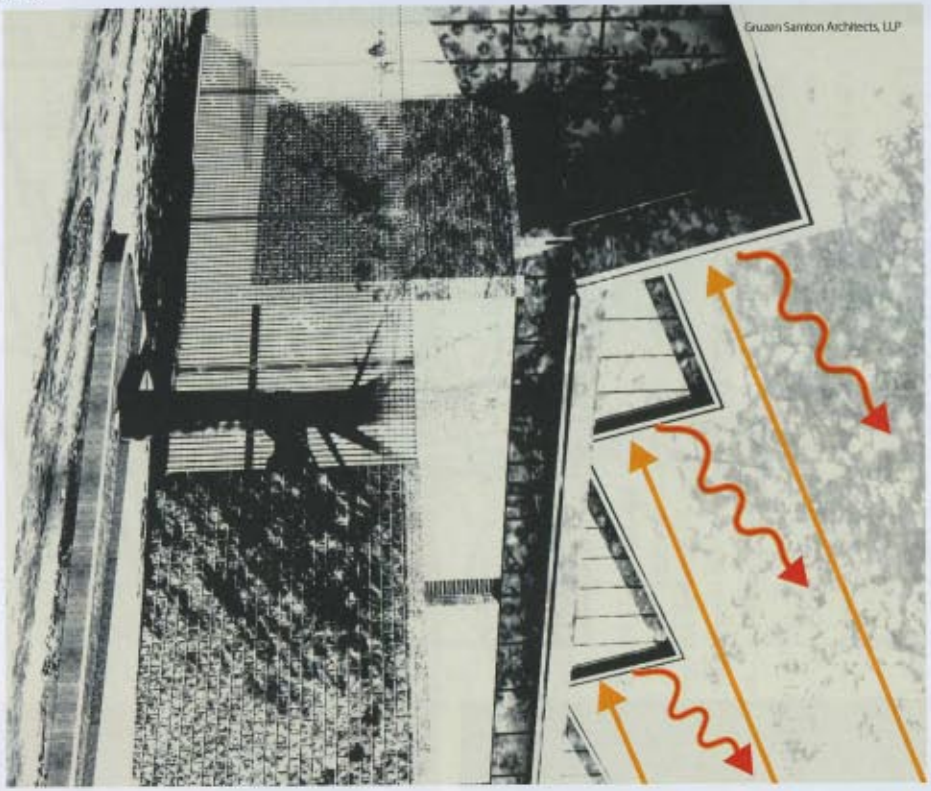
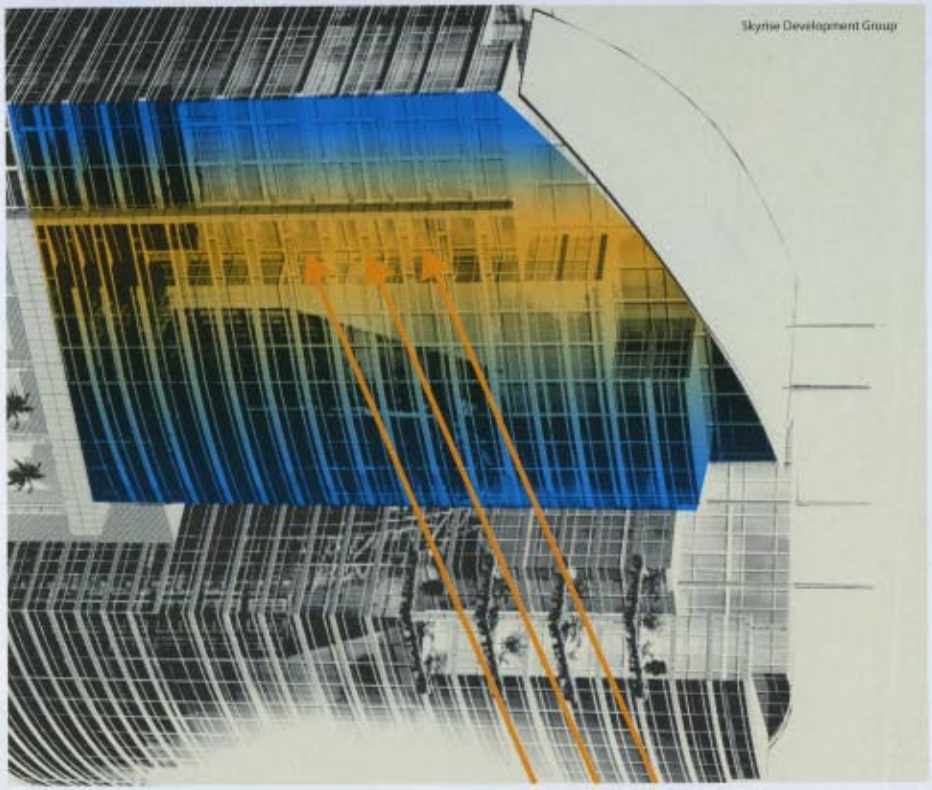

