.

We also have to change the attitudes of the people who occupy these buildings; we have to do a little expectation management about what it means to work in a high-performing public building. If we want to walk around in T-shirts whether it's 0 or 100 degrees outside, if we have to have all the lights on, if we always want massive floor plates that prevent daylight penetration, then we're always going to use a ton of energy.

It always struck me as odd that many hybrid cars look like their regular selves, because the new technology should be an opportunity to invent a new form and new patterns of use. We're in a time where we're getting our heads around the technology first—but integrating technology into the spatial concept is really critical to pushing these fields forward. Sustainable buildings should look different. They should express their sustainable performance.

That standards of security and sustainability are always evolving makes for a very dynamic building type. No two buildings need to be the same, and there's great beauty in that. But these land ports do need to have some traits in common, such as incorporating lessons learned from prior buildings. Ultimately, we can take those bits and pieces, those achievements and lessons learned, and combine them into an architecture that's exciting and highly functional. So what we're really talking about is experimentation within a constraint, innovation that's not necessarily prototypical. And that's a responsible approach to using public money.

We also conduct testing before rolling out new approaches. For the land port of entry in Calais, we wanted to install a shade screen around the building. It is an expanded aluminum mesh, and nothing like it had been done on a federal building before. Not surprisingly, there was huge concern that this mesh would fill with ice, becoming impossible to see through. We were able to mock it up on site in wintertime, and the CBP officers made sure that it was functioning properly from a visibility perspective.

No project is too small to not have a lot of thought put into it. No project is too small to not be crafted really well. There is no project that shouldn't function perfectly. Setting that as the standard of public building—making sure that good quality is actually referred to as the normative—is a real benefit to our society. Otherwise we're handicapping our future for short-term gains. Building and renovating in ways that are enduring is the mission that distinguishes public architecture from much of commercial architecture.

There's no one particular way to achieve that enduring quality. At the land port currently going up in Van Buren, Maine, we have all sorts of sustainable technology; similarly, at Otay Mesa East, we have microturbines on the building, we have photovoltaic arrays, geothermal fields. Yet in Calais we have none of that. The building is like the people who live in Maine; it's humble, it's resourceful. In Calais we have bioswales instead of hard drainage. Bioswales collect and filter rainwater naturally, and they also provide the building with a defense benefit, because you can't drive a truck into it. Instead of putting up a visible barrier, the landscape and the building are really working all together toward several goals.

FOR LAND PORTS OF ENTRY, SUSTAINABILITY MAKES A LOT OF SENSE. ACHIEVING NET-ZERO ENERGY OR GOING OFF THE GRID COMPLETELY WOULD MAKE SENSE IN LOCATIONS WHERE THE POWER SUPPLY IS NOT RELIABLE.

Something is unique about Calais: If you think about a land port of entry, it's a building in the middle of a highway, with all sorts of trucks and other vehicles going past it. Yet you have to get fresh air into a building, which we didn't want to channel from the roadway. Instead, the land port has a courtyard space designed into it, in order to provide cleaner air as well as a quiet space for contemplation.

I think a building can possess a high-tech concept, but that it can be made of low-tech parts that are easy to fix and maintain. Especially in a remote area this is important, because it makes it more likely for that building to be monitored and maintained to last for a long time. A building located in a major city in the United States has access to all kinds of facilities expertise that a land port may not. Also, a site like Calais has a lot of acreage on which we can pursue low-tech sustainability strategies. In a more constrained situation, we would have to resort to technology or gadgets to maximize our energy performance and overall sustainability. So I think deployment of an individual project's sustainable strategies is as driven by site as it is driven by the client and their expectations.

