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REISER + UMEMOTO'S 0-14 TOWER IN DUBAI

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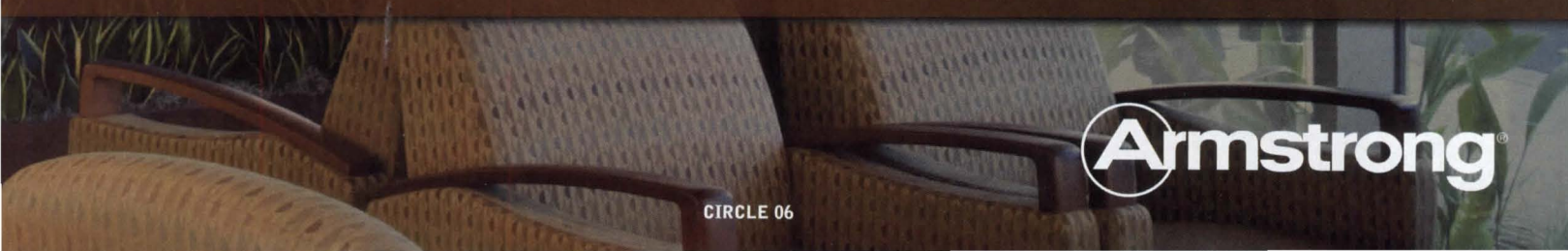

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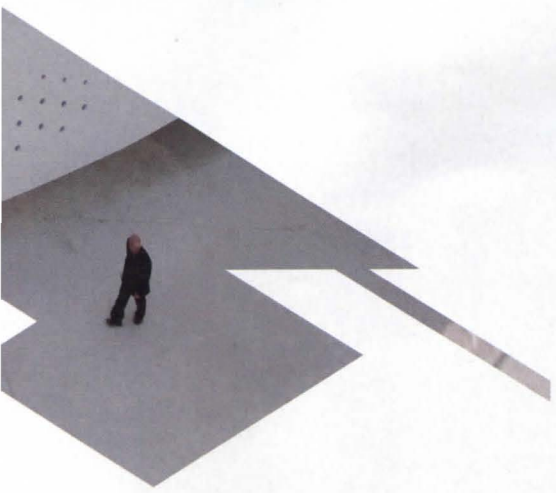

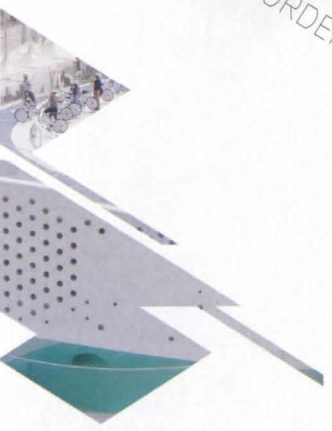

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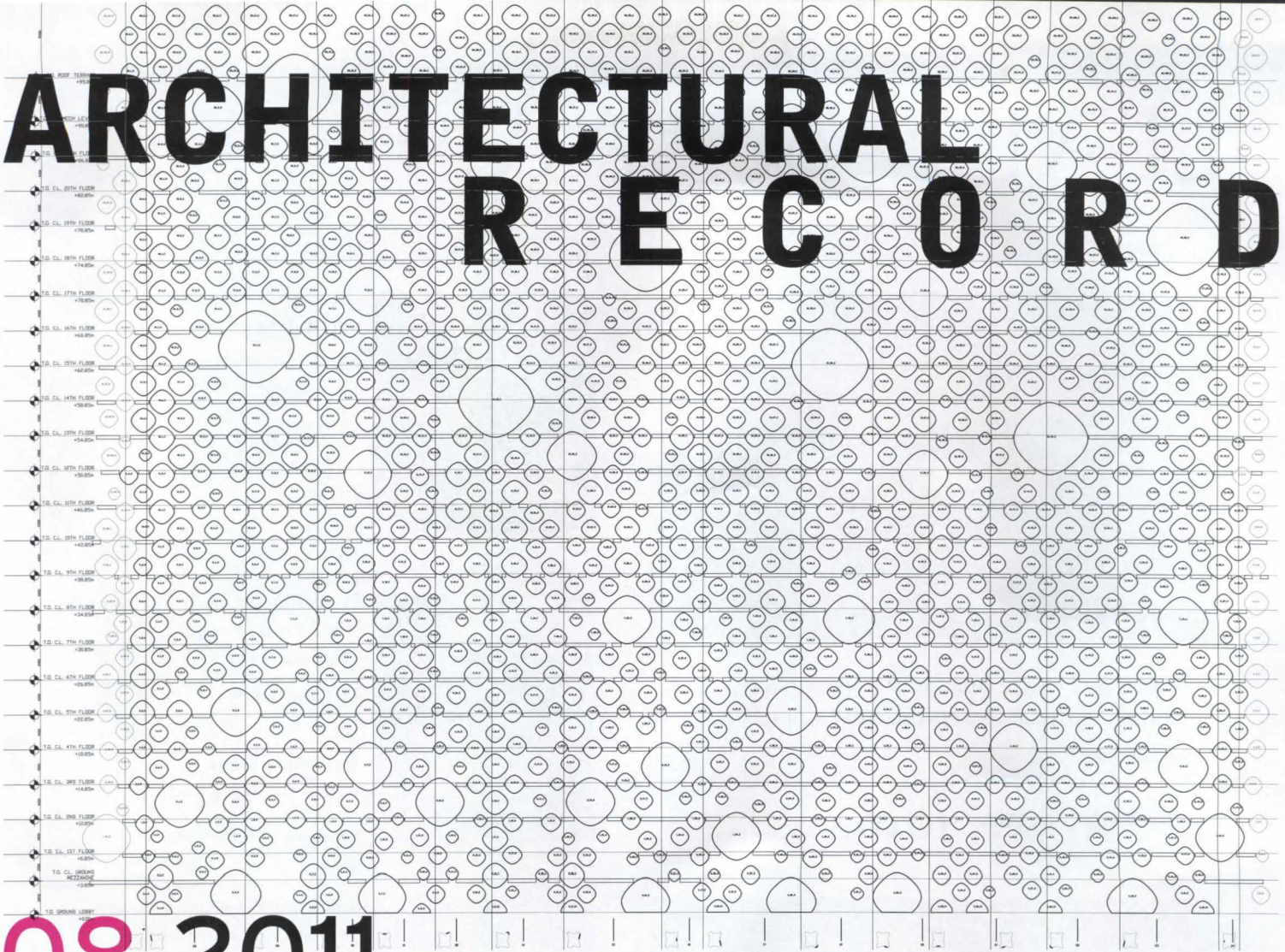

08 2011

NEWS

DEPARTMENTS

FEATURE

PROJECTS

BUILDING TYPES STUDY 915

HEALTH CARE

LIGHTING

ABOVE: A drawing of the O-14 Tower's concrete exoskeleton, "unrolled." Courtesy Reiser + Umemoto.

ON THE COVER: *Fabrikstrasse* 15, Novartis Campus, Basel, Switzerland, by Gehry Partners. Photo by Thomas Mayer.

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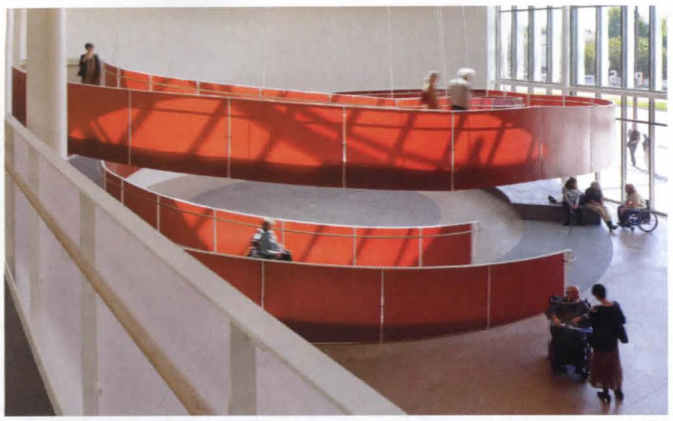

Photo courtesy of Tim Griffith

Accessible by Design: Innovative Approaches to Achieving Universal Design and ADA Compliance

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Fire and Smoke Curtains: Meeting Atrium Code Requirements

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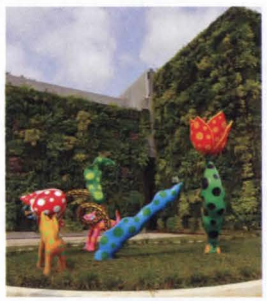

Green Walls: Integrating Nature into Buildings

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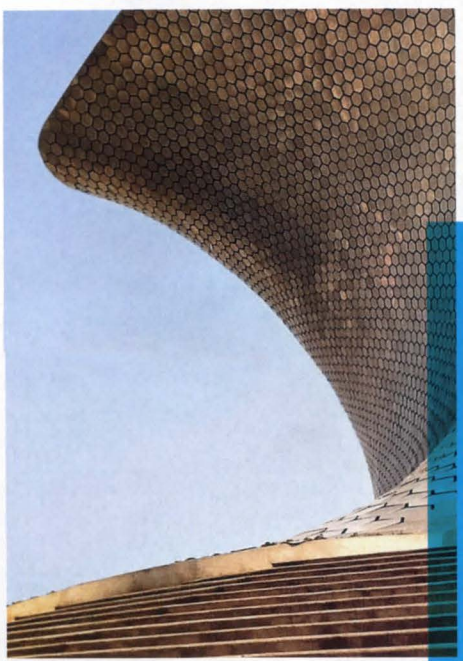
When the *New York Times* announced that its architecture critic of seven years, Nicolai Ouroussoff, was leaving the paper, we posted a poll on our website asking readers who they thought would succeed him. While fellow newspaper critics Blair Kamin and Christopher Hawthorne led in the results (with 11.5 and 10.8 percent of the vote, respectively), the *Times* announced last month that its own longtime art critic and chronicler of European culture, Michael Kimmelman (lowest on our poll with 3.6 percent), would assume the architecture beat under the new job title "senior critic." Reaction from our readers was mixed.

[COMMENTS AND LETTERS]

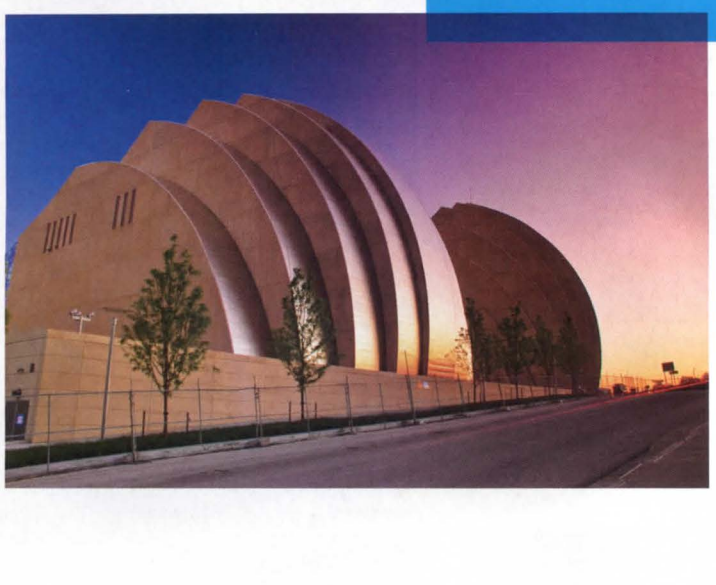
I guess it is too much to ask that an actual architect, landscape architect, urban designer, or anyone trained in any discipline related to the built environment be named the architecture critic.
—*Anonymous*

Most, if not all, of the great architecture critics have not been architects: Lewis Mumford, Ada Louise Huxtable, Allan Temko, Jane Jacobs. I think being outside the profession is very helpful because the writer does not get so caught up in architectural jargon, trends, and design profession politics. And it's a benefit for architects and architecture if a critic can translate complex projects into language that a wide range of readers can comprehend.
—*Dirk Sutro*

[READER PHOTOS]



While we focused on museums and performing arts spaces in July, readers also submitted their own images of those building types to our online gallery, including photos of the Soumaya Museum (left) in Mexico City by Fernando Romero and Mauricio Ceballos as well as Moshe Safdie and BNIM's soon-to-be-completed Kauffman Center (below) in Kansas City, Missouri.



Julie Snow turned a bland roadside box into a fitting headquarters for a young creative company.

The office buildings featured on our site through the month of June drew divergent opinions, but Julie Snow Architects' Minneapolis project, "The Glen," garnered a lot of praise.

Thank you for including Julie Snow Architects' "The Glen" as part of your office Building Types Study. The building importantly demonstrates the value of design within a framework of an ordinary budget and an unremarkable existing building. There must be millions of threadbare buildings waiting for the right combination of freewheeling program, fearless client, and inventive architect to transform them into good places. We need more projects like this, ones that strengthen the fabric of existing communities and give the layperson reason to appreciate good design.
—*Jason Forney, Bruner/Cott*

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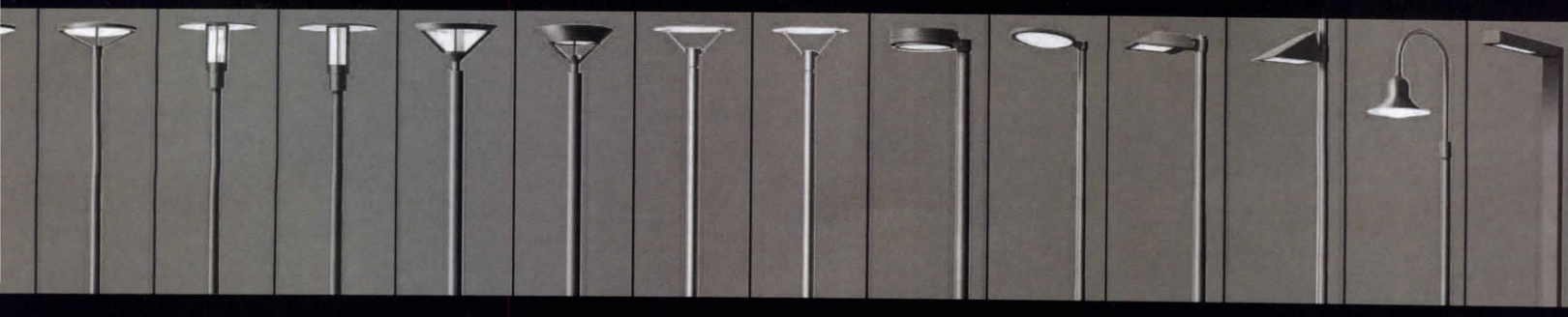

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CIRCLE 21

Modern Medicis

The Critical Role of the Client

IT TAKES A great client to make a great building, as architects like to say when they're feeling modest. One of the major patrons of the 20th century put it this way: "Great architecture is . . . a triple achievement. It is the solving of a concrete problem. It is the free expression of the architect himself. And it is an inspired and intuitive expression of his client." Those were the words of J. Irwin Miller, whose elegant Modernist house by Eero Saarinen, built in 1957 in Columbus, Indiana, opened to the public for the first time in May. Since then, tours of the house have been booked solid and are sold-out through August.

The house was one of four projects that Saarinen built for Miller. Three are now National Historic Landmarks: Besides the residence, Saarinen designed the family's bank, the Irwin Union Bank and Trust Company, and its place of worship, the North Christian Church, both in Columbus as well. Saarinen's work has been extensively explored in recent years in several books and a traveling exhibition – but what about the man who was his most important client?

Miller, as you might expect, was an extraordinary figure, beyond the fact that he commissioned several radically modern works of architecture for a small town in southern Indiana in the 1950s. Born in 1909, he took over a struggling family business, the Cummins Engine Company, and grew it into a global Fortune 500 company. He'd studied at Yale and Oxford; he was deeply committed to his Christian faith; he was a philanthropist and public servant. His profile was high enough that in October 1967, *Esquire* magazine put him on the cover with the line: "This man ought to be the next President of the United States."

The political times were, in some ways, similar to ours. A Democratic president, stuck in an unpopular war, had seen the Republican party make gains in the midterm elections. Yet a year out from the next presidential race, no obvious Republican candidate had emerged to take on the incumbent (President Lyndon Johnson did not withdraw from running until the following spring). *Esquire*'s conceit was to find the ideal challenger – "a Republican of proved leadership abilities whose character, experience, and intelligence might qualify him" (there was no thought then of "her"). New York mayor John Lindsay suggested Miller as a dream candidate to *Esquire*'s writer, who would later call the highly principled Indiana business leader almost too good to be true, someone Spencer Tracy would play in a movie.

Miller never entered elective politics but had a significant impact in his day. A moderate, he had encouraged the unionization of his own factory in the 1930s; he was the first layperson elected president of the National Council of Churches; he helped organize the 1963 Civil Rights March on Washington (Martin Luther King Jr. called him "the most progressive businessman in America"). Yet those achievements have faded next to Miller's concrete legacy: the remarkable Saarinen commissions (and the collaboration with Dan Kiley, who created the stunning landscape surrounding the Miller house, and Alexander Girard, who worked closely with Miller's wife, Xenia, on the wonderfully idiosyncratic interiors).

Miller's passion for design also brought many mid-century Modern architects to work in Columbus. Through the Cummins Foundation, he proposed to pay the design fee for new schools if the school board hired from a list of talented younger architects (Saarinen drew up the list). The embrace of contemporary architecture spread to those who commissioned other public buildings and churches in town. Columbus became an architectural tourist destination because of the work by such figures as I.M. Pei, Harry Weese, and Edward Larrabee Barnes. Now Saarinen's Miller House is the latest lure.

Miller's level of patronage is rare. But in Basel, Switzerland, the Novartis pharmaceutical company, under the leadership of the chairman of the board, Daniel Vasella, has been constructing a 50-acre campus of office and laboratory buildings over the last decade, by a roster of top international architects, such as SANAA, Yoshio Taniguchi, and Rafael Moneo, with Bill Lacy advising on their selection. Vasella wanted to create a model workplace, not only in the quality of each building but also with the overall design of the campus, the landscape, and the installation of artwork. The idea is that great design inspires creativity among those who work there – and helps attract top talent to the company. We're pleased to be the first American architecture magazine to cover this ambitious ongoing project in some detail, with a close look at the lighting and design of two of the buildings, by Frank Gehry and Fumihiko Maki. Maki has also designed a building for Novartis's new campus in New Jersey, as have Rafael Viñoly and Weiss/Manfredi. There are tentative plans for a building by Maya Lin at Novartis's complex in Cambridge, Massachusetts. We look forward to following the progress of these North American projects as an "inspired and intuitive expression" of this forward-looking client. And we're wondering who else will create such rich architectural legacies in the 21st century. ■

Cathleen McGuigan

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CIRCLE 34

BY C.J. HUGHES

[FOREIGN MARKETS]

Is Vietnam the New Frontier for Architects?

IT MIGHT HAVE been unthinkable as a place to do business just a few decades ago, when half of the country was at war with the United States. It doesn't have the resources of China, its booming neighbor to the north. And its communist government might not appeal to citizens from capitalist nations.

But quietly, Vietnam has become a hot spot for Western architects, as work in their home countries remains elusive. About two dozen North American and European firms now have projects in the Southeast Asian nation, including Foster + Partners, HOK, and Skidmore, Owings & Merrill. And some are opening permanent offices there, according to architects working in the country.

Vietnam "wants to make a mark on the international scene," says Anthony Montalto, a principal with Chicago-based Carlos Zapata Studio. Two of his firm's buildings are reportedly among the first by U.S. architects to be built in the country: A 450-room Marriott it designed for a waterfront in Hanoi is now under construction, and in Ho Chi Minh City (formerly Saigon), its 68-floor Bitexco Financial Tower was completed last year.

Opportunities in Vietnam often entail urban planning. Recently, HOK was hired by Sacom, a telecom and real estate company, to conceive a 27-wacre development in Ho Chi Minh City (where the firm has a six-employee office). Geared toward young professionals, the master plan features 1,600 homes and is crisscrossed by canals, says Tyler Meyr, an HOK senior associate. Like many projects in Vietnam, the development will be built on state-owned farmland, which is viewed as expendable now that the country is transitioning from agriculture to heavy industry, architects say.

The state, and the population at large, do not seem to bear a grudge against America, despite the fact that it conducted a decades-long war there. "They are in a very optimistic time and thinking about the future rather than the past," Meyr says.

That upbeat mood can be partly explained by the influx of jobs due to foreign investment. With 87 million people, Vietnam is seen by many as a favorable place to locate factories because the labor force is comparatively cheap – about half that of manufacturing districts in China, according to World Bank figures. The United States' normalization of trade within Vietnam in 2000 has also strengthened relations and spurred development, analysts say.

In turn, architects have come knocking, prompted by continued softness in the U.S. building industry. There are roughly a dozen American firms working in the southern city of Long Xuyen alone, explains Ming Wu, a design principal with Ehrenkrantz Eckstut & Kuhn Architects (now owned by Perkins Eastman). There, the firm has proposed a multibuilding project for downtown, in addition to conceiving a master plan that calls for transforming 470 rural acres into dense urban neighborhoods. Both schemes await approval.

EE&K is tapping into other cities, as well. In Ho Chi Minh City, it is working alongside Carlos Zapata on a mega-development dubbed Ma Lang Center. In Hanoi, the same team has created a master plan for a new 200-acre district called Hoang Mai Park City. British firms are showing up in Vietnam, too. Last fall, Foster + Partners broke ground on a bank complex in Hanoi.

One of the busier global firms in Vietnam might be SOM, which has six projects in the country, all master plans. It recently was tapped for Green Tech City, in Hanoi, which features two villages and a lush park that will act as a sponge for rain runoff, says Daniel Ringelstein, SOM director of urban design and planning.

Working in Vietnam has its drawbacks. Projects don't always pay competitve fees, and some cite systemic corruption in the awarding of contracts. Also, clients often emphasize cars over trains, meaning the country might repeat mistakes seen in the United States. "We've learned in the West that if you build more roads, it won't solve traffic problems," Ringelstein says. "It means more cars will come." ■

WEB HIGHLIGHTS

- Francis Kéré Wins Marcus Prize
- Legorreta Nabs Praemium Imperiale
- New Architecture Critic for *NY Times*

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In Ho Chi Minh City, Carlos Zapata Studio and EE&K (now owned by Perkins Eastman) have designed a 7.5 million-square-foot, mixed-use development dubbed Ma Lang Center.

IMAGE COURTESY CARLOS ZAPATA STUDIO AND EE&K

To see more images of projects in Vietnam, visit us online at architecturalrecord.com/news.

ON THE BOARDS

Project Niarchos Cultural Center
Location Athens, Greece
Architect Renzo Piano Building Workshop

As Greece wrestles with its ongoing debt crisis, a major cultural project there is moving forward. Renzo Piano has unveiled final designs for the Stavros Niarchos Foundation Cultural Center, a 915,000- square-foot facility in southern Athens that will house a 1,400-seat theater, 400-seat performance space, and expansive library. The $803 million project is being privately funded. Construction starts this year and concludes in 2015.

Project Wuhan Greenland Center
Location Wuhan, China
Architect AS+GG

Adrian Smith+Gordon Gill Architecture – founded in 2006 by Smith, Gill, and Robert Forest after they split from SOM's Chicago office – has won an international competition to design the Wuhan Greeland Center in central China. Resembling a slender glass bullet, the 1,988-foot-high tower is slated to be the country's third-tallest building. Floor space will total 3.2 million square feet; programmatic elements include offices, luxury condos, a five-star hotel, and a private club. Construction is scheduled to begin this summer and be completed in roughly five years.

Project 3Beirut
Location Beirut, Lebanon
Architect Foster + Partners

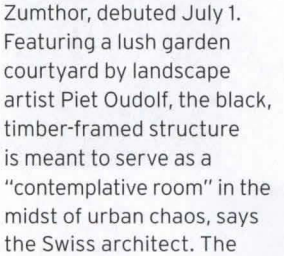
Construction of 3Beirut, a mixed-use complex in the city's historic central district, has begun – marking Foster's first project to break ground in Lebanon. Part of a larger initiative to make Beirut an international destination, the scheme features residential towers that rise from a podium containing shops, cafés, a gym, an art gallery, and public gardens. Glazing on the north offers views of the Mediterranean Sea.

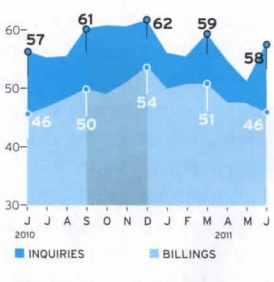
Holl's Surf Museum Opens in France

The Museum of Ocean and Surf, or *Cité de l'Océan et du Surf*, opened June 26 in Biarritz, France. Designed by Steven Holl with artist Solange Fabião, the 50,900-square-foot structure features a cobblestone-sheathed roof whose curvature mimics a rising wave. While much of the facility is underground, two glass "boulders" on top contain a surfer's kiosk and restaurant. The museum, Holl's fourth in Europe, hosts oceanography exhibits.

Zumthor Zen Comes to London

Each year, the Serpentine Gallery, in London's Kensington Gardens, hires a renowned designer to create a temporary pavilion for various events. This year's installation, by Peter Zumthor, debuted July 1. Featuring a lush garden courtyard by landscape artist Piet Oudolf, the black, timber-framed structure is meant to serve as a "contemplative room" in the midst of urban chaos, says the Swiss architect. The pavilion closes October 16.





Downward Slide

The Architectural Billings Index continued its decline, slipping to 46.3 in June from 47.2, with the biggest losses in the Midwest and greatest gains in the West. The inquiries score rose sharply, from 52.6 to 58.1. Regional scores were: Midwest, 44.6; South, 47.3; Northeast, 47.5; West, 51.7. The index reflects a nine- to 12-month lag time between architectural billings and construction spending.

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CIRCLE 39

Sustainability Scrutinized

Criticism arises in academic and professional discourse

AT TWO RECENT architectural events – one academic, the other professional – sustainability met with both skepticism and criticism in ways I hadn't anticipated. It suggests we have reached a point where sustainable architecture needs to be addressed more rigorously.

The academic event was a conference at the University of Michigan's Taubman College of Architecture and Urban Planning in April that focused on the place of history in architecture school curricula. Most explicit was Ellen Grimes, a professor in the School of the Art Institute of Chicago, for whom sustainability too often turns into the desire to return to a putatively "original" nature. She argued instead for an approach to the environment that is committed to the design of new ecological conditions.

To be sure, criticism of "sustainability" is not new. Michelle Addington, professor of sustainable architectural design at Yale, has become well-known for her deflation of architects' excessive environmental claims. But it was a first for me at Michigan to sense a generalized skepticism about "sustainability" on the part of younger architectural historians and theorists. Since the term was an almost universal mantra of the Association of Collegiate Schools of Architecture (ACSA) conferences I attended as a member of its board from 2006 to 2009, I found myself supposing that future ACSA events would be considerably stormier.

Just two months later, I attended a joint conference of the Architectural Institute of British Columbia and the Royal Architectural Institute of Canada in Vancouver. There, Dr. Raymond J. Cole of the Environmental Research Group at the University of British Columbia contributed to a session on "high-performance building envelope design." Before Cole – a grand old man of sustainability in Canada – could conclude, he was criticized for encouraging architects to act in ways that could increase their risk of liability claims. His challenger was Chicago construction lawyer and principal of the Alberti Group, Ujjval Vyas, who was speaking the next day on "Going Green: A Cautionary Tale."

Vyas, with his co-presenters, John Hackett, an architect in charge of risk management at Pro-Demnity Insurance Company, and Bernie McGarva, a Toronto construction lawyer with Aird and Berlis LLP, documented numerous claims made by both clients and third parties against architects in relation to the environmental performance of their designs. Some concerned allegations of technical failure of building components or assemblies that may have resulted from environmental-design ambition. It did not seem to me that they were so fundamentally different from technical liability claims already familiar to architects. A second set of allegations charged that buildings, once completed, failed to meet their designers' predictions of improved environmental performance, or of lowered operating costs. Finally, and most problematic of these, were allegations arising from public statements made by architects about environmental topics, unrelated to specific designs prepared for particular clients. Although Vyas did not give any specific examples, he insisted that architects needed to be careful about pronouncements on sustainability that relied on knowledge beyond their own professional expertise. Such statements could expose them to legal risk.

The Philip Merrill Environmental Center in Annapolis, Maryland, by SmithGroup (2000) is the subject of a lawsuit.

Vyas cited the Philip Merrill Environmental Center in Annapolis, Maryland, designed by SmithGroup (2000) which Cole had illustrated. It was the first American building to receive a LEED Platinum certification and has been called the greenest building in the world. It is now the subject of litigation between the Weyerhaeuser Company and the owner, architect, and contractor regarding the failure of certain "environmentally specified" structural members.

Needless to say, the issues raised in such discussions were not resolved there. Still, these experiences led me to conclude that we have reached the end of an initial phase of the development of sustainable architecture in North America. It is clear that we will need to redouble our future efforts in three important ways: first, to ensure successful fulfillment of technically based environmental ambitions for our buildings; second, to be more rigorous with regard to our predictions of performance – especially parameters of performance that are only partly within our own professional control.

Lastly, we need to find appropriate ways to defend our right – and our obligation – to act in our capacity as public intellectuals in this vitally important arena. Although our scientific expertise is limited, our generalist orientation to sustainability means that we architects remain uniquely positioned to articulate its manifold aspects in architecture and urbanism to the public at large. ■

George Baird, a principal of Baird Sampson Neuert Architects, is a former dean of the University of Toronto's architecture school.

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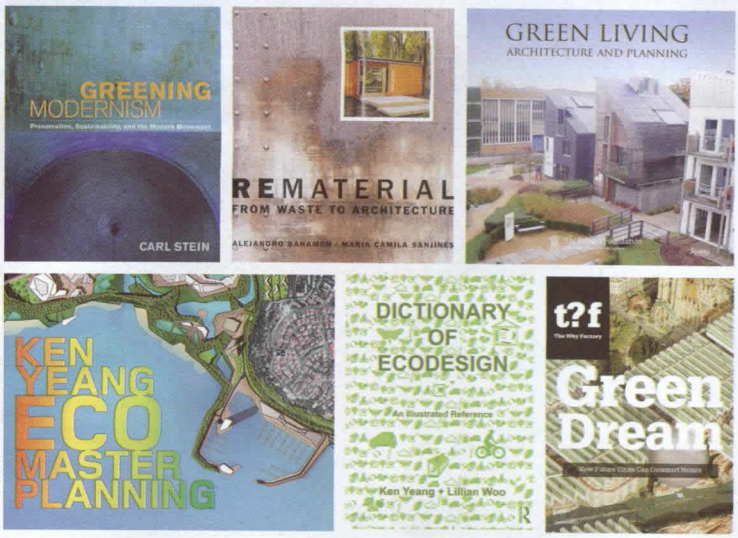


From words and materials to buildings and cities, authors examine the challenges of sustainable design

Dictionary of Ecodesign: An Illustrated Reference, *by Ken Yeang and Lillian Woo. Routledge, 2010, 312 pages, $65.*
Green Dream: How Future Cities Can Outsmart Nature, *by Winy Maas, John Thackara, Ulf Hackauf, and Pirjo Haikola. NAI Publishers, 2010, 408 pages, $45.*
EcoMasterplanning, *by Ken Yeang. Wiley, 2009, 256 pages, $75.*
Rematerial: From Waste to Architecture, *by Alejandro Bahamón and Maria Camila Sanjinés. W.W. Norton, 2010, 340 pages, $50.*
Greening Modernism: Preservation, Sustainability, and the Modern Movement, *by Carl Stein. W. W. Norton, 2010, 296 pages, $60.*
Green Living: Architecture and Planning, *by Dr. Barbara Kenda, Steve Parissien, and HRH The Prince of Wales. Rizzoli, 2010, 208 pages, $45.*

IF WHAT YOU'VE been seeing on the Weather Channel or right outside your window has you increasingly concerned, these books will offer some sound advice on designing sustainable architecture.

For a subject that relies on measurement, benchmarking, and technical precision, Ken Yeang and Lillian Woo offer a book packed with terms having to do with all things green. *Dictionary of Ecodesign* has more than 1,500 terms that stretch way beyond the boundaries of green architecture, into the fields of engineering, physics, chemistry, biology, ecology, public policy, landscape architecture, and urban planning. Architects will find the book useful when consulting with folks from other disciplines as will students getting up to speed with the language of sustainability. The dictionary is illustrated with technical drawings, tables, and graphs that help explain some of the more arcane terminology. Unlike many dictionaries, this one has appendices, among them explanations of international environmental agreements, photovoltaics, conversion tables, and a listing of world population by country. What's the smallest country by population? The Pitcairn Islands in the South Pacific has 50 people.