Gruzen Samton Architects, LLP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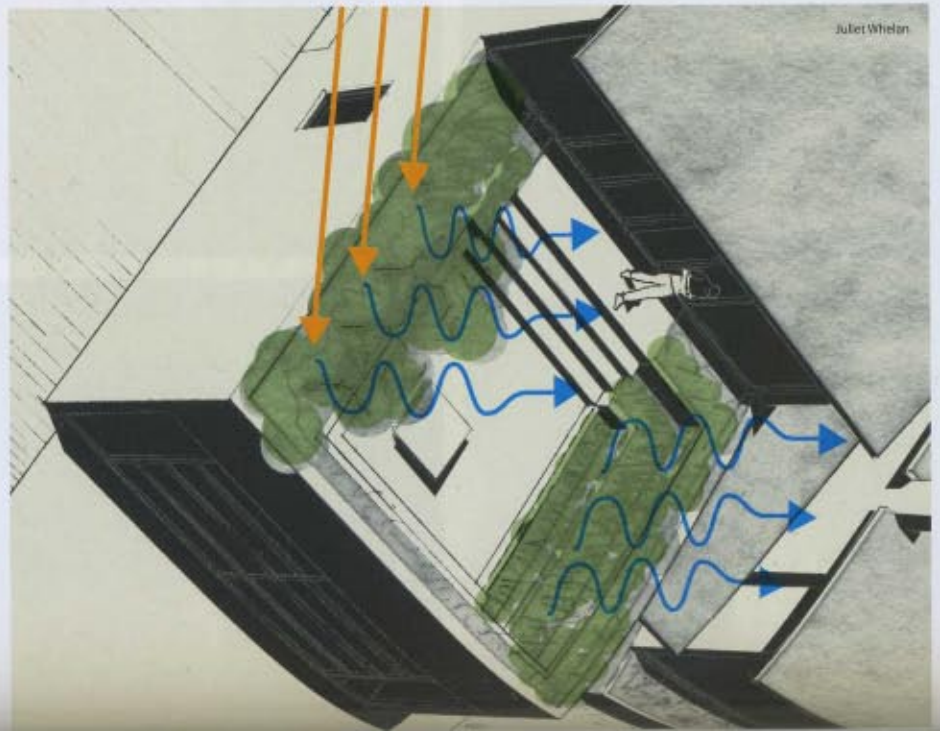

Juliet Whelan


Ric Steel

SUSTAINED EFFORT

Clients, Technology, Aesthetics Drive Innovative Design

BY ADAM STONE

GREEN CHANGES EVERYTHING.

The roofline of a suburban New York police station draws its pitch from an environmentally sensitive HVAC choice. In Pennsylvania, sustainability drives lighting choices in a renovated carriage house. The sweeping curves that define a pair of Florida commercial towers draw their inspiration from a desire for cooling efficiencies.

