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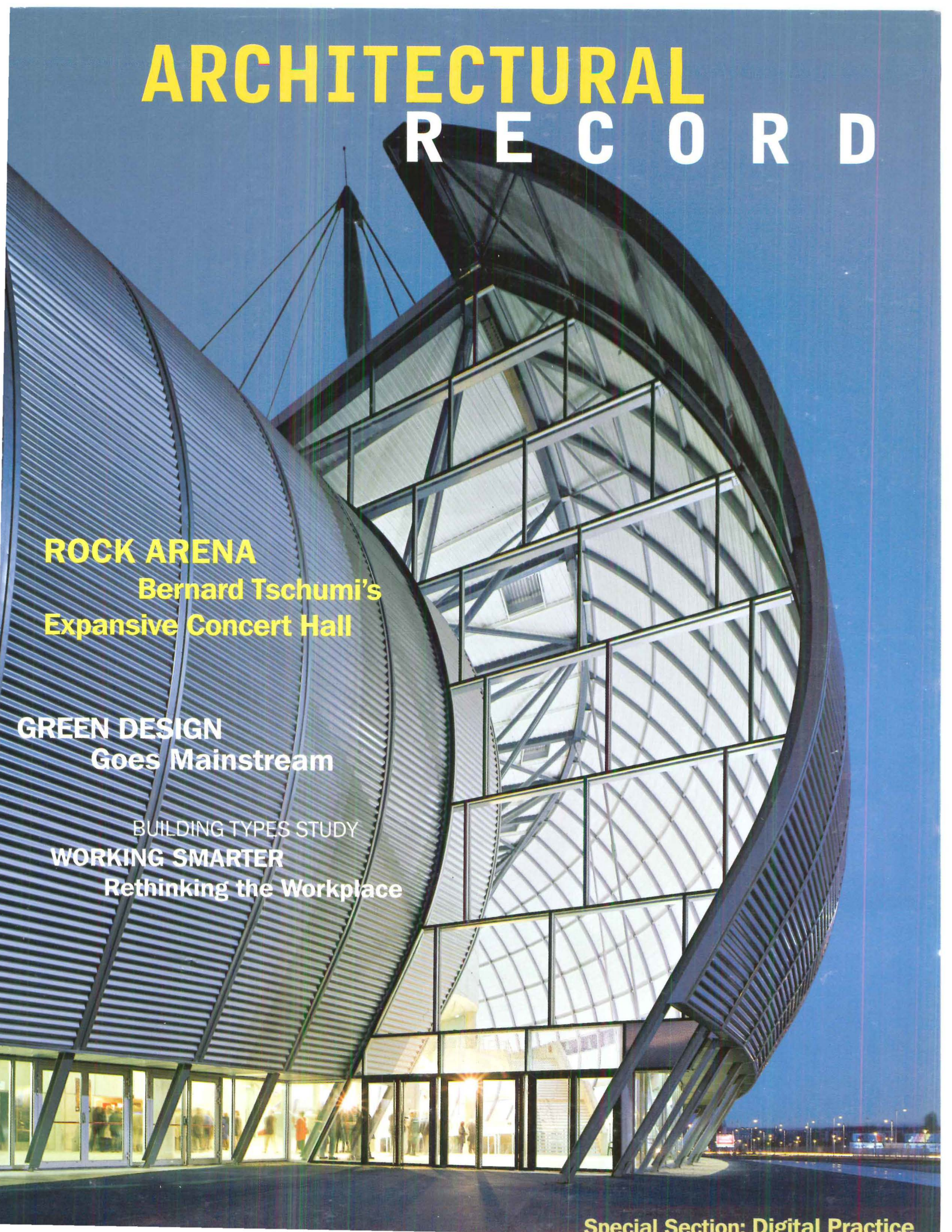

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On the Cover: *Zenith Concert Hall designed by Bernard Tschumi, Photograph by Peter Mauss/ESTO*
Right: *School gym by TEN Arquitectos, Photograph by Jaime Navarro►*

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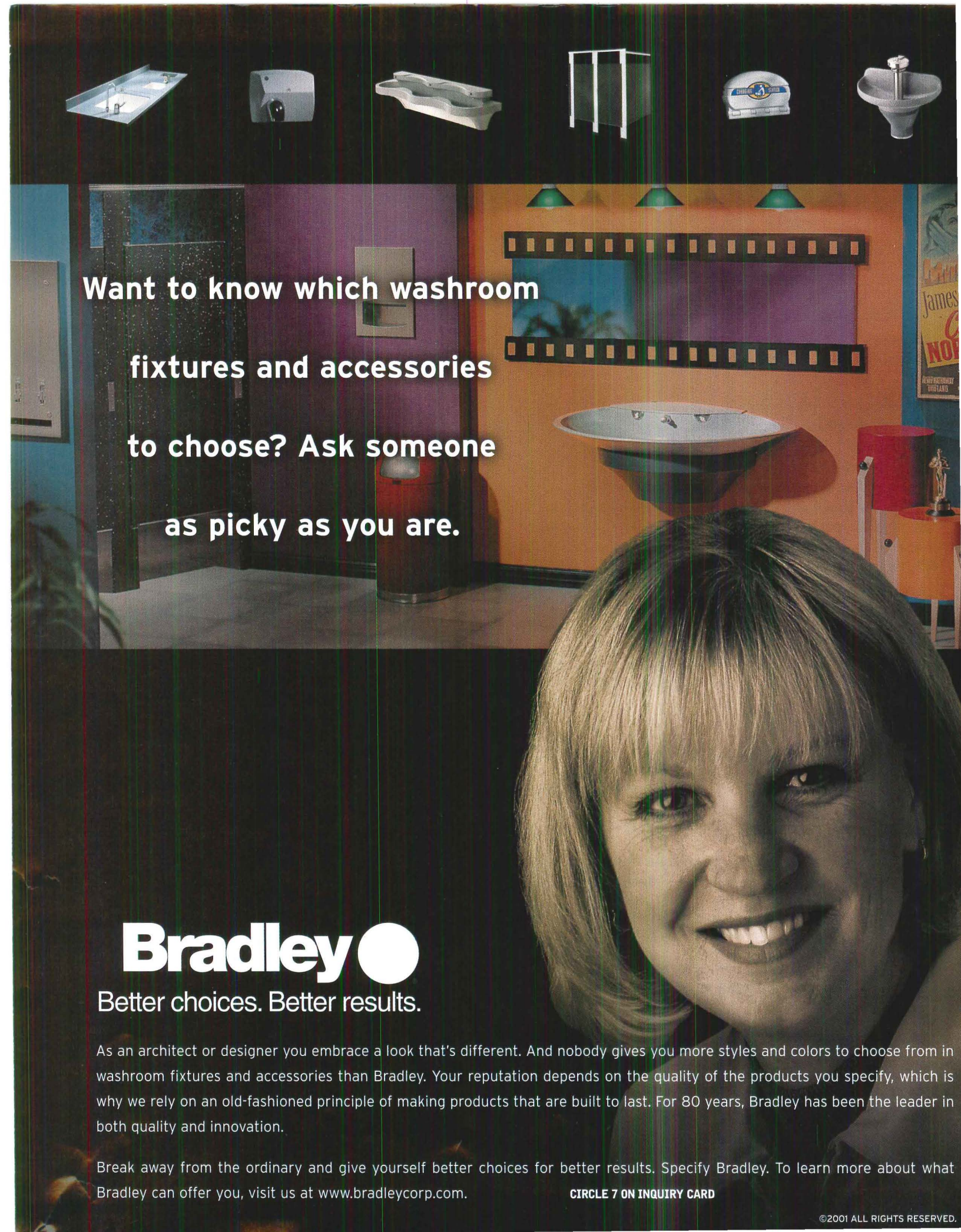

