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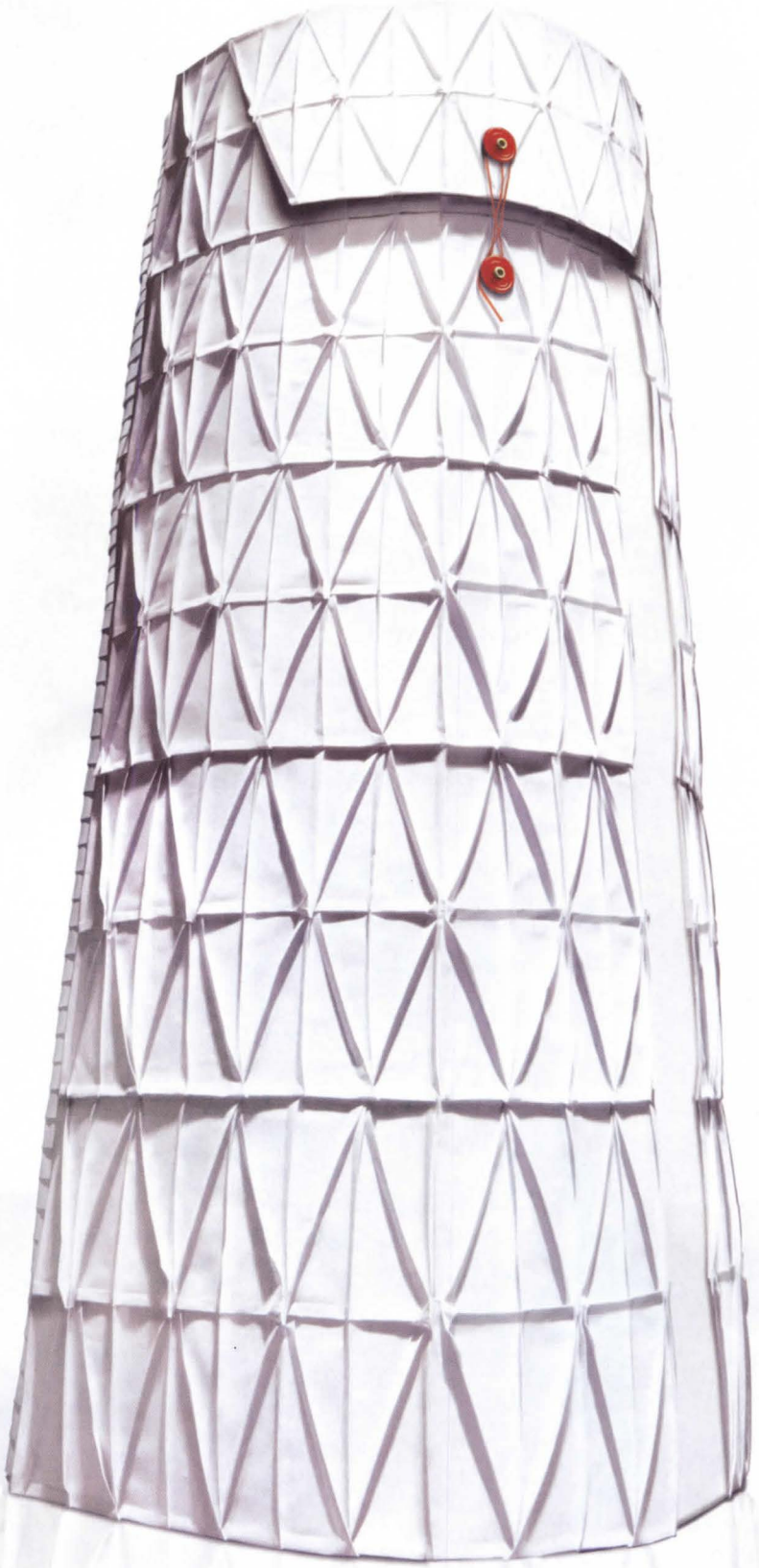

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ABOVE: Giant Interactive Group, by Morphosis. Photograph © Iwan Baan.

ON THE COVER: Photograph by Jason Frank Rothenberg for ARCHITECTURAL RECORD.

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EIFS Update: Pick the Right Substrate

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Carpet for Schools: A Sustainable Solution that Enhances Learning and Health

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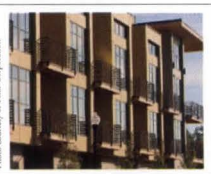

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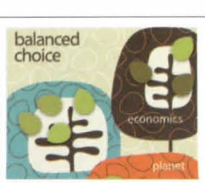

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FEEDBACK, CONTRIBUTIONS, AND COMMENTARY FROM OUR READERS

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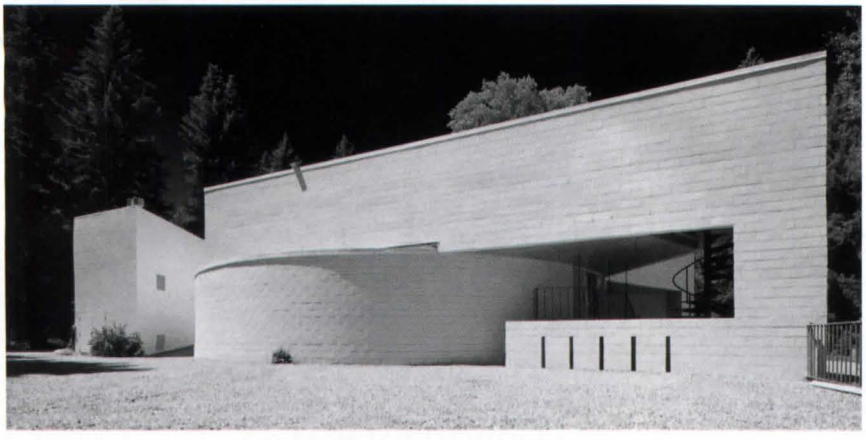
[READER PHOTOS]



MOST READERS WHO SUBMIT PHOTOS TO OUR GALLERIES OPT FOR BURSTING, SATURATED PALETTES, BUT A FEW RECENT SUBMISSIONS PROVE THAT BROODING BLACK-AND-WHITE CAN BE EQUALLY ATTENTION-GRABBING.

[TOP] Mies van der Rohe's Farnsworth House, Plano, Illinois | Submitted by "jcedano30"

[CENTER] Harry Weese's Given Institute, Aspen, Colorado | Submitted by "gnwatts"

[BOTTOM] Frank Gehry and Vlado Milunic's Dancing House, Prague, Czech Republic | Submitted by "ulysses.apr"

[COMMENTS AND LETTERS]

OUR STORY **"USGBC, LEED TARGETED BY CLASS-ACTION SUIT"** TOUCHED OFF A DEBATE ABOUT HOW BEST TO ASSESS THE ECOLOGICAL IMPACT OF BUILDING PROJECTS. HERE ARE SOME HIGHLIGHTS...

USGBC should be commended for moving the building industry forward, helping to create standards, and spending money to advertise to the general public to create demand.... Working within green standards is changing the building industry's practices. I'd testify to that in court. —PAM PIERCE, LEED AP

LEED has its good points. But, as an architect, I contend that if LEED is that good it needs to be written into the code. Perhaps a "LEED Inspector" becomes part of the code, with a sign-off spot on the Building Inspection Card. —ANONYMOUS

As a recent 19-year veteran and past chairman of the ASHRAE committee that sets the LEED energy benchmark, and as a practitioner who also sees the actual utility bills for thousands of buildings — new, old, and LEED — I can tell you that most LEED buildings' energy performance is no better than that of most other new and old buildings. And in too many cases, it is worse. Between compliance with ASHRAE 90.1 and the measures that many people use to get more LEED energy points, buildings have become so complex that they cannot be operated efficiently, and too often they waste energy efficiently. The widely publicized LEED Platinum ASHRAE Headquarters Building is just one example. —LARRY SPIELVOGEL, PE, ASHRAE

I would much prefer that green design and construction be voluntary. A grassroots approach is much more effective than when the government gets involved and starts mandating compliance with unproven science. —ANONYMOUS

The USBGC is a business that might have started with good intentions, but like almost every good start, greed changes its pace and purpose. —ANONYMOUS

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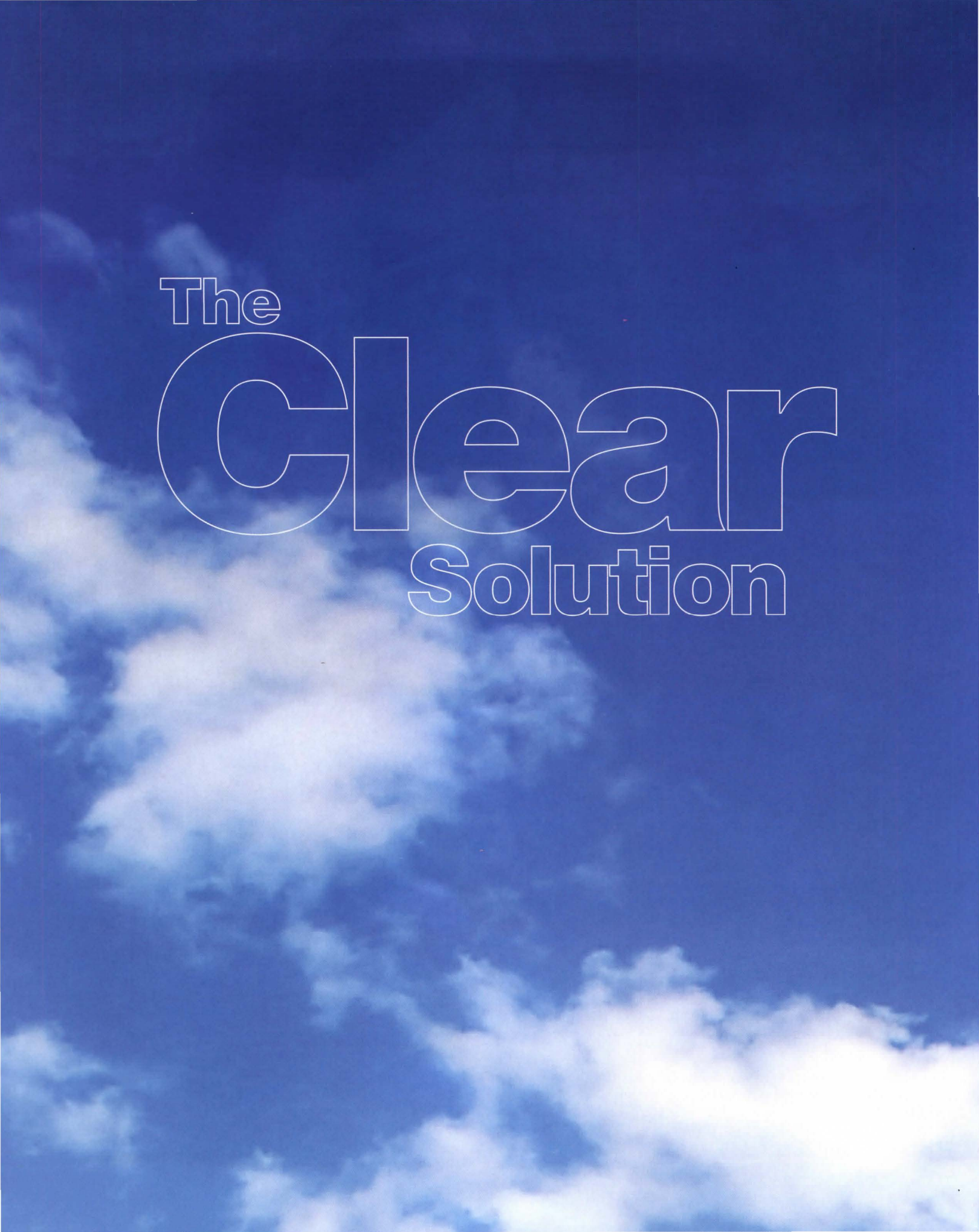
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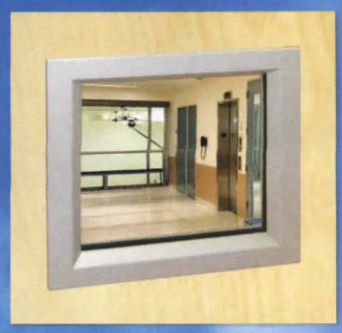

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Still Standing: The Architect in 2011

Following a Decade of Highs and Lows, America's Architects Are Asking, "What Now?"

WHOA. WAIT A MINUTE. That's not an ARCHITECTURAL RECORD cover. At least not one I'm familiar with. What's a person doing there? Where's the building? Where's the beef?

If you're confused, thinking that you might be inhabiting a parallel universe, calm down – you're right. Except for the blurred image of passersby, RECORD has not featured a living soul, except for the portrait shot of the AIA Gold Medalist we've run every year since 1999, when Frank Gehry took center stage with a rock-star, black-and-white poster moment. Yet here is an average architect staring back at you in the year 2011, looking, well, normal. (By the way, which issue did you receive, the one with the man or the woman?)

Since the foundation of the world, architects have consistently told us, "Please, please, do not put people on the cover." Why? You've said that you think it trivializes the work we architects do. It places too much emphasis on gender or race or all of the above. Our work as architects should be paramount. We've studied and worked for years to arrive at professional status, so go easy on the personalities. Focus instead on architecture. Clearly, we understand your concerns. So when we chose a person for this special cover, we meant to grab your attention in a watershed year that has us gasping, but unbowed. "What now?" indeed. The architect still stands.

In addition to drawing attention to a new decade, our poster architects signal changes within the publication. For eons, readers have asked us to include more criticism in our pages and on the Web. We have raised our hands (right or left?) to make the critical pledge, more than once. Yet architectural glossies have too often been guilty of a kind of "boosterism," as Alexandra Lange states herein, so we added more criticism into the mix this month. Change, which we serve up with this issue, pumps oxygen into any publication, in any form. It gives it zip for another sprint, allowing ARCHITECTURAL RECORD to enter 2011 on an oxygenated high.

The central theme of the publication, announced on the cover and on our Web site, is "What Now"? After a decade of ultimate highs and lows (the richest decade/the poorest years), we stand at a crossroads. Deputy editor Clifford Pearson has composed a polyphonic arrangement for days past and yet to come, with multiple voices that include respected architects, economists, historians, and our own staff. (We do have points of view. You should hear us kvetch.)

You, the reader, will notice the differences most in the departmental matter at the front of the publication, where we have adopted a decidedly more conversational, critical tone. Call the title of this section "Kultur," but don't be fooled by the innocuous-sounding individual sections. There's a bit of tooth behind the polish. Ask Suzanne Stephens, our deputy editor, who helped shape the columns. "Community," for example, captures threads, letters, forum entries, and anything else that has been contributed to our Web site – in this case, a range of opinions on the LEED rating system.

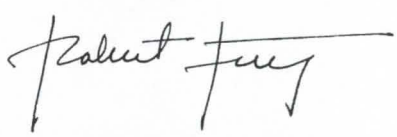
When is news not news? Today we recognize that you have already seen the news on your PDA or gulped breaking events with your morning latte. In this fast-as-light world, what's a monthly to do? Rather than mimic a newspaper, we weigh; we think. In this issue, you will find news in perspective, an analytic look, even an opinion or two, about important or interesting actual events. Read our take on the recession at the dawn of another decade, or follow the interview of the German-African architect Francis Kéré, who engages with the communities that help build his designs. "On the Boards" presents the most fascinating projects worldwide, while "Briefs" brings the news full circle, pointing us from print back to the Web site. Jenna McKnight, our news editor, leads you through the paces – fast on the Web, slow-burning and thoughtful in print.

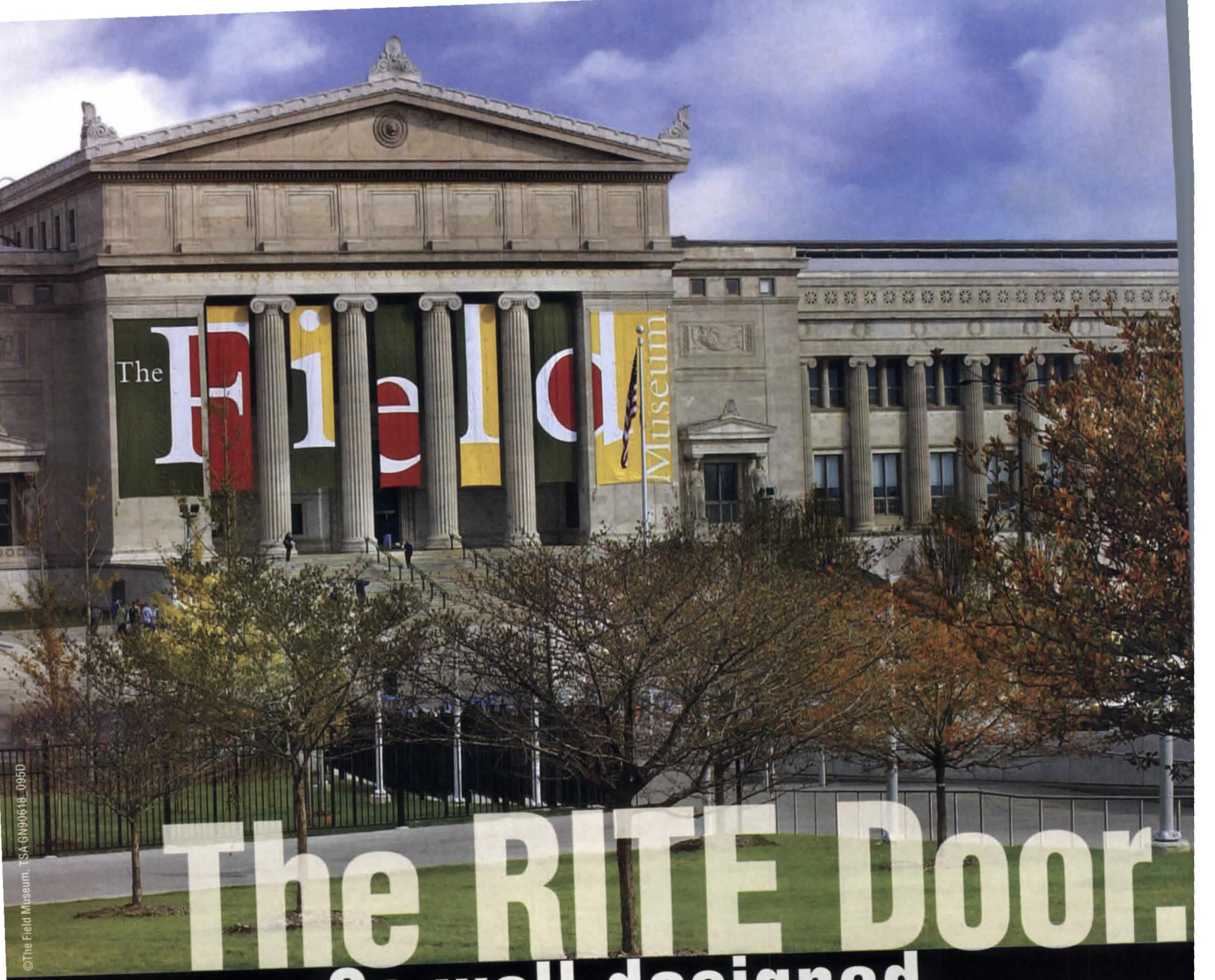
Ah, who doesn't love a rant? At least a funny one. Expanding on our legacy of great writing, Martin Filler takes a bite at contemporary architectural practice. We give him free rein, almost, in our "Commentary" column, in which he sends up architectural firm names. Are they wannabe rock bands or what? The field seems begging for the treatment, and Filler and Charles Linn deliver. Reviews, always a chance for get-real language, here take on an art installation, film, and books, rounding out the sparky front matter, which changes monthly.

All this hype for the January issue might seem more dramatic than the actual publication you are leafing through. We've talked change, but RECORD will always feature architectural projects. *Plus ça change, plus c'est la même chose.* One difference, already inaugurated, involves integration, in this case the meshing of two vital ingredients – call it an ultimate mash-up. Featured projects will occasionally offer continuing education credits, where the depth of content and a full presentation warrant. Such is the case in this issue with the newly opened Brooklyn Bridge Park. Ingest, synthesize, learn, and count your credits.

Many of us design schools, a perennial building type that will always find a place in ARCHITECTURAL RECORD. But for this issue, even our franchise "Schools of the 21st Century" has been refreshed with a story on architects finding the simplest solutions for educating students around the world, things you could imagine doing yourself.

So how do we follow up? Another generic architect on the cover? How would they be dressed? Who would do their hair? As dramatically as this issue announced change, next month's cover will feature one of the most informative or inspirational or amazing architectural projects, wherever it might be located on planet Earth. So relax: ARCHITECTURAL RECORD remains ARCHITECTURAL RECORD, even as the decades roll. The curtain closes, dramatis personae recede into the shadows. Please tune in for Act II, next month, wherein "everything old is new again: renovating and retrofitting your way to success."





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WEB HIGHLIGHTS

- Cruz, Lynn Win $50K Awards from Nonprofit U.S. Arts Group
- LEED Gold Now a Must for Federal Buildings
- Five Firms Competing in MoMA PS1 Young Architects Program

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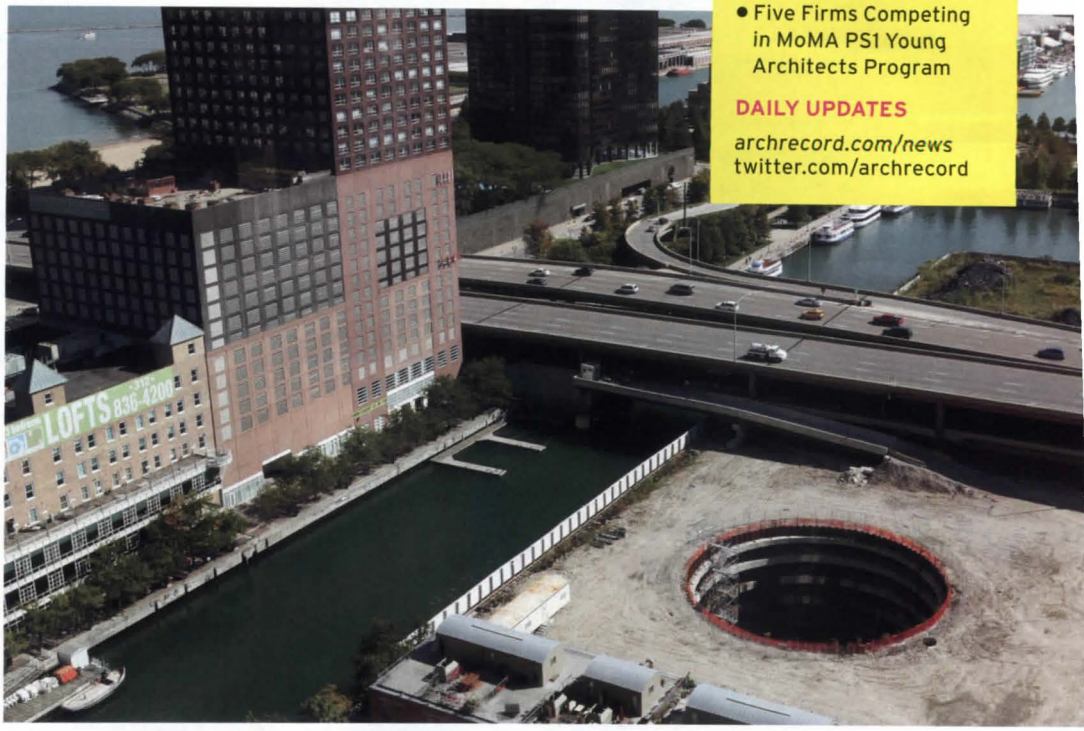
[ECONOMIC OUTLOOK]

Will We Ever Get Out of This Hole?

For architects, the Great Recession hasn't really let up since its official start in December 2007. Countless projects are stalled or canceled, including Santiago Calatrava's Chicago Spire – now a 110-foot-wide void. Writer **C.J. HUGHES** investigates what's in store for architects in the near future and beyond.



Numerous projects have been halted globally, including Calatrava's Chicago Spire, now a 76-foot-deep hole.

IF THE SLEW of Internet posts, letters to editors, and comments to reporters are to be believed, the economy has put the architecture business in such a deep funk, it's like a proverbial doornail: dead.

And there's plenty of long-term statistical evidence – about unemployment, a lack of projects, tight credit markets – to back up that prognosis. Besides, architects who have lived through previous downturns often say that this one feels different in a not-so-good way.

Yet an alternate reading of the tea leaves suggests that what may really be happening is that architecture is not keeling over but molting. The field is becoming a multidisciplinary profession that will benefit generalists over experts, however painful that transition might be, according to employed and unemployed designers alike.

"I don't think it's dying, but I do think it's taking a different direction," says Paul Mendolia, 60, of New York City. The 35-year practitioner was let go from a firm in 2009. He has since been hired back as a freelancer, though at a fraction of his former wage, for tasks like filing paperwork with local building departments.

In Mendolia's view, the only chance he has to land steady, dignified work again is to become more proficient with modeling software, which seems to be a requirement of the few jobs that are advertised. Though classes can be prohibitively pricey, he says, "if I don't get up to speed with CAD [computer-aided design] and the rest of it, I think I will be left behind."

Joblessness persists in the field: Some AIA leaders put the unemployment rate at 20 percent or higher. And more gloom is spelled out by the Architecture Billings Index, compiled by the AIA. Since January 2008, the index has cleared 50 only twice, in September and November of 2010 (anything less than 50 suggests an industry in contraction).

The next generation of architects may be in a better position to weather slowdowns if they act as their own clients by becoming developers, too, says Vishaan Chakrabarti, who runs the real estate development program at Columbia's Graduate School of Architecture, Planning, and Preservation.

"Architecture is by no means dead," says Chakrabarti, 44, who once worked for Skidmore Owings & Merrill (SOM), though being successful now requires more than just making sure a structure doesn't leak or fall down. Business savvy is key, which might explain why 55 of his 103 students, a recent spike, have architecture degrees or are pursuing them. When Chakrabarti was a student, he says, "it was sort of a badge of honor to be stupid about money, but no longer."

That holistic spirit can be realized on the professional level as well, according to Bill Sharples, 47, a founding partner of the 14-year-old New York firm SHoP Architects, which recently created three other stand-alone businesses. These include a two-year-old construction arm that is hired by other architectural firms as a subcontractor.

"Before, we were doing [pattern-design work] in-house, and we weren't getting any fees. So we decided to get paid for it," says Sharples about SHoP Construction, which was profitable this year and will be handing out holiday bonuses.

In fact, Sharples credits his diversified revenue stream – he also has green technology and design software businesses – with helping SHoP bounce back quickly from layoffs that cost them 30 employees in 2008. Today, the firm employs 67 people, he says.

Some sectors, such as housing, may still be R.I.P. for a while, especially in certain U.S. markets – Nevada, Florida, California – that have too much "overhang," says Bradford Perkins, chairman of Perkins Eastman. Those woes contributed to his firm's axing of 20 percent of its staff in late 2008, says Perkins, adding that this recession dwarfs the previous three he has worked through since the mid-1970s.

But Perkins Eastman will be hiring again in 2011, fueled largely by overseas demand, says Perkins. He predicts that other major firms like SOM, Kohn Pedersen Fox Associates, and Gensler will begin to boost their staffs, too.

The foreign projects that Perkins is most focused on now are senior centers in China, which by 2050 will have 300 million people over the age of 65, he says. Also, his firm, which has six offices overseas, has been busy designing schools for expatriates in Hanoi, Shanghai, and Beijing.

"It is a cyclical business, but people didn't see this [recession] coming," Perkins says. Studies in the mid-'00s showed there was an undersupply of architects. "Unless all the research prior to the recession is completely erroneous," Perkins says, "I remain cautiously optimistic about a recovery."

[NEWSMAKER] **Diébédo Francis Kéré**

Kéré's story is remarkable: He grew up in poverty-stricken Burkina Faso, won a scholarship to study carpentry in Germany, and went on to earn an architecture degree from the Berlin Technical University. While still a student, he built his first project: a school in Gando, his native village, which received a 2004 Aga Khan Award and starred in the recent MoMA exhibition *Small Scale, Big Change*. Today, Kéré lives in Berlin but remains focused on designing (and raising money for) sustainable buildings in Africa. Editor **JENNA M. MCKNIGHT** speaks with Kéré about his work.

Kéré, an award-winning West African architect, runs an eight-member firm in Berlin but remains focused on his homeland.

What led you to become an architect?

I wanted to make things better in Burkina Faso. When I was a young child, one of my jobs was to go far away to make bricks and bring them home with a donkey and cart. In my mind, I thought, One day I will make it better for my people.

Are there any educated architects in Burkina Faso?

No. There is only one architecture school in French-speaking West Africa, in Togo, and it has fewer than 200 students. They don't have access to information, they don't have the chance to discover and be inspired by other projects. I am very privileged.

Which architects have inspired you?

This is difficult to say. I am impressed by the quality of design by many architects. Of course there is Mies as the rationalist, whose work I studied at university. But if there is one architect I admire the most, it is Louis Kahn. His dedication to architecture is so unique and inspiring to me.

Architecture school can be very competitive. Was it difficult studying in Germany?

I tried not to be the best, but to have a good project. Everyone said, You don't want to build a skyscraper? You don't want to build a huge villa? I said, No, nobody needs it in Gando. *My greatest concern* was to learn how to use very simple techniques to do something for my community, and to be able to teach people these techniques. I started to look at brick production, to study how people built in Europe's past, and from there I discovered the longest-lasting things are not high-tech but are made by people with local means.

Your first project, the Gando primary school, is made of clay bricks. Were villagers surprised that you wanted to use a traditional material instead of, say, concrete?

They were thinking the Germans had brainwashed me.

Once you started building it, and engaging them in the process, I imagine they became receptive. Do they like the school?

They are really proud; they really love it. We built the first school for 120 pupils, and three years later, we had to make an extension because there was a big demand. Now we have 800 students; we're going to have 1,000 next year. For you, here in the U.S., it may seem like it's nothing. But for my village in Burkina Faso, it is significant.

You must feel satisfied.

More than that. I am proud of my people, that we have done this together.

Are you working on other projects in Gando?

I am building a library, which is under construction. I look forward to being able to build a high school. The government has agreed to send the teachers, so I don't have to worry about that; I just need to construct the building. And then, I am looking forward to building a women's center. It would empower women and help them become more economically independent, because women suffer the most in developing countries. It is going to be my most important project.

Do you have funding?

I am still waiting for complete sponsorship. I want somebody who really understands what we are doing. I am really connected to this project. I need 100,000 euros. It's not a lot of money when you regard what it can be.

You now have commissions outside of your homeland – a park in China, for instance, and a permanent exhibit for the International Red Cross and Red Crescent Museum in Switzerland. Why are you expanding the scope of your work?

I have to lead a life, and I need this money to keep developing ideas for my people. When you earn the money yourself, you can use it how you like.

Do you think it's good when Western architects come work in Africa?

Yes, when it's a convergence, an exchange. When you have somebody from the U.S., which has modern knowledge, and someone from my culture, which is traditionally strong – when they work together in a real partnership, it is great.

Do you think there's a growing interest in humanitarian design?

Oh yes. Climate change, the economic crisis, the need for infrastructure – students are seeing there are opportunities to make a difference. And some well-known architects are starting to talk about going back to the root. Everything is interconnected; we are all living in the same world. *And you can change* your world, step by step.

Read more about Kéré's work on page 118, where we feature a secondary school he completed in Dano, Burkina Faso.

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CIRCLE 38

ON THE BOARDS

Project Zayed National Museum
Location Abu Dhabi, UAE
Architect Foster + Partners

Foster's design for the Zayed National Museum – in which five solar-thermal steel towers emerge from a mound – seems to buzz imperceptibly. Are those wings? Eyelashes? The 21st century's Gregor Samsa? The museum will be built on Saadiyat Island and will be dedicated to Sheikh Zayed bin Sultan Al Nahyan, who ruled Abu Dhabi from 1966 to 2004 (he also was president of the UAE). Exhibitions will be devoted to the region's history, natural resources, and people.

Project Museo Soumaya
Location Mexico City, Mexico
Architect LAR Fernando Romero

Scheduled to open in early 2011, a new 172,000-square-foot building for the Soumaya museum in Mexico City will no doubt be the focus of an over 6-million-square-foot mixed-use development in this former industrial zone. The steel structure will support windowless facades clad in hexagonal aluminum panels. Inside, a series of ramps will lead visitors through six levels of exhibition space housing the museum's eclectic art collection.

Project Okhta Tower
Location St. Petersburg, Russia
Architect RMJM

Slated to be Europe's tallest building, the 1,322-foot Okhta Tower is the centerpiece of a planned 190-acre complex. While the project has sparked protests – and UNESCO has threatened to strip St. Petersburg of its heritage status if the supertall skyscraper is realized – a federal building agency recently green-lighted the scheme. It now awaits approval from city hall. RMJM has been tight-lipped about the $2.5 billion project, which is being developed by the Russian government and the energy giant Gazprom.

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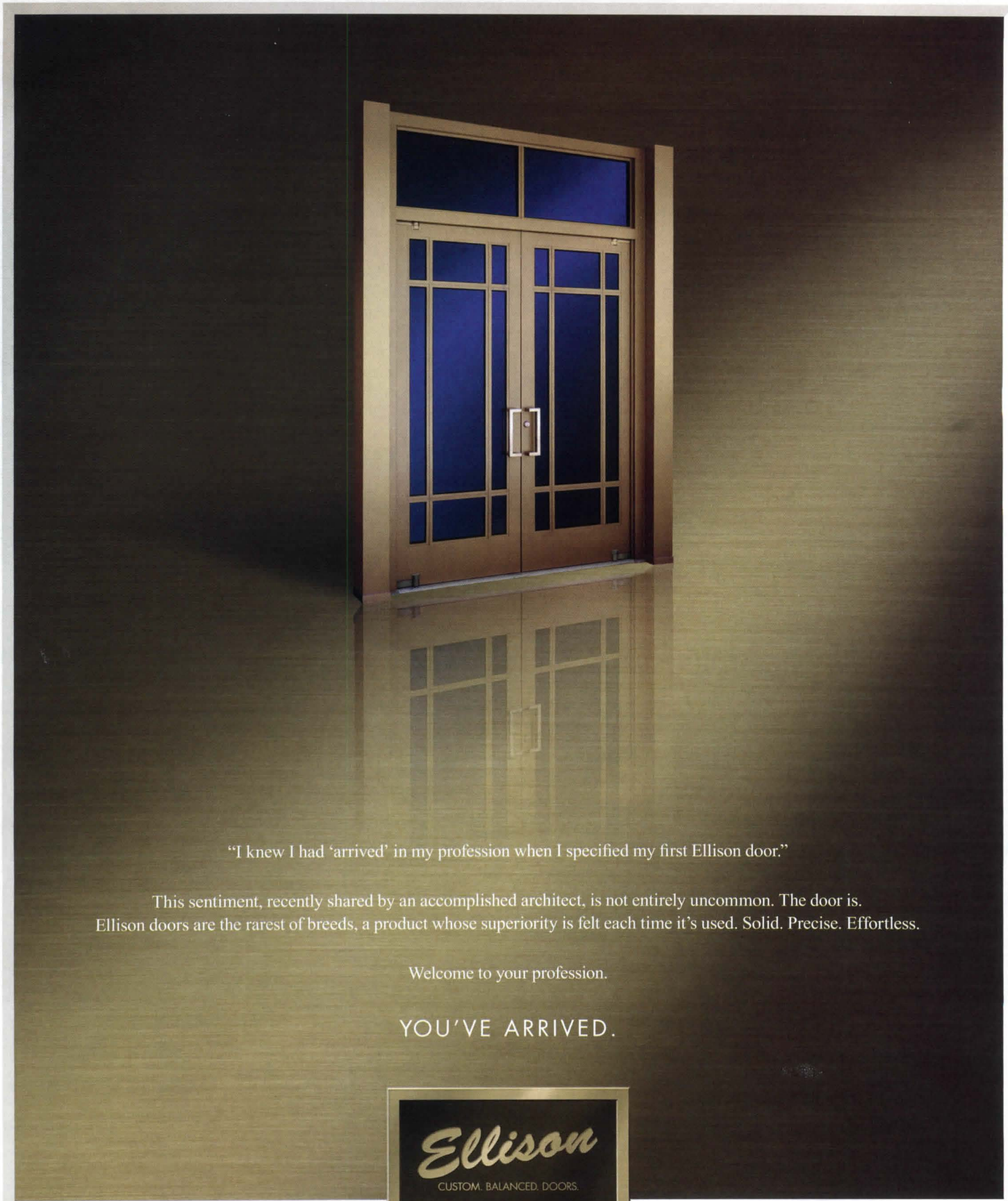
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CIRCLE 25

Haiti Housing Designs to Be Unveiled

After notable delays, the winners of the "Building Back Better Communities" competition, a Haitian government-sponsored initiative to generate housing solutions there, will finally unveil their ideas.

This month – one year after the 7.0-magnitude earthquake devastated the country – 150 teams representing designers, manufacturers, and builders from around the world are expected to converge in Port-au-Prince for a four-day conference at which they will present renderings to government officials and the general public.

The competition, which attracted 400 submissions when announced last summer (including one, pictured here, by New York architect Rodney Leon), was organized by John McAslan + Partners, a London-based design firm, along with the Clinton Foundation, the World Bank, and Architecture for Humanity.

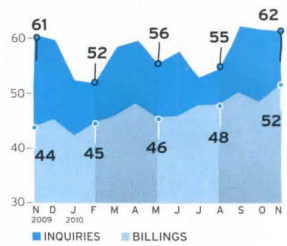
The conference is just a prelude to the main event, an expo slated for May, which will feature small-scale prototypes of the winners' designs built on the northern half of a 12-acre former sugar plantation. At the expo, representatives from nonprofit organizations and development groups will shop among the various designs and possibly commission architects to reproduce them, says architect John McAslan.

Next November, the best designs will be constructed at full size on the southern half of the plantation site, for a permanent village, McAslan adds. But details are still murky, given the chaos that ensued after Haiti's disputed elections. Those same elections initially forced the delay of the expo, pushing it from October 2010 into 2011.

The January 12 quake destroyed 200,000 homes, and 1.5 million people are reportedly still homeless. *C.J. Hughes*

A Grand Opening for Gehry's Concert Hall in Miami

Frank Gehry's first Florida project – a concert hall for the New World Symphony in South Beach – will officially open on January 25. From the street, the roughly 100,000-square-foot boxy building doesn't look like a Gehry edifice. But the architect's stamp is evident inside, where sculpted volumes are suspended inside a soaring atrium. An 80-foot-tall glass curtain wall gives passersby a glimpse into this canyonlike space. The site also features a new 2.5-acre park designed by the Dutch firm West 8.



ABI Jumps Over 50

At last, the market for architectural services might be bouncing back. In November, the ABI rose to 52, up from 48.7 the month prior and 50.4 in September. (A score above 50 denotes an increase in activity, and below 50, a decrease.) The inquiries score, which has registered in the sixties for several months, hit 61.4 in November. Here's hoping 2011 will bring the long-awaited recovery.

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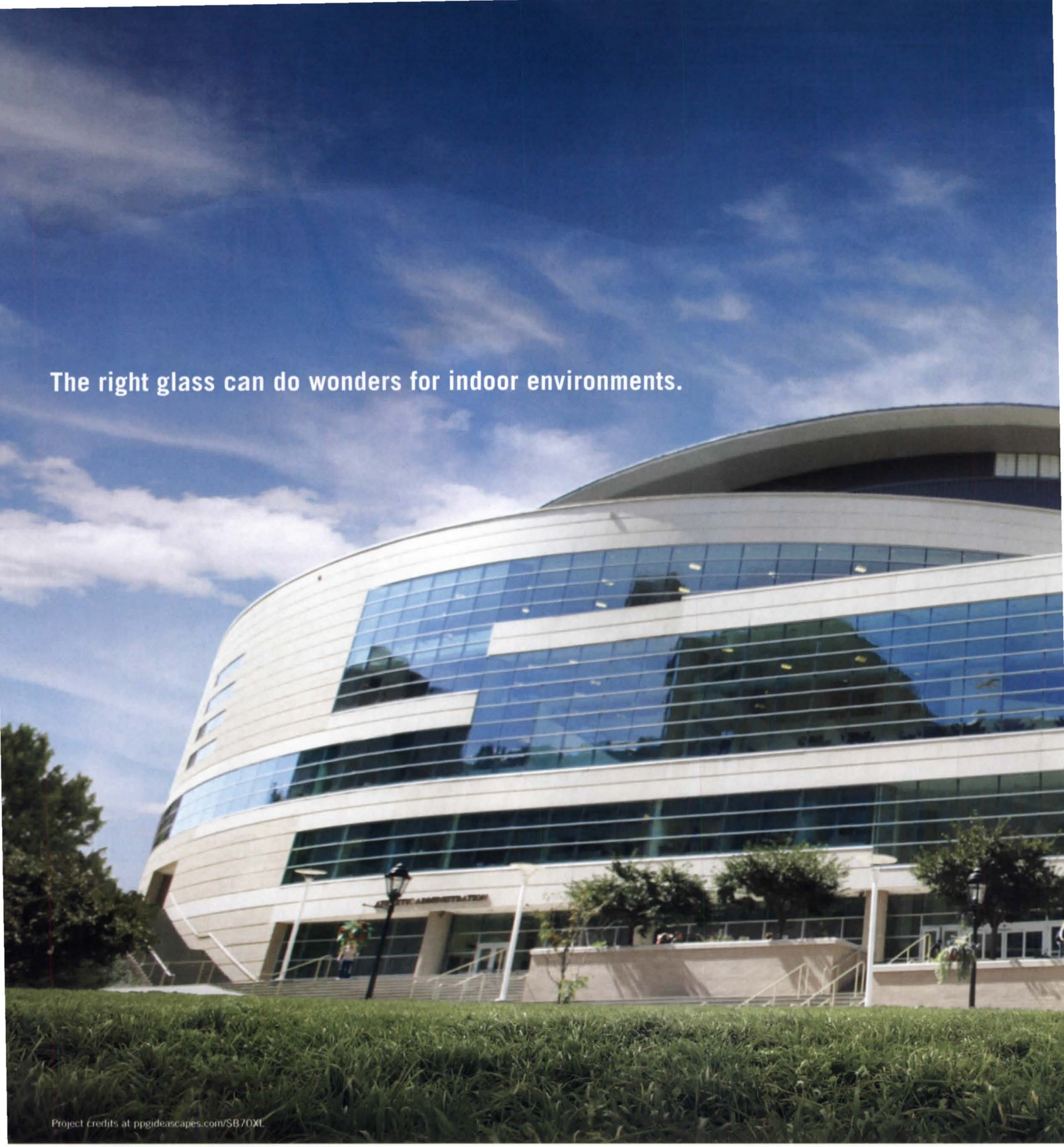
CIRCLE 52



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CIRCLE 54

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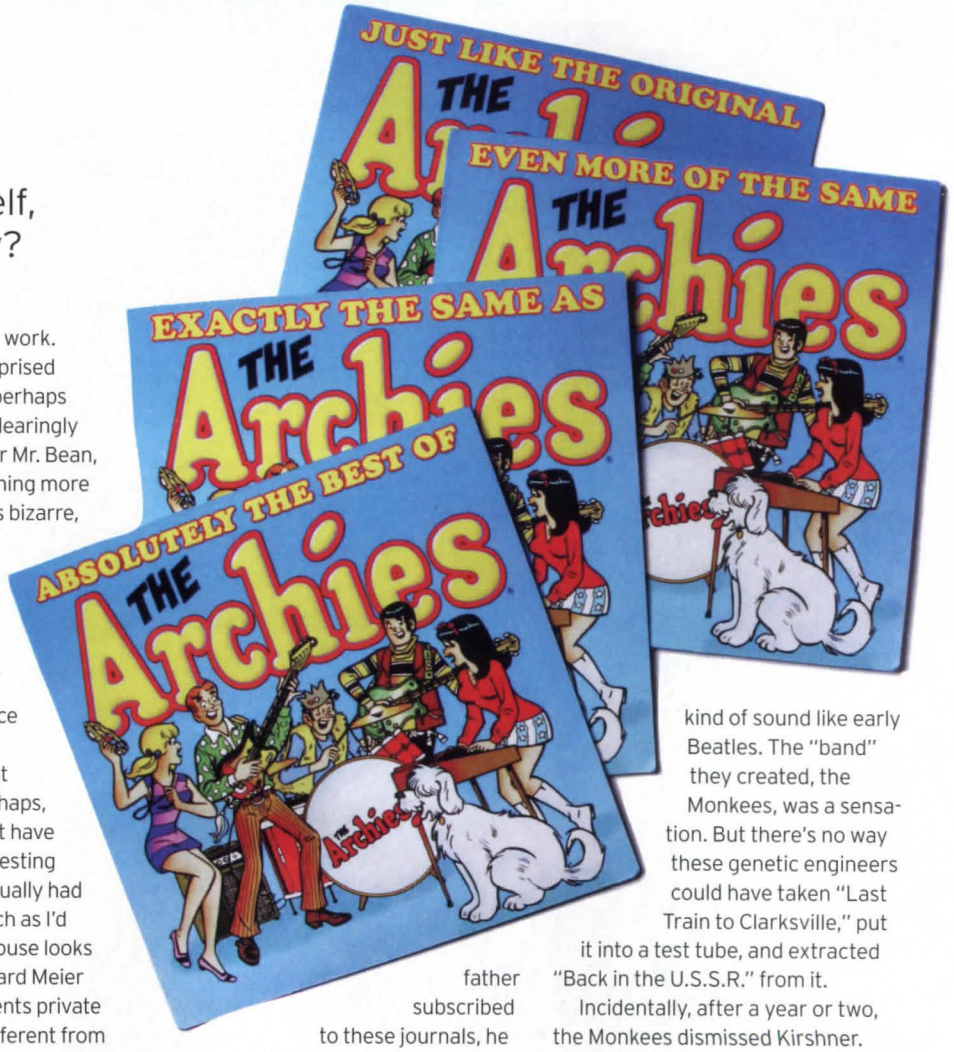
CIRCLE 30

One-Hit Wonders

If a client asks you to imitate yourself, is that the sincerest form of flattery?



IF YOU EVER think that the architecture business has gotten too tough, you can always lay down your mouse, pick up a guitar, and go into pop music. Architects are problem solvers, right? The best make their livings predicting what people need and what will appeal to them. They produce materials lists and instruction sheets, then contractors follow them, a ribbon is cut, and euphoria ensues.

So it shouldn't be too hard for us to figure out which noises will inoculate young boys and girls with bliss. At most we are talking about three or four minutes of 4/4 time, three chords, and a snazzy backbeat, all of which can be produced with GarageBand, which Apple gives away free with every Macintosh. Yoke up a catchy tune with a few rhyming couplets alternating mania with despair, and next stop, Hitsville.

All you need is one smash and you'll be set for life. Well, you will be until someone asks you to do another like it. Then you're back to the quandary every rock 'n' roller who's scored big on his first record faces: let your work evolve, like Dylan going electric, which seemed to please nobody, or be remembered as a one-hit wonder who spent the rest of a brief career cloning his or her best effort to meet the demand for more of the same.

All of this came to mind recently when a colleague posted a blog entry on archrecord.com about a new house Richard Meier had designed for the British actor Rowan Atkinson. Two commentators easily connected the dots between the Atkinson residence and Meier's 1968 Smith and 1972 Douglas houses: They're white, have flat roofs and vast areas of glass, and are sited in the middle of nowhere. They are beautiful. But the general tone of the thread seemed to be that we are really entitled to much more from Mr. Meier than a rehash of early work.

Others seemed surprised that Atkinson, who is perhaps best known for his endearingly incompetent character Mr. Bean, hadn't ordered something more like Pee-wee Herman's bizarre, visually frantic playhouse (which was extremely interesting and really quite suitable for its purpose, I think). Ummm, but since Rowan Atkinson is not actually Mr. Bean, what they really meant, perhaps, is that the house might have been much more interesting if Mr. Meier's client actually had been Mr. Bean. As much as I'd like to see what that house looks like, the idea that Richard Meier somehow owes his clients private residences that are different from those he is known to do and does well strikes me as a little unfair.

Joni Mitchell once said to an audience of whiney concertgoers begging her to play their favorite songs, "Nobody ever said to Van Gogh, 'Paint *A Starry Night* again, man.' He painted it, and that was it." Well, that might have been true where Vincent was concerned, but you don't go to Richard Meier to get a polka-dotted blue house.

I have admired Meier's work since 1968, when a copy of RECORD with the Smith House on the cover arrived at my parents' home. I was 11, growing up in tract housing, and the Smith House completely changed my view of the world. The Douglas House showed up on the cover of *Progressive Architecture* a few years later, just after financial difficulties had forced me into architecture school. (My parents refused to fund a journalism major, because though my father subscribed to these journals, he also famously said, "Nobody ever made a living writing magazine articles.") Work like Meier's convinced me that the architecture profession was a pretty good second choice.

Many of us in those days tried to design Meier houses of our own, when we weren't trying to design Graves houses or Gwathmey houses. The halls of my college were jammed with them. Well, most of us got the color right, but that was about it. Sure, you can imitate someone's work, but the real geniuses in architecture or music or any of the arts leave an inimitable mark on whatever they do. There's no getting around it.

In 1966, when the Beatles had abandoned bubblegum and were well on their way to "Lucy in the Sky With Diamonds," a couple of television producers saw an opportunity to pick up where they left off. They pulled four actors together and put Don Kirshner in charge of fabricating music that did kind of sound like early Beatles. The "band" they created, the Monkees, was a sensation. But there's no way these genetic engineers could have taken "Last Train to Clarksville," put it into a test tube, and extracted "Back in the U.S.S.R." from it.