Efforts to "greenify" buildings are aimed at more just than lowering electric bills. Form itself is driven by choices made in the realms of lighting, power, water usage and other environmental factors. Responding to clients' desires for sustainable solutions, architects are adapting not only the functional but also the visual elements of homes, offices and civic structures.

"You can design a green building that looks like a conventional building. They don't need to be different," said Ralph DiNola, principal with the consultancy Green Building Services in Portland, Oregon. "But we have a growing number of clients who want some visual cues. They are very much attached to the idea of making it part of the design, to educate people about green buildings or sustainability or even about their corporate culture of social responsibility."

Increasingly, technological innovation and market pressure alike are pushing architects to make their buildings stand out as environmentally sensitive.

SUB-TROPICAL CHALLENGES

This spring, Skyrise Development Group charged Waldorf Architecture & Design, its in-house architectural arm, to design the World Trade Center Orlando, a $200 million LEED project to comprise two towers of 25 and 28 stories. The form of these twin structures is intimately driven by environmental ambitions, said Brian Kring, the principal architect on the project. Prompted by concerns about heat gain in the subtropical climate, designers pushed a curvilinear vision with external space defined by sweeping arcs, while facing areas between the towers nestle together in curves that bring the structures just 30 feet apart.

Heat gain is least when the façade is close to a right angle to the sun as it passes through the least amount of the Earth's atmosphere. Kring said the circular form "provides the least amount of glass facing the optimum angle of the sun at any given time, for a short period of time. This also minimizes the transfer of heat that is provided by one large flat surface, and limits thermal expansion and contraction and long term movement, (and maintenance) of the wall."

Other design elements—like the broad steel bows of the roofs that catch runoff for irrigation and green roofing for further water management—also contributed to the pursuit of LEED certification. Context drove design as well: sheared-off planes offset the curves, a reflection of the shapes seen in local palms.

Kring would have gone rounder still, with a cylindrical solution that would absolutely minimize heat gain, but there were practical limits. "Unless you are at a very large scale, that round form isn't going to work, for example, in terms of putting square elevators in it and square duct work. So we have to make some compromises."

Despite concessions, the form here ultimately was the product of the local climate. Driven foremost by this environmental concern, an entire design schema emerged.

Just outside Philadelphia, Juliet Whelan, a principal at Jibe Design, is tackling a renovation project from the ground up based on green principles. From the superstructure through flooring materials and lighting design, each design choice has been informed by a desire for sustainability.

IN THE DETAILS

The owners of the 1,100-square-foot carriage house in Mt. Airy, Pennsylvania, want the space doubled. Whelan also wanted to clean up existing design elements, which include a brick face and peaked roof, with enclosed wood-paneled porch tacked on. "A bit of a mish mash," as Whelan put it.

Guided by the client's call for sustainability, the architect's first decision was to retain and reuse, specifically keeping the foundation and exterior walls in circulation, extending their functions within the new structure. "There is a big pile of brick and concrete that I am going to keep on site, so that is a green consideration," she said.

Inside, Whelan shied away from her instinctive choice to use recessed lighting cans, which might diminish the impact of insulation. Her use of pendant and surface mount lighting has fundamentally altered the look and feel of interior spaces. "With this you get more visual noise on the ceiling, and that can be a great design element, These pendants can hang between exposed beams and the beams have a horizontal rhythm, while the pendants have a vertical rhythm. So it makes a nice sculptural element."

Even the mood of the flooring bows to green intent. "I would typically choose wood flooring, but tile or concrete are better conductors for (environmentally sensitive) radiant floor heating, so we are choosing slate tile for the floor," Whelan said. "The look is completely different, it is harder, so it feels different on your feet. And it is not a traditional look, so you are asking someone to see things in a different way."

THE RIGHT LIGHT

In the civic realm, Susan Drew and her team at Gruzen Samton Architects in New York have fashioned an entire facility around the core green principle of intelligent daylighting. Drew, a principal at the firm, is designing a mixed-use structure for the city's Department of Transportation. Known as the Sunrise Maintenance Yard in Ozone Park, Queens, the 27,000-square-foot structure houses a maintenance workshop, offices and warehouse.

