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CHAPTER I

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—sustainability 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+ MERRILLELAM

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.



BOBFRASCA+ CHRISFLINT 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.