The question of sustainability is also a matter of scale. A single building can be green but not very sustainable if it is isolated from other buildings and does not share transportation, power-generation, and other mutually supportive systems. In *Green Dream*, the Why Factory (a think tank headed by MVRDV's Winy Maas) challenges conventional approaches to sustainability and asks if a green city is actually feasible.

Ken Yeang's answer in *EcoMasterplanning* is a definitive "yes." He designs his master plans to have the least effect on the natural habitat – or strengthen it, if possible. The balance of the book shows planning principles as worked out in Yeang projects on sites around the world (none yet built) with amazing drawings.

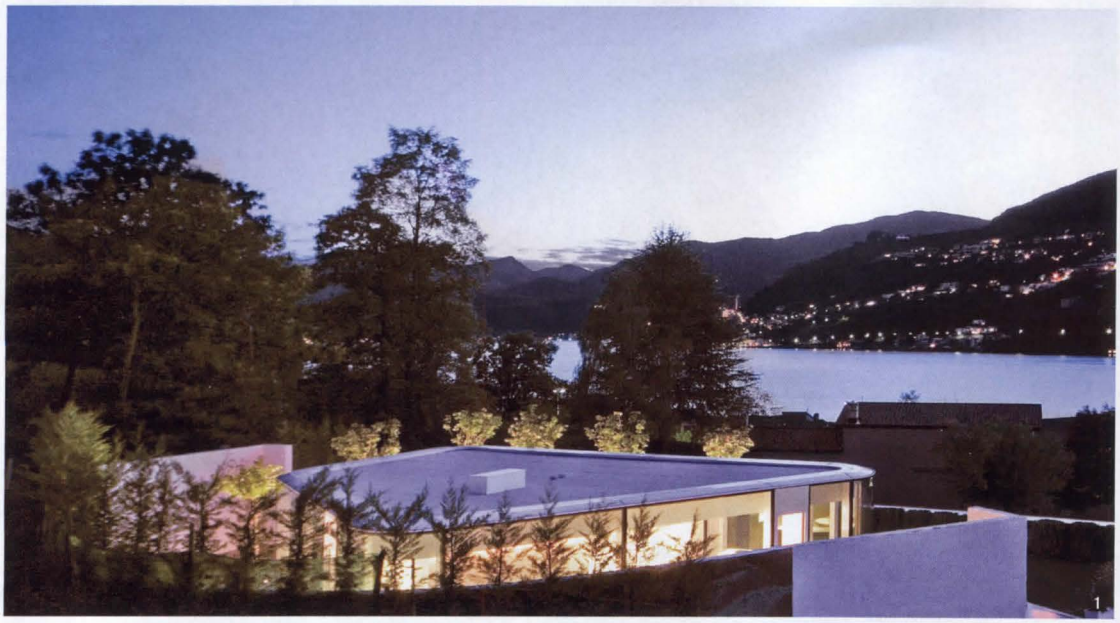
Rematerial: From Waste to Architecture is a provocative book, though the idea it pushes is not new. We live in an age awash in trash – why not build architecture with it? For most of human history, people did exactly that. One building became part of another, and a society's cast-offs found new uses in new construction. Only in the past 75 years or so, and almost exclusively in the world's developed countries, has waste been recategorized as not architecturally useful. *Rematerial* presents beautiful and innovative projects from around the globe made of garbage. Would you believe flooring made of peach pits? A library made of railroad ties? A green roof made of used disposable diapers? Chairs and entire buildings made of old tires? Some projects recycle glass, wood, and other waste into new materials, which are then used to build anew. The truly inventive examples take substantially unaltered waste and make architecture out of it. The authors, Alejandro Bahamón and Maria Camila Sanjinés, explain the projects in words, photos, and drawings that show how "garbage" becomes architecture. Really cool.

If *Rematerial* is an ode to trash, *Green Living: Architecture and Planning* is a genteel product of the Prince's Foundation for the Built Environment. With a foreword by the Prince of Wales himself, the book is a collection of essays by such New Urbanist figures as Andres Duany, Victor Deupi, and Stephen Mouzon, who tend to look to the past to understand where we should go next. The thread weaving through this beautifully illustrated volume is that we once knew how to design and build in harmony with nature, with sustainable and energy-efficient materials. This book asks us to look deeper, beyond style, to understand how old buildings and towns and cities worked, and shows us new projects designed with these principles in mind.

For the Prince, Modern architecture has been the bogeyman. But the Modern movement, with its emphasis on realizing maximum value from minimum means and on tailoring design to local conditions, was a precursor of today's quest for sustainability, argues Carl Stein in *Greening Modernism: Preservation, Sustainability, and the Modern Movement.* Stein believes that if Modernism had not veered from its original philosophy of frugality – Corbusier's notion that a house is an unembossed machine for living, Mies's watchword that less is more – its evolution would have been toward increasingly sustainable architecture. Stein asks us to put Modernism's principles to work in solving 21st-century problems. Since the most sustainable building is an existing one, he advocates retaining and upgrading our vast inventory of buildings. By reintegrating Modernism, preservation, and sustainability, he offers an optimistic prospect for an architecture suited to an era of climate change.
Michael J. Crosbie ■

HOUSE OF THE MONTH INGRID SPENCER

BETWEEN THE SWISS ALPS AND LAKE LUGANO, JACOPO MASCHERONI CREATES A ROUNDED GLASS PAVILION ATOP A SUBMERGED BASE.



1. To instill a feeling of weightlessness, a thin, slightly slanted concrete slab covers the pavilion. Insulated aluminum doors with carved-in handles flush with the glass offer access to the upper-level gardens.

2. The pavilion's high-performance glass walls came curved and already treated with argon gas pumped between their airtight double panes as insulation against the cold Swiss winters. A dropped ceiling hides electronic shades, while Prunus trees provide shade in summer but let in winter sun when they lose their leaves. Reflective, crushed white Carrera marble covers most garden surfaces, while round skylights offer glimpses of the house's lower level.

3. Built-in and custom furniture, such as a 45-degree angled sofa, become part of the architecture.

ACCORDING TO ARCHITECT

Jacopo Mascheroni, people from the village of Brusino Arsizio, Switzerland (population 475), have been trying to get a glimpse of the house he designed for Nicoletta Messina, a financial consultant, and her family. The 3,700-square-foot polygonal glass pavilion and garden above a partially buried lower level is almost hidden behind walls on a hill. An engineering feat resulting in an innovative modern artifact, it is unlike any other house in the village.

Mascheroni, who worked for Stanley Saitowitz/Natoma Architects in San Francisco and Richard Meier & Partners in New York City before founding JM Architecture in 2005 in Milan, admits that his client was brave. "I asked him for a house with many large windows," says Messina, "and then I gave him carte blanche."

With Lake Lugano on one side and the Swiss Alps on the other, a glass house on a hill seemed the obvious move. But the challenges of a steep slope, building-code setbacks, and surrounding houses made a typical solution impractical and undesirable. Instead, Mascheroni carved into the slope and inserted a reinforced concrete structure, which is approached from a private lane leading to a garage on the west.

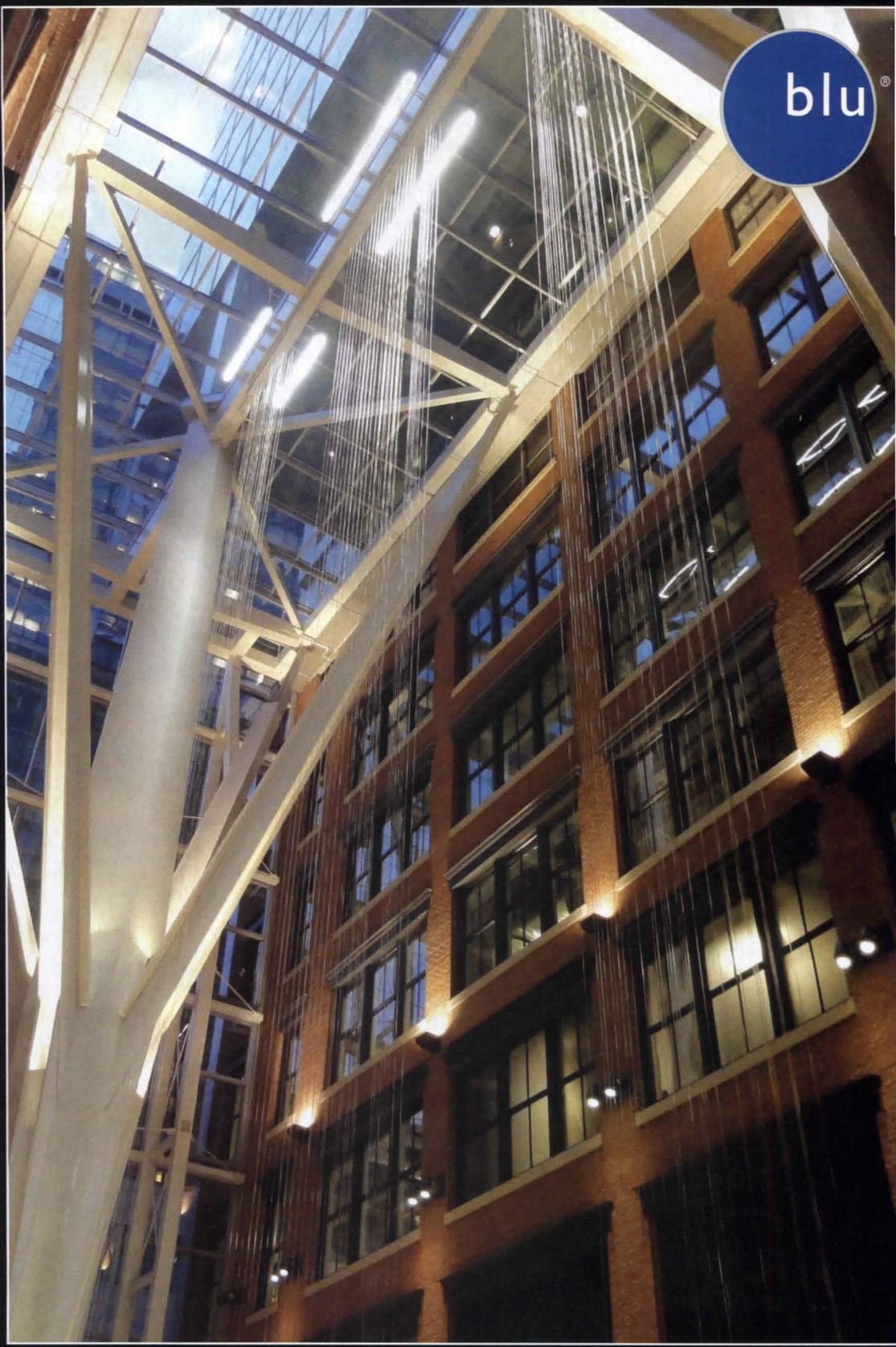
The underground level comprises three bedrooms, two baths, an office, formal entry, laundry, staircase, and playroom. Rather than facing out toward houses that block the lake view, the bedrooms open onto a garden enclosed by a wall and tall hedges. Climb the stairs to the public spaces of the house and you find another garden – on 2 feet of earth atop the lower-level roof. Here the house's curved glass walls allow extensive views of the landscape beyond a perimeter wall to the northeast and a parapet wall to the southwest.

Within the glazed pavilion, no walls divide the living areas, but a central, white-lacquered rectilinear-wood volume contains the kitchen, bathroom, stairway, and all mechanical and technological equipment.

Geothermal heat pumps, a rainwater collection system, and radiant heating are some of the environmentally friendly systems used. The house is sculptural, sustainable, and practical. Messina, who works in the house, says that to witness the lights of the village and lake from the upstairs pavilion each night "is a wonderful experience. I live so much more intensely than ever before." ■

View a slide show on our website or in our iPad edition.

PHOTOGRAPH COURTESY JACOPO MASCHERONI



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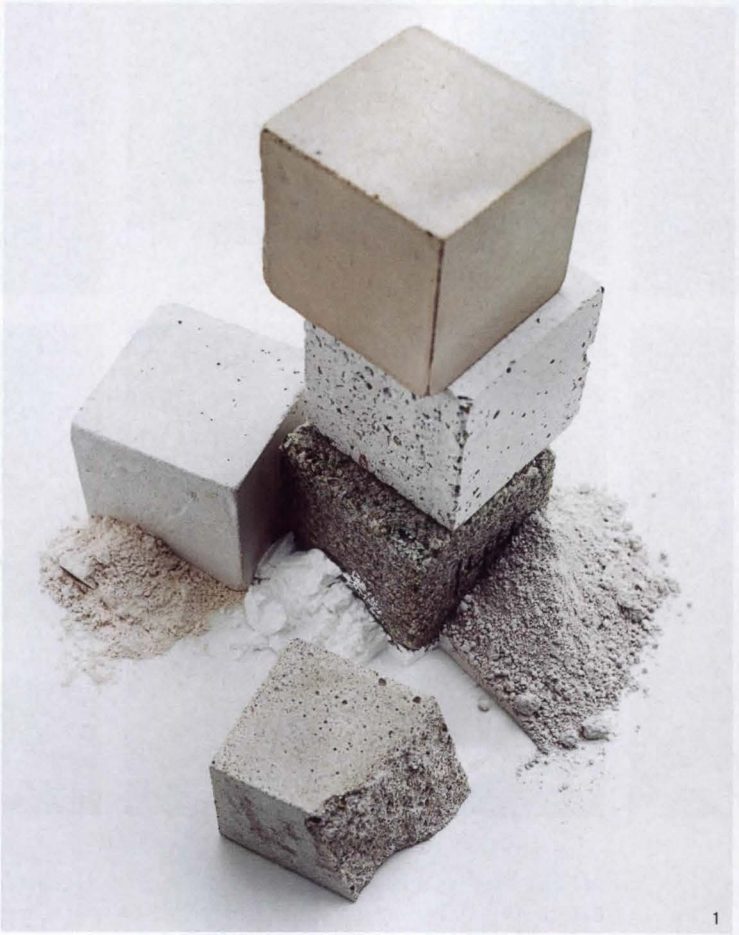
CIRCLE 09

Carbon Negative Cement Named Material of the Year

FOR THE SECOND year in a row, a concrete-related product has been chosen as material of the year in Material ConneXion's MEDIUM Award program. Material ConneXion, a global materials consultancy and library, awarded Novacem's Carbon Negative Cement as the winner. This follows last year's inaugural winner, Concrete Canvas, which won for its Concrete Cloth cement-impregnated flexible fabric technology.

According to Dr. Andrew H. Dent, Material ConneXion's vice president, library and materials research, half of the roughly 500 materials considered for this year's award were related to the building arena. "That wasn't intentional," explains Dent. "We don't think we need to represent one particular area of the materials industry, in the same way that we didn't have sustainability as a main attribute when choosing the materials." The jury was more focused, says Dent, on products that "herald some real change for the future." The high percentage of building materials signifies a push in that area toward both innovation and sustainability, says Dent.

Typical cement is responsible for approximately 5 percent of man-made carbon dioxide; the emissions are caused by the processing of limestone and raw materials and the burning of fossil fuels. Novacem's carbon negative cement replaces calcium carbonates used in typical cement formulation with magnesium silicates and uses a lower-temperature production process that runs on biomass fuels. Novacem associate engineer Daniel Bowden says that while the cement is still in development, they are already achieving strengths of up to 80 Mpa. Dent says the cement was the clear winner. "If implemented, the material would take care of most of construction's attempts at carbon reductions in one fell swoop." Bowden says that a commerical rollout is currently planned for 2014-2015.



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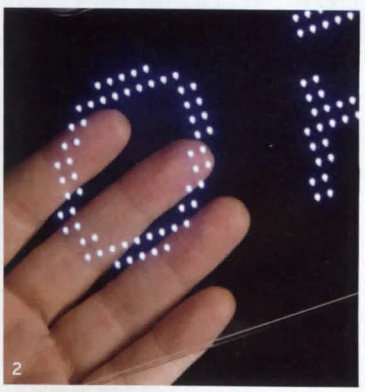
Out of the nine runner-ups for the award, four are construction materials with notably green attributes: Saratech Permasorb Wallpaper, which removes toxins embedded in wall surfaces; Lumisys transparent LED signboard that uses low-energy, long-life LEDs; ECOR panels made from cow manure and other recycled content; and Eco-HPL, the first high-pressure laminate made without phenol-formaldehyde.

Dent thinks industry certifications, though often limited in scope, are what give building material companies an advantage: "Construction is one of the few industries where there is a clear framework of what you are supposed to do." Novacem Limited, London. novacem.com CIRCLE 200

1. **Novacem's Carbon Negative Cement won Material ConneXion's second annual MEDIUM Award.**
2. **Lumisys transparent LED signboard uses low-energy, long-life LEDs.**
3. **Saratech Permasorb Wallpaper removes toxins embedded in wall surfaces.**
4. **Eco-HPL is the first high-pressure *laminate* made without phenol-formaldehyde.**



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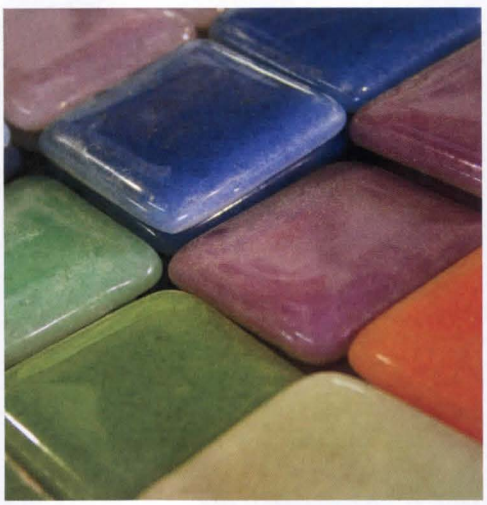

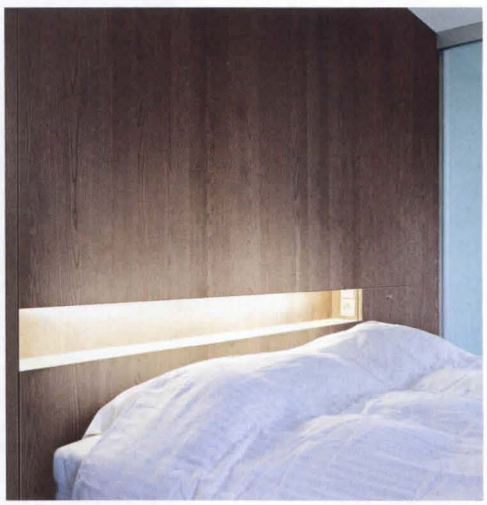

Redeux Material Take Back Program

ECORE ecoreintl.com

Starting last April, ECORE customers can now send back old or remnant recycled rubber and cork products for recycling to the manufacturer's Lancaster, Pa., manufacturing facility. As the products are already made from recycled materials, the reclaimed material will be "re-recycled" into new flooring, underlayments, and industrial products through ECORE's proprietary process. **CIRCLE 201**

EcoCycle Recycling Process

Crossville Inc. crossvilleinc.com/green

TOTO has formed a cross-industrial strategic partnership with Crossville to supply preconsumer waste for Crossville's new EcoCycle Recycling Processes. EcoCycle is a proprietary system for processing preconsumer sanitary ware, fired tile, and production-related waste back to powder that is used in the manufacture of new tile. Crossville is the first U.S. tile manufacturer to achieve SCS certification for its waste-recycling program. **CIRCLE 206**

Recycled Bricks and Pavers

CalStar Products calstarproducts.com

CalStar Products uses a proprietary technology to produce bricks and pavers that incorporate 40% postindustrial recycled material. This allows CalStar to avoid the energy-intensive kiln firing required for clay bricks and pavers and the use of Portland cement in concrete pavers. As a result, Calstar uses 50–85% less energy in manufacturing and generates 85% less carbon dioxide. **CIRCLE 203**

Crush Glass Tile

Fireclay Tile fireclaytile.com

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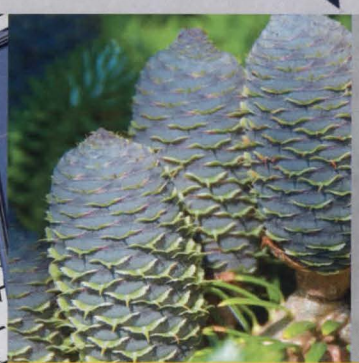

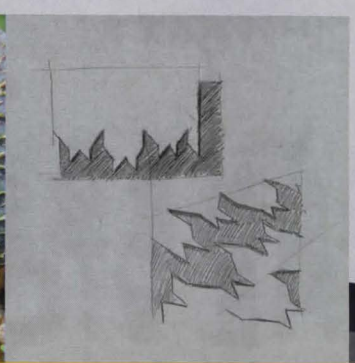

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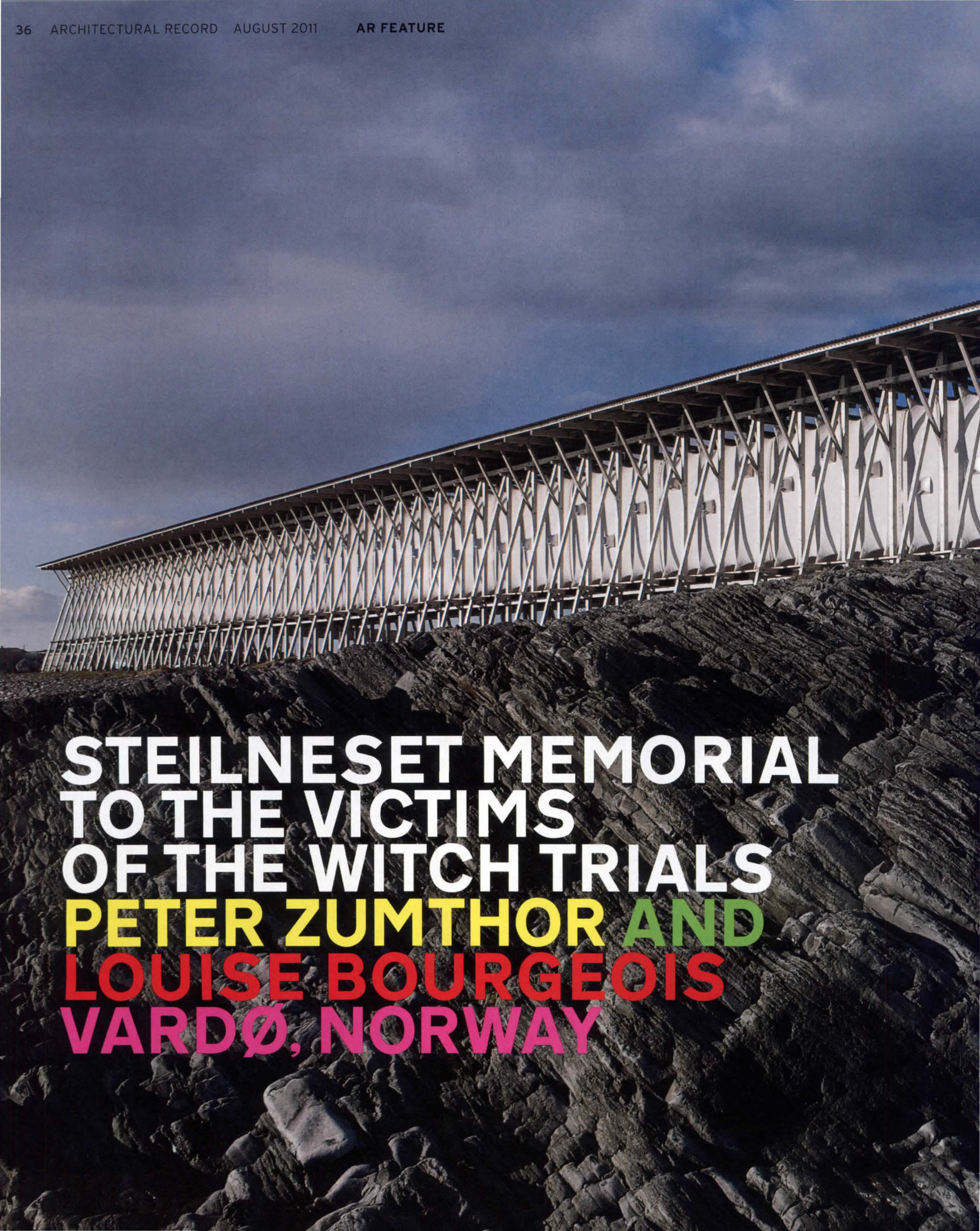

STEILNESET MEMORIAL TO THE VICTIMS OF THE WITCH TRIALS

PETER ZUMTHOR AND LOUISE BOURGEOIS

VARDØ, NORWAY

A COLLABORATION BETWEEN AN ARCHITECT AND AN ARTIST RESULTS IN AN INTRIGUING TWO-PART MEMORIAL IN NORWAY. BY SUZANNE STEPHENS

RAW BEAUTY AND haunting poetry emerge from the idiosyncratic collaboration between Swiss architect Peter Zumthor and the late French-born artist Louise Bourgeois in Vardø, Norway. Here in the country's northeastern-most town (population: 2,000) above the arctic circle, you now find an arresting shrine to 91 people in the area who were tried and burned at the stake in the 17th century for the crime of witchcraft. Centuries later, the Steilneset Memorial for the Victims of the Witch Trials in Vardø officially opened June 23, presided by Her Majesty Queen Sonja of Norway.

The unusual project, sponsored by the town of Vardø, Finnmark County, the Varanger Museum, and the Norwegian Public Roads Administration, offers another stop on the much- heralded National Tourist Routes in Norway [RECORD, October 2007, page 90]. Because the memorial brings belated attention to aberrations of justice that occurred long ago, it may seem just a touristic ploy to attract sightseers to the craggy Steilneset promontory off the barren Varanger peninsula, where reindeer gambol and sheep never seem to sleep – at least on sunny summer nights. However, as Sturla J. Stalsett, general secretary of the Vardø Church City Mission, pointed out during the opening ceremonies, the memorial is meant to remind us of the ongoing danger of collectively creating scapegoats. If historical circumstances seem peculiar now, the intent behind the work addresses larger moral claims.

While Norwegian architects competed for commissions to design the rest areas and look-out points on the scenic routes, the Steilneset memorial, initiated in 2000, was different. Artist Knut Wold, a consultant and curator for the National Tourist Routes, along with colleague Svein Rønning, suggested Bourgeois be commissioned for a different point of view. Since an architect would be needed to enclose her piece, Wold thought of Zumthor, whom he knew from the design of the Zinc Mine Museum in Sauda, Norway, begun in *2002 and now* under construction. Wold discovered that Zumthor and

Bourgeois already were working together on an art/architecture project for Dia:Beacon museum in Hudson, New York (2003), that ultimately was not realized. The new collaboration seemed a natural.

Since Bourgeois, who died in 2010, was 94 at the start of the memorial design in 2006, she enlisted her longtime assistant, Jerry Gorovoy, to help execute her ideas and asked Zumthor to go to the site first for his impressions. As Zumthor puts it, "She was to make the art installation, and I would make the shell." Arriving in Vardø, the architect was struck by the harsh, treeless landscape along the Barents Sea, and the indigenous man-made elements such as spindly diagonal wood racks for drying fish, once a major export item. He also found the lamps in the small curtainless windows of the houses had a certain poignancy.

To memorialize the 77 women and 14 men who were victims of the witch hunt, Zumthor envisioned a long building with a taut wood-frame structure and a sailclothlike walls, to be perched atop the rocky, granite coast. Inside the elevated structure, he designed small windows randomly punched on both sides to commemorate those executed. In the center of each window would be suspended a single lightbulb. "I didn't want an aggressive, massive monument. Creating a light, delicate structure was best for this rough place," he says.

When Zumthor showed his sketches to Bourgeois, she said she liked them but felt his work was complete. She needed her own space, and so it was agreed that Zumthor would design a separate building for Bourgeois's piece, which features a burning chair.

Visitors enter the memorial on the north by a gangplank placed perpendicularly to the elevated Zumthor structure, a 410-foot-long building within which a tensile structure of polytetrafluoroethylene (PTFE)-coated fiberglass fabric is suspended on cables. Once inside, the visitors proceed along a 328-foot wood-plank catwalk about 5 feet wide. As they thread their way through the dark cocoon of the interior, visitors pass 91 windows, each dimly lit by an exposed-filament bulb. Ropelike cords from the lamps form scalloped borders at the edges of the undulating ceiling. The feeling is like being in the stomach of some prehistoric creature, half-fish, half-reptile – except there is a glimmer of light.

At the south end, visitors exit on a gangplank that leads down to the entrance of the glass cubiform volume housing Bourgeois's piece. The pavilion's 39-by-39-foot square roof of Cor-Ten steel is supported by Cor-Ten steel columns at the

PREVIOUS SPREAD AND ABOVE: **Peter Zumthor designed two distinct structures, one a delicate, elongated, wood-frame building perched on a granite coast above a sound; the other, a glass and Cor-Ten steel-frame volume containing Louise Bourgeois's installation.**

RIGHT: **The end of the 410-foot-long structure illustrates how the cable-stayed PTFE-coated fiberglass exhibition space is tapered at the end and suspended within the wood frame composed of 60 bays. The roof is corrugated aluminum.**

Watch a video and view additional images online.

room's perimeter. Horizontal steel brackets in turn brace the 17 large panes of dark glass, which Zumthor likens to welding goggles.

Owing to the high winds on the site, the glass walls stop short of the ceiling and floor and slide past each other to allow gaps for wind drafts. In the middle of the space is Bourgeois's piece, an aluminum chair with gas flames shooting out of the seat. In this rather literal evocation, the burning chair is reflected in seven oval mirrors placed on metal columns in a ring around the fiery seat, like judges circling the condemned. If you think you'll be too warm standing near the burning chair, don't worry. In this blustery place, temperatures rarely rise above 51 degrees Fahrenheit.

The extremely harsh climate naturally raises the question about the life of the long house's fiberglass fabric. Zumthor maintains that it is supposed to last 77.2 years. Let's hope. Because of the soil and wind, wood is hardly plentiful, and so the framing members were fabricated off-site. The membrane, made in Germany, with panels stitched in the factory, had to be installed in place using heat bags. In spite of the vernacular build-it-yourself look of the long house, its fabrication, like the glass pavilion, depended on contemporary techniques.