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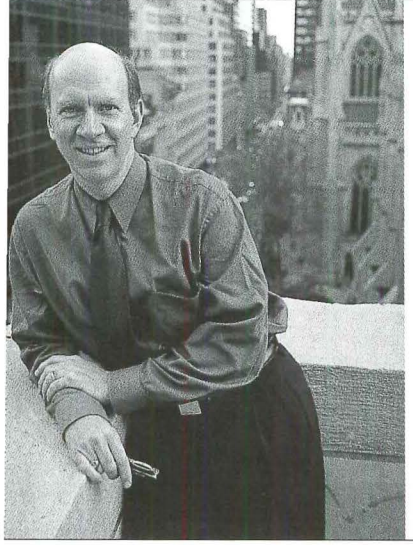


More power!

Editorial

By Robert Ivy, FAIA

Take the elevator to the 25th floor, climb the nearest hill and listen: The American city hums beneath you, a force made up of cars and temperature-controlled structures roaring in concentrated bursts, a voracious automaton constantly feeding itself on fossil fuel, demanding more and more power. And we hold one key to taming the beast.

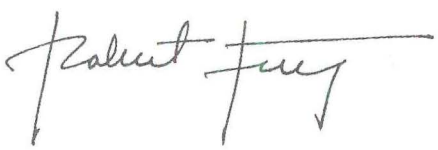
The language may resort to hyperbole, but not by much. Our national addiction to cheap power has grown, not shrunk, and it is catching up with us. This summer, Americans are confronting another emergency in energy usage and supply. Ask any Californian who faces rolling blackouts—a policeman confronted with the increased risk of crime, or a researcher who faces spoiled test results. Ask a homeowner in the temperate Mid-South who faced a natural gas bill that quadrupled in one month. Could you afford to pay a $1,000 gas bill to heat your own home? Many homeowners faced similar bills this past winter, and they became instant experts, at the micro-scale, in insulating to limit infiltration and in lowering thermostats.

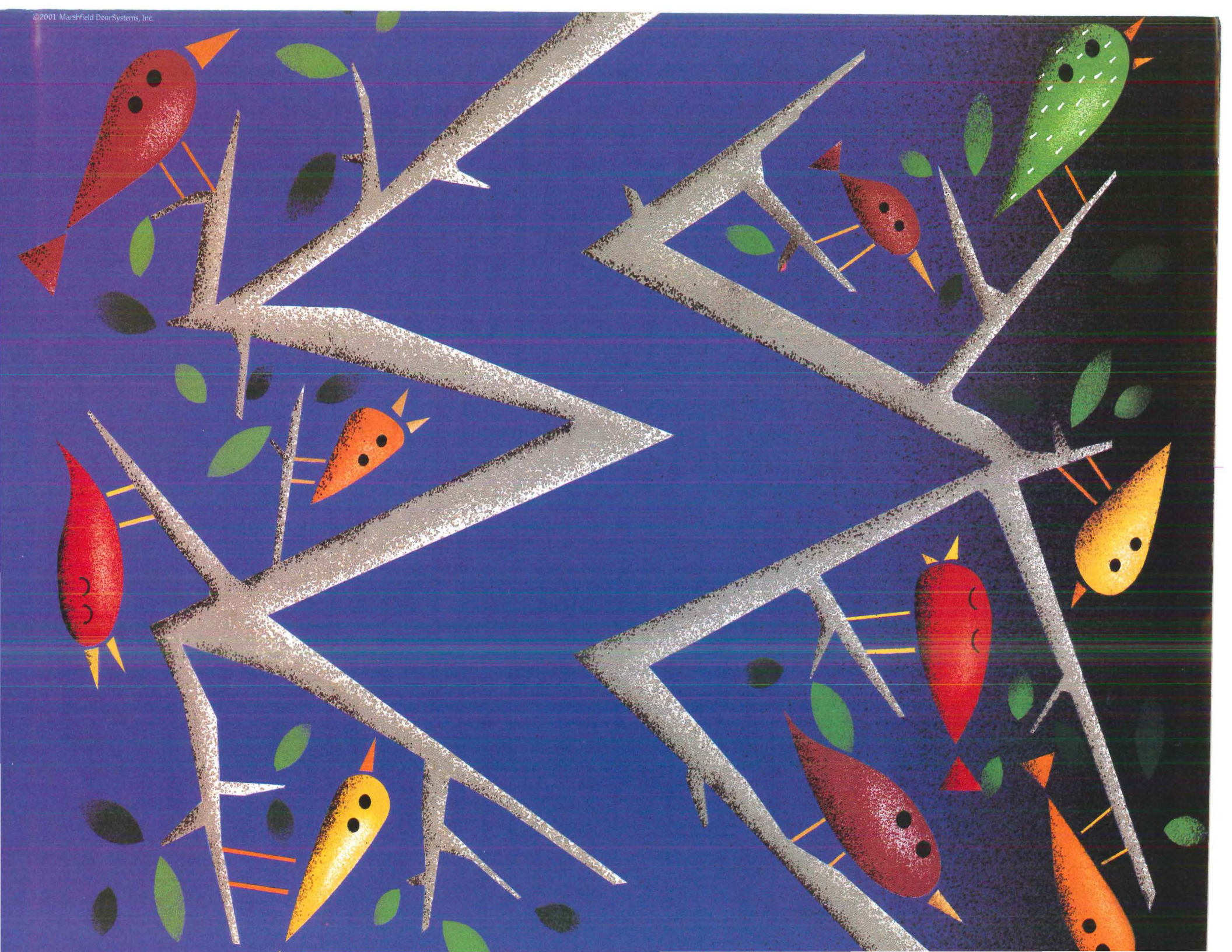
Where can the beleaguered country look for help? Not to Washington, apparently. At the federal level, the Bush administration has embraced increased supply, rather than conservation. According to the energy policy just released by the administration, efforts will focus on additional drilling for oil in Alaska and on other sensitive public lands, and in increased power production with nuclear fuel, coal, and natural gas. We clearly need more energy, but this is at high cost to all of us. Simultaneously, the administration policies marginalize conservation of resources, an approach consistent with their previous actions, including reneging on the worldwide Kyoto accords and flip-flopping on carbon dioxide emissions. The frantic states, by contrast, are already taking action. According to the New York Times, "California has an ambitious plan intended to cut peak power use this summer by 5200 megawatts, or almost 10 percent." Take note. California's new code for building construction, the nation's most restrictive and conservation oriented, applies this summer after June 1 in the most populous state. How we are charged for usage will change as well. Power companies will offer declining costs, based on reduced consumption, and other states should follow the march toward conservation. Architects' clients will not take long to cut consumption.