JULIE**SNOW**+ SHANE**COEN**

JULIE SNOW LEADS A DESIGN PRACTICE IN MINNEAPOLIS WHOSE APPROACH TO THE BUILT ENVIRONMENT EXPLORES MATERIAL AND DETAILING. SINCE FIRST SPECIALIZING IN INDUSTRIAL FACILITIES, JULIE SNOW ARCHITECTS HAS GRADUATED TO LARGER AND MORE COMPLEX COMMISSIONS, INCLUDING PUBLIC WORK. IN THIS INTERVIEW, SNOW TRACES THE EVOLUTION OF HER FIRM, AND THE ROLE OF SEVERAL GSA PROJECTS IN THAT GROWTH. SHE IS JOINED BY **SHANE COEN**, PRINCIPAL-IN-CHARGE AND FOUNDER OF THE LANDSCAPE ARCHITECTURE STUDIO COEN+PARTNERS: SNOW PARTNERED WITH COEN TO COMPLETE A LAND PORT OF ENTRY IN WARROAD, MINNESOTA. THEY WERE ALSO COMMISSIONED BY GSA TO CONCEIVE A LAND PORT IN VAN BUREN, MAINE, THAT HAS SINCE BEEN COMPLETED BY A DESIGN-BUILD TEAM THAT INCLUDES ROBERT SIEGEL ARCHITECTS. FOR *VISION+VOICE*, THE COLLABORATORS DISCUSS THIS PAIR OF HIGHLY ACCLAIMED LAND PORTS, UNDERSCORING HOW ARCHITECTURAL AND LANDSCAPE DESIGN CAN SUPPORT ONE ANOTHER TO MAXIMIZE A PROJECT'S SUSTAINABLE PERFORMANCE.

JULIE SNOW ARCHITECTS' MANY ACCOLADES INCLUDE THE AIA HONOR AWARD, PROGRESSIVE ARCHITECTURE AWARD, AND HOLCIM NORTH AMERICAN BRONZE AWARD. COEN+PARTNERS HAS EARNED MORE THAN 25 INDUSTRY AWARDS SINCE ITS INCEPTION. OF NOTE IS ITS 2003 PROGRESSIVE ARCHITECTURE CITATION FOR THE REDESIGN OF THE MAYO PLAN #1 COMMUNITY IN ROCHESTER, MINNESOTA, WHICH WAS ONLY THE SECOND TIME A LANDSCAPE ARCHITECTURE FIRM WON AN AWARD IN THE PROGRAM'S HISTORY.

JULIE SNOW: Our architecture is frequently described as elegant and simple, but I think our buildings also have distinctive personalities. This evolves through our critical investigation of detail and material to understand the building as both a tactile and visual experience.

Our studio often takes on projects that are a bit unusual, maybe a little bit outside the boundaries of architecture. We've done projects like a dog collar and "telematic" table. So the idea of doing the temporary courthouse for the Warren E. Burger Federal Building and U.S. Courthouse project was an intriguing opportunity. Due to its temporary nature, our courts architect Dick Gilyard suggested that we might conceive of the project as a stage set. With this and the project's aggressive schedule in mind, we developed a design strategy that used panels of blue glazing along the corridor to bring natural light into the courtroom, combined with plate steel folded to form the bench, jury box, witness stand, and attorney tables.

With minimal fabrication, this single material provided the structure, the finish, and the required bullet resistance. Fortunately, we were working with very open-minded judges who allowed us the latitude to put them behind steel plate.

JS: We begin our projects by doing a fair amount of research of economic, cultural, and landscape contexts. During this research, we're peeling away various layers of a project—we're not really designing anything yet.

Our work is often about conveying a sense of place through architecture, which requires studying physical landscape as well as the political, cultural, and economic contexts. Another absolutely critical piece of this research is to get a very vivid understanding of how a building will be used—to really comprehend our clients' operations. In our land port in Warroad, we developed a deep understanding of how the officers work and think about their work.

In a certain sense, the experience of passing through a land port is very orchestrated, but for the visitor it involves a bit of anxiety. Meeting an officer is coming face to face with authority. Yet from the officer's point of view, he should always be within eyesight of his fellow officers, to have backup in case of an incident. By understanding these motivations and processes, we can give our clients a building that performs well for them.