Incidentally, after a year or two, the Monkees dismissed Kirshner. He is said to have decided that he would never put up with actors again. That is why Kirshner's next group, the Archies, was made up entirely of comic book characters brought to life through the magic of animation. Their sound was created entirely by studio musicians according to his strict formula that was also very successful – if not original.

The industrialized production of buildings by the best and brightest of our profession isn't new either, of course, and there is no doubt that we long for our idols to surprise us with something new. But their clients have to want that, too. And I don't feel sorry for them much, because, frankly, they get what they pay for. The people I really feel for are those who labor in obscurity helping their bosses put out these formulaic buildings. What would you call them? No. No. Don't say it!

Not Archie Architects! ■

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The Name Game

The biggest quandary facing some architects is the wording on the door.

AS ANY GOOD psychologist will tell you, names are destiny, imposing on newborn babies parental expectations that often become self-fulfilling prophecies. But just as children's names go through inevitable cycles of fashion, so have architectural firms endured nomenclature fads that now have reached an unprecedented degree of ridiculousness.

Time was when multiple-partner architectural practices styled themselves like law offices, epitomized by McKim, Mead & White – the title it retained until 1961, more than three decades after the death of its last original principal. But by the late 1960s, firms began fiddling with their names in a transparent attempt to seem hip and happening.

Among the first indicators of change was the rampant substitution of plus signs for ampersands, suggested by trendy graphic designers to give logos architectonic snap – a dated usage that Foster + Partners still affects.

As the profession became more egalitarian, ever-longer lists of partners were not enough to placate anonymous staffers slaving away in the back room. Thus began a vogue in which none of the employees' personal identities figured whatsoever. Whereas Charles Moore's Bay Area-based partnership had been called Moore Lyndon Turnbull Whitaker, his subsequent East Coast consortium was named Centerbrook (after the small town in Connecticut where it is located), which sounds more like a soap opera.

Thom Mayne and Michael Rotondi called their Santa Monica practice Morphosis, and when the partners split, Mayne got custody of the magic word. Yet Rotondi, whose surname is perfection for his occupation, regrettably called his new office RoTo Architects, a contraction unhappily reminiscent of the drain-cleaning company Roto-Rooter. Then, in the who-can-tell-them-apart category, there are the look-alike sound-alike firm names based on several overworked words: Studio E Architects, Studio Gang, Studio Luz Architects, Studio One Architects, Studio SUMO, STUDIOS Architecture, TOIStudio, as well as Studio Works, Allied Works Architecture, WORK Architecture Company, and, inevitably, Work Architects.

But surely no architectural moniker has been as thoroughly annoying as Coop Himmelb(l)au, dreamed up in Vienna in 1968 (perhaps over a funny *Zigarette*?). The effortfully parenthesized second part of that contorted tag conflates the German words for heaven (*Himmel*), blue (*blau*), and building (*Bau*). However, the underpunctuated first part leaves Americans wondering whether it refers to a cooperative or a henhouse. Pity, when that firm's best-known personality is the unimprovably named Wolf Prix.

But if underlings think such portmanteau terms will derail the pernicious star system, forget about it. I cannot be alone in reflexively telling myself that the tongue-twisting Asymptote Architecture is the Lise Anne Couture-and-Hani Rashid office, that UNStudio is the Ben van Berkel-and-Caroline Bos firm, or that 1100 Architect is headed by Juergen Riehm and David Piscuskas (whose names may be mouthfuls but are preferable to a cryptic numeral).

When gimmicky symbols pall, there is always arbitrary capitalization to catch a jaded eye. However, the subliminal effect of such letter-play can subvert its intended purpose. The bumpy orthography of SHoP Architects reminds me of a deflated tire, and my reaction to the recent "rebranding" of the landscape architect Laurie Olin's office as OLIN was "Why is he SHOUTING?" Then there are those proliferating pile-ups of incomprehensible acronymic initials, exemplified by BmasC Arquitectos, dECOi, and my favorite for sheer silliness, :mlzd, which needs only a close-parenthesis to form a smiley face.

Certainly the most ill-considered office-name rechristening of late – apart from the baffling transformation of HOK Sport into Populous – has been that of Polshek Partnership Architects, which decided, five years after the 2005 retirement of its founder, James Stewart Polshek, to call itself Ennead Architects (ancient Greek for a group of nine things – the number of that firm's partners, but fustily evocative of Virgil's *Aeneid*). One only hopes it was the result of an in-house contest rather than the handiwork of some high-priced corporate-identity consultant.

Conversely, when a practice believes its marquee name remains bankable, principals often cling to it long after the star has departed to other firmaments, as with Pei Cobb Freed & Partners, now headed by Henry N. Cobb following the retirement of I.M. Pei in 1990 and the death of James Ingo Freed in 2005. However, those seeking the services of the unretired Pei, now 93, will need to contact him at Pei Partnership Architects, set up by his sons C.C. ("Didi") Pei and L.C. ("Sandi") Pei. Not least of the elder Pei's gifts has been an instinct for faultless presentation. We can thus imagine him advising against the new family firm being burdened with the worrisome repetition of Pei, Pei, and Pei. ■

Martin Filler writes for The New York Review of Books.

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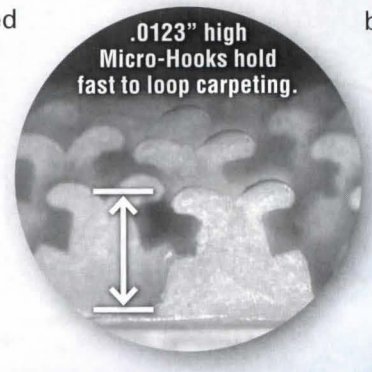

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CIRCLE 68

REVIEW SUZANNE STEPHENS
Leonardo's Last Supper: A Vision by Peter Greenaway
at the Park Avenue Armory

Kitsch in the age of digital reproduction

YOU HAD TO be there. A hyperbolic production that fuses the hokey theatricality of "son et lumière" (sound and light) tourist attractions with the razzle-dazzle antics of Cirque du Soleil was on view at the Park Avenue Armory in New York City until January 6, 2011. *Leonardo's Last Supper: A Vision by Peter Greenaway*, a kitschy, multimedia spectacular (kitschtacular?), is basically a photographic reconstitution of da Vinci's famous fresco, punched up by films, lighting, music, and voice-overs. Masterminded by Greenaway, the Welsh-born impresario, filmmaker, and artist (with a strong interest in architecture), this splashily souped-up phantasmagoria sought to heighten the experience of a work of art painted in 1498 for the convent refectory at Milan's Santa Maria delle Grazie.

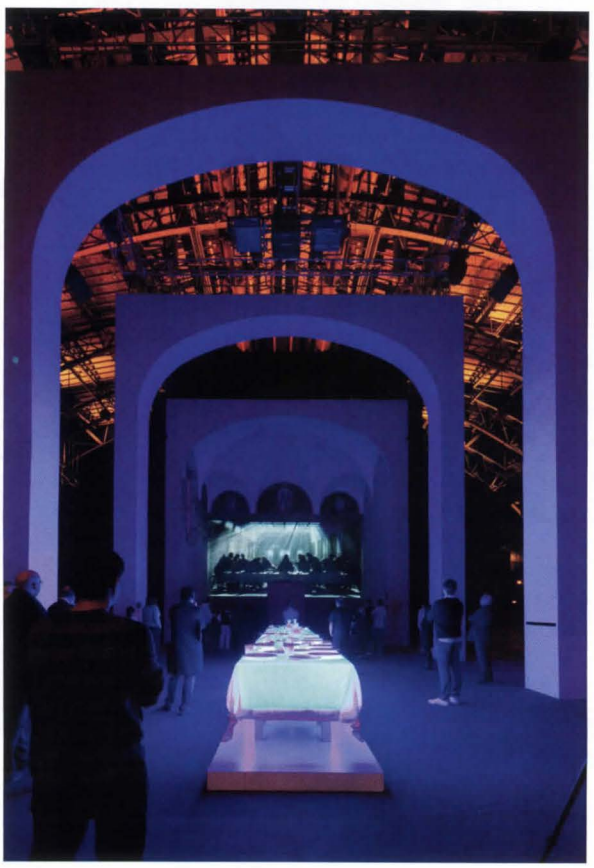
The original fresco remains in Milan, fragilely holding onto its aura, while its "clone," as it is called by Factum Arte, the Madrid- and London-based digital production company that created the photographic facsimile, has been painstakingly mounted here in an exactly dimensioned, abstractly rendered reconstruction of the chapel and refectory. *The Last Supper* clone owes its physical (but not spiritual) substance to high-resolution images made with three-dimensional scanning machines and ink-jet printers rolling over plaster panels mounted on aluminum sheets.

Greenaway's overwrought production begins with a prologue in which glimpses of Italian Renaissance and Baroque architecture flash on gigantic wall-like screens while a film shows a male ballet dancer in a white loincloth (yes!) prancing from scrim to scrim, and white doves flutter by against a pale blue sky.

The tripartite event ends with a digital presentation of Paolo Veronese's painting *Wedding at Cano* (1563), now hanging in the Louvre. In this didactic three- and two-dimensional staging, wedding guests are circled in red and scenes are diagrammed, also helpfully in red, to impart what is going on in the painting. You may get lost when virtual rain starts to hail down on one and all in this digital overdrive.

In his much-cited essay of 1936, "The Work of Art in the Age of Mechanical Reproduction," Walter Benjamin defended film and its "exhibition value." He noted, but did not regret, the loss of the "aura" of the traditional painting viewed one-on-one. Maybe Greenaway was thinking of Benjamin. But in the age of digital reproduction, sheer amplitude of technical effects, by their very distraction, easily catapult exhibition values into a lurid, Sturm-und-Drang sentimentality. Greenaway's concoction makes Andy Warhol's Pop homages to *The Last Supper* (1984) look downright ascetic.

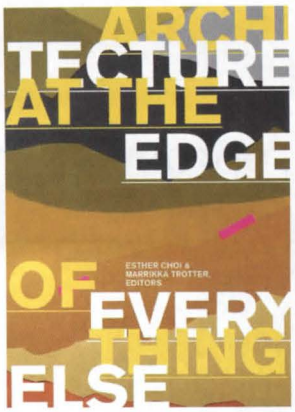
This romanticized farrago does offer one socially redeeming value. It attracted a large art-worshipping public to the 19th-century landmark, which is undergoing a skillful restoration. The Gothic Revival armory, designed in 1881 by Charles Clinton, with rooms by Louis C. Tiffany and Stanford White, is architecture, in genuine, unmediated splendor. ■

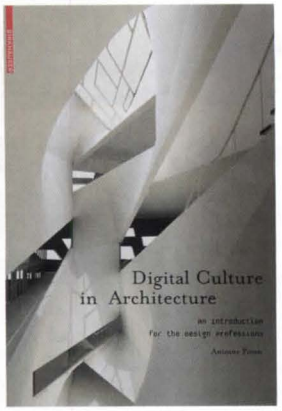


ABOVE: **Didacticism in 3-D defined the digital reproduction of *Wedding at Cano*, Veronese's painting executed for Palladio's San Giorgio Maggiore monastery in Venice (1563), and now hanging in the Louvre.**

RIGHT: **Creepily crepuscular lighting effects jazzed up the mixed-media vision of da Vinci's *Last Supper* in the refectory of Santa Maria delle Grazie. The Greenaway simulation included a white table set for dinner that runs perpendicular to the "clone" of the original fresco. Aided by three-dimensional scanning machines, the pieced-together clone was rolled out by ink-jet printers over plaster panels (more durable than Milan's), and mounted on aluminum sheets. Touch-ups by hand and brush topped off the intensive process.**

The profession adapts to new technologies





Architecture at the Edge of Everything Else, *edited by Esther Choi and Marrikka Trotter. Work Books and MIT Press, 2010, 224 pages, $28.*

You will find here a series of essays, conversations, and even e-mail exchanges that explore architecture reaching across generational and disciplinary divides.

The editors, artist Esther Choi and Marrikka Trotter, founder of Harvard's Department of Micro-Urbanism, have included essays by well-known practitioners, young architects, scholars, and artists, including Sylvia Lavin, Liam Gillick, Michael Meredith, Teddy Cruz, Sanford Kwinter, K. Michael Hays, and Philippe Rahm. *Architecture at the Edge* attempts to start a new type of conversation about the profession. Through text and graphics, the contributors examine architecture as it extends into art, music, and the social sciences. What we see here is definitely architecture "under the influence."

Choi's lead essay establishes this theme by imagining the field under the influence of psychedelic music from the 1960s. She suggests that, just as psychedelic music mixes atonality, rhythms, and melodies to create something new, "theory" becomes a means for selectively bringing outside influences into architecture in order to explore and enliven design.

Given today's backlash against theory, *Architecture at the Edge* reasserts the importance of situating architecture within a broader cultural context, beyond appearance, programmatic requirements, or "what the client wants." In the context of the current unyielding economic climate, the book also grants architecture more tools for presenting itself to the public and positioning itself as a vital cultural practice. *Guy Horton*

Provisional – Emerging Modes of Architectural Practice USA, *by Elite Kedan, F. Jonathan Dreyfous, and Craig Mutter. Princeton Architectural Press, 2010, 288 pages, $40.*

By profiling nine United States architectural firms strongly committed to critical reflection about their practices, *Provisional* offers a window on how 21st-century architects are redefining their profession. Insightful interviews and a wealth of drawings, renderings, and photographs bring into sharp focus a cross section of young architects thoroughly comfortable with new technologies. Even wary older practitioners will find much in these interviews to ponder.

Regrettably, the book opens with 50 pages of *essays, bombastic* manifestos heralding an approach that describes each of the architects as "equal parts con artist and alchemist." Luckily, the nine contributors speak with refreshing candor, nary a con man or hermetic theoretician among them.

Meejin Yoon of MY Studio sounds a theme when she says, "You have to become very facile in different design processes, methods, and languages and learn to move skillfully between and beyond them." Gehry Technologies' Dennis Shelden, whose pencil sketches helped make Frank Gehry's effervescently fluid designs possible, notes that innovative visualization and fabrication software catalyzes previously unimaginable designs. Sheldon amplifies Yoon's view of the 21st-century emergent practitioner as a master orchestrator of methodologies.

Unbound by grand theories and skeptical of architectural practice as political action, the nine architects describe practices constantly on the search for design opportunities presented by new materials and digital tools. The Internet broadens and deepens architectural collaborations, but it also contributes to the book's major flaw: a peppering of hundreds of illustrations, linked to themes mentioned in interviews by a thoroughly confusing hyperlinked code. *Norman Weinstein*

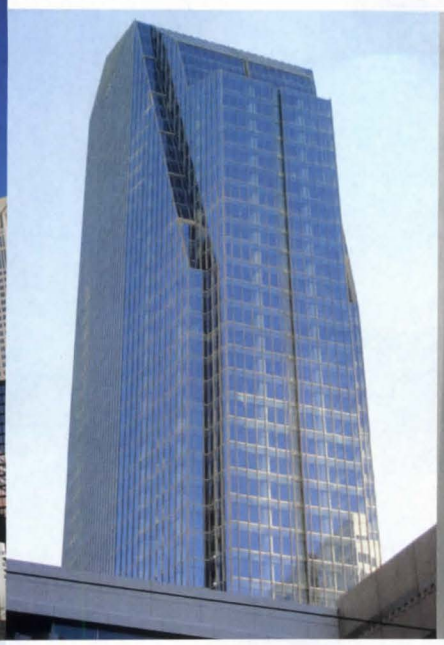
Digital Culture in Architecture: An Introduction for the Design Professions, *by Antoine Picon. Birkhäuser, 2010, 224 pages, $50.*

This book offers the first comprehensive portrait of the many ways digital technologies have affected architectural production and stimulated practitioners' imaginations. Unlike much of the existing literature on the topic, *Digital Culture in Architecture* does not argue or defend any new thesis on digital architecture. It is, rather, an objective, thoughtful historical account, a much-needed reference allowing us to pause and critically *reflect on an overheated* topic. The author, Antoine Picon, is an architectural historian teaching at Harvard, whose training included engineering, science, and technology. So he brings to his task a considerable breadth of knowledge and is capable of moving swiftly and expertly among domains that are normally foreign to one another.

The book is efficiently structured in four chapters of roughly 50 pages each. The first recounts the evolution of our information-based society. Starting at the turn of 20th century, it details the rise of large companies and their need for high-volume information management; the development of new means of communication; the creation of computer knowledge; and, finally, the emergence of new architectural design and production methods organized around patterns, systems, and networks. The next three chapters are devoted to recent developments in digital architecture: new experiments in form and generative geometries; the redefinition of surface, ornament, and materiality; and, lastly, the reconceptualization of the modern city. These chapters cover the most significant practices in the field today.

Picon provides an annotated map of the key issues created by the new digital media. The text is extremely rich in critical reflection, yet open-minded. The numerous illustrations are well chosen and lavishly reproduced. *Martin Bressani*

Form & **Function**



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CIRCLE 62

FILM SUZANNE STEPHENS
Architecture & Design Film Festival

Architecture: Ready for Your Close-Up?

A film festival highlights the proliferation of design documentaries.

FOR YEARS, DOCUMENTARIES on architecture have appeared mainly on public broadcasting stations in the form of earnest presentations of buildings and their pioneering creators. Often they are too earnest. But a number of factors indicate vibrant growth and change. Perhaps the accessibility of video cameras allows more architecturally minded novices to turn from amateurs to auteurs. Add to that the proliferation of short trailers or film excerpts on YouTube and such online outlets, and architecture on film seems to be everywhere. (Even RECORD's Web site offers numerous short videos created by editors, plus excerpts from professional documentaries.)

In mid-October, the Architecture & Design Film Festival (ADFF) at New York City's Tribeca Cinema helped bring this moment into focus. (RECORD was an ADFF media sponsor.) Kyle Bergman, AIA, the founder and festival director (with Laura Cardello), put on an out-of-town tryout last year in Whitefield, Vermont. Encouraged by the 1,000-person attendance, he brought it to where the density is thicker. Without much advance publicity in a hyperscheduled town, ADFF was able to attract 2,800 people to see more than 40 films in four days.

Bergman says his team selected documentaries of various lengths that combined a good design story with a strong human interest component. An ADFF survey determined that the highest-rated film was *Citizen Architect: Samuel Mockbee and the Spirit of Rural Studio* (2010), which includes an interview with the late architect. Other architectural biographies shown were *Eye Over Prague* (2010), about the late Jan Kaplicky's battle to get his blobular New National Library in the Czech capital off the ground (still to be decided); *Citizen Lambert: Joan of Architecture*, a film about Phyllis Lambert with Citizen Kane conceits (2009); and *Vincent Scully: An Art Historian among Architects* (2010). Another film brought to life 1960s counterculture architects: *Space, Land and Time: Underground Adventures with Ant Farm* (2010). Strictly architectural films (especially short ones) offered intense and speedy ways to cover the subject, such as *Kimbell Museum: Water and Sky* (2010) or *St. Louis Can Soar* (2010), made by specialists in this genre of brevity, Spirit of Space.

If interest is high, money, not surprisingly, remains a major hurdle with making these documentaries, no matter what length. Grants offer the means for filmmakers and nonprofit organizations that produce them (such as Checkerboard Films or Design on Screen), as costs are rarely earned back.

And then there is TV. The syrupy banality of cable shows devoted to decorating houses leaves public television as the main source of financing for more substantive architecture productions. But it's tough. Stephen Chung, a Boston architect, is putting together a 10-part "cool" architecture series he hopes will attract funding from the Corporation for Public Broadcasting and Public Broadcasting Service's diversity and innovation initiative. Although he has teamed up with a producer, Idea Factory, he's already spent a lot of his own money to make a test clip. And that is just to get selected for the pilot. ■

LEFT: **Nicknamed "The Blob," a scheme for the New National Library in Prague, designed by the late Jan Kaplicky and his firm Future Systems, is the subject of *Eye Over Prague* (2010).**

BELOW: **The crash-and-burn legacy of Ant Farm, late-1960s counterculture architects, is captured on *Space, Land and Time: Underground Adventures with Ant Farm* (2010) .**

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CIRCLE 66

HOUSE OF THE MONTH INGRID SPENCER
GRAMAZIO & KOHLER'S RIEDIKON HOUSE

FROM CERTAIN ANGLES, the house resembles the gable-roofed cottages in the Swiss village of Riedikon, which dates back at least to the early 8th century, on the lake known as Greifensee, near Zurich. Come closer and you realize this house, with its pitched, tentlike roof, its strip window following the angled roofline, and its enclosing screen of 315 vertical spruce slats, rough sawn on the sides and CNC-milled on the front and back, is nothing like its neighbors. The 3,175-square-foot house, designed by Zurich firm Gramazio & Kohler Architecture and Urbanism, is a reinterpretation of the regional typology that, as the firm's principal Matthias Kohler explains, "parametrically adapts form to context."

The program was simple enough – a two-bedroom, two-bath house for a young family with one small child. The polygonal volume is intended to blend in with neighboring structures and provide generous, contemporary, adaptable spaces, including a ground floor atelier with a separate entrance for an art studio. Although the brief remained constant throughout the design process, the architects found obtaining building permits for the open, light-filled spaces a challenge. "According to the building laws of the region, the maximum window size is 16 square feet, except for the exits to the garden," says Kohler. But, he adds, "he design of the slatted exterior allowed the screen to be legally interpreted as a wood facade, allowing large windows behind the wooden veil."

Inside the house, the veil, although visible, does not make you think you are behind bars. Gently, even comfortingly, shadows and sunlight play upon the interior concrete walls and black-painted asphalt floors.

"The slats provide an important feeling of intimacy and warmth," says the homeowner. "And the eye focuses on where it wants to look." With only two entrance doors and one glazed sliding door that leads to the garden and pool, and with all windows concealed, the house is "quite radical in terms of visual accessibility," says Kohler, explaining that although the slatted facade makes the structure look completely immured, the house is open to views and sunlight.

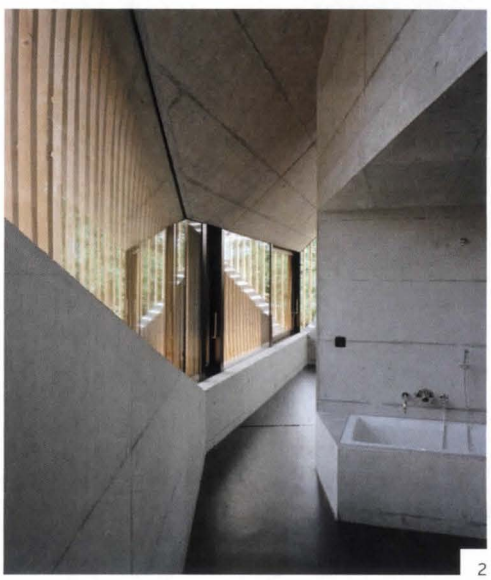
Extensive built-in storage throughout – including a central utility/laundry room behind the kitchen, multiple cabinets and even a wardrobe in the kitchen, sliding shelves underneath the stair, as well as diverse niches and shelves embedded in the concrete walls throughout the house – eliminated the need for a traditional underground cellar. In this way, the architects note, the house becomes a functional, private sanctuary for the family in the winter while offering itself (along with the pool) as a gathering place in the summer. ■

1

1. **An asymmetrically gabled roof covering a polygonal volume of concrete and wood slats melds the vernacular with the abstract.**

2. **The window running under the eaves allows views from the second floor bath to the outdoors.**

3. **The house's wood slats are slightly curved in profile and splay-cut at the edges to open up the view or restrict sightlines from within.**



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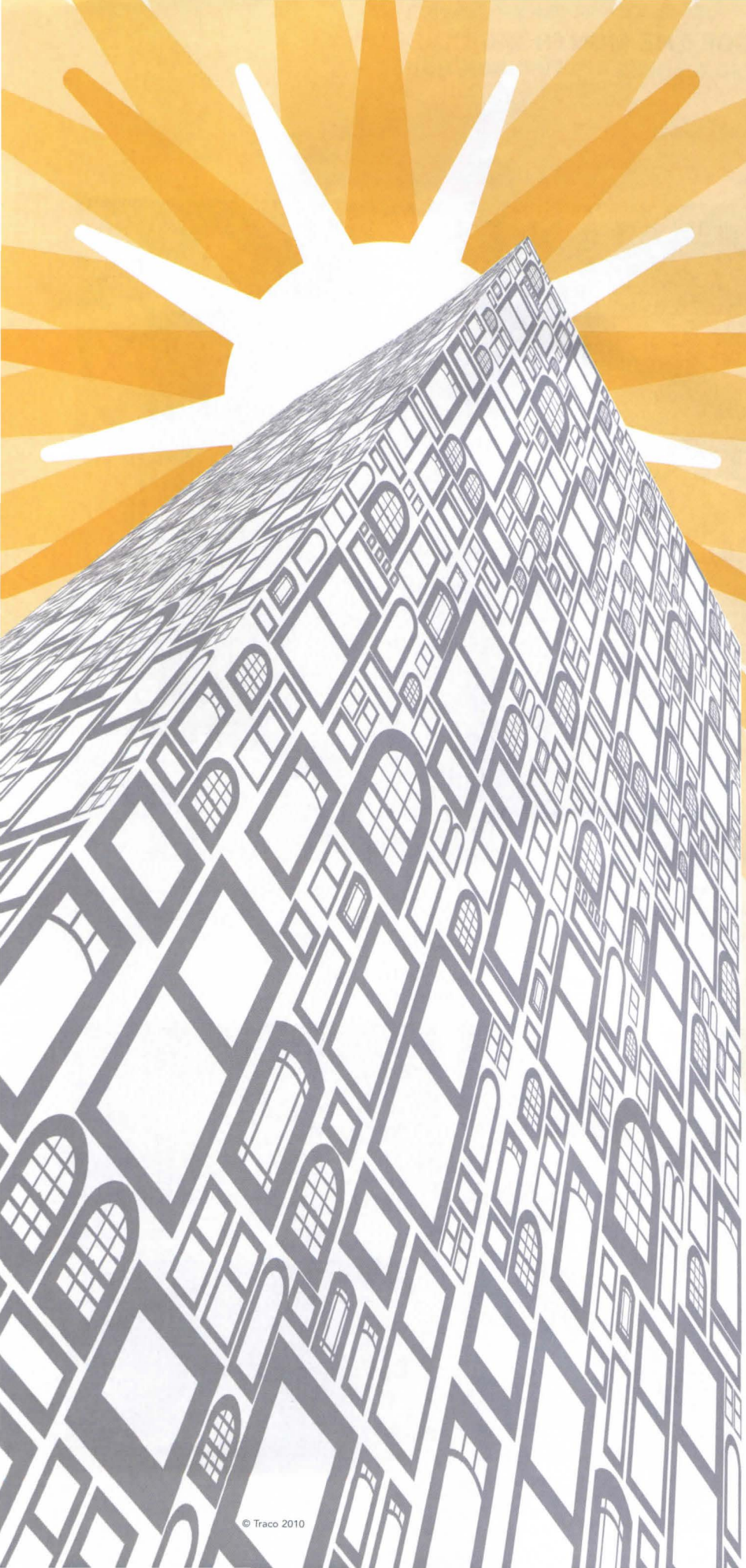

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CIRCLE 39

PRODUCT FOCUS DOORS & DOOR HARDWARE

Help make a good first impression with the latest handles, pivots, and door options, including a line of high-end Italian-made doors designed specifically for the U.S. market (below). RITA CATINELLA ORRELL

Lualdi American Designer Collection

REGARDED AS ONE of the world's leading producers of luxury doors, Lualdi invited a group of American designers and architects to create the Italian manufacturer's first collection specifically geared to the American market.

"A beautiful product has no boundaries, but each country has its trends, and the three designers have interpreted the door keeping local trends in mind while adding small details that make their doors up-to-date and successful," explains Lualdi president Alberto Lualdi. Lualdi directed the designers to interpret the door according to their style and vision: Dror Benshetrit, eclectic and innovative; David Rockwell, modern and linear; and Robert A.M. Stern, classic and elegant. The designers all have previous product design credentials for major manufacturers, ranging from furnishings to footwear.

Available this month, the interior doors are appropriate for both residential and commercial projects. Benshetrit's Davina design features a simple diagonal fold that gives the door a two-toned depth that subtly reveals the inside door frame, creating the illusion that the door is ajar. Rockwell's door is distinguished by its handle, a vertical bar wrapped in leather that runs the entire length of the door. Rockwell and his team (principal Barry Richards and product designer Shunyi Wu) found inspiration in the grand, hand-carved entrance doors to the Chambers Hotel in New York, which his firm designed in 2000. "A door is the first touch point for visitors, so it is important to create an inviting first impression," says Rockwell.

Avenue by Robert A.M. Stern is a series of three crisply detailed doors – available with single, double, or triple paneling in glossy or natural wood finishes – that reinterpret the doors of a classic New York prewar apartment. "One of the challenges is not to overdesign the door," explains Alex Lamis, who worked with Stern, Nathaniel Pearson, and Alvaro Soto on the designs. "It must be kept simple enough so as not to be distracting, but rather to differentiate itself through the elegance of its proportions and refinement of detail." For Benshetrit, crafting the hardware was the project's most challenging aspect: "Although doors are very minimal, the little hardware they use must be extremely precise and adjustable for different conditions." lualdiporte.com **CIRCLE 200**

1

1,2. **The Davina door and handle designed by Dror Benshetrit.**

3. **The Avenue door with a single panel designed by Robert A.M. Stern.**

4,5. **David Rockwell's leather-wrapped handle detail and MIDtown door with a bleached walnut-veneer finish.**

2

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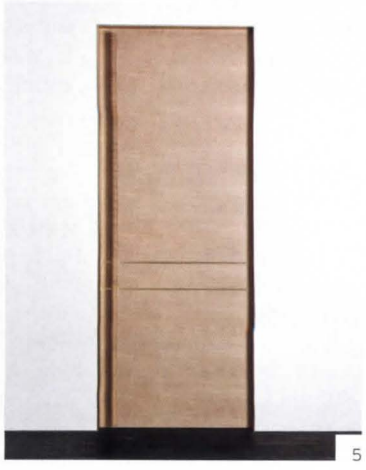

5

Sliding Door Systems

Amba Products ambaproducts.com

Distributed in North America by Atlanta-based Amba Products, this line of German-designed and -manufactured stainless-steel sliding door systems works with both glass and wood doors and room dividers in residential or commercial projects. Five sliding-door designs come in double and single systems in oil-rubbed bronze or stainless-steel finishes. Shown here is the Shield line in stainless steel. **CIRCLE 201**

Light Duty Pivot Series

Rixson rixson.com

The Light Duty Pivot Series Models 173 and 176 bring high-end door control to lightweight, narrow, and low-frequency doors and eliminate the angular tension common with hinges. Model 173, for offset applications (shown), and Model 176, for center-hung doors, show no visible attachments and can be used for interior doors up to 150 pounds, up to 3 feet wide and 8 feet high, and up to 1¾" thick. **CIRCLE 202**

Stone Door Knob

Sun Valley Bronze sunvalleybronze.com

Sun Valley Bronze hardware is crafted using high-quality art-grade bronze that is certified by Scientific Certification Systems to contain a minimum of 90% preconsumer recycled bronze content for Silicon Bronze and a minimum 95% preconsumer recycled content for White Bronze. The 2¼" Bronze Stone Knob, shown here in a White Bronze finish, references a cross section of river rocks. **CIRCLE 203**

Fine Architectural Hardware

H. Theophile htheophile.com

With production facilities in Michigan, New York, and Connecticut, H. Theophile offers integrated design, planning, and production services for residential and commercial hardware projects. As well as custom designs, there is a full range of standard lock sets, mechanisms, and hinges. The firm specializes in the replication and adaptation of historical designs to contemporary applications. **CIRCLE 204**

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Panda Windows & Doors panda-windows.com

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CIRCLE 205

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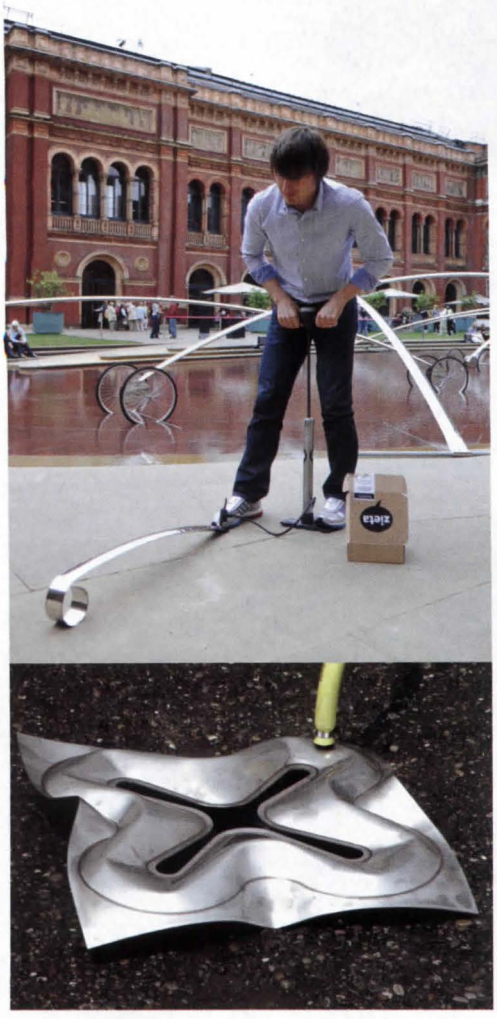
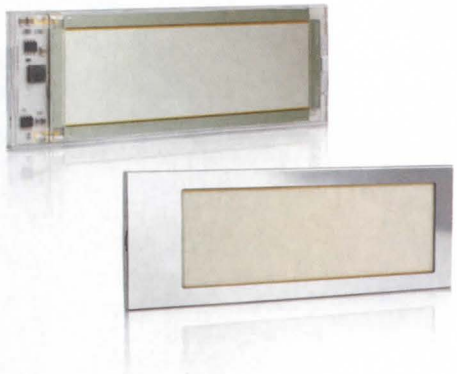
CIRCLE 29

PRODUCTS IN BRIEF

Some of the industry-leading materials and technologies that will be available on the market in 2011. RITA CATINELLA ORRELL





FiDU Technology

Zieta Prozessdesign shop.zieta.pl

Developed by the Polish-Swiss design firm Zieta, FiDU technology is a process by which two pieces of thin metal sheet are cut into a desired shape, welded together at the edges, and then inflated with air – transforming them from a 2-D into a 3-D object. Molds are not required for complicated shapes, as the forms are simply cut to size. Flat and rolled elements can be cost-efficiently transported on-site and then inflated and unrolled to the stable form. In 2010, Zieta was commissioned by the London Design Festival to conceive an installation built in FiDU technology at the Victoria & Albert Museum in London (shown top), which resulted in the world's first rolled-steel profile. **CIRCLE 207**

Hybrid Halogen-CFL Light Bulb

GE geconsumerproducts.com

Featuring the shape of an incandescent bulb, GE's new hybrid halogen-CFL bulb combines the instantaneous brightness of halogen with the energy efficiency and longer rated life of CFL. The halogen capsule inside the bulb comes on instantly and shuts off once the CFL comes to full brightness. GE scientists engineered the bulb to operate with 1 mg of mercury, a low level compared with typical CFLs. **CIRCLE 208**

Varisol

Kingspan Solar Inc. kingspansolar.com

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TAKTL taktl-llc.com

Available in a range of colors, finishes, and patterns, TAKTL transforms ultra-high-performance concrete (UHPC) from a technical construction material into a collection of multidimensional interior and exterior wall elements, panels, and site furnishings. The Bevel Bench (shown in front of a TAKTL panel in a Grass pattern) demonstrates the material's remarkable strength in thin profiles. **CIRCLE 210**

Lumiblade Module

Philips Lighting lumiblade.com

Scientists from Philips have developed the first organic light-emitting diode (OLED) module that can be powered directly from a mains electricity supply. The prototype leads the way for OLED systems to be plugged directly into standard power outlets without the need for bulky power management circuitry. Philips has sample kits available (for a charge) to encourage experimentation. **CIRCLE 211**

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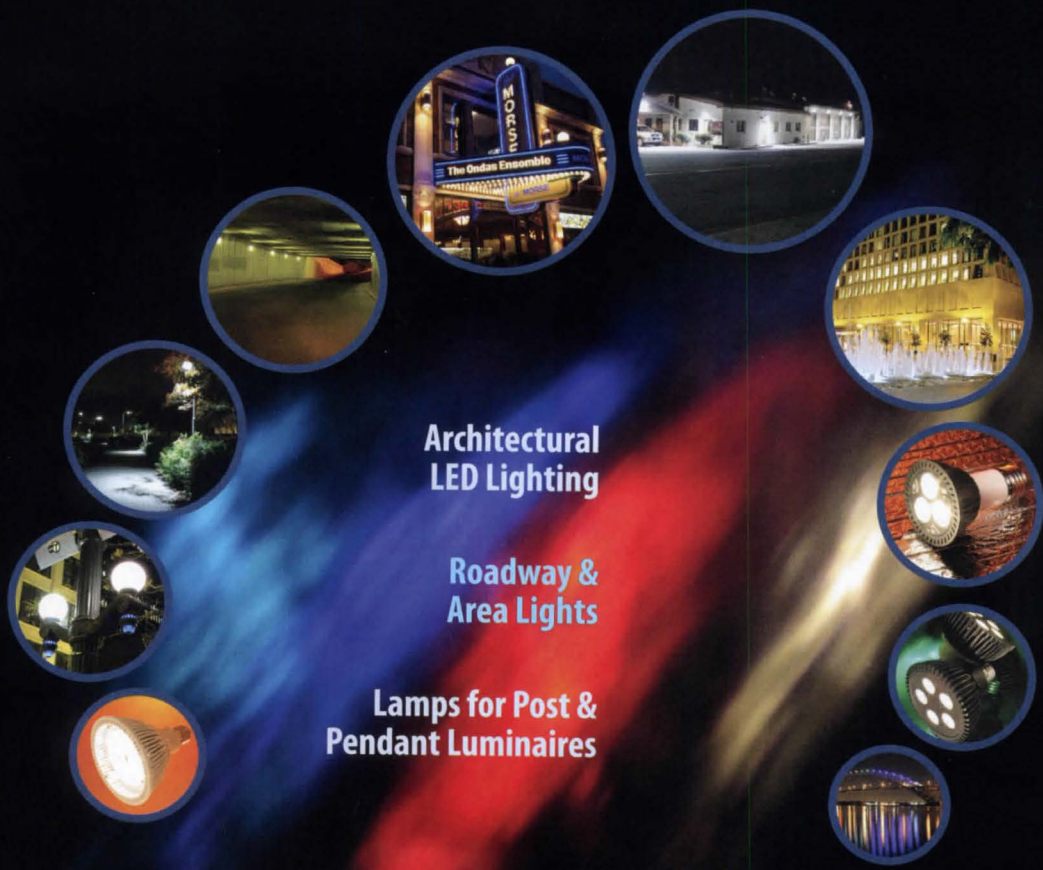

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CIRCLE 41

WHAT NOW?

ARCHITECTURE AT A CROSSROADS

Buffeted by economic uncertainty, globalization, and disruptive technologies, architects today have more questions than answers. Where are we headed? How can we position ourselves for future success? What are some of the innovative ideas that will shape the design landscape of tomorrow? Although the editors of ARCHITECTURAL RECORD don't have definitive answers to these questions, we put together this special issue intending at least to wrestle with them.

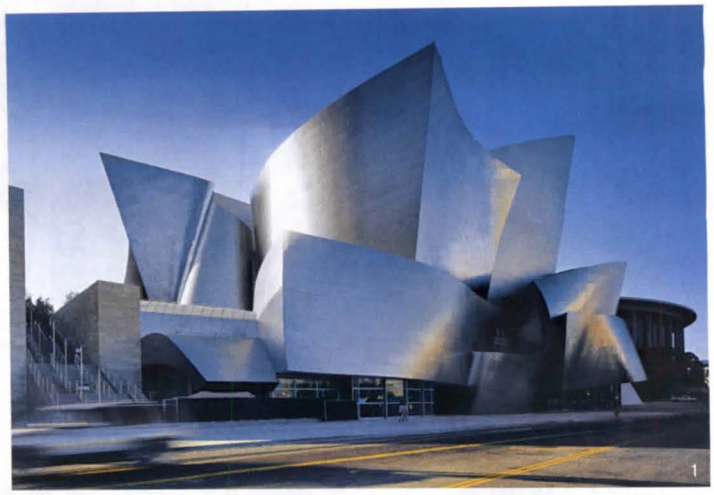
To begin to understand what the future might look like, we peered in the rearview mirror and reflected on what has happened over the past 10 years. At a roundtable in our New York offices, the magazine's editors discussed critical issues and key projects from the last decade and tried to figure out what they all meant. You can eavesdrop on that conversation by reading the story titled "What Was." Then you can explore "What Next," a feature bringing together interviews with experts in 10 different areas – from BIM and engineering to suburbia and sustainability – that will affect architecture over the next decade.

The three projects we selected all integrate buildings and landscape, a noteworthy trend that points to our interdependence with the natural world. Two of the projects, public works, demonstrate the importance of community interaction through architecture. The third presents a totally new model for a corporate headquarters.

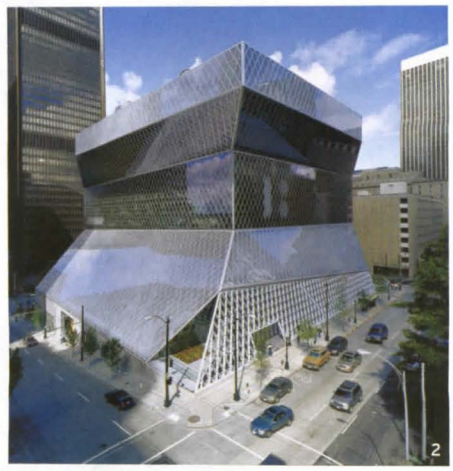
The present is always a precarious place, sitting between a past that's only partially understood and a future that's unknown. But the start of 2011 seems like a particularly confusing moment, with architects facing a crossroads in terms of social and professional priorities, economic concerns, and design approaches. With digital technologies compressing time and geography, and financial pressures raising the stakes, the choices architects make in the next few years will affect their profession well into the future. *Clifford A. Pearson*

WHAT WAS... 2000-2010

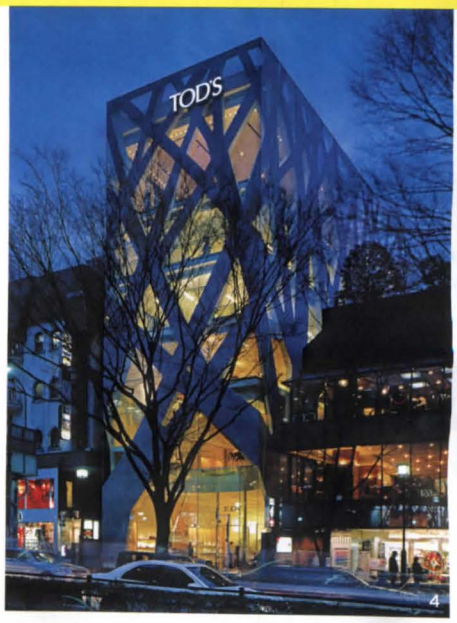
Wretched excess. Sustainability and the rise of LEED. Architecture as spectacle. Architecture for Humanity. Buildings as collectibles and architects as brands. . . Making sense of the past decade means confronting forces and trends pointing in radically different directions. Should we remember the first 10 years of the 21st century — the naughts — for advances in digital technologies that allow building designs to be rapidly analyzed and improved or for those that allow super-tall buildings to rise in the middle of deserts? After a period of wealth creation on a scale never before seen, what do we have to show for it all?



1. Frank Gehry's Disney Concert Hall helps reactivate downtown L.A.
2. The Seattle Public Library by Rem Koolhaas and OMA offered a new approach to libraries.
3. Record focused on Chicago in May 2004.
4. Toyo Ito's building for Tod's Shoes rises like a tree in Tokyo.
5. Herzog & de Meuron inserted the Caixa Forum within Madrid's existing urban fabric.



CITIES/URBANISM



The editors of ARCHITECTURAL RECORD usually cover the here-and-now of what's being designed and built. But for this special issue, we looked back at 10 years of architecture – more as historians than as journalists. What follows are highlights of a roundtable discussion the editors held recently. Not surprisingly, we found that analyzing a decade filled with contradictions and complexities elicited disagreements and revealed different perspectives. Given the luxury of a 120-month time frame starting before 9/11 and ending after (or is it still the middle of?) the Great Recession, we considered how much has changed and how much more needs to be done.

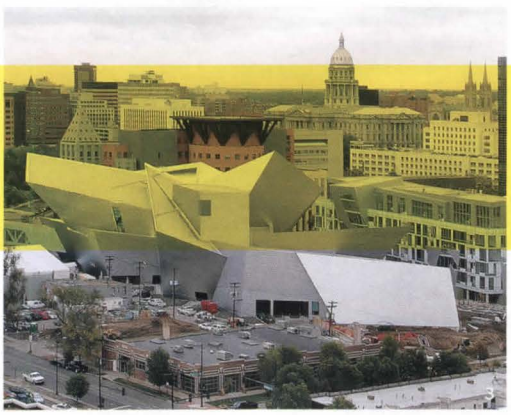
We began by talking about urbanism.

"Browsing through old issues, I was struck by how many times we focused on cities," said editor in chief Robert Ivy, noting special issues on Beijing, Los Angeles, Tokyo, the San Francisco Bay area, and Chicago, and articles on sprawl and rebuilding New Orleans. In many ways, it was a halcyon decade for cities, stated deputy editor Suzanne Stephens. The transformation of Bilbao – with Frank Gehry's Guggenheim in 1997, bolstered by important projects by Foster, Calatrava, and Legorreta – put the once-obscure city in northern Spain on the international must-visit map.

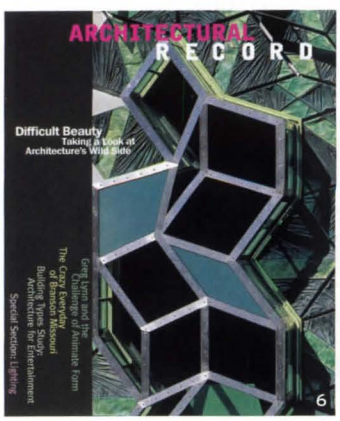
A lot of people, including quite a few mayors and government officials from around the world, looked at Bilbao and thought they could replicate its success merely by commissioning a high-profile building by a big-name architect. At our roundtable discussion, RECORD editors disagreed about whether this was a waste of money and effort or better than nothing. We talked specifically about Santiago Calatrava's addition to the Milwaukee Art Museum and whether such a project reduces architecture to the status of an urban bauble acquired like a piece of jewelry to glitter for the masses. "There's a getting-and-spending class that benefits from these city-defining objects, even though they may stretch municipal finances," stated William Hanley, web editor. "They reveal a lot about civic priorities in specific urban places."

"Architecture became a branding opportunity," noted Ivy. "Every city wanted to announce itself to the world. The buildings needed to be expensive, formally exuberate, and visible," he added. Was this a good thing? "Spectacle became a way of engaging the public with architecture," said deputy editor Clifford Pearson. "When used properly, it can generate renewal." Ivy offered another reason for supporting such efforts: "The Calatrava building has become part of the new image of Milwaukee, helping to change its public perception from that of an old industrial town into something more modern."

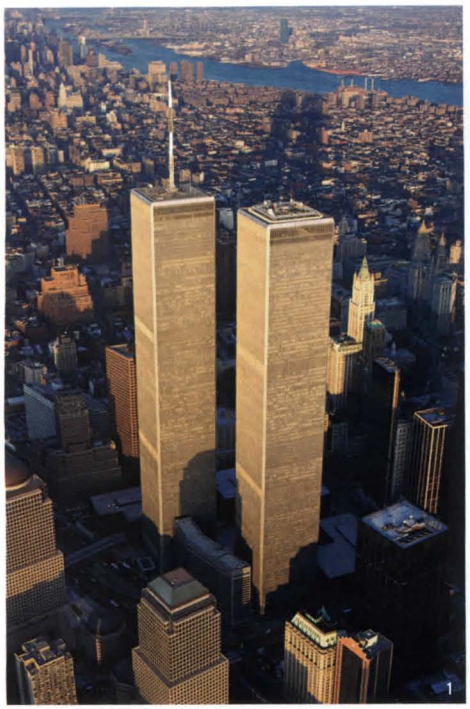
The discussion then segued to the increasing importance architecture is playing at grand public events such as the Olympics and World's Fairs and what happens when the huge crowds disappear. All too often, the buildings commissioned for such events lie empty afterward, ripping large holes in the urban fabric or standing as symbols of squandered resources. Everyone at the table had heard stories of how the Olympic Stadium in Beijing serves little purpose these days and is acquiring a reputation of being more White Elephant than Bird's Nest. As a result, the



SPECTACLE



1. The Scottish Parliament, by Miralles and Tagliabue, fuses topography and architecture.
2. Santiago Calatrava's Milwaukee Art Museum addition grabs attention on the lakeshore.
3. The Denver Art Museum hired Daniel Libeskind to add some spice to its campus.
4. Jean Nouvel created an architectural mashup for the Musée du Quai Branly in Paris.
5. Peter Cook's Kunsthaus shook up Graz.
6. Record looked at "Difficult Beauty" in November 2000.



1. The World Trade Center anchored lower Manhattan until September 11, 2001.

2. The people of Haiti struggled to find housing after an earthquake in January 2010.

3. Eight Inc's design won an award from Record for housing in New Orleans after Hurricane Katrina.

4. Cleaning up after Katrina posed enormous challenges, as did rebuilding the Gulf.

London Olympics in 2012 will feature a giant basketball arena that will be dismantled and mostly recycled after the Games and a stadium that will downsize from 80,000 to 25,000 seats [see article on page 80].