Green calls for natural lighting. More than this, though, environmentally sensitive design demands lighting that is appropriate to the circumstance. In this case those circumstances vary. The offices need daylight, the shops need natural light but without any glare, the warehouse needs minimal illumination and no air conditioning. All these concerns naturally impact energy consumption.

To accommodate these varied needs, designers broke down their building into three separate components, distinct physical spaces that could be oriented and illuminated according to their specific needs. Office spaces face the street, with a southern exposure shaded by mature trees, light shelves and user-controlled shades. In the workshops, north-facing monitors totally prevent direct sun.

The tri-fold structural approach "was the fundamental design choice," Drew said, and it grew directly from the desire to go green. In addition to supplying each area with the lighting best suited to the specific function, this decision also made it possible to optimize the mechanical systems for each operational area.

To fulfill the further green ambition of fitting buildings into the local context, designers took their cue from neighborhood design elements such as masonry, clerestories and a folded roof with overhanging eave details. A necessary security fence incorporates public art created from brick salvaged from the demolition of a prior structure. In all these ways, the ultimate form of the facility reflects environmental ambitions.

In another civic example, Steelbone Design Company (formerly Flynn Stott) in Southampton, New York, recently took on a police station for Southampton Village. Seeking an energy-efficient HVAC, the team chose a geothermal solution, and that decision had a marked effect on the overall form.

"If we had used conventional equipment it would have required a flat roof at one point or another," said Principal Richard F. Stott. "As it stands, this is a big pitched roof, which is very typical for the area, a copper-green painted, standing-seam roof that reflects light nicely and doesn't heat up too much."

Guided by the client's call for sustainability, the architect's first decision was to retain and reuse, specifically keeping the foundation and exterior walls in circulation, extending their functions within the new structure.

As a piece of design, the roofline succeeds in large measure because of the architects' readiness to address green concerns early on in the process. "The sooner we begin to think about employing these things in the design phase, the more we can integrate them into the design, rather than screwing them down onto the roof as an afterthought," Stott said.

Such matters of process underlie much of the interplay between sustainability and design outcomes. Green adds another level of consideration, and this ought to require extra time, effort and planning on the part of designers. Yet some say the biggest design decisions in regard to green are often the ones most easily made.