For architects, the issue is nothing new. We embraced sustainability in the built environment over 30 years ago as an outgrowth of the expanding ecological awareness movement of the 1960s. After an early gestation as a sort of benevolent cult in the 70s, sustainability has evolved, not as a singular goal, but as one characteristic, one vital component, in total design. Contemporary proponents maintain that green architecture is not a religion, but what any well-considered project should be.

Ironically, this crisis may breed opportunity for architects, since buildings account for 36% of total energy consumption, according to the U.S. Department of Energy, the largest percentage of all energy use, in a country with only 5% of the world's population. The fact is, without incurring greater cost our expertise can help at all scales throughout the sustainability spectrum without greater cost. Basic principles of orientation, attention to site, and climatically responsive design, including passive heating and cooling principles, can radically change building performance with minimal effort. Material choices, efficient lighting and heating, and wall and fenestration systems affect long-term power usage, and dollars. Now is the time to promote our knowledge and abilities for clients and whole communities.

While true sustainability involves more than energy awareness, this power crisis may serve as a wake-up call to architects and the clients and communities that they serve. Now is our time to speak up for the whole environment. Now is the time to lobby for changes to the tax laws that give unrealistic advantage to accelerated depreciation schedules and throw-away structures. Now is the time to promote our knowledge and abilities. The message is sustainability, one characteristic of real value, and we can gain the nation's attention while society needs our skills. That's real power.





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Letters

DEPARTMENTS

School space squeeze

In response to "A New Era in School Construction Begins" [FEBRUARY 2001, page 155], here's another issue for architects to consider. When our library was being renovated in the early 1990s, we were told that additional storage space was unnecessary in "a library for the 21st century"—i.e., one with digital capability. Though our library is beautifully designed, alas, we still need more storage space! Other erroneous predictions were that students wouldn't need books or magazines anymore. Yet our book collection of 15,000 thrives, and our subscription have increased to approximately 100 magazines, which are kept on file for five years. Our students use all these materials extensively in addition to accessing our online databases from classrooms and home. Architects must remember that when designing a space, it would be wise to consult with the people who actually use it.

—Katherine Cagle
Library/Media Coordinator
R.J. Reynolds High School
Winston-Salem, N.C.

Calendar conflict

Every May, architecture faculty members try to participate in events surrounding the important graduation ceremonies of their students. Yet, at exactly the same time, the AIA convention is held—which is arguably the most important "ceremony" for the profession as a whole. While many architects still see themselves as heroic figures, none of us can be in two places at the same time. The AIA convention is the premier opportunity to bring educators and practitioners together, and yet the AIA continues to hold its convention at the busiest and most demanding time of the year for the newest members of the profession and the professionals who educate them. Practitioners, often AIA component leaders involved in their local schools of architecture, are regularly forced to choose between events. Similarly, in an informal survey we conducted via *ArchVoices* intern newsletter last year, a majority of student readers cited "graduation" or "finals" as a primary obstacle to attending the AIA convention. While the AIA's convention dates have been set through 2005, it is time for it to demonstrate its commitment to students and educators by moving subsequent convention dates to a more accessible time.

—John Cary Jr., Assoc. AIA, Casius Pealer, Assoc. AIA, coeditors,
ArchVoices

Immaterial world

Your recent paean to materiality [MARCH 2001, page 91] reinforces the errant—but widely shared—perception that achievement in architecture resides in an object's uniqueness and materiality only, instead of how these very qualities affect human beings, as well. Your article illuminates no public or human dimension of materiality and, therefore, nothing of larger social value. What of cultural and political issues within materiality? What of labor, sustainability, cost? These and other questions are not incidental to

the human act of making objects—they are fundamental to it.
—Christopher Monson, AIA
Mississippi State University

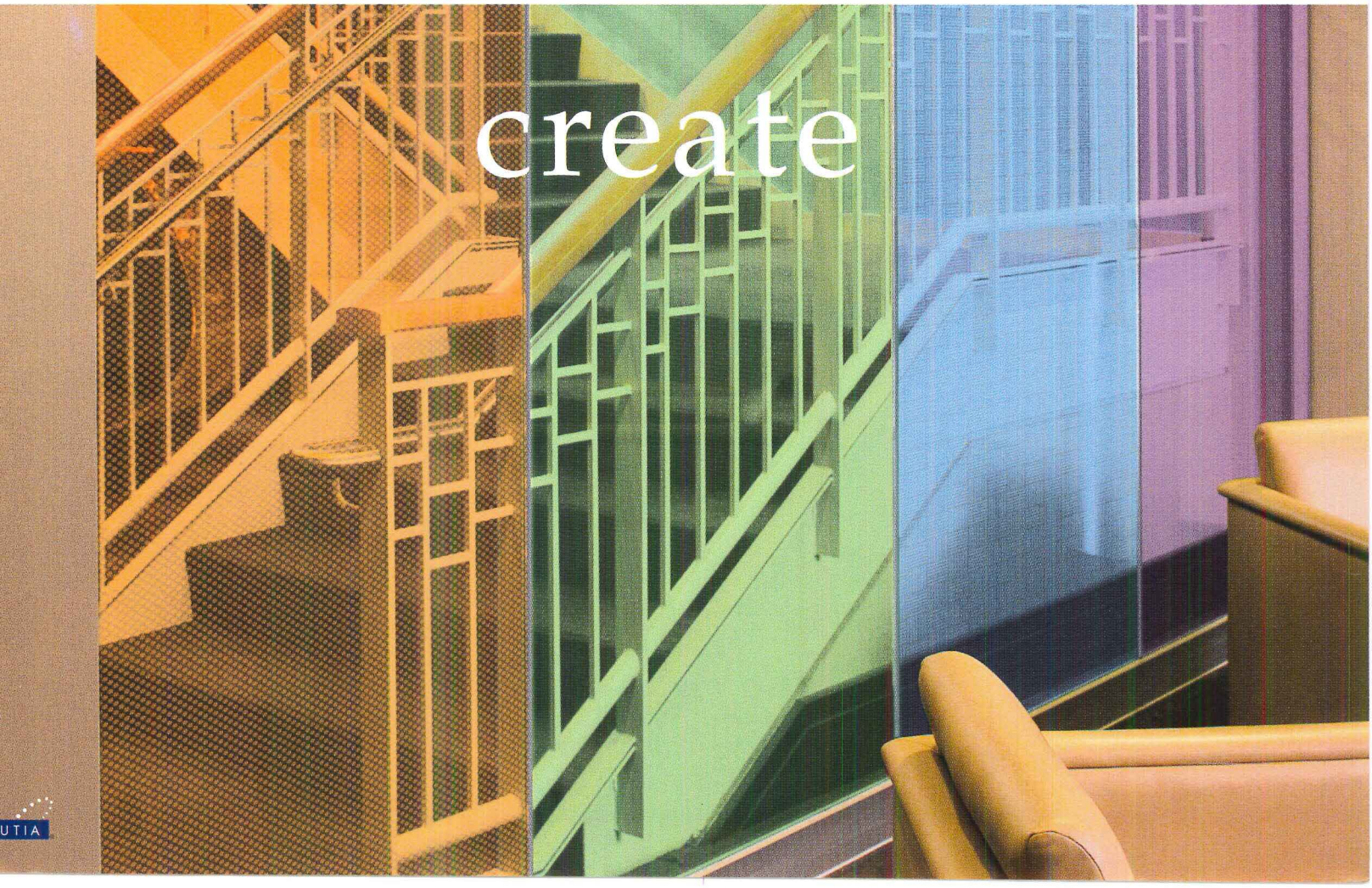
Colorado or California house?
I was thoroughly disappointed by the lack of originality and inappropriate design to site relationship of the ARO house headlining your Record Houses section [APRIL 2001, page 114]. A glass house belongs in L.A., not at an elevation of 10,000 feet in Telluride, Colo. Maybe the architect should have done some heat-loss calculations for a cold-weather climate where the average temperature is only above 70 degrees four months of the year. This type of irresponsible design is part of the reason for our recent and future energy crisis. It looks good in the glossy photos but doesn't make much sense. I know the clients sign the check, but it is the architect's responsibility to promote smart, sustainable design.
—Kevin Beytien
Boulder, Colo.