In the last analysis, you might well wonder if you need two separate structures, at a cost of about $15 million, to commemorate events that took place so long ago. Zumthor's long house would seem to do the job very effectively. But then again, you do get two distinct, provocative experiences for making the pilgrimage to Vardø. ■

ABOVE: **In the long house, the floor extends 328 feet. Deep windows set in metal frames are clamped onto the fiberglass fabric panels that are stitched together. Exposed-filament bulbs hang in the center of the 91 windows: On one side of the apertures suspended silk scrolls detail the individual histories of the victims, compiled by Liv Helene Willumsen.**

LEFT: **In the pavilion Zumthor designed for Louise Bourgeois's installation, Cor-Ten steel columns and brackets support tinted glass panels and a Cor-Ten roof. In the center is a rough concrete tub containing an aluminum chair. Gas-fueled flames shoot up from the chair seat, reflected by seven oval mirrors on columns encircling it.**

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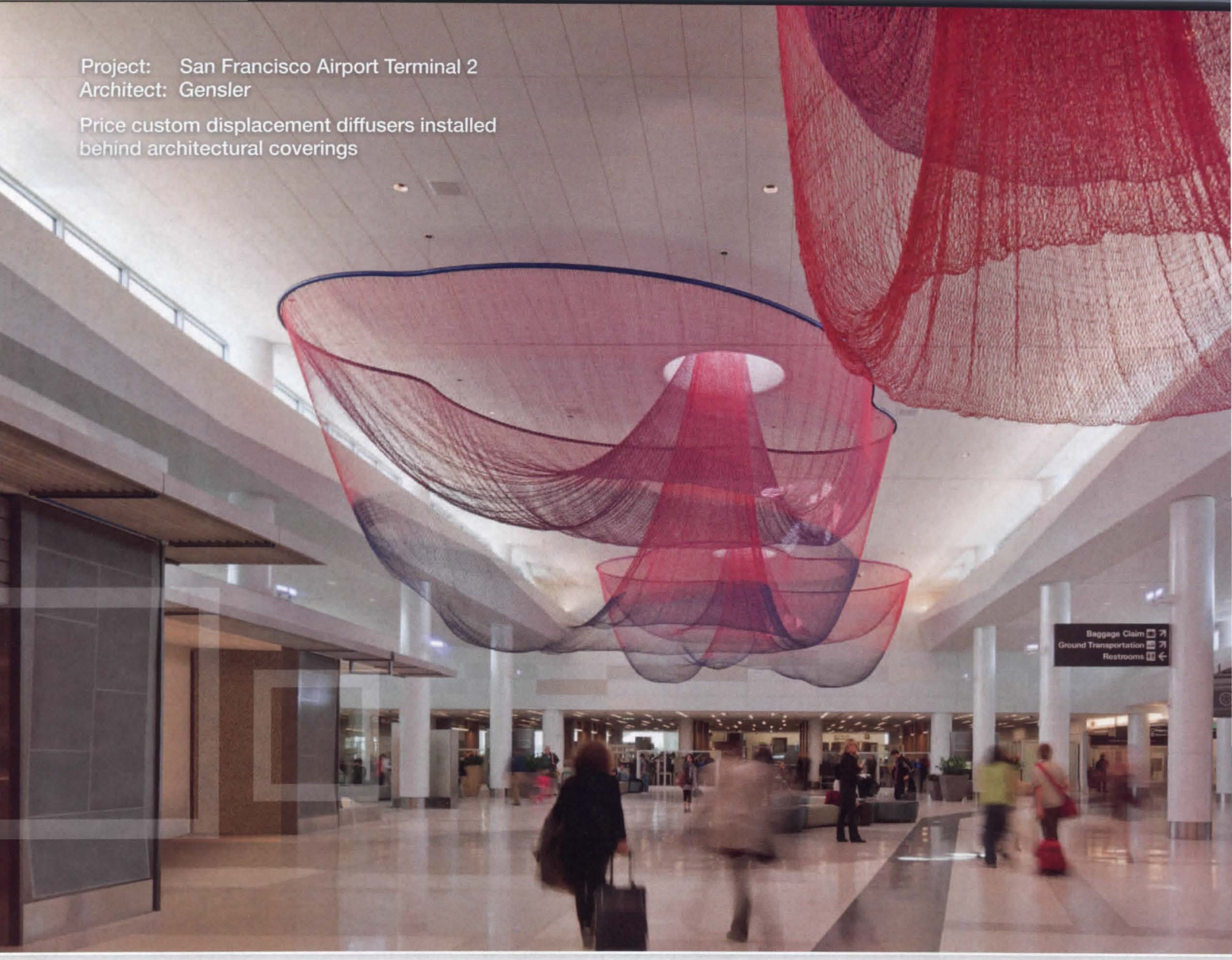
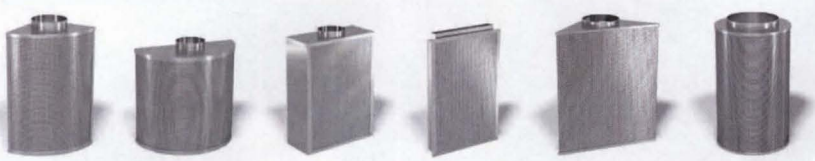


Hidden in Plain Sight

Displacement Ventilation by PRICE



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Bjarke Ingels Group / By Joann Gonchar, AIA

The 8 House is located at the southern tip of Ørestad, a new development rising along a branch of Copenhagen's metro line. The building sits alongside a canal and next to the Kalvebod Fælled's vast meadowlike landscape (background, opposite).

8 HOUSE

For the latest of his apartment buildings in a developing neighborhood at the edge of Copenhagen, an architect creates a daring and complex geometry in support of an ambitious social vision.

"HUMBLE" SEEMS AN unlikely word to associate with an architect who, at 36, has already built three inventive apartment complexes on his home turf of Copenhagen, has a high-profile commission for another in New York City, and is the darling of the design blogosphere. But that's one of the adjectives (along with "talented") that Danish developer and general contractor Per Høpfner uses to describe Bjarke Ingels, founder of the six-year-old Bjarke Ingels Group (BIG). According to Høpfner, Ingels knows how to listen to his clients and is sensitive to budget issues.

For anyone familiar with BIG's work, it won't be surprising to hear that the firm's goals are larger than keeping costs in check. "We build in the most economical way," says Ingels, "but are constantly asking ourselves, 'What can the project provide for the neighborhood and its residents?'" Otherwise, "the money is wasted and the opportunity is lost."

For the most recently completed and largest of Ingels's Copenhagen residential projects – the $133 million 8 House, which includes 476 apartments

ABOVE: **With almost 500 apartments and more than 650,000 square feet, 8 House is Denmark's largest private development to date. It is so big, according to the architect, that "it straddles the boundary between building and city planning."**

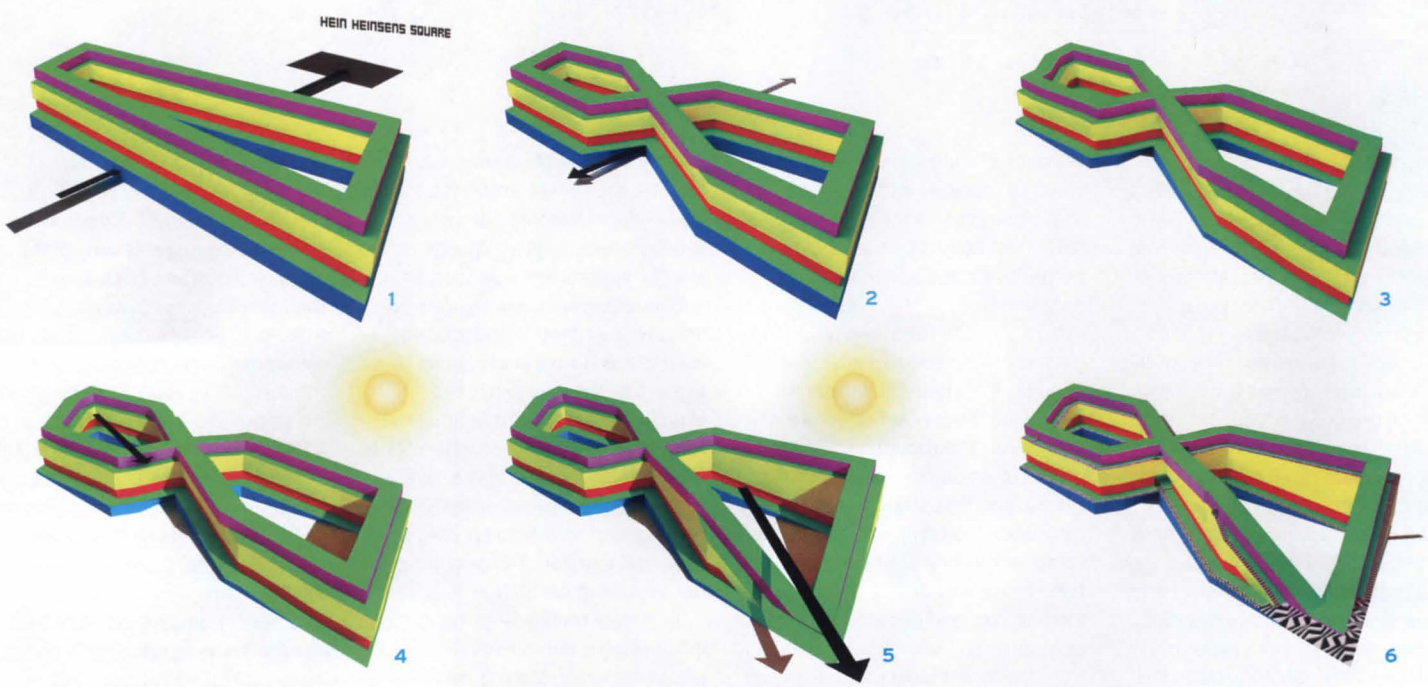
OPPOSITE LEFT: **The building is 10 stories at its tallest point, sloping down to only one story at the southwest corner, where a café sits overlooking the canal.**

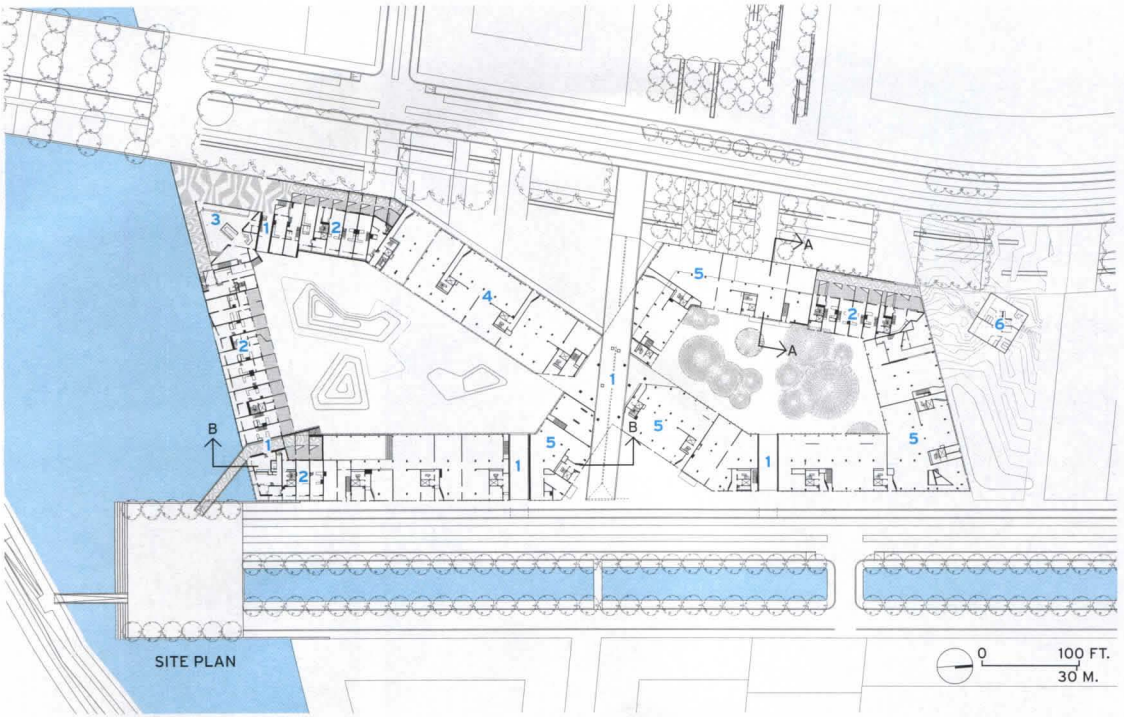
OPPOSITE RIGHT: **A number of passageways penetrate the building's figure-eight-shaped perimeter block, providing access from the building's courtyards to the street.**

and more than 100,000 square feet of commercial space and shared facilities – the aim was to build a "three-dimensional community even though the building is in the middle of nowhere," says Ingels. The "nowhere" is about 7 miles from the city center at the southern tip of Ørestad, a still somewhat barren district rising along a branch of Copenhagen's new metro line. Ingels's two earlier residential projects – the 221-unit VM Houses, named after the shape of the complex when seen from the air, and the Mountain, which features 80 apartments that terrace down over a parking garage – are located not far away in the same developing quarter. Høpfner joined forces with the Danish Oil Company to develop the first two buildings. For 8 House, he teamed with holding company St. Frederikslund, but has since sold his interest in the project.

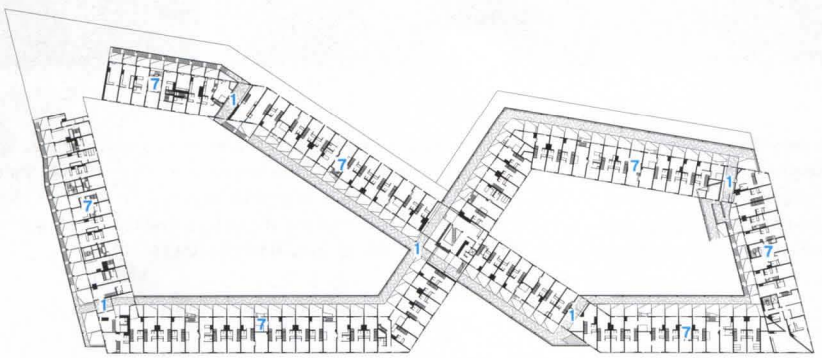
Design work on 8 House, which is reportedly Denmark's largest private development, began in 2006, before Copenhagen's housing bubble burst. In order to create an architectural framework for the community the designers envisioned

BELOW: 1) BIG started the design process for 8 House with a traditional perimeter-block typology but stacked the various programmatic elements one on top of the other. 2) To accommodate a master-plan requirement for a passageway through the middle of the site, BIG pinched the perimeter block to form a bowtie and define two courtyards. 3) It then began playing with the height of the sides of the block to provide the apartments with access to sunlight. 4, 5) By pulling up the northeast corner and compressing the southeast corner, BIG creates a shape that gives residents views of adjacent marshes and grazing lands. 6) The manipulations allow for a sloping path that loops around the building, following the figure eight.





SITE PLAN



LEVEL TEN

PLANS

1 PASSAGEWAY
2 TOWNHOUSES
3 CAFÉ
4 DAY CARE
5 COMMERCIAL SPACE
6 PLANNED TOWER
7 PENTHOUSES

there, they based the 8 House scheme on the typology of a perimeter block, but squeezed it in the middle to form a bowtie shape that defines two courtyards. At the central "knot," they created a 30-foot-wide passageway that connects the east and west sides of the site. They then layered the components of the program one on top of the other like a cake: Commercial uses, including retail space, a café, a day care center, and offices, are placed near the base, so that they can benefit from direct contact with the street, while the different types of apartments – townhouses, flats, and penthouses – are stacked above. And in order to provide the residential units with daylight and views of marshes and grazing lands that sit directly to the south, they raised the building's northeast corner to 10 stories, sloping it to only one story at the diagonally opposite corner by stepping down each successive line of apartments. The result is plenty of variety in the building's precast-concrete structural components.

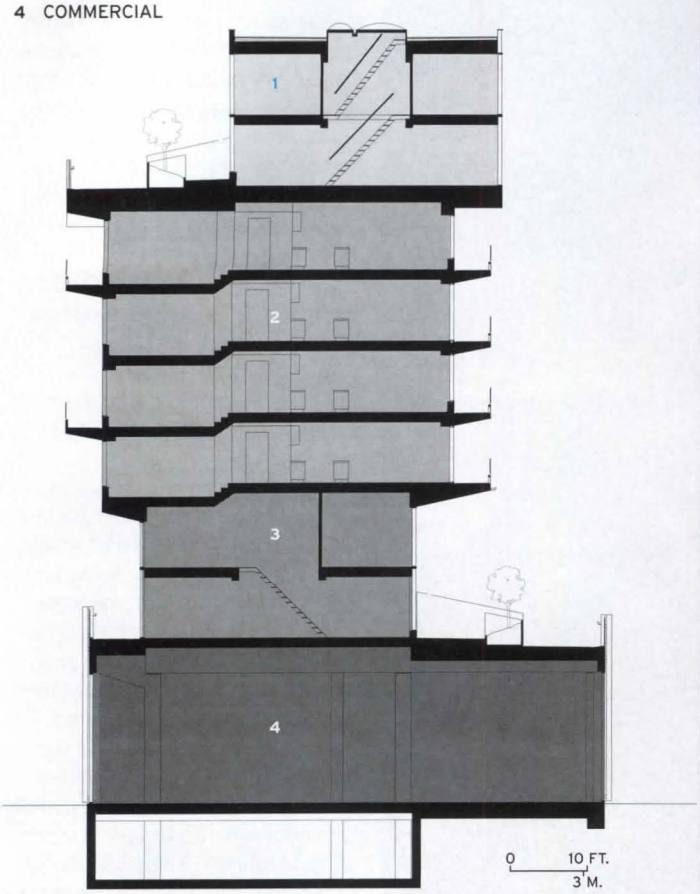
The most unusual aspect of 8 House, one that stops just shy of gimmicky, is a continuous open-air ramp. Along with stairs and elevators, it provides access to the townhouses and penthouses as it loops around the building, stretching from the street level to the top floor and back again. More than any other feature, the ramp is intended to imbue the mammoth complex with a sense of community: "Where social life, the spontaneous encounter, and neighbor interaction are traditionally restricted to the ground level, the 8 House allows them to expand all the way to the top," explains Ingels. The resulting environment, according to the firm's promotional literature, is a "lively urban neighborhood" with the "intimacy of an Italian hill town," even in the midst of Copenhagen's flat-as-a pancake terrain.

In 8 House's big, bold moves and its geometric complexity one can easily recognize the influence of Rem Koolhaas and the Office of Metropolitan Architecture (both Ingels and Julien De Smedt, his former partner in the now-dissolved practice PLOT, are OMA alums). The inventiveness extends to the smaller scale with cleverly conceived components, such as a zigzagging cable system supporting the stairs inside two-story apartments and the outdoor ramp's stone paving pattern delineating a slope gradual enough for people in wheelchairs. However, on the whole, 8 House isn't a project of refined details. Some elements, like the aluminum rainscreen cladding, feel undeveloped; at certain locations, the spaces between the individual facade panels read as

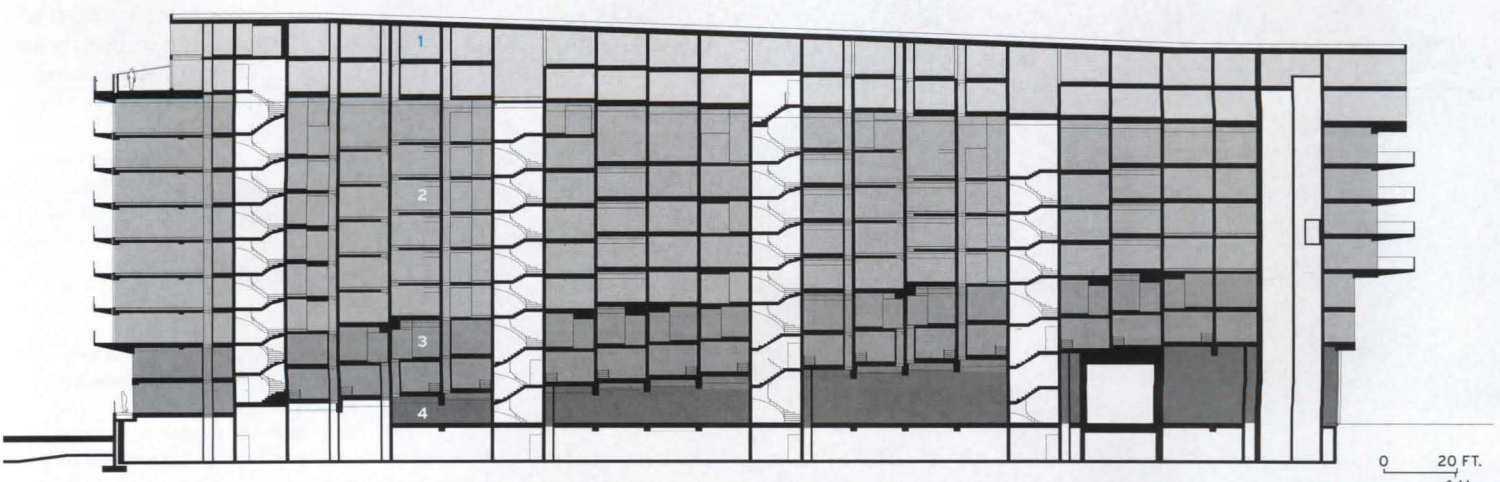
The layer-cakelike arrangement of different uses is recognizable in the building's street-facing facades, with commercial space enclosed behind a glass curtain wall at the base and the various types of apartments behind projecting aluminum-clad bands above.

SECTIONS

1 PENTHOUSES
2 FLATS
3 TOWNHOUSES
4 COMMERCIAL



SECTION A-A



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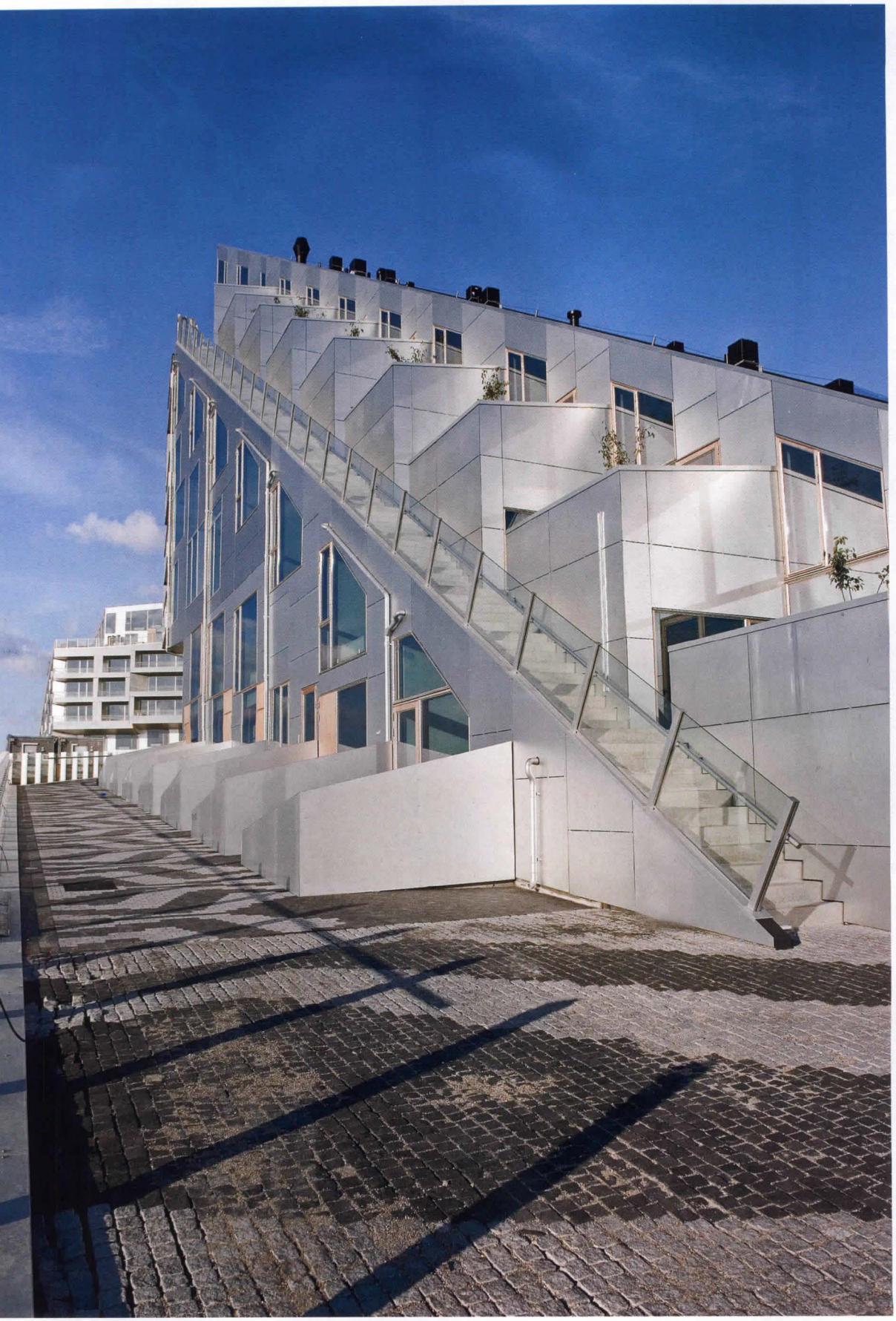


gaps or awkward joints, rather than carefully considered reveals.

Although they may be a little rough around some of their edges, the 8 House units, which are considered "mid-market" by Danish standards, seem like appealing places to live. Most apartments have dual exposures and all have open and airy layouts, terraces or garden spaces, and niceties such as tiled baths and hardwood floors. And then there is the allure of BIG's social vision. But it is too soon to know for certain if the hoped-for sense of community and neighborhood vitality will materialize, because current market conditions are very different from those during the boom times when the project was conceived. A little over half of the apartments have sold since the building's completion in December and a 25-unit apartment tower included in the original scheme has been put on indefinite hold.

However, there are encouraging signs of 8 House's potential. On a gloomy early spring afternoon, the café, which sits at the building's low, southwest tip, had customers even though it was well after lunchtime. Patio furniture had begun to populate the terraces and entry gardens, and from a vantage point in the northern courtyard, office workers could be seen busy at their desks.

The building is apparently popular with nonresidents, including architectural tourists. There are enough of these visitors that one page of the sales office website has instructions for obtaining permission for tour groups. It is the only part of the site in English – one indication that the building is already a destination for design junkies from all over the world.

According to Ingels, the building also attracts people from other parts of the city. In good weather, they stroll on the looping path's man-made terrain. "Since Copenhagen is so flat," he says, "they come to enjoy the urban landscape." ■

LEFT: **The sloping path that loops around the building provides direct access to some apartments. The pattern in the paving is intended to delineate a slope comfortable for people in wheelchairs.**

For a video tour of the project see our website or iPad edition.

TOP: **There are three basic types of 8 House apartments – townhouses, flats, and penthouses – but all have open and airy layouts, hardwood floors, and individual terraces or garden spaces.**

BELOW: **The bowtie's knot houses various communal facilities, including a shared roof deck that affords views out over the complex.**

CREDITS

ARCHITECT: Bjarke Ingels Group – Bjarke Ingels, Thomas Christoffersen, principals in charge; Ole Elkjær-Larsen, Henrick Poulsen, project leaders; Finn Nørkjær, Henrik Lund, project managers

ENGINEERS: Moe & Brodsgaard (structural, m/e/p)

CONSULTANTS: KLAR (landscape)

GENERAL CONTRACTOR: Høpfner Partners

CLIENT: St. Frederikslund Holding

SIZE: 650,000 gross square feet

COST: $133 million

COMPLETION DATE: December 2010

SOURCES

ALUMINUM FACADE PANELS: VINK

PREFABRICATED CONCRETE: DS Elcobyg

SITE-CAST CONCRETE: Hoffman

WINDOWS: Krone Vinduer

SKYLIGHTS: Lumex

GREEN ROOFS: Veg Tech

RAILINGS: HB Trapper & Stål

LIGHTING: Fugmann El-Anlæg

EXTERIOR DOORS: Eiler Thomsen/ Schüco

INTERIOR DOORS: Swedoor/Jeld-Wen

ELEVATORS: KONE

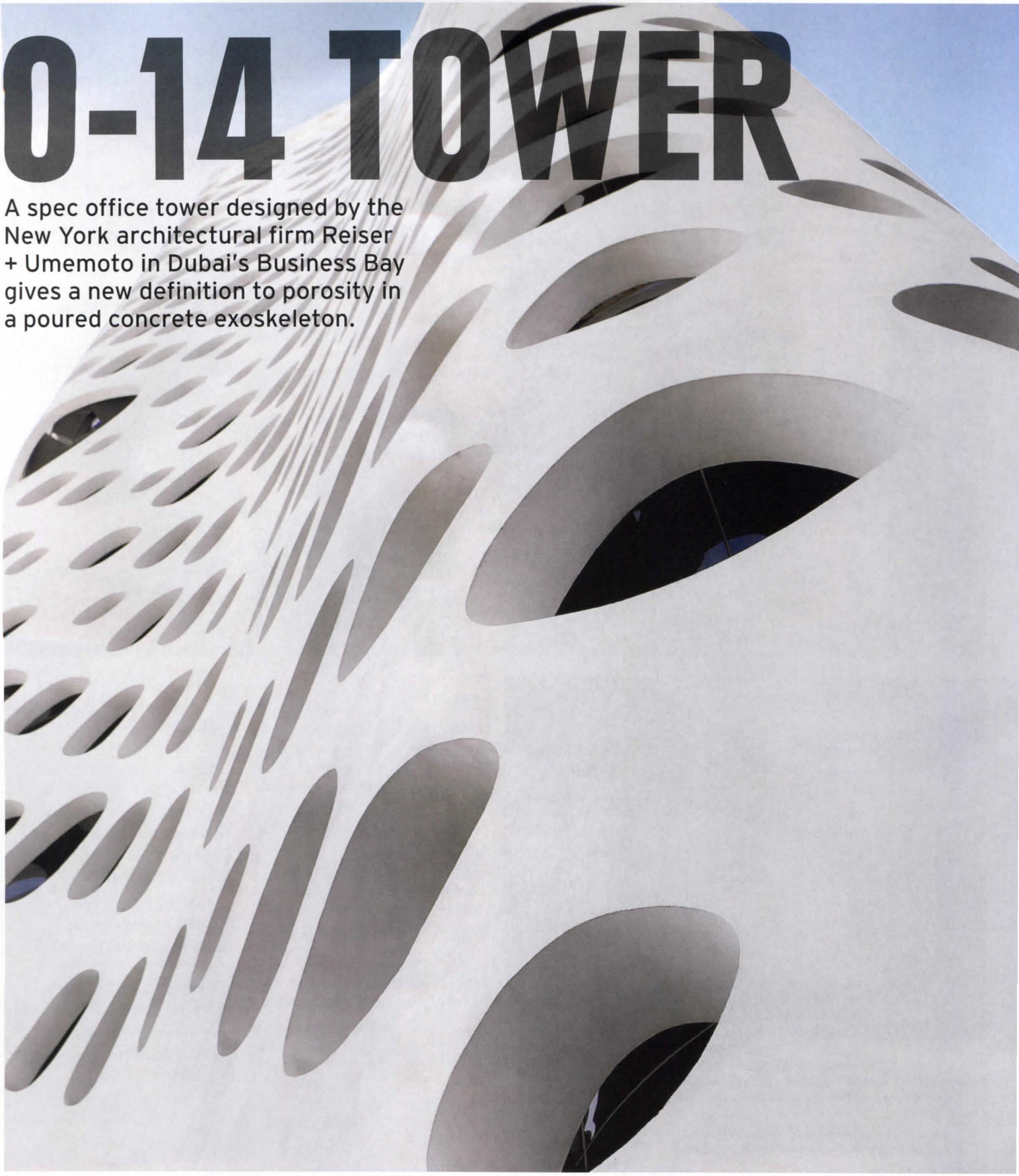
FLOORING: Danish Hardwood

PREFABRICATED BATHROOM UNITS: E.J. Badekabiner

Reiser + Umemoto / By Suzanne Stephens

O-14 TOWER

A spec office tower designed by the New York architectural firm Reiser + Umemoto in Dubai's Business Bay gives a new definition to porosity in a poured concrete exoskeleton.

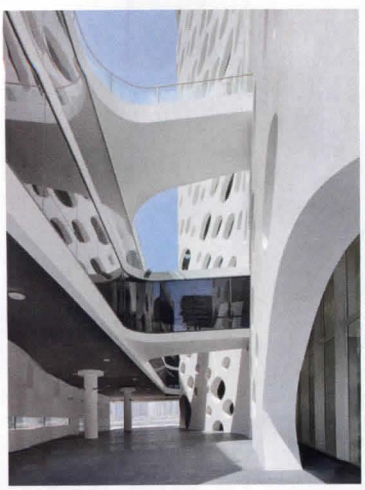


Holes in the concrete exoskeleton, which is 2 feet thick at the base and 1 1/4 feet thick above, offer arresting glimpses of Dubai. On the roof you can see the Burj Khalifa rising in the haze.

THE SHOWY SKYSCRAPERS that established Dubai's identity in this hot, humid, desert site on the Persian Gulf have been overshadowed by the towering Burj Khalifa [RECORD, August 2010, page 78]. Yet one short office building – a mere 22 stories– holds its own against Skidmore Owings & Merrill's 2,717-foot-high glass-and-steel behemoth. The diminutive office tower (347 feet high), designed by New York architects Reiser + Umemoto, stalwartly rises from a white, sandy lot in this instant city in the United Arab Emirates. It makes its mark by original means: with a holey, curvaceous outer shell.

Called O-14 after the site number of the Business Bay district, the slim structure's dominant feature is a poured-concrete exoskeleton gouged with 1,326 blobby holes in five sizes. The architects intentionally sought to create an alien presence in the melange of banal towers. "We embraced the radically abstract terrain of nowhere and its artificiality," says Jesse Reiser.