"Integrated design process" typically refers to building information modeling. We think of integrated design more as a methodology than a tool. Our office really began as a space in which we would convene all of our engineers and other consultants to collaborate on a project. For us, the key to engaging many voices on a project is to withhold your own design voice: to lead by really listening and starting the creative process, not by setting forth a particular agenda. It's very important to defer your presence, in order to hear every voice at the table.

Sustainability for us begins with the integrated project team. We don't want a laundry list of sustainability tactics to layer onto the design. We want the pieces of the project to work together so that each sustainable tactic is related to another. These do not perform in a singular way but are multifunctioning.

Take the land port in Van Buren, for instance. Interestingly, it is such a large site that the drive to the port was quite long before entering the secure portion. Our intent was to make that experience into something. We incorporated berms that provide not only visual variety, but also play a part in the port's security strategy—appearing like moguls, the landscape elements prevent people from leaving the road and bypassing the inspection process. They also slow stormwater as it washes across the site toward the St. John River. This kind of integrated design requires having everybody at the table, discussing how the design will perform across many measures.

At Warroad we were very interested in investigating ground source heat pumps. We inherited a very wet site, so a good amount of the construction dollars were needed for the foundation system. But we found that, through ground source heat pumps, we could turn that poor soil into an advantage. Geothermal heating performs well in those soil conditions and is often used in residences in that area, so it was something that could be locally maintained.

Perhaps the strongest link between Shane's office and ours is that we both emphasize the broader context of a project before we dive in. When we're working with colleagues, we want to be able to engage them before the form of the building is set, while we're still posing questions about what this place is about.

SHANE COEN: Preparing for our second-round interview for the Warroad project, we had an amazing story to tell about the history of the region and what it's like to drive through it. Going back and forth between quick sketches and ideas, we uncovered things. So it wasn't like one studio did all the research and the other did all the drawing. It was way more interactive. Research, idea, sketch, drawing. That's how we wound up presenting in the interview, and it was a very dynamic presentation.

JS: It was great. To mine those possibilities is essential. To have a colleague that's willing to go through that evolutionary thinking process with you is essential.

The northern border at Warroad has this incredible vastness. Giving the land port and its immediate site presence in this dramatic, flat, expansive landscape was key. Van Buren was a completely different question. The site is much more topographic, located within the St. John River valley. It is heavily identified with Acadian culture. The design team came together for awhile, and then we let everybody go off and do their own thing. We lost our landscape colleagues for about a day: they were in the library—

SC: —reading about the original plat lines, the potato farming, and Acadian culture. When you get two offices like ours together, where there's not a lot of ego flying around and everybody is searching for the right idea, good things happen.

The vastness that Julie was speaking about at Warroad was really fascinating, because she always talked about the building as being quiet but symbolic and integrated into the site. Our diagrams from the very beginning reached back for miles. We were like, We'll start an ecological process three miles down the road, as a kind of buildup of anticipation.

With a highway that goes on and on forever, you can't help but think at that scale.

JS: I think, in addition to landscape architects, we have an equal collaboration with all of our engineers and other specialists. With land ports, that's honestly wonderful, because we're literally inventing a new building typology.

SC: You can't talk to anyone who's done a new land port of entry who doesn't speak incredibly enthusiastically about the process and the outcome. We're creating the first thing people get to see as they come into our country; of course, the land port also is a symbol for anyone who's leaving. These are dynamic opportunities. Just the transportation functions that happen around these buildings are incredible. The traffic engineering alone is enormous. So take the idea of creating a symbolic, contextual project; of creating a seamless solution between engineering, architecture, and landscape architecture; of weaving the best security through all of it. The potentials are enormous. There's no way a project team is not going to be wildly enthusiastic about designing a land port.

JS: At the same time I think it's a frustration for some architects who are very excited about doing public work, because land ports defy the notion of public space that one

learns from courthouses. It's a different typology. We're really talking about an experience that begins in a car surrounded by a ton of signage, which is re-released into the landscape after inspection. We believe that the land-port building and the landscape design must evolve together to create this different kind of public space. The relationship between place, the inspection process, and port security, as well as the experience of passing through the port, come up continually through the design process.