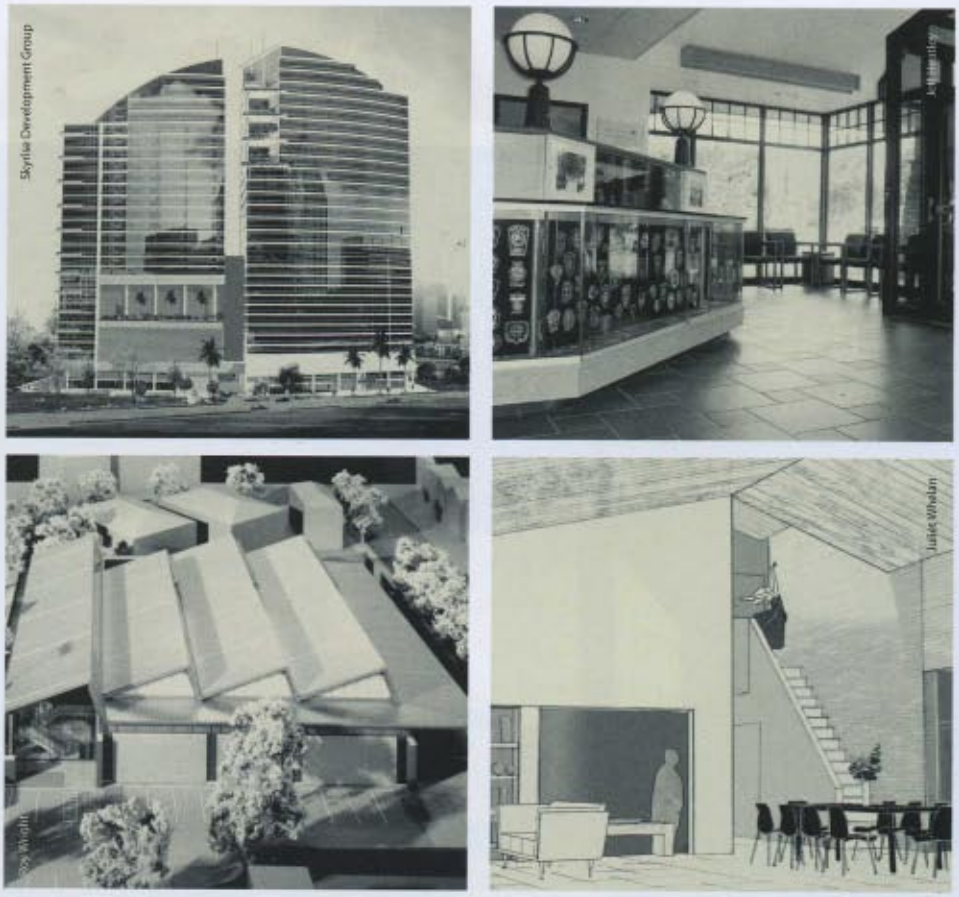
"The amount of time it takes to say that we will use a concrete structure because concrete in this location will take less energy to manufacture than steel—those are decisions you make up front. How long does that decision take? Not very," Kring said. "But then when you get to the end of the project and you are choosing finishes, it is far more time-consuming to determine when the manufacturing process is less energy intensive for one solid-surface counter top than for another solid-surface counter top, and then looking at the relative cost and deciding."

Ironically, green's influence over the fundamental elements of scope, form and orientation—the basic aesthetics of form—may be more readily determined than the environmental impact of the kitchen tiles.

BUT IS IT PERMITTED?

All this assumes that the kitchen tiles—never mind the alternative HVAC, the green roof, the high-performance ventilation—will ever be permitted in the first place. While green capabilities may shape the organization of form, it is equally true that bureaucratic resistance to these technologies can apply a strong counter pressure.

In 2004-2005, Randall Teal of Teal Studio in Eugene, Oregon, was brought in to design a residence for a client with strong environmental ambitions. She wanted the greenest she could get, including an on-site self-treating water system, but the Eugene's Department of Environmental Quality balked.



Environmental considerations played into the designs of, clockwise from upper left, the World Trade Center Orlando, a police station in Southampton, New York, a residential rehab outside Philadelphia and New York City transportation maintenance yard.

"They were very sympathetic but the message basically was: 'Don't even bother. The plumbing code is from 1970 and it would take an act of Congress to change those codes,'" said Teal, an assistant profession in the University of Idaho College of Art and Architecture, Department of Architecture and Interior Design.

Things are changing, though. Far from resisting green design ideas, a growing number of municipalities now are requiring them. Earlier this year, Maryland Gov. Martin O'Malley signed a bill establishing green building standards for state buildings and public schools and Maine adopted a new set of uniform building and energy codes requiring new homes to meet minimum energy performance standards. Seattle already requires LEED Silver certification for all city projects over 5,000 square feet.

Some in the design community say these changes all are to the good. They argue that green concerns not only can but must be allowed to inform the shapes of our homes and offices in the coming years. And those considerations need not drive dramatic changes in design.

"It doesn't have to been some wacky form with lots of moving parts, something screaming green," said Chris Schaffner, principal of The Green Engineer consultancy in Concord, Massachusetts. Whether it's a profoundly distinctive exterior element or something as subtle as a choice of lighting fixtures, the growing influence on form of green design likely will continue, and it will continue to be driven by evolving client tastes.

"Maybe they want a fancy car with all the bells and whistles, or maybe the want something much more subtle," Schaffner said. "Ultimately it has to do with who you are building for. It has to do with the ambitions and the budget of the owners." ■