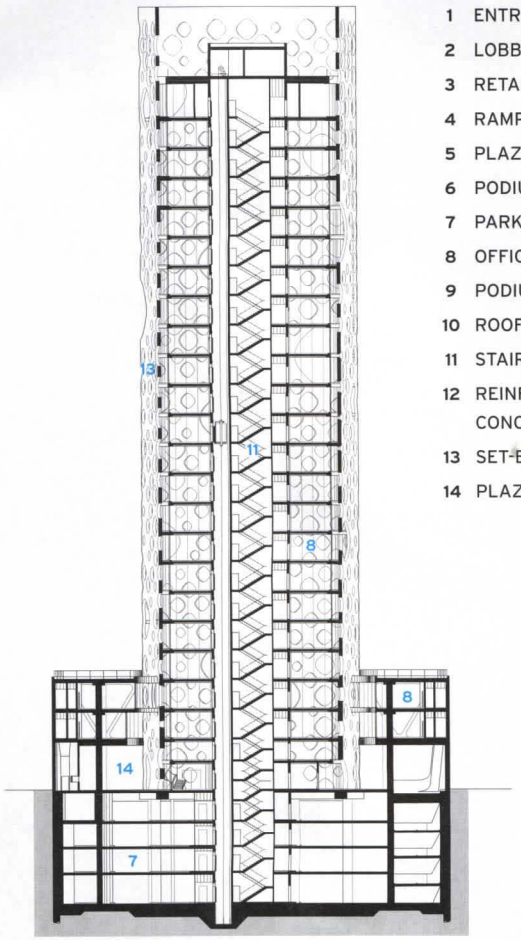
The ghostly white exoskeleton



ABOVE: **The two-story elevated podium links to the concrete exoskeleton and the glass tower via bridges. The rear is open at the ground level to permit access to the plaza overlooking the bay.**

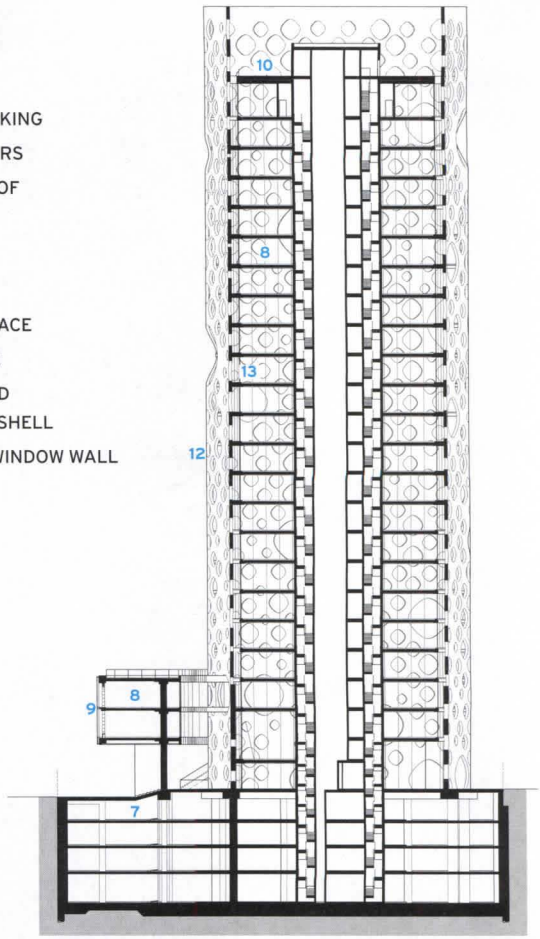
RIGHT: **A dense basket weave of rebar strands supports the shell. Foam forms covered in melamine laminate were inserted into the holes before concrete was poured.**

OPPOSITE: **The architects wanted the tower to be read as a monolithic and scaleless shaft from the street.**

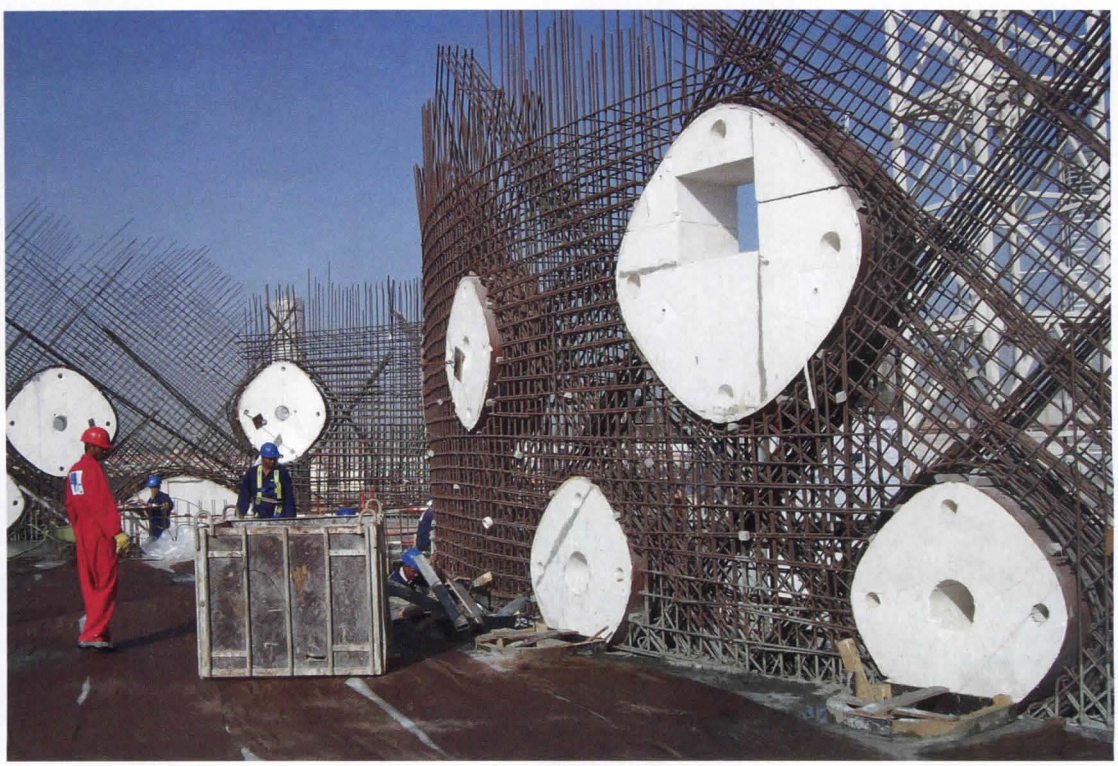


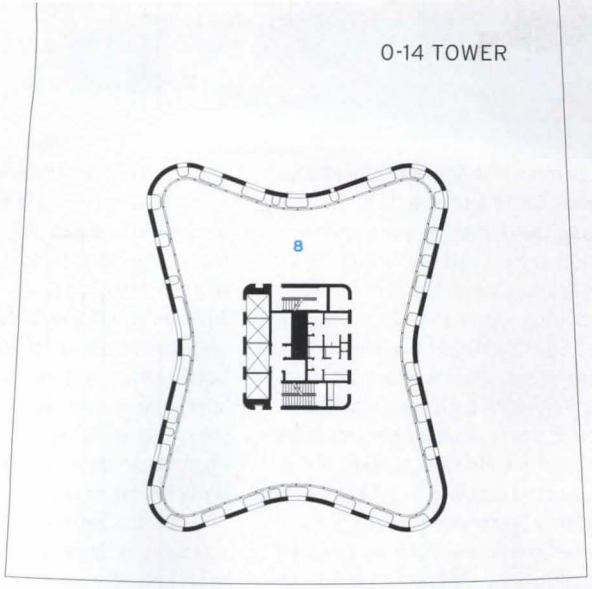
SECTION A-A

1 ENTRANCE
2 LOBBY
3 RETAIL
4 RAMPS PARKING
5 PLAZA STAIRS
6 PODIUM ROOF
7 PARKING
8 OFFICES
9 PODIUM
10 ROOF TERRACE
11 STAIR CORE
12 REINFORCED CONCRETE SHELL
13 SET-BACK WINDOW WALL
14 PLAZA

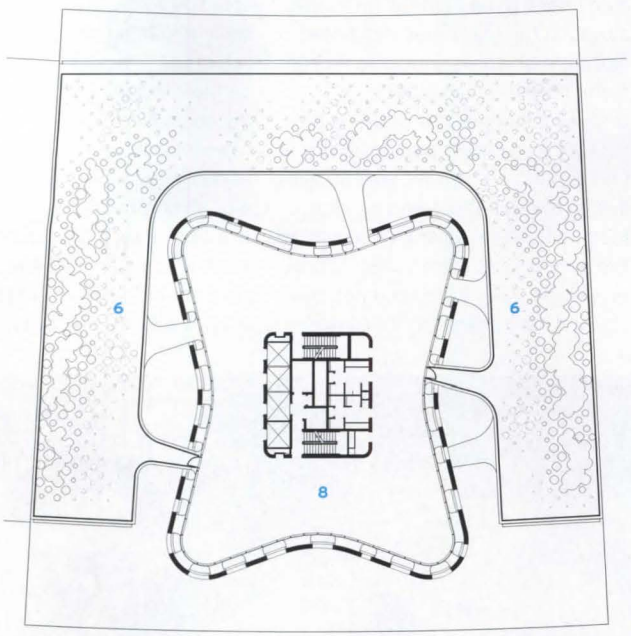


SECTION B-B

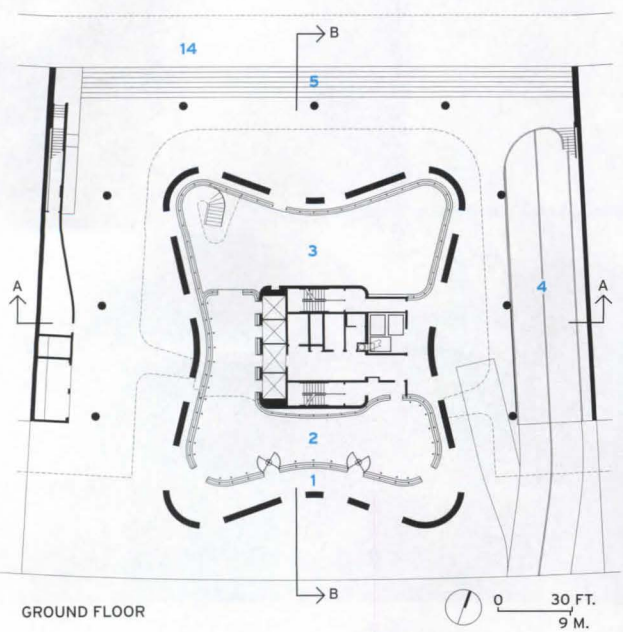




TYPICAL FLOOR



THIRD FLOOR



GROUND FLOOR

BELOW: **A corner office in the tower's column-free interior allows ample views out in spite of the exoskeleton's presence.**

OPPOSITE: **In the lobby, the architects designed the powder-coated aluminum reception desk to echo the curve of the walls and blend in with the luminescent white marble floors.**

stands 3 feet away from an inner glass-walled enclosure that follows its swerving contours: The two are linked by structural concrete tongues. With a central stair and elevator core, the interiors are column-free, allowing each floor to provide 6,000 square feet (net) of office space to its tenants.

Jesse Reiser and Nanako Umemoto, best known for winning international architectural competitions, got this commission unexpectedly in 2005. They had entered a competition for another site in the Business Bay district, held by Dubai Properties. While they lost the project to Zaha Hadid (still unrealized), their scheme piqued the interest of one of the developers, Shahab Lutfi, who was about to open his own office. By coincidence Lutfi was working with a Dubai architect, Khalid Alnajjar, who had studied under Reiser at Columbia University's architecture school, and highly recommended the team.

In an early version, the architects conceived the 0-14 building as an amorphous shape with glazed apertures. But the problems of placing gaskets around the glass and connecting the shaft to the concrete floors convinced the firm to develop a double-layered structure. By separating a concrete exoskeleton from a glazed concrete deck and core tower by 3 or more feet, the architects found the residual space would create a stack effect that takes hot air out of the building. Furthermore, the solar protection afforded by the curvilinear outer cylinder reduced cooling expenses by about 30 percent. Since the glass is shielded, it didn't need to be high-performance, although the team specified tinted glazing that would appear to recede farther behind the facade.

The master plan for Business Bay calls for towers on a podium that contain parking, with street-level arcades linking to retail shops and building lobbies. Reiser + Umemoto convinced the developer to place parking underground on this 34,000-square-foot site and have a two-story elevated podium wrap the tower on three sides to accommodate more office space and a restaurant. The revision meant the front facade could still be read as monolithic and scaleless, while elevating the podium allows pedestrians access to a plaza at the back overlooking the bay. A truss spans the rear of the podium to keep the ground less cluttered by columns, and bridges on two levels link the podium to the tower.

Since the exoskeleton would offer lateral resistance to wind, the architects and engineers found that the elevator core and the concrete shell could be lighter than normal. The shell, which Reiser refers to as "atectonic," lacks any break in its surface, including expansion joints. But the hole-ridden, contoured slipcover of concrete required a dense basket weave of rebar – its underlying "structural tectonic," in Reiser's words. The team tied the rebar at intersections with stirrups in the zones of high stress, creating a diagrid with 40 percent openness.

The concrete pour offered its own challenges since the subcontractors ignored the architects' 3-D modeling of the formwork for the holes. Their own methods turned out to be OK, says Reiser, but some deformation of the foam forms in the holes at the bottom required wrapping them with melamine laminate.

Inside the 398,655-square-foot tower, occupants are protected from the high heat and gusts of sandy wind, while they still have expansive views out. In some respects the design could provide an influential prototype for other desert buildings. It comes as no surprise that the sculptural solution was expensive to build. Although the design saves in cooling costs, the up-front investment, withheld by the developer, was higher than a conventional structure, Reiser notes. Like many high-rise buildings erected in far-flung places, the willingness of clients, particularly before the economic free fall of 2008, has encouraged a liberty to experiment that could provide technical and sustainable lessons for the next building boom. Whenever that comes. ■

PHOTOGRAPH: COURTESY REISER + UMEMOTO

CREDITS

ARCHITECT: Reiser + Umemoto – Jesse Reiser and Nanako Umemoto, principals in charge; Mitsuhisa Matsunaga, Kutan Ayata, Jason Scroggin, Cooper Mack, Michael Overby, Roland Snooks, Michael Young, and Neil Cook, design team.

CLIENT: Creekside Development Company (owner); Shahab Lutfi, HH Investment & Development (developer)

ARCHITECT OF RECORD: Erga Progress

ENGINEER: Ysrael A. Seinuk, e.Construct, (structural)

CONSULTANTS: R.A. Heintges & Associates (window wall); L'Observatoire, (lighting); Reginald D. Hough

SIZE: 398,655 square feet (gross)

COST: Withheld

COMPLETION DATE: March 2011

SOURCES

METAL AND GLASS CURTAIN WALL: Wuhan Lingyun Building Decoration Engineeering Co.

FORMWORK: Beijing Aoyu

RECEPTION DESK: Artistic Metal Works

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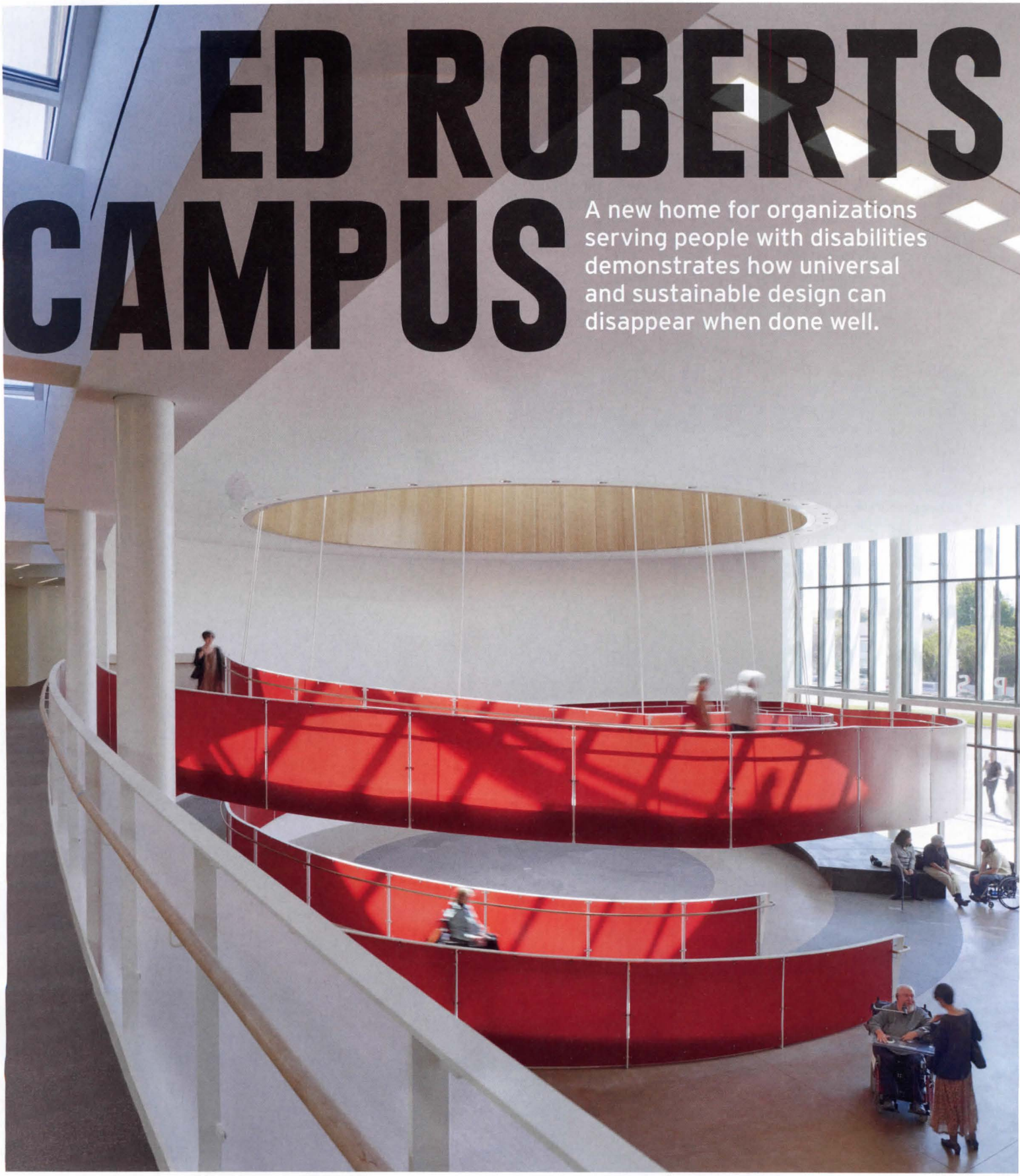
Leddy Maytum Stacy Architects / By Clifford A. Pearson

ED ROBERTS CAMPUS

A new home for organizations serving people with disabilities demonstrates how universal and sustainable design can disappear when done well.



WITH ITS GRAND roof canopy and sweeping entry plaza, the Ed Roberts Campus welcomes everyone into its fold. The 82,500-square-foot building, which sits atop a Bay Area Rapid Transit (BART) station in a scruffy part of Berkeley, sends a powerful message of inclusiveness to the diverse groups of people who work in and use it, as well as the neighborhood around it and, indeed, the world beyond. As the new home of 10 organizations serving people with many different kinds of disabilities, the center caters to the specific needs of people who have been shut out of buildings in the past or brought in through the backdoor ramp. But its architecture speaks to everyone, using a design vocabulary that emphasizes the universal, rather than the particular.

Many people walking by or heading to the BART station have no idea the building provides offices and meeting spaces for groups helping individuals with special needs. That's exactly what these groups like about it. "We didn't want it to look institutional, like a hospital," states Dmitri Belser, executive director of the Center for Accessible Technology (CforAT) and president of the Ed Roberts Campus (ERC).

OPPOSITE: **A 56-foot-diameter helical ramp off the lobby serves as a social hub for visitors and people working in the building. Wide enough for two wheelchairs to descend together, so people can continue conversations begun upstairs, it also wraps around a space that can be used for exhibitions or receptions.**

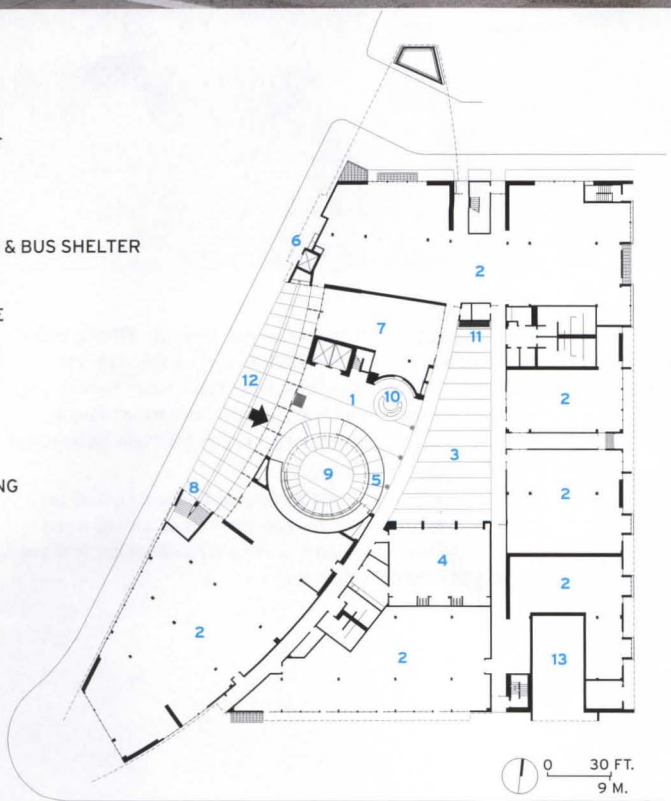
ABOVE: **A steel-and-wood canopy projecting out 30 feet from the Adeline Street facade gives the building a civic presence, while a curving entrance plaza provides a place for cars to drop off visitors.**

CEU

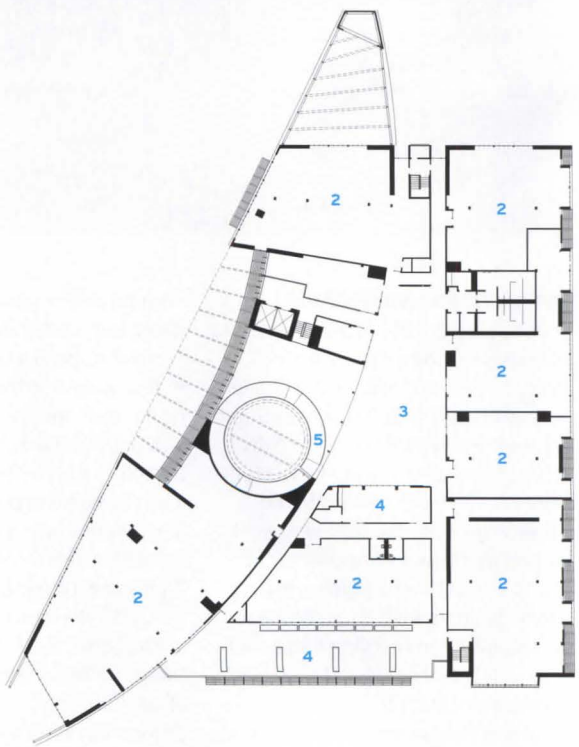
The architects used the entry plaza and various facade treatments to break down the long Adeline Street elevation. Ipé-wood screens help shade offices inside.

RIGHT: **The east side of the building overlooks a parking lot for BART riders. By occupying part of what had been a much larger lot, the building helps fill a gap in the urban fabric.**

1 LOBBY
2 LEASE SPACE
3 CENTRAL COURT
4 CONFERENCE
5 RAMP
6 BART ELEVATOR & BUS SHELTER
7 CAFÉ
8 BART ENTRANCE
9 EXHIBITION
10 RECEPTION
11 FOUNTAIN
12 PLAZA
13 RAMP TO PARKING
14 ROOF DECK



FIRST FLOOR



SECOND FLOOR

Of the 10 tenant organizations, seven are ERC partners and serve on the board of directors. "We wanted it to be open to everyone," he explains. "Buildings that shut us off from others imply there's something shameful about having a disability," says Belser, who is legally blind. One piece of evidence pointing to the building's broad appeal is the story of a local couple with no disabilities who liked the place enough to rent it for their wedding in June.

The project began in 1995 right after Ed Roberts, an activist for people with disabilities, died. The first student with significant disabilities to attend the University of California at Berkeley and the first disabled person to serve as California state director of rehabilitation, Roberts inspired and led a movement to bring handicapped Americans into the mainstream of society. To honor his legacy, many of his admirers decided to create a place where some of the groups he influenced could come together and carry on his work.

Instead of looking for an architect with expertise in accessibility, the ERC searched for one who could deliver good design. In 1999 it interviewed a number of firms and ranked San Francisco–based Leddy Maytum Stacy Architects (LMSA) second. But after working with its first choice for a couple of years and not being completely satisfied, the client switched to its backup led by principal William Leddy. "Bill Leddy got it immediately and took the time to educate himself in the needs of the building's users," says Yomi Wrong, executive director of the Center for Independent Living, an ERC partner organization. "He drank the Kool-Aid," she adds with a laugh.

"This client group was incredibly committed and tenacious," recalls Leddy. "They had this dream that was such an ambitious stretch for them. None of these organizations

CONVERSATION WITH **Susan Henderson**
Disability Rights Education and Defense Fund

"From the very beginning, it was clear to us that this building was about developing the best design for everyone," states Susan Henderson, executive director of DREDF, a national civil rights and policy center founded in 1979. "It wasn't just a place where we met code." Trained in anthropology and business, Henderson found the design process "exciting," even though it involved long meetings on bathroom stalls and door knobs. Because some people on the building committee were blind, the architects had to develop new ways of communicating their ideas. So they devised solid models and tactile floor plans printed on embossed paper that people with impaired vision could explore with their fingers.

"Sometimes there were disagreements among people with different disabilities," recalls Henderson. "But we always found a solution." For example, when people in wheelchairs said they hated the raised bumps in flooring that help the blind find their way around, the architects specified grooves recessed in the floor instead.

What works for specific groups, though, often works for everyone, she explains. The central court with its tables and chairs has proved to be as enticing to visitors without disabilities as those with. The ERC has also found it can generate revenue renting out its meeting rooms and even its lobby, where one bride walked down the ramp to be wedded to her groom.

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RIGHT: **Like the ramp, walkways are 7 feet wide to accommodate two wheelchairs. In the most active areas on the entry level, concrete floors provide good surfaces for wheelchairs. But on the walkways, carpeting softens ambient sounds to help the hard of hearing.**

OPPOSITE: **In the central court, contrasting colors and flooring textures assist visually impaired people to find their way. Skylights and clerestories also help by bringing daylight into the court and along walkways.**

had ever raised much money before, but here they were putting together a $47 million project." Some of the money came from the city of Berkeley, some from federal transportation funds (because the campus adjoins a mass transit station), and much of the rest was raised by the ERC partners.

Although many people think of Berkeley as a place populated by students, well-off liberals, and foodies with palates trained at Chez Panisse, the city has some less affluent areas. South Berkeley, where the ERC is located, is one of those neighborhoods, in part because the construction of the Ashby BART station in the early 1970s left a large hole in the urban fabric. "This was an unloved part of town," states Leddy. Facing Adeline Street, a main artery connecting Berkeley with Oakland, the ERC fills an urban void, acting as a low-rise, civic building block. It helps stitch a residential neighborhood on its east side to the more commercial activities along Adeline on the west.

Despite all these urban design moves, the building elicited a significant amount of local opposition – in part because of its size and in part because of the special needs of the people it would serve. Responding to neighborhood concerns, the ERC agreed to reduce the building's height from three to two stories. To break down the long Adeline Street elevation, LMSA varied the materials and facade treatment and carved out a central plaza where cars can drop off people without slowing down traffic. An open-frame steel canopy cantilevering 30 feet out toward Adeline brings daylight down to the entry plaza, while ipé wood screens the north and south portions of the facade. The wood elements echo the shingles found on many houses in the area.

"Our focus on mission-driven work made us a good fit for this project," states Marsha Maytum, another principal at LMSA. The firm has designed a number of low-income and affordable housing projects, along with schools, sustainable workplaces for organizations such as the Thoreau Center and the Natural Resources Defense Council, and cultural facilities for the California Shakespeare Theater and the Bay Area Discovery Museum.

The ERC clients asked the architects to take a "visionary" approach to the building, recalls Leddy. "They wanted it to be a case study of integrating universal and sustainable design, one that could be replicated by others and flexible enough to evolve over time." So the architects mostly used economical, "off-the-shelf" components and avoided expensive new technologies such as infrared wayfinding devices. As these technologies become more widely available and less expensive, they can be added to the building.

While universal design – a somewhat vague set of principles aimed at creating buildings, interiors, and products usable by nearly everyone in society – has been applied to individual homes and certain residential projects, it has rarely been attempted at such a civic scale, says Leddy. The architects did a lot of basic research, a process made more challenging by the continually evolving nature of the field. "Standards for universal design are changing all the time," says Leddy.

Universal design goes beyond the

CONVERSATION WITH Yomi Wrong
Center for Independent Living

"This building has raised the bar," states Yomi Wrong, executive director of the CIL, the largest tenant at the ERC. "Organizations from other cities and countries want to come here and tour it." Wrong, who uses a wheelchair, is an engaging tour guide, explaining how the building has improved the efficiency and morale of her staff, how its connection to a BART station has increased the number of people using her group's services, and how its architecture entices even people without disabilities to come inside. "The ramp is the most stunning part of the building," she exclaims. But it also provides her with peace of mind. "It's empowering to know I can get out on my own and not have to rely on anyone else."

"We weren't really sure how well the building would work," she says, because it had to accommodate a lot of different kinds of people. But she has become a believer, as she has discovered how easy it is now for her to get into and move through the building. "I'm able to get everywhere now." She also says the building makes an important statement about her organization. "It says we've grown up and become more established, more prominent."

rules set out by the Americans with Disabilities Act (ADA) of 1990 by accommodating groups of people not covered by the act, such as those without the use of their arms or those with sensitivities to chemicals, explains James L.E. Terry, chief executive officer of Evan Terry Associates, an accessibility consultant on the project. "While there are some buildings designed for specific groups that have accessibility features not found at the ERC, I don't know of any that has as many features in one place," he says.

Instead of viewing universal design as a set of rules constricting the architecture, Leddy saw it as "just good design." He adds, "I don't want architects to think of it as being something different or something they need to be certified in."

To help themselves understand the scope of universal design, the architects broke it into six categories: 1. the physical environment (including the way people approach and arrive at the building, move through it, understand its organization, and engage with its life-safety features); 2. the visual environment (including daylighting, electric lighting, visual contrasts, and wayfinding); 3. the acoustical environment; 4. the thermal environment (including natural ventilation and filtered outdoor air); 5. the electronic environment (including security, communications, and digital access); and 6. the chemical environment (including using materials that don't emit volatile organic compounds or other toxins).

Many of the things LMSA did at the ERC to help people with disabilities, such as using daylight to assist the blind with wayfinding, are good for everyone. For example, the architects brought sunlight into a covered central court through a set of circular skylights and used long skylights and clerestory windows along second-story walkways. Likewise, specifying operable windows wherever possible and nontoxic materials creates healthier indoor-air quality, which helps everyone, not just people sensitive to chemicals.

Leddy and his team even treated elements that might at first seem to be clearly aimed at disabled people – such as the building's 56-foot-diameter ADA ramp adjacent to the lobby – as design opportunities rather than code-compliance problems. So instead of tucking the ramp off to one side, the architects celebrated it as the building's iconic element and put it front and center. The helical ramp with its translucent red resin balustrade panels is suspended from cables attached to its inside radius, so it seems to float when viewed from other parts of the lobby or the central court. A large skylight with boards of warm bamboo lining the light well sits above the ramp.

By making the ramp 7 feet wide, the designers created enough space for two people in wheelchairs or a person in a chair and one on foot to descend together without having to break off a conversation.

CONVERSATION WITH **Dmitri Belser**
Center for Accessible Technology

"This building tells our story," states Dmitri Belser, executive director of CforAT, an organization that trains disabled children and adults to use computers and helps companies, libraries, and government agencies make their websites accessible to everyone. "Look at the ramp," he continues. "Bill Leddy took something that most architects would see as a necessary evil and made it the proud focus of the building." The ramp, though, is more than just a powerful symbol. It encloses a space that the ERC uses as an exhibition area where history, art, and the politics of disability rights come together. It also works well in moving people with all kinds of disabilities from upstairs to down. The day after the ERC opened, a smoke emergency occurred and firefighters came racing over, recalls Belser. "They got here pretty fast, thinking they would need a lot of time to get people out of the building. When we told them everyone had already gotten out on their own, they couldn't believe it."

The building serves a number of critical needs, explains Belser. "It fosters collaboration between the various agencies here and it gives the disability community a real presence." He says the building has helped his organization develop a national profile and gives it greater credibility with foundations and other agencies that provide grants.