Olympics and World's Fairs, though, can push cities to build infrastructure that will pay dividends for many decades, said Pearson, pointing to the five subway lines that Shanghai built for its 2010 Expo. "Like Chicago in 1893, Shanghai used its Expo to transform a dirty, industrial city into a modern capital of commerce," he said.

Looking back at the past 10 years, products editor Rita Catinella Orrell noted, "It was the decade of the 'starchitect.' Frank Gehry was on *The Simpsons*! Did we do a disservice to the profession by promoting this?" Some of her colleagues replied that the magazine merely covered what was happening and didn't have the power to stop or launch such trends. Special sections editor Linda Lentz observed that the phenomenon of star architects goes back a long way but has gotten out of hand in the past decade. "Architecture became a consumable and architects became brands," said Ivy. "Cities and corporations used them to enhance their own reputations and prestige." Sometimes this was window dressing, hiding a less attractive or substantial reality. But sometimes it brought remarkable buildings, like the Disney Concert Hall in Los Angeles, which, Ivy said, "performs beautifully and elevates the human experience."

The decade saw more than its fair share of extravagant architecture, some of it decidedly contorted and forced. In November 2000, RECORD's editors organized an issue on the theme of "Difficult Beauty" and looked at buildings "on architecture's wild side." On the cover, we put Ashton Raggatt McDougall's Storey Hall in Melbourne, Australia, which features a grottolike entrance painted lurid green and purple.

On September 11, 2001, terrorism brought architecture to the top of the public agenda. For months after the attacks, citizens and their representatives discussed security, master planning, and the role of buildings and outdoor spaces in a city's civic life. It was a remarkable period when architecture and design made the news and shaped public debate. Of course, it didn't last. And reports of the death of the skyscraper proved unfounded, as emerging countries such as Dubai and China announced plans for towers that would break all kinds of height records. But security issues *remained on* the table, helping to shape the next generation of skyscrapers, airports, and government buildings.

At the same time, increasingly powerful digital tools unleashed a sea change in design. New technologies provided rapid structural and performance analyses and enlarged the way we think. In the process, they freed up the designer to be more intuitive and to explore new forms. "They also changed the role of the contractor and

DISASTER

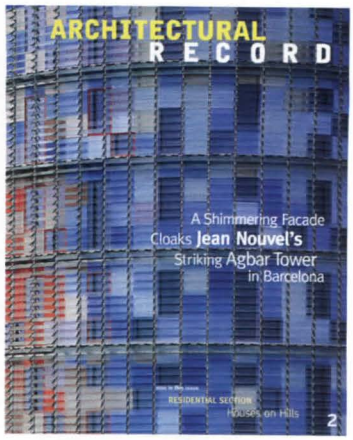
subcontractor, getting them involved much earlier in the process, and allowed teams to become more complex and collaborative," explained senior editor Joann Gonchar. How this affected architecture was often determined by the ability of the architect to play master builder and his or her willingness to assume risk.

Much of the roundtable discussion revolved around sustainability and the emergence of LEED as a tool both for advancing green design and for greenwashing. "Every developer has gotten on the eco-bandwagon, touting projects with exaggerated claims," stated senior editor Jane Kolleeny. "Finding the truth behind the claims challenges every designer," she added. "They're like nutrition bars that are still sugar-coated," commented Stephens. Looking at the magazine's coverage of sustainability over the past decade, the editors saw how green design went from being a special topic to a part of every article.

As a record wave of wealth creation crested in 2006 and 2007 in parts of the U.S., Europe, the Middle East, and Asia, an undertow of social consciousness pulled many architects back to places where poverty, war, and natural disaster had exposed critical needs for a different kind of practice. In 1999, Cameron Sinclair and Kate Stohr founded Architecture for Humanity, which grew during the next decade into an impressive network of chapters around the world and became a symbol for many people in the profession and the academy of why architecture matters. And as the Asian tsunami in 2004, Hurricane Katrina in 2005, and the Haitian earthquake in 2010 showed, the need for emergency architecture and disaster planning is expanding as climate change affects weather patterns, sea levels, and population movement.

For the first time in history, a majority of the world's population now lives in cities. In China alone, more than 250 million people have moved from rural to urban areas in the past three decades. The rise of megacities such as Lagos, Dhaka, Shanghai, Mumbai, and São Paulo presents architects and planners with enormous challenges now and for the foreseeable future. At the same time, parts of Europe and the U.S. are losing population and foreclosures are emptying out certain suburban areas or turning them into pockets of poverty.

Forces that grew more powerful in the past decade – such as the sustainability movement, rapid urbanization, and digital technologies – will almost certainly continue to transform architecture and the built environment in the next 10 years. How they play out, though, will be affected by economic conditions, social challenges, the emergence of new ideas and developments, and the kinds of totally unexpected events that make front-page news. ■



LOCAL / GLOBAL

1. Marlon Blackwell reinterpreted vernacular forms in the Keenan TowerHouse in Fayetteville, Arkansas.

2. The globe-trotting Jean Nouvel used a louvered skin to adapt the Agbar Tower to Barcelona's climate.

3. Rick Joy combined modern materials with traditional design strategies on his Desert Nomad House in Tucson.

4. Even before it was completed, OMA's CCTV Tower had become one of the most recognizable buildings in Beijing.

5. Zaha Hadid grafted her design for the museum called MAXXI onto the urban fabric of early 20th-century Rome.

WHAT NEXT...

Experts inside and outside the profession discuss some of the critical issues architects will face in the next 10 years—from reinventing suburbia and expanding urban infrastructure to exploring new materials and leveraging new technologies.

STRUCTURES

WILLIAM F. BAKER IS THE STRUCTURAL ENGINEERING PARTNER FOR SKIDMORE, OWINGS & MERRILL AND HAS BEEN INVOLVED IN PROJECTS SUCH AS THE BURJ KHALIFA AND JAMES TURRELL'S RODEN CRATER. INTERVIEW BY CHARLES LINN.

Architectural Record: How does the research you do help architecture to evolve?

William Baker: We are developing tools that are useful in solving myriad problems. One of the biggest things we're doing, which is just in its infancy, is optimizing for multiple variables. I try to come up with efficient structures that can turn into interesting architecture. Is there an ethical position for engineers? One could say they shouldn't be wasteful.

AR: Where do you see technological advances happening in the near future?

WB: There is a lot happening with the development of new structural materials. Metallurgists and material scientists are using powerful computers to look at what happens at the molecular level, and that knowledge will help them create the next generation of steel, concrete, and other materials. These advanced structural materials will change what is possible.

AR: Is anything changing in terms of the way we construct buildings?

WB: The automation of the construction site is happening quickly. The Burj Khalifa was basically a vertical factory. The large Japanese and Korean construction firms are spending a lot on R&D, but in the U.S., there isn't as much money spent in this area as there should be. We will probably see the results of this research overseas before it comes to the U.S.

AR: How have computers changed the field?

WB: Computational tools continue to develop rapidly. This is good for research (such as what we're doing with structural topology) but often bad for design. It enables engineers to design structures that are conceptually unclear (and perhaps conceptually unfathomable). I am urging designers to go back to first principles to develop structural concepts that make sense.

BIM

JAMES P. BARRETT IS THE NATIONAL DIRECTOR OF INTEGRATED BUILDING SOLUTIONS AT TURNER CONSTRUCTION COMPANY, WHERE HE OVERSEES THE ADOPTION OF BUILDING INFORMATION MODELING (BIM) ON PROJECTS. INTERVIEW BY JOANN GONCHAR.

Architectural Record: Everyone defines BIM differently. What is BIM to you?

James Barrett: Some people think BIM is a particular piece of software. But it is a set of problem-solving tools. I think of BIM as a carpenter's toolbox. You need to have a big toolbox so you can bring to bear the tool that makes the most sense for the task at hand.

AR: Is BIM changing what gets built?

JB: There is certain software that allows the creation of shapes that wouldn't otherwise be realized. But that isn't where BIM is having its greatest impact. It is producing greater collaboration and integration among members of project teams. To some extent this is a function of the fact that BIM isn't terribly well developed. The tool is still in its infancy, and there are large interoperability issues with the software. As a result, firms are almost forced to work more closely to bridge these performance gaps and overcome the problems with the transfer of models and information.

AR: Do BIM and the integrated process you've described require that architects relinquish control over a project, or does it allow them to have more control?

JB: They have the *opportunity* for greater control. Are they taking advantage of that opportunity? Many aren't. For many architects, construction managers, and subs, BIM is just a better way of doing what they have always done. But BIM can provide a real understanding of the parts and pieces of a building at a level of detail that a 2-D documentation environment can't. It allows an architect to be a part of the discussion with us and our trade contractors about the building's literal assembly, not just about aesthetics and the design intent.

AR: Are you saying that architects should play a role in determining construction means and methods?

JB: Yes, but there are concerns about contract forms and liability. The industry culture and the contracts that are derived from it haven't caught up with the technology. So, when working with architects and engineers, I encourage what I call the Las Vegas approach: What happens in BIM stays in BIM. You recognize mistakes will happen without letting that get in way of using the tools in new ways to produce a better product for the client. We do that by lowering our fences and engaging the architect in activities that might be considered means and methods. On the flip side, we sometimes perform services that are typically the architect's responsibility, such as coordination. We need to share more and not worry about the risks and liabilities that tend to make us hunker down in our traditional corners. BIM requires a lot more communication between the design and construction industries. This is happening, but fairly selectively.

ECONOMY

ROBERT MURRAY IS VICE PRESIDENT OF ECONOMIC AFFAIRS FOR MCGRAW-HILL CONSTRUCTION, WHICH INCLUDES *ARCHITECTURAL RECORD*. INTERVIEW BY CHARLES LINN.

Architectural Record: People are comparing our current economic situation to 1979 and 1991. To me, it seems to be a much bigger problem.

Robert Murray: Of course, no one really knows. Despite the huge amount of overbuilding, retail is starting to show some signs of life. The office market is another story, though. In the case of corporate headquarters, some activity is taking place, but when it comes to spec building, that's going to take longer.

AR: What do you see happening in the near future?

RM: Once we get through a difficult period in the next year or so, in terms of state and local finances, I think you'll see a lot of plans moving forward again for redevelopment – transit-oriented redevelopment. If I had to pick any positive area to focus on in the near term, it would be residential construction. My recommendation to architects would be to look for apartment projects.

AR: What you call income-generating properties – stores, offices, hospitality – those are the ones that have the biggest volume overall and the most to lose, correct?

RM: In the near term, those categories have all reached bottom. In contrast, education has fallen back but still has room for further deterioration, given its relationship to state and local finances.

AR: The new Republican-dominated Congress says it's going to cut spending, and there is already talk of a deficit ceiling.

RM: It's going to suck big-time, because it will affect the institutional market, with perhaps the exception of health care. And if they say, "Let's repeal health reform," more projects will be put on hold.

AR: When do you think money will become available for businesses to borrow?

RM: It is quite possible that in another year or so the banking industry will be looking for opportunities to grow revenue and be more willing to lend.

AR: So what's the short-term forecast?

RM: It's going to be a stumble-along, muddle-through period. When we emerge, hopefully we'll see relatively decent volumes of activity. But will it be a replay of the 2005–2007 period? Probably not. Any time there is a period of substantial overbuilding, you have to go through a lengthy process of correction.

LEED

BOB BERKEBILE, PRINCIPAL OF KANSAS CITY, MISSOURI–BASED ARCHITECTURE AND PLANNING FIRM BNIM, HAS WORKED FOR DECADES TO PROMOTE SUSTAINABLE DESIGN. HE IS FOUNDING CHAIRMAN OF THE AIA'S NATIONAL COMMITTEE ON THE ENVIRONMENT (COTE) AND WAS INSTRUMENTAL IN THE FORMATION OF THE U.S. GREEN BUILDING COUNCIL (USGBC) AND ITS LEED RATING SYSTEM. INTERVIEW BY JOANN GONCHAR.

Architectural Record: Since its inception LEED has grown and changed significantly, but does it need to transform even more fundamentally?

Bob Berkebile: Of course. LEED was always envisioned as a tool that would evolve. You may recall that the first LEED tool was for commercial office buildings. Period. Now there are tools for a variety of building types and a variety of scales. And there are always stakeholders working on the next refinements to the LEED system. That's as it was always envisioned and as it must continue if the rating system is to remain viable. Without any question, LEED has been the most transformative tool in the design and construction industry in my professional career. But it is still not a great design tool.

AR: It's not?

BB: No, but it is a great educational tool. It enlarges the conversation among the design team, the client, and the users about the issues that should be considered in the conceptualization of a design solution. It became an even stronger educational tool when agencies like the GSA [General Services Administration] said, "This is our standard." Many other agencies, local governments, and institutions followed suit. That changed everything. It changed the supply stream. It changed the way contractors operate. It has changed the way we design and build.

AR: What are LEED's limitations as a design tool?

BB: Once a project team gets into analysis, it turns to the LEED checklist. And often there is a tendency to add features and components to the building in order to earn points. This is not a systems approach. Instead of encouraging the addition of features, a design tool should support solutions that are more elegant.

AR: How would you like to see LEED evolve?

BB: LEED is not nearly sensitive enough to bioclimatic conditions in different regions. Such variations should be one of the rating system's fundamental drivers. It should also promote social equity. If you don't already have this sensitivity, LEED is not likely to take you there. It does require commissioning, and as a result, certified buildings operate more economically and provide healthier environments than they otherwise would. But LEED should also require that projects incorporate systems for monitoring building performance. Built-in feedback loops would create a Prius effect among occupants and owners.

AR: Do you predict that the USGBC will establish a level of certification beyond Platinum?

BB: A Platinum rating is third-party certification that your building is doing less damage to the environment than anyone else's. It is clearly time to move beyond less damage to a regenerative model. BNIM is working with the USGBC on such a concept. Rather than being another certification level, it's a road map for making better decisions supported by powerful tools.

BIG FIRMS

PAUL NAKAZAWA TEACHES PROFESSIONAL PRACTICE AT HARVARD'S GRADUATE SCHOOL OF DESIGN AND WORKS AS A BUSINESS STRATEGIST AND COACH FOR ARCHITECTURE, LANDSCAPE ARCHITECTURE, AND URBAN DESIGN FIRMS. INTERVIEW BY CLIFFORD PEARSON.

Architectural Record: In the past few years, we've seen the rise of some very big firms. According to *Engineering News-Record*'s list of top design firms, AECOM weighs in at number one, with revenues of $6.5 billion in 2010 and more than 50,000 employees.

Paul Nakazawa: Architects aren't accustomed to these kinds of numbers. There are a few extra zeros at the end of them. It doesn't mean, though, that traditional practices are endangered. It means there's a new kind of animal in the ecosystem.

AR: Why are we seeing this gigantism now?

PN: A confluence of factors is driving it. Developing countries are experiencing rapid urbanization on a gigantic scale, bringing with it massive infrastructural needs. These are not individual-building issues or even aggregate-building issues. They're systemic issues. So clients – mostly governments and public-private agencies – are looking for very large firms to manage these projects. Countries like China and Brazil are still spending money.

AR: Has this ever happened before?

PN: In the 1980s, a group of firms – mostly in the U.K. – experimented with going public and selling shares on the London Stock Exchange. After the stock market crash in 1987, most of these firms saw the value of their shares get hammered and in the following years suffered substantial losses. Although firms today are using different means to grow, the emergence of very big entities raises the question: Are we just doing the same stupidity, but on a larger scale?

AR: How is the current economic situation affecting the landscape of big firms?

PN: This recession will be a real watershed. It will separate those firms that are able to come to grips with technology, diversification, and globalization from those that can't.

AR: What do you forecast for the near future?

PN: In the first 10 years of this century, we saw lots of liquidity at low interest rates. So there was economic exuberance, although a lot of it was just smoke and mirrors. Still, there are real advantages in being big. To be a global player, you need more than 1,000 employees. At that size, you can take risks. Smaller firms can't, because a really big project can take down the company if it doesn't work out. When you're in a big storm, it always seems safer to be on a big boat.

CITIES

RICKY BURDETT IS A PROFESSOR OF URBAN STUDIES AT THE LONDON SCHOOL OF ECONOMICS AND THE FOUNDING DIRECTOR OF LSE CITIES, AN INTERNATIONAL RESEARCH AND TEACHING ORGANIZATION. INTERVIEW BY JANE KOLLEENY.

Architectural Record: More than 50 percent of the world's population now lives in urban areas. If this migration continues, what will its impact be?

Ricky Burdett: There is no doubt that urbanization will continue, but it is progressing at different rates in different parts of the world. Asia and Africa are experiencing exponential growth rates in their cities, while urbanization in South America is slowing down. Many cities in the old industrial heartlands of the U.S. and Eastern Europe are, in fact, losing population. Climate change will accelerate this process of urban migration, with more and more people leaving rural areas that have become arid or prone to flooding. The irony is that the cities these climate-change refugees will flock to are often the ones most at risk from rises in the sea level and other hazards.

AR: What are some of the lessons we can learn from what is happening now?

RB: Recent initiatives in Bogotá, Barcelona, and Turin show that some cities can be retrofitted with green transport systems, bringing city centers and suburban neighborhoods back to life and making the most of existing urban assets. We can learn from Bogotá how to use bicycles and dedicated bus lanes to move people around more efficiently; and from London, how to reduce car use in the center city by imposing congestion charges.

AR: What do you see as the main challenges facing cities?

RB: Building basic infrastructure is a major challenge, especially in the poorer regions of the world. Over 30 percent of all urban residents live without access to clean water, sewers, or sanitation. But we should also remember that urban areas consume over 60 percent of global energy and contribute to 75 percent of CO_2 emissions. So reducing the energy footprint of a city becomes a major priority. We also need to ensure that the vast proportion of new urban residents over the next decades do not end up living in slums, inhabiting landscapes of difference characterized by ghettos of the very rich and very poor.

AR: What do you think about new "green" cities, like New Songdo City and Masdar?

RB: I am not optimistic about these one-off solutions, however worthy they are. They rely on massive levels of investment that are difficult or impossible for even the richest nations to afford. Sustainable solutions can and must be found by modifying the DNA of existing cities, adjusting and calibrating their spatial, social, and economic organization in a realistic way that reflects the organic processes of urban growth and availability of resources. Powering all of New Delhi's buses and auto-rickshaws with natural gas rather than diesel is the sort of statement that is needed. Ensuring that cities have clear growth boundaries – like London's Green Belt – and insisting that all available urban land, especially previously industrial land, is redeveloped before building on green fields outside the city, will also make the next generation of cities more sustainable without incurring massive costs.

MATERIALS

SHEILA KENNEDY IS A PRINCIPAL OF BOSTON-BASED KENNEDY & VIOLICH ARCHITECTURE AND A PROFESSOR AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. IN 2000, SHE ESTABLISHED MATx, A MATERIALS RESEARCH UNIT AT KVA INVESTIGATING PRODUCTION ACROSS VARIOUS FIELDS. INTERVIEW BY RITA CATINELLA ORRELL.

Architectural Record: Looking at materials, what is the biggest challenge for architects in the next decade?

Sheila Kennedy: In the United States we have forgotten how to make things. I'm working on a project now where stone is quarried in the Northeast and is being outsourced to India for fabrication. In architecture schools, there is great interest in materials, but many programs still don't have the facilities or the pedagogy to really get traction on teaching an embodied-material, savoir-faire architecture. A key challenge is bridging the gap between the now robust world of 3-D modeling and the world of prototyping and digital fabrication.

AR: Are you working with any exciting new materials in your MATx studio at the moment?

SK: We are involved in a project that's not out yet, but the broad parameters have to do with thinking about wood and phase-changing materials [which store and release thermal energy in the process of changing from one phase to another, such as from a solid to a liquid].

AR: What kinds of manufacturers will lead the way in material research in the next decade?

SK: The manufacturers that will be most able to take advantage of innovation with materials will be those that have the ability to vertically integrate, either within their own company structures or by engaging architects and other consultants. I think that a company's approach to manufacturing is going to be key – those that are able to make changes in the way their materials are extracted and produced, or the way their materials are assembled and distributed, will be well positioned to succeed.

AR: What do you hope to see in the next decade with photovoltaic material developments?

SK: I think it's great that we have some relatively high-performing crystalline silicon- and glass-based solar panels, but this poses a material science dilemma that gets back to the manufacturing problem. Can we afford up-front carbon emissions in order to get clean energy a little bit farther down the line? There are pretty good models that show you need to run a glass-based solar panel for two years before you can get the embodied energy out of it.

AR: What would you say to a company that's wondering whether it's worth investing in a more sustainable product in this economy?

SK: The answer depends on your time frame. If you look at a midrange period, let's say the next five years, a company that does *not* innovate is probably going to do worse than one that engages now and is slightly ahead of the curve.

SUBURBIA

JUNE WILLIAMSON IS AN ASSOCIATE PROFESSOR AT THE SCHOOL OF ARCHITECTURE AT THE CITY COLLEGE OF NEW YORK AND THE COAUTHOR, WITH ELLEN DUNHAM-JONES, OF *RETROFITTING SUBURBIA: URBAN DESIGN SOLUTIONS FOR REDESIGNING SUBURBS.* INTERVIEW BY LAURA RASKIN.

Architectural Record: What are the main issues associated with thinking about the suburbs today?

June Williamson: Retrofitting or remaking or infilling suburbia is going to be the big design and development project for the next half century. We spent 50 to 60 years building it up, so we're going to have to spend an equivalent period of time restructuring it, especially in the context of challenges such as climate change, oil scarcity, affordability, and changing demographics.

AR: What is suburbia going to look like in the next five to 10 years?

JW: The composition of the American population is changing, and that means a shift away from the single-family house and all of the commercial development that has gone along with it. The recession has brought all of this into high relief, although the trends were happening already.

AR: What can be done to make the suburbs better? Finding new uses? Increasing density? Connecting them to cities in better ways?

JW: All of the above. One of the most interesting things is a more widespread recognition of the diversity of suburban communities. There is growing diversification, with higher numbers of people living in poverty in suburbs than in cities. Also, suburbs are increasingly gateway locations for new immigrants. They go straight to suburbia.

AR: The reverse used to be true, with the wealthy leaving the city for the suburbs and immigrants going to cities.

JW: It's not universal, but certainly the old stereotypes need to be thrown out the window. And we need to create pockets of development within suburbia that can be served by mass transit and provide higher density housing. This would provide more choices for singles and couples and offer proximity to jobs. It's not about remaking everything; it's about preserving open space and directing new development to nodes.

AR: Are there some distant suburbs that should be abandoned?

JW: That's hard to say, but regions need to think about cities and suburbs together. They need to combat sprawl and better utilize the infrastructure that's in place – transit, water, power, sewers, social services. That might mean establishing urban growth boundaries or other mechanisms at the planning level to inhibit sprawl. But there is a lot of underperforming asphalt, as well as "toxic assets" or red fields – failed commercial properties – that could be retrofitted.

AR: What is the role of the private sector versus urban planners, and how will these roles change?

JW: In the past decade, it certainly was the private sector leading both development and innovation – in retrofitting suburbia, challenging zoning, and making mixed-use profitable. At the current moment, we have a real opportunity for proactive planning, and we should make structural changes to correct zoning regulations and codes that unintentionally further sprawl and inhibit innovative retrofitting projects.

CRITICISM

ALEXANDRA LANGE IS A CRITIC, JOURNALIST, AND ARCHITECTURAL HISTORIAN. SHE IS THE COAUTHOR, WITH JANE THOMPSON, OF *DESIGN RESEARCH: THE STORE THAT BROUGHT MODERN LIVING TO AMERICAN HOMES*. INTERVIEW BY SUZANNE STEPHENS.

Architectural Record: With newspapers and magazines struggling, what do you see as the future of architectural criticism?

Alexandra Lange: While architectural criticism seems to be a shrinking field, we still need it. So I hope new media channels can deliver it to people who want it. For decades, however, people have wondered why there isn't more criticism in architecture magazines. It seems to be due to the conflict of having boosterism of the profession and criticism in the same pages.

AR: What about blogs? Do they free up criticism?

AL: With blogs, architecture suffers from the problem of gee-whiz images, only some of which are real. Architecture could become focused too much on images, especially now, when less is being built.

AR: You have been blogging and recently joined Design Observer's Web site. Why did you start blogging?

AL: I started blogging in June 2009, when work was slow and it was driving me crazy not to give my opinions. I did it for free, to have a platform. The piece that brought the most attention – plus other commissions – was my critique of [*New York Times* architecture critic] Nicolai Ouroussoff. I felt I had nothing to lose, and at that time I was thinking of leaving criticism. I wrote out of a sense of frustration: Here was someone who had a great platform and was not using it. I figured the worst that could happen was that the *Times* would never call me with an assignment again. But that didn't happen.

AR: How can print magazines differentiate themselves from digital media?

AL: Since you can get a lot of material online, print magazines could become more like reviews. Instead of just reporting, they could review books and buildings. Print magazines should have more distinctive voices and points of view. I'm not saying there's a market for this. But they are losing their sense of exclusivity of coverage as images of buildings get distributed on the Internet.

AR: In the past, critics were on the staffs of newspapers and, in some case, magazines. What's the reality of making a living from blogging?

AL: Now it feels as if there are more outlets, but the pay is terrible. Some blogs don't pay at all. You have to have other sources of income.

AR: You teach and write design criticism as well as architectural criticism. What's your motive for doing both?

AL: It's true: I write about half the time on design and half on architecture. Having a larger category includes more people in the discussion. It redefines the audience and brings it with you to see the world as a designed place.

THEORY

GEORGE BAIRD IS A PRINCIPAL IN BAIRD SAMPSON NEUERT ARCHITECTS AND WAS THE DEAN OF THE JOHN H. DANIELS FACULTY OF ARCHITECTURE, LANDSCAPE, AND DESIGN AT THE UNIVERSITY OF TORONTO UNTIL 2009. INTERVIEW BY SUZANNE STEPHENS.

Architectural Record: In 2004, you highlighted theoretical questions facing architecture in a much discussed essay, "Criticality and Its Discontents," for *Harvard Design Magazine*. You pointed out how earlier theoretical investigations, under such rubrics as structuralism, poststructuralism, and deconstruction, were being questioned. What happened to the interest in the high theory of the 1970s, '80s, and '90s?

George Baird: That was a time of wide expansion of studies in areas such as psychology, literature, and feminism, which got refracted through the lens of architectural theory. But this eventually led to an impatience with critical and theoretical concerns – as opposed to considerations having to do with architectural practice. In my "Criticality" text, I expressed my fear that the new generation's emphasis on pragmatic, open-ended architectural concerns could lead to a certain amorality in outlook.

AR: So, where are we today?

GB: There is no dominant theoretical position at the moment. Certainly we still theorize about architecture. But today's new theory has not yet developed a relevance to practice. Although deconstructivist thinking was radical, it never had much of a social component. The current generation is attempting to form a position about the role of the architect that can address multiple aspects of reality. At the same time, the fascination with the star system is waning and you see a growing influence of social concerns with, for example, the rising prestige of the Aga Khan Award for Architecture, not to mention the Museum of Modern Art in New York's recent exhibition *Small Scale, Big Change: New Architectures for Social Engagement*.

AR: Who is important to thinking in this theoretically transitional moment?

GB: Rem Koolhaas continues to be one of the liveliest critics in the field. While he has been accused of being cynical, his alignment with global capitalism was a way of keeping architects from being marginalized. His interest in Africa highlighted urban issues for the profession. It has been energizing. I would say that what has been called his cynicism is actually simply a manifestation of his phobia of architectural "do-goodery." On this continent, Columbia University architecture professor Reinhold Martin is one of the most politically engaged theorists and critics. But he embeds his political interest in the discussion of actual buildings. Another person to watch is Tim Love, whose firm, Utile, Inc. Architecture + Planning, in Boston, reflects his theoretical and pragmatic interest in the typologies of small-scale housing and the way zoning codes and building codes affect design.

AR: European architects have always been more interested in philosophy than their American counterparts. Where do they stand today?

GB: A number of Europeans are doing interesting work. Since theory is in a transitional phase, the work could be quite influential in the future. The 20-year-old Berlage Institute in Rotterdam is providing an intellectual base for this effort, as is the Canadian Centre for Architecture in Montreal. ■

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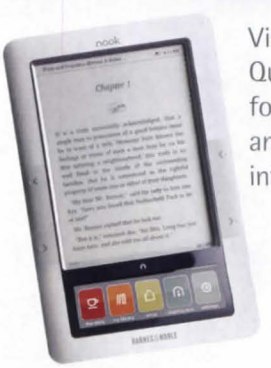

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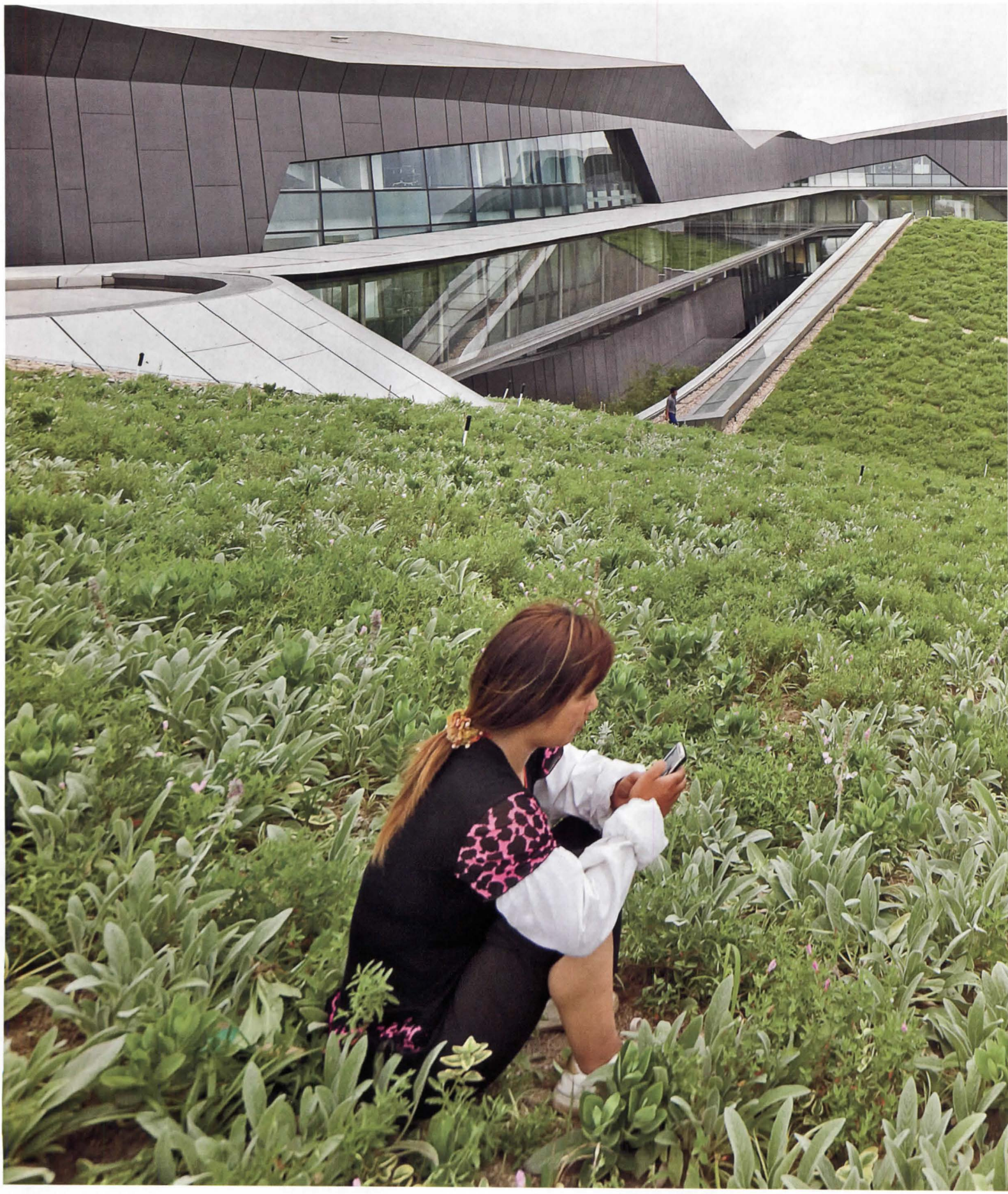


GIANT INTERACTIVE GROUP

MORPHOSIS ENGAGES LANDFORM WITH ARCHITECTURE TO CREATE A NEW KIND OF WORKPLACE FOR CHINESE CAPITALISM.

BY CLIFFORD A. PEARSON

CORPORATE OFFICE BUILDINGS used to offer architects the chance to tap into fat construction budgets and make serious design statements. Think Mies van der Rohe and Seagram or Eero Saarinen and General Motors. Today, only a few U.S. corporations are investing in significant architecture, and some (such as the New York Times) have been criticized for spending too much on it, while others (such as Bank of America) have kept quiet about their new buildings for fear of being criticized. Corporate China, though, is starting to flex its muscle and sees architecture as a fine way of showing off its bulging profits. Many of the new office buildings rising in both urban and suburban China scream wildly for attention, but a few are taking more sophisticated – if no less bold – approaches to shaping the workplace and expressing the role of capitalism in a nominally communist society.

Flashy, famous, and fearless, Yuzhu Shi, the chairman and founder of Giant Interactive Group, represents a new generation of Chinese entrepreneurs. With his face on the covers of glossy lifestyle magazines and an executive suite stocked with female assistants who could model clothes in those same publications, Shi had no interest in commissioning dull architecture. So he hired Thom Mayne and his firm Morphosis to design a headquarters for the interactive, online games division of his fast-growing group of companies, knowing full well that Mayne had made even the California Department of Transportation and the United States federal government look sexy in sleek new office buildings in Los Angeles [RECORD, January 2005, page 120] and San Francisco [RECORD, August 2007, page 96]. Although Giant had offices in a number of buildings in central Shanghai, Shi decided to build his new complex on the city's outskirts where it could spread out.

ABOVE: **Shared facilities such as a gym, pool, and hotel sit under a green roof (right in photo), while offices occupy an east wing of glass, steel, and fiber cement panels.**

BELOW: **A walkway along the office wing connects to a bridge spanning a highway.**

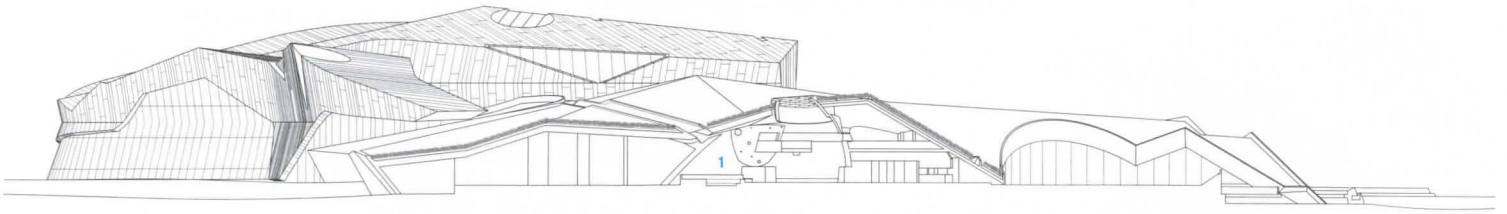
OPPOSITE: **The bridge, which curves and slopes, presented an engineering challenge.**

When Mayne and his team first visited the site, they found farms and a flat landscape. Other architects might have seen a featureless setting, but Mayne envisioned the land playing an active role in the project. Since learning about Michael Heizer, Robert Smithson, and other "earth artists" in the 1980s, Mayne had designed a number of projects – including the Crawford Residence in Santa Monica (1990) and the Diamond Ranch School in Pomona (1999) – that dug into and engaged their sites. "Giant is the culmination of this train of thought," states Mayne. "In all these projects, we tamper with the figure/ground relationship and turn the land into an active component."

Working with the landscape architecture firm SWA, which had master-planned the 44.5-acre site as a parklike setting with a new lake connected to existing canals, Morphosis designed the building as a series of snaking forms burrowing under and through the land. Almost all of the western half of the building (containing shared elements such as an indoor pool, a gymnasium, and a hotel for corporate guests) sits below a 164,000-square-foot green roof, which reads from afar as a faceted hill or folded meadow. The east half of the complex (containing the general offices, executive offices, auditorium, cafe, and library) jumps over a highway bisecting the site and reaches out to the lake. In a dramatic flourish, the east wing cantilevers out 115 feet, hovering above the lake with a glass floor offering views of the rippling water below.

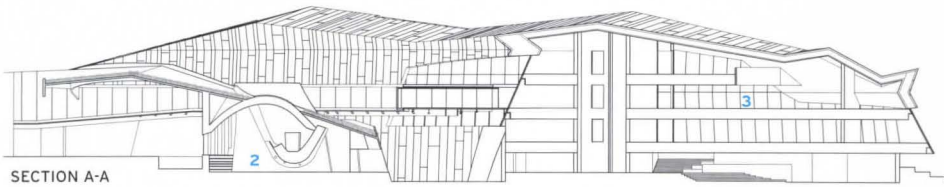
"When we showed the client the design for the cantilever, he asked, 'Is it big enough?' " marvels Mayne, contrasting this bravado with the risk-averse approach of most American companies. "We couldn't do anything like this in the U.S. today."

While the enormous green roof, the lake, and a series of plazas and courtyards carved into the building offer employees ample opportunities to enjoy the outdoors, Mayne's approach to nature is anything but naturalistic. "It's an augmented landscape," says the architect. He and his team designed the building as a "multiplicity of components" acting on and responding to the folded land, the highway running through the property, and major programmatic needs. The goal, says Mayne, was to



SECTION B-B

1 SWIMMING POOL
2 LIBRARY
3 GENERAL OFFICES



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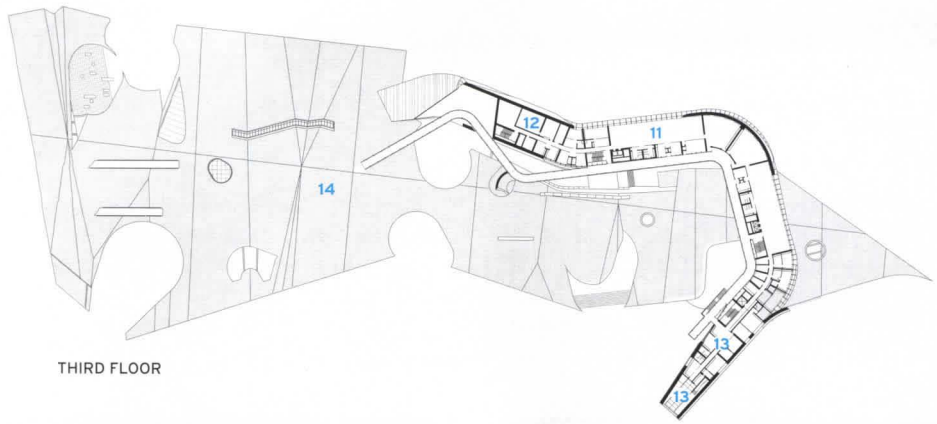
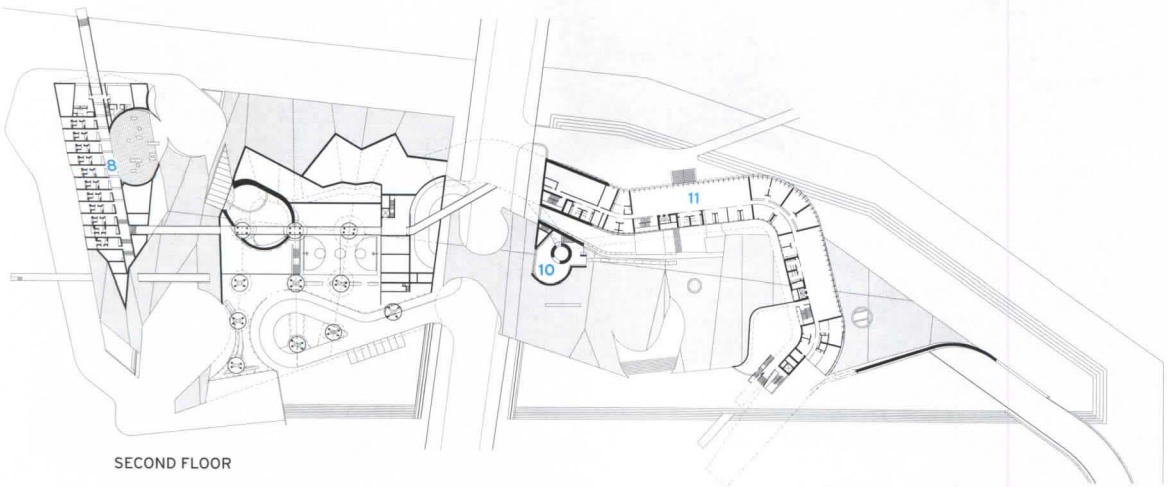
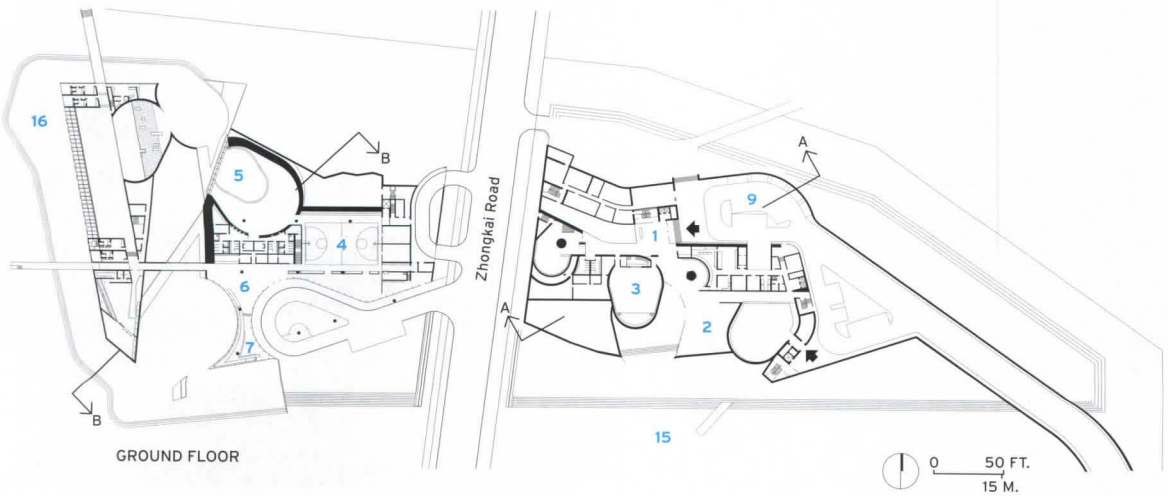


THIRD FLOOR



SECOND FLOOR



GROUND FLOOR

1 MAIN LOBBY
2 CAFE
3 AUDITORIUM
4 FITNESS CENTER
5 SWIMMING POOL
6 HOTEL RECEPTION
7 BAR
8 HOTEL GUEST ROOMS
9 PARKING
10 LIBRARY
11 OPEN OFFICES
12 PRIVATE OFFICE
13 CEO AREA
14 GREEN ROOF
15 LAKE
16 POND

CREDITS

ARCHITECT: Morphosis – Thom Mayne, design director; Tim Christ, Paul Gonzales, project managers; Hann-Shiuh Chen, Ted Kane, Mario Cipresso, project architects; Leonore Daum, project designer

DESIGN INSTITUTE: MAA Engineering Consultants

LOCAL ARCHITECT: SURV

ENGINEERS: Bao Ye, Thornton Tomasetti (structural); MAA Engineering Consultants (structural, mechanical, and electrical); IBE Consulting Engineers (mechanical/electrical/concept)

LANDSCAPE ARCHITECTS: SWA Group; TOPO Design Group

GENERAL CONTRACTOR: China State Construction Engineering

SOURCES

FIBER CEMENT PANELS: Swisspearl

STANDING SEAM METAL ROOF: Corus Kalzip

GLASS FIBER-REINFORCED GYPSUM PANELS: EGROW

DOWNLIGHTS: Thorn

RAISED FLOORING: Lindner

CARPET TILES: Interface Flor

LEFT: **A reception area leads onto a plaza carved from the building's sprawling form, part of a strategy to link a variety of outdoor spaces with indoor ones.**

ABOVE: **Conical forms mask columns in the hotel lobby.**

BELOW: **An indoor swimming pool is one part of an extensive fitness center open to all employees.**

1. **The executive portion of the office wing cantilevers 115 feet and extends above a lake.**

2. **A combination of fiber cement panels and glazing offers views from offices while protecting them from the sun. A promenade lets employees walk along the lake.**

3. **A glass-floored conference room adds a dramatic touch to the executive suite.**

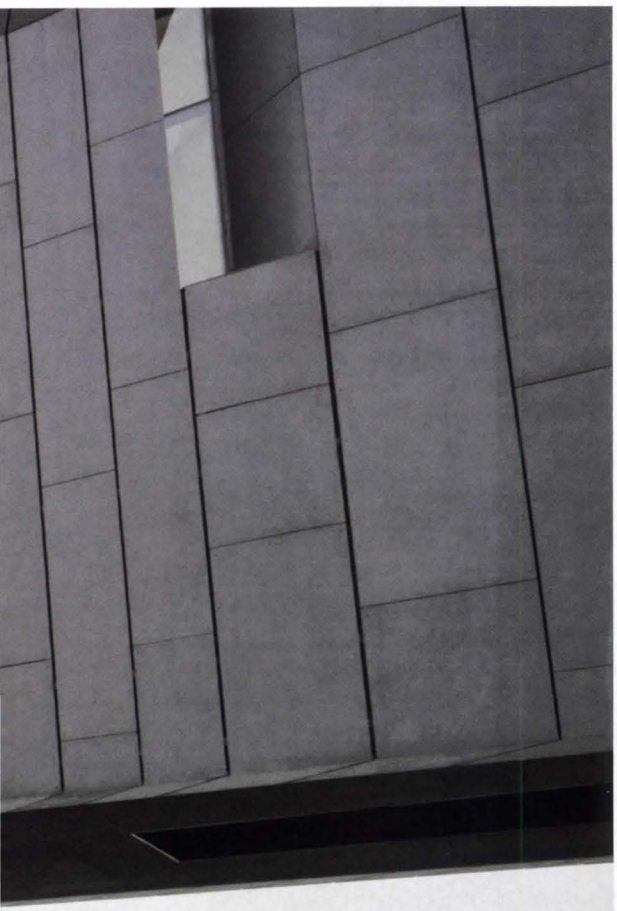
"attack singularity" and echo "the messiness, the ad-hoc-ness that we love in cities." Finding the right balance between "coherence and chance" was critical to during the design process.

The 258,000-square-foot headquarters represents a new, magnanimous approach to employee relations emerging in China. Extensive recreational facilities and outdoor spaces reflect Giant's strategy of using perks to attract talented staff, inspired by the approach used by Google and U.S. software companies.

The steel-frame building took two and a half years to build and required some sophisticated coordination between the Morphosis team generating 3-D computer models and the steel fabricator in China. In some places – such as the curving, sloping bridge that spans the highway and connects the east and west wings – the design borders on the excessive. But the architects kept other parts of the building – such as the area under the green roof – fairly simple, in part to allow flexibility in how it is used. While Mayne's attitude to landscape began as an artistic concept, it led him to a design that has important green benefits. For example, burying so much of the building in the ground reduces heating and cooling loads. In addition, an enclosed and ventilated (but not conditioned) walkway runs along the south side of the west wing, buffering offices from the sun, and a double skin on portions of the north facade also creates more temperate interior spaces.