The money isn't there
You can tell that the members on the National Architectural Accrediting Board (NAAB) are far from completing their own educations. When I heard that the board was studying the repercussions of accrediting only master's programs, I was truly angered [DECEMBER 2000, page 34]. Am I alone in reporting that I had about $30 to my name at the end of my five-year undergraduate education? According to a major university's survey of the starting salaries for graduates, architecture sank right to the bottom of the list, falling below related disciplines like engineering and computer science by as much as $10,000 to $25,000. Therefore, how is the average graduate to pay for his or her extra schooling? Forcing all those who wish to become architects to pay for graduate school will only serve to reduce drastically the number of architects entering the field. Good people are already hard to find. Low salaries pushed many of my fellow graduates into other fields. They were talented people who would have made fine architects. Besides, a master's degree doesn't translate into more billable hours. It's just more school.
—James A. Mehaffey, AIA
Lancaster, Pa.

Perils of Studio Culture
Last November an architecture student was killed in a car accident during finals week because he fell asleep at the wheel after pulling many all-nighters on his studio project. As a result, the AIAS initiated the Studio Culture Task Force, which investigates the variety of unhealthy and dangerous practices that exist in educational institutions across the country. These include sleep deprivation, injury, and drug use. Some students, professors, and practitioners already believe the current studio culture (encouraging long hours) is unreasonable. Others view all-nighters and exhaustion as a necessary rite of passage. We must put an end to this misconception in the best interests of students and the future of the profession.
—Scott Baldermann, AIAS
President, AIA Student Director

Corrections
Harper Partners should have been credited as the architects for the Ann Storck Center, in Fort Lauderdale, Fla. [MAY 2001, page 174]. The Williams Natatorium at Cranbrook [MAY 2001, page 113] is in Michigan, not Minnesota. The firm 1100 Architect designed the Irish Hunger Memorial [MAY 2001, page 53], and the name of David Piscuskas, was misspelled. An incorrect photo ran with the DuraCast finish system for Centria's Series panels [Product Briefs, MAY 2001, page 368]; the photo depicts one of the Dimension Series' patterned stainless-steel options, instead. Shigeru Ban's "Naked House" [APRIL 2001, page 150] uses wood braces, not steel.

E-mail letters to:
rivy@mcgraw-hill.com



Record News

Architects inspired to build community at Denver AIA convention

Although all hotels in downtown Denver were booked solid and the convention center was relatively small for the crowd, attendees at the 133rd convention of the American Institute of Architects (AIA) had plenty of opportunities for inspiration and education. Held May 17–19, the convention themed "Leaders and Partners in Creating Community" had the third largest attendance of any AIA convention and, with more than 600 exhibiting companies at Expo2001, the second largest expo in AIA history.

Susan Stamberg (left) and Santiago Calatrava (center) delivered theme presentations. The 2002 AIA executive committee (right photo, left to right) includes: (top row) First Vice President Thompson E. Penney, FAIA; President Gordon H. Chong, FAIA; Vice President James A. Gatsch, AIA; (front row) Treasurer Douglas L. Steidl, FAIA; Secretary Stephan Castellanos, FAIA; EVP/CEO Norman L. Koonce, FAIA; Vice President Edward Kodet, FAIA; Vice President Eugene Hopkins, FAIA.

"We had hundreds of comments from members on how they enjoyed and benefited from the convention," says Norman Koonce, FAIA, EVP/CEO of the AIA (see story on AECdirect and AIA finances on the following page).

Nearly 16,500 people, including approximately 7,000 architects, attended the convention. Only the 2000 convention in Philadelphia and 1998 convention in San Francisco had larger attendance. "We thought that the attendance would not be as high as it was," say Koonce. "The support and enthusiasm from the state AIA component and the city and state were outstanding."

AIA business

Delegates to the convention passed a resolution from the floor, titled "Design and Energy Efficiency Initiative—Committee on the Environment." The resolution names a committee to assist government and private-sector leaders in developing the National Energy Policy for Building Codes and Standards.

Delegates voted to extend a $50 annual assessment per architect member for three years, through 2004, to finance the advertising campaign that began in 1998. In 2003 and 2004, the assessment will be adjusted in an amount equal to the change in the Consumer Price Index for the preceding 12-month period. A successful resolution sponsored by AIA Philadelphia supported educational and licensing standards; it encouraged the separation of the licensing exam into one portion taken upon completion of a professional degree and a second taken upon completion of the intern development program. A proposed bylaw change that would have lengthened the term of AIA vice presidents from one year to two years failed.

Thompson E. Penney, FAIA, of Charleston, S.C., was elected 2002 first vice president/president-elect. Penney, the director from the South Atlantic Region, is president and CEO of LS3P Associates, a 185-person firm in Charleston and Charlotte. Penney will be president in 2003, following 2002 President Gordon Chong, FAIA, of San Francisco, and 2001 President John D. Anderson, FAIA, of Denver. James A. Gatsch, AIA, Eugene Hopkins, FAIA, and Edward Kodet, FAIA, were elected AIA vice presidents for 2002. Douglas Steidl, FAIA, was elected treasurer for the 2002–2003 term.

Theme presentations

Susan Stamberg, special correspondent for National Public Radio (NPR), was the opening theme speaker. While making the comparison to NPR's community of millions of listeners, Stamberg spoke of how architects are designers of community. An ebullient Daniel Libeskind presented five of his museum projects, including his design for the addition to the Denver Art Museum [APRIL 2001, page 32]. Libeskind awed the standing-room-only crowd, as did the visionary architect/engineer Santiago Calatrava. Calatrava inspired the architects with his projects—shown in a lengthy presentation followed by a video of his work set to chamber music—which clearly demonstrated architecture as an art. His bridges, buildings, and sculptures left slack-jawed attendees to ask, "How does he do it?"

Construction outlook

In a presentation on the state of the construction industry, F.W. Dodge Vice President Robert Murray said the market overall is not as robust as it was a year ago, but growth, though slowed, remains evident.