Some design decisions, though, involved "dueling disabilities," which meant that helping one group might disturb another. For example, the highly textured floor surfaces that visually impaired people use as directional clues can be uncomfortable for those in wheelchairs. And the hard surfaces that wheelchair users like to roll on can create acoustical problems for the hard of hearing. Working with the various user groups, LMSA made trade-offs in some instances and found compromises in others. The firm developed textured floor surfaces that are more gentle on wheelchairs than the typical raised "buttons" and supplemented these with contrasting colors. It specified concrete floors in the public spaces with the most wheelchair use, but angled walls to

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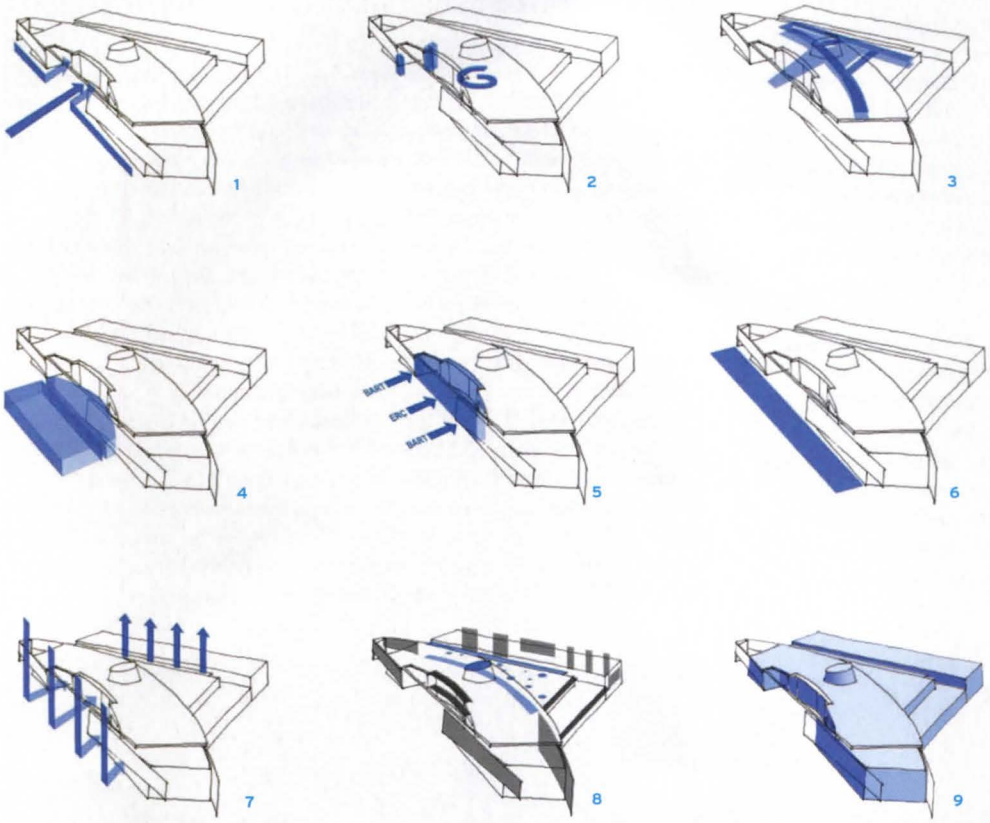
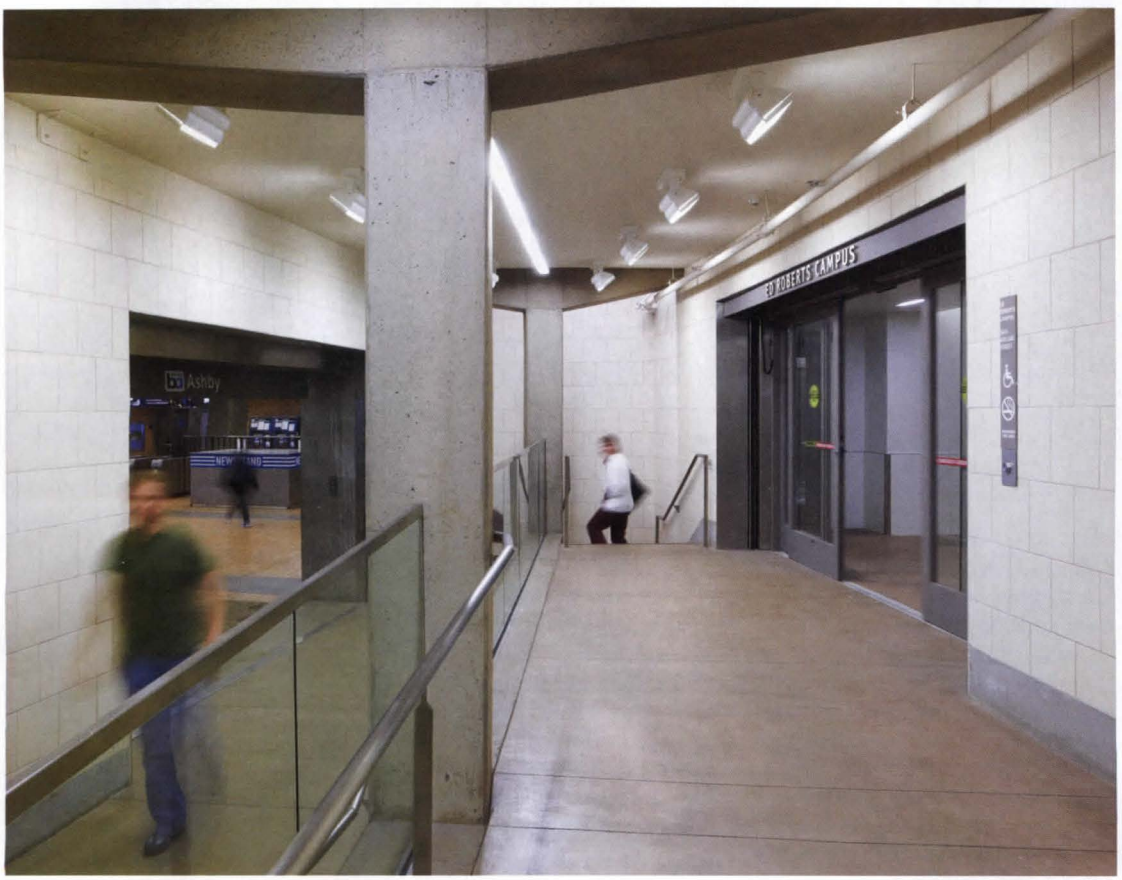
UNIVERSAL AND SUSTAINABLE DESIGN STRATEGIES



1 LEGIBLE APPROACH AND ENTRY
2 VERTICAL CIRCULATION FOR EVERYONE
3 WIDE CORRIDORS AND CLEAR ROUTES
4 BART STATION INTERFACE
5 PLAZA AS TRANSIT THRESHOLD
6 BUS, PARATRANSIT, AND TAXI ZONES
7 NATURAL VENTILATION
8 DAYLIGHTING AND SUN CONTROL
9 HIGH INDOOR AIR QUALITY



CREDITS

ARCHITECT: Leddy Maytum Stacy Architects – William Leddy, principal; Gregg Novicoff, project architect; Tom Monahan, Roberto Sheinberg, project architects for concept design; Christopher May, Sannihita Takkallapalli, Matthew Wadlund, Luke Taylor-Brown, Mike Kothke, Claudia Merzario, Laura Klinger, Sean Kennedy, Aron Eisenhart, Lawton Chang, project team

ENGINEERS: Arup (structural, m/e/p); BKF Engineers (civil)

ACCESSIBILITY CONSULTANTS: Evan Terry Associates, Mikiten Architecture

CLIENT: Ed Roberts Campus

SIZE: 82,500 square feet (above ground); 52,000 square feet (below ground)

COST: $36 million (including site work and transit interface)

COMPLETION DATE: November 2010

SOURCES

CURTAIN WALL: Kawneer

GLASS: Viracon

RESIN BALUSTRADES ON RAMP: 3-Form

ACOUSTICAL CEILINGS: Eurospan Fabric Ceiling

OPPOSITE: **The interface with the BART station is a poured-concrete structure and provides a seamless connection with the rest of the campus. The below-grade structure also includes parking for 121 cars.**

ABOVE: **While some tenant spaces feature adjustable work surfaces, others have standard workstations. Plenty of daylight, operable windows in most areas, automatic doors with long-range card readers, and fully accessible bathrooms have boosted the morale and efficiency of workers here.**

diffuse sound and used a special stretch fabric on the central court's ceiling to absorb sound. In general, the architects tried to create a quiet environment, but they used acoustical accents – such as a fountain at one end of the court – to provide wayfinding clues for the blind.

Many of the accessibility features are fairly simple, but rarely used in other buildings. For example, in elevators and elevator lobbies, control buttons near the floor can be pushed by wheelchair users with their feet if they can't reach the usual set with their hands. Double-sided elevators allow wheelchairs to exit without having to turn around. Automatic doors with long-range card readers provide hands-free access. And signage at different heights ensures that everyone can see where to go, no matter if they are in wheelchairs or standing.

Restrooms are always an important issue for disabled people. To accommodate different needs, the building offers a range of bathroom options, including stalls with handgrips on the left and others with them on the right, and some large enough for a caretaker to help out.

Most offices have occupancy sensors to turn lights on and off automatically, which helps disabled people and saves energy, too. The sensors, along with plenty of daylighting, operable windows, and other green components, make the building perform 15 percent better than California's strict Title 24 energy code.

But Leddy's goal for the ERC was a lot more than assembling a laundry list of strategies and features in one building. "It's a social justice issue," says the architect. "How do we make architecture open to everyone? It's about celebrating diversity, not just accommodating disabilities." He cites the story that Louis Kahn told about building a beautiful bench into a stair landing, so an old man walking with his grandchild could rest for a moment without calling attention to his infirmity. Leddy says he approached this building as he would any other, searching for "the poetic and aesthetic aspects that would make it attractive to everyone." ■

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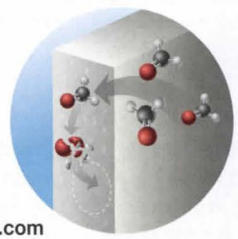

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CIRCLE 14

National Center for Tumor Diseases

Heidelberg, Germany

Across the Neckar River from Heidelberg's medieval heart, cancer researchers and patients come together in a contemporary environment. By **Michael Dumiak**

IN A SUNLIT lab filled with genotyping equipment, Dr. Christof von Kalle and colleagues at the National Center for Tumor Diseases (NCT) plumb the secrets of cellular mechanisms that create cancers. That is the future. Downstairs on a terrace bordering a sculpted garden, outpatients walk the grueling path that cancer demands right now.

The new $42 million facility near old Heidelberg, Germany, is one of relatively few top-level laboratories to bring fundamental research and frontline patient care under a single roof. This spirit of collaboration is what drives the architectural themes of the 141,000-square-foot building, which opened last October, designed by Behnisch Architekten, the Stuttgart-based shop of partners Stefan Behnisch, David Cook, and Martin Haas.

Built on five floors, including the basement and a sunken garden, the NCT is composed of two main elements: a rectangular plinth wrapped in green reflective glass, and a white stucco "floating" volume set on top of it, with a punched-hole facade offset at irregular intervals. Operable windows, a terrace, and a balcony connect occupants to the fresh air outside. The central atrium sits at the heart of the building, connecting the disparate elements inside: the lab research floors, the day clinics, and administration.

The atrium is designed to encourage collaboration among different users of the building. Walking inside through the main entrance, one's eye is drawn to a sculpture of the late physician Mildred Scheel in full stride.

TOP: **The green plinth and white key-shaped form of the NCT nestles on the edge of the Neuenheimer Feld campus. Skylight openings in the folded-construction roof over the building's atrium bring in fresh air as part of the circulation system.**

ABOVE: **The day clinics on the two green levels have outdoor access, either to the balcony or the wooden terrace. Behnisch Architekten also designed the surrounding garden landscape.**

The sheltered front entrance to the NCT is not intended to be a barrier. Patients can take beepers with them and leave the building for the campus grounds to remain remotely available as needed. A botanical garden and zoo are a short stroll away.

Scheel founded German Cancer Aid, a nonprofit that funds the NCT, which is a joint project of the University of Heidelberg's Medical School and the Helmholtz Association's German Cancer Research Center. The 5,113-square-foot entrance hall opens around Scheel's likeness, with a free-standing multilevel staircase guiding visitors inside and up.

"What we are doing with this atrium space is making it as complex as possible," Behnisch architect Peter Schlaier says over coffee in the open café on the first level, around a bend and opposite the staircase. "It feels like a little city. You have streets, places, pathways. From every point the atrium looks different; it's always interesting, you have a lot of different situations." Patients, researchers, and physicians mingle in the natural eddies created by the angled design of the spaces around the atrium shaft, where they can interact.

Three upper floors connect to this central space. One side of the building houses the research labs, with their higher-than-standard floor-to-floor requirements. On the other side, on the ground and first floors, one finds the day clinics, consulting and examining rooms, lecture and exercise rooms, and the specialist tumor board consulting hall. Administrative offices are mixed throughout, with the bulk on the upper level. A basement level connects the NCT to nearby buildings and a sunken garden level.

These connections integrate the *NCT into the small* city called Neuenheimer Feld, the university's massive medical and mathematics campus, which is located across the river from Heidelberg's old town. Here, postwar architecture reigns. Passageways connect many of the buildings underneath the greens. The NCT mostly serves clinical outpatients, but *it can take gurneys*

GROUND FLOOR

1 MULTIPURPOSE
2 OFFICE
3 KITCHEN
4 RESTROOM
5 VESTIBULE
6 STORAGE/MECHANICAL

The aluminum-sheathed "Raum der Stille," a place of contemplation, quiet, and shelter, is a feature that David Cook sees as "hanging" within the atrium. "It is light: It articulates the natural or artificial light falling on its surfaces," he says. The basket-weave stainless steel cladding comes custom-made from KLASS Metall of Offenburg.

in its big elevators and broad basement halls to bring patients from the advanced heavy-ion therapy lab across the garden or the nearby children's clinic.

The lower levels also mark the foundation of the building's ventilation system. Large loops of 0.31-inch-diameter pipes are embedded inside the floor slabs, coordinated with structural reinforcement, explains Behnisch partner David Cook. The soffits of the in situ slabs are exposed, and the building mass itself serves as a form of thermal storage. Depending on heating or cooling requirements, hot or cold water is pumped through the slabs, allowing the superstructure to function as a radiant device.

Air flows from bottom to top in a hybrid system of natural and artificial ventilation. An intake in a nearby garden draws fresh air underground, where it is either cooled or heated; it circulates through the building up to the folded-construction concrete slab roof, which opens over the atrium to north-facing skylights.

Of great importance is the ability to open windows, Schlaier remarks, adding that this is especially true for chemo patients who perk up when exposed to fresh breezes, as do tired physicians and researchers. The day clinic labs have additional domestic details – they feature curtains, for instance, and wooden floors. Chemo chairs are designed to lend the impression of a living room, located near views and open windows. Patients can move around freely, spending time on the terrace, balcony, or further afield.

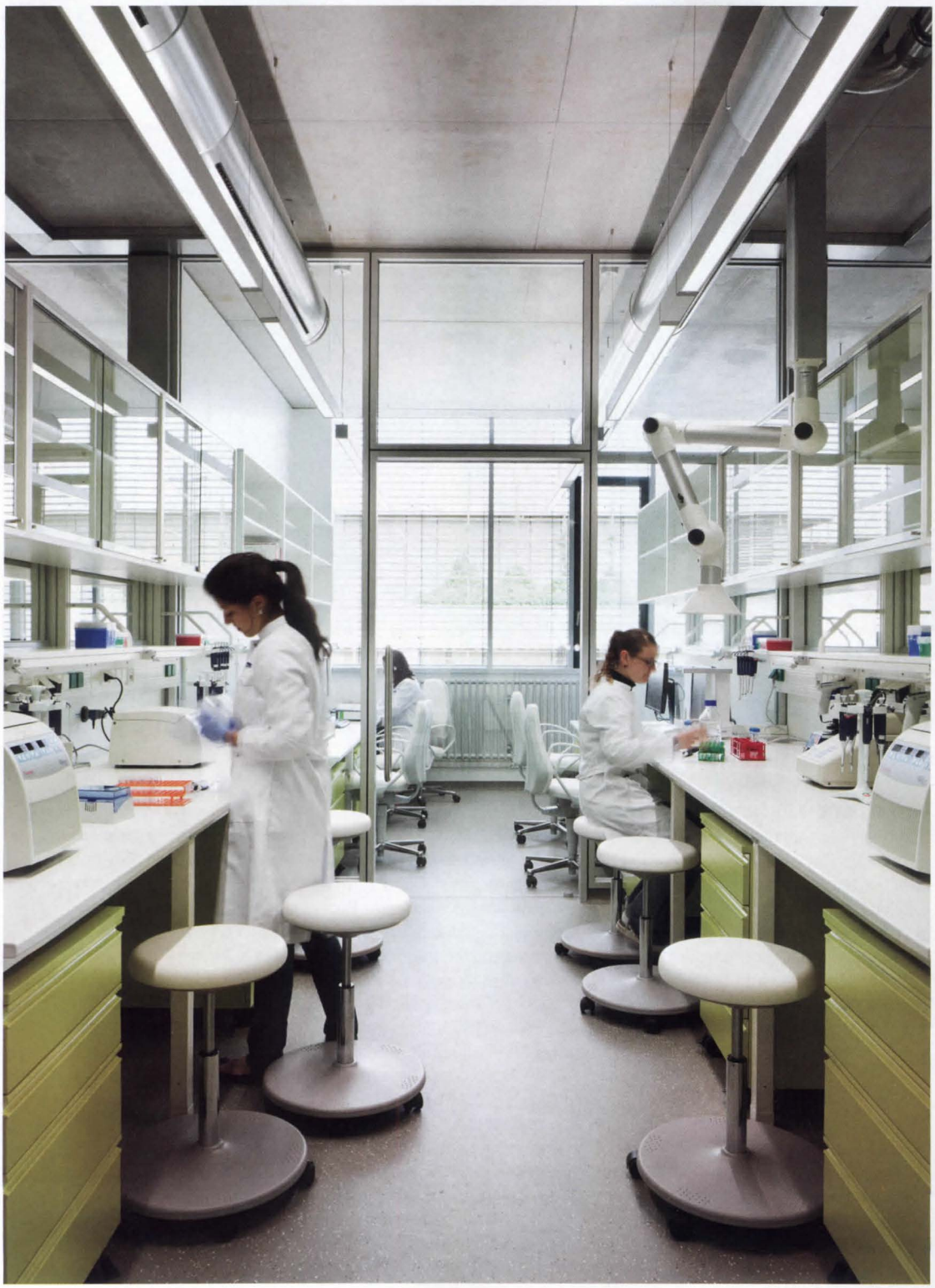
As a whole, the NCT is organized as a think tank for clinical trials. "It's all about moving promising findings from the laboratory bench to the bedside of the patient," says NCT spokeswoman Alenka Tschischka. Chance encounters among medical professionals, from spare moments in the café to downtime in the lab, may well spark the innovative ideas that eventually become important medical realities for patients. ■

Michael Dumiak reports on design, architecture, and science from his base in Berlin.

TOP: **Waiting areas are not small rooms tucked away in the building's far reaches – chairs and benches are found throughout the NCT.**

BELOW: **Deep window reveals "express the thickness of the facades," Cook explains. "In combining boards, reveals, shelving, and alternative seating, we tried to create simple elements that lend character." The view is of the sunken garden.**

BELOW: **Workspaces have a direct visible connection to the outside, and a minimum of suspended ceilings create a feeling of space. Lab equipment is shared to encourage researchers to collaborate and to spark informal conversations that nurture new ideas.**



CREDITS

ARCHITECT: Behnisch Architekten – Stefan Behnisch, David Cook, Martin Haas, project team

CLIENT: Deutsche Krebshilfe e.V./Dr. Mildred Scheel Stiftung

ENGINEERS: Pfefferkorn Ingenieure (structural); ZWP Zibell, Willner und Partner Ingenieur AG (m/e/p and climate)

CONSULTANTS: Behnisch Architekten (landscape); Belzner Holmes LDE (lighting); ITA Ingenieurgesellschaft für Technische Akustik mbH (acoustical)

GENERAL CONTRACTOR: Leonhardt + Weiß

SIZE: 141,000 gross square feet

COST: $35 million

COMPLETION DATE: October 2010

SOURCES

ROOF AND GREEN ROOF: Essenpreis Holzbau und bedachunge

WINDOWS/GLAZING/SKYLIGHTS: HolzGlasVision e.K.; Otto rossmanith, fensterbau

WOOD DOORS: Strähle Raum-Systeme GmbH /Ohning Innenausbau

FLOORING/CARPET: raumstudio falter

LIGHTING: XLA, Phillips, Bega

ELEVATORS: : Alois Kasper

FURNITURE: FaArper Viasit, OKA, Hussl, Arper, Casprini, OKA, Bimos Viasit

The Methodist Hospital Research Institute

Houston

A new lab building is designed to attract top talent and reflect an institution's changing culture while facilitating the full spectrum of translational research.

By Beth Broome

IN THE LATE 1960s, Dr. Michael DeBakey performed some of the country's first heart transplants at the Methodist Hospital in Houston. As the teaching hospital for Baylor College of Medicine since 1950, Methodist was no stranger to cutting-edge technology and research, though for a long time it relied on its partnership with the college for biomedical investigation. But in 2004 the two institutions parted ways as Methodist decided to become an independent academic medical center and formed the Methodist Hospital Research Institute (TMHRI). Dedicated to translational research, TMHRI would employ a bench-to-bedside approach for "translating" laboratory findings into new diagnostics, therapies, and treatments for a range of diseases. To attract top talent, the institute brought in Baylor's world-renowned pathologist and cancer researcher Dr. Michael Lieberman as its founding CEO and president and, soon after, New York–based Kohn Pedersen Fox (KPF) as design architect to help create this 430,000-square-foot, state-of-the-art facility in the heart of the Texas Medical Center (TMC).

With 49 institutions and over 34 million square feet of patient care, education, and research space, TMC is the largest such center in the world. Its dense urban landscape is dominated by architecturally unambitious structures. "For Methodist to hire us along with [executive architect] WHR was a big step," says KPF principal Douglas Hocking, "because they had

ABOVE: **Shoehorned onto a highly compressed lot, the building form became as much about site coverage as about program; the signature bowed glass front was a response to the property line, which hugs the curve in Bertner Avenue.**

OPPOSITE TOP: **The sweeping facade employs glass with a high light-transmittance value that also mitigates solar heat gain, an important consideration in Houston. Inside, a grand stair leads to public spaces on the second level.**

OPPOSITE BOTTOM: **A single reception desk serves both the hospital (accessed by the corridor to the right) and the research institute (accessed to the left). Portuguese sandstone, terrazzo, and cherry wood line the lobby.**

PHOTOGRAPHY: © AKER IMAGING

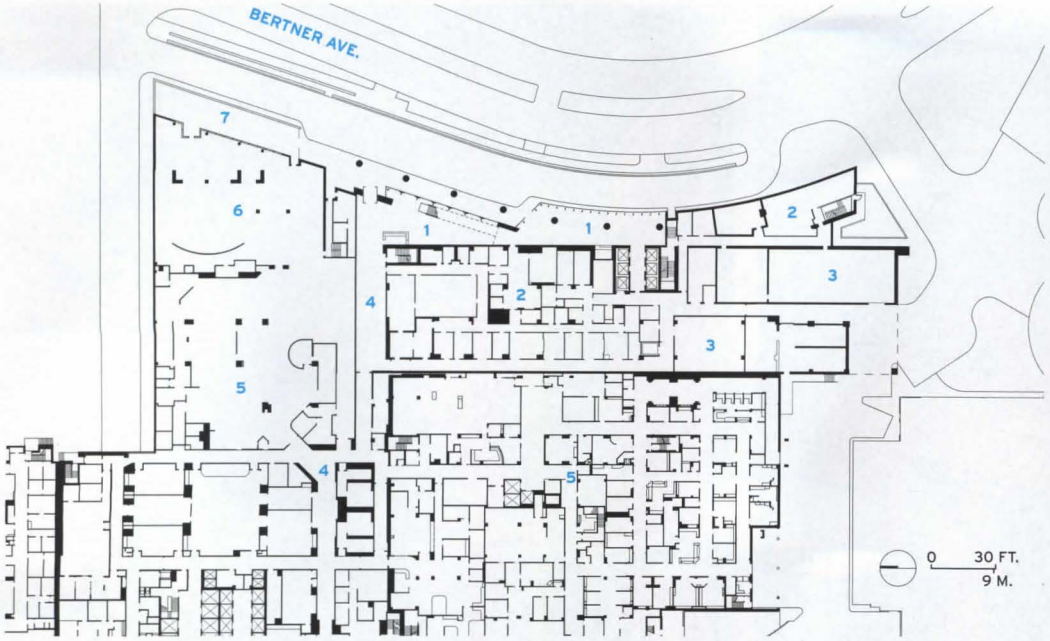
The double-height lobby looks out to Bertner Avenue and draws the outside world into the facility's 232-seat state-of-the art auditorium, boardroom, and pre-function space.

never really done modern buildings. It was part of their larger vision of where they wanted to be for the future."

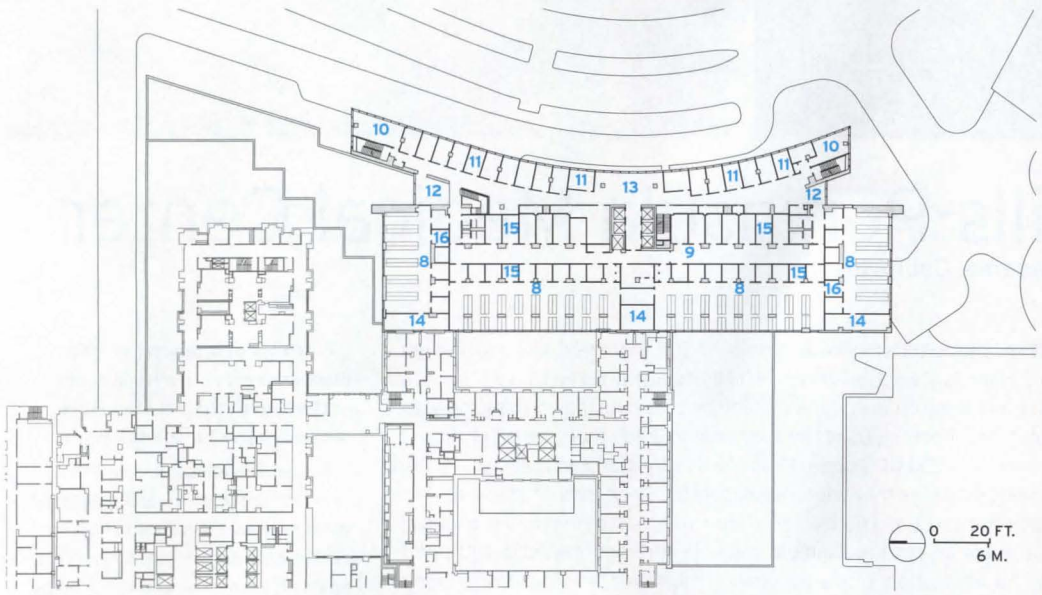
The team spent the first six months studying various sites on Methodist's campus. The challenge became preserving a wide-open lot for a future hospital expansion (in which KPF is involved, but which is currently on hold), while finding a site that was physically connected to the hospital facilities – a crucial component of translational research. In a stroke of luck, the team found that a one-acre sliver of land, used as a vehicle drop-off for the hospital, could, if done artfully, accommodate the program. The team's basic moves are simple: An east-facing glass-walled volume houses conference rooms and principal investigators' (PIs) offices, while a precast-concrete bar to the west ties into the campus and holds the labs.

The client had a goal of accommodating about 90 PIs and 800 staff. Charged with recruiting an esteemed academic faculty, Dr. Lieberman worked closely with the architects and lab consultant to ensure the building would aid in this pursuit and address unforeseen future needs. As the project progressed, the program continued to evolve. "We reached the end of schematics," says KPF principal Jill Lerner, "and then they added two floors." The 12-story concrete structure supports six lab floors, with a surgical-training facility on the fifth floor and a 12th floor that will be fit-out as an amenity level as well as an FDA-regulated manufacturing facility for making therapeutics, vaccines, and imaging agents for use in human clinical trials.

On the lab floors, linear equipment rooms bridge research areas, while breakout spaces (double-height on the north and single-height on the south) link offices and labs and provide opportunities for people



GROUND FLOOR



SEVENTH FLOOR

1 LOBBY / CORRIDOR
2 DIAGNOSTIC SUITE
3 MECHANICAL
4 CIRCULATION
5 EXISTING HOSPITAL
6 CAFETERIA
7 TERRACE
8 LAB
9 LINEAR EQUIPMENT ROOM
10 CONFERENCE ROOM
11 PI OFFICE
12 BREAKOUT AREA
13 LOUNGE
14 RESOURCE
15 PROCEDURE ROOM
16 ALCOVE

to connect. "We could design the offices and labs as pretty generic," says Lerner, "since researchers were not in place." Adds Hocking, "The big challenge was threading everything together, particularly at the ground plane." An expansion of the Dunn building's cafeteria helps connect the new research facility to the hospital, and a double-height shared lobby addresses the client's requirement for entry points to both. It was also critical that the ground-floor imaging suite be easily accessed from both the lobby and the vivarium, which is located on the second level (because Houston is on a floodplain, many functions that would typically go below grade had to be raised). The basement houses a cyclotron and hot-cell and nuclear pharmacy facilities, which are protected by floodgates.

While the institute's new home was completed in October 2010, upper floors are still being fit-out and will take shape as new researchers join the team. "The building makes a statement about the type of research we're going to do here, which is very patient-centric," says Edward Jones, TMHRI's vice president of operations. "It's also given us a chance to put a new face on the front of Methodist Hospital that reflects the changing culture here, where we're going from being just a great hospital to becoming an academic medical center." ■

CREDITS

ARCHITECT: Kohn Pedersen Fox Associates – Jill N. Lerner, managing principal; Douglas Hocking, design principal; Michael Greene, principal; Elaine Newman, project manager

ARCHITECT OF RECORD: WHR Architects – David H. Watkins, principal in charge; Peter Lotz, project manager; Jan Madey, project architect

ENGINEERS: Walter P. Moore & Associates (civil); Haynes Whaley Associates (structural); Affiliated Engineers (m/e/p)

CONSULTANTS: Jacobs Consultancy (lab planner); Curtain Wall Design & Consulting (curtain wall)

SIZE: 430,000 square feet

COST: $178 million

COMPLETION DATE: October 2010

SOURCES

GLAZING: Viracon (glass); Novum Structures (point supported glass)

PRECAST CONCRETE: Redondo Mfg

EXTERIOR CLADDING: American Stone

Mills-Peninsula Medical Center

Burlingame, California

Evidence-based design and stringent earthquake requirements drove the architecture at this Bay Area hospital/medical center.

By Jane Kolleeny

THE NEW MILLS-PENINSULA Hospital in Burlingame, California, is a good example of evidence-based design, which has firmly taken root as the premiere influence on hospital architecture today. Anshen + Allen, now part of Stantec Architecture, used the approach to guide their design of this state-of-the art, 450,000-square-foot facility outside San Francisco. Based on scientific evidence that patients heal better when their physical and emotional comfort is maximized, Anshen + Allen's scheme puts the patient squarely at the center. For example, patients here are treated to 100-percent fresh air for ventilation; single-occupancy rooms for privacy; large windows to bring in light and provide vistas to the outdoors; exterior healing gardens and walking paths; and strategies to minimize noise and infection. "Patients recover more quickly if they have views of nature. Single-room occupancy works better as there is less risk for medical error, for infection, and on the human side healing is more rapid," remarks Kevin Day, senior architect from Anshen + Allen. "Patient-centered care affected all our decisions."

The new hospital, which includes a 180,000-square-foot office building and 800-vehicle parking structure, replaces a 1950s concrete building, which proved to be a "collapse hazard," according to a 1994 state-mandated seismic-safety review of California hospitals. The architects considered renovation but found the cost and logistics prohibitive. "It didn't make sense to retrofit a building that doesn't meet the needs of health care today, which has huge technology needs that won't work in an older building," explains Larry Kollerer, senior project manager from Mills-Peninsula.