Mayne says he didn't want to design "a perfume bottle," a building as icon. Instead, he created a sprawling complex that captures the restless energy of 21st-century China – a place that may have too much going on, but that nevertheless impresses us with its daring and its indomitable will to keep pushing forward. ■

1



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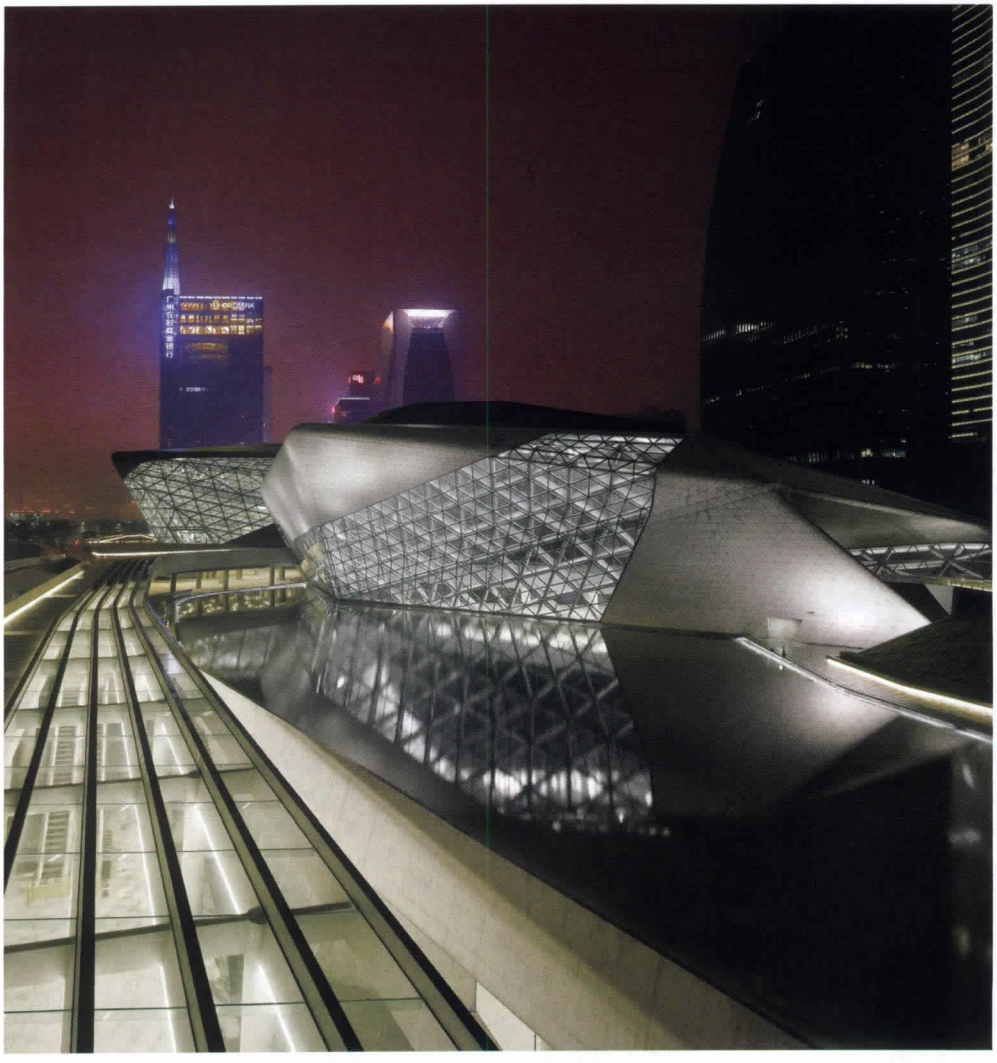
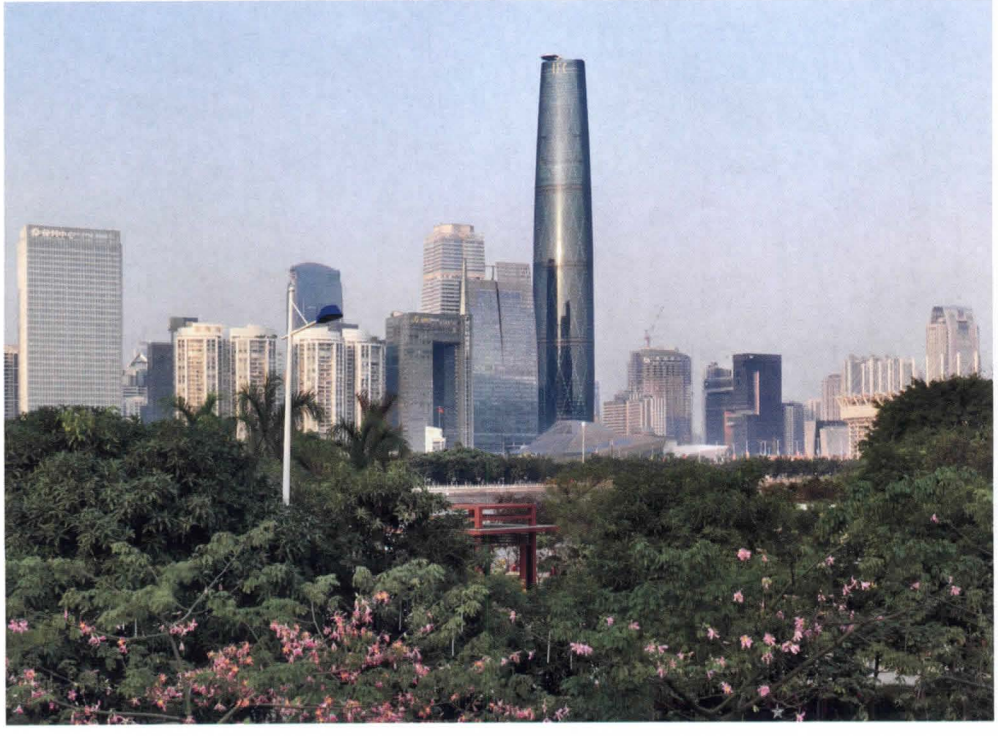
3

AR PREVIEW PEARL RIVER DELTA

Occupying one corner of the Pearl River Delta, the city once known as Canton is grabbing attention with high-profile buildings.





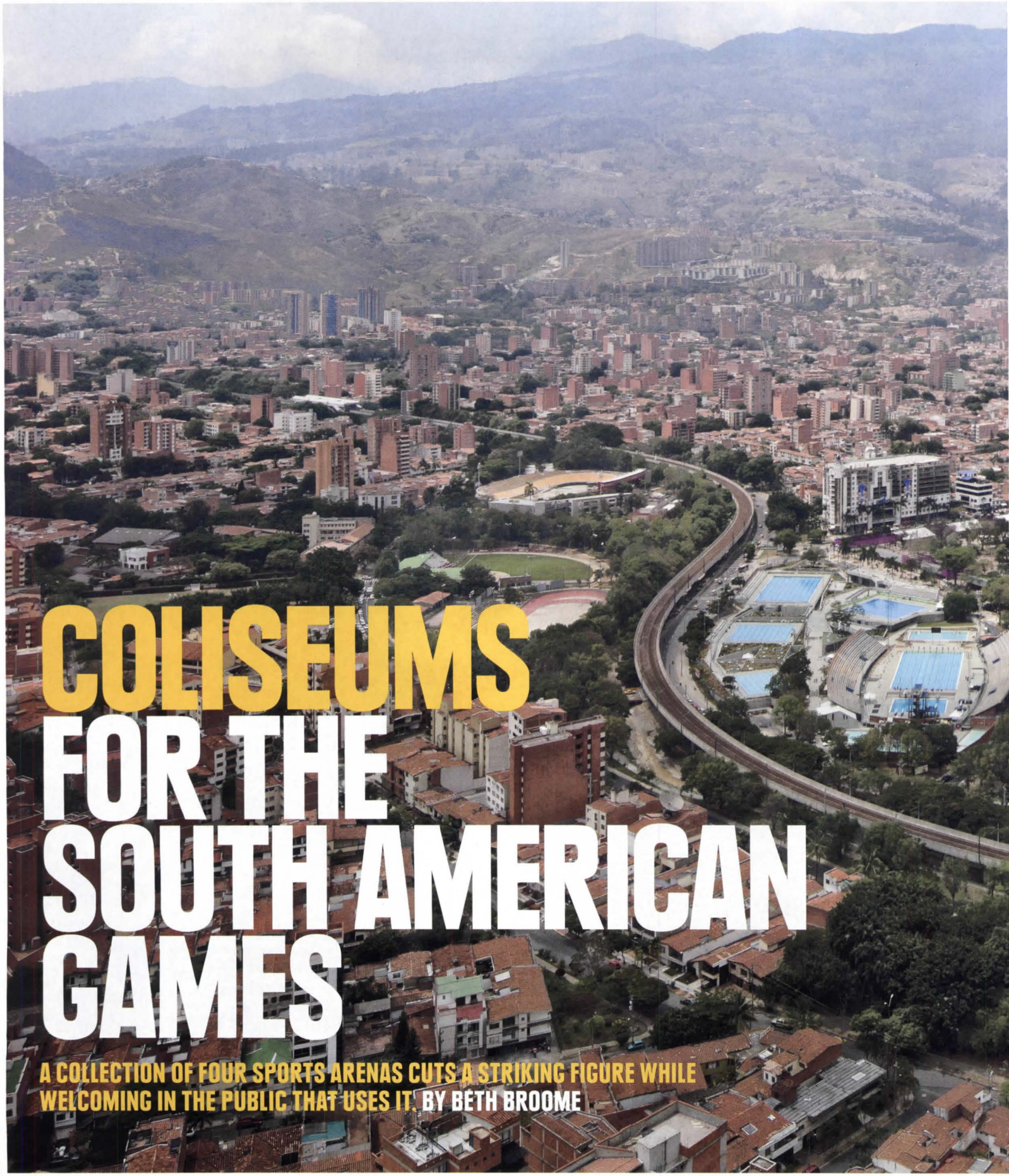
CANTON TOWER Mark Hemel and Barbara Kuit of the Amsterdam firm Information Based Architecture worked with Arup to design this 2,000-foot-tall television tower (opposite) as a twisting form generated from a pair of ellipses – one at its foundation and the other at a "waist" 1,475 feet up.

OPERA HOUSE Zaha Hadid designed a pair of "boulders" to house an 1,800-seat grand theater, a multifunction hall, and ancillary spaces. The complex (left) opened in November 2010.

INTERNATIONAL FINANCE CENTRE This 1,445-foot, 103-story tower by Wilkinson Eyre anchors Guangzhou's Zhujiang New Town with the city's commercial district to the north and the Pearl River to the south. The building (below left) includes offices, a hotel, and retail.

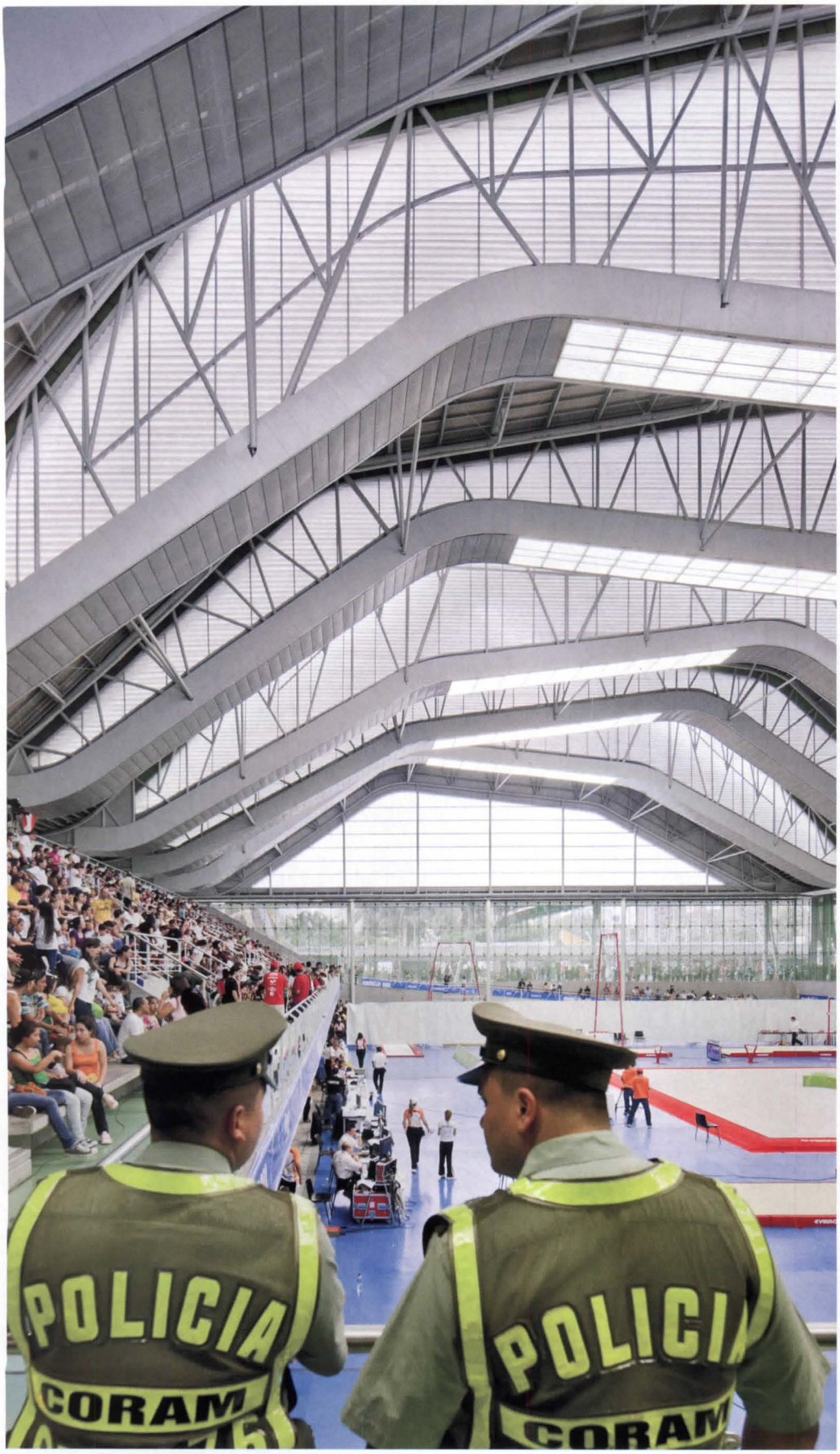
PEARL RIVER TOWER When this 71-story tower (below right), designed by SOM, opens later this year, it will feature sustainable strategies such as wind turbines at two mechanical floors, solar panels, and a double-skin curtain wall.

PHOTOGRAPHY: COURTESY INFORMATION BASED ARCHITECTURE (OPPOSITE); © ROLAND HALBE (TOP); JONATHAN LEIJONHUFVUD (BELOW LEFT)



COLISEUMS FOR THE SOUTH AMERICAN GAMES

A COLLECTION OF FOUR SPORTS ARENAS CUTS A STRIKING FIGURE WHILE WELCOMING IN THE PUBLIC THAT USES IT. BY BETH BROOME



Perforated metal screens provide a visual and social transparency between the animated public spaces on the buildings' peripheries and the gymnasium interiors.

LEFT: **Daylight streams into the arenas through polycarbonate-clad clerestories, which are created by the roof's topography.**

WITH ITS UNDULATING roof profile, the Coliseums, a complex built for the 2010 South American Games in Medellín, Colombia, appears as a mountain – albeit a caricature of one – in the midst of the city. Indeed, the design team, the offices of Bogotá-based Mazzanti Arquitectos and Medellín-based plan:b arquitectos, conceived the project, which is sited in surreal juxtaposition to the Andes in the background, as a new landform within the Aburrá Valley.

Shortly after Medellín was selected to host the 2010 South American Games, the city (which has been much hyped for its recent architectural renaissance) set forth plans for significant investments in athletic facilities. And, in mid-2008, in cooperation with the public agency Institute for Sports and Recreation (INDER) and the Colombian Society of Architects, it sponsored an open international competition for a series of gymnasiums. The selected site housed preexisting sporting facilities, such as a stadium and aquatics center, some of which had fallen into disrepair. Among these was the Iván de Bedout basketball coliseum built for the 1978 Central American Games. The competition brief called for a new facade for this arena, as well as three new facilities to accommodate gymnastics, martial arts, and volleyball. With the March 2010 Games creating a hard deadline, the winning team had just 18 months from competition to completion of the 493,000-square-foot, $50 million project.

"We conceived of the four buildings as a single large urban structure with sporting arenas and covered areas for public zones," says plan:b's Felipe Mesa. "Basically, what we did was to make these four buildings with the same modules," notes Giancarlo Mazzanti. "Every piece of one building is identical to the pieces of the building next to it, just arranged differently." To start, the team removed the roof of the existing gymnasium, retained the concrete risers, and reinforced the structure for seismic resistance. They then designed six different trusses and ordered them in unique parallel configurations for the existing arena as well as each of the three new buildings. This system of modular bands enabled the manipulation of the section to accommodate the vertical requirements of the respective sports as well as allowing for extending the strips beyond the enclosures to create covered outdoor areas that provide shade and shelter from the rain. The repetitive use of the elements creates flexibility, rendering a form that can be easily expanded as needs change in the future. Also, while the four gymnasiums function independently, this topographic "cover," which calls to mind the landformlike architecture of Peter Eisenman's City of Culture of Galicia, Spain, enables the entire complex to be read as a whole and, with the protected public zones it creates along the buildings' peripheries, creates a spatial continuity as well.

Fundamental to the architects' approach was the idea of creating an open architecture. Laminated metal facades perforated with a delicate, laser-cut leaf pattern respond to the mild local climate (Medellín, after all, is known as the City of Eternal Spring), permitting breezes to enter and condition the spaces. This veil, which shrouds the muscular structure, Mesa points out, "also results in social transparency and accessibility." Not only can users catch glimpses out to the city while inside, but they also can peer in without entering, enabling them to observe sporting events without having to pay admission. Now that the Games have ended, professional teams, the general public, and schoolchildren regularly use the facilities. "In general, coliseums are closed buildings," notes Mazzanti. "You can't see what's inside. With these buildings you can see everything. This is truly a public place." Indeed, the covered interstitial areas between the buildings – which are visually a bit cavelike, edged with a mangrovelike forest of steel double columns – have a great democratizing force. In addition to serving as extended viewing areas for sports fans, they encourage pedestrian circulation through the complex (each gym has its own entrance) and host a wealth of both organized and spontaneous activities. On a recent weekend afternoon, the spaces were animated by the movements and sounds of pep squad practices, skateboarders, and team warm-up drills.

In line with the rest of the surrounding sporting complex, the coliseums are arranged along a north-south axis. This siting optimizes cross-ventilation by taking advantage of the predominating northerly breezes, an important consideration for a building that has no central cooling. The orientation also acts in concert with the roof forms, which create giant north- and south-facing clerestories. These apertures, in addition to those at both ends of the buildings, are positioned to block the sun's glare while admitting a pleasing ambient light through their polycarbonate channel glazing.

A basic material palette reinforces the project's municipal feel. The floor slabs and precast bleachers are concrete. The architects opted for steel for the structure, facades, and roof.

CREDITS

PROJECT: Coliseums for the South American Games
ARCHITECT: Mazzanti Arquitectos – Giancarlo Mazzanti, principal; and plan:b arquitectos – Felipe Mesa, principal; Andrés Sarmiento, Luz Rocío Lamprea, Alberto Aranda, Carlos Bueno, Susana Somoza, Juan Pablo Ramos, design team
CONSULTANTS: Nicolás Parra and Daniel Lozano (structural engineers); Jorge Granados (plumbing); Jorge Ramírez (environmental)
GENERAL CONTRACTOR: Coninsa-Ramón H.
BUILDING INSPECTOR: Carlos Mario Rodríguez

SOURCES

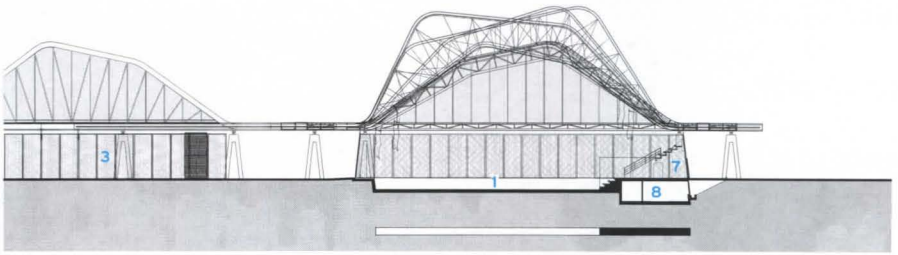
STEEL STRUCTURE: Corpacero
PERFORATED METAL PANELS: Rolformados
RISERS: Cimbrados
FLOORING: Mondo (resilient); PPG (protective coating)

LEFT: **Fans watch a sporting event projected onto a screen in the interstitial space outside the arenas. They also observe it firsthand through the punched metal facades that veil the structure and emphasize the roof forms to dramatic effect.**

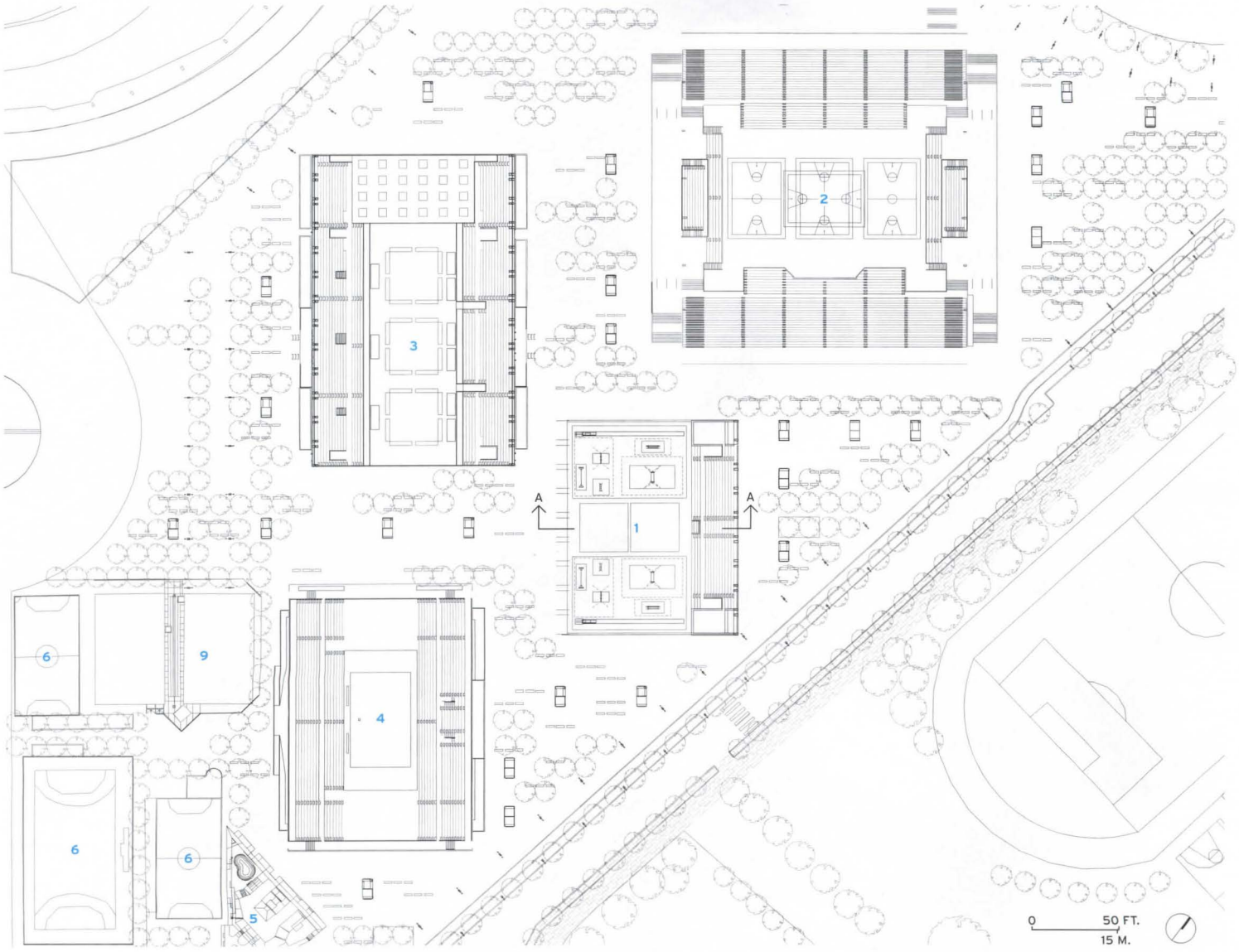
This, combined with modular components fabricated off-site, they reasoned, would speed up construction, enabling them to meet the tight deadline. Light-gauge steel trusses, placed every 16 feet and resting on the double columns that proliferate around the buildings' exteriors, form box beams that house lighting for the courts. The roof assembly itself consists of a sandwich of fiber cement board, a waterproofing membrane, and bands of metal roofing painted in varying shades of green to echo the tones of the surrounding mountains.

The accelerated pace of design and construction that typify Colombia's competition system for public work can lead to limited material choices and detailing or compromised construction quality. Yet haste has its advantages as well. In the case of Medellín's Coliseums, squeezed budgets of time and money caused the architects to focus on form making and social place making. And snap decisions resulted in an immediacy in design and construction, yielding a monumental complex that buzzes with activity and is at once fresh, undiluted, and raw. ■

1 GYMNASTICS ARENA
2 BASKETBALL ARENA
3 MARTIAL ARTS ARENA
4 VOLLEYBALL ARENA
5 SKATE PARK
6 OUTDOOR COURTS
7 STADIUM SEATING
8 SERVICES
9 BEACH VOLLEYBALL



SECTION A-A

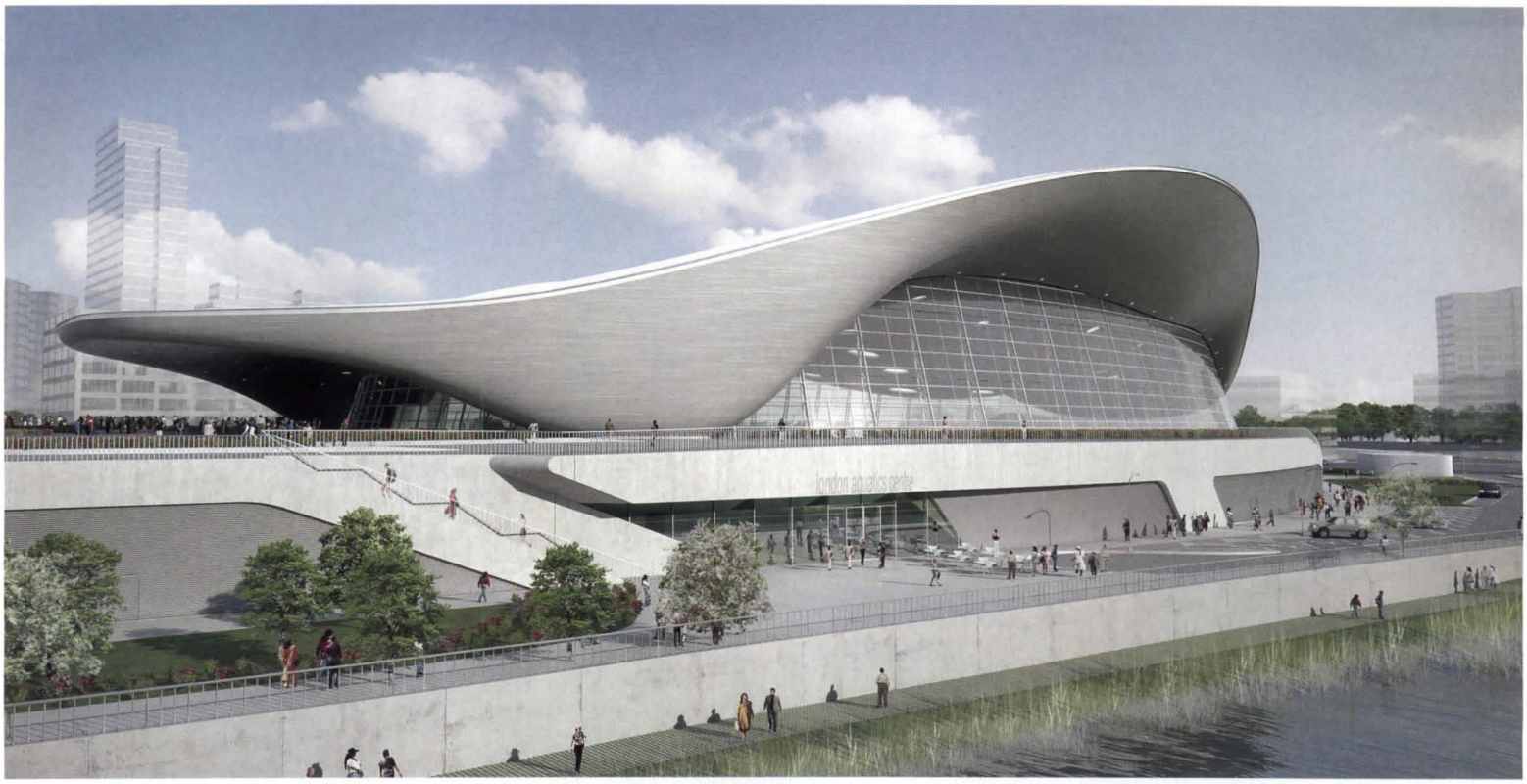


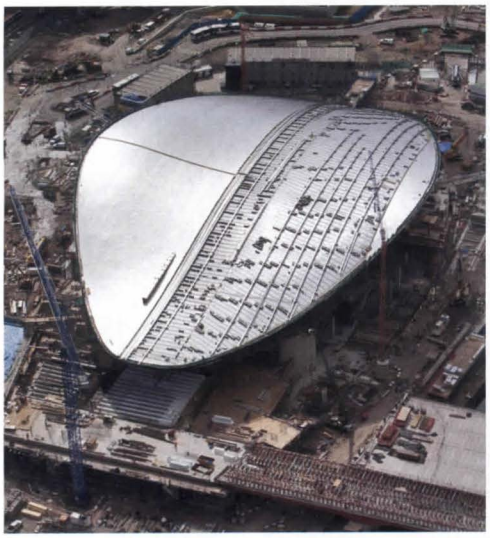
SITEPLAN

For expanded video coverage of this project, visit our Web or iPad edition.

AR PREVIEW OLYMPICS

Construction for the London 2012 Games is under way in Olympic Park, where dynamic, sustainable buildings have already won Gold.

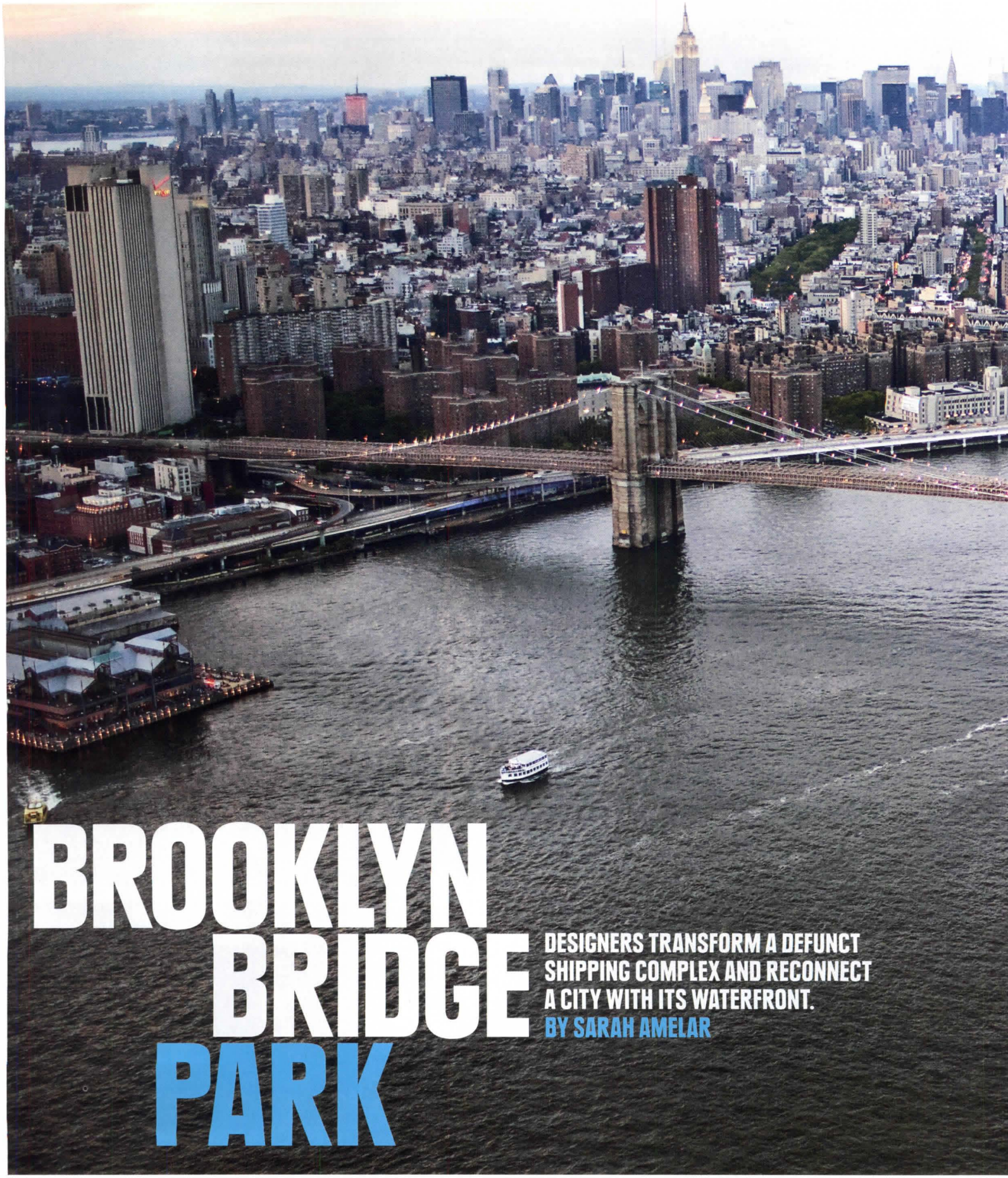




STADIUM Populous's spare design for the Olympics' flagship building has a "legacy" element too, seating 80,000 during the Games and 25,000 after, when the upper tier of the structure will be removed. The stadium (opposite) is located in the south of Olympic Park and is surrounded by water on three sides; five bridges connect it to spectators. Fabric-wrapped steel rakers form the sunken bowl and support precast concrete terrace units.

AQUATICS Zaha Hadid's aquatic center (left and above) anchors the southeast corner of Olympic Park, located six miles from Trafalgar Square. The concave, manta-raylike roof is made of aluminum-covered steel. The center will seat 17,500 spectators during the Games and 2,500 afterward, when temporary seating (not shown) is removed and the center reverts to its public "legacy" mode.

BASKETBALL A collaboration between Sinclair Knight Merz, Wilkinson Eyre Architects, and KSS Group, the basketball arena (below left and right) is one of the largest venues ever built for any Games. The structure will be dismantled and removed entirely once the Games are over; two-thirds of the materials will likely be reused elsewhere. The single-skin cladding is made of PVC and hemp.



BROOKLYN BRIDGE PARK

DESIGNERS TRANSFORM A DEFUNCT SHIPPING COMPLEX AND RECONNECT A CITY WITH ITS WATERFRONT.

BY SARAH AMELAR

"WHEN WE WERE planning Brooklyn Bridge Park [BBP], people kept telling us how much they wanted to be able to touch the water," says BBP's designer, landscape architect Michael Van Valkenburgh, recalling the hundreds of community meetings he attended in the making of this park. Simple as that request may seem, it reflects the complicated saga of our cities and their rivers – and, specifically, the tale of this narrow, irregular 1.3-mile-long stretch of waterfront in Brooklyn, New York, and its barriers to neighborhood enjoyment.

Though they live surrounded by water, most New Yorkers have never touched the city's East or Hudson Rivers. And while both rivers are tidal estuaries, their extensively bulwarked banks scarcely register such ephemeral events as rising and falling tides.

Like many American cities, New York long severed much of daily life, particularly leisure activity, from direct engagement with its waterways. Visitors to urban riverside parks have historically been sequestered in scenic overlooks or railed-in promenades. And with good reason: Through the 19th and much of the 20th centuries, harbors developed into gritty and inhospitable industrial places. But in recent decades, that water-land disconnect has been gradually

1

2

1 PIER ONE
2 PIER TWO
3 PIER THREE
4 PIER FOUR
5 MARINA
6 PIER FIVE
7 PIER SIX
8 PARK ENTRANCE
9 MAIN STREET PARK
10 EMPIRE FULTON FERRY STATE PARK
11 BROOKLYN-QUEENS EXPRESSWAY

SITE PLAN

healing, as New York and other cities have shifted from manufacturing to service economies, coupled with serious measures to clean, preserve, and access their aqueous riches in pleasurable, old-fashioned ways.

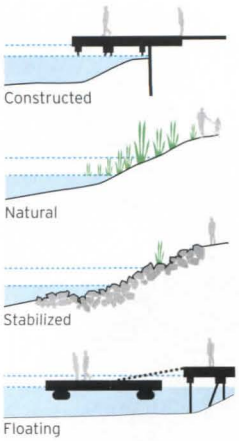
Along the East River, landfill expanding the working shoreline dates back to the 1680s and forms BBP's underlying terrain. But the site's most significant modern shapers came in the 1950s, when the Port Authority of New York and New Jersey developed it as an 85-acre shipping complex, with six piers of warehouses. In that same era, a new traffic artery, the Brooklyn-Queens Expressway (BQE), isolated this low-lying waterfront from its inland and upland adjacencies. The BQE's tiered road decks and the pedestrian promenade above them cantilever from a steep bluff. While this engineering feat preserved residential Brooklyn Heights's views, it also produced a virtually impenetrable divide. And by the early '70s, containerized shipping had rendered the once state-of-the-art facility obsolete, ending its life as a cargo complex in 1983.

PREVIOUS PAGE: **Pier One, completed this past spring as part of the project's first phase of construction, sits just to the south of the Brooklyn Bridge.**

OPPOSITE: **The park has open meadows as well as seemingly wild landscapes.**

1. **A wide stair of salvaged, rough-hewn granite blocks steps down a slope like raked theater seats providing views of the river, two bridges, and Manhattan.**

2. **Before its transformation, the BBP site was a complex of six warehouse piers.**



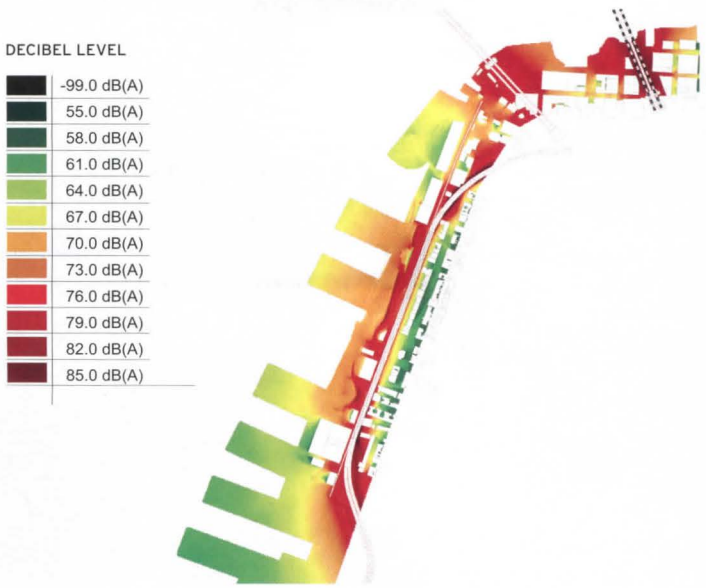
WATER-LAND EDGE STRATEGIES

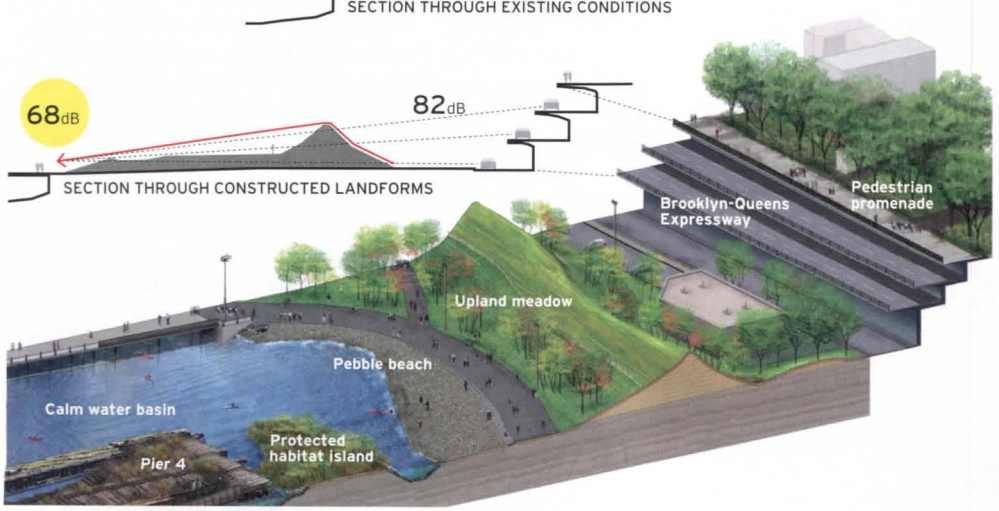
The vacant site saw a series of high-rise, high-density development proposals, countered by nearly two decades of community activism and engagement before Mayor Michael Bloomberg and Governor George Pataki signed off on the park's creation in 2002. Van Valkenburgh's 2005 master plan lays out a vision as well as hard realities – reimagining the defunct piers as richly varied parkland while recognizing BBP's need, in the face of tight public funding, for economic self-sufficiency in maintenance and operations. The controversial solution was to cede 10 acres of the site, divided between two parcels at either end, to income-generating private development, including residential and retail space and a hotel. This past spring brought the completion of the project's first phase: part of Pier Six, as well as Pier One, just south of the Brooklyn Bridge.

As you enter the park, that spectacular span, with the Manhattan Bridge just beyond it, comes exhilaratingly into view. Most striking is the scale of these looming structures – and your intimate proximity to them. As Van Valkenburgh points out, there is a contemporary quality in the way the park engages the visible infrastructure, the "800 acres of water," and the cityscape. When the $350

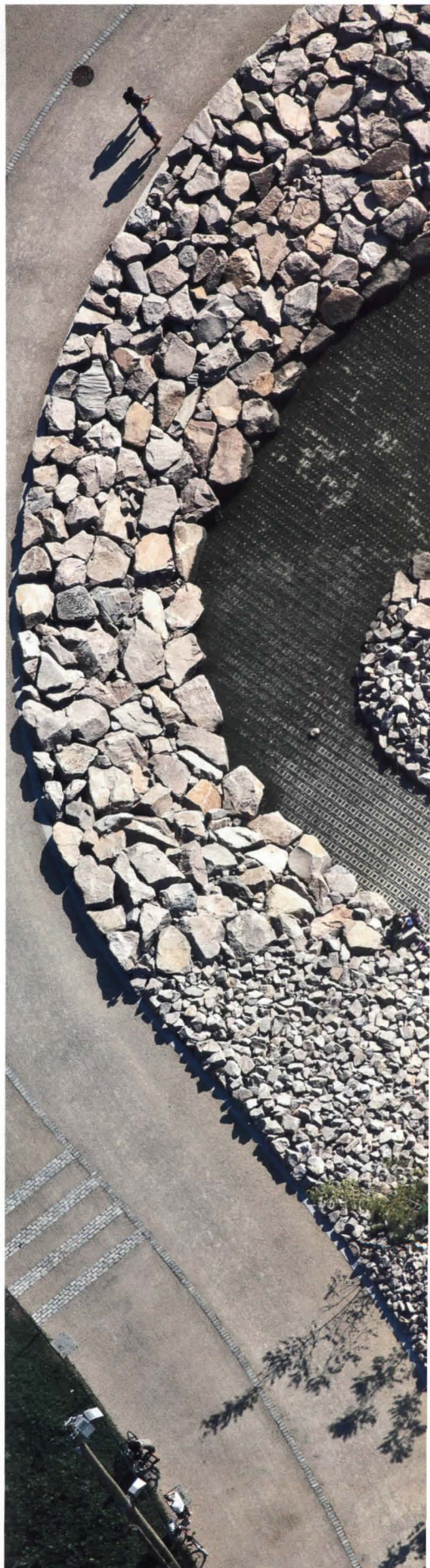
TOP: **Designers devised several treatments for the water's edge, creating diverse ecosystems along the park's length.**

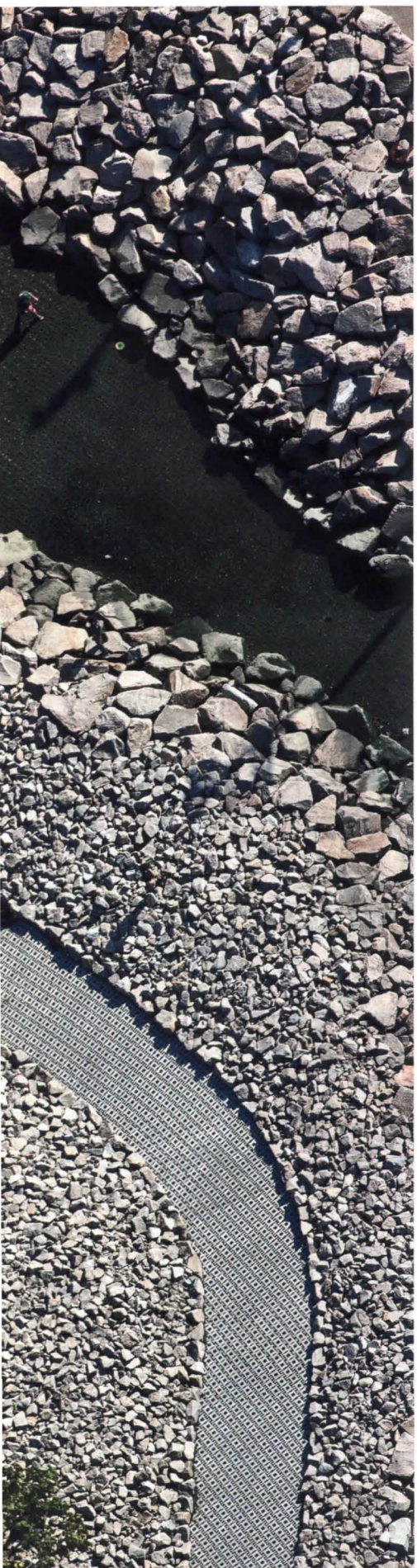
RIGHT AND BOTTOM: **The roar from traffic on an adjacent expressway raised noise levels on the site to about 75 decibels. To make the park quiet enough for reflection and comfortable conversation, the project team created sound barriers with berms of earth.**





SECTIONAL AXONOMETRIC





PHOTOGRAPHY: © ELIZABETH FELICELLA (ABOVE)

ABOVE: **Boat launches provide access to calmed water fields protected from waves.**

LEFT: **With piles of rubble, designers defined irregularly shaped pathways that double as tidal pools, filling with water and then emptying over the course of the day.**

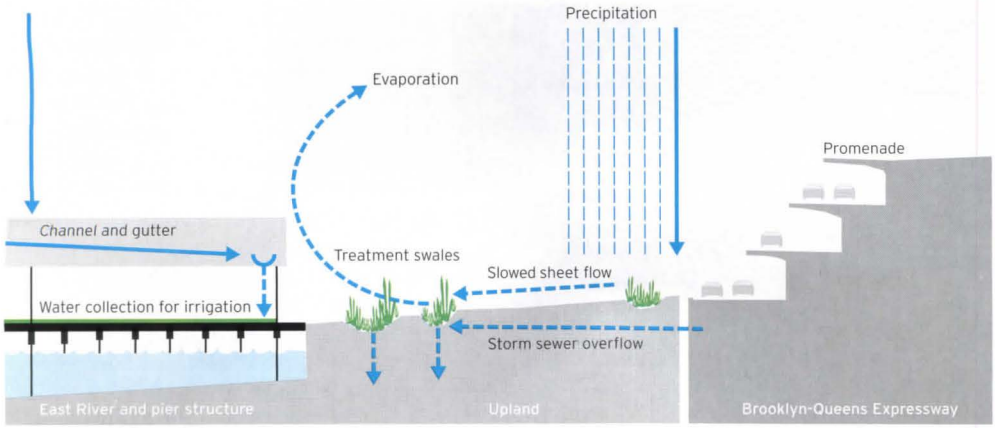
million park is complete (likely in 2015), it will extend more than a mile, snaking under both bridges. Countering the dramatic backdrop, BBP's landside entry points (reached from three existing through streets) convey the modesty of a neighborhood park. Water-taxi moorings plus a proposed footbridge over a surface roadway will provide additional access.

The decisively industrial character of the Brooklyn and Manhattan Bridges, with their structural underbellies fully revealed, is key to BBP's dialogue with its past. Here, as in earlier works, Van Valkenburgh does not re-create, or fabricate, an untouched primal landscape. "One big distinction between [landscape architecture] of the 19th versus 21st centuries," he says, "is how much we accept the imprint of prior habitations."

In keeping with this approach, artifacts of marine infrastructure – such as the rectilinear edges of five of the 1950s piers and the partially submerged pilings where another stood (now a bird and fish habitat) – will remain. And the steel skeleton of Pier Two's stripped-down sheds will stay, providing armatures for lights, shading devices, and swings. But rather than slavishly preserving the monotonously flat, impervious hardscape, the park introduces undulant topography and lush native vegetation, playing machine-edged relics against diverse, seemingly wild landscapes – gardens with sweet gum trees and dogwoods, salt marshes, and tidal pools – and cultivated lawns, both rolling and flat.

As you cross Pier One from the landside toward the water, the play of small scale versus large scale unfolds, with water gardens, woodlands, wetlands, and other microclimates native to the region revealing themselves around the bends and turns. Big moves orient and reorient you to river and city views. On Pier One's landfill, a new 29-foot-high hill tilts toward the water. An amphitheater and a wide stair of rough-hewn granite blocks – salvaged from recently repaired or replaced New York City bridges – step down like raked theatrical seating opening to the panorama. Ultimately, the park, with different terrain on each pier, will include basketball courts, soccer fields, playgrounds, a marina, fishing piers, and calm-water zones for canoeing and kayaking, as well as meadows for simply relaxing and paths for jogging, bicycling, or strolling.

Essential to this narrow greenway are its edges – the meeting places of water and land, road and park, built density and open space, site artifact and new intervention – and the ways these borders are dissolved, strengthened,



WATER-MANAGEMENT AND REUSE DIAGRAM

LEFT: **Stormwater runoff is naturally treated and filtered in swales, then stored on-site and reused for irrigation, reducing BBP's dependence on the municipal water supply.**

BELOW: **The playground at Pier Six. When the park is complete, it will include a wide variety of facilities, such as a marina, basketball courts, soccer fields, and fishing piers.**

OPPOSITE: **Swales and filtering ponds are lushly planted with species that thrive in soggy soil.**

reconfigured, or simply retained. Along some stretches, beach grasses meet the river. In other places, piers extend out on pilings, floating walkways will connect piers, and craggy cairns will form tidal pools that fill and recede. The rock-piled edges, or riprap, deflect waves, stabilizing erosion-vulnerable coastline.

To provide launch lanes for kayaks and canoes, Piers Two and Three have been cut from the land and reconnected via footbridges. Water-calming devices – docklike structures incorporating 10-foot-deep baffles, or wave fences, on their undersides – define protected boating areas between piers. Floating up and down with the tides, these devices are ring-connected to rigid pilings. The system is designed to reduce three-foot waves to about six inches, creating "fields," 10 acres in all, of calm water.

"We had to be extremely resourceful – on land and with water," says Stephen Noone, Van Valkenburgh's construction-phase project manager. "Once you divide $350 million by 75 acres, you're not left with much budget per square foot." Meandering over the hilly earth forms, most visitors will be unaware of the landscape's pragmatic underside and technological complexity – the ways it's not merely visual and experiential, but designed for such functions as noise attenuation and stormwater management.