John E. Czarnecki, Assoc. AIA

The Denver Convention Center, site of the 2001 AIA convention.

FUTURE AIA CONVENTIONS

2002
Charlotte, May 9–11

2003
San Diego, May 8–10

2004
Chicago, June 10–12

2005
Las Vegas, May 12–14

PHOTOGRAPHY: © JOHN E. CZARNECKI (ALL)

OFF THE RECORD

The Cleveland Museum of Art has announced six finalists in its competition for an expansion and renovation: Beyer Blinder Belle of New York, Foster and Partners of London, Frank O. Gehry & Associates of Santa Monica, Calif., Pei Cobb Freed & Partners of New York, Rafael Viñoly Architects of New York, and David M. Schwarz/Architectural Services of Washington, D.C. A winner will be chosen this summer.

The American Academy in Rome has announced winners of the 2001–2002 Rome Prize. Recipients in architecture are Alexander Kitchin and Evelyn Tickle of Charlottesville, Va., and Kelly D. Powell of Detroit. William H. Fain Jr., FAIA, of Los Angeles won in the design arts category. In historic preservation and conservation, winners are Elizabeth Riorden of Cincinnati and Ellen Phillips Soroka of Phoenix.

Construction has started after a May 24 groundbreaking for the Contemporary Arts Center in Cincinnati by Zaha Hadid. The $34.1 million building will be Hadid's first in the United States.

The Minneapolis Public Library has begun an architect-selection process for a new 400,000-square-foot building that will include a central library, planetarium, retail, and parking in downtown Minneapolis. Architects must submit qualifications by June 12, and a shortlist of firms will be announced on or about June 26. The shortlisted firms will submit detailed proposals by July 24.

The new Terminal 4 at Kennedy Airport in New York officially opened May 24. Skidmore, Owings & Merrill designed the $1.4 billion terminal.

Centro Kursaal in San Sebastián, Spain [MAY 2000, page 212] by Rafael Moneo won the Mies van der Rohe Prize as the best work completed in the European Union (EU) in 1999–2000. The EU sponsors the prize.

Faced with dissolving AECdirect, AIA assesses financial health

The financial health of the American Institute of Architects (AIA) is on shaky ground, but a plan is in place. Due primarily to the dissolution of the AECdirect Web site, coupled with a deficit spending from 1997 to 1999, the AIA now has a total net worth of negative $5.6 million. The AIA lost $4.4 million in net assets directly attributable to the consolidation of the AECdirect costs into its budget.

At its May 15 meeting, the AIA board of directors approved a plan to reduce the deficit and increase the AIA's total net worth to $2.5 million by the end of 2003. Cost reductions include cuts in board expenses, advertising, contributions to related organizations, and scholarships.

"I just want all members to know that we're being completely candid on financial issues," Norman Koonce, FAIA, EVP/CEO of the AIA, told RECORD.

In a May 8 letter to all AIA members, Koonce outlined the state of the organization's financial health. The letter was sent to inform members prior to the AIA annual meeting at the AIA convention in Denver, May 17–19. "We had a large number of members [at the convention] who expressed appreciation that we sent the letter and that we were very candid in the letter," Koonce says. "They were supportive of setting an attainable goal. It was very comforting and reassuring."

The origin of the current dilemma lies in past decisions and management. In the late 1990s, Koonce writes, "AIA financial oversight was unacceptably weak, and many practices had contributed to a steady weakening of our overall financial condition." At the same time, supplemental dues were eliminated.

The overall financial situation was weakened by the need to dissolve AECdirect, the Internet-based work site for the design and construction industry in which the AIA was majority stakeholder. [Editor's Note: McGraw-Hill, publisher of RECORD, was one of a number of minority investors in AECdirect.] It was assumed that AECdirect, like many dot-com ventures, could have been a revenue-generating Web site. After one year, AECdirect has ceased operation.

"I JUST WANT ALL MEMBERS TO KNOW THAT WE'RE BEING COMPLETELY CANDID ON FINANCIAL ISSUES." —KOONCE

Koonce says that the AIA has strengthened its financial management within the past year, with a balanced budget in 2000. Cash flow is now well managed, and the organization's reserve funds exceed the amount mandated by board policy. The loss in net assets, though, precipitated the need to cut costs.

To deal with the loss in net worth, the AIA management, executive committee, and finance committee have prepared a cost-reduction plan. Taking primary responsibility, the AIA board of directors chose to cut board expenses by $650,000 total through 2003. "The board has prescribed cuts that will not be in areas [absolutely essential to] architects," Koonce says.

The AIA's operating budget for advertising will be cut by $640,000 per year in 2002 and 2003, although delegates at convention voted to extend an assessment of $50 annually per architect member for three years (through 2004) to finance the advertising campaign. The assessment revenue will provide primary funding for the continuation of the campaign that began in 1998.

Contributions to related organizations (such as ACSA, NAAB, AIAS, AAF, and the Young Architects Forum) will be cut by $250,000 per year in 2002 and 2003—a 25 to 30 percent reduction. The board expressed a desire, though, to reinstate contributions to collateral organizations as a high priority. The AIA has contractual agreements for contributions to some organizations that will continue to be met.

Scholarship support will be reduced by approximately $280,000 per year in 2002 and 2003. The exact cut in this area will be determined by the scholarship committee and staff based on performance of restricted funds used for scholarship grants.

Miscellaneous operating expenses and administrative services, including meeting costs and discretionary grants, will be cut by $435,000 annually in 2002 and 2003. Koonce notes that the board does not call for staff cuts, although the number of people on staff at the national office has been severely reduced in recent years.

At the convention, some AIA members discussed the possible need for a dues assessment specifically to cover the deficit. However, delegates did not bring the issue to the floor. Koonce says the board is confident that a dues assessment is not needed. *JEC*

CHANGE IN AIA NET ASSETS, 1996 TO 2003

1996
$9 million

1999
$1.33 million

2000
$715,000

TODAY
-$5.6 million

2003
$2.5 million (projected)

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CIRCLE 15 ON INQUIRY CARD

OFF THE RECORD

The shortlist in the competition for the $200 million renovation and expansion of the Los Angeles County Museum of Art includes Rem Koolhaas, Daniel Libeskind, Jean Nouvel, Steven Holl, and Thom Mayne of Morphosis. An architect will be selected this fall.

Mancini Duffy has merged with Liminality. Their office in Washington, D.C., is now known as Mancini Duffy Liminality.

Richard Meier, FAIA, has his first commission at his alma mater, Cornell University, with a life sciences genome research facility that will be completed in 2006. Ground was broken this spring on Meier's $20 million Hospitality Center at the Crystal Cathedral in Anaheim, Calif. Meier was honored in May with a Lifetime Achievement award by the Americans for the Arts.

Finalists in the competition to design 46 canopies for the Metro station escalators in and near Washington, D.C. [DECEMBER 2000, page 34] are: Lourie & Chenoweth with Richard Houghton, Stanley I. Hallet, FAIA, with Ali Omar, Arthur Cotton Moore/Associates, and Weihe Design Group.