The 1994 legislation also compelled the team to pursue a progressive seismic strategy stringent enough to meet 2030 standards. That included a

1. **A palette of stone, wood, and precast concrete varies in color, pattern, and texture, bringing a natural character to the exterior.**

2. **Separate vehicle circulation is provided for visitors and emergency-room traffic. The existing hospital, visible on the far right, will be torn down this summer and replaced by a new emergency entrance, helipad, and more surface parking.**

3. **One passes under an entrance canopy – clad in a sustainably harvested wood-veneered resin panel – into the lobby, which connects on the ground floor to clinical, diagnostic, imaging, surgery, and emergency functions.**

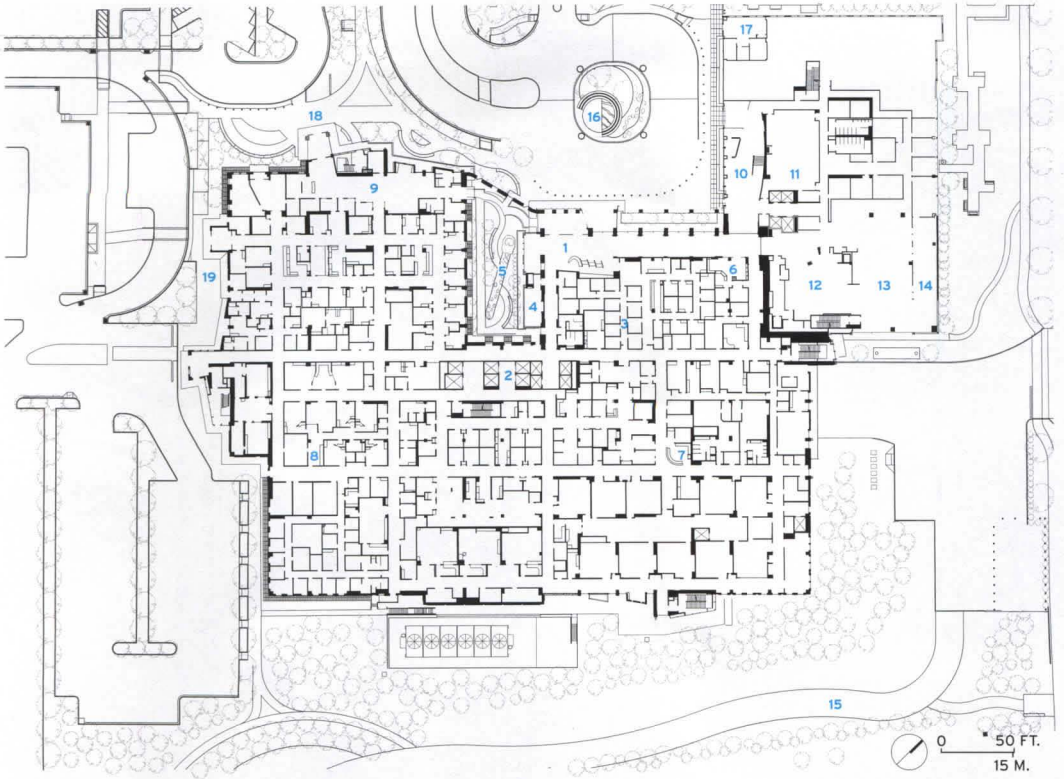
4. **The adjoining medical office building contains a cafeteria and dining room, providing food for patients and staff alike. Modern dining furnishings are complemented with artful lighting fixtures.**

building that could not only withstand a 500-year, 8.0 earthquake in terms of structure, but also could continue operating afterward (the hospital lies just over a mile from the San Andreas Fault). A base isolation structural system reinforces the building's foundation (see sidebar). The design also includes backup generators, tanks for 50,000 gallons of water and 50,000 gallons of sewage storage, and 40,000 gallons of fuel in case of emergency.

Because the hospital has the luxury of a 25-acre site, it was possible to phase out use of the existing building while constructing the new one. "First we built the garage and removed surface parking. Then we built the new hospital, and moved the patients in," explains Day. The architects located structures that require high-volume traffic, like parking and offices, near the street to maintain a quiet atmosphere deeper into the site. A low-rise podium contains emergency, surgery, and diagnostic services while two L-shaped five-story towers, with a total of 311 patient rooms, sit on the podium, pinwheeled to allow for distant views of the bay and mountains.

The design team determined that the Green Guide for Health Care was the best benchmark to ensure sustainability. Through modeling and analysis, the architects developed a strategy to save energy that includes a variable-air-volume system with heat recovery and a high-performance building envelope: The hospital's energy consumption is expected to be 33 percent lower than California's stringent Title 24-energy-performance baseline. Numerous other sustainable strategies include low-flow plumbing fixtures, lighting controls, daylighting, and materials made with minimum toxicity and renewable and recycled content.

While Mills-Peninsula employs an abundance of high-tech and sustainable strategies, implemented with shiplike efficiency in the tightly programmed spaces, its greatest success is the way the design addresses users' well-being. The warm and inviting public spaces – the gardens, lobbies, dining area, and a meditation room – combined with patient rooms that reflect the holistic values of evidence-based design, make this a model facility. ■



1 MAIN LOBBY
2 CIRCULATION CORE
3 ADMITTING / PATIENT INTAKE
4 MEDITATION ROOM
5 ACCESSIBLE HEALING GARDEN
6 GIFT SHOP
7 INVASIVE SERVICES / SURGERY
8 DIAGNOSTIC AND IMAGING
9 EMERGENCY DEPARTMENT
10 OFFICE BUILDING LOBBY
11 CONFERENCE CENTER
12 SERVERY
13 DINING AREA
14 OUTDOOR DINING TERRACE
15 WALKING PATH / FIRE LANE
16 FOUNTAIN
17 SECURITY
18 EMERGENCY ENTRY
19 AMBULANCE ENTRY

Each of the building's columns sits on a seismic-isolation bearing, in this case a friction-pendulum bearing, a technology designed to both protect buildings and their occupants, and allow the facility to remain operational after a magnitude 8.0 earthquake. This form of base isolation technology was used due to the proximity of the hospital to the San Andreas Fault. Initial geotechnical results indicated the need for displacement capacity that exceeded that of more conventional base isolation systems. "This is the first hospital in California to use this proprietary technology, developed by Earthquake Protection Systems," explains Rutherford & Chekene structural engineer Tom Lauck. "It allows buildings to ride smoothly through large magnitude events, rising up as much as 3 inches within the concave dish the column rests in, coming back down, and riding up the other side of the dish. It's a gentle rocking motion."

CREDITS

ARCHITECT: Anshen + Allen, part of Stantec Architecture (hospital); Hawley Peterson Snyder (medical office building); Anderson Brulé Architects (interiors)

ENGINEERS: Rutherford & Chekene (structural); Ted Jacob Engineering Group (m/e/p); KCA Engineers (civil)

CONSULTANTS: Antonia Bava Landscape Architects (landscape); h.e. banks associates (lighting); Architectural Energy Corporation (energy modeling); Arup (thermal comfort study)

GENERAL CONTRACTOR: Turner Construction Company

CLIENT: Mills-Peninsula Health Services, a Sutter Health Affiliate

SIZE: 450,000 square feet (hospital); 180,000 square feet (office building)

COST: $488.6 million

COMPLETION DATE: May 2011

SOURCES

DOORS: Kawneer, Besam

CURTAIN WALL: Oldcastle BuildingEnvelope

PANELING: Trespa North America, Ltd.

LIGHTING: Mark Architectural Lighting, Infinite, Axis Lighting, Lightolier

PLUMBING: Kohler, Toto, Delta, Haws

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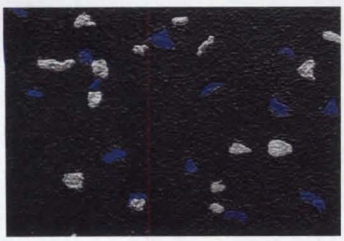

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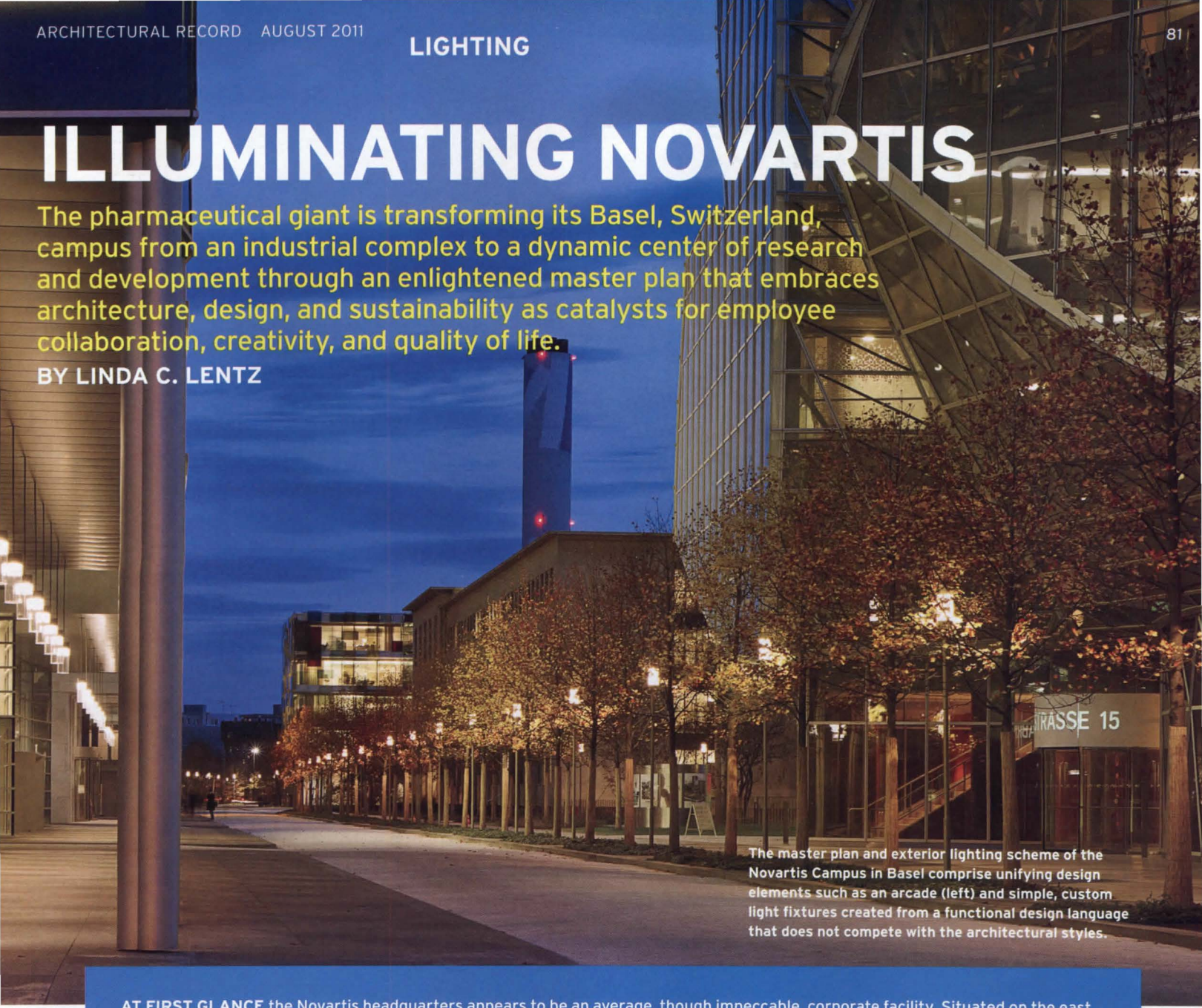
ILLUMINATING NOVARTIS

The pharmaceutical giant is transforming its Basel, Switzerland, campus from an industrial complex to a dynamic center of research and development through an enlightened master plan that embraces architecture, design, and sustainability as catalysts for employee collaboration, creativity, and quality of life.

BY LINDA C. LENTZ



The master plan and exterior lighting scheme of the Novartis Campus in Basel comprise unifying design elements such as an arcade (left) and simple, custom light fixtures created from a functional design language that does not compete with the architectural styles.

AT FIRST GLANCE the Novartis headquarters appears to be an average, though impeccable, corporate facility. Situated on the east bank of the Rhine near the borders of France and Germany in the St. Johann district of Basel, Switzerland, the 50-acre campus is sheltered by trees, old buildings, busy thoroughfares, and the river. But that impression shifts as one approaches the ethereal reception pavilion, designed by Swiss architect Marco Serra, and glimpses the diversity of building forms beyond it.

A work in progress, the Novartis campus is the brainchild of Chairman of the Board Daniel Vasella, who began a collaboration with Italian architect and urbanist Vittorio Magnago Lampugnani in 2000 to develop a 30-year master plan that would convert the property from a manufacturing complex to a center of innovation and commerce, gradually replacing the factories with laboratories and office buildings. In so doing, Vasella aims to alter the company culture by creating a flexible, exciting workplace – most visible through its architecture – to foster employee communication, well-being, and pride of place. Along with Serra (who is also campus-planning coordinator) and Lampugnani himself, Vasella and his project steering committee are hand-picking a virtual "Who's Who" of architecture, with buildings by Tadao Ando, David Chipperfield, Diener & Diener, Frank Gehry, Adolf Krischanitz, Fumihiko Maki, Peter Märkli, Rafael Moneo, SANAA, Alvaro Siza, and Yoshio Taniguchi already in operation. A lab by this year's Pritzker laureate Eduardo Souto de Moura will open in the fall, and buildings by Juan Navarro Baldeweg, Herzog & de Meuron, Rem Koolhaas, and Rahul Mehrotra are in the works.

Abandon thoughts of a theme park, however. While the individual structures maintain the integrity of the architects, Lampugnani's curatorial approach has assured an aesthetic balance. Based on the existing city grid, his plan incorporates streets and green spaces, and determines building height and footprint, as well as basic interior configurations. Light, too, is a unifying factor, both the sunlight that infuses and reflects off the structures, changing with the time and season, and the general electric-lighting scheme established by the German lighting design firm Licht Kunst Licht – a strategy that facilitates way-finding and allows such divergent buildings as those by Frank Gehry and Fumihiko Maki to shine both as single entities as well as in concert.

View an expanded slide show on our website or in our iPad edition.

Square 3, Novartis Campus Basel, Switzerland
Architect **Maki and Associates**
Lighting designer **Licht Kunst Licht**

A STUDY IN urban planning, the Novartis campus manifests a logic and order that facilitates its day-to-day operations. Yet the grounds are neither sterile nor overtly homogeneous. Entering onto Fabrikstrasse, the main boulevard, one is immediately struck by the numerous environments for employees – landscaped piazzette, informal indoor and outdoor seating and dining areas, day care centers, even a supermarket, pharmacy, and health club – all integrated in and around the new and renovated buildings. Art is everywhere. Moreover, while the various architects are given similar briefs and physical parameters, their solutions are, of course, unique.

Two blocks east of Fabrikstrasse, towards the Rhine – where Novartis is building a new public promenade – Fumihiko Maki's pristine Square 3 office building meets the master plan's standard dimensions for its type: approximately 59 feet wide, 169 feet long, and 72 feet high. This configuration allows abundant sunlight to penetrate its five stories – a feature the architect manipulates with a deft sleight of hand.

Luminous by day and night, Square 3, in many ways, embodies the essence of light in both its fabric and functionality. Maki and Licht Kunst Licht (LKL) principal Andreas Schulz collaborated to integrate the lighting strategies into the building's fundamental design.

Daylight figures prominently in the scheme. The architects created a glazed facade composed of three types of glass – clear-view, ceramic-frit, and an opaque white aluminum-backed panel – arranged for privacy and light control. In the clear and fritted translucent areas, the sophisticated system has

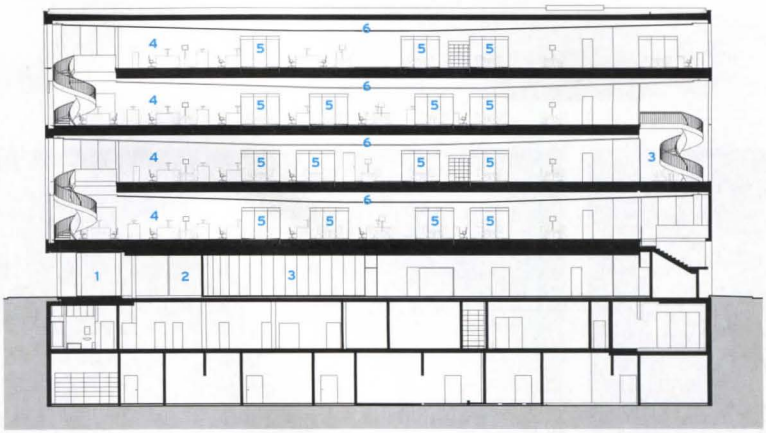
ABOVE: **Opening onto a campus square (under construction), the ground level of Fumihiko Maki's Square 3 office building features warm tones to provide a natural transition from the future green space outside. On the upper levels, the purity of the ceiling plane on the office floors is maintained by an even, ambient illumination coming from the furnishings below them.**

OPPOSITE: **Luminous in its simplicity and materiality, the building radiates a gentle glow from within. There are no outdoor lighting fixtures directed at the glazed structure, and the light inside, generated from discreet ambient sources, is neither glaring nor obvious from the campus grounds.**

sensor-controlled motorized shades sandwiched between an insulating triple-glazed layer and a fourth layer of low-iron, low-E glass. Inside the 66,198-square-foot flat-slab structure, they inserted a versatile ceiling system comprising perforated aluminum panels that feature a central diagonal plane, bringing air in from radiant heating and cooling pipes above it, and acoustic peripheral sections that slope 2 feet up to the windows to provide maximum daylight during working hours.

"It is such a transparent building," says LKL project manager Martina Weiss. "We decided to light it from within, so [in the evening] it is like a glowing box from the inside. There is no exterior lighting."

This glow emits from several sources, which were determined by a number of programmatic strategies. According to Maki and Associates project manager Gary Kamemoto, the notion of a multispace open office encouraging mobility, flexibility,



SECTION A-A

LIGHTING PLAN-TYPICAL OPEN OFFICE FLOOR

1 ENTRY PORCH
2 LOBBY
3 MEETING AREA
4 OPEN OFFICE
5 PRIVATE ROOM
6 SLOPED CEILING

1 TASK LIGHT
2 SIDEBOARD LIGHT
3 LUMINOUS PRIVATE ROOM CEILING
4 PENDANT LUMINAIRE
5 LINEAR GLAZING LIGHT
6 BALCONY UPLIGHT
7 PENDANT LUMINAIRE
8 MIRROR LIGHTING
9 LUMINOUS STAIRWAY PROFILE

and interaction among various research and business groups is a key component of Novartis chairman Daniel Vasella's vision.

To create a sense of continuity in the confined footprint, Maki applied a series of S-curves in plan to vertically connect the five levels above grade, linking them with communal double-height spaces and open stairs at the ends of alternating floor plates. Then the architects established two cores at opposite diagonals to keep the floors open.

"Within this framework," says Kamemoto, "it was crucial to keep the geometry of the ceiling as pure and uninterrupted as possible." Since the ambient light in most offices comes from the ceiling, this strategy would require an atypical approach.

Together, the Maki team and LKL devised purpose-built workstations and sideboards with integrated light fixtures. These emit multidirectional ambient light with linear fluorescents that illuminate the desk and ceiling, and direct LED task lighting. Likewise, glass-enclosed "private rooms" for small meetings and phone calls – another Vasella concept – are topped with integral luminaires that direct light up and down through taut stretch ceilings. Nearby, handsome floor fixtures add a hospitable touch, while sculptural stainless steel pendants – also multidirectional – hover above conference tables, and recessed linear fixtures wash the adjacent glazing. On the ground floor, slender fixtures fit snugly into a slatted wood-veneer ceiling negotiating the luminance needs of the lobby and glazed meeting and office areas.

The overall effect is subtle, elegant and illuminating – never glaring. A lustrous jewel in the midst of ongoing construction, Square 3 will eventually open onto a large parklike green. When it does, the thoughtful collaborative tactics of Maki and LKL will come to full fruition.

ABOVE: **Maki collaborated with Licht Kunst Licht to develop hybrid luminaires integrated into the office furnishings: Small, glass-enclosed "private rooms" are topped by illuminated stretch ceilings that provide even light distribution above and below, as well as into the circulation space; custom fixtures built into the desks and sideboards illuminate work surfaces with ambient and task lighting, and reflect up off the ceiling.**

OPPOSITE: **The wood-veneer aluminum-plank ceiling in the lobby is inset with linear fluorescent fixtures that emphasize openness and continuity and also fulfill the varied luminance needs of the different areas in the space.**

CREDITS

ARCHITECT: Maki and Associates – Fumihiko Maki, design principal; Gary Kamemoto, project manager

ARCHITECT OF RECORD: Zwimpfer Partner Architekten – Jean-Claude Cadalbert, project manager

LIGHTING DESIGN: Licht Kunst Licht – Andreas Schulz, principal; Martina Weiss, project manager

ENGINEERS: PP Engineering (facade); ZPF (structural); Todt Gmür+Partner (mechanical); Sytek (electrical); Locher, Schwittay Gebäudetechnik (plumbing)

SOURCES

GLAZING: Okalux (low-iron insulated glass units)

LIGHTING: ERCO (downlights); Serien (decorative floor lamp); Siteco (wall-recessed ceiling washers, desk/sideboard fixtures); Regent (light batten for indirect lighting); Rentex (private room); We-ef (balcony uplight)

STRETCH CEILING: Barrisol (private room)

FLOORING: Interface, Vorwerk (carpet); Forbo (resilient)

Fabrikstrasse 15, Novartis Campus Basel, Switzerland
Architect **Gehry Partners**
Lighting designer **L'Observatoire International**

Completed in 2009, Frank Gehry's Fabrikstrasse 15 is an icon on the growing Novartis Basel campus. In the evening its brilliant sculptural form is underscored by *layers of light – all on the interior –* that gently wash the facade, illuminate the workstations, and glow from within its core.

BREAKING THE BOUNDS of of Vittorio Magnago Lampugnani's master plan, Fabrikstrasse 15 by Frank Gehry stands in a surprising juxtaposition to the serene array of rectilinear buildings that dominate the Novartis campus. It is located at the geographic heart of the campus, in full view of the company's renovated 1939 Forum 1 International Headquarters building, and across the street from a refined stretch of porticoed offices and labs by Adolf Krischanitz, Rafael Moneo, Lampugnani, and Yoshio Taniguchi. The highly visible, independent site gave the architect freedom to exploit his expansive, free-spirited style.

Relieved from many of the constraints binding the other architects, Gehry and his team created a voluminous 209,896-square-foot building that manifests the Novartis commitment to an open and environmentally responsible workplace in its crystalline transparency and intricate sustainable strategies.

Anchored to a load-bearing reinforced-concrete skeleton that sits on a rigid 56-foot-deep basement box, the building's structural steel shell supports an active triple-glazed envelope that is tied to its natural ventilation and lighting systems through a centralized building facility-management system. Like a finely tuned machine, the building performs unobtrusively to provide comfortable

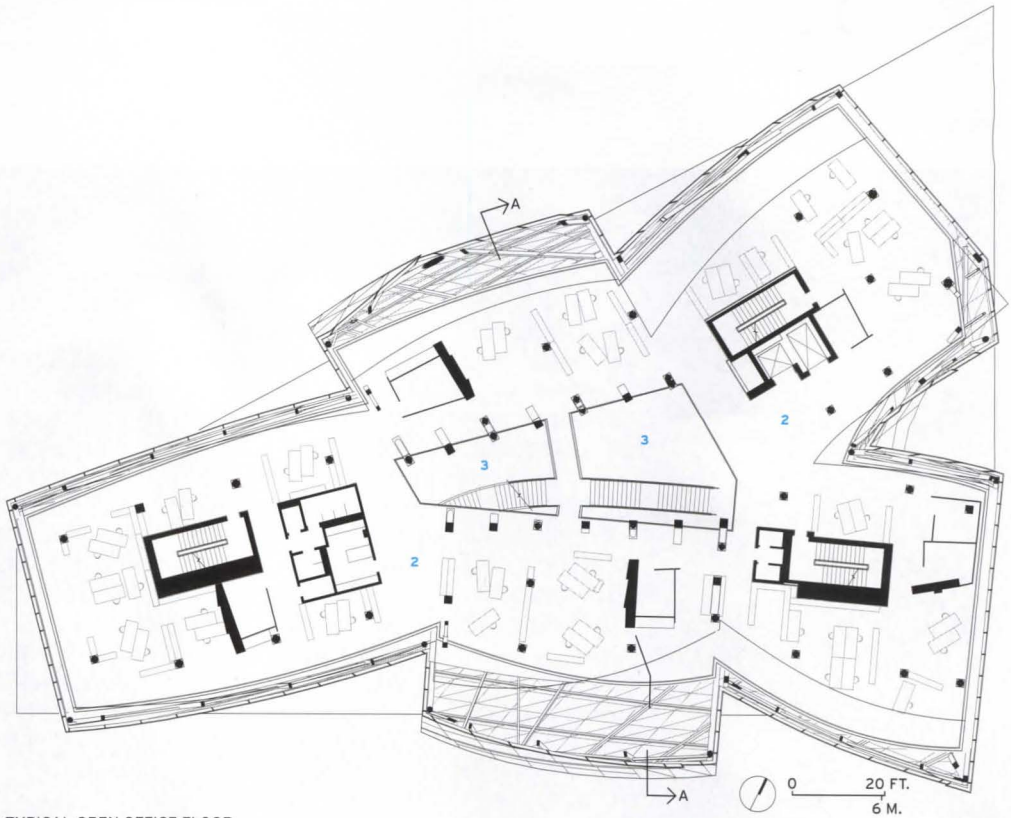
surroundings for its occupants. Sliding glass doors on the ground floor and operable windows discharge excess solar yields and facilitate the flow of outside air, aided by a mechanical fresh-air system around the perimeters of the upper levels.

Home to the human resources (HR) department, as well as to a top-floor campus reading room, a 600-seat multiuse auditorium and IT learning center (both below grade), and a ground-floor restaurant and café that spill out onto the campus green, Fabrikstrasse 15 is a hub of activity. The warm, wood-lined interiors feature whimsical LED-backed-veneer media-columns and modular Gehry-designed furnishings and workstations.

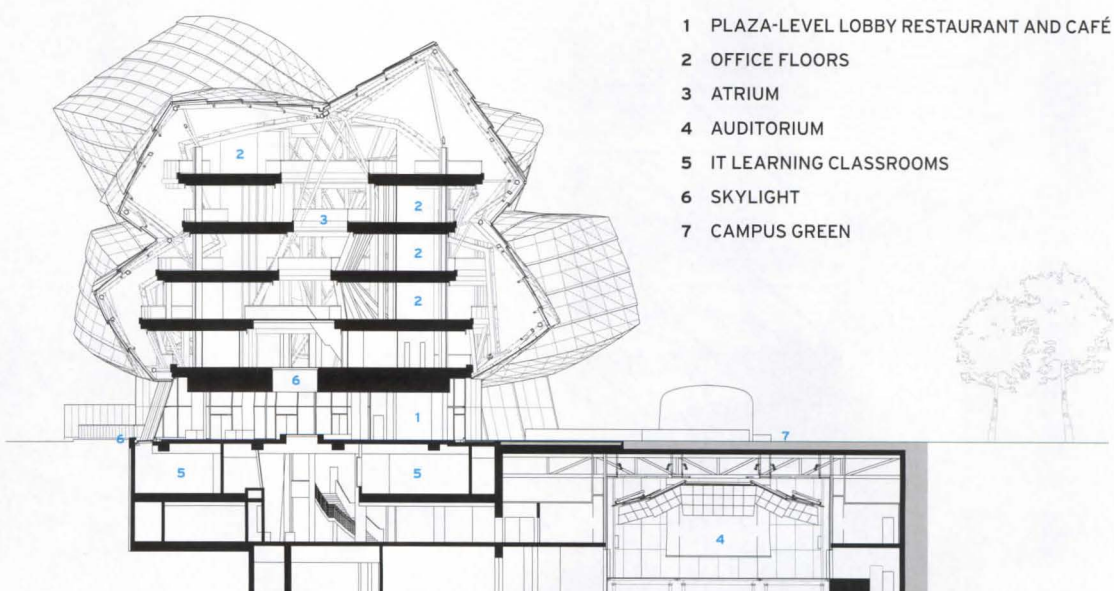
In accordance with Novartis chairman Daniel Vasella's versatile "multi-space" office concept, the architects arranged the HR floors on the five upper levels with flexible, open-plan work spaces and glass-enclosed "private rooms," bisecting them with a central atrium and serpentine stainless steel stair to bring light down through the core of the volume. A series of skylights strategically inserted into the floor and grounds around the building carry daylight to the café, the lower-level learning center, and the auditorium stage.

According to Gehry Partners project architect Kamran Ardalan, daylight is harvested and managed in several ways: The low-E glazing is articulated with ceramic frits on the facade to reduce direct solar gain; an orchestrated series of low-E-coated, saillike interior shades operate on sensors to minimize glare and additional heat; and sound-absorbing lamellas under the roof diffuse sunlight and further compensate for the thermal load by serving as cooling radiators filled with slightly chilled water. In addition, photovoltaic cells integrated into the glass roof panels not only generate enough power for the building's electric lighting, they supply an additional layer of solar shading.

"The amount of daylight inside the building is consistently monitored," says Ardalan. Electric lighting is used only when there isn't



TYPICAL OPEN OFFICE FLOOR



SECTION A-A

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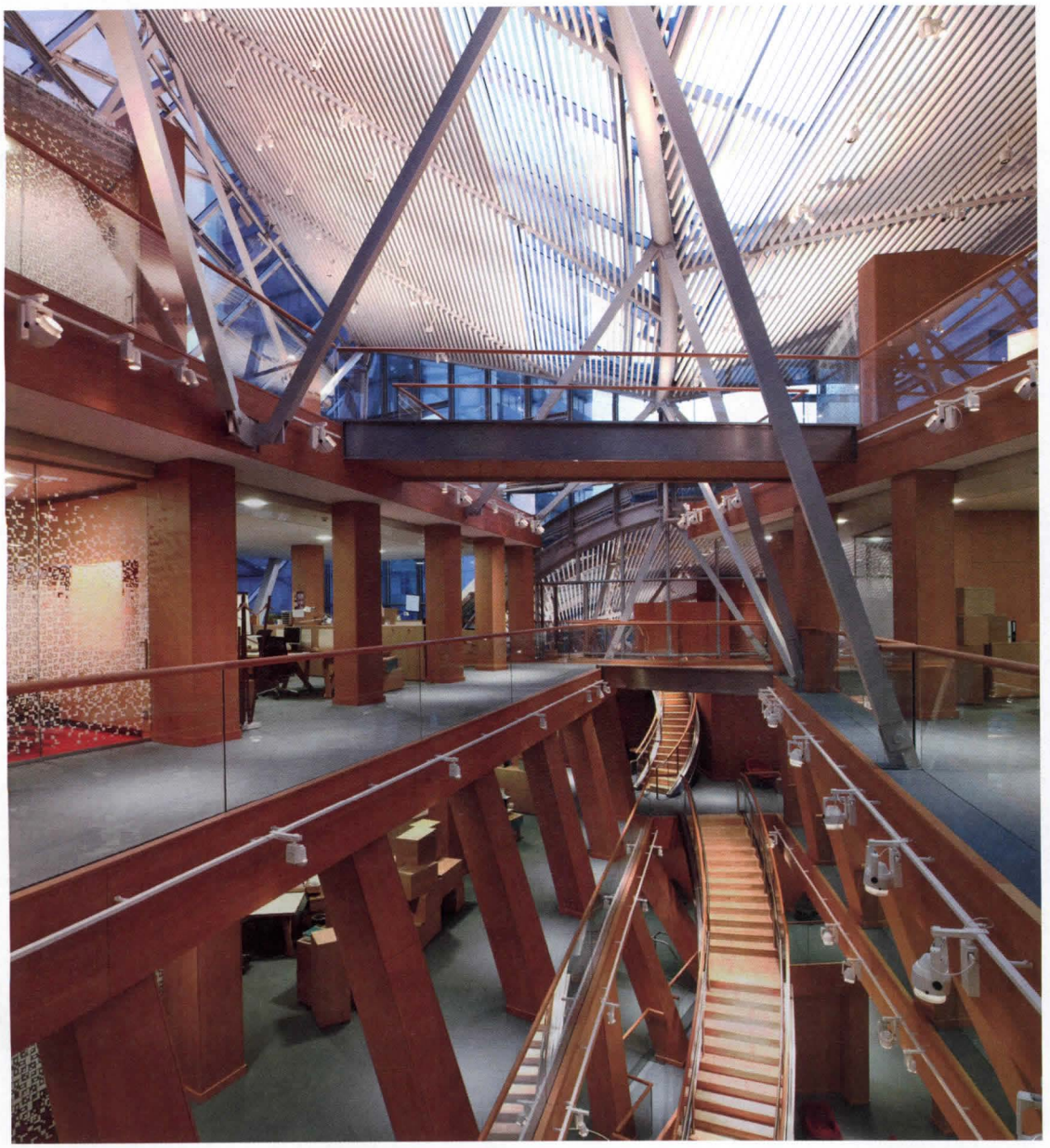

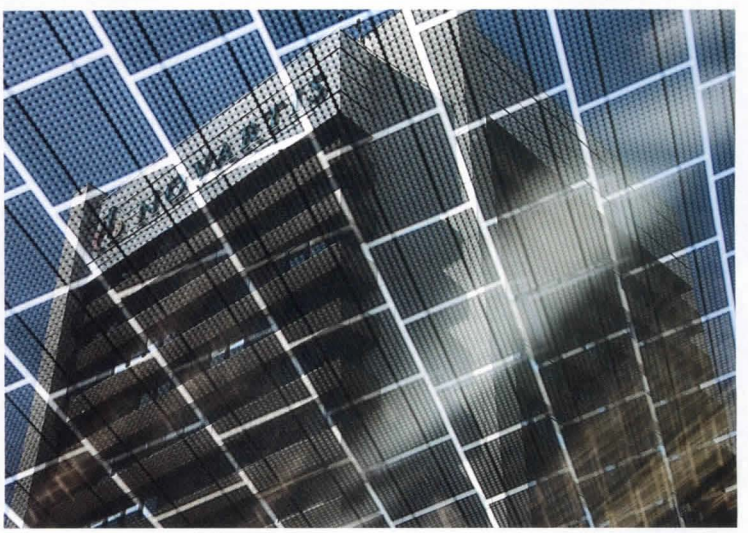

ABOVE: **A central atrium brings daylight to interior Gehry-designed workstations and glass-enclosed "private rooms" at the heart of the office floors. Adjustable metal-halide up and downlights illuminate this space when necessary and reflect off overhead white lamellas (a radiator-like array that also diffuses sunlight from the glass roof and provides radiant cooling).**

RIGHT: **Photovoltaic cells are integrated in the glass roof surfaces to generate renewable energy for the electrical lighting and to provide an effective sunscreen against solar gain in upper levels of the building.**

enough daylight, he adds – and to illuminate the building at night.