The new topography – particularly the 38-foot-high ridge, nicknamed "the Mohawk," that will run along the site's upland edge – was precision-engineered to attenuate the roar from the BQE. Acousticians Cerami Associates initially considered precast highway sound barriers. But this conventional solution would have concentrated expressway air pollution while bouncing sound directly into Brooklyn Heights. So the acoustics team deployed 3-D computer modeling to generate topography specifically contoured to reduce noise. With a projected reduction of almost 75 percent, the landforms rival the engineering achievement of the cantilevered BQE they endeavor to block out.

The topography is as complex in composition as performance. Consistent with BBP's commitment to repurposing, the hills owe their curves to 59,000 cubic yards of fill, drilled from Manhattan bedrock to create a future tunnel between Grand Central and Penn Stations. Each 14-inch lift, or layer, of fill was compacted and then reinforced with a geogrid of high-density, high-tensile-strength polyethylene mesh. The strata promote subsurface water percolation, preventing clumping and slope failure, while providing water for direct uptake by plants. The core is covered with horticultural soils (subsoil, soil, topsoil, and nutrient layers) blended with polypropylene geofibers to provide shear strength and meet the regulated global safety factor of 1.5. The safety factor, explains Noone, takes into account the inherent ability of a particular "structure," in this case soil, to maintain a slope without collapsing.

BBP's diverse plantings are already proven in urban conditions and the park's specific microclimates. The piers, for example, integrate "pioneering species," such as sumacs, known to colonize nearby abandoned piers; while the marshy areas integrate spicebush, pussy willow, rose mallow, ferns, and other plants that thrive with "wet feet," in water-saturated soil.

CREDITS

LANDSCAPE ARCHITECT: Michael Van Valkenburgh Associates – Michael Van Valkenburgh, Matthew Urbanski, Paul Seck, Gullivar Shepard, Nate Trevethan, Rachel Gleeson, Stephen Noone, Nik Elkovitch, Dorothy Tang, project team

CONSULTANTS: AECOM, formerly DMJM + Harris (civil, marine, and m/e/p); Cerami Associates (acoustical); Domingo Gonzalez Associates (lighting); Great Eastern (ecological); Nitsch Engineering (stormwater); Northern Designs (irrigation); Pine and Swallow Associates (soil scientists); R. J. Van Seters (water features); Maryann Thompson Architects (Pier Six warming hut); Richmond So Engineers, Ysrael A. Seinuk (structural)

SIZE: 16 acres (Phase I); 85 acres (full build-out)

COST: $350 million (full build-out)

COMPLETION DATE: 2015 (full build-out)

SOURCES

LUMINAIRE: We-Ef

HANDRAIL LIGHTING: C. W. Cole

MARINE RAIL: Carl Stahl DécorCable

PLAYGROUND EQUIPMENT: Richter Spielgerate; Kaiser & Kuhne; Berliner Seifabrik, All City Play Equipment, Sonic Architecture

Not merely noise attenuating, the topography strategically directs stormwater into filtering swales and drain inlets, leading to an underground network of 36-inch-diameter pipes. At Pier One, the capture cascades through water gardens – a pond and terraced wetland that double as a gravity-fed, natural treatment system. The runoff, from paths, landscape, and the development parcels' rooftops, is stored in five subterranean cisterns of up to 140,000 gallons each. New York has a combined sewer system, which carries wastewater from buildings and stormwater runoff in the same pipes. During heavy rains, overflow of such outmoded systems is common, dumping untreated automotive and biological pollutants into rivers. But here, by contrast, the rainwater is captured and recycled on-site, satisfying 70 percent of BBP's irrigation needs.

To further minimize environmental impact, organic soil-release fertilizers, made from fish emulsion and natural minerals, were used during construction, instead of synthetic fertilizers, pesticides, or herbicides – a policy adopted in the park's ongoing maintenance. And to vastly reduce demolition waste, the existing 65 acres of hardscape were left in place, perforated for permeability, and married to the soil layers above them.

Now pathways strewn with tiny pale gray stones evoke beach dune trails. Their light color reflects, rather than absorbs, solar radiation, diminishing the heat island effect. Just as the material continuity of these paths will visually tie together BBP's experiential range, such consistent elements as benches, decking, and picnic tables – built from remilled long leaf yellow pine salvaged from one of the demolished storage buildings – will have a similar effect.

On a difficult, monotonous site – essentially a vast parking lot, devoid of self-sustaining ecological systems – BBP has already achieved remarkable biological and programmatic diversity. New ecological processes have been evolving in its fish and bird habitats, in tidal pools, and in communities of plants designed to reestablish native species while inhibiting invasive ones.

As flora and fauna thrive here, so do people. On last summer's steamiest nights, some 8,000 visitors flocked to Pier One for open-air movie screenings amid the bridges' necklaces of light and a river sparkling with reflections .

If ambitions for other New York greenways – including Governors Island and the Manhattan side of the East River – are realized, they will radically reorient the entire city toward its rivers. Chances to touch the water have already arrived. Likely there will be many more. ■

Sarah Amelar is an ARCHITECTURAL RECORD *contributing editor.*

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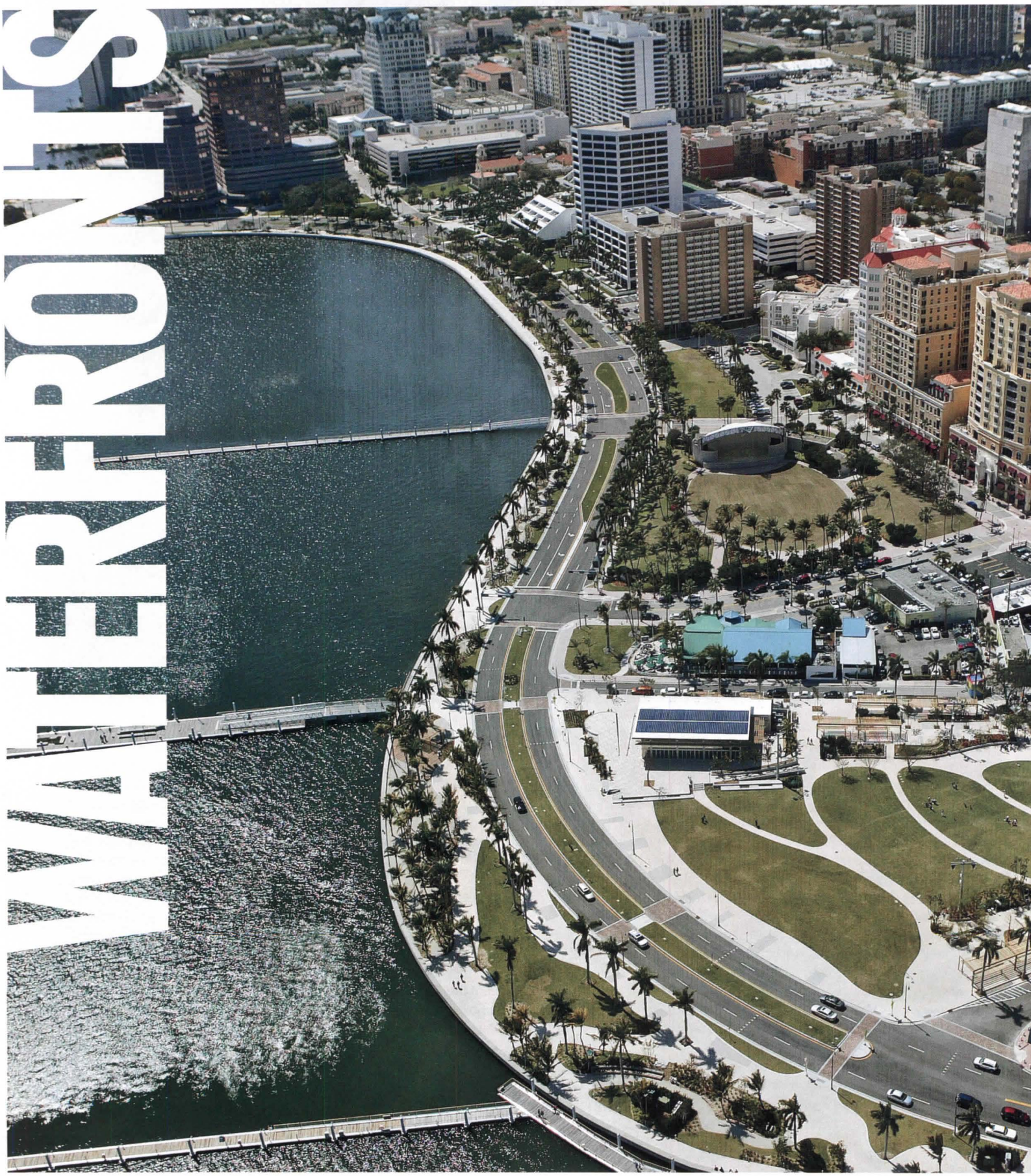
AR PREVIEW URBAN PARKS

From coast to coast, new parks in North American cities are bringing people back to the water's edge.

WATERFRONTS



WEST PALM BEACH Artist Michael Singer worked with city planners to rejuvenate a sapped downtown (opposite). His extensive scheme includes a LEED-certified pavilion, the ecological restoration of the South Cove (under construction), and three "living" docks, where native mangroves, sea grass, and oyster beds are built into the design.

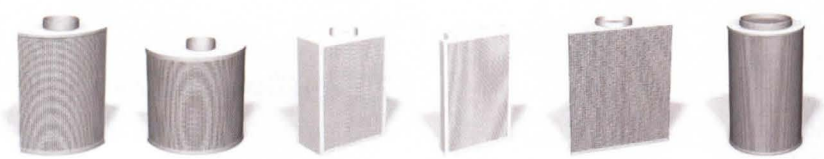
TORONTO Phillips Farevaag Smallenberg's design for Sherbourne Park (above), the largest parcel (3.5 acres) in the redevelopment of the city's East Bayfront, extends from a boardwalk north to Lake Shore Boulevard. Teeple Architects' pavilion sits south of a water sculpture by Jill Anholt.

CINCINNATI A decade ago, Sasaki Associates won the design contract for 33 acres of public space on the Ohio River, with a goal of reconnecting the city grid and the community to the waterfront. Phases 1 and 2 wrap up this spring. Visitors can swing toward Kentucky on a 400-foot-long steel-and-wood pergola (left).

PHOTOGRAPHY: COURTESY CATALANO CONSTRUCTION (OPPOSITE); MILLER STAREVAAG SMALLENBERG (TOP); SASAKI ASSOCIATES (BOTTOM)

Hidden in Plain Sight

Displacement Ventilation by PRICE



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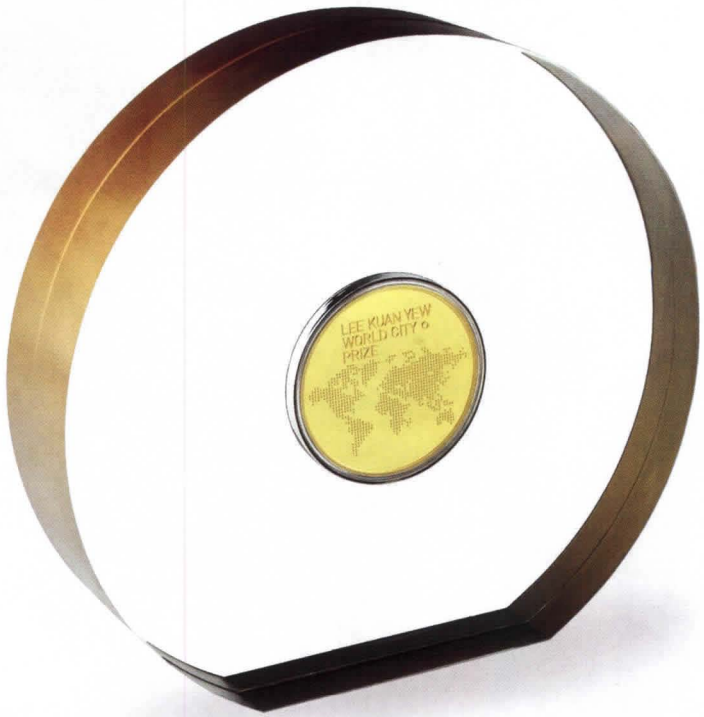

About The Award

The Lee Kuan Yew World City Prize is a biennial international award to recognise individuals and organisations that have made outstanding contributions to the creation of vibrant, liveable and sustainable urban communities around the world. Nominations are applicable for all individuals and organisations who have demonstrated key leadership role in the fields of (but are not limited to):

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- **Urban policies and programmes**
- **Urban management**
- **Application of technology to urban solutions**

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The Lee Kuan Yew World City Prize Laureate will be presented with an award certificate, a gold medallion and a cash prize of S$300,000, sponsored by Keppel Corporation. The Prize will be awarded at the Lee Kuan Yew Prize Award Ceremony and Banquet, which will be held during the World Cities Summit 2012 in Singapore.

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CONTINUING EDUCATION

EIFS Update: Pick the Right Substrate

Total wall design using Exterior Insulation and Finish Systems (EIFS) can maximize energy performance, address moisture issues, and exceed code requirements.

Photos courtesy of Georgia-Pacific Gypsum and STO Corp.

The installation of an Exterior Insulation and Finish System (EIFS) can produce excellent results as long as the underlying substrate is correctly chosen.

Provided by Georgia-Pacific Gypsum

By Peter J. Arsenault, FAIA, NCARB, LEED-AP

Exterior Insulation and Finish Systems (EIFS) are currently a popular choice as an exterior cladding system throughout the country for commercial construction and to a lesser extent, residential as well. While there are multiple manufacturers of EIFS, they all share the same basic make-up in that they are multi-layered exterior wall systems combining continuous rigid insulation with a reinforced, field-applied finish. In that regard, they have been shown to provide superior energy efficiency, better moisture control, and offer much greater design flexibility than other cladding products. To be successful, however, the system must be designed and installed correctly, and just as importantly, it must be installed over an appropriate substrate on an appropriate wall system. Lessons learned in the past decade or so from manufacturers, installers, and architects reinforce the need to understand how all of the parts and pieces of a total EIFS wall system work together for energy and moisture control, aesthetics, economy, and sustainability.

EXTERIOR INSULATION AND FINISH SYSTEMS CHARACTERISTICS

According to the EIFS Industry Members Association (EIMA), EIFS were initially developed in Europe in the 1950s, then introduced in the U.S. almost 40 years ago. "They were first used on commercial buildings, and later, on homes. Today, EIFS account for nearly 30 percent of the U.S. commercial exterior wall market." EIMA and others point out that a total wall system using EIFS typically consists of the following components (see Fig. 1).

- Wall framing on steel studs is designed and installed in standard fashion either as the structural component of the wall or as infill between the primary structural frame. Depending on a given situation, insulation may or may not be installed between the wall studs. Further, since the EIFS is lighter in weight than masonry, stone, or concrete cladding, the impact on the structure is less, often resulting in some cost savings on the structural frame.
- A solid substrate panel attached to the outside of the studs. This is the layer that is typically installed by someone other than the

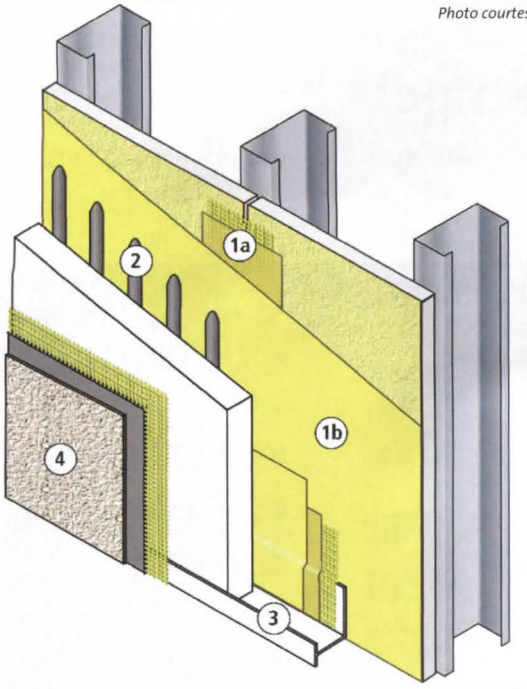
CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **EIFS Update: Pick the Right Substrate**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare and sustainable design (HSW/SD) credit, answer the questions on page 99, then follow the reporting instructions or go to **ce.architecturalrecord.com** and follow the reporting instructions.

Learning Objectives
After reading this article, you should be able to:

- Identify the issues and concerns associated with the proper design of a total Exterior Insulation and Finish System (EIFS).
- Differentiate and distinguish among different types of substrates to which to apply the EIFS.
- Investigate different building applications for the proper use of substrates and EIFS.
- Specify and design appropriate substrates for EIFS into architectural projects.

Figure 1 *Photo courtesy of STO Corp.*



The typical components in a total wall construction using an Exterior Insulation and Finish System

EIFS subcontractor, but has a big impact on the performance of the system and the flow of construction activity. Not surprisingly, manufacturers and technical specialists have developed particular and stringent requirements for this substrate layer. Further, the joints of this layer need to be covered with an appropriate mesh or wide tape-like seal.

- A water-resistant barrier or liquid membrane applied over the substrate before the installation of insulation. This barrier has been added in recent years in response to some past concerns about water penetration into the rest of the wall assembly and has been shown to be an effective solution to those concerns.
- Insulation board adhesive typically consisting of a specially formulated make-up to adhere to the membrane-coated substrate as well as the insulation. The prevailing installation method is to install the adhesive in continuous vertical ribbons that allow any trapped moisture to drain down the surface of the coated substrate and weep out the bottom. While less common, the insulation can also be held in place with mechanical fasteners, although each fastener will obviously compromise the integrity of the water-resistant barrier.
- Rigid insulation boards that are commonly made of expanded polystyrene (EPS) or polyisocyanurate foam and can range in thickness from 1 to 4 inches. The preference is for a single board of the desired thickness rather than multiple, overlapping layers requiring additional labor and potential for separation. The insulation is usually set into a base channel or starter track mounted at the bottom of the exterior wall. This track is intended to contain regularly spaced weep holes to allow the release of any trapped moisture but not compromise the thermal integrity of the wall.
- A formulated base coat that is durable and water-resistant is then hand applied on top of the insulation. Fiberglass mesh is commonly installed as part of this base coat as reinforcement for added tensile strength.
- A finish coat selected for attractiveness and durability. Typically this finish coat is made with an acrylic material that employs co-polymer technology, all of which is known to be both colorfast and crack-resistant. In some cases, an intermediate coat may also be applied between the base and finish coats.

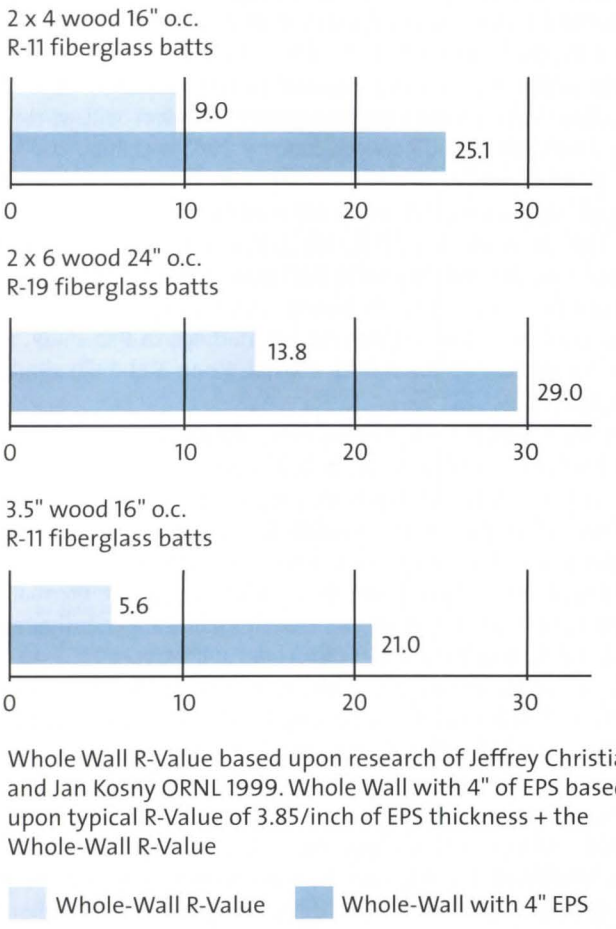
Variations do occur in this make-up between different manufacturers and for different applications, but the fundamental process is the same and produces the same basic characteristics of the wall. According to the National Institute of Building Sciences (NIBS) Whole Building Design Guide, those characteristics include the following four quoted in part below:

- First, placing all of the insulation outside of the wall cavity reliably locates the dew point (the temperature at which humidity condenses to form water) outside of the wall cavity. This is a key consideration. Dew formation inside the wall can create conditions conducive to mold growth and material decomposition. Cavity insulation moves the dew point inward, and should be balanced with an appropriate amount of exterior insulation. By exploiting the high insulation value of insulation board used in an EIFS, walls can be designed to locate the dew point outside the wall sheathing. In an EIFS with drainage, sheathing is protected with a secondary water-resistive barrier and a drainage plane. Design professionals should always evaluate dew point locations for their projects.
- Second, exterior insulation eliminates thermal bridging (heat transfer across a solid element such as wall framing). This is a very important consideration that has gained increased attention in recent years. In many climate zones, steel framed walls cannot meet prescriptive requirements without continuous exterior insulation. This is because thermal bridging reduces the effectiveness of cavity insulation by up to 65 percent (see Fig. 2).

  By way of example, R-21 batt insulation in certain cases delivers as little as R-7.4 actual measured performance. The reason for this decrease in performance is the regular interruption of the insulation by the wall framing at 16 or 24 inches on center plus top and bottom tracks/plates and framing around openings. The combined area of all of that framing can account for up to a third of a wall surface with a substantially lower or even negligible R-value. Worse yet, steel studs efficiently conduct heat across their depth accelerating the unwanted heat flow. Using exterior insulation eliminates this problem since all of the framing is contained inside the thermal envelope of the building and does not have an opportunity to create a thermal bridge to the exterior. Hence, the building is capable of performing to its full energy efficiency potential.
- Third, rigid insulation board can be highly cost-effective. Increasing the thickness of the insulation board adds insulation value for material cost only, since little or no extra labor is needed. In addition, all costs associated with cavity insulation can often be eliminated.
- Fourth, thermal expansion and contraction of the building framing is dramatically reduced because framing is no longer subject to daily temperature changes. This reduces building movement and associated stresses.

Figure 2

Photo and data courtesy of STO Corp. and the Oak Ridge National Laboratory



Whole Wall R-Value based upon research of Jeffrey Christian and Jan Kosny ORNL 1999. Whole Wall with 4" of EPS based upon typical R-Value of 3.85/inch of EPS thickness + the Whole-Wall R-Value

The typical components in a total wall construction using an Exterior Insulation and Finish System

NIBS goes on to point out that the only drawback they find to a completely exterior insulation system is a slight increase in overall wall thickness which presumably can be addressed by appropriate design measures.

IMPORTANCE OF THE SUBSTRATE

Particularly important for the installation of EIFS, as it is for other wall types, is the choice of sheathing that forms the substrate upon which to build the EIFS. Common choices in the past have included plywood and paper faced exterior gypsum board. It didn't take long to realize that these choices had some distinct limitations and the potential for some severe problems.

First, the organic nature of wood and paper surfaces means that they are not particularly well suited to withstand weather exposure during construction. If they became wet, they would swell and cause deformities which telegraphed through the EIFS causing unwanted irregularities in the final surface. For the contractor to reduce the amount of weather exposure on the sheathing, the installation of the sheathing would need to be protected and then coordinated with the installation of the EIFS. This could mean delays in the construction process since the building might not otherwise be considered fully enclosed enough for other aspects of the work to occur. It would also mean the contractors would need to return afterwards to try to correct the defects caused by the weather exposure on the sheathing, often with limited real success.

Second, the presence of wood and paper provide one of the key ingredients for mold formation in walls: organic food. It is commonly understood that mold requires this organic material to feed on in addition to the presence of water and favorable temperature conditions. In the course of building design and construction it is problematic to completely eliminate moisture or even water in an assembly. Similarly, the range of temperatures that a wall assembly experiences in order to be favorable for human habitation is also favorable for mold growth. Hence, the only real tool to combat mold growth is the elimination of the organic material.

Third, the nature of both plywood and paper faced gypsum is that the outermost surface is laminated to interior surfaces within the substrate. Under normal conditions, the lamination process is appropriate and suitable to many applications. However, if moisture entered the space between the EIFS and the substrate, that lamination process was compromised and the outermost layer would sometimes separate (delaminate), causing the EIFS to literally come apart from the building it was applied to. This was clearly a problem and one that wasn't likely to be solved by trying to seal out all moisture in the wall.

Given these limitations and the significant problems with these organic substrates, a suitable alternative was sought and often required by regulators and EIFS manufacturers. Over the past decade, a number of sheathing manufacturers have looked for and developed alternatives. Currently, the most common choice is to specify engineered exterior gypsum sheathing (see Fig. 3).

This type of sheathing typically contains a specially treated gypsum core with embedded fiberglass mats on both sides of that core. This process is referred to as glass mat bonding and means that there is no lamination that can become separated—the core and the surface are integral. And since mineral based fiberglass is used, the presence of organic materials is eliminated. The result is that this type of glass mat bonded sheathing provides superior moisture, fire and mold resistance. From a construction standpoint, it means that this type of sheathing and EIFS substrate can remain exposed to normal weather conditions for up to twelve months and still perform admirably.

Particularly important for the installation...is the choice of sheathing that forms the substrate upon which to build the EIFS.

An additional requirement imposed on the sheathing is the ability to act as a true drainage plane. In previous decades, EIFS installations were experiencing water problems, particularly in southern climates on residential applications, where water vapor resulting from high humidity conditions was entering and getting trapped between the insulation and the sheathing substrate. This caused the predictable problems of physical damage and deterioration along with the associated liability and business concerns. Once again regulators and manufacturers sought and found solutions. The current dominant approach is to use a vapor permeable air and moisture barrier, usually liquid applied. This

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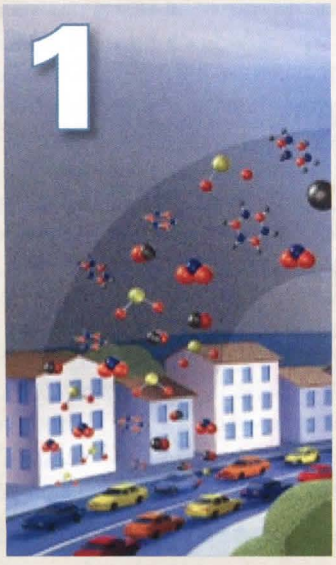
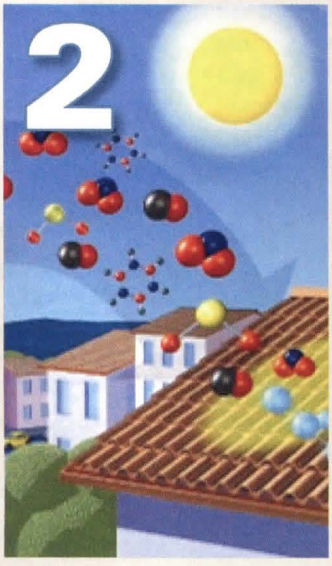
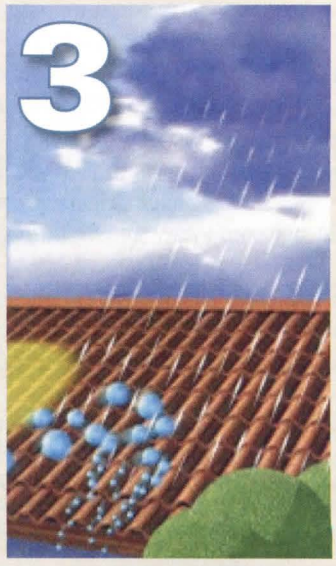


Vehicles produce smog releasing toxins into the environment



When tile is exposed to light, the photo catalyst on the surface speeds up the oxidation process to reduce pollution



When it rains, the small quantity of organic residue is washed off the roof

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AFTER READING THIS ARTICLE, YOU SHOULD BE ABLE TO:

- Specify materials that improve interior and exterior air quality.
- Discover design strategies for increasing flexibility in school design.
- Discuss fire and security solutions to increase school safety.
- Select durable materials that respond to environmental targets.

Photo courtesy of High Concrete Group LLC; Designed by AEM Architects, Inc.

High-performance precast concrete walls enabled a faster construction schedule, as well as added to energy savings at Tilden Elementary School in Hamburg, PA.

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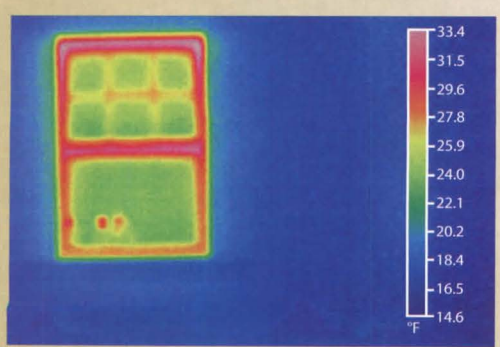

Thermal imaging shows no heat loss or thermal bridging through the precast concrete sandwich wall panels.

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First in Their Class: Innovative Design Solutions for Schools of the Future

WHEN SELECTING MATERIALS FOR SCHOOL CONSTRUCTION—SMART, SAFE, DURABLE MATERIALS WILL PROVIDE SUSTAINABLE SOLUTIONS FOR HEALTHY ENVIRONMENTS.

Innovative tiles that convert smog into fertilizer will protect air quality for new schools.

Exceptional accomplishments are the expectation of schools across the country when budgeting for comprehensive school improvements. Stretching taxpayers' dollars is imperative as more and more school districts expect excellence in classroom design, durability, increased air quality, as well as environmental efficiency. New materials are providing innovative solutions for designers who want to assure quality buildings for the nation's children who spend almost 90 percent of their school day inside buildings.

The Council of Educational Facility Planners International (CEFPI) defines a healthy school as one that "cares for and looks after the overall well-being of its occupants."[1] Healthy schools are environmentally friendly. They save energy and are designed to increase air quality. This article will focus on numerous products and materials that provide opportunities to deliver healthy schools for all communities.

These unique solutions span the gamut, including high-performance exterior walls, acoustics, roofing, fire safety, transparency, flexible spacing and even insulation that can transform smog and Volatile Organic Compounds (VOCs) to benefit air quality.

Hand-in-hand with many of these solutions is a desire for durability and permanence. To this point, Rich Thomas, LEED AP, marketing manager at Boral Roofing notes, "when budgeting for schools, longevity, ease of maintenance as well as a material's contribution to a healthy environment are all factors considered by school systems when planning their projects during this time of economic uncertainty."

Whether or not your project is part of a green rating system, such as the U.S. Green Building LEED® for Schools, the Association for the Advancement of Sustainability in Higher Education (AASHE), Sustainable Tracking Assessment & Rating System (STARS), or Collaborative for High Performance Schools (CHIPS), manufacturers are responding to the call for new products that help the environment without changing the project budget. As Mike Petersen, president of Petersen Aluminum states, "We assume that architects want to design responsibly whether or not it is a LEED® project. LEED® may have been the driver, but, it meant, for the entire industry, an improvement on whole product lines to meet solar cool roof criteria to save energy."

Brian Miller, managing director of business development at PCI, Precast/Prestressed Concrete Institute, also acknowledges this point, noting, "More designers are implementing designs that combine environmental performance with efficiency. They're realizing new ways for products to meet more than one design goal at a time."

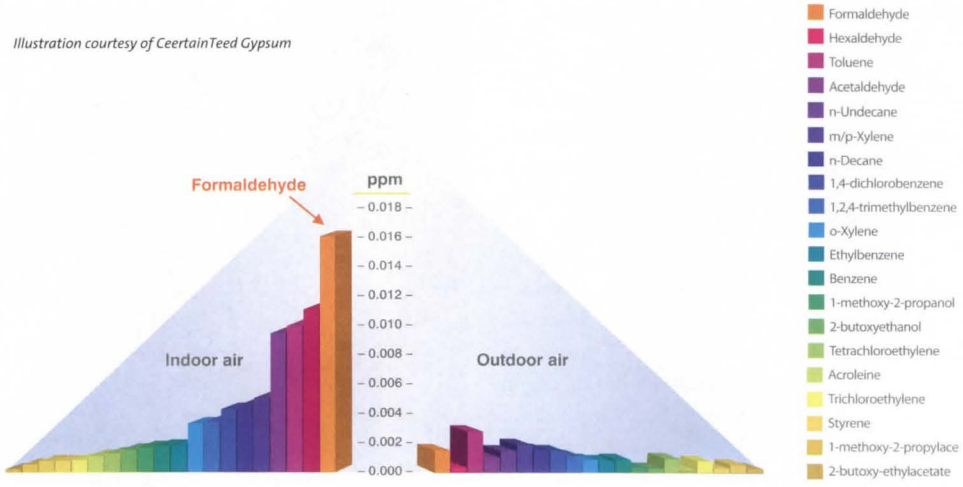
The products and design solutions discussed in this article can be used to satisfy multiple design and performance criteria as part of an economic, environmental and social strategy for school projects.

TRANSFORMING AIR QUALITY—INDOOR AND OUTDOOR AIR POLLUTANTS

Poor air quality and high levels of indoor and outdoor air pollutants have been linked to the increase in asthma cases in school-age children over the past 30 years.[2] A few of the major culprits of poor air quality in schools are adhesives and other chemicals found in many building materials, as well as the use of harsh cleaning solvents. These products and many more building materials and common installation practices have high concentrations of VOCs, chemicals that evaporate into the air to become irritants, often causing headaches, dizziness and even sick building syndrome. Amy Lee, manager of marketing communications for CertainTeed Gypsum, notes, "With a focus on continuously improving the learning environment, sustainable building design is integral to the future of our schools. Recent advancements in building materials that improve indoor air quality and acoustics now provide more options for school design and construction."

According to the *American Lung Association 2010 State of the Air Report*, children face greater risks than adults from poor air quality because they are smaller and more active than adults. They cite a World Health Organization report that has documented the air effects on children to include short-term and long-term decreased lung function, worsening of asthma, increased incidence of cough and bronchitis and increased risk of upper and lower respiratory infections.[3] Mold is also a contributing factor to poor indoor air quality. New products that address this

Illustration courtesy of CeertainTeed Gypsum



Analysis of chemical concentrations in residences, daycare centers and school buildings indicate that VOCs are the most prevalent pollutants. At the top of this list is formaldehyde, which may cause health concerns.

air quality crisis include gypsum wallboards that capture VOCs and transform them into benign compounds, as well as smog-eating exterior roof tiles that turn pollution particles into fertilizer. In addition, manufacturers are making interior doors and wall panels that reduce VOC emissions.

Walls: Cleaning Indoor Air

Engineered to capture formaldehyde, a new sustainable gypsum product converts this harmful chemical compound as it comes into contact with the board—by typical airflow movement—into an inert substance that is stored in the core of the board. A performance test of this wall system using ISO 16000-23 (indoor air evaluation performance test for evaluating the reduction of formaldehyde concentrations by absorptive building materials) demonstrated that within seven days, the formaldehyde concentrations in the air dropped to close to zero percent, permanently removing the VOCs circulating indoors. Walls that can clean the indoor air provide bonus environmental benefits.

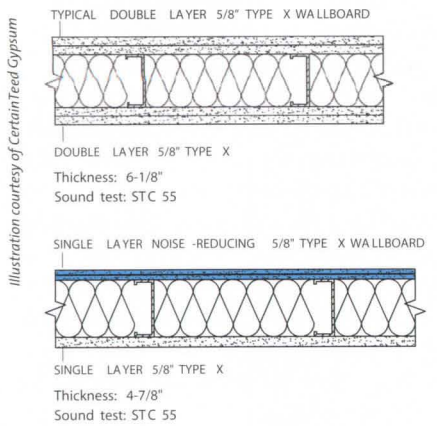


Illustration courtesy of CertainTeed Gypsum

Design professionals can reduce the wall thickness by 5/8" and still obtain good acoustic properties

According to the Gypsum Association, even though mold spores are everywhere, "gypsum board does not generate or support the growth of mold when it is properly transported, stored, handled, installed, and maintained."[4] New technologies using treated paper enhances mold and moisture resistance to meet ASTM standard D3273, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber," achieving a score of 10, and an ASTM G21 score of zero for mold resistance, the highest ratings possible.

In addition, new sustainable gypsum wallboards have enhanced acoustical properties. Design professionals who specify double-layer Type X wallboard in order to meet the necessary fire ratings in auditoriums, classrooms and hallways, may want to consider these new gypsum wallboards. Along with improving the acoustical environment, these Type X wallboards are moisture- and mold-resistant, abuse-resistant, and designed for fire-rated wall assemblies.

Indoor, for both air quality-improving gypsum boards and noise-reducing boards, these innovations also provide additional environmental benefits, containing as much as 99 percent total recycled content.

Roofs: Transforming Outdoor Air

The development of photocatalytic coatings on tile and concrete roofs has delivered on the vision of self-cleaning buildings. This catalytic process was first introduced in Europe for road construction and medical facilities, and is now available in North America. These new roof tiles tend to promote a cleaner environment while turning "waste into food."[5] One of the oldest roofing systems, concrete tiles, has new properties that make them able to mitigate air pollution. They can now be coated with a specially prepared catalyst that is embedded in the upper portion of the tile body. When exposed to sunlight, this catalyst speeds up the oxidation process, thereby resulting in the reduction of the formation of air pollution. Additionally this unique function destroys organic substances that come in contact with the tile surface such as mold, algae and moss.

The upper portions of the tiles are coated with a mineral crystal substance, similar to those used in toothpaste or sunscreen. When exposed to sunlight, this catalyst speeds up oxidization, and converts nitrogen oxide that is in the air from automobile pollution, into nitrogen. Working much like a catalytic converter does in a car, this roofing system transforms harmful substances into safe ones. The dirt, algae and moss neutralized by contact with the roof surface can be easily washed off the roof surface to fertilize the plants below.

Air pollution is an undisputed problem and the World Health Organization estimates 2.4 million people die annually of causes attributable to air pollution. Manufacturers estimate that 2,000 square feet of treated roofing tile can mitigate the same percentage of nitrogen oxide (a major component of smog) produced by one car driven just over 10,000 miles. Airborne pollutants are destroyed by the effect of sunlight on the catalyst and are rinsed off by rainfall or a garden hose. A study by the Fraunhofer Institute[6] showed a significant decrease in air pollution when tiles were exposed to UV lighting. An additional benefit of a treated concrete tile is when installed on the roof it reabsorbs up to 20 percent of carbon dioxide emissions created during its manufacturing process.

Both concrete and clay roof tiles are made from materials with an inorganic surface and recycled content that withstand the harshest wind and weather conditions. They are durable and often are considered the most practical choice when calculating the lifecycle effectiveness of a construction material. Used on a school roofing system, they will reduce maintenance, as well as lower its smog footprint.

For centuries, architects have chosen tile roofs for aesthetics and durability. Today, with catalytic coatings, tile roofs can also enhance air quality.


Photo courtesy of Nana Wall Systems, Inc.

One of many configurations used by Burleson Elementary teachers in Texas.

MAXIMIZING SPACE—FLEXIBLE SOLUTIONS

Multipurpose Classrooms

Although the benefits of multitasking have been disputed, the benefit of multi-occupancy in schools of the future continues to be a goal for educators. Seeking a means to provide environmental support for teaching methods that allow for active participation, self-direction and the clustering of different interest groups, educators are asking professionals to design facilities that maximize their use throughout a busy school day. Multipurpose rooms, per se, are not a new innovation, but using movable high-performance glass walls provides a new means to enhance classroom facilities.

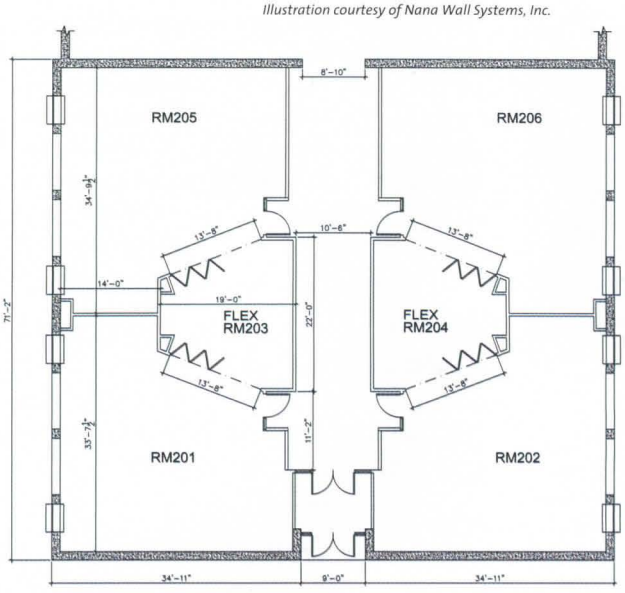
Flexible classrooms allow for the design of smaller classroom buildings. Teachers can utilize them to engage in "response intervention" for behavior problems and as safe zones during school lockdowns with limited visibility from public corridors. They can provide a space for makeup exams and joint classroom projects. Educators and staff can monitor several classrooms at the same time. According to Ebrahim Nana, president of Nana Wall Systems, Inc., "Teachers have come up with over 100 ways to use flexible classrooms to enhance learning opportunities." When used in cafeterias, flexible spaces can provide many food-serving areas with one single clean-up area. For science or art configurations, central lab sinks, cabinetry and storage areas can save construction costs and reduce classroom footprints.

Here are some components that are important when planning a flexible classroom:

- Acoustic performance and sound-dampening qualities
- Swing doors as an option for easy access
- Visibility from adjacent classrooms by careful placement of glass panels
- White boards as an option for wall panels

In addition to interior configurations, new movable panels with higher energy performance values allow teachers to expand the learning environment outdoors (weather permitting).

Illustration courtesy of Nana Wall Systems, Inc.



This configuration (Diagram A) uses movable walls to either enlarge a classroom or provide for separation into small learning groups.

Case Study:

Flex Space for Texas Schools

When architects from SHW Group, Inc., of Dallas, Texas, met with the Texas Association of School Boards, they expressed interest in classroom flexibility for the new elementary schools being built in Texas independent school districts. At the direction of the Curriculum Director, SHW proposed an effective "flex space" concept that would give them maximum flexibility while reducing lab installation costs. Their challenge was to optimize and provide efficient use of limited floor space in schools, increase student learning and create a more enjoyable work experience for teachers.

Flex space was created in this school, by eliminating the common wall between two classrooms and installing two operable glass walls (see Diagram A). Configured in a V shape with a laboratory installation at the wide end, the space enclosed by the movable walls can be part of either or both classrooms. The teaching staff for the combined classroom can either monitor activities in all of the rooms or use the flex space to separate students for specific activities. They use this third space to provide alternatives in the classroom configurations. The walls have a horizontal mullion dividing the clear glass upper portion from the opaque, lower panel. When the pupils in the flex space are seated at their desks they are not distracted by the other activity in the other classrooms or by their classmates, yet the teacher can stand up and see both classrooms at once.

The principals, teachers and students at the new Texas schools all agreed on the effectiveness of flex space created by movable walls to enhance the learning environment. The school board appreciated the cost savings incurred by dual use of resources installed in the flex space. Architect Konrad Judd, AIA, defined his experience with a flex space system in the Burleson School District as a vision for the future of school design as a means to provide "education delivery into the 21st century with a more flexible learning model."

CONTINUING EDUCATION

Case Study:

North Layton Junior High School, Layton, Utah

AJC Architects of Salt Lake City, Utah, needed a solution for the renovation of the media center and new counseling center for North Layton Junior High School. They discovered that they could take advantage of a clear fire-rated glazing to keep the look of the media center and provide an open, welcoming entrance to the new counseling center.

"Prior to the renovation, masonry and non-rated hollow metal storefront and glazing were used in the building. Due to the increased square footage of the building, new fire-rated areas needed to be created," says Jodi Geroux, AIA, LEED AP of AJC Architects. "The existing hollow metal storefront glazing was located in walls that needed to be upgraded to 1- and 2-hour fire walls."

To achieve this, the design team chose a glass wall system that would meet the code requirements and maintain the building's original design, which incorporated a lot of glazing. They wanted a product with both an impact safety rating and a 2-hour fire rating that would meet ASTM E-119, the stringent wall criteria that limits the average glass surface temperature rise to 250 °F on the non-fire side. ASTM E-119 performance standards apply where fire ratings of 60 minutes or more are required in order to protect against dangerous radiant heat and provide a safe path of egress in the event of a fire.

Stringent fire-safety criteria were met in the corridor designs at North Layton Junior High School.

Tested and approved in large sizes, fire-resistant glass can be combined with 60- to 120-minute aluminum-clad framing to provide wall-to-wall and floor-to-ceiling expanses of glass that provide beauty, elegance and maximum fire safety within a school's tight construction budget.

Fire-resistive glass assemblies can create a sense of openness, add natural lighting, and increase the visibility to safe pathways.

Hallways, Fire Safety and Transparency

New products that open up classroom flexibility indoors and outdoors, in fact, can provide not only fire safety, but transparency along corridors or as part of new learning clusters. According to Jeff Griffiths, director of business development with SAFTI *FIRST*, as an increased measure of safety, design professionals are encouraged to "look at not just the fire rating of a system, but the ability of fire-resistant glass to stop the transmission of radiant heat from one area to another."

Fire-resistant safety glass is available for architects who want to design a school that meets fire codes without sacrificing visual continuity and transparency. Some newer fire-resistive glass is comprised of two pieces of tempered glass with an intumescent gel product in the middle. In a fire, the glass facing the fire will break as the temperature reaches about 400 to 500 °F. When the glass breaks, the gel solidifies and expands to create the equivalent of a fire-rated, masonry barrier wall.

New products that open up classroom flexibility indoors and outdoors, in fact, can provide not only fire safety, but transparency along corridors or as part of new learning clusters.

Practice Makes Perfect

Permanent constructions, as well as portable, high-tech plug-ins for existing buildings are also part of the new school budget. Providing adequate rehearsal space for a school's musicians is difficult because of the numerous requirements for sound quality, sound isolation and privacy. Modular rehearsal studios, engineered as virtual acoustic environments, maximize rehearsal possibilities while minimizing the construction footprint. New music isolation rooms can be installed as part of new construction or renovation. The rooms range in size from approximately 4 ft. by 5 ft. up to 20 ft. by 25 ft. The height of these modular units ranges from 7 ft. 6 in. to 10 ft. high. The most common size selected by schools is approximately 9 ft. by 6 ft. (inside dimensions), which can house an upright piano, or up to a trio of instrumentalists. Ventilation, power and optional advanced electronics complete this "plug-in" performance module.

Units are constructed of thick metal walls and ceilings, both filled with high-grade acoustical insulation. Doors are made of

Measuring with Sound Transmission Class (STC) Ratings

As defined in the ANSI Standard S12.60-2002, "Acoustical Performance Criteria, Design Requirements and Guidelines" for schools and summarized by the Acoustical Society of America,[7] the amount of airborne sound blocked from transmission through a partition is measured in a Sound Transmission Class (STC) rating. The lower the STC rating, the greater the sound transmission through walls, adding to the background noise level in the space, degrading the ability to hear and understand speech. ANSI recommends an STC rating of STC-40 for music room doors.

steel with a fiberglass core and feature a glass window for easy monitoring and more inviting ambience. The wall panels are locked together with gaskets that seal the seams. Units are placed on floor rails and a pad that seals the floor to the floor of the existing enclosure. When placed in a row, sound transmission is almost inaudible, as each component in the modular unit meets stringent Sound Transmission Class (STC) ratings and Noise Isolation Class (NIC) ratings. Students who play a variety of instruments—from percussion to strings—can practice without distractions in side-by-side units or face-to-face units along the corridors of the school building.


Photo courtesy of Wenger Corporation

Optional recording equipment, speakers and digital signal processors allow the performer to "dial" their desired practice environment.

Standard 120v 60hz electrical outlets are provided in the rooms and the units are plugged into standard building outlets making it easy to install, particularly for existing building renovations. Unique to these new modular units are the performance capabilities embedded in the selected electronic packages. Optional recording equipment, speakers and digital signal processors allow the performer to "dial" their desired practice environment. With a push of a button, the room will provide the acoustical response of nine different venues—including recital hall, cathedral or large arena. Active acoustics technology helps musicians learn how to optimize their performance in different environments. Benefits include accelerated development of critical listening skills; improved articulation, dynamics and timing; and a more enjoyable practice session. In a busy school setting, it's often difficult for musicians to schedule rehearsal time in performance venues. These high-tech practice rooms can serve as surrogate performance spaces.

Furthermore, design professionals stymied by budget constraints can discover new products with superior acoustics to enhance learning while saving space. For example, "virtual acoustic environments allow the school to build small performance practice areas that provide large performance values," notes Stacy Hanson, marketing manager for Wenger Corporation.

CHARTING PERFORMANCE—SAFETY, DURABILITY AND ENVIRONMENTAL TARGETS

Smoke Prevention

Noncombustible, fire-resistant, energy-efficient stone wool roof insulation provides additional benefits for the prevention of fire. Unlike many other insulation materials, stone wool will not burn and will not release lethal toxic smoke, or cyanide gasses into the atmosphere when exposed to fire. The spread of toxic smoke in a fire can lead to more fatalities than those from the fire itself. According to Dave Lawlor of Roxul Inc., "When designing schools for children, we need to plan for safety, including noncombustible insulation that doesn't emit lethal toxic gases, such as cyanide, if there is a fire."

Roof performance includes many factors: longevity, warranties, insurance rates, energy efficiency but most importantly, fire safety. Most if not all accredited testing organizations in North America, measure the quantity of smoke developed during combustion and not the toxicity of the smoke itself.