SC: It's subtle. If the architect and landscape architect were to have a truly back-and-forth process, you're inspiring each other to play off each other's ideas. And that started so early in Warroad that it's difficult to pin down who was responsible for what.

The same goes for Van Buren. Our understanding of the site and of the architecture evolved with every site visit and research effort. So it's hard to define a single idea of the context and the architecture as belonging to one group or another. Our perspective has been pretty unified since the start of the project, of wanting to create a sequence that takes you to and through the building. The experience is a little more dynamic in Van Buren, because of the cultural history of the region, but you're still setting up an interaction between the traveler and the built environment. You're setting up a rhythm, in order to present the building to the traveler.

JS: A lot of it had to do with pattern making—looking at patterns in the landscape and relating them to patterns on the building.

I have to give GSA an enormous amount of credit for leveraging our studio's capabilities and in leading large project teams. It's given us the ability to demonstrate that a small, intense, focused look at a design can be applied to a project that is much larger and more complex. And for us one of the greatest opportunities is the breadth of voices that GSA brings to a project. Now, we have assembled very large, very specialized teams because we know that on the other side of the table, GSA has a very large and very specialized team of people reviewing our work. And fundamentally I think that speaks to the leadership that GSA has assumed to raise the level of architectural quality in its portfolio. In fact, I would say that when you look at GSA leadership, you immediately think design leadership, you think sustainable leadership. I think there is an emphasis on design across the board at GSA.

It's been a great honor to work for GSA and with GSA. I've been able to learn so much from everybody. As a designer of GSA work, the agency allows us to have a voice: Before we started working with GSA, our clients tended to have very discreet functional objectives. They also had aspirations for architecture that were very challenging. When we began to work with GSA, it was a time when the agency's combined goals of high functionality and inspiring architecture were expanded to incorporate sustainable strategies for 100-year buildings and public spaces. That really allowed our practice to operate in a much broader dimension.

You're looking at building a 100-year building. You're looking at the regional context. You're looking at conveying very lofty aspirations as well as making very practical and streamlined workplaces. So for me the fact that GSA has raised the bar consistently is incredibly important. Though we were very excited to win significant recognition for the Warroad and Van Buren land ports, this insistence on quality isn't just design in terms of winning design awards. It's design across all measures of performance.

Photography Taylor Ledinum/GSA Design Excellence Program except page 42: courtesy of Ennead Architects

U.S. GENERAL SERVICES ADMINISTRATION AND THE DESIGN EXCELLENCE PROGRAM

Public buildings are a part of a nations legacy. They are symbolic of what Government is about, not just places where public business is conducted.

Since its establishment in 1949, the U.S. General Services Administration has been responsible for creating federal workplaces, and for providing all the products and services necessary to make these environments healthy and productive for federal employees and cost-effective for American taxpayers. As builder for the federal civilian government and steward of many of our nations most valued architectural treasures, GSA is committed to preserving and adding to Americas architectural and artistic legacy.

GSA established the Design Excellence Program in 1994 to better achieve these mandates of public architecture. Under this program, administered by the Office of the Chief Architect, GSA has engaged many of the finest architects, designers, engineers, and artists working in America today to design the future landmarks of our nation. Through collaborative partnerships, GSA is implementing the goals of the 1962 *Guiding Principles for Federal Architecture:* producing facilities that reflect the dignity, enterprise, vigor, and stability of the federal government, emphasizing designs that embody the finest contemporary and architectural thought; avoiding an official style; and incorporating the work of living American artists in public buildings. In this effort, each building is to be both an individual expression of excellence and part of a larger body of work representing the best that Americas designers and artists can leave to later generations.

To find the best, most creative talent, the Design Excellence Program has simplified the way GSA selects architects and engineers for construction and major renovation projects and opened up opportunities for emerging talent, small, small disadvantaged, and women-owned businesses. The program recognizes and celebrates the creativity and diversity of the American people.

The Design Excellence Program is the recipient of a 2003 National Design Award from the Cooper-Hewitt, National Design Museum, and of the 2004 Keystone Award from the American Architectural Foundation.

U.S. General Services Administration