Looking frosted and icy-white on a bright afternoon, the building assumes a brilliant clarity as the sun sets, revealing its inner workings like a child's "visible engine" kit. This effect stems from a perceptive, energy-efficient electric lighting scheme by the New York–based L'Observatoire that balances program and architecture.

It was a challenge, says principal Hervé Descottes: "It's such a transparent building that you could lose its sculptural aspects." To achieve a soft, lanternlike glow, Descottes and his team layered the structure with light from within.

Initially, they created a layer by washing the mullions of the facade with metal-halide uplights installed inside the perimeter of the first level. Then they added a second layer of ambient and task lighting on the office floors, using compact fluorescent lamps. Here the lighting team kept the general light levels lower than usual to emphasize the glow of the fixtures at each desk, a tactic used to establish an intimate ambience for employees.

Next they installed linear fluorescent fixtures to wash the wood walls on all the levels, and inserted cool T5s above awninglike glass ceiling panels in the auditorium that create a seamless transition with the sunlight penetrating the skylight.

Last, they lined the atrium with adjustable metal-halide fixtures from the ground floor up to the roof, directing them up and down, and reflecting light off the white lamellas. This move, perhaps the most important, brightens the center of the building and underscores its voluptuous form.

During a recent visit on a warm and sunny summer morning, the offices were bursting with light – without a hint of glare – and wonderfully temperate minus the chill of air conditioning. A holistic tour de force, Fabrikstrasse 15 is illuminating in its transparency and ability to harness the aura and power of light – both generated and from the sun. Such a building defines the spirit of Novartis as an enlightened workplace. ■

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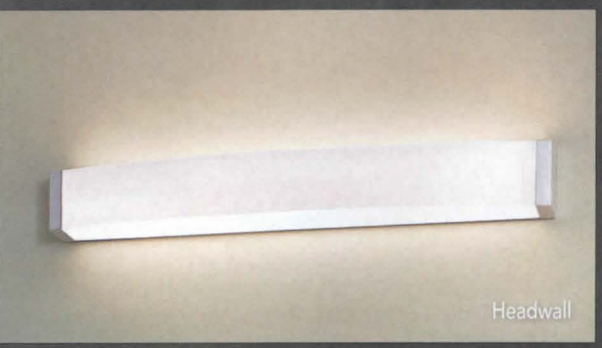

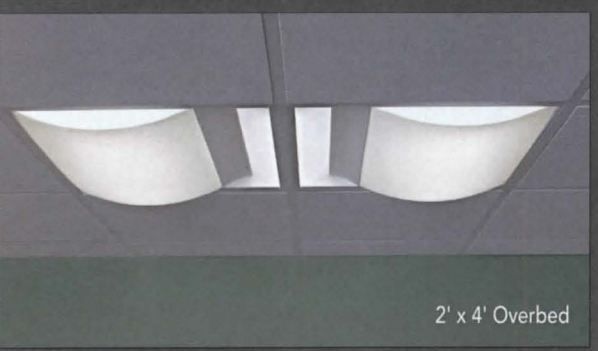

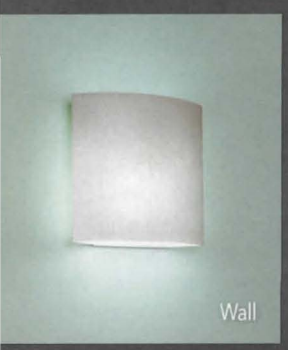

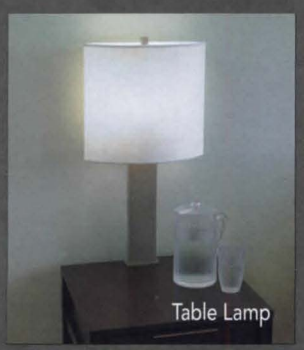

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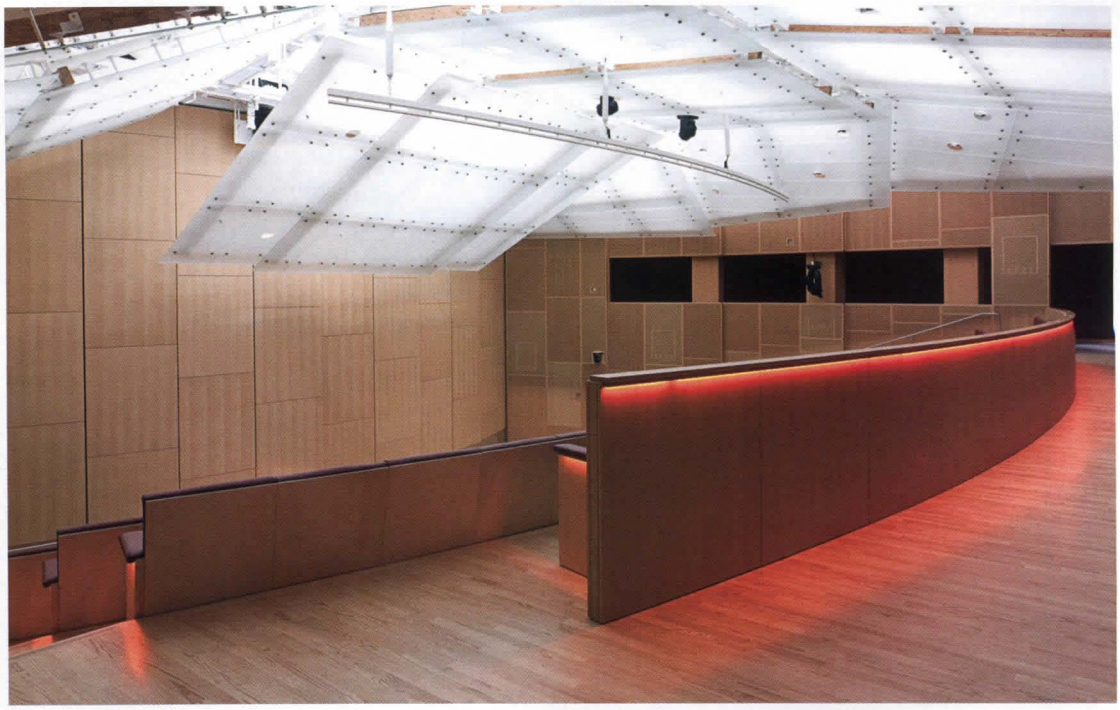
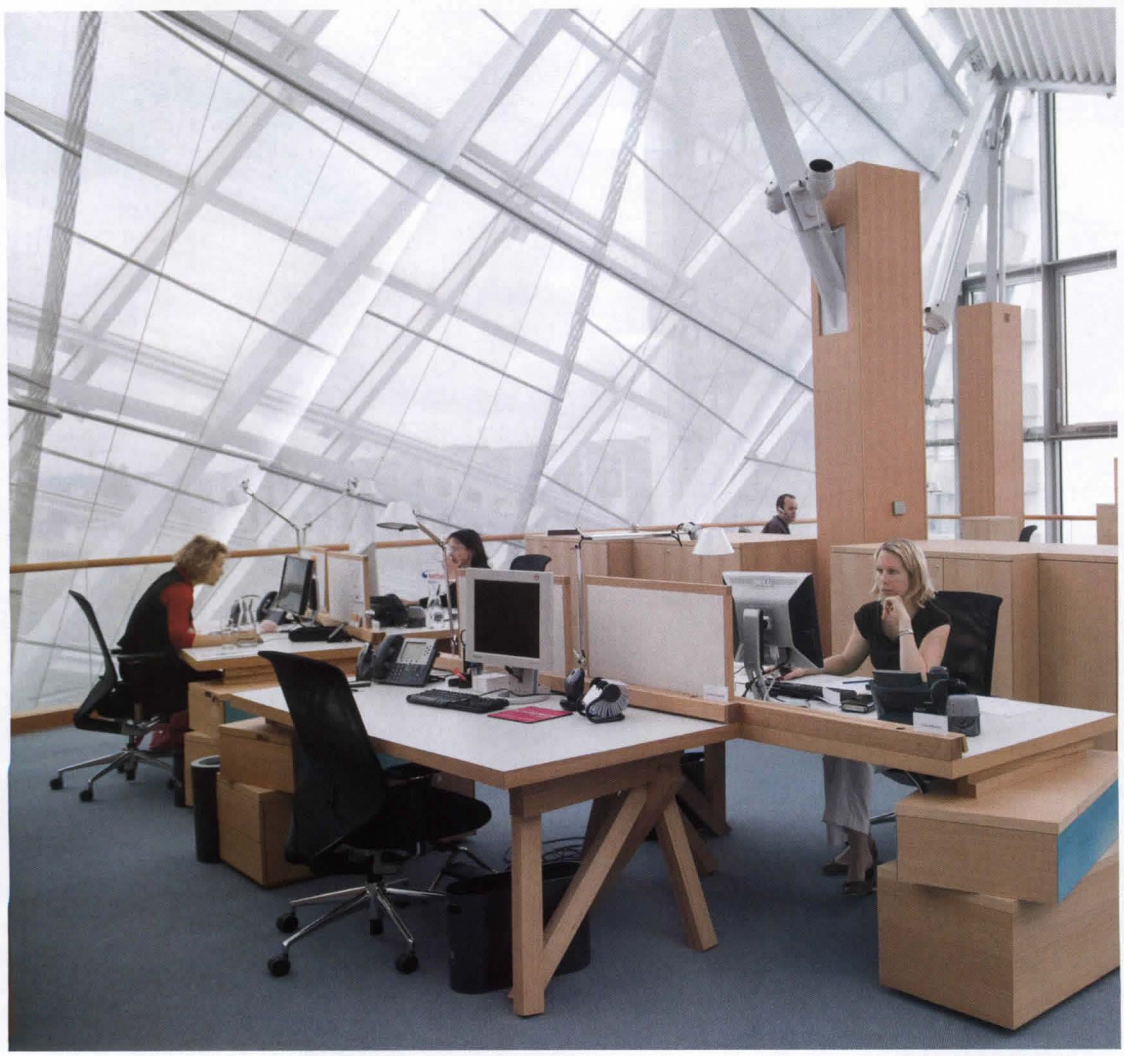
RIGHT: **Below grade, a 600-seat auditorium can be divided into two sections. It features: a wood-lined acoustical wall perforated with a subtle graphic pattern by the New York-based graphic design firm 2x4; a flexible glass-ceiling system that evenly distributes the light of cool, *daylight-quality* linear fluorescent lamps; and amber LEDs that create an atmospheric glow into the room from under the seats.**

BELOW: **Employees sitting at workstations designed by Frank Gehry are protected from the sun's glare by a sophisticated system of saillike shades, controlled by daylight sensors. Artemide Tolomeo desk lights provide additional task lighting for a more personal, intimate environment.**





CREDITS

ARCHITECT: Gehry Partners – Frank Gehry, partner in charge; Edwin Chan, design partner; Terry Bell, project partner; Kamran Ardalan, Herwig Baumgartner, project architects

ARCHITECT OF RECORD: Planergemeinschaft Arcoplan/Nissen & Wentzlaff – Daniel Wentzlaff, Thomas Oetiker, Timothy Nissen, project management

LIGHTING DESIGN: L'Observatoire – Hervé Descottes, principal; Socorro Sperati, Beatrice Witzgall, project team

ENGINEERS: Schlaich Bergermann und Partner (structural); ADZ-Aicher De Martin Zweng (building services planning/automation); Gruner (building physics)

CONSULTANTS: McKay Conant Brook (acoustics); 2x4 (graphics/signage); Emmer Pfenninger (facade planning); Transsolar Energietechnik (energy); Vogt Landschaftsarchitekten (landscape)

CREDITS

LIGHTING: Erco, Neuco, Regent, Schmitz, Reggiani, Philips, Regiolux, Zumtobel, Artemide

GLASS: BGT Bischoff Glastechnik (curtain wall); Hunsrücker (auditorium ceiling)

LAMELLAS: Barcol-Air

FURNISHINGS: Vitra (workstations/chairs); Poltrona Frau (auditorium seats)

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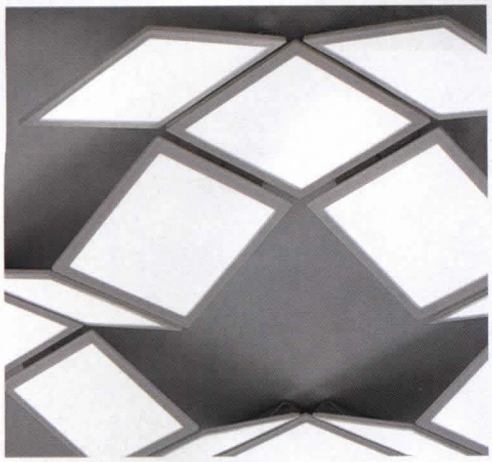
PRODUCTS LIGHTING

BELOW ARE JUST A FEW OF THE NEW INNOVATIVE SOLUTIONS THAT WERE ON DISPLAY AT MAY'S LIGHTFAIR INTERNATIONAL IN PHILADELPHIA. **RITA CATINELLA ORRELL**



Revel Organic LED

Acuity Brands acuitybrands.com
Winner of Lightfair's Most Innovative Product of the Year award, the Revel Organic LED (OLED) uses a plug-in mounting that allows the luminaire to break the traditional design pattern of grid-based lighting layouts. With high-quality color and brightness control, each flower-shaped module delivers a discrete amount of light that can be positioned where it is needed. **CIRCLE 207**

AmbientLED bulb

Philips Lighting lighting.philips.com
Lately, lightbulbs advance faster than you can install them. Philips' AmbientLED lightbulb, the first LED replacement for a 60-watt incandescent, is now the first to earn ENERGY STAR qualification. The bulb lasts 25 times longer and uses 80 percent less energy than a 60-watt incandescent. The bulb meets or exceeds ENERGY STAR requirements with 806 lumens, a color temperature of 2700K, and a color rendering index (CRI) of 80. **CIRCLE 208**

PowPak Modules

Lutron lutron.com/PowPak
PowPak modules are a group of junction box-mounted load controllers that respond to Lutron's Pico wireless controls and Radio Powr Savr occupancy/vacancy and daylight sensors. The wireless controls allow for easy lighting or equipment adjustment and reduce installation labor costs. The PowPak group includes a dimming module (shown), a relay module, and a dry contact closure output (CCO) module. **CIRCLE 209**

LRP-38

Cree LED Lighting creeledlighting.com
Designed to replace PAR38 lamps, the LRP-38 provides higher efficacy and longer life than ceramic metal halide with the light quality expected of halogen. The lamp is an ideal solution for directional lighting in applications including museums, furniture stores, and grocery stores. At 11 watts, the LRP-38 offers a light output of 55 lumens per watt, a color temperature of 2,700K, a CRI of 94, and is dimmable to 20 percent. **CIRCLE 210**

Edgelighting Fixtures

GE Lighting Solutions gelightingsolutions.com
GE previewed a line of recessed and suspended fixtures that feature an ultrathin "light guide" with built-in LED technology. The fixtures are available as ceiling troffers (coming Fall 2011) and suspended fixtures (coming Spring 2012) that appear to float by way of a dramatically framed light source. Each fixture features high-quality transparent or opaque light panels coupled with Rambus MicroLens technology. **CIRCLE 211**

Cove Light AC

Traxon Technologies traxontechnologies.com
Powered directly with line voltage, Cove Light AC eliminates the need for external power supplies or complex wiring, enabling extended run lengths and easy installation. A solid-state option suitable for general lighting, wall washing, and alcove illumination, the fixture offers a high output of 300–400 lumens per foot for warm white and cold white applications. It is available in five dedicated color temperatures, ranging from 2,700K to 6,500K. **CIRCLE 212**

For more information, circle item numbers on Reader Service Card or go to architecturalrecord.com/products.

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CIRCLE 43

FIRE AND SMOKE CURTAINS:

MEETING ATRIUM CODE REQUIREMENTS

Relatively new to the United States, fire and smoke curtains are less complex and less expensive than comparable mechanical systems and support the use of daylighting design.

Sponsored by Smoke Guard, Inc.

By Karin Tetlow

CONTINUING EDUCATION

EARN ONE AIA/CES HSW LEARNING UNIT

Use the learning objectives below to focus your study as you read **Fire and Smoke Curtains**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit, answer the questions on page 101, 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:

- Discuss fire and smoke code requirements for atrium designs, interior stairs and escalators.
- Describe the sustainable features of fire- and smoke-rated curtains.
- Explain how fire and smoke curtains can be used to supplement or replace smoke evacuation systems in ways that save energy and reduce mechanical system costs.
- Summarize the ways fire and smoke curtains may be specified so they enhance daylighting by supporting atrium design.

Shown here, vertical flexible smoke-rated curtain used to compartmentalize upper floor of atrium space in a fire event. Deployment of curtain systems can eliminate the need for costly mechanical smoke evacuation and increase usable building space.

hoto courtesy of
moke Guard, Inc.

Originally an open central court in ancient Rome, the modern atrium dates back to Victorian times when advances in manufacturing techniques enabled courtyards to be covered in glazing. Nowadays, the atrium is a design *feature* that gives multiple building types architectural distinction.

By expanding the amount of natural light within a building, atrium designs also contribute significantly to sustainable design. Daylighting strategies reduce operating costs and have been documented to deliver energy savings through improved life cycle costs and reduced emissions. Moreover, daylight vitalizes interior spaces and has been shown to increase user satisfaction and visual comfort leading to improved performance.

Since the 1980 MGM Grand fire in Las Vegas, with its multiple deaths on upper floors due to smoke inhalation, life safety fire and smoke code regulations have become increasingly stringent and are now one of the most critical atrium design issues. Unlike other building configurations whose code requirements focus on structural fire-resistant floors, walls and glazing, atrium building codes require more complex systems that are activated in the event of fire. Automatic sprinklers, smoke exhaust systems and even rolling steel doors have all been employed in keeping people in atrium designs safe in the event of fire.

Yet architects and their clients, driven by the growing green demand for open office floors, and eager for new structures with larger, soaring open spaces, have found that they are constrained in terms of both design and cost by familiar and conventional solutions and have often been forced to reject atrium designs. Similarly, architects planning to incorporate or add an atrium to an existing structure have learned that such solutions can add a significant amount to construction budgets.

Shown here, typical fire- and smoke-rated flexible curtains partially closing in a horizontal application. Fire-rated curtains rated up to 2 hours can be constructed of stainless steel strengthened glass filament fabric.

To address these concerns, a new and simpler solution has come on the market: flexible smoke and fire barrier curtains. They have the added benefit of not being an impediment to design aesthetics since they are invisible when not deployed. These new systems can be selected as an alternative to meeting atrium code requirements or as a supplement to conventional approaches. Well-tested and used in Europe for a number of years, these systems are now available in the United States. They offer an intriguing, energy saving and cost-savings option for addressing code requirements for unenclosed openings such as an atrium, interior stair or escalator.

Smoke-rated flexible curtains before (left) and after (right) deployment. This unique system has primary and back-up power sources.

ATRIUM DESIGN

The International Building Code (IBC), the most widely adopted building code in the U.S., and National Fire Protection Agency (NFPA) 101 "The Life Safety Code," NFPA's standard for regulating all components of the building impacting occupant life safety in the event of fire, have extensive code provisions for atrium designs with explanatory material spelled out in the IBC commentary and *Life Safety Code Handbook*.

A significant change in the 2006 IBC code regarding atrium designs and open spaces is that IBC has adopted NFPA 92B: *Guide for Smoke Management Systems in Malls, Atria and Large Spaces*, which allows design flexibility, with a corresponding wider range of approaches that can impact costs. Codes are interpreted differently by state and local building authorities, but the basic fire and smoke code provisions for atrium designs and open spaces are as follows:

- IBC defines an atrium as an opening connecting two or more stories other than enclosed stairways, elevators or escalators, which is closed at the top and not defined as a mall.

- The 2009 IBC code for an atrium permits multiple floors to be connected to one another by a floor opening provided that the building is protected by an electrically supervised sprinkler system and smoke management system. A two-story atrium is generally exempt from smoke control requirements. A three-story (or higher) atrium generally does require a smoke control system.

- IBC 404.6 requires that the floor openings forming the atrium be separated from occupied spaces by a 1-hr. fire-resistive construction or horizontal assembly. Exceptions to this requirement include: Exception 1 permits glazing to be utilized as a substitute for the one-hour separation where the nonrated glazing is protected by sprinklers located in close proximity to the glazing. Another exception to the separation requirement permits a maximum of three floors to be open to the floor openings forming the atrium if the volume calculated for the design of the smoke control system includes the volume of the spaces not separated from the atrium.

To be in compliance with code regulations for atrium designs, design professionals specify sprinkler systems, smoke management systems and fire-rated barriers.

Automatic Sprinkler Systems

Sprinkler systems are *de rigueur* in response to the IBC code requiring an approved automatic sprinkler system be installed throughout an entire building—including atrium designs (one exception is when that area adjacent to or above the atrium is separated by a 2-hr. fire-resistance fire-rated barrier or horizontal assembly, or both).

Sprinkler systems are designed to control a fire, not to extinguish it. It is therefore likely that significant quantities of smoke may be generated that can travel far from the initial fire source. Since sprinkler systems are not sufficient to protect an atrium from potential smoke migration—codes require the addition of a smoke management system.

CASE STUDY 1: USE OF HORIZONTAL FLEXIBLE SMOKE CURTAIN IN OPEN PLAN OFFICE

This case study demonstrates that multiple components of a mechanical smoke control system could have been replaced by a single passive horizontal smoke control curtain at considerable cost savings.

A four-floor office building was renovated to include a series of floor openings. A skylight extended above the center of the third floor in the area above the atrium opening. Height from the ground floor to skylight was approximately 53 ft. The floor openings were offset and did not line up vertically to provide a typical atrium configuration. This made it difficult to maintain smoke at least 6 ft above the highest occupant. A tenability smoke exhaust control system was therefore proposed based on performance-based requirements developed using a modeling approach.

The intent of the design was to exhaust smoke from the floor containing the fire and from the skylight, also to exhaust smoke that might spill into the atrium. Supply/make-up air was delivered to the two non-fire floors. For a fire directly beneath the atrium opening where smoke would rise unimpeded up into the skylights, beam detectors in the skylights aligned the system to exhaust the uppermost third floor in conjunction with the skylight exhaust.

The skylight exhaust and floor exhaust were accomplished using new, dedicated mechanical equipment. The supply air was provided via a combination of new, dedicated equipment and existing equipment that was also used to provide normal HVAC.

For this project it would have been possible to replace the entire smoke exhaust system by a single horizontal 2-hr. flexible fire curtain at the second floor slab. This would separate the building into two 2-story connected spaces, neither of which would require active/mechanical smoke control. The size of the opening was nominally 20 ft x 60 ft. Activation of the flexible fire barrier would be via the fire alarm control panel upon smoke detection or sprinkler water flow.

Mechanical Smoke Control System Required:

- Two 50,000 cfm fans
- Two 30,000 cfm fans
- Two three-story risers within a common shaft
- Twelve large fire/smoke dampers (varying sizes)
- U-shaped distribution ductwork on 3 floors
- UUKL (specific panel function to ensure compatibility within the smoke control system) smoke control panel/fire fan control panel
- Associated interlocks/controls/monitoring devices
- Increase in emergency generator size

Passive Smoke Control System:

- One 20-ft x 60-ft horizontal smoke curtain having a 2-hr. fire-resistance rating

Top: Cross-sectional view of office showing offset configuration of floor openings; **Bottom left:** Smoke exhaust control system design; **Bottom right:** Horizontal flexible smoke curtain at second floor

Smoke Management Systems

Smoke management is required within atrium spaces connecting more than two stories (per IBC Section 404.4.) and requires all smoke control systems to be tested by a special inspector who shall have expertise in fire protection engineering (Section 909.18.8.)

Given the large volume of open space in an atrium, smoke control is the most critical design issue. Many sources report that as many as 76 percent of deaths and injuries that occur as a result of a fire are caused by smoke.

Smoke management or smoke control systems can be active, passive, or a combination of both active and passive measures. The fire protection engineer or professional system designer has the latitude to use these options without relying on the building code to spell out how this can be done. One code requirement is to address means of egress. This is typically accomplished by designing the smoke control system so as to keep smoke away from egress or escape paths.

Active System: Smoke Exhaust or Evacuation. The conventional widely used solution to smoke control is a smoke exhaust or evacuation system. This is considered an "active" system because it uses mechanical equipment to control the spread of smoke. Exhaust inlets located near the ceiling remove smoke at a rate that is greater than or equal to the rate at which it is generated, or at a rate which will allow people to evacuate the building.

Designing a smoke exhaust system is a complex engineering exercise that includes calculations regarding the size of exhaust and replacement air, number and size of exhaust fans and intake vents, smoke plume equations and meeting the current requirement of maintaining a smoke layer height of 6 ft above the highest walking surface.

IBC also requires that a registered professional develop a design fire size of 5,000 Btus, as part of the analysis (a design fire is an engineered description of a fire over time.) One potential problem is over-designing the exhaust system, which may lead to "plugholing" (where a relatively shallow smoke layer and too-high exhaust rate can lead to entrainment of cold air from the clear layer, thus blocking smoke from being exhausted.)

Smoke exhaust systems may have a dedicated power source, or draw on the building's power source and mechanical systems. In either case, a standby power source is required in the event of loss of power. For these reasons, an active smoke exhaust system uses more energy than a passive system such as flexible smoke curtains (see next section in online portion). See Case Studies 1 and 2 for examples of smoke exhaust systems and their required fans, ducts, dampers, power and control systems.

Continues at ce.architecturalrecord.com

Photo courtesy of Smoke Guard, Inc.

This example of a large-opening automatic flexible smoke-rated curtain has zero percent residual opening when activated and employs a gravity fail-safe system.

CURVING HORIZONTAL

Ceiling horizontal smoke curtains have versatile applications for challenging ceiling situations, such as an open curved ceiling in an atrium. Typical smoke-rated curtains constructed of glass filament fabric with urethane coating on one side are fire-rated up to 2 hours and are available in widths up to 98-ft 5-in. and height up to 26-ft 3-in.

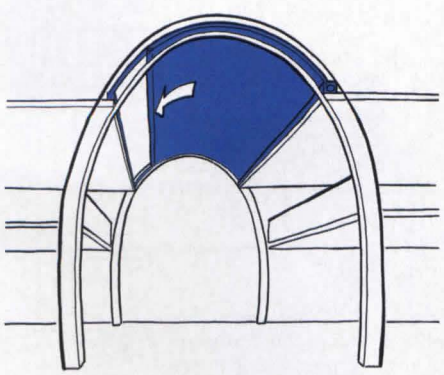

Image courtesy of Stöbich/Smoke Guard, Inc.

See Quiz on the Next Page or
Take the Quiz Free Online

To receive AIA/CES credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test. The quiz questions below include information from this online reading.

Program title: **"Fire and Smoke Curtains " (08/11, page 97)**. AIA/CES Credit: This article will earn you one AIA/CES LU hour of health, safety and welfare credit. (Valid for credit through August 2013). **Directions:** Refer to the Learning Objectives for this program. Select one answer for each question in the exam and fill in the box by the appropriate letter. A minimum score of 80% is required to earn credit. **To take this test online and avoid handling charge, go to ce.architecturalrecord.com**

1. The International Building Code (IBC) defines an atrium as an opening connecting:
- ❑ **a.** two or more stories plus enclosed stairways closed at the top.
- ❑ **b.** three or more stories including open stairways, open at the top.
- ❑ **c.** two or more stories other than enclosed stairways, elevators or escalators, closed at the top.
- ❑ **d.** three or more stories including open stairways, open at the top.

2. An atrium is generally exempt from smoke control requirements if it:
- ❑ **a.** has only two stories.
- ❑ **b.** is fitted with fire-resistant barriers on the first floor.
- ❑ **c.** has three floors.
- ❑ **d.** has an opening in the glazed roof.

3. Floor openings forming the atrium can be separated from occupied spaces by:
- ❑ **a.** always using a vertical fire-resistant assembly.
- ❑ **b.** a 20-minute fire resistive construction or horizontal assembly.
- ❑ **c.** nonrated glazing protected by sprinklers in close proximity to the glazing.
- ❑ **d.** a 15-minute horizontal fire-resistant assembly.

4. Smoke evacuation systems:
- ❑ **a.** may be designed according to building type standards.
- ❑ **b.** must maintain a smoke layer height of 6 feet above the highest walking surface.
- ❑ **c.** do not require a design fire developed by a registered professional.
- ❑ **d.** require only exhaust fans.

5. Smoke curtains:
- ❑ **a.** are passive systems that contain the spread of smoke.
- ❑ **b.** have a virtually invisible operating system.
- ❑ **c.** can be equipped with a gravity fail-safe function that allows them to deploy even if power is lost.
- ❑ **d.** all of the above.

6. UL 10C test for fire rating:
- ❑ **a.** is for 30 minutes or more.
- ❑ **b.** incorporates both the Standard Time Temperature Curve for heat exposure over time and the hose stream test.
- ❑ **c.** does not include the hose stream test.
- ❑ **d.** does not include reaction to thermal shock and pressure.

7. Escalator openings or stairways that are not a portion of the means of egress can be protected:
- ❑ **a.** without requiring a smoke exhaust system.
- ❑ **b.** by a roll down smoke and draft curtain for openings less than four stories.
- ❑ **c.** only by automatic fire-resistant shutters rated at not less than 1.5 hrs if openings are less than four stories.
- ❑ **d.** a. and b. above

8. Flexible fire and smoke curtain assemblies are constructed using recycled sustainable materials.
- ❑ **a.** True
- ❑ **b.** False

9. Compared with smoke exhaust systems, flexible smoke curtains:
- ❑ **a.** cost more to install.
- ❑ **b.** always require more analyses and calculations by registered professionals.
- ❑ **c.** have to be tested for plugholing effect.
- ❑ **d.** potentially reduce initial and operating costs.

10. Smoke and fire curtains support atrium designs by:
- ❑ **a.** providing a simpler and less expensive smoke control solution.
- ❑ **b.** being translucent.
- ❑ **c.** being operable only by occupants.
- ❑ **d.** their highly visible control assemblies.

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Material resources used: This article addresses issues concerning health, safety, and welfare.