One of the most widely accepted testing organizations for fire-resistance is FM Approvals. Roofing materials are classified by a number of test laboratories by class. Class 1 is the highest recognized standard, which includes testing for flame spread (ASTM E 108) and flame exposure below the roof deck. The FM 4470 NCC (noncombustible core) classification is an optional test targeting just the insulation component. It consists of three test methods, ASTM D 482 relating to ash content, ASTM E 2085 testing for flammability, and ISO 1716:2002 testing "heat of combustion" or energy released from the product. Most insulation products can meet the Class 1 standard, however stone wool insulation meets the more stringent testing methods

Case Study:

Toronto Four-Alarm Fire

At 5:30 a.m., on October 29, 2010, a four-alarm fire broke out on the roof of York University's Toronto Track and Field Center. According to the National Post,[8] *there were "concerns that the propane tanks inside the building could explode." There were 36 fire trucks and 108 firefighters called to the scene, according to Captain David Eckerman from the Fire Prevention office, City of Toronto. The fire was confined to the roof and the first material to ignite was the exterior roof covering. Additional harm or injuries may have occurred if the roof insulation had not been made of a noncombustible material. Stone wool unlike other types of insulation does not ignite when exposed to flame or contribute to the spread of fire.*

The roofing consultant on this project, Pinnacle Group Inc., is dedicated to environmental responsibility and has specified stone wool products for many years because of their combined benefits of durability, fire safety and insulation qualities. As Brandon Hexham, BA, RRO, GRP, vice-president of the company and roof consultant on this job stated, "Pinnacle Group Inc. strongly supports the use of stone wool insulation as part of a roofing system and we have specified stone wool on numerous projects over the past 10 to 15 years. On a recent project (a local university) where a fire broke out along the perimeter of the roof, it was the installed stone wool insulation that stopped the fire from spreading and destroying the entire roof and the building contents. The superior fire performance of this product saved the owner an immeasurable amount of money and damage to the building."


Photo courtesy of Courtesy of Roxul Inc.

Roofing insulation stands up to an intense four-alarm fire at York University in Toronto, Canada. Noncombustible stone wool insulation prevented the fire from spreading, avoiding damage to property and possibly any human loss.


Photo courtesy of Petersen Aluminum Corporation

Standing seam metal roofs bring new aesthetics to school designs.

of FM 4470 NCC (Noncombustible core) Rated Roof Insulation.

Stone wool has added material benefits as a non-directional fiber that is excellent for sound absorption. This product is mold and mildew resistant, and it is easy to install as well as maintain. It is used as an integral component for the excellent acoustic performance of interior and exterior walls and roof systems. Stone wool has been successfully used as an insulation solution for institutions along highways and near airports to reduce sound transmission.

This material has dimensional stability and maintains its R-value over time, unlike insulation that degrades, shrinks, or prematurely oxidizes as will some foam insulation products. Thermal resistance values range from 3.5 to 4.2 hr.ft^2.F/Btu as measured at 75 °F according to ASTM C 518 (C 177). It will often outlast the membranes that cover it and provide the longevity that institutional buildings require.

Stone wool products are a sustainable solution, having a high-recycled content, reusability, and can even be recycled where facilities exist. This insulation is made from natural stone and steel slag. This slag is a manufacturing by-product of the steel industry, which is used as a raw material in the stone wool manufacturing process. Some stone wool manufacturing facilities have been able to recycle all of their production waste materials back into the manufacturing process, creating a zero-waste-to-landfill strategy; making both environmental and economic sense.

In addition, a lifecycle analysis of stone wool shows that the energy it costs to make this insulation will pay back that energy and CO_2 used in its manufacturing within four to five months of service.

Cool Roofs with Cool Colors and Building Integrated PV Panels

One of the simple strategies for reducing the solar gain on a roof system includes the installation of a cool roof. Cool roofs reflect solar visible, ultraviolet and infrared rays as well as have a property of high thermal emittance—the ability to radiate absorbed, non-reflected solar energy. The U.S. Environmental Protection Agency (EPA) estimates that Americans spend about $40 billion annually to air-condition buildings.[9] An innovation to this energy saving strategy is the removal of one of the obstacles for the application of cool roof specifications. Designers have resisted choosing cool roofs because of the limited roof color palette that met a design professional's aesthetics or project budget.

Cool roofs that are ENERGY STAR-qualified reflect more of the sun's rays and are estimated to lower the roof surface temperature by up to 100 °F, decreasing the amount of heat transferred into buildings and lowering the cost of air-conditioning. According to ENERGY STAR, qualified roof products can help reduce peak cooling demand by 10 to 15 percent.[10] The ENERGY STAR cool roof project includes research by The Oak Ridge National Laboratory, as well as partnerships with roofing manufacturers who agree to continue testing for certification of their products.

ENERGY STAR metal roofs must meet tests that include the ASTM C1371 - 04a Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers and ASTM C1549 - 09 Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer. Variegated roof products may also be rated according to the Cool Roof Rating Council (CRRC) Test Method #1.

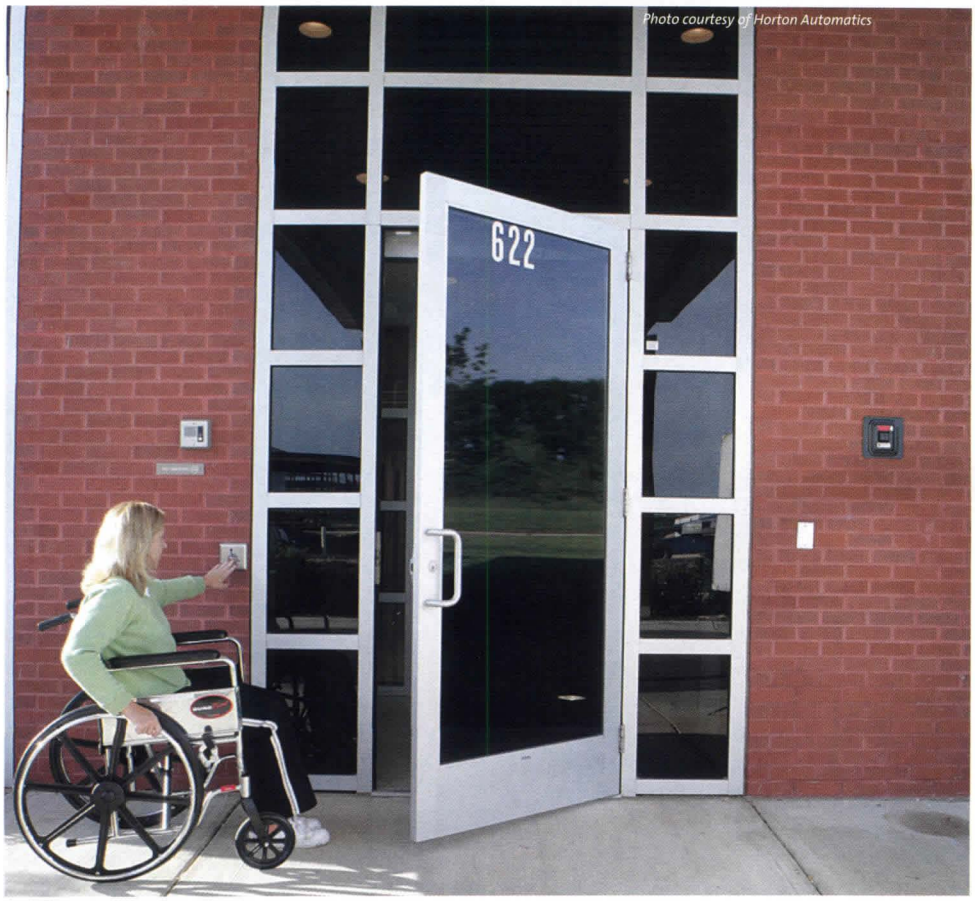
Metal ENERGY STAR cool roofs have performance requirements based on the slope of the roof. Solar reflectance is a measurement from 0 (no reflectance) to 100 (highly reflectant). The initial Solar Reflectance Index (SRI) of a low-slope roof (less than a 2:12 pitch) is greater than or equal to 0.65 and after three years, greater than or equal to 0.50. The initial SRI of a steep roof must be greater than or equal to 0.25 or greater than or equal to 0.15 after three years. Partners in the ENERGY STAR program must offer warranties equal to those of their products that may not have these characteristics. Emissivity is a measurement between 0 percent and 1 (100 percent). An ongoing discussion among professionals and scientists is whether a highly emissive roof is better in cold cloudy climates. ENERGY STAR does not require minimum emissivity values for roofing products.

Up to recently, most cool roofs were white or a light color compromising many designs that required darker or broader color palettes. New infrared-reflective pigments have been developed for metal roofs that allow even dark colors, to achieve higher reflectivity values. Architects can choose from broad color palettes of ENERGY STAR colors to meet the requirements set forth by rating systems to reduce the heat island effect. Dark bronze, greens, colonial reds, browns, deep charcoal roofs are among a variety of color choices provided to the designer with high solar reflectance values.

New cool metal roofs also offer a platform for the integration of solar power. Building integrated photovoltaics (BIPV) are innovative thin-film laminates that can be applied directly to metal roofing panels. This factory-installed system is part of the roof finish; they require no penetrations through the roofing at the construction site. The metal standing seam roof locks together in panels that are attached to the roof by channels.

Accessible Entries that Control HVAC Cost

According to Ron Grabowski, marketing product manager of Horton Automatics, "Increased focus on handicap accessibility, energy savings and student safety has driven the adoption of automatic means for entrance operations in school facilities."



Providing wheelchair accessibility through a swing door requires knowing act activation.

Particularly on college campuses, demand for student safety and accessibility is a 24/7 requirement. Budget cuts that have reduced maintenance and security staff have created opportunities for new design solutions. Electronic access control systems such as card readers have become popular additions to new door installations.

Automatic swinging, sliding, and revolving doors must meet the American Disabilities Act (ADA) and the American National Standards Institute (ANSI) requirements to provide safe access to building occupants. Automatic doors are typically part of a vestibule design to reduce heat transfer to and from the building. Swing and slide door systems are routinely synchronized so that one will open after the other one has closed. Often architects and designers combine swinging, sliding and/or revolving doors in an entrance to enhance aesthetics and optimize energy efficiency. In this arrangement, the second set of swinging or sliding doors will not open until the first set has closed, completing the air lock in both cold and hot climates.

An important facet of using Low-energy/ADA-compliant swing door operators for entrances and vestibules is ensuring that architects and specification writers apply them to the appropriate MasterFormat™ sections. At times, these types of swing doors are specified in sections 08 06 71 or 08 71 00 "Door Hardware Schedule/Door Hardware" rather than the correct sections of 08 42 29.33 or 08 71 13 "Swinging Automatic Entrances/Automatic Door Operators." Why is this critical? Doors specified in the appropriate sections ensure that:

- An independent, certified professional installer trained through the American Association of Automatic Door Manufacturers (AAADM) completes the installation
- ANSI standards for opening and closing of doors are followed, reducing risk and liability
- Automatic operators are properly calibrated and meet applicable codes for mode of operation
- Operators are paired correctly with the doors and associated hardware
- Product and labor warranties are backed by qualified professionals

Thermal Mass Serving Multiple Functions

Along with energy efficiency, speed of construction, durability and prefabrication, materials that are high in recycled content, are important attributes for school buildings. Designers can use one material system to

Case Study:

Energy-Saving Automatic Revolving Doors

Automatic and manual revolving doors have increased environmental benefits. In 2006, Massachusetts Institute of Technology (MIT) students studied the value of energy loss using swinging doors versus revolving doors.[11] These students, members of a sustainability planning class, were curious about the use or lack of use of revolving doors on campus.

The students wanted to know why users were less likely to use a revolving door and more often opted for the adjacent low energy or standard swing door. A revolving door reduces air leakage because its curved design provides an air lock, effectively acting as a small vestibule. Due to this curved design, revolving doors are excellent entrance and exit systems for controlling heat transfer between the interior and exterior of a facility. Swing doors are used next to revolving doors because swing doors are required within 10 feet of a revolving door as required by the National Fire Protection Association 101 Life Safety Code.

The MIT students measured the air leakage between the use of revolving and swinging doors. They calculated that to heat and cool the annual air leakage through a typical entrance (both swinging and revolving combined) was 98,912.8 kilowatt-hours (kWhs) of energy. That energy is enough to heat 6.5 single-family houses for one year, or to light a 100 Watt bulb for 37.8 years. To generate that much energy, 18.8 tons of CO_2 is emitted. They calculated that by increasing the use of revolving doors from 50 to 100 percent, MIT could save from 14.5 percent to 74.5 percent of the energy costs from a given door leaks and from 3 to 14.6 tons of CO_2.

During the research, the majority of users responded that swing doors were easier and faster to use and the manual revolving doors were harder to push and often locked. However, when told that there could be as much as a 50 percent energy savings increase for MIT by using the manual revolving doors, more students said that they would use the revolving door if signs were added with this information.

The final results of this study included recommending additional educational signage at the swinging doors and the automation of the revolving doors.

In 2009, students began a "Resolve to Revolve" campaign as part of a sustainability MIT initiative.


Photo courtesy of High Concrete Group LLC

Precast concrete can be quickly erected even in the winter, as shown in construction photo of Willow Creek Elementary School in Fleetwood, Pennsylvania. Designed by AEM Architects Inc.

solve multiple aspects of the building design. Precast concrete sandwich wall panel systems are being left exposed to serve as the interior wall finish, as well as exterior envelopes. Precast walls are both structural and aesthetic, and can be finished with a variety of colors, textures, or veneer materials.

Concrete walls can also have integral colorants (pigments) applied to the mix, creating a consistent wall surface color even through renovations. Concrete is hard to scratch or nick and products are available to seal these durable wall surfaces. Manufactured off-site, these wall panels can contain continuous insulation and can be designed to meet performance values for acoustic design. When used as an interior wall with lighter-colored finishes, its reflectance can lower interior lighting costs. Concrete has low to negligible VOCs, improving indoor air quality, and it can contain recycled content and is recyclable.

Precast building walls and floors allow a design professional to take advantage of thermal mass as a design strategy. Due to its density, concrete has the capacity to absorb and store large quantities of heat, and then release it back into the building as the interior temperature decreases, contributing to a high-performance building envelope. The thermal mass effect reduces peak heating and cooling loads and delays the time at which these loads occur. The resulting savings can be significant—up to 30 percent of heating and cooling costs. Designers must understand the overall envelope system in order to optimize the benefits of using thermal mass. ASHRAE Standard 90.1 allows design professionals to lower minimum insulation R-values and provides higher maximum wall U-factors as a result of the properties of these wall assemblies.

Precast concrete is a durable, long-lasting material that is noncombustible, providing natural fire control, and resistant to wind, hurricanes and floods. It is nonorganic and cannot support mold growth. Precast concrete can be quickly erected, allowing the building to be enclosed faster. Manufactured in controlled factories, finish quality and high insulation properties can be guaranteed. Precast concrete reduces life cycle costs and with strengths of 6,000 to 7,000 pounds per square inch, it's an extremely durable building material.

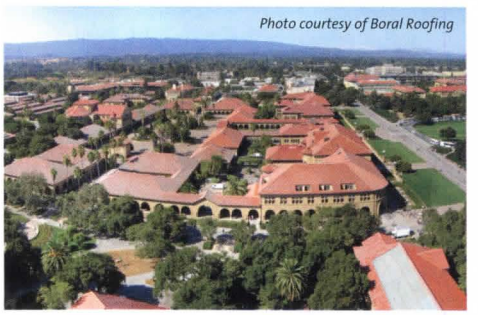


Photo courtesy of Boral Roofing

Tile roofing chosen at Stanford University in California, not only for permanence, durability and historic authenticity, but also for enhanced air quality

STRATEGIES FOR INNOVATIVE DESIGNS

Tony Cortese is the president of Second Nature, co-organizer and leader of the American College & University Presidents Climate Commitment, co-founder of the Association for the Advancement of Sustainability in Higher Education (AASHE), as well as a consultant on institutionalizing sustainability principles and programs. In October 2010, he spoke to a group of educators and students at the national Bioneers Conference. In his speech he framed a call to action by educators as well as students to continue to educate their facility managers and administrators to change the way they are building and managing their facilities. The commitments to good environmental practices by educators are growing and the AASHE Climate Action Planning Wiki references numerous organizations, as well as rating systems that provide strategies for greening campuses.[12] Many of these innovative solutions will assist the design professional in meeting AASHE targets.

CONCLUSION

Whether designing a new school or renovating an old one, there are new, innovative products that save time, money and the environment. Manufacturers continue to develop new technology, methods of construction and responses to environmental stewardship. Designers work on innovations that will help educators resolve to meet the challenge of the 21st century school.

See Endnotes in the online version of this course.

Architect Celeste Allen Novak, AIA, LEED AP, specializes in sustainable design and planning in Ann Arbor, Michigan.

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CIRCLE 21

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CIRCLE 58

SCHOOLS OF THE 21ST CENTURY

116 BUILDING BLOCKS
125 K-12 SCHOOL PRODUCTS
130 PROJECTS

AT THE TURN of the 20th century, American education systems hired architects – confident in the criteria of the building type, materials, and construction methods – to design and build schools that would last. These structures, often masonry with solid wood and plaster interiors and filled with daylight, became central to growing neighborhoods of lower- and middle-income immigrants.

This commitment to learning environments for child and community lost its focus around the 1960s. Slipshod renovations and deferred maintenance compromised the integrity of well-built, but out-of-date, school buildings; makeshift temporary structures filled schoolyards with isolated classrooms; and poor-quality schools were erected to meet the bottom line in terms of dollars, space, and design.

More recently, an enlightened contingent of educators, legislators, parents, nonprofits, and designers are striving to rectify the errors of the past 50 years – reevaluating and reconstructing K-12 school programs and buildings in their districts. Meanwhile, an increasing number of architects are working with communities in need to provide good classrooms for the children. Thoughtful, sustainable architecture, no matter how basic, and public outreach are equally essential elements in the development of the "master plans."

Many of these efforts are taking shape as we settle into the 21st century. For this special section, we selected a group of public schools that demonstrate the viability and potential of such initiatives through sustainable design, as well as student and community engagement. For a more global perspective, our feature story looks at the elegant solutions of three architects who have devoted much of their time and expertise to designing and building simple school buildings for needy areas in Haiti, Burkina Faso, and the Southeastern United States.

By most accounts, this scholastic renaissance should progress into coming decades. This is good news for architecture – and even better news for our kids. *Linda C. Lentz*

Building Blocks

BY JENNA M. MCKNIGHT

Architecture, when done well, can improve lives. And perhaps no building typology better exemplifies this transformative power than schools – the place where young minds are nurtured, where future leaders are reared. Here, we spotlight three modest yet remarkable projects making an impact in impoverished areas: classrooms in quake-ravaged Haiti, a secondary school in West Africa's Burkina Faso, and rural day-care centers in the U.S. These projects aren't elaborate; rather, they are smart, simple structures built with a little money and a lot of heart. Although each is different in execution, they all serve as sources of pride and optimism in communities where dreams often are shelved because of the daily struggle to survive. Hopefully, as the do-good design movement gains momentum, we'll see empowering projects such as these emerge in greater numbers around the globe.

THE MASSIVE, 7.0-MAGNITUDE EARTHQUAKE that struck Haiti one year ago, on January 12, killed an estimated 230,000 people and left more than 1.5 million homeless. Thousands of aid groups are working in the distressed island country, but conditions are challenging, and reconstruction is slow going. One organization, however, has managed to make some progress: With the help of architect Jack Ryan, Plan International has built dozens of simple light-frame classrooms that are providing stability and hope for afflicted communities.

Plan, a nonprofit group focused on child development, began working in Haiti in 1973. Today, with 267 employees on the ground, its efforts vary, from training teachers to providing medical care. After the deadly quake, Plan put special focus "on establishing safe spaces for children," including schools, says Hanna Jamal, education coordinator. "Returning to school gives kids a sense of normalcy," she notes, "which is really important after a crisis."

Plan set out to construct 76 semipermanent facilities that would last five to 15 years. The goal was to build them for existing primary schools, both public and private, in Port-au-Prince and Jacmel, a town in the southeast. The locations were chosen in collaboration with the Haitian education ministry.

When attempts to use a local architect fell through, the group reached out to Ryan, a Rhode Island–based architect referred by a Plan employee. Ryan is an associate at 3SIXØ Architecture; when time allows, he does personal projects on the side. Although he has ample construction experience, Ryan

TRANSITIONAL CLASSROOMS
JACK RYAN
HAITI

OPPOSITE: For Plan International, architect Jack Ryan designed a 1,000-square-foot light-frame classroom building affixed to a concrete foundation and topped by a gabled roof clad in Ondura, a corrugated asphalt material. Load-bearing walls feature pine boards that are placed 0.5 to 3.5 inches apart to allow in light and fresh air. Total cost of construction was about $30 per square foot.

ABOVE: The column-free interior contains an exposed 24-foot-wide wood truss. Desks, chairs, and chalkboards were salvaged from quake-damaged buildings.

had never worked in a developing country or in a postdisaster environment. "I'm not a disaster architect by any means," he admits. But he was eager to help Haiti and agreed to donate a portion of his services.

Getting started on the design wasn't easy. "I was a little overwhelmed by the vast approaches people can take," Ryan says. Then Plan told him he had one week to come up with a scheme, as building materials would be arriving in Haiti at any moment. "Everything went from very vast and open to very focused," he says. The materials had been selected in January by engineering consultant Nigel Stuart, who had worked for Plan immediately after the quake. Sensing that shipments to Haiti would be severely delayed, a prescient Stuart had ordered 22 cargo containers full of lumber, tools, nails, hurricane straps, and other material required to construct basic shelters. "At that point, he didn't have construction documents," Ryan says. "He just had a napkin sketch."

Ryan's design process became an exercise in speed mathematics. He entered the shipping manifesto into a spreadsheet and started to assess how to divvy up the material. Then he reached out to Wilbur Yoder, an engineering friend who had experience building earthquake- and hurricane-resistant structures. He was warned to keep construction methods simple, particularly because local laborers don't generally work with wood.

In the end, Ryan conceived a 1,000-square-foot single-story box topped by a gabled roof sheathed in a corrugated asphalt material. The load-bearing walls are composed of plywood panels and pine boards. Resembling a brise-soleil, the boards are positioned a 0.5 to 3.5 inches apart to provide natural light and ventilation.

Inside, a shear wall cuts the space in half, creating two classrooms, each accommodating 50 students. The interior – furnished with salvaged benches, desks, and chalkboards – is column-free, thanks to a truss system that spans the 24-foot-wide structure. All of the building's components are measured and cut at a central location and then assembled on-site.

Last April, Ryan traveled to Haiti for the first time to present his plan to the government. He returned in May for three weeks to train local workers and oversee construction of the first buildings. "I was very hands-on with them," he says, noting that the crew would work from sunrise to sunset. Given that the concrete foundation had been poured one week prior to his arrival, the team was able to complete the first school, in Jacmel, in a little more than a week. Plan has since completed 54 buildings, with 22 more slated for construction.

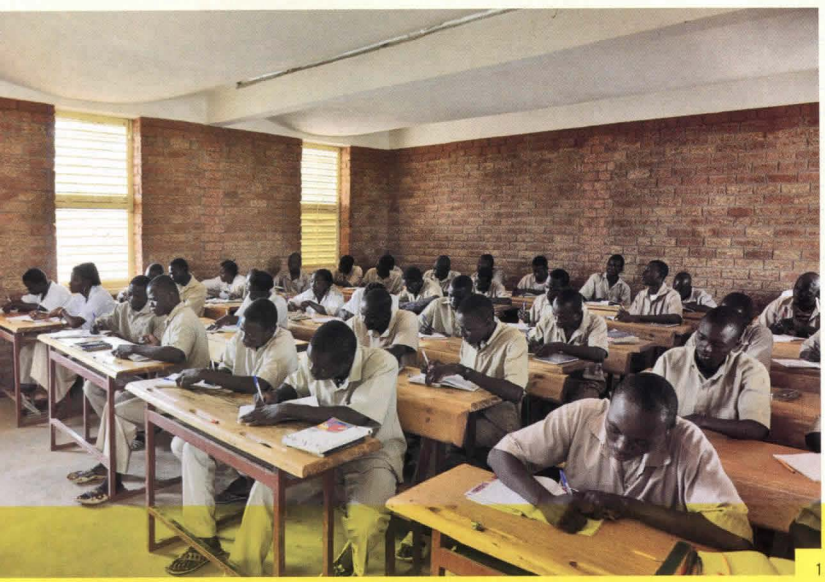
The classrooms have been well received. "The airflow is great, which is so important in Haiti," notes Jamal. Ryan continues to work on the project remotely and hopes to return to Haiti at some point. Witnessing the impact such a modest structure can have on a community in need was inspiring, Ryan says. "Children would run up and want to hold our hand and thank us," he says. "It was really rewarding to be a part of helping rebuild the country."

Building Blocks

IN 2001, WHILE STILL a student at the Berlin Technical University, Diébédo Francis Kéré completed his first project: a small primary school in Gando, his native village in Burkina Faso. An exemplary piece of architecture, built in a poor country rife with illiteracy and unemployment, the Gando project earned Kéré a coveted Aga Khan Award in 2004 and helped put the young West African architect on the map.

Kéré now runs an eight-employee practice in Berlin and works worldwide. Designing sustainable buildings for Africa, however, remains his primary focus. His nonprofit organization, Schulbausteine für Gando, or School Building Blocks for Gando, helps raise money for his work. "My motto," he says, "is help to self-help."

In 2006, Kéré was hired by the Dreyer Foundation, a Munich-based philanthropic group that finances projects in Africa, to design a new building for a secondary school in Dano, a small Burkinabè town. The building was to house roughly 180 students. As with his Gando project, Kéré wanted to create a naturally ventilated building that responded to the region's stifling heat, yet also was sturdy enough to endure its four-month rainy season. He also was determined to utilize local materials and labor – a key component of his design philosophy.



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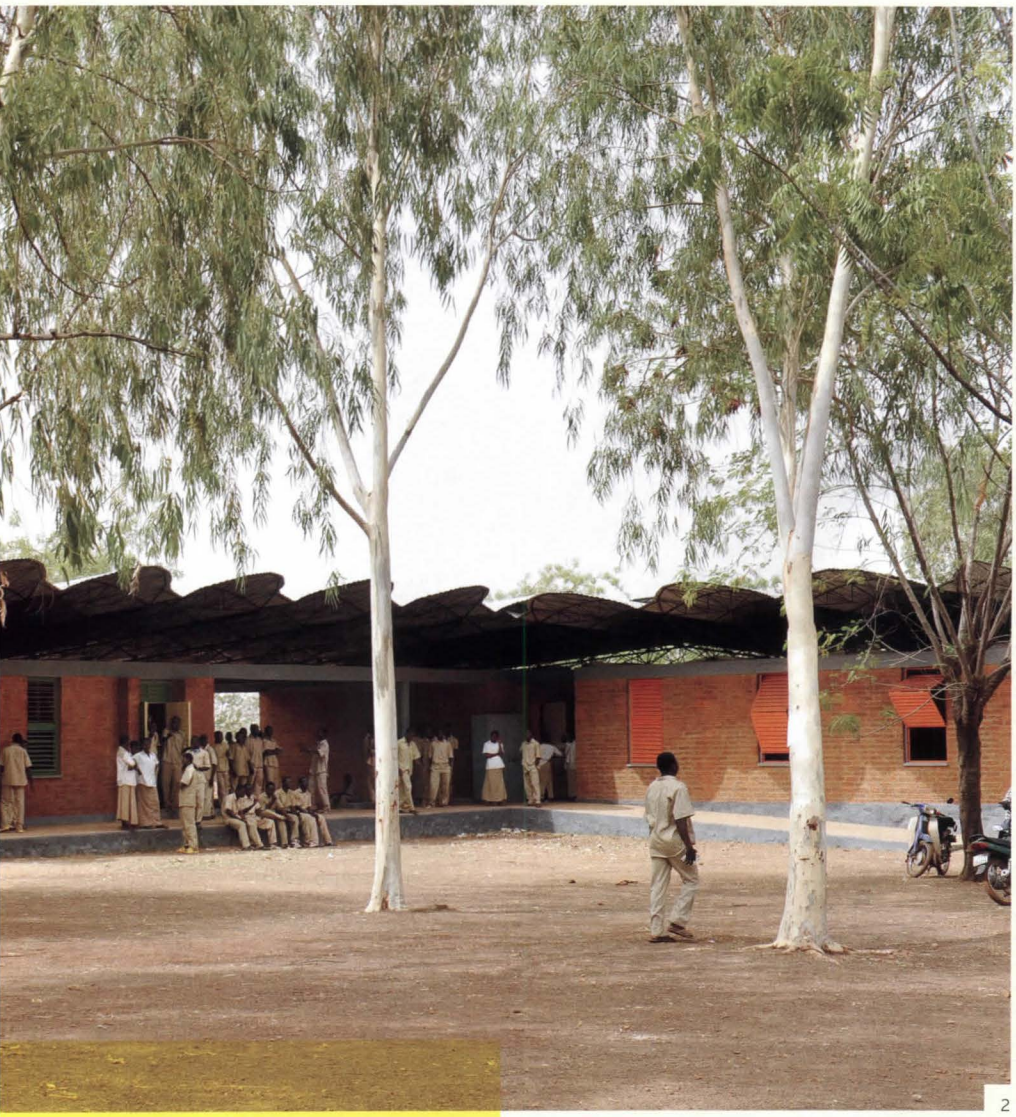
For the flat site dotted with trees, Kéré created a single-story L-shaped building that is oriented east to west, to mitigate heat gain. Its rectangular volume is partitioned into four 615-square-foot units – three are classrooms, while the fourth is an open area with sunken, oval-shaped seating. The adjoining 615-square-foot cubic volume is reserved for teachers and the school director.

The building includes several innovative features that reveal Kéré's ingenuity. The load-bearing masonry walls, for instance, are made of laterite, an iron-rich soil found in the area that hardens when exposed to air. Villagers shaped the red bricks with basic tools. "This is very important – they don't need to buy a new tool to do this building," emphasizes Kéré. In constructing the walls, the architect opted to use less mortar than is typically applied in bricklaying. His goal: to "let the material be seen like it is," while also boosting the walls' strength.

To protect the building from the elements, Kéré developed an undulating, corrugated tin roof that hovers several feet above the building and is supported by an elegant truss system made of common rebar. Aesthetically striking, the roof's wavelike form also has a pragmatic function: Water is channeled into the folds and funneled off the roof, away from the building. (Money permitting, Kéré hopes to someday add a catchment basin.) Moreover, the roof's deep overhangs shade the structure, ensuring cooler temperatures indoors.

Indeed, creating a comfortable learning environment was important to Kéré, who spent his childhood school days in Burkina Faso. (At age 19, he received a scholarship to study carpentry in Germany and later earned his architecture degree there.) Kéré has vivid memories of pupils crammed into sweltering classrooms with low ceilings and little air circulation. "I could touch the roof," he says. "It was very hot inside because the air didn't move." For the Dano project, he incorporated two features that promote natural ventilation. First, the ceiling, made of concrete and brick, is a series of inverted barrel vaults, each separated by 8-inch slots that allow hot air to escape. Second, the rooms have glassless windows covered by collapsible tin shutters called lamellas. "When you open these," Kéré says, "the air is flowing."

Completed in 2007 at a cost of about $80,000, the Dano school received critical acclaim and helped Kéré garner several more prestigious accolades, including the 2009 Global Award for Sustainable Architecture and the 2010 BSI Swiss Architectural Award (a $100,000 prize). For the architect, however, the real success was the community's engagement in the project. At times, half of the village was on-site, working on the building. "They are really proud," Kéré says. "I didn't say wait and see what I do. We did it together. It's a process with the people."



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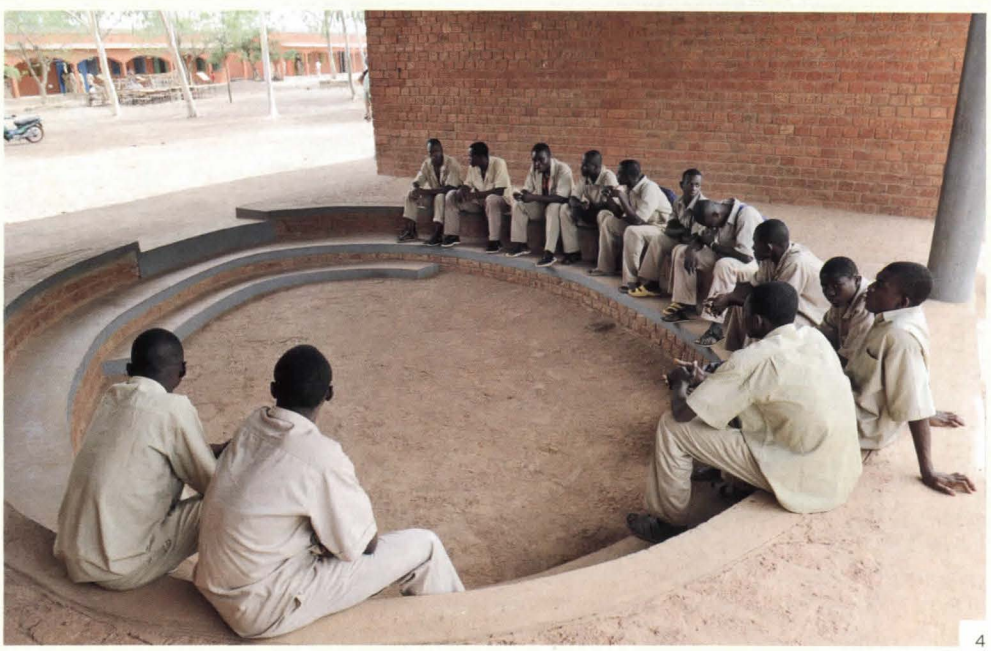
SECONDARY SCHOOL DIÉBÉDO FRANCIS KÉRÉ DANO, BURKINA FASO

1. To provide natural ventilation, the architect conceived a billowing concrete-and-brick ceiling system; hot air escapes through 8-inch slots between each inverted barrel vault.

2. Load-bearing masonry walls are made of laterite, an iron-rich soil found in the area. Local workers cut the earth bricks using basic tools. The school's undulating roof is attractive and pragmatic: The folds conduct rainwater away from the building.

3. An elegant truss made of common rebar supports the corrugated tin roof. Folding tin shutters, called lamellas, cover glassless windows and add a splash of color to the building.

4. The 3,980-square-foot L-shaped school contains classrooms, offices, and an outdoor seating area. The project cost about $80,000.



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Building Blocks

CHILD CARE CENTERS
TED HOFFMAN
SOUTHEASTERN U.S.

EACH YEAR, COUNTLESS MIGRANT laborers travel from Mexico, Honduras, Haiti and other economically challenged countries to rural areas in the Southeastern U.S. to harvest fruits and vegetables, often with children in tow. In many cases, parents are unable to put their infants and toddlers in day care and are forced to take them into the fields.

Enter the East Coast Migrant Head Start Project (ECMHSP), a federally funded nonprofit organization created in 1974. Each year, the group provides free child care to roughly 5,000 migrant workers' children, ages six weeks to five years. Often the program is operated out of old schools and churches.

In 2006, ECMHSP received funding to construct purpose-built child care facilities in four different locations, and later received funding for two more. To design the buildings, it turned to Ted Hoffman, an architect based in Labelle, Florida. Over the past 30 years, Hoffman, who only accepts socially responsible commissions (he cites Samuel Mockbee as a role model), has designed more than two dozen day-care centers. "I do a few projects a year that are special to me," he says, "and I get to spend time designing and building. It's allowed me to do what makes me happy." His design process is rather old-fashioned, Hoffman notes: "I draw by hand. I never learned how to use AutoCAD."

Given his background and beliefs, Hoffman was happy to take on the Head Start project. His task was to create a roughly 15,000-square-foot complex that could be replicated at each location (one in North Carolina, one in South Carolina, two in Alabama, and two in Florida). There were two major considerations: cost and the possibility that the centers would be moved in the future because of changes in crops or land ownership. Given these concerns, Hoffman opted to use a flexible, hybrid approach: prefabricated modular units linked together with custom-built, covered wooden decks. Head Start didn't give the architect much direction. "It was Ted more or less presenting to us his vision, and us going, '*Wow*,'" explains John Menditto, the organization's general counsel, who worked closely on the project.

The complex is intended to be welcoming and dynamic. At each site, four to six steel modules sit up to 20 feet apart at various angles and wrap an outdoor play area. Each 72- by 28-foot module contains three classrooms, with the exception of one designated for offices and a kitchen. To jazz up the units, Hoffman worked with the manufacturer, Florida-based Affordable Structures, to incorporate custom features, such as sloped ceilings and large windows placed low so kids could peer out. "When you're inside them," he says, "there's no way you think they're modular construction." Delivered and set up, the units cost $80 per square foot. "It was important to me to make the dollars go as far as I could," Hoffman notes.

Another critical aspect: ensuring the units could withstand a major storm. Hoffman employed a footing suitable for a stick-built building of the same size. Thus, the units have been certified by the State of Florida to withstand winds up to 150 miles per hour.

The project's most interesting feature is the elevated wooden decking that

ABOVE: The East Coast Migrant Head Start Project hired Hoffman to design child care centers for sites in Alabama, Florida (pictured), North Carolina, and South Carolina. Each complex is approximately 15,000 square feet and features four to six prefabricated units linked by wooden decking.


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Building Blocks

doubles as corridors and gathering areas. "In my work, I've always been interested in the space that occurs between buildings," says Hoffman. Although each site varies slightly, the steel-clad canopies rise 12 to 20 feet above the deck and are supported by an exposed wooden truss. Clerestorylike openings in the canopy structure usher in natural light and air (and some rain, unfortunately). The decks have become an important amenity for both kids and parents. Hoffman has even seen piñatas hanging from the truss.

ECMHSP has completed all six centers, with the final one opening this past December. When asked how people feel about the buildings, Menditto says they're not thinking about design. "These families have so little," he says. "They're just very grateful to have a safe place for their children. It's as fundamental and as simple as that." For Hoffman, the centers embody his life's mission. "I hope to never retire," he says. "Get a job you love, and you'll never work another day in your life." ■

ABOVE: As this North Carolina center shows, an outdoor play area is surrounded by prefabricated *modular units*, which contain custom features, such as windows placed low so kids can peer out.

RIGHT: Steel-clad canopies hover 12 to 20 feet over the decking. (Pictured is a South Carolina center.)

View slideshow online.

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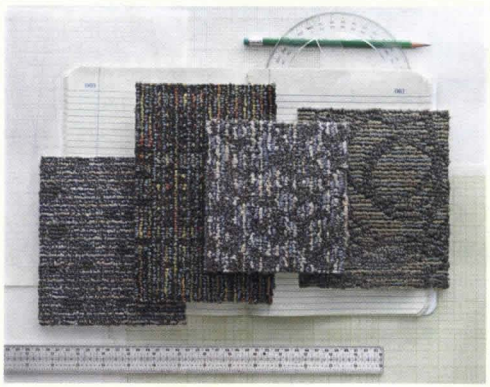
K-12 SCHOOL PRODUCTS

Node

Steelcase steelcase.com

Steelcase collaborated with global design consultancy IDEO to develop Node, a classroom chair that provides seamless transitions from one teaching mode to the next. Currently being tested at the University of Michigan in Ann Arbor and Northview High School in Grand Rapids, the chair includes a swivel seat to easily rotate, an open seat design to change positions, and a mobile base to allow students to move from lecture mode to team-based learning, without interruption. **CIRCLE 212**



Class Act

Lees Carpets leescarpets.com

Class Act is a new broadloom and modular carpet collection manufactured specifically for education interiors. Ideal for the safety, comfort, maintenance, and high-traffic requirements of school environments, the line includes linear patterns and swirling wheels available in a palette of 12 rich colors. All well suited for a variety of learning, health care, and public space applications. **CIRCLE 213**

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Hitachi America hitachi.com

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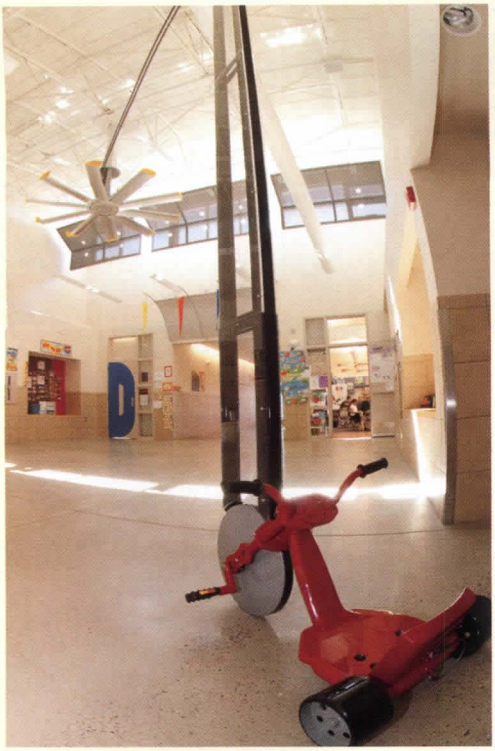

Ceiling Fan Learning Tool

Big Ass Fans bigassfans.com

PA Architects of Albuquerque transformed a ceiling fan into an interactive learning tool for students in the LEED Silver certified Alamosa Elementary School. To adapt the fan, the firm removed its motor and connected its gears to a tricycle via an automotive quality belt. The project teaches students about air circulation while also serving as a reward for good performance. CIRCLE 215

Concord Site Furnishings

Landscape Forms landscapeforms.com

Developed in collaboration with Robert A.M. Stern Designs, the Concord collection of site furnishings from Landscape Forms is intended for higher-ed, K-12, and office campuses. Featuring a Modern Traditionalist style, the collection includes a bench (with or without a curved backrest), a litter/recycling receptacle, a 3' tall pedestrian light, a 12' tall pathway light, and a cast-aluminum bike rack. CIRCLE 216

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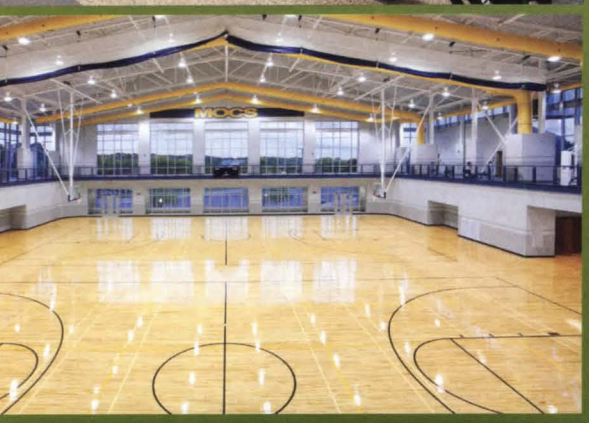

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CIRCLE 11

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THE ABC'S OF WHY CARPET IS PERFECT FOR SCHOOLS.

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Carpet for Schools: A Sustainable Solution that Enhances Learning and Health

Documented benefits of specifying carpet in schools include an enhanced learning environment, improved air quality and lower life cycle costs.

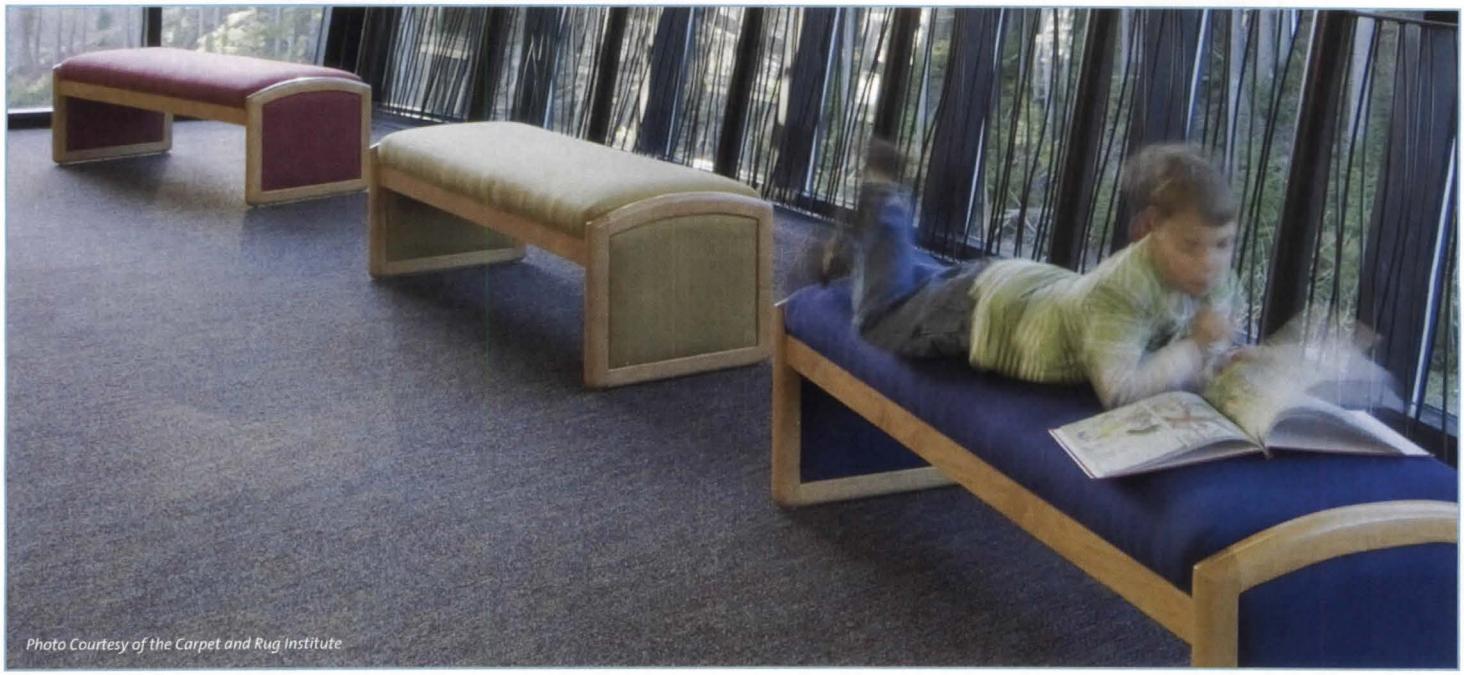

Photo Courtesy of the Carpet and Rug Institute

Provided by the Carpet and Rug Institute

From kindergartners to postgraduate students, a pleasing school environment is a plus that can add up to superior performance. Over the past several decades, school design has been widely recognized as a factor in creating a good learning environment that strongly affects student achievement, social development and attendance, as well as teacher retention and satisfaction. In a 2001 study by the Atlanta-based research firm, Beth Schapiro & Associates, more than 92 percent of teachers surveyed believe general classroom design has a strong impact on students' learning and achievement. In the same study, teachers identified the top five design elements that promote the best learning environment: comfort, safety, lighting, temperature control and good acoustics.

Carpet helps achieve several of these design goals, and is a factor in the creation of welcoming, friendly and less institutional classrooms that can contribute to a better educational environment for students, teachers and school personnel. In fact, more than 70 percent of teachers surveyed in the Schapiro study prefer carpet on their classroom floor.

This article will cover the sustainability, safety and health issues related to carpeting in schools, as well as guidelines to selecting the right carpet and keeping it a sustainable choice for the life of the product. The proper way to clean and maintain carpets will be explored, as well.

Continues at ce.architecturalrecord.com.

CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Carpet for Schools: A Sustainable Solution that Enhances Learning and Health.** To earn one AIA/CES Learning Unit, including one hour of health safety welfare/sustainable design (HSW/SD) credit, go to **ce.architecturalrecord.com** to read the complete article and take the test.

Learning Objectives
After reading this article, you should be able to:

- Identify the benefits of installing carpet in schools that relate to health, learning, safety and sustainability.
- Identify sustainability standards and ratings for carpet performance.
- Explain how carpet improves air quality and helps reduce asthma and allergies.
- Discuss methods for increasing the life cycle and sustainability of carpet in schools.

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1

LYNNWOOD HIGH SCHOOL
BOTHELL, WASHINGTON
BASSETTI ARCHITECTS

BY KATHARINE LOGAN

THOSE AMONG US BEWILDERED by the lack of character that afflicts great swathes of the developed landscape – vast parking lots, relentless strip malls, mindless billboards, awkward housing, and multilane roads – may be surprised to discover the distinctive profile of Lynnwood High School, 20 miles north of Seattle in the middle of nowhere.

Located in Bothell, this new public school (part of Edmonds School District No. 15) replaces a fragmented 1969 campus a mile away, notable for poor exterior circulation between shoddy blocks of classrooms. In 2004, the Edmonds Project Advisory & Review Committee initiated a research-based planning process to redefine the program and aspirations of the ailing school, and to guide an effective design. Subsequently, they tapped Seattle-based Bassetti Architects to structure the school into a humane and experientially rich piece of architecture.

Approaching the brief in a holistic way, the firm developed a scheme by treating the relationships among the project's many parts as an urban design. "Once we settled on the concept of a whole school space, understanding the urban patterns was key to an effective solution," says Bassetti design principal Rick Huxley.

The near 220,000-square-foot, $73 million structure serves a diverse student body of 1,600 (who speak 28 languages among them). In deliberate contrast to the scattered old school and incoherent landscape, the criteria informing the new building define a series of linked centers at a variety of scales. The Agora is literally and figuratively the heart of the school. Filled with daylight from clerestory windows, this unifying double-height volume serves as lobby, cafeteria, event space, performance venue, study hall, and "village square." Its fully glazed end walls provide views out to the playing fields, wetlands, and trees beyond, connecting the Agora to the larger world.

The building is organized into four two-story clusters that front onto the Agora: an athletic and library cluster, an arts cluster that includes a theater, and two classroom clusters. Each articulates the edges of the Agora with enclaves and display areas that invite interactions on a more intimate scale. Form, material, and color designate elements with specific functions. Balconies designate cluster entrances, for example, and maple cladding designates administrative areas, which are dispersed for ease of access and passive supervision. "I can honestly say we've had fewer problems and fewer behavior issues because of the Agora," says school principal Dave Golden.