Barton Myers Associates + Architekton will design the new Tempe Performing & Visual Arts Center in Tempe, Ariz.

Work on site began in May to correct the swaying Millennium Bridge in London [AUGUST 2000, page 28; MARCH 2001, page 157]. Arup has designed a solution that employs a combination of viscous dampers and tuned mass dampers that will be installed by the end of the year.

For the Meadows Museum at Southern Methodist University, Santiago Calatrava has designed a water fountain called Wave, with rocking steel arms through which water will flow.

WW II Memorial saga may be near end

Just when it appeared that plans were set for the World War II Memorial [SEPTEMBER 2000, page 40; OCTOBER 2000, page 19] on the Mall in Washington, D.C., the process took new twists in May.

At press time, the U.S. Senate had unanimously approved a bill for construction of the proposed World War II Memorial and sent the measure back to the House of Representatives. (The House had approved a slightly different version of the measure on May 15 by a 400-to-15 vote.) Final House passage was expected by the end of May, and President Bush, who supports the memorial as proposed, was expected to sign. If approved by the House and signed by the President, the measure would validate past approvals by the National Capital Planning Commission (NCPC).

The memorial design by architect Friedrich St. Florian had passed what was considered the final hurdle for approval in a 7–5 NCPC vote on September 21, 2000.

The proposed memorial design by Friedrich St. Florian may be built.

However, in a surprise move, the NCPC voted unanimously May 3 to reconsider both the site and location of the proposed memorial. The 12-member commission, which must approve the project, voted for possible review of all six of the approvals it has made on the memorial. Until May 3, the commission was focused on the question of the legality of several votes cast by Harvey B. Gantt, FAIA, a former NCPC chair. Gantt's term as chair had officially expired when he cast several votes, including his vote in the 7–5 majority that approved the final plans for the memorial.

A special extended public meeting was planned by the NCPC for June 13 and 14 to review the proposed memorial. The NCPC was planning to vote after that meeting to (1) ratify the site and design of the previous proposal, (2) ratify only the site, (3) ratify only the design, or (4) reject the proposed site and design. Even if President Bush signs the bill by June 13, the NCPC may hold the meeting as planned for design review purposes.

Opponents claim that the memorial will obstruct the Mall's visual axis and evoke imagery of Nazi-era design. *JEC*

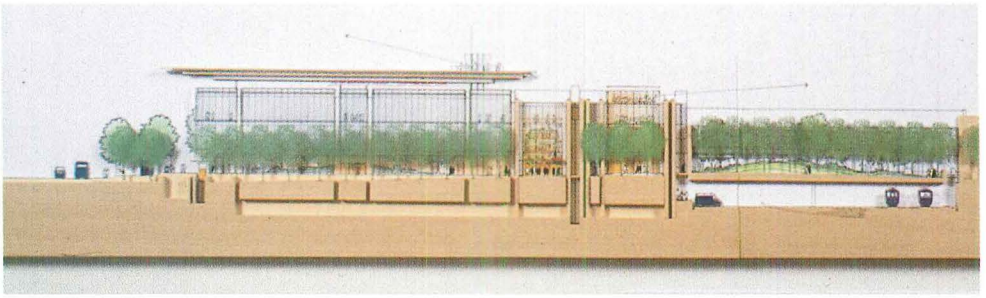
WWW For updates on the World War II Memorial, click on News at **www.architecturalrecord.com**

Makeup of commission changed after 7–5 vote in favor of memorial

The National Capital Planning Commission voted 7–5 in favor of the World War II Memorial on September 21, 2000. Here's the tally of the decisive vote (*names in italics* are no longer on the commission).

YES	NO
Presidential appointee Harvey Gantt, FAIA (chair)	***Presidential appointee Margaret Vanderhye***
Secretary of Interior Bruce Babbitt	**Mayor of Washington, D.C., Anthony A. Williams**
Secretary of Defense William Cohen	**Mayoral appointee Patricia Elwood**
Administrator of U.S. General Services Administration (GSA) David J. Barram	**Mayoral appointee Arrington Dixon**
Chair of Senate Committee on Government Affairs Fred Thompson (R-Tenn.)	**Chair of the Washington, D.C., City Council Linda W. Cropp**
Chair of House Committee on Government Reform Dan Burton (R-Ind.)	
Presidential appointee Robert Gaines	

Of the commission's current members, three voted in favor, four voted against it, and four (listed below) have not cast a vote on the project. The seat held by Presidential appointee Margaret Vanderhye is currently vacant. New commission members include Secretary of Interior Gale Norton, Secretary of Defense Donald H. Rumsfeld, Presidential appointee Richard Friedman (chair), and Acting Administrator of GSA Thurman M. Davis, Sr.



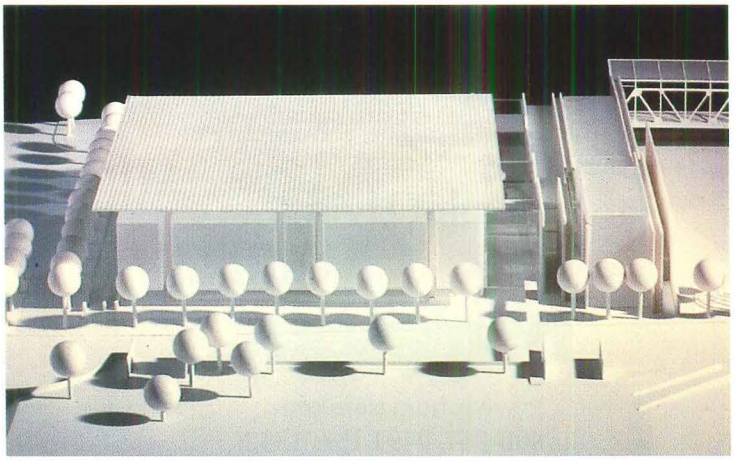
Creating a new face for the Art Institute of Chicago, Renzo Piano shows plans for $200 million museum addition

The Art Institute of Chicago unveiled in May its designs for a $200 million addition and accompanying master plan by Pritzker Prize–winning Italian architect Renzo Piano. Scheduled to open in 2006, Piano's 290,000-square-foot addition, an L-shaped, five-story building of steel, glass, and limestone, will establish the Beaux-Arts museum's 21st-century identity and clarify the museum's circulation, according to Robert Jones, AIA, the museum's director of design and construction. This will be the most dramatic reorganization of the museum since it opened in 1893.

Piano's addition will be built on the northeast end of the museum grounds, at the corner of Monroe Street and Columbus Drive. The addition's northern facade on Monroe Street will face Millennium Park, a mammoth $300 million project featuring a band shell by Frank Gehry now under construction to the north of the museum. Though the Art Institute's primary entrance will remain on the western facade of the complex along Michigan Avenue, between the famous lions, Piano's addition will have a new public entrance on Monroe Street. The axes of the original building's Beaux-Arts circulatory patterns will be extended and abstracted eastward in Piano's new building.

Piano affectionately refers to the addition's overhanging glass roof on *pilotis,* placed on the structure's skylit top, as a "flying carpet." The urbanely Modernist building will also add a separate entrance for the hordes of students who visit each year, and it will require demolition of the Goodman Theater, built in 1926 by Henry van Doren Shaw. Nearly 75,000 square feet of Piano's addition will be gallery space to consolidate contemporary and modern art collections now spread throughout the 950,000-square-foot museum.