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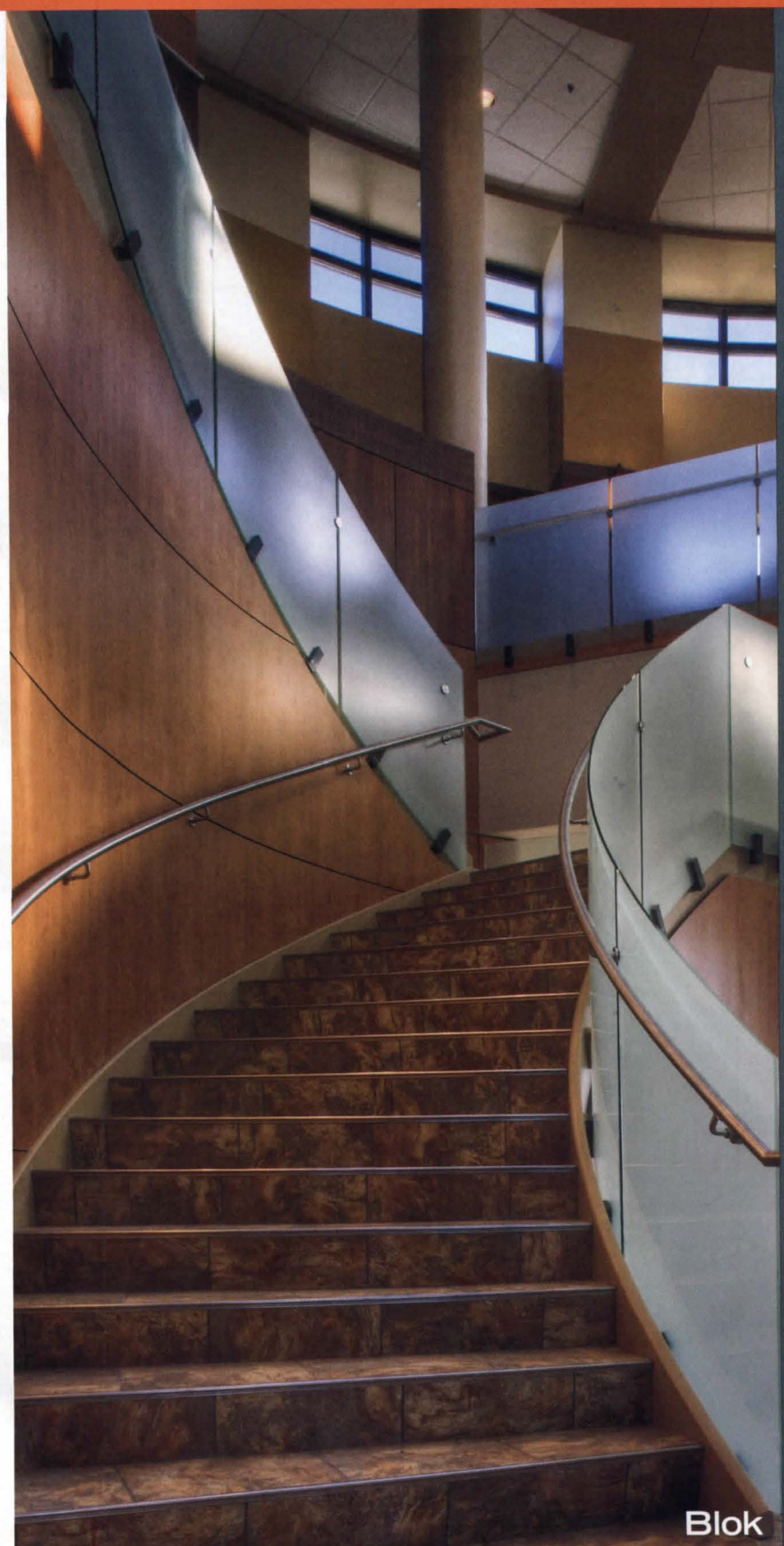

Go to **www.LiversDesign.com** to see innovative designs and product specifications.

CIRCLE 31

ACCESSIBLE BY DESIGN:

INNOVATIVE APPROACHES TO ACHIEVING UNIVERSAL DESIGN AND ADA COMPLIANCE

Product innovations foster independence and celebrate the diversity of human ability.

CONTINUING EDUCATION

EARN ONE AIA/CES HSW LEARNING UNIT

Use the learning objectives below to focus your study as you read **Accessible by Design: Innovative Approaches to Achieving Universal Design and ADA Compliance**. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit, answer the questions on page 106, 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:

- Discuss Universal Design principles and ADA compliance as part of a focused initiative for a design practice.
- Analyze products for the bath that promote independent living.
- Evaluate handrail systems with high aesthetic values that meet and/or exceed 2010 ADAAG regulations.
- Explain the relationship between Universal Design and social sustainability.

Floor-to-ceiling integration of materials, products and equipment enables all individuals, as demonstrated in the lobby for this international center for the Disabled Rights/ Independent Living Movement located in Berkeley, California.

Designed by Leddy Maytum Stacy Architects in association with Paulett Taggart Architects.

Photo courtesy of Tim Griffith

ACCESSIBLE BY DESIGN:

INNOVATIVE APPROACHES TO ACHIEVING UNIVERSAL DESIGN AND ADA COMPLIANCE

By Celeste Allen Novak, AIA, LEED AP

Every environment has an innate characteristic and every human has innate or inherent behaviors. The responsibility of the architect to change environments goes beyond compliance with Americans with Disabilities Act (ADA) or numerous other minimal regulations (see side bar), and calls for design for social sustainability. The World Health Organization agrees and calls for mainstreaming the experience of disability and recognizing it as a universal human experience. They have redefined disability as a contextual phenomenon, dictated by the intersection of a person and his/her environment. Universal Design proponents see this movement as a framework for design and a challenge for designers in the 21st century. As a response to support the movement towards removing disabilities for all, industrial designers, product engineers and manufacturers are designing products that enhance experiences for people of all ages and abilities by design.

CELEBRATING HUMAN DIVERSITY WITH ACCESSIBLE DESIGNS

This article will discuss some product innovations as a means of illustrating creative ways to meet current ADA requirements. In addition, we will look at means by which to design beyond ADA to address opportunities of multi-generational ergonomics using Universal Design principles. According to Josh Safdie, Assoc. AIA, the director of the Institute for Human Centered Design (IHCD), "There is a difference between following an ADA checklist and focusing a practice on Universal Design." He believes that "design powerfully and profoundly influences us and our sense of *confidence, comfort* and control. Variation in ability is ordinary, not special and it affects most of us for at least part of our lives." He and Gunnar Baldwin were both part of the panel on Universal Design at the 2011 AIA National Convention in New Orleans, where panelists discussed the numerous social, cultural and individual impediments that make the transition to Universal Design difficult for designers. Some of these impediments include preconceived attitudes about aging, the denial of the need to plan for aging, economics and regulations that address an aging population. Confronting issues of human usability requires an increased awareness of human abilities in order to develop new, focused Universal Design practices for the 21st century.

Universal Design solutions can be "invisible" and an accessible house can be a multi-story structure on an urban lot.

Undeniably, variation in ability becomes even more marked in the aging process. The ability to perform simple basic tasks, such as eating, dressing and bathing can affect the psychology and awareness of a person's value. A 91-year-old senior may be able to read books, magazines and newspapers on his iPad but not able to securely walk up and down steps to the upper level bathroom. According to Gunnar Baldwin, a water efficiency specialist at TOTO, "Bathroom experiences are the most frequent reasons people give up their independence. Once you can't wash yourself or use the toilet, the elderly begin to think about getting home care, someone to live with them or checking-in to a nursing home."

Gunnar Baldwin is also a former USGBC technical assistance water expert team member and has recently worked with the AIA to develop a new focus for architects to encourage the inclusion of socially sustainable design (the confluence of Universal Design and environmental sustain*ability*) in architecture's mainstream best practices for good design. Designing for a continuum of human behavior and growth adds a new dimension to a design practice, one that requires an even greater attention to the saying often attributed to Mies Van Der Rohe: "God is in the details."

Disabilities that can create functional limitations for most adults include arthritis, back problems, diabetes, heart and respiratory disease. Designing for an average adult assumes that the two-thirds of the population that are either children or seniors will have only a short span of time in which to easily access most household equipment or have access to most public spaces. Design for human growth, physical variations and design for differing abilities is more than designing for accessibility.

Architects who were part of the massive changeover of buildings to meet ADA standards in the 1990s will remember that these guidelines were thought of then (and sometimes even today) as obtrusive rather than intrinsic to their design practices. Similar to what took place in the green product revolution, many of the early ADA-compliant products were considered unattractive and poorly built. Today, according to Charlie Livers, vice president of Livers Bronze,

A floating glass ramp designed for Hallmark Cards at the Crown Center in Kansas City, Missouri, meets design criteria for both accessibility and aesthetics.

"contractors sometimes own the power of purchasing an ADA product, and particularly with handrail selection, owners and architects can suffer. The end result may mean that the product may not match the aesthetics of the project or even worse, may not be built correctly and may be structurally unsound." A better solution would be that the design professional think about accessibility in the beginning of a project and specify products that meet Universal Design goals.

BATHROOM INDEPENDENCE

At the 2011 AIA convention one of the continuing education credits achievable was from a manufacturer that allowed individuals to don an "aging suit." Fogged, tinted goggles and earmuffs simulated restrictions in sight and hearing. Stiffened leggings, vest and armbands restrained movement and the ability to turn or bend. Webbed gloves with padded fingers quickly showed the impediments to touch, reach, and manipulation of buttons and knobs. After "suiting-up," the designer was asked to maneuver a bathroom designed to current ADA standards. With and without a wheelchair, lessons were quickly learned as to why these guidelines include such common details as the 19-in. toilet seat height, a 5-ft turning radius and front clearances for approaches to sinks.

It is easy to understand why someone with a disability or who is elderly might be embarrassed to be assisted in the bathroom. One innovation in bath design includes the adaptable washlet that is designed to remove this lack of independence in the bathroom. A washlet is an electric toilet seat that can convert an existing or new conventional toilet to a bidet. A washlet has a warm water spray that provides washing and drying without the use of toilet paper. A washlet can also be added as a replacement seat to many existing toilets as long as they are dimensionally compatible. They require a standard electrical outlet, placed unobtrusively within 3 ft of a toilet.

There are many advantages to the washlet. It can be activated by sensors or by remote control that both open/close the lid as well as automatically flush the toilet. Those with restricted movements can choose front or rear cleansing, warm-air drying or even a massage by using an accessible LCD panel with large buttons or a wireless remote control. This affordable unit is available as part of a standard facility or residential renovation and provides another option for those wishing to stay independent for as long as possible.

Washlets are designed to save energy, conserve water and toilet paper. Energy-saving timers control the electrical output. A washlet uses less than a half gallon per day of water when used by a family of four and when combined with a high-efficiency toilet (HET) increases water conservation. (HETs exceed the standards that should be met for true water savings and flush using at least 20 percent less water than is mandated by law.) In comparison, the same family of four would use up to 183 rolls of toilet paper a year which amounts to 1.3 trees and 732 gallons of water as one roll equals four gallons of water use. By using a washlet, users reduce the use of toilet paper, conserve water and save energy.

Universal Design is not just for the aging. New products that make the bathroom safer for all users include wireless sensors for lavs and showers. Wireless remote controls allow for hands-free operation particularly useful for wheelchair users. Remotes can easily be operated from wheelchairs or attached to the rear or side of the bathroom wall that can be reached with an elbow, a knee or a foot. A remote control is another means of providing independence without sacrificing the aesthetic design of the bathroom.

A remote control is another means of providing independence without sacrificing the aesthetic design of the bathroom.

Continues at ce.architecturalrecord.com

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

See Quiz on the Next Page or
Take the Quiz Free Online

CONTINUING EDUCATION

To receive AIA/CES credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test. The quiz questions below include information from this online reading.

Program title: **"Accessible by Design: Innovative Approaches to Achieving Universal Design and ADA Compliance" (08/11, page 103)**. AIA/CES Credit: This article will earn you one AIA/CES LU hour of health, safety, and welfare (HSW) credit. (Valid for credit through August 2013). **Directions:** Refer to the Learning Objectives for this program. Select one answer for each question in the exam and fill in the box by the appropriate letter. A minimum score of 80% is required to earn credit. **To take this test online and avoid handling charge, go to ce.architecturalrecord.com**

1. **One of the most frequent reasons people consider moving into assisted living facilities is because of their loss of independence in:**
- ❑ **a.** kitchens.
- ❑ **b.** the outdoors.
- ❑ **c.** bathrooms.
- ❑ **d.** bedrooms.

2. **Variation in ability is ordinary, not special and it affects most of us for at least part of our lives.**
- ❑ **a.** True
- ❑ **b.** False

3. **To use a washlet as a conversion for a conventional toilet:**
- ❑ **a.** there must be an electrical outlet provided.
- ❑ **b.** the toilet must be dimensionally compatible.
- ❑ **c.** requires major renovations to the bathroom.
- ❑ **d.** a. and b.

4. **Washlets save:**
- ❑ **a.** water.
- ❑ **b.** energy.
- ❑ **c.** toilet paper.
- ❑ **d.** all of the above.

5. **Glass railings can be used in stair systems if they are composed of:**
- ❑ **a.** tempered glass.
- ❑ **b.** fire glass.
- ❑ **c.** double-pane glass.
- ❑ **d.** frosted glass.

6. **The main advantage of choosing handrails as a system is:**
- ❑ **a.** reduced shipping costs.
- ❑ **b.** one source responsibility for meeting codes and engineering.
- ❑ **c.** easy assembly by onsite contractors.
- ❑ **d.** conformance to ASTM regulations.

7. **Which is the main reason to avoid purchasing railings from millwork providers?**
- ❑ **a.** The rail may not meet color specifications.
- ❑ **b.** The rail may not meet FSC green certification targets.
- ❑ **c.** The rail may not meet engineering requirements for the particular installation.
- ❑ **d.** The rail may be assembled by contractors.

8. **Which of these federal Title Acts of the Americans with Disabilities laws most affect design professionals?**
- ❑ **a.** Title I
- ❑ **b.** Title II
- ❑ **c.** Title III
- ❑ **d.** Title IV

9. **Which report defined sustainability as an interaction between social equity, the economy and the environment?**
- ❑ **a.** Agenda 21
- ❑ **b.** LEED
- ❑ **c.** Brundtland
- ❑ **d.** Climate Change Initiative

10. **A home designed to be socially sustainable:**
- ❑ **a.** accommodates physiological and psychological lifetime changes.
- ❑ **b.** appears different then other homes.
- ❑ **c.** incorporates green products.
- ❑ **d.** requires certification.

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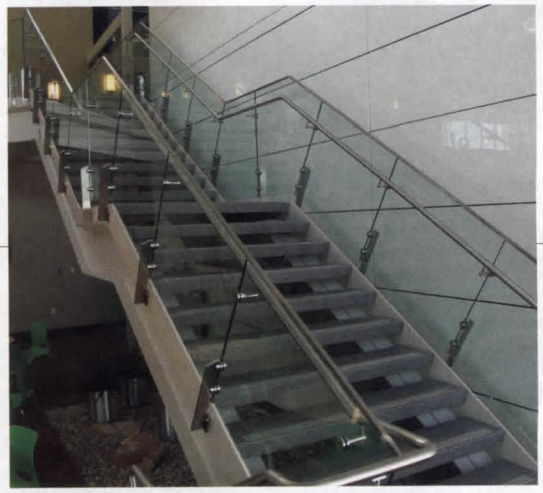
CIRCLE 45

ACCESSIBLE BY DESIGN

PRODUCT REVIEW



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www.certainteed.com/ceilings circle 2

3

3. TOTO

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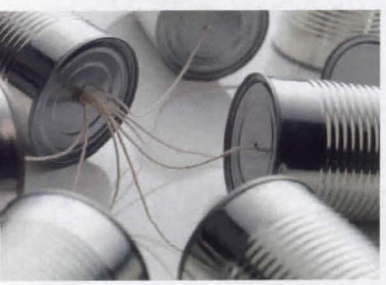
When it comes to comfort and hygiene, the TOTO Washlet is the ultimate personal care system. The Washlet incorporates Universal Design principles, which provide ease of use by all ages and abilities. TOTO's mission is to deliver, through Universal Design, elegant products that focus on the human-centered detail.

www.totousa.com circle 3

Solve Your Acoustics Problem With One Word



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Ongoing conversations

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CIRCLE 13

New and Upcoming Exhibitions

Picturing the City: Downtown Pittsburgh, 2007-2010
Pittsburgh
September 17, 2011–March 25, 2012
Nine Pittsburgh photographers have turned their lenses toward the city's downtown to document the significant changes in the natural and built environment brought on by an unprecedented development boom. The exhibition reflects the evolution of the city's downtown and features work by photographers Melissa Farlow, Richard Kelly, Jim Judkis, Kenneth Neely, Annie O'Neill, Mark Perrott, and more. Visit web.cmoa.org.

Jim Olson: Architecture for Art
Pullman, Washington
September 30–December 10, 2011
A graduate of the University of Washington Department of Architecture, Olson has long been inspired by the relationship of architecture, art, and nature. The exhibition features projects from as early as 1959, presented through drawings, models, plans and photographs, and a specially built "ideal room" so visitors can experience Olson's architecture firsthand. For more information, visit wsu.edu.

Ongoing Exhibitions

Glimpses of New York and Amsterdam in 2040
New York City
Through September 10, 2011
New York and Amsterdam are affected by shifting demographics, changes in climate, energy transitions, and global economic patterns. They share extensive waterfronts, a strong entrepreneurial spirit, and a long tradition of international collaboration and cultural diversity. The cities' plans focus on creating vibrant and sustainable urban environments. The Center for Architecture in New York and the Amsterdam Centre for Architecture commissioned architects and landscape architects in both cities to contemplate the "future of the future," with an emphasis on five basic necessities for living: breathing, eating, making, moving, and dwelling. Visit cfa.aiany.org.

MonoVision
New York City
Through September 19, 2011
This exhibition of architectural photographer Scott Frances's work coincides with the release of his first monograph of the same title. The exhibition was recently extended through the summer. Frances is renowned for his architecture and lifestyle photography, and his images reflect the synthesis of his interests in carefully balanced composition, using atmospheric and naturally motivated light. With a journalist's need to tell a story simply, along with his passion for the decorative arts, his imagery bridges recurring themes throughout art history. Visit ddbuilding.com.

Public Domain: Public and Civic Spaces in the Arab World
London
Through September 24, 2011
Using material drawn from photojournalists, professional photographers, and architectural practices, the exhibition will provide a journey through the public and civic spaces of the Arab world and showcase daily life in the region. For more information, visit london.gov.uk/shubbak.

Designing the Republic: Architecture, Design and Photography in Slovenia, 1991–2011
Ljubljana, Slovenia
Through October 23, 2011
The Museum of Architecture and Design will celebrate the 20th birthday of Slovenia. The great transformation that began 20 years ago with political, social, and economic changes encompassed almost all spheres of life. Slovenia's independence is today seen as a controversial turning point that on the one hand unleashed creative energy and

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PROJECT (1993): "SOLARIA" KATONAH, NEW YORK;
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opened up new opportunities in architecture, design, and other creative practices, but, on the other hand, placed architecture and design within new circumstances that demanded a proactive attitude towards finances and clients. For more information, visit mao.si.

Michael Singer: Projects in Art, Design, and Environmental Regeneration
Aalborg, Denmark
Through October 31, 2011
This exhibition of sculpture, collages, gardens, architectural projects, infrastructure design, and urban planning by artist and designer Michael Singer shows how artists, architects, and landscape architects are increasingly collaborating. His most recent work has been instrumental in transforming public art, architecture, landscape, and planning projects into models for urban and ecological renewal. Visit utzoncenter.dk/en/welcome.htm.

The Life and Death of Buildings
Princeton, New Jersey
Through November 6, 2011
This exhibition explores the unique relationship uniting architecture, photography, and time. The 115-plus works of art on display are an indirect meditation on the upcoming 10th anniversary of 9/11. The exhibition doubles as a survey of extraordinary photographs from the 1840s to the present, drawn from Princeton's collection and a select list of public and private lenders. The central theme – the constancy of architecture's life and death, as uniquely realized through the camera – is recurringly struck by selections of works by an international roster that includes William Henry Fox Talbot, Eduard Baldus, Alexander Rodchenko, Alfred Stieglitz, Laura Gilpin, Danny Lyon, Bernd and Hilla Becher, and Zhang Dali. Visit artmuseum.princeton.edu.

Talk to Me
New York City
Through November 7, 2011
This exhibition by the Department of Architecture and Design at the Museum of Modern Art investigates the communication between people and objects, which range from interfaces and products to diagrams, visualizations, and furniture by designers, students, and scientists – all created in the past few years or under development. For more information, visit moma.org.

SUPERTALL!
New York City
Through January 2012
The Skyscraper Museum presents a survey of superlative skyscrapers worldwide, featuring projects that have been completed since 2001, are under construction, or are expected to top out by 2016. This recent generation of giants, generally 100 stories or higher, represents a new paradigm of slender mixed-use towers. The installation includes models, renderings, animations, photographs, and films. Visit skyscraper.org.

194X-9/11: American Architects and the City
New York City
Through January 2, 2012
This exhibition examines the work of leading architects in light of the history of urban renewal in the United States. The selections trace an arc from the idealism of the World War II years through the subsequent criticisms of the 1960s and '70s, to the threshold of today's post-9/11 period and the debates catalyzed by the rebuilding of Ground Zero through 85 drawings and models drawn from MoMA's collection by renowned architects. For more information, visit moma.org.

Lectures, Conferences, and Symposia

International Marble and Granite Fair
Espírito Santo, Brazil
August 23-26, 2011
The Cachoeiro de Itapemirim region, where this fair takes place, contains the largest quarries of marble in Brazil; shelters large, medium,

and small extraction; and processes dimensional-stone companies. For its 20th year, this fair highlights the evolution of dimensional-stone marketing, technology, and innovation. For more information, visit cachoeirostonefair.com.

In Wright's Drafting Room: Architecture Fantasy Camp
Oak Park, Illinois
October 2–5, 2011
This workshop at the Frank Lloyd Wright Home and Studio offers amateur design enthusiasts the chance-of-a-lifetime opportunity to create unique designs with the assistance of a professional architect. No architecture experience is necessary. Visit gowright.org.

Made Expo
Milan
October 5–8, 2011
The Made Expo will focus on cutting-edge, high-tech innovations in design materials. The show takes a holistic approach to building design and construction, examining all the steps of the building process, from initial design and planning through construction and fit-out. A returning event this year will be the Building Technology Forum, which provides a collaborative setting for exchanging ideas on the building process. For more information, visit madeexpo.it/en.

CTBUH 2011 World Conference
Seoul
October 10–12, 2011
This conference will focus on the significant value of high-rise buildings in modern society from three perspectives: sustainability, safety, and livability. The goal of the conference is to provide an opportunity to share information with top industrial and academic experts in the field of high-rise buildings as well as to experience dynamic aspects of Seoul. For more information, visit ctbuh2011.org.

American Society of Landscape Architects Expo 2011
San Diego
October 30–November 2, 2011
More than 6,000 landscape architecture professionals from across the United States and around the world will gather for this annual expo to earn up to 21 professional development hours and to reconnect with the fundamental elements of design. For more information, visit asla.org.

Future Cities 2011
London
December 15–16, 2011
Future Cities is an annual conference series dedicated to the sustainable development of England's cities and urban areas. During the two-day event, more than 700 delegates from across the globe will listen to a range of presentations. They will discuss key issues and topics. Visit rantrad.co.uk.

Competitions

Tucker Design Awards
Deadline: August 19, 2011
The Tucker Design Awards are the natural-stone industry's most prestigious awards program. Highly respected by the design communities, the biennial Tucker Design Awards provide an opportunity to recognize and honor those professionals whose projects achieve excellence in the use of natural stone in design and construction. For more information, visit buildingstoneinstitute.org.

AIA Honor Awards
Deadline: August 26, 2011
Each year since 1949, the American Institute of Architects has celebrated outstanding architecture through the Honor Awards program. The AIA continues that tradition by inviting architecture firms to submit their best recent work for the 2012 program. The program recognizes three divisions: architecture, interior architecture, and regional and urban design. Visit aia.org/awards.

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Zerofootprint Re-Skinning Awards
Deadline: August 31, 2011
This annual competition celebrates the year's most successful holistic retrofitting projects from around the world. The Zerofootprint Re-Skinning Awards invites the best minds in architecture, design, building, and engineering to submit green building projects that demonstrate the innovative use of energy-retrofitting technologies. Retrofitting and re-skinning involve the use of design solutions to dramatically reduce the environmental footprint of older, energy-inefficient buildings. For more information, visit thezeroprize.com.

Close the Gap
Registration Deadline: September 1, 2011
This international design competition, sponsored by Transportation Alternatives and d3, invites architects, landscape architects, urban designers, engineers, and students to broaden the dialogue of alternative solutions for sustainable urban living. The competition focuses on the Midtown sector of New York City's East River Greenway, a critical missing link in Manhattan's alternative transportation infrastructure. Entrants are asked to critically examine the relationship of pedestrians and cyclists to public space, opportunities for merging the city with nature, as well as reengagement of the individual with social environments in a Midtown Manhattan context. For more information, visit d3space.org/closethegap.

WHY STOP Competition
Deadline: September 16, 2011
With this competition, SHIFTboston challenges urban planners, architects, urban designers, designers, and landscape architects (professionals and students) to explore and visualize destinations along the proposed South Coast Rail extension, which will connect Boston to Taunton, New Bedford, and Fall River, Massachusetts. For more information, visit shiftboston.org.

The Greatest Grid: A Call for Ideas
Deadline: September 26, 2011
This competition invites architects, landscape architects, urban designers, and other design professionals to use the Manhattan street grid as a catalyst for thinking about the present and future of New York. For two centuries, the Manhattan street grid has demonstrated an astonishing flexibility to accommodate the architectural gestures and urban planning theories of successive generations of architects, urban designers, private developers, and city officials. Visit archleague.org.

Symbiosis With the Landscape: Green Building in the Humid Tropics of Costa Rica
Deadline: October 10, 2011
This competition offers architects the opportunity to propose cutting-edge, responsible environmental design solutions for the headquarters of FUNDECOR, a Costa Rican NGO dedicated to the preservation of the natural environment. As an environmentalist institution, the new building must be exemplary in green design and construction. The project is to be located in Puerto Viejo de Sarapiquí, in the Caribbean region of Costa Rica. The jury includes architects Carlos Jiménez, Thomas Spiegelhalter, and Mauricio Quirós of the CCA in Montreal. Visit fundercor.org.

Tile of Spain Awards
Deadline: October 25, 2011
The Spanish Ceramic Tile Manufacturers' Association (ASCER) sponsors these annual awards with a prize fund of about $75,000. Awards are divided into three categories: architecture, interior design, and degree projects. Architect Benedetta Tagliabue will chair this year's jury. For more information, visit tileofspainawards.com.

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

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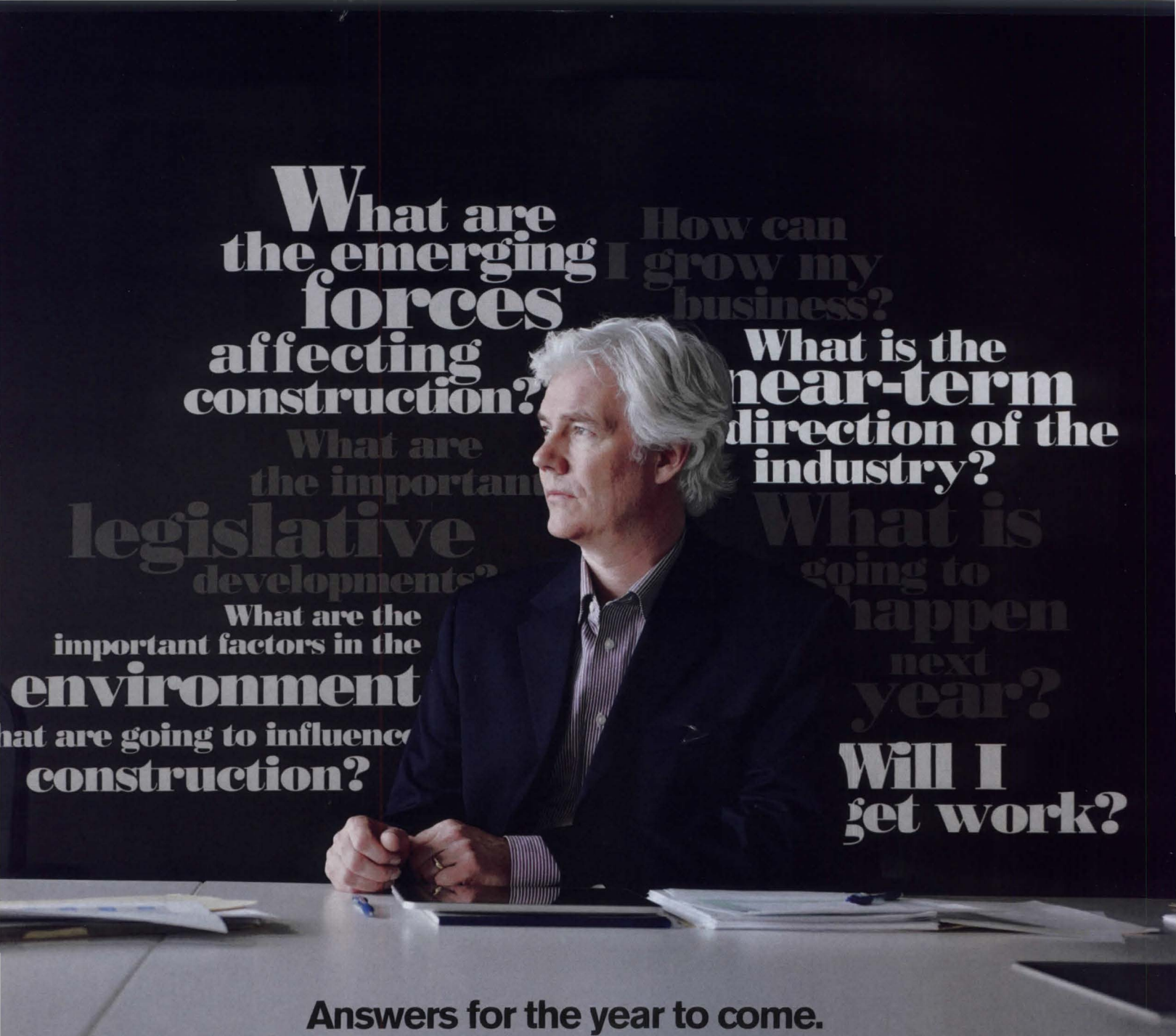

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ARCHITECTURAL RECORD

Product Reports 2011 CALL FOR ENTRIES

The editors of ARCHITECTURAL RECORD are currently accepting submissions for the 2011 Product Reports review process. Manufacturers are welcome to submit new building products for the December issue presenting the best and most innovative offerings available to architects, specifiers, and designers.

A panel of architects, design professionals, and editors will select products for publication.
For submission instructions and to download the entry form visit **architecturalrecord/call4entries.com.**

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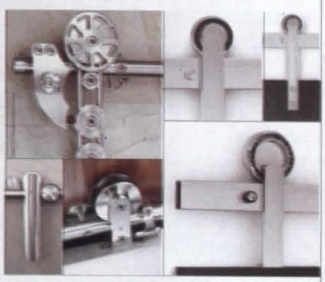

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Circle 158

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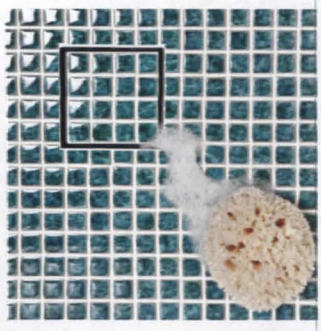

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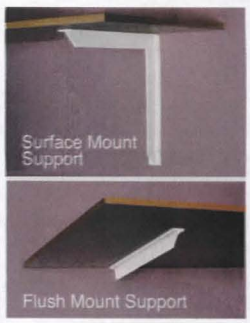

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SNAPSHOT

PROJECT METROPOL PARASOL
LOCATION SEVILLE, SPAIN
DESIGNERS J. MAYER H. ARCHITECTS

"WE HAVE A saying in our office," says Andre Santer, project architect at Berlin-based J. Mayer H. Architects. "Democracy follows form." The "form" to which Santer refers is the firm's Metropol Parasol, an exuberant, 140,000-square-foot and 94-foot-high glue-laminated timber structure that has sprouted over the Plaza de la Encarnación in Seville, Spain. Built over a site once scattered with the city's Roman ruins, the structure shelters restaurants and shops below, and includes a pedestrian path on its roof that offers expansive views of the country's fourth-oldest city. Steel rods connect the Parasol's wood slabs, which vary in width between 2 ½ inches and 1 ½ feet. Each steel rod helps evenly distribute the structure's weight. Though it is at the mercy of the elements, the Parasol is not entirely unprotected; polyurethane spray-coating and ivory paint cover its surfaces, providing a shield against Seville's summer heat, direct sunlight, and would-be vandals. "Democracy" here may be abstract, but it is no less apparent: Since the project's completion in April, its undulating forms – along with public squares in Spanish cities as far and wide as Madrid, Barcelona, Valencia, and Bilbao – have played host to frustrated young people protesting the country's 45 percent youth unemployment rate and perceived inadequacies of Spain's standing government. Seville's new icon, an outspoken aesthetic voice of its own, speaks loud and clear amidst the impassioned calls for reform. *Asad Syrkett*

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CIRCLE 15

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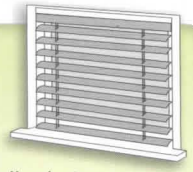
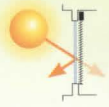
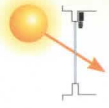
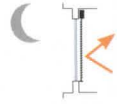




Summer Days: angle blinds to keep heat out while providing soft, even light for visual comfort



Winter Days: open blinds to let sunlight warm the room, saving heating costs



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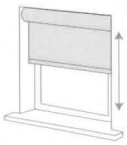

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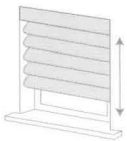

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