Reiterating the ordering principle of the Agora, each classroom cluster centers on its own smaller gathering space, which links classrooms, break rooms, and administrative offices into a comprehensible part of the larger whole. Remarkably, Bassetti's execution of the spatial concept avoids the inefficiencies of more widely distributed functions. Just as buildings on a main square connect along back streets and alleys in a city, here the science rooms in each cluster back onto a shared resource block, and staff offices link "backstage" to promote informal communication and continuity of the student experience.

The building's outward expression comprises shading devices, lightshelves, passive-ventilation louvers, and fenestration, bringing rhythm, texture, and complexity to a metal-panel and concrete-block envelope. In terms of environmental performance, it exceeds state energy code requirements by 50 percent, with an Energy Star Performance Rating of 91.

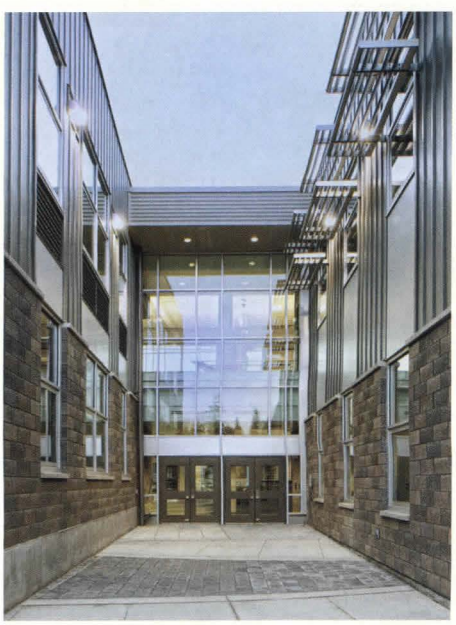
The building's genius, however, lies in its play of scale. By approaching the design as an urban exercise, the architects generated a connective community for young citizens to inhabit. Open since September 2009, the new school engages students and offers them a meaningful place in the world. "The building has completely changed the image of Lynnwood," says Golden. "People used to go elsewhere. Now we can't keep them away." ■

ABOVE: Bassetti Architects balanced the exterior of Lynnwood High School with contrasting patterns of scale and form, bringing rhythm, texture, and complexity to a metal-panel and concrete-block envelope. Central to their design, the building's bold canopy directs students through the jewellike glazed entrance into the school's Agora, and also points back out toward the world beyond it.

RIGHT: Designed to meet criteria for a LEED for Schools Silver certification, the building was shaped with such sustainable design strategies as energy efficiency, stormwater management, natural ventilation, and daylighting. Visible elements, such as exterior lightshelves, serve as teaching tools for students and the community.

Katharine Logan is a British Columbia–based writer for RECORD.

For expanded video coverage of this project, visit our Web site.

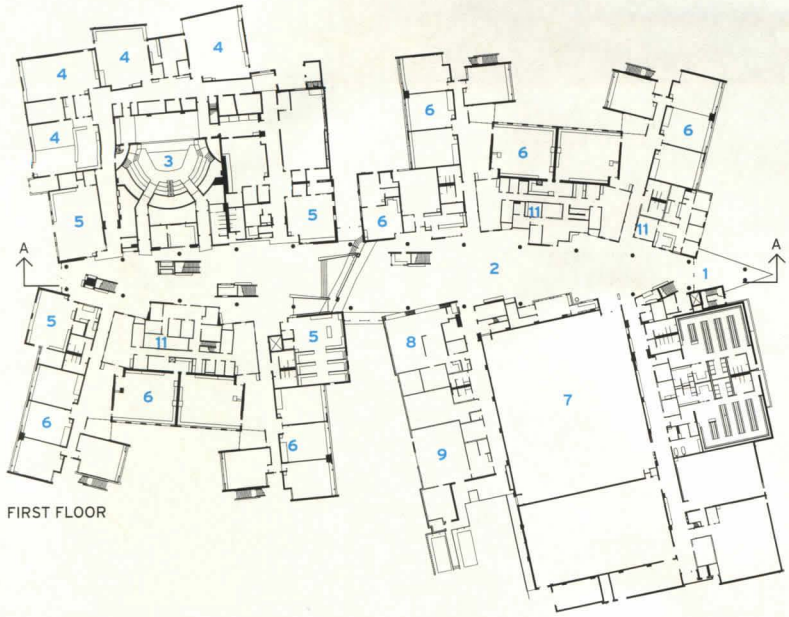


CREDITS

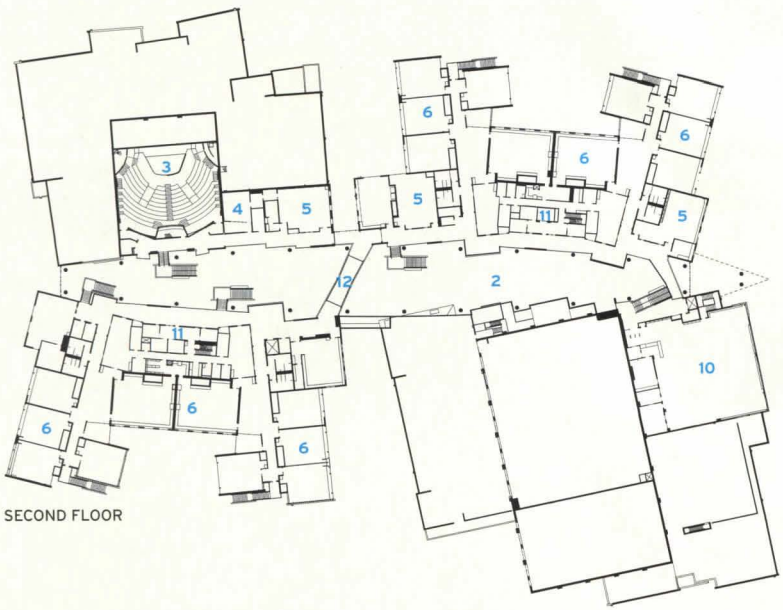
ARCHITECT: Bassetti Architects – Rick Huxley, AIA, design principal; Lorne McConachie, AIA, principal; Tom Truesdell, AIA, project manager; Judy Yeoh, project architect; Garrett Cress, Don Breiner, AIA, Ross Parker, AIA, David Axt, AIA, Cassie Hillman, Kate Vincent, Dante Wilkins, Jennette Chen, project team
ENGINEERS: Reid Middleton (civil); Magnusson Klemencic Associates (structural); Notkin (mechanical); Sparling (electrical)
CONSULTANTS: The Berger Partnership (landscape); Candela Lighting Design (lighting); SSA Acoustics (acoustical); PLA DEsigns (theater); George E. Bundy & Associates (food service); Wayne Chabre (artist)
CLIENT: Edmonds School District No. 15
COST: $73 million
SIZE: 219,768 square feet (gross)

SOURCES

STRUCTURAL SYSTEM: Allied Steel (framing); Epic Metals (long span decking)
CLADDING: Mutual Materials (concrete masonry units); AEP Span (metal panels); Keith Panel System (aluminum composite panels)
ROOFING: Malarkey Roofing Products (built-up); AEP Span (metal)
WINDOWS: EFCO (metal frame)
GLAZING: Oldcastle *Building*Envelope
DOORS: Security Metal Products (metal); VT Industries (wood); Cornell Iron Works (fire)
CEILING: USG
FLOORING: Mannington Commercial
LIGHTING: Lutron; WattStopper (controls); Linear; SPI; Metalux (ambient); Belfer; Cooper; Selu; ERCO (task)



FIRST FLOOR



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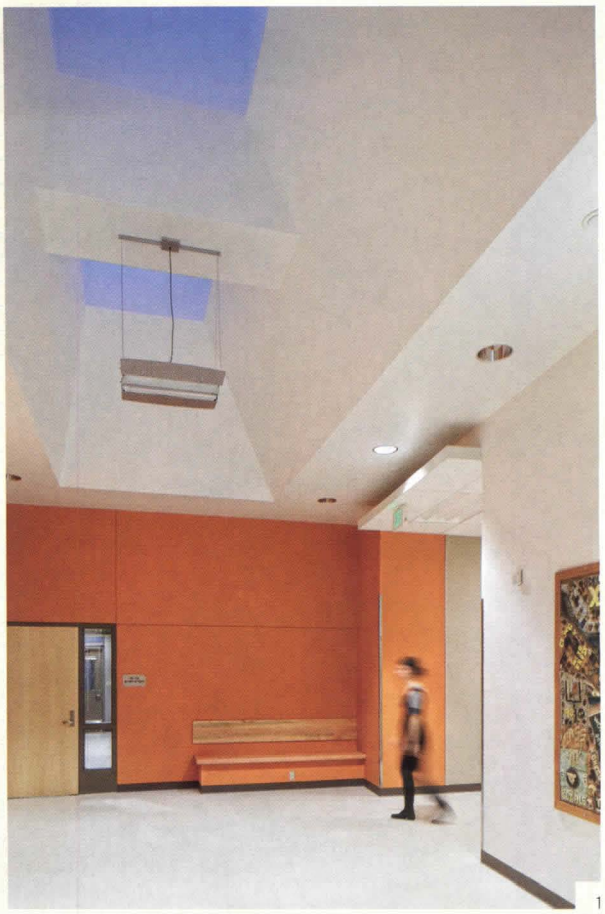


1

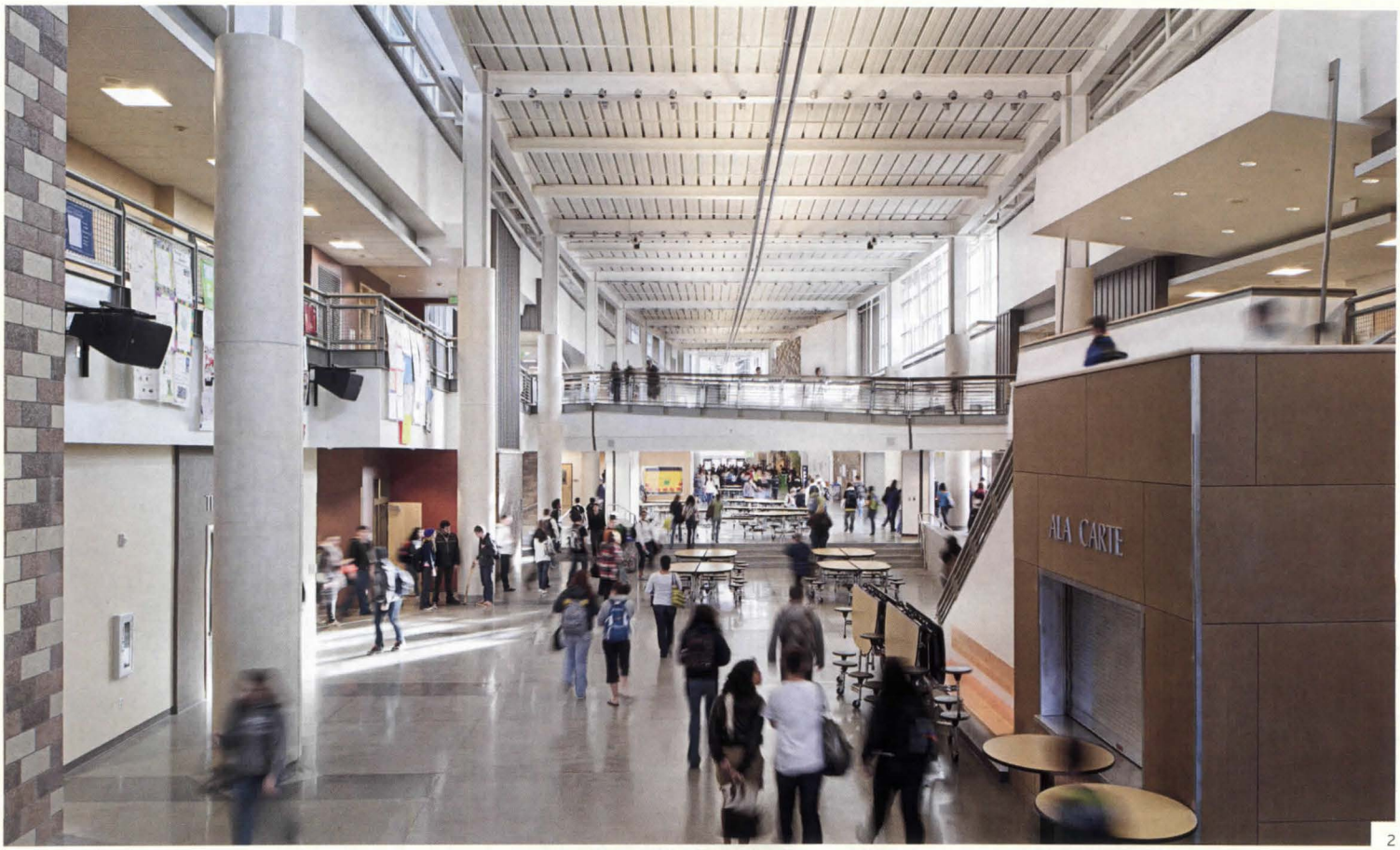
1 MAIN ENTRANCE
2 AGORA
3 THEATER
4 ARTS COMMUNITY
5 CAREER AND TECHNICAL EDUCATION
6 SMALL LEARNING COMMUNITY/CLASSROOMS
7 GYM
8 KITCHEN/SERVING STATION
9 STORAGE
10 LIBRARY
11 ADMINISTRATION
12 BRIDGE

1. Skylights and clerestory windows provide much of the daytime illumination for the upper halls and Agora. Upbeat colors and built-ins add a trendy ambience.

2. Slicing through the building's core, the Agora serves as lobby, cafeteria, study hall, and event/gathering/performance space. Bridges connect the clusters on the second level.

3. Classrooms and studios such as the food lab offer students valuable professional learning experiences.

SECTION A-A



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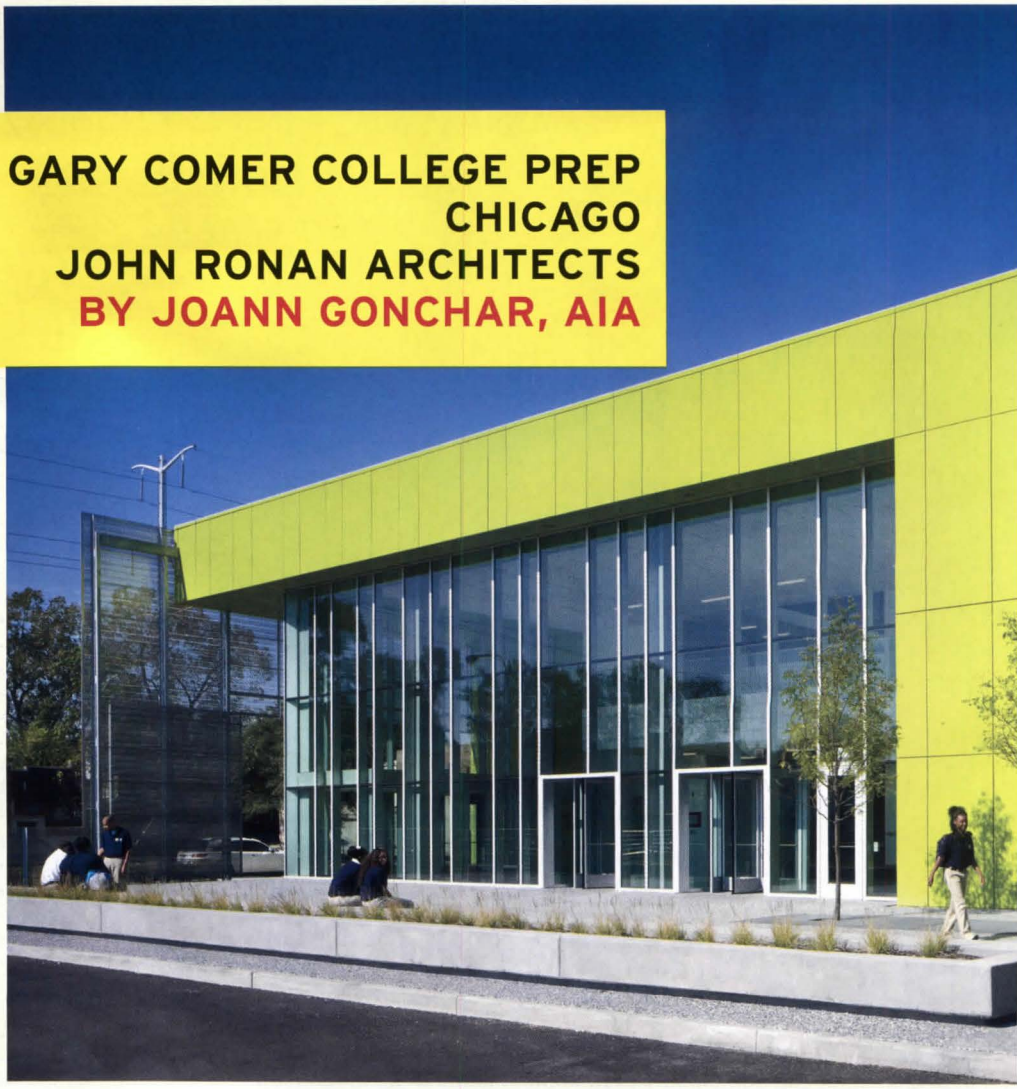
3

2

GARY COMER COLLEGE PREP CHICAGO JOHN RONAN ARCHITECTS

BY JOANN GONCHAR, AIA



"I WANTED SOMETHING fresh, young, and optimistic," says architect John Ronan about the chartreuse facade panels on his recently completed Gary Comer College Prep School in the Grand Crossing neighborhood of Chicago's South Side. Although the color may seem improbably bright, the high school, along with an equally bold youth center that sits at the opposite end of a parking lot, energizes the otherwise drab surroundings, characterized by vacant lots, warehouses, and humble wood-frame and brick single-family homes.

Like the nearby youth center, completed in 2006 and also designed by Ronan [ARCHITECTURAL RECORD, February 2008, page 114], the school was built by the science and education–focused nonprofit organization created by the late Gary Comer, founder of mail-order clothing retailer Lands' End, who grew up in the neighborhood. Run by Chicago charter school operator Noble Street, Comer Prep admitted its first students in the fall of 2008, holding classes in the youth center before moving into the newer building this past September, with 500 freshmen, sophomores, and juniors.

Although the school now has its own purpose-built home, it uses many of the youth center's facilities daily, including the cafeteria and the combined auditorium and gymnasium. This sharing allows the newer building to be "lean," says Ronan. The steel-frame and precast-concrete structure encloses about 45,000 square feet for a population that is expected to top out next fall at 600 students in grades 9 through 12, almost all from the South Side.

The school may be compact, but it feels open and full of daylight. The lobby, for example, is a welcoming double-height space with a fully glazed wall that provides a visual connection to an adjacent plaza and to the youth center. University insignias incorporated into the wall graphics put Noble Street's goal of readying students for college front and center in the mind of anyone who enters the school.

Beyond the lobby, two floors of classrooms wrap

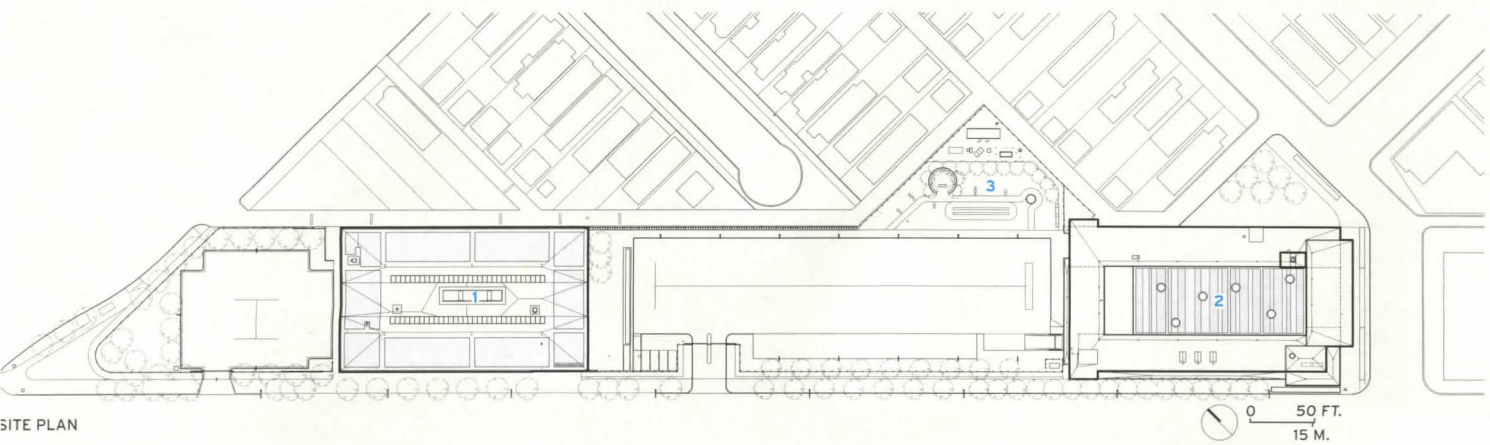
3

1. A generously glazed wall allows a visual connection between the lobby and a small entry plaza. Tall grasses are planned for the planters at the plaza's edge to help shield the adjacent parking lot from view.

2. A stainless-steel scrim veils the building and classroom windows.

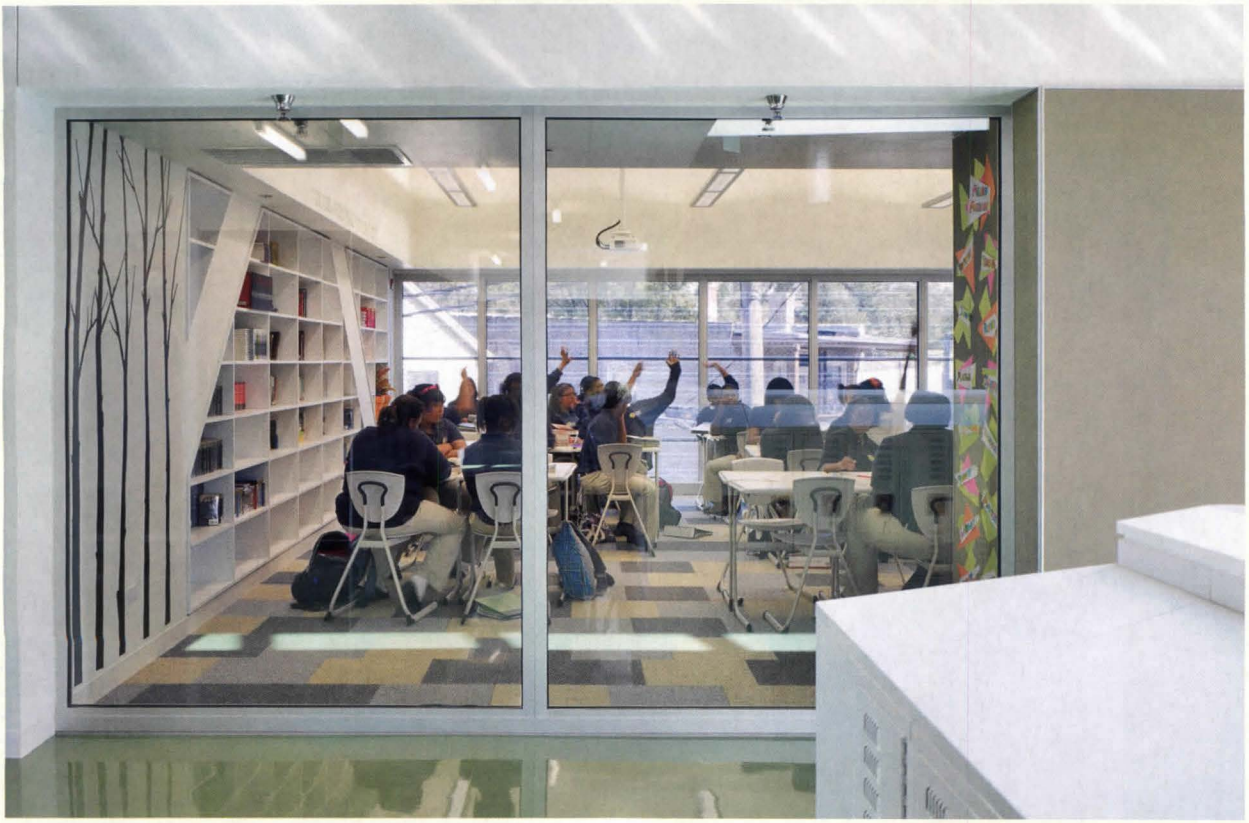
3. The scrim extends to become a fence in front of the parking lot between the youth center and the school, helping tie the two buildings together.

1 2



SITE PLAN

1 SCHOOL
2 YOUTH CENTER
3 EDUCATIONAL GARDEN



LEFT: Interior glass walls allow anyone in the corridor to observe activity in the classrooms. A scrim shields the exterior of the windows on the opposite wall but does not obstruct views to the outside.

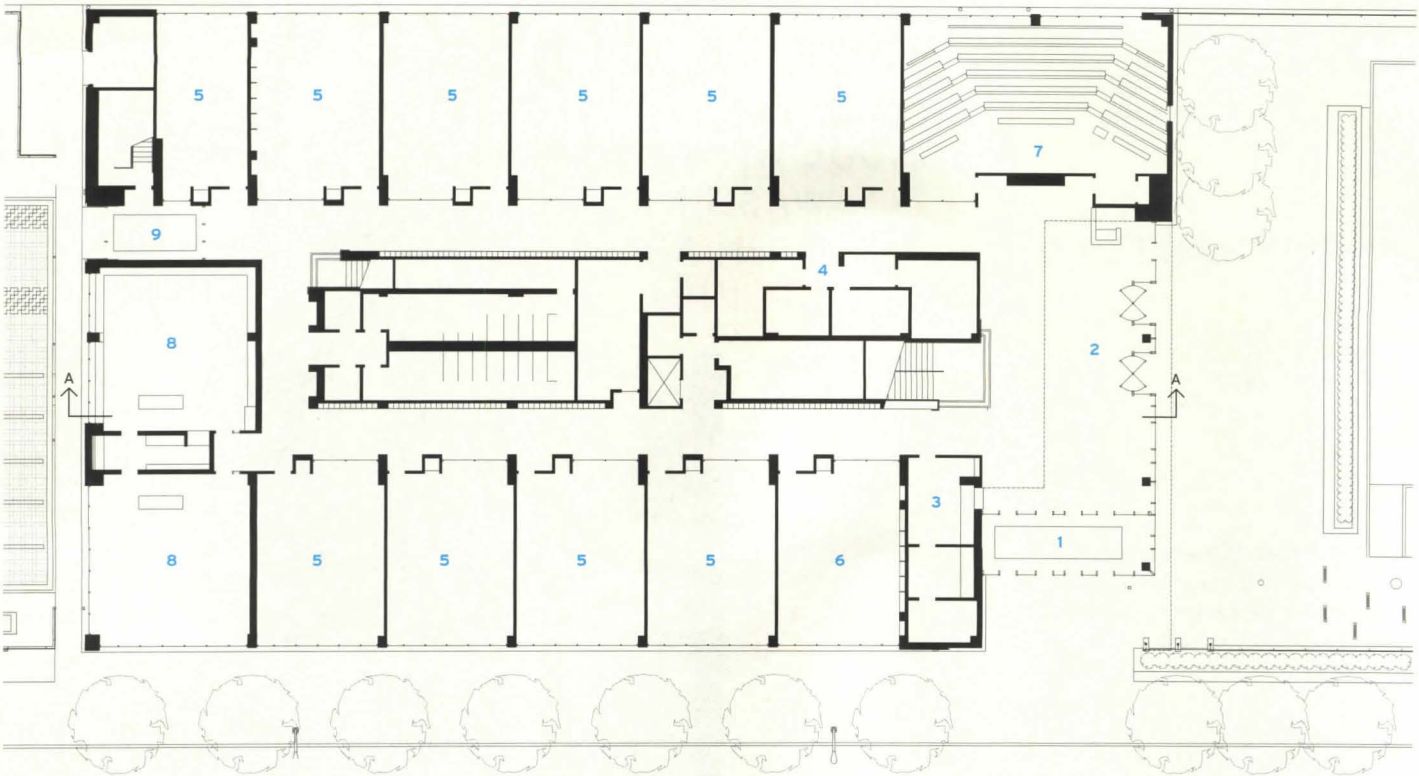
BELOW: A skylight above the top-floor corridor and a narrow, two-story void allow daylight to reach the first floor circulation space.

a core with bathrooms and offices. A skylight above the intervening corridor and a slim, two-story void allow daylight to reach the lower level's circulation space.

The biggest contributor to the feeling of spaciousness is the configuration of the classrooms. Each has two glazed walls – an interior one facing the corridor and another looking out onto the street, but veiled on the exterior by a corrugated and perforated stainless scrim. The scrim performs multiple functions. It continues a fence, made of the same material that runs in front of the parking lot between the school and youth center, tying the buildings together visually and physically. It also serves as a shading device, helping to mitigate heat gain while providing students with almost unobstructed views of the outside and allowing a diffuse daylight into the rooms. Finally, in a sobering reminder of the neighborhood's tough realities, it camouflages the windows, preventing students from becoming targets of drive-by shootings.

The youth center gallery – a long room enclosed on two sides by glass – provided the inspiration for this layout. The space was a favorite with faculty and pupils, and not because of an aesthetic preference for transparency: The interior glass walls "give any passerby a look at the performance of the teacher and the engagement of the students," explains James Troupis, school principal.

Just a few months into Comer Prep's first school year in its new home, it is too soon to know the effect of the building on academic performance. But Troupis's statement indicates how thoroughly the architecture has become part of the school's character, not only reflecting, but also shaping, its culture. ■



FIRST FLOOR

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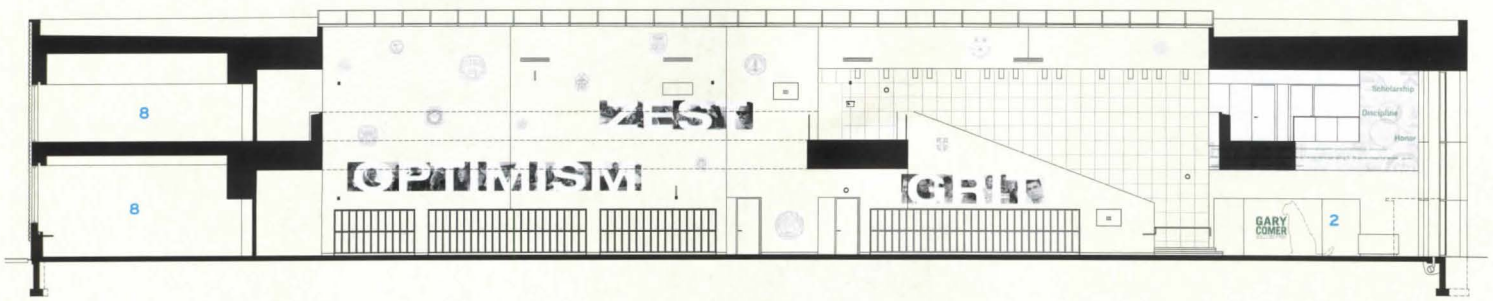


SECTION A-A

0 10 FT.
3 M.

CREDITS

ARCHITECT: John Ronan Architects – John Ronan, AIA, principal in charge; Josh Bergman, project architect; Evan Menk, senior technical coordinator; Anna Ninoyu, Marcin Szef, Lane Van Buren, Sam Zeller, design team
ENGINEERS: TERRA Engineering (civil); Goodfriend Magruder (structural); WMA Consulting Engineers (m/e/p)
CONSULTANTS: Hoerr Schaudt (landscape); Kirkegaard Associates (acoustical); Schirmer Engineering (security)
GENERAL CONTRACTOR: Norcon
CLIENT: Comer Science & Education Foundation
SIZE: 45,000 square feet
COST: Not available

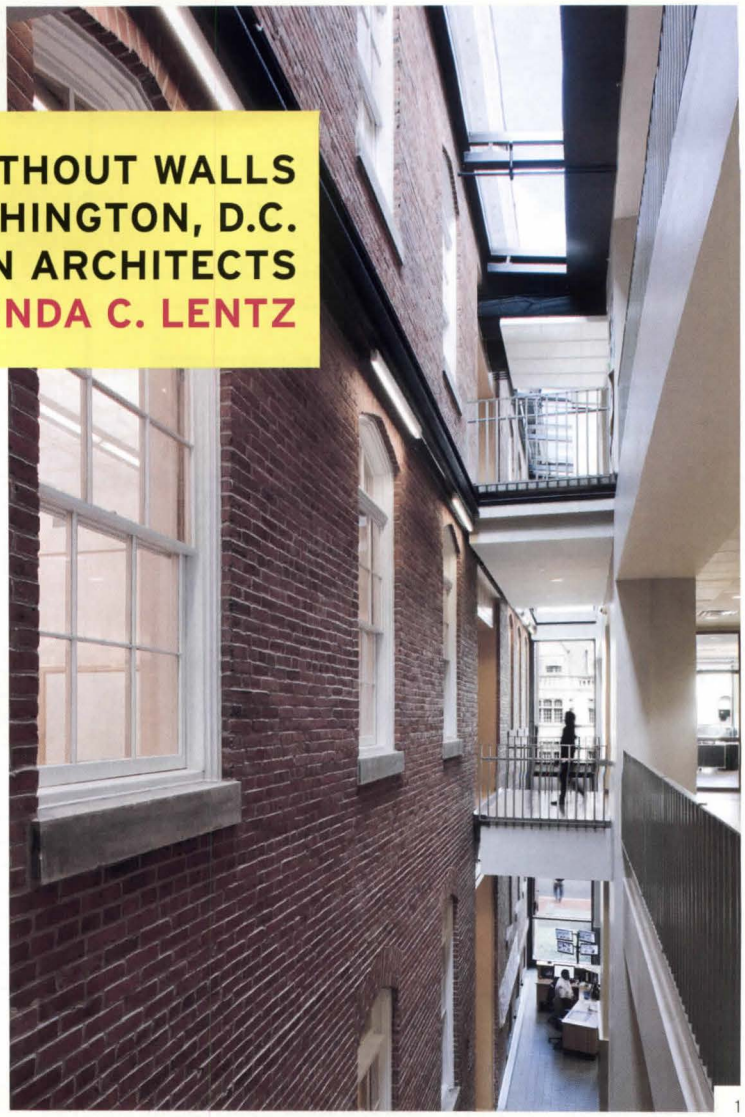
SOURCES

EXTERIOR CLADDING: Apolic (composite panels); Centria (corrugated stainless steel)
GLAZING: Oldcastle BuildingEnvelope; Viracon; Arch Aluminum & Glass
SKYLIGHTS: Super Sky
DOORS AND ENTRANCES: Oldcastle BuildingEnvelope; Steelcraft; VT Industries; Hafele
ACOUSTICAL CEILINGS: Tectum; Armstrong
DRY-ERASE WALLCOVERINGS: Walltalkers
EPOXY FLOORS: General Polymers
CARPET: Interface; Bentley Prince Street
CLASSROOM FURNITURE: KI
INTERIOR AMBIENT LIGHTING: Axis; Lightolier
LIGHTING CONTROLS: Lutron
BUILDING AUTOMATION: Johnson Controls

1 MAIN ENTRY
2 LOBBY
3 RECEPTION
4 ADMINISTRATION
5 GENERAL CLASSROOM
6 LITERATURE CLASSROOM
7 LECTURE HALL
8 SCIENCE CLASSROOM
9 FACULTY/STAFF ENTRY

3

SCHOOL WITHOUT WALLS
WASHINGTON, D.C.
EHRENKRANTZ ECKSTUT & KUHN ARCHITECTS
BY LINDA C. LENTZ



1. Bridges span an atrium that connects old to new. This allows daylight into the old building's windows and balconies.
2. The school's media center occupies the building's penthouse, giving it wonderful views. Because students have access to George Washington University's libraries, space devoted to books is minimal.
3. The elevation of the new addition reads as a separate building as opposed to an add-on. At the same time, it respects the massing, cornice lines, materiality, and proportions of the adjacent townhouses.

FOR SOME, THE NAME "School Without Walls" will conjure memories of the experimental, open-plan schools of the 1960s, some of which were ill-fated. The Washington, D.C., School Without Walls (Walls), however, is a successful 40-year-old public high school on the grounds of George Washington University (GWU), a location that brings with it more than a prestigious campus address. The two institutions also share facilities. So, in addition to the city's resources, Walls's 460 students use GWU's libraries, gyms, auditoriums, and food services as part of an innovative expanded classroom program. If they qualify, they can even graduate with a GWU associate of arts degree along with a high school diploma. The university, meanwhile, takes advantage of the high school to supplement its overcrowded halls during peak hours and to provide a place for graduate students to hone their teaching skills.

When it was established in 1971, Walls assumed the premises of the historic Grant School, a former model elementary school, built in 1882, so past its prime that in 1942 Eleanor Roosevelt criticized its poor condition. Over the years, piecemeal retrofits improved the functionality of the existing masonry building's classic foursquare plan – a classroom in each corner grouped around a central hall. But the structure, blighted by water damage and crumbling plaster, suffered from lack of maintenance, space, and the technological upgrades necessary to catapult the pioneering school into the 21st century.

Salvation came in the mid-2000s, when the city's Office of Public Education Facilities Modernization (OPEFM) accrued funds to implement a renovation and expansion of the building through the $13 million sale of a section of the school's parking lot and excess air rights to GWU for the construction of a residence hall. The resulting $30 million, 51,846-square-foot LEED for Schools Gold hybrid facility sits on a half-acre adjacent to the new dorm and fills the remainder of the parking lot with an L-shaped addition. "The modernization of the [existing] building was very extensive," says

3

Sean O'Donnell, principal in charge at Ehrenkrantz Eckstut & Kuhn (EE&K). "It was falling apart."

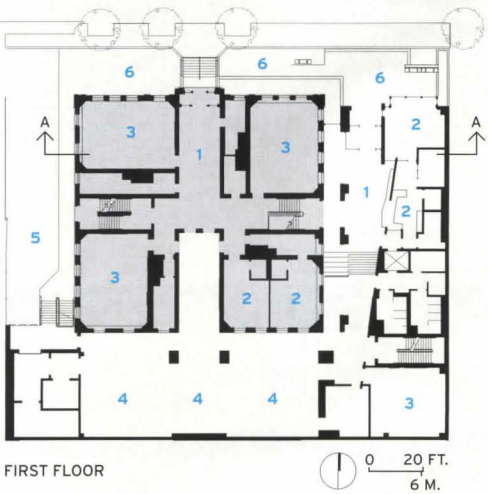
So O'Donnell and his team returned the landmarked structure, listed on the National Register of Historic Places, close to its original 19th-century design. To do this, D.C.-based EE&K removed ad-hoc, 20th-century partitions, replaced the slate roof, and restored the facade – along with more than 95 percent of the windows, floors, and walls. At the same time, the architects integrated essential modern infrastructure in terms of mechanical systems, insulation, educational technology, lighting, and acoustics.

Set back several feet to create a public entry plaza, "the new building touches the old one very lightly," says O'Donnell. Leaving the historic facade intact, the architects inserted a glazed three-story atrium and connected the floors with slender bridges between the two buildings. This scheme not only retains the Grant School's architectural integrity; it infuses daylight throughout both the old and new structures. Crowned by a state-of-the-art media center, the steel-framed masonry addition provides everything the older building lacks: ample bathrooms, elevators, science labs, a roomy outdoor roof terrace, and a large indoor "commons" that accommodates gatherings and events.

"School Without Walls is about education," says O'Donnell. "It has nothing to do with architecture." But by respecting the old building, the architects revived its relevance for future generations, as well as for a vibrant academic community that continues to blur the boundaries between high school and higher education, the city and beyond. ■

G STREET NW

ROOF



FIRST FLOOR

0 20 FT.
6 M.

SECTION A-A (LOOKING NORTH)

1 ENTRY
2 OFFICE
3 CLASSROOM
4 COMMONS
5 SERVICE DRIVE
6 TERRACE
7 ATRIUM
8 SKYLIGHT
9 CENTER HALL
10 MEDIA CENTER

CREDITS

ARCHITECT: Ehrenkrantz Eckstut & Kuhn – Sean O'Donnell, AIA, principal in charge; Matt Bell, AIA, design principal; Stephen Penhoet, project manager; William Griffin, senior project architect

ENGINEERS: ReStl Designers (structural); C.C. Johnson & Malhotra (civil); Limback Facility Services (m/p); M.C. Dean (electrical)

CONSULTANTS: Michael Vergason (landscape); Alliance Lighting (lighting); Shen Milsom Wilke (acoustical)

CONTRACTOR: Turner Construction

CLIENT: Office of Public Education Facilities Modernization

SIZE: 51,846 square feet (gross)

COST: $30 million

SOURCES

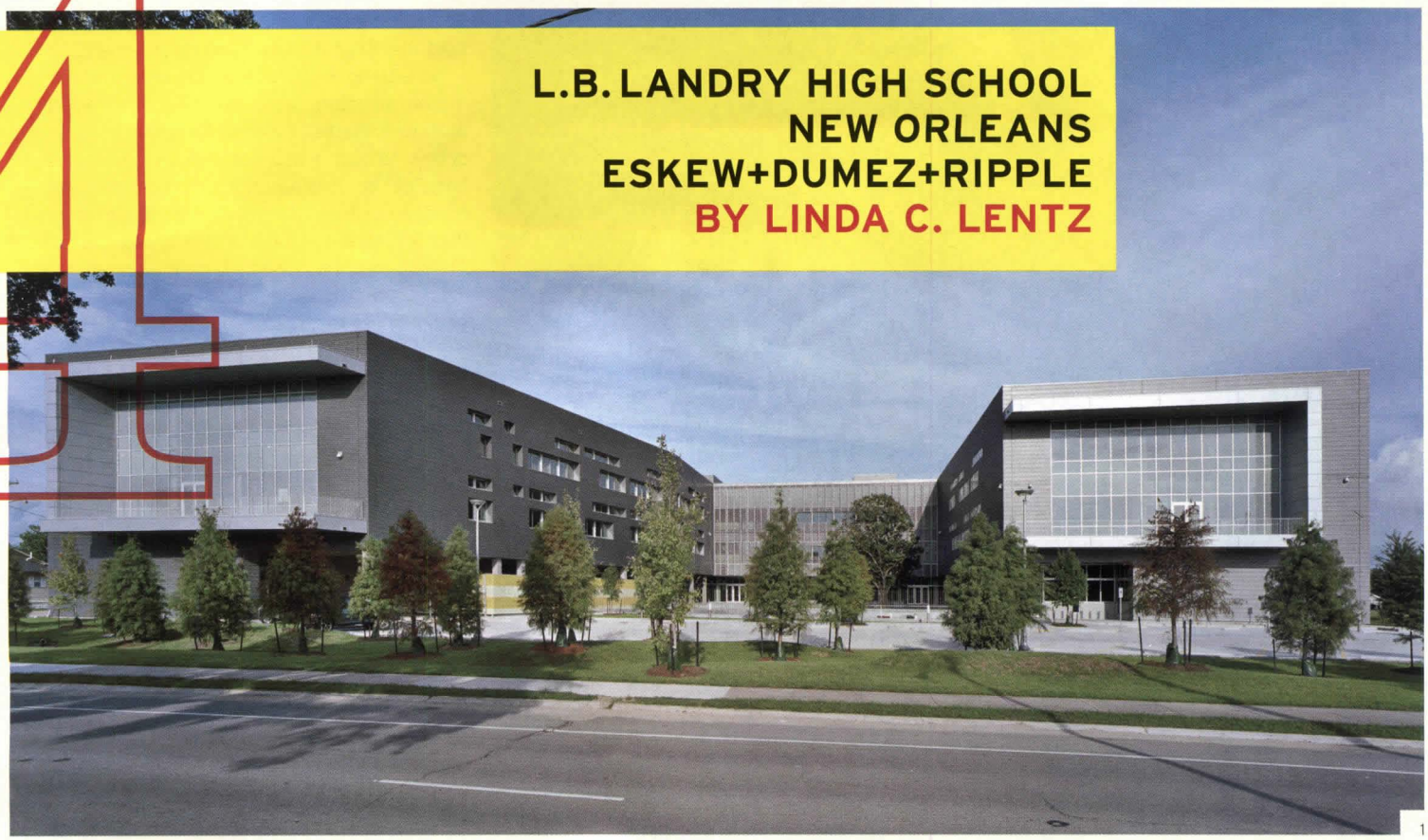
CLADDING: Interstate Brick, Betco, Hohmann and Barnard (masonry); Northern Virginia Cast Stone (precast concrete); Kawneer (curtain wall)

ROOFING: Firestone (elastomeric); Pac-Clad (metal); North Country Slate (slate)

GLAZING: PPG; Supersky (skylights)

L.B. LANDRY HIGH SCHOOL
NEW ORLEANS
ESKEW+DUMEZ+RIPPLE

BY LINDA C. LENTZ



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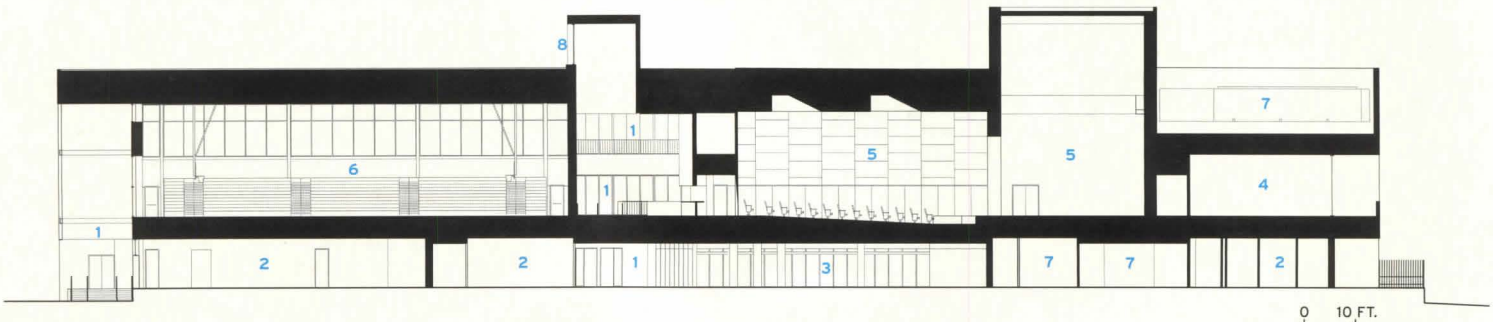


SECTION A-A

1 CIRCULATION
2 SPECIALIZED ACADEMIC CLASSROOM
3 CAFETERIA/FLEX SPACE
4 ART
5 PERFORMING ARTS
6 GYM
7 BUILDING SUPPORT
8 MONITOR

WHEN HURRICANE KATRINA swept through New Orleans in 2005, it impacted more than 120 schools in the Orleans Parish School District (OPSD). Already suffering from the abuse of time and neglect, L.B. Landry High School (Landry) was shuttered after the storm because of extensive rain and wind damage. Few expected it to reopen. But Landry has deep roots in Algiers, a residential neighborhood rich in local architecture across the Mississippi from the central business district. More than 70 years old, Landry was the first high school in the area to admit African-American students. So a dedicated cadre of alumni, community leaders, and newly energized city and state officials rallied to save it from the wrecker's ball.

Their opportunity came through a joint effort of the OPSD and the Recovery School District (RSD), a special district established in 2003 by the Louisiana Department of Education to oversee substandard schools and, now, postrecovery initiatives. The two agencies were soliciting proposals for Quick Start schools, one in each of the city's five Council Districts, to be realized while they devised a long-term $1.8 billion master plan (largely funded by FEMA) to transform the city's devastated education system with state-of-the-art programs and facilities. To qualify, local committees had to demonstrate an immediate need, as well as the viability and potential for such a project. Landry's support group

2

1. Built around an existing magnolia tree, L.B. Landry High School reaches out to its Algiers neighborhood with a community library/media center and health clinic fronting the street at the base of each of its academic wings.

2. In addition to having vistas that provide a visible link to the city, the school building and grounds illustrate the value of sustainability through deep-set south-facing windows; light monitors on a solar-ready, reflective white roof; and a landscaped stormwater management system in the courtyard.

3. A vibrant metal scrim wall along the entrance to the clinic and offices and retractable gates across the courtyard allow for flexible security.

not only confirmed its commitment; it substantiated the school's historic significance and potential as a community resource and catalyst for the future redevelopment of Algiers.

The existing facility, a city block of one- and two-story buildings arranged around a courtyard, was slated for demolition and replacement. The New Orleans–based Eskew+Dumez+Ripple (EDR) was selected to design a new 200,000-square-foot, $55 million building for the site. "We were given five months to go from delivery of program to completion of bid documents," says architect Steve Dumez, the EDR principal in charge. Working with education architects SHW, Dumez and his team created a scheme that retains the old school's basic layout, with one notable exception. Instead of enclosing a central quadrangle, they removed one wing to provide visual access into the heart of the school, as well as back out to downtown New Orleans.