The addition will allow more daylight to penetrate and will afford more views of the city for greater orientation and context. Indeed, the museum's dimly lit Gunsaulus Hall, a popular meeting place and home to the arms and armor exhibits, will be transformed into a glass-walled axis framing views of Millennium Park and the commuter trains that run under the museum. To ensure museum-goers remain unencumbered by Chicago's biting winter weather, Piano is now honing the conceptual plan to create a more direct route between the museum and Millennium Park's 4,500-space parking lot. A midblock pedestrian bridge may link the museum to the park itself. *Rosemarie Buchanan*



A $200 million, 290,000-square-foot addition by Renzo Piano to the Art Institute of Chicago (above and left, view of the northern facade along Monroe Street) will include a new entrance facing Millennium Park. The addition, in steel, glass, and limestone, will open in 2006.

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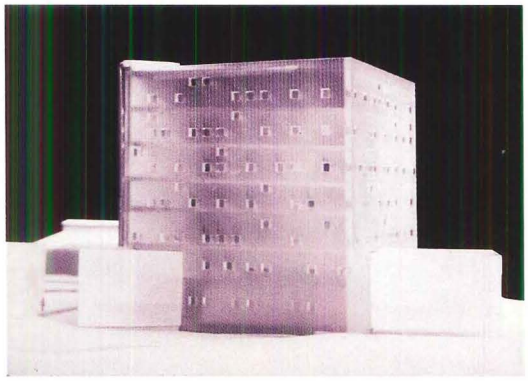
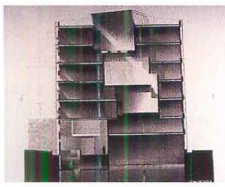
CIRCLE 19 ON INQUIRY CARD

Holl wins Cornell University architecture building competition

A commission to design a school of architecture building is rare. The opportunity is especially unusual when the school is one of the best in the country, and the four competing architecture firms are all well known for quality design work. That was the case in the competition to design a new home for the department of architecture in the College of Architecture, Art, and Planning at Cornell University in Ithaca, N.Y. Steven Holl, of New York, was selected for the $25 million building in an invited competition that included Thom Mayne with Morphosis, Tod Williams Billie Tsien and Associates, and Peter Zumthor. The building, to be built on a prominent location on the crest of Fall River gorge, is expected to be completed by fall 2004.

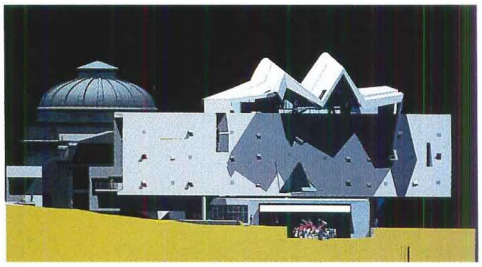


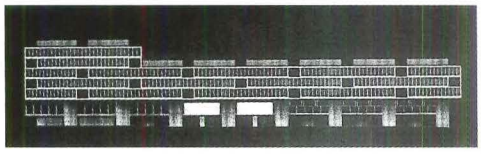


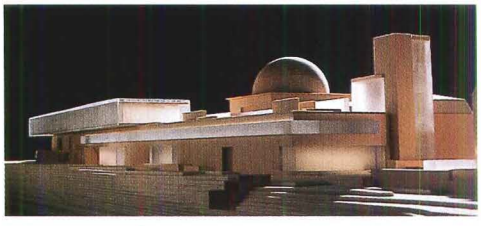
Steven Holl's winning design (above and left) is a cubic structure with translucent and transparent facades. Structural glass cladding will span clear between floors.

Holl's scheme was chosen unanimously by the jury, which included James S. Polshek, FAIA (chair), Terence Riley, Toshiko Mori, Heinz Tesar, Kenneth Frampton, and Carme Pinós.

A seven-story cubic mass, Holl's design is described as a "hyper cube" that will act as a gateway or lantern for that portion of the campus. Sited on a busy pedestrian path, the building will have a 24-hour accessible passage through the ground floor of the building. Three of the building facades will be clad in a recycled structural glass with inset openings that are three feet deep for three-foot-square windows. Initially the pattern of window placement was generated randomly through a computer program. The west wall, along which most of the building's core functions are congregated, will use a relatively new material—foamed aluminum—as a cladding panel. Three large seminar/critique spaces (see section drawing above), will be in the center of the building, surrounded by studios. The top seminar room will have skylights, and transparent flooring for the top two seminar rooms will allow light to filter down to all three seminar spaces.







The three finalist schemes in the competition were by (from top) Thom Mayne with Morphosis, Peter Zumthor, and Tod Williams Billie Tsien.

According to the jury's written comments on Holl's design: "If constructed as designed, this brilliant design will set a new standard of excellence for Cornell's architecture."

Holl told RECORD, "In the 20th century, American architectural education was haunted by the myth of the Cornell School of Architecture. For an architect, realizing architecture for a school of architecture resembles autodidactic brain surgery. In the case of Cornell, it includes the challenge of a ghost in search of a new body."

Thom Mayne's entry featured what the jury described as a "crustacean profile" with an "oversailing roof." According to the jury, Zumthor's design is a "brilliant typological scheme consisting of a series of longitudinal studio volumes ranged on either side of a six-story, top-lit galleria." The low, linear building with three public nodes by Williams and Tsien was deemed "too attenuated in plan" by the jury. *JEC*

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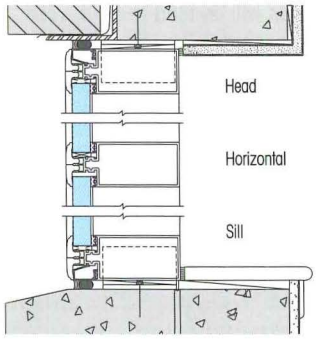

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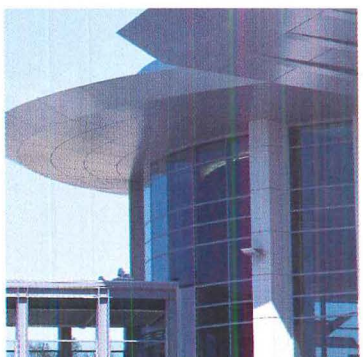

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CIRCLE 21 ON INQUIRY CARD

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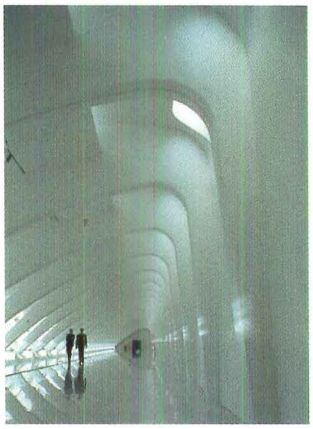
First portion of Calatrava's MAM addition opens to public

A portion of the addition to and renovation of the Milwaukee Art Museum by Santiago Calatrava opened to the public on May 4. New gallery spaces, a museum store, and a 300-seat auditorium were inaugurated, as were expanded, renovated, and reinstalled permanent collection galleries in the existing building. Calatrava was not present for the opening.