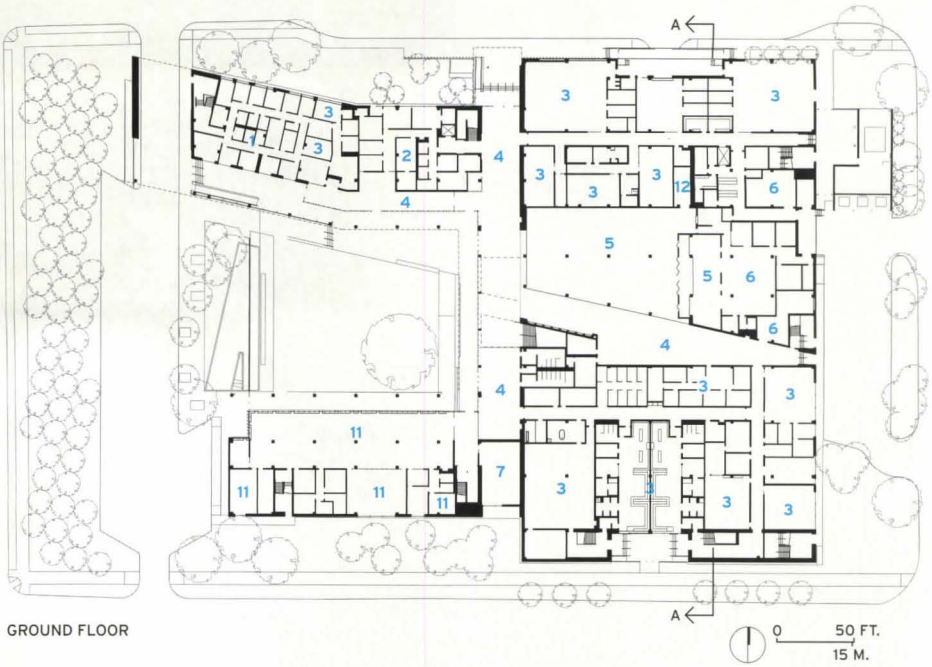
The brief stipulated a building for 1,000 students that meets stringent hurricane-resistance standards, earns LEED for Schools Silver certification, and allocates areas for community services. The architects developed a U-shaped concrete-and-steel-framed structure covered in cast-stone and insulated-metal panels. They raised the foundation three feet higher than the adjacent street to avert flooding. Echoing the original school's plan, they created two longitudinal academic wings extending from a rear hub, stacking classroom floors above a community clinic on

3

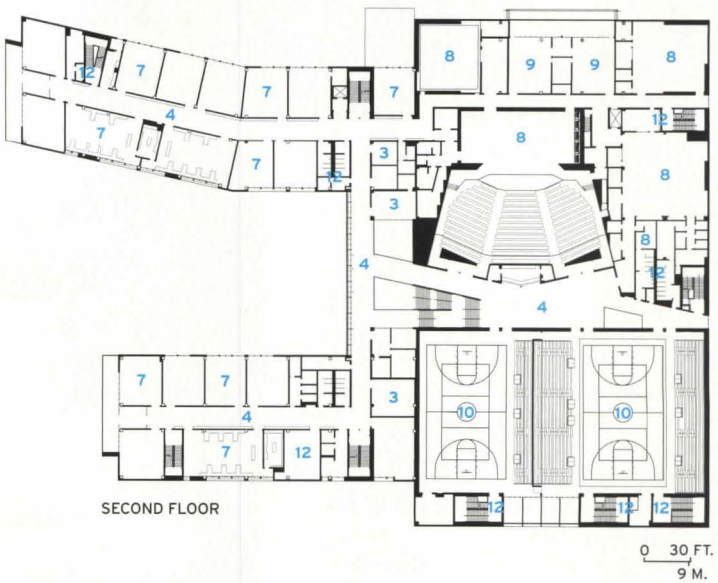
one side and a dual-use student/public media center on the other. Fully glazed on the courtyard side, these public areas can be separated from the school by rolling gates and accessed from the street. EDR continued the glazing on the building's three-story west facade, adding a brise-soleil to control solar gain. Inside, they inserted a corridor, dubbed Main Street, that directs traffic to an open cafeteria, a vocational/technology center, and a courtyard on the ground floor, or up a grand stair to a double-height lobby and fully outfitted arts and sports complexes.

On track for LEED Silver (at publication), Landry has sustainable features designed to be didactic, says Tracy Lea, EDR project director. In particular, he notes that daylight filters through roof monitors, diffused by perforated metal ceilings; illuminates the school's two gyms with rows of skylights; and penetrates classrooms via clerestory windows. Meanwhile, Lea adds, a water runoff feature in the courtyard (funded by Global Green) manages excess rainwater from the roof, and shedlike sections on the low-albedo white roof are ready to receive photovoltaic panels when funds become available.

Open since August 2010, L.B. Landry High School points to a bright future for the youth of Algiers. With its direct line of sight toward the skyline of New Orleans – a city striving to rebuild and learn from the past – the new building offers them a sense of place and vision of tomorrow. ■



GROUND FLOOR



SECOND FLOOR

1 CLINIC
2 ADMINISTRATION
3 SPECIALIZED ACADEMIC CLASSROOM
4 CIRCULATION
5 CAFETERIA/FLEX SPACE
6 FOOD SERVICE
7 CORE ACADEMIC CLASSROOM
8 PERFORMING ARTS
9 ART
10 GYM
11 MEDIA CENTER
12 BUILDING SUPPORT

CREDITS

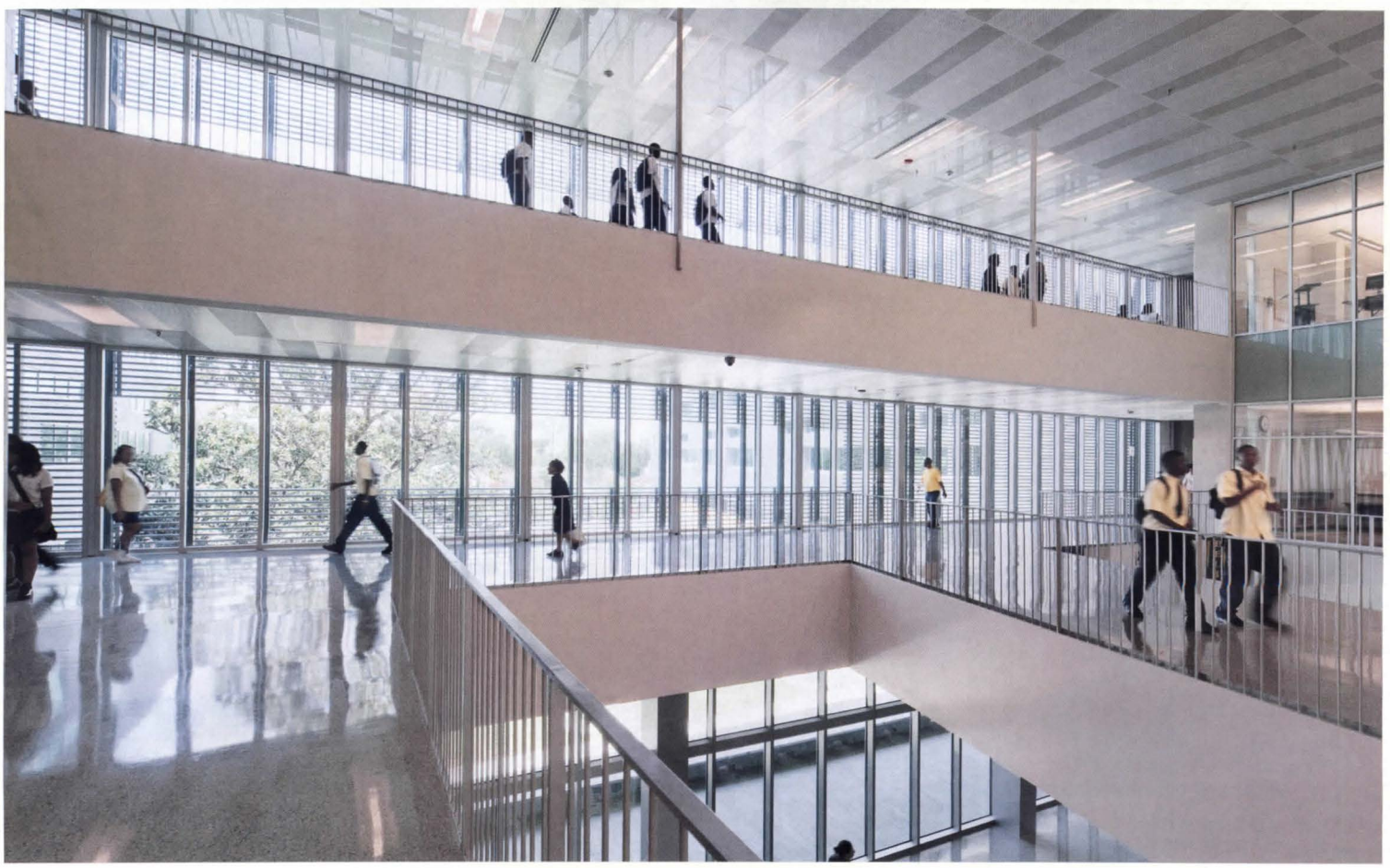
ARCHITECT: Eskew+Dumez+Ripple – Steve Dumez, FAIA, design director; Tracy Lea, AIA, project director; Randy Hutchison, senior designer/contract administrator; Cynthia Dubberley, AIA, project architect; Jennifer Pele, AIA, Amanda Rivera, AIA, Robert Kleinpeter, Jason Richards, AIA, Dru Lamb, David Demsey, Thadeus Zarse, Cecile Richards, Wendy Kerrigan, design team
ASSOCIATE ARCHITECT: SHW Group – Mark Lam, AIA, principal; Bill Wadley, AIA, Dan Whalen, AIA, designers; Mary Alack, education programmer
ENGINEERS: Moses Engineers (m/e/p/fp); Schrenk & Peterson (structural/civil)
CONSULTANTS: Daly Sublette (landscape); Gracenote (acoustical/audio-visual); Futch Design Associates (food facilities designer)
CONTRACTOR: Satterfield and Pontikes Construction
CLIENT: State of Louisiana; Department of Education, Recovery School District
SIZE: 236,000 square feet (gross)
COST: $55 million

SOURCES

EXTERIOR CLADDING: Prairie Stone (masonry); Centria (metal panels); Neogard (moisture barrier)
CURTAIN WALL: Kawneer (metal); Viracon (glass)
ROOFING: Johns Manville (built-up); Berridge (metal)
SKYLIGHTS: Solutube
CEILING: Hunter Douglas Contract; USG
LIGHTING: WattStopper (controls); Corelite, Guth, Winona, Cooper, Forms+Surfaces (fixtures)

LEFT: The ground floor cafeteria spills onto the school's "Main Street," where a central stair leads to the second floor Commons. Here, daylight from a large roof monitor filters through a metal scrim ceiling, illuminating bold graphic quotations that line the outer walls of the theater and gym complex.

BELOW: Upper-floor lateral connections to the academic wings were shifted slightly outboard above the main concourse so students and teachers could observe activities at grade and vice versa. They also offer ideal views of the courtyard and downtown New Orleans through strategic breaks in the glazing's brise-soleil.



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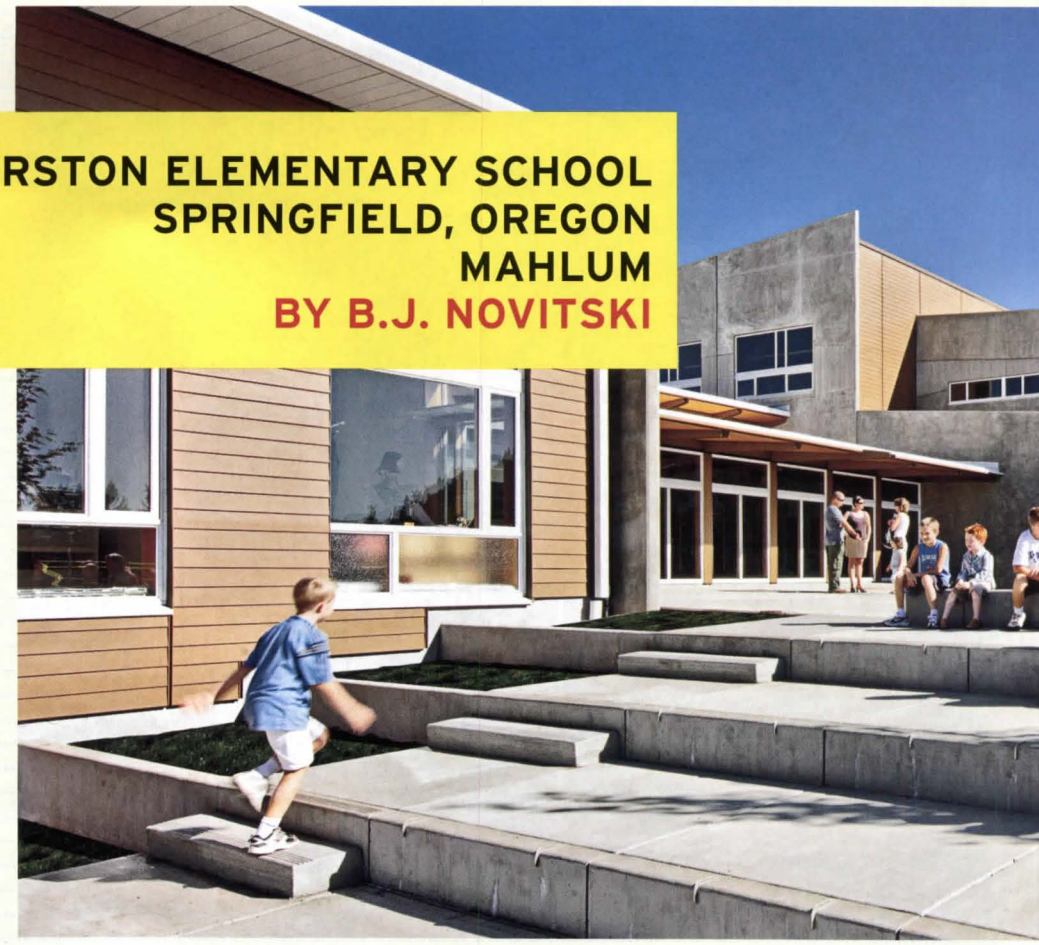
THURSTON ELEMENTARY SCHOOL
SPRINGFIELD, OREGON
MAHLUM
BY B.J. NOVITSKI



LOCATED NEAR A fragment of the Oregon Trail, a new school reflects the pioneering traditions of the historic area and a local sense of economy and practicality. The K-5 Thurston Elementary School, in Springfield, Oregon, replaces a 55-year-old building that was "falling around our ears," says principal Shari Furtwangler. She and her staff are delighted with the 18-month-old facility, and they have a lot to be proud of.

Explicit goals for the project included creating a safe and welcoming environment for learning; integrating sustainability features that could double as learning tools; and providing a venue for community events. The Portland, Oregon, office of Mahlum, in association with Eugene-based Robertson Sherwood Architects, developed the 500-pupil facility as a prototype for the school district.

The organizational plan supports a collaborative teaching philosophy. Three wings extend from an administrative/public realm spine, each with its own "neighborhood": four classrooms per floor clustered around a shared breakout space for small group instruction. To emphasize a community feeling, the design team inserted interior windows between classrooms and breakout spaces in these sections. Expansive exterior windows give students vistas to fields and hills. The gentle slopes of the building's massing both reflect this landscape and make graceful transitions between high-ceilinged public spaces and kid-scale environments.

Mahlum partner in charge Diane Shiner says her team was able to keep construction costs under control through judicious use of materials and methods. For structure and shell, they relied on steel and insulated tilt-up concrete construction, a system used primarily for local industrial buildings. To relieve the coarseness of the concrete, the architects designed a pattern of curves and vertical striations on the exterior to mimic the surrounding hills and trees; they "embossed" one panel at the entrance with a mural depicting nearby historic

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buildings; and they trimmed many of the interior spaces with wood. The concrete, mostly left exposed, eliminates the expense of interior and exterior siding. Likewise, the team sized spans for the poplar library ceiling in consultation with local mills to minimize waste. Although wood is a much-loved material for its warmth and ties to the region's timber economy, they detailed it strategically to maximize the effect while minimizing the cost.

Another striking material choice enlivens hand-washing stations cleverly inset in the corridors near – not inside – the restrooms. Here, the students actually painted wall tiles, depicting their teachers and one another, before the tiles were fired.

Thurston Elementary offers bonuses for adults, too. The teachers rave about the lighting quality and the ample storage space. A white wall makes the gym suitable for public presentations and opens it up onto a commons room, turning a small stage with a drop-down curtain into a theatrical venue. A nearby pantry is available for community use.

Shiner explains the school district chose to avoid the expense of LEED certification, but she believes the school is LEED Silver equivalent. Sustainable features include daylighting with lightshelves, reflective ceilings, and occupancy sensors; high-efficiency HVAC; and white reflective roofs. Additionally, roof rainwater is channeled from downspouts into concrete runnels that flow openly though the courtyards between classroom wings. The water then flows into bioswales, so the ebb and flow becomes a seasonal lesson on the environment. At the front entrance, the water pours down into a plaza fountain.

This small gem of an elementary school has found fans at every level, from the students who maintain a 95 percent attendance level, to the teachers who brag about their "awesome views," to the neighbors who share the facilities and playing fields. In a time when all school districts are feeling pinched budgets, it's heartwarming that the architects have found small touches that add up to big differences. ■

B.J. Novitski is a contributing editor for RECORD.

3

4

1. Fiber cement lap siding provides a welcome residential element at the entrance of the building, where parents and students congregate.

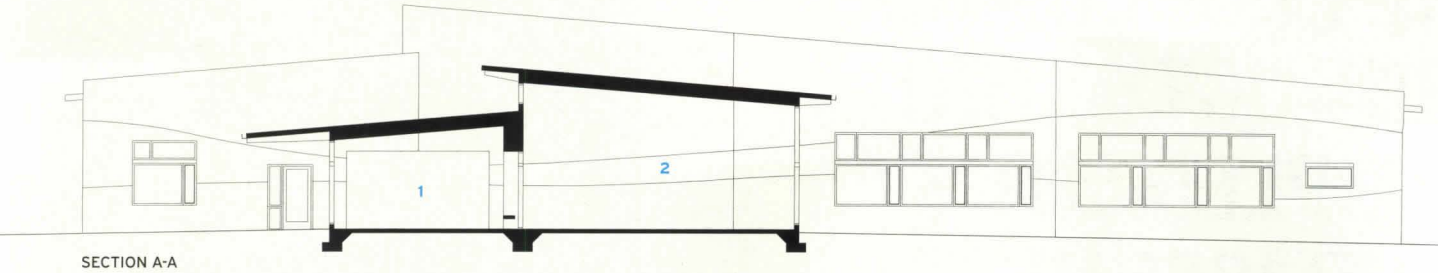
2. Two-story classroom wings are infused with daylight from clerestory windows and double-height window walls. Colorful red steel framing complements the wood finishes and playful resilient flooring.

3. The decorative tiles lining the walls of the public hand-washing stations were painted by the students under the guidance of a local artist.

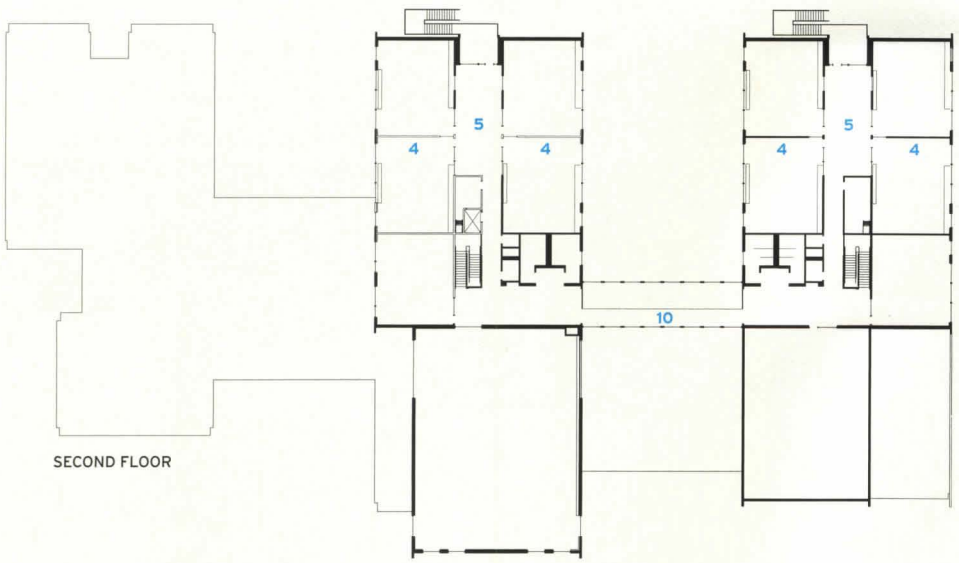
4. The massing and the low, sloped profile of the rugged exposed tilt-up concrete structure subtly mimic the textures, form, and scale of the surrounding tree-lined hills and landscape.

ABOVE: Classroom wings are linked by one-story public zones, where an infusion of wood surfaces and details creates a warm learning environment and reflects the importance of the local timber industry.

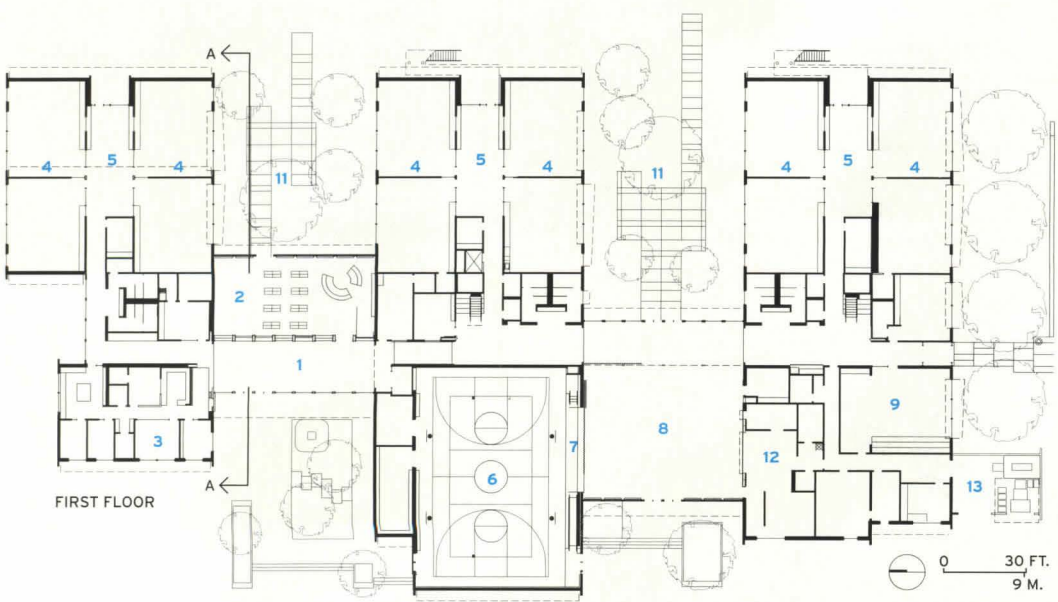
LEFT: The school is divided into small learning environments comprising four classrooms grouped around one breakout space with direct access to the outdoors. Interior glazing fosters a friendly, community spirit.



SECTION A-A



SECOND FLOOR



FIRST FLOOR

1 ENTRY
2 LIBRARY
3 ADMINISTRATION
4 CLASSROOM
5 BREAKOUT SPACE
6 GYM/PERFORMANCE
7 STAGE
8 COMMONS
9 MUSIC
10 SKYBRIDGE
11 BIOSWALE, OUTDOOR CLASSROOM, AND LEARNING GARDEN
12 KITCHEN
13 SERVICE YARD

CREDITS

ARCHITECT: Mahlum – Diane Shiner, AIA, partner in charge; Rene Berndt, AIA, project designer; Amy Noe, IIDA, interior designer

ASSOCIATE ARCHITECT: Robertson Sherwood Architects – Dave Guadagni, AIA

ENGINEERS: KPFF (civil/structural); Interface Engineering (m/e)

CONSULTANTS: Walker Macy (landscape); Interface Engineering (lighting); Altermatt Associates (acoustical); Halliday Associates (food service)

CONTRACTOR: Hyland Construction

CLIENT: Springfield Public Schools

SIZE: 58,770 square feet (gross)

COST: $12.9 million

SOURCES

SIDING: James Hardie (fiber cement)

WINDOWS: Pella Commercial; PPG

CEILING: Armstrong; Rulon (wood)

TILE: Daltile

FLOORING: Mannington (resilient); Interface (carpet)

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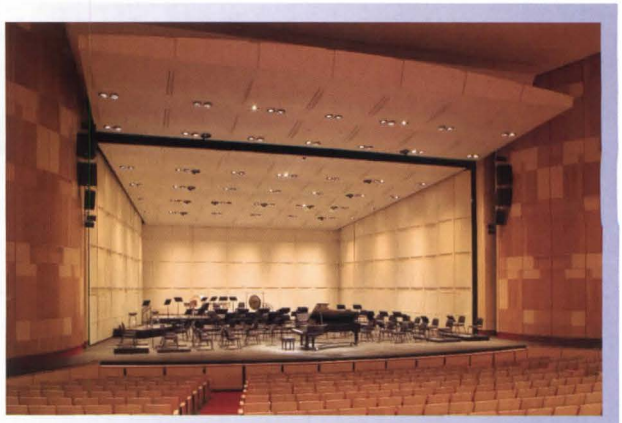

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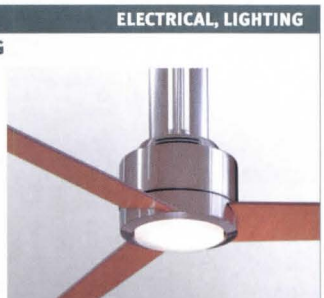

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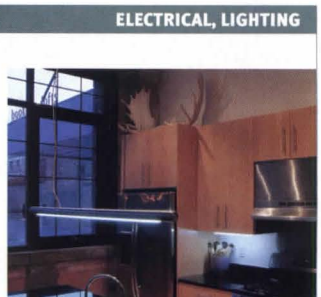

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POSITION START DATE: JUNE 1, 2011

Please send curriculum vitae and letter of interest to:
Attn: Molly Peckham or Stacy Munroe, Human Resources
Boston Architectural College
320 Newbury Street Boston, MA 02115

Screening will begin immediately and will continue until the position is filled. Each program head will report to the Provost.

The BAC is committed to providing our learning community with faculty and staff who reflect the values and concerns of the students we serve. Diverse applicants are strongly encouraged to apply.

For more information, please visit us online at
the-bac.edu/x432.xml

THE BOSTON ARCHITECTURAL COLLEGE, founded in 1889, is the largest independent, accredited, spatial design college in the United States. Our degree programs in Architecture, Interior Design, Landscape Architecture, and Design Studies are collaborative, innovative, practice-based and socially conscious. Our Continuing Education programs, lectures, exhibitions, and symposia offer a wide range of programs to the general public. 84% of our May 2010 graduates were immediately employed within the design professions. The BAC is a diverse, fast-paced, community focused environment that encourages creative thinking and promotes new ideas.

CIRCLE 17

POSITIONS VACANT

SENIOR FACULTY CHAIR IN ENERGY FOR THE BUILT ENVIRONMENT

The **MIT Energy Initiative (MITEI)**, started in 2006, is an Institute-wide initiative designed to help transform the global energy system to meet the needs of the future and to help improve today's energy systems. The **MIT Energy Initiative** is undertaking a search for a senior faculty member in the field of energy for the built environment. The faculty member will have the opportunity to work with the expanding **MIT** energy research and educational programs in architecture, building technology, urban studies, and engineering applied to the built environment. Programs range from those focused on large urban areas, through community level, individual buildings to building components.

The emphasis of the search is on candidates who will provide leadership for new initiatives in energy that will integrate and build on existing programs at **MIT** and initiate new research directions. The successful candidate could be appointed in the School of Architecture and Planning or in the School of Engineering, or could have a joint appointment in more than one department. The candidate should have an outstanding record of research and teaching and should thrive in a multidisciplinary environment. Research could address a number of areas related to the built environment such as policy, economics, and system planning and implementation to achieve major energy objectives, as well as research creating passive and active designs of energy efficient buildings urban environments, and advanced technologies.

Interested candidates should send applications or inquires to **Professor Leon Glicksman, Chair, Search Committee, Room 5-418, MIT, 77 Massachusetts Ave., Cambridge, MA, 02139 or kross@mit.edu.** Complete applications should include curriculum vitae, a three to five page statement outlining energy related scholarship, research, teaching, professional and institutional service, three to five sample publications, along with the names of five or more references. Other media can be submitted where appropriate. It is anticipated that candidate interviews will take place in early spring 2011 with the successful candidate appointed and in place as early as fall 2011.

MIT is a culturally diverse faculty and strongly encourages applications from women and minority candidates.

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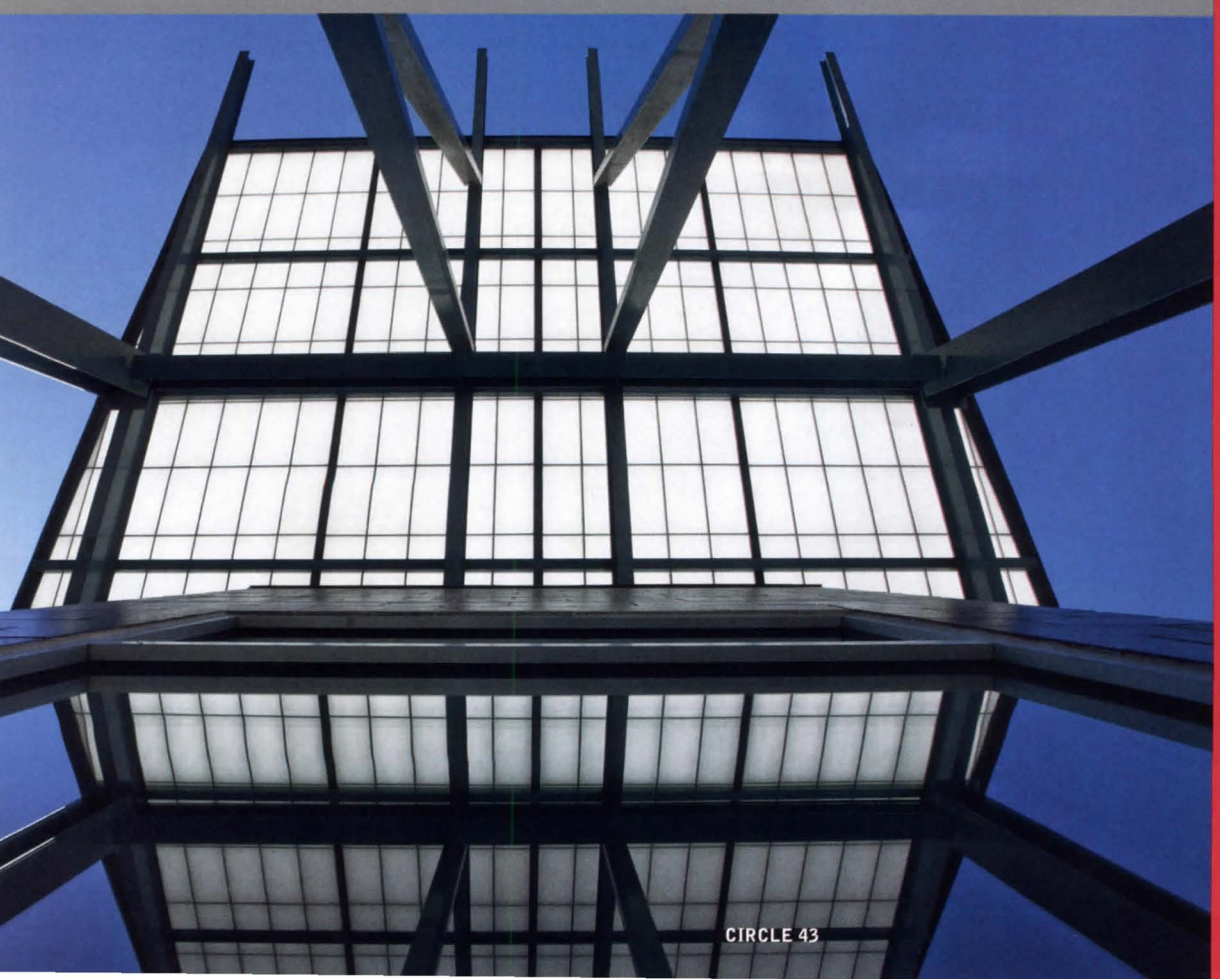

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CIRCLE 27

DATES & EVENTS

New and Upcoming Exhibitions

Ezra Stoller
New York City
January 6–February 12, 2011
A pioneer in the field of architectural photography, Ezra Stoller was commissioned by architects such as Frank Lloyd Wright, Paul Rudolph, Eero Saarinen, I.M. Pei, Marcel Breuer, and Richard Meier because of his unique ability to capture a building according to the architect's vision and to lock it into the architectural canon. His photographs will be on display at the Yossi Milo Gallery. For more information, visit www.yossimilo.com.

Ozark Modern
Fayetteville, Arkansas
January 10–February 16, 2011
This exhibition features midcentury Modern furniture designed by Edward Durrell Stone in the Fine Arts Center Gallery at the University of Arkansas. It will underscore the distinctive characteristics of the furniture and illuminate the particular circumstances of its development. For more information, visit www.uark.edu.

Ongoing Exhibitions

David Chipperfield Architects – Form Matters – Questioni di forma
Pisa, Italy
Through January 16, 2011
Presented at the Arsenali Medicei, this exhibition of David Chipperfield Architects' work features a large amount of primary material. It includes the new projects Masterplan for the City (PIUSS) and the Regeneration of the Santa Chiara Area for the City of Pisa. Visit www.davidchipperfield.co.uk.

Nordic Models + Common Ground: Art and Design Unfolded
New York City
Through March 9, 2011
"Nordic Models" examines a diverse selection of works – including architecture, product design, fine art, graphic design, fashion, and photography – by 35 emerging and established artists and designers. It offers a compelling look at contemporary Nordic art and design, highlighting shared practices and ideas and their global impact. All of the Nordic countries – Denmark, Finland, Iceland, Norway, and Sweden – are represented. For more information, visit www.scandinaviahouse.org.

Light Frames
Los Angeles
Through March 13, 2011
"Light Frames," an installation by Los Angeles architect Gail Peter Borden, will transform the exhibition space with two complementary towering structures. The exhibition was created using component-based structural frames that combine to create complex geometric forms. Borden makes a conscientious effort to emphasize the method of fabrication by truthfully exposing joints and materials. For more information, visit www.emanate.org.

On Becoming an Artist: Isamu Noguchi and His Contemporaries
Long Island City, New York
Through April 24, 2011
This exhibition explores the relationship between Isamu Noguchi and 40 figures from the worlds of art, architecture, design, and theater. It integrates artworks and documentary materials to examine Noguchi's relationships with figures such as Constantin Brancusi, Frida Kahlo, R. Buckminster Fuller, Gordon Bunshaft, and Louis Kahn. For more information, visit www.noguchi.org.

Lectures, Conferences, and Symposia

Makeshift Metropolis: Ideas about Cities
Washington, D.C.
January 10, 2011
Prize-winning author, professor, and architecture critic Witold Rybczynski discusses his latest book, *Makeshift Metropolis*, which explores the history of city planning, the kind of cities we want, and the kind of cities we need. This program continues the National Building Museum's Intelligent Cities Initiative, a multiyear effort to improve the way our cities look, feel, and function. For more

information, visit www.nbm.org.

Middle Ground/Middle East: Religious Sites in Urban Contexts
New Haven, Connecticut
January 21–22, 2011
This symposium will focus on the role of religious sites in shaping the urban environments in the Middle East. Recognizing that sacred building has often been regarded as representative of patterns of social and cultural division, the symposium seeks to address the centrality of religious traditions, inter-faith relationships, and long practices of learning and tolerance. Leading architects and scholars from a variety of fields and religious backgrounds will examine the recent paradigm shifts in the relationship between architecture and religion. Visit www.architecture.yale.edu.

For the Greener Good: Inspired by Nature
Washington, D.C.
January 26, 2011
In its seventh season, one of the National Building Museum's most popular public education forums culminates with four timely discussions about the state of sustainability in our nation. In the first, Chris Garvin, Veit Kugel, Taryn Mead, and Susan Szenasy discuss how architects, builders, and engineers can create a greener, stronger, and more sustainable built environment. The museum will be tweeting live from the events and taking questions submitted via Facebook and Twitter. Visit www.nbm.org.

Subtropical Cities 2011 Conference – Subtropical Urbanism: Beyond Climate Change
Fort Lauderdale, Florida
March 8–11, 2011
The international collaborative conference will discuss the future of development in subtropical cities around the world. Key themes include: subtropical cities in the urban age, sustainable practices and decision making for resilient cities, and adaptation to climate change. At Florida Atlantic University. Visit www.subtropicalcities2011.com.

Permanent Change: Plastics in Architecture and Engineering
New York City
March 30–April 1, 2011
"Permanent Change" sheds new light on plastics and their implications for the fields of architecture and engineering. Materials that forecast easily molded, reformed shapes have become a permanent measure and control point in design. This conference explores the boundaries between architecture, engineering, and materials science by mobilizing symposia, studios, exhibitions, books, and films in an intensely focused investigation. Architect Greg Lynn is the keynote speaker. Visit www.arch.columbia.edu/permanentchange.

Competitions

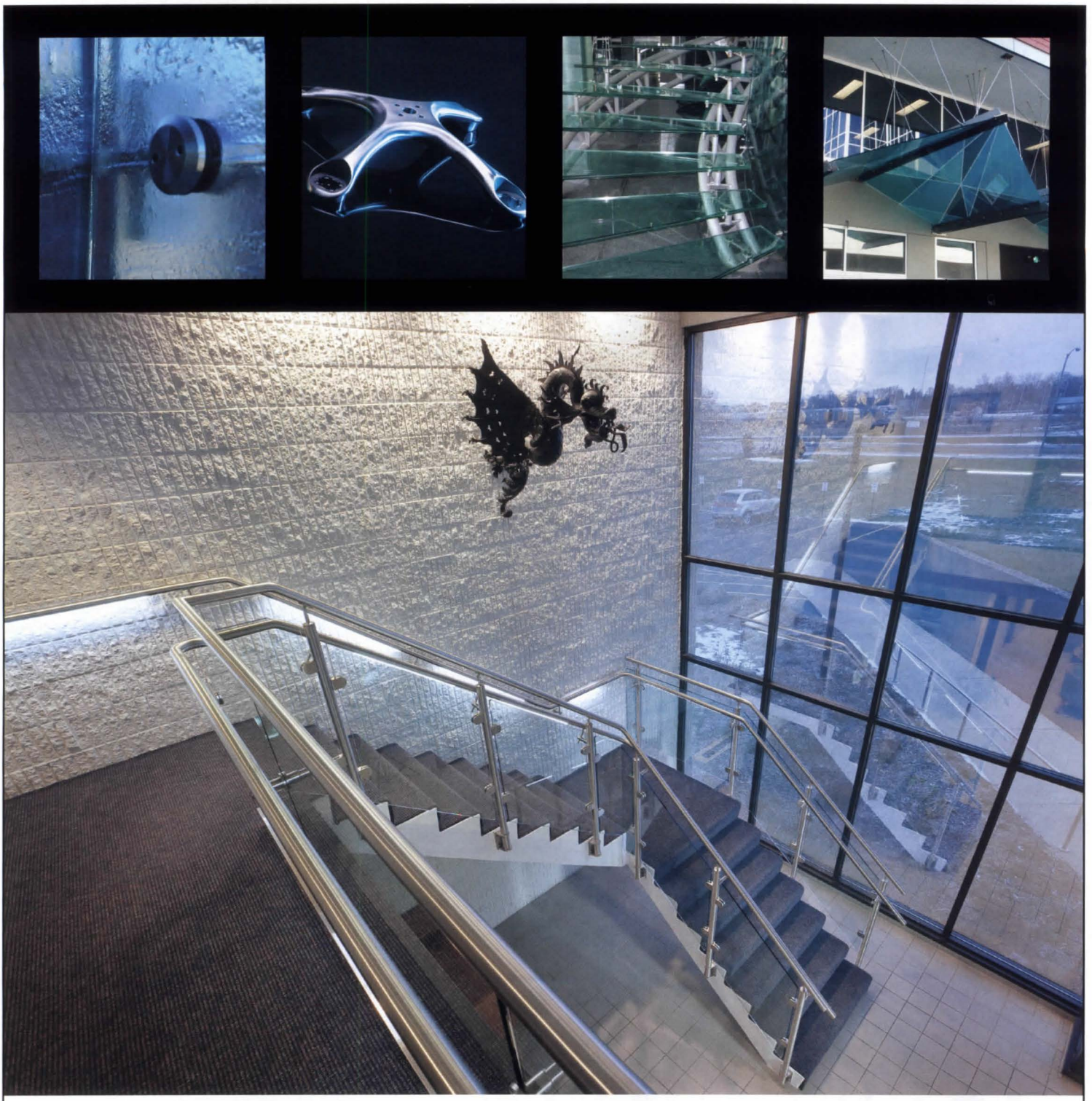
2011 AIA/COTE Top Ten Green Project Awards
Deadline: January 24, 2011
Now in its 15th year, the program is one of the best-known sustainable design recognition programs in the nation. Winning projects will be recognized with an AIA/COTE award certificate and acknowledged in the national press, on the AIA Web site, and at the AIA national convention in New Orleans, May 12–14, 2011. Visit www.aia.org.

The AIA Diversity Recognition Program
Deadline: February 9, 2011
The Diversity Recognition Program seeks to recognize architects for exemplary commitment and contributions to diversifying the profession of architecture. Up to 12 submissions will be selected annually to be recognized for Diversity Best Practices. An award will be presented to each selected recipient, whose diversity efforts will be featured in AIA publications, on the AIA Web site, and in the Architect's Knowledge Resource. For more information, visit www.aia.org.

Puerto Rico Design eXchange 2010
Deadline: February 11, 2011
Established by the Puerto Rico State Department, this is an open design competition for emergent professionals and students in six different categories, including architecture, industrial design, and interior design. The architecture competition category is centered around the design of unbuilt or built residential projects. For more info, visit www.prdx2010.com.

American Society of Landscape Architects
Deadline: February 25, 2011 for professionals; May 6, 2011 for students
Each year, the ASLA Professional Awards honor the best in landscape architecture from around the globe, while the ASLA Student Awards give us a glimpse into the future of the profession. Award recipients receive featured coverage in *Landscape Architecture*, the magazine of ASLA, and in many other design and construction industry and general interest media. For more information, visit www.asla.org.

E-mail information two months in advance to recordevents@mcgraw-hill.com. For more listings, visit architecturalrecord.com/news/events.



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CIRCLE 69

What makes a Green Community?

Find out how the *Green Community Teaching Kit* helps students plan and construct a model green city based on key concepts of sustainability.

For more information on bringing *Green Community Teaching Kits* to your community, contact the National Building Museum Development Department at 202.272.2448.

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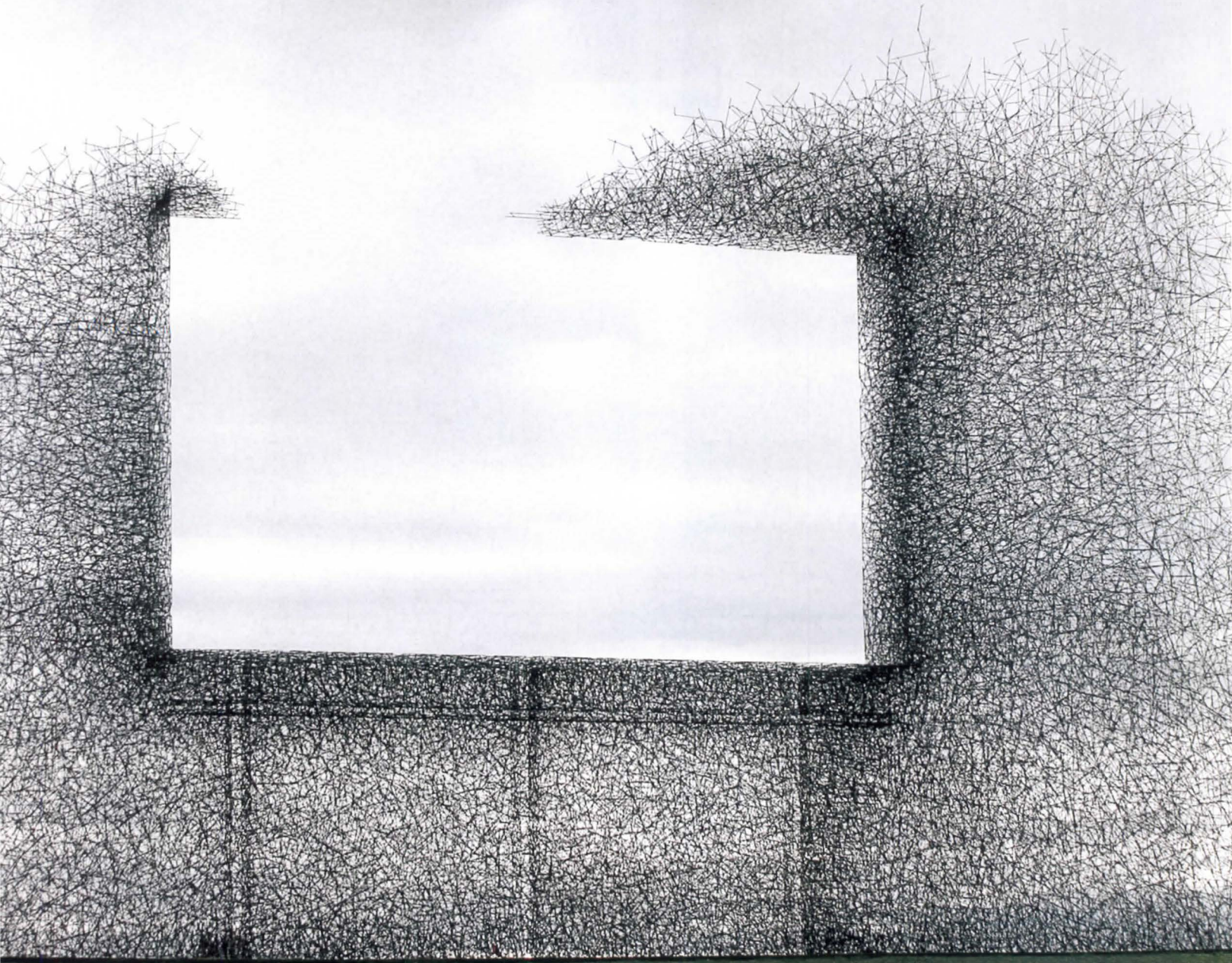
SNAPSHOT

PROJECT NON-SIGN II
LOCATION BLAINE, WASHINGTON
DESIGNERS LEAD PENCIL STUDIO



BORDERS, BOTH LITERAL and figurative, invoke a particularly fraught sense of unease – not a great state of mind for looking at art. At a patrol station on the border of the U.S. and Canada, design firm Lead Pencil Studio asks road trippers to look *through* a staticky billboard that highlights arbitrary divisions. "It's probably the most challenging site we've had to reckon with because of all the political issues around borders and security," says Lead Pencil's Daniel Mihalyo. Commissioned by the U.S. General Services Administration, the 50- by 30- by 3-foot installation borrows the language of the neighboring freeway, where billboards clog the sky. At the same time, Mihalyo and his partner Annie Han wanted to avoid an obvious response. "We wanted to reframe the focus back to the natural environment," says Han. With the help of two assistants, Han and Mihalyo built Non-Sign II in their Seattle shop, working full-time for about nine months. They randomly MIG-welded varying lengths of 0.08-inch-thick blackened stainless-steel rods. The chaotic design comes to a full stop at the crisp edges of the void. Han and Mihalyo then transported the billboard in six pieces and welded them on-site. The firm's interest in technology as a research tool often leads it to an exploration of negative spaces, the designers say, and the GSA commission allowed them to expand on that theme with few restrictions. "It's a real shining example of what the U.S. government is capable of doing," says Han. *Laura Raskin*

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NanaWall Thermally Broken Folding System SL70
Architect: Deems Lewis McKinley Architecture

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NanaWall Aluminum Framed Folding System SL45
Architect: SHW Group LLP

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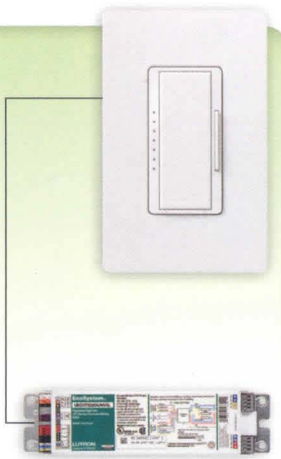

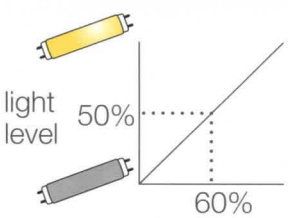

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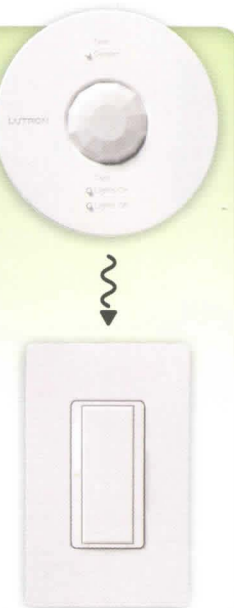
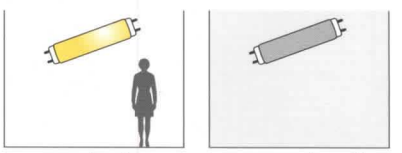
- Sensors automatically turn lights off when a room is vacant
- Easy to retrofit with wireless communication and 10-year battery life
- Can provide up to 20% lighting energy savings





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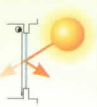

Winter Nights: close shades to keep heat in

Year Round Days: close shades to reduce glare and increase employee productivity

Smart Grid Integration

- Automatically or manually reduce energy usage to avoid peak pricing penalties by adjusting lights and shades
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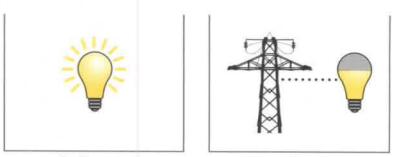

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