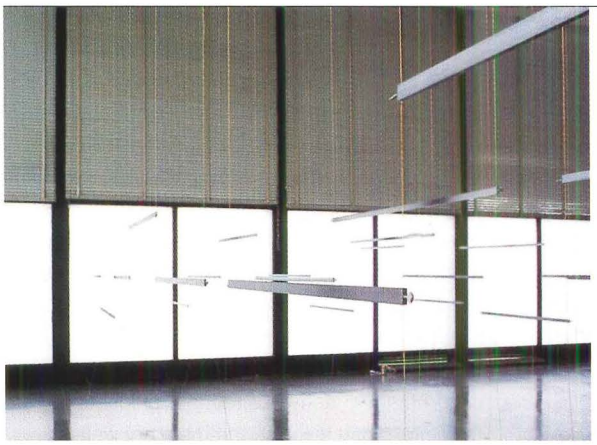


Concrete arches create a rhythm in the MAM addition.

A reception hall under the brise-soleil, a cafe, and an underground parking garage will open on September 14, 2001, and landscape designed by Daniel Kiley will be completed in October. The movable brise-soleil, the key feature of the building, might not be installed until 2002. In May, the museum was undecided on whether the brise-soleil would be constructed of aluminum, steel, or carbon fiber.

The long, low-lying portion of the building that has opened is a link between the museum's existing buildings, by Eero Saarinen and David Kahler, FAIA, and the grand entrance and reception hall scheduled to open in September. Two gallerias (one is shown at left) flank a changing-exhibition gallery with movable walls. The gallerias and gallery space are punctuated by 38 expressive concrete arches that create a dynamic rigor. Z-shaped bands of glass with a bluish tint line the east and west gallerias. An exhibition of the work of Wisconsin native Georgia O'Keeffe opened in the new rotating-exhibition gallery.

Kahler's Milwaukee firm, Kahler Slater, has worked with Calatrava as the architect of record for the addition. *JEC*



Crown Hall strung up and played as an instrument for IIT open house

Mies van der Rohe's legacy of sober material investigations rang with new significance in May at Crown Hall at the Illinois Institute of Technology (IIT). Chicago's MASS Ensemble, a conceptual music group, strung the interior volume of Crown Hall with 28,000 feet of brass wire and played the building like a guitar. Crown Hall is a candidate for National Historic Landmark status.

To commemorate the IIT School of Architecture's annual open house, architect and exhibit coordinator Mark Schendel reinterpreted Mies' transparency, universal space, and floating symmetry by making it hum. With barely visible metal strings that catch the occasional glimmer of daylight, MASS Ensemble plucked and rubbed the wires like moistened glass rims. Musical license wasn't the only parameter guiding their piece: "We superimposed a musical staff over elevations of Crown Hall as inspiration," said Bill Close, MASS Ensemble's founder. Close, a classically trained instrumentalist, conjured the stonemason's son by penciling in notes where the five-lined staff intersected Mies' beams.

To create the building-as-instrument, students gutted two large blocks of plywood lockers that usually serve as partitions for the school's one-room studio space. Wires were then connected to opposing walls' steel beams where they meet the ceiling. Those wires were pulled taut, harnessed like a ponytail, and fastened inside the empty locker boxes, which became guitarlike resonant chambers. Pulled through to the other side of these chambers, the wires stretched to adjacent walls where their tail ends connected to more beams. The opening performance was May 11, and the installation was struck soon after its final strumming on May 26. *RB*

The Wexner Center for the Arts by Peter Eisenman requires a $10 million renovation due to extensive maintenance issues.

Only a decade old, Eisenman's Wexner Center in need of $10 million retrofit

They don't build Deconstructivist buildings like they used to. Thankfully, some may say.

Dedicated in November 1989, Peter Eisenman's Wexner Center for the Arts on the Ohio State University campus in Columbus, Ohio, is in desperate need of repairs. The university has hired the Columbus architecture firm Schooley Caldwell Associates for architectural and engineering services related to a planned $10 million Wexner Center renovation/retrofit.

The Wexner Center for the Arts was a key commission for Eisenman, who had completed mostly small residential and theoretical projects up to receiving this job. The winning scheme in a national design competition, this was his first major public built work. Designed with Richard Trott of Columbus, Eisenman's building integrates the grid plans of both Columbus and the university, "town and gown."

Although an important building in Eisenman's career, the Wexner Center, completed in 1989, did not fare well in the ensuing years. According to the university's request for proposals (RFP): "In recent years, the Wexner Center has experienced problems including building leaks, environmental control difficulties, and operational inefficiencies involving space planning and patterns of use."

The RFP notes, however, that "the renovation/retrofit should be considered a preservation project for a landmark building. The project must be undertaken with the understanding that a successful design will have minimum impact on the original design."

Before issuing the RFP, the university hired a team of consultants to analyze the Wexner's problems. According to the RFP, the consultants found that the building has severe maintenance issues that the university did not anticipate: "Many parts of the Center's physical plant have required greater maintenance than typically found for similar systems in other campus buildings. The painted steel exterior grid has required painting every three to five years. Caulking and sealing maintenance schedules are significantly more intensive than typical campus buildings due to the types of materials in the exterior envelope system. It is difficult to maintain temperature and humidity control in galleries due to the lack of zoning and system controls."

In addition, the RFP notes: "Leakage is occurring frequently in a number of locations in the Center and involves the masonry walls, flashing and coping, curtain wall, and skylights. The leaks have increased in number and frequency with time. Condensation is appearing in the south end of the building and elsewhere along curtain walls when exhibit walls are erected in front of curtain walls. Leakage has occurred in the pressurized piping system of the radiant heating system—the presence of water piping above some areas is not in conformance with museum practice."

Schooley Caldwell will verify the building condition and appropriate building program, develop contract documents, and be responsible for contract administration. The firm will submit contract documents by March 2002, with construction beginning in May 2002. *JEC*

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CIRCLE 24 ON INQUIRY CARD

CNU gives inaugural Charter Awards

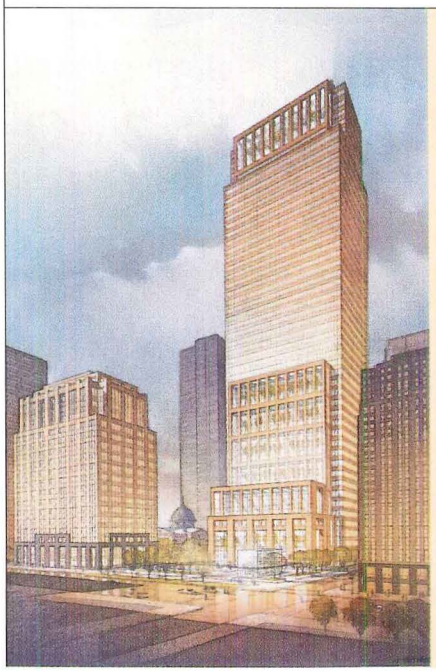
Johnson Street Townhomes in Portland, Ore., by Mithun.

The Congress for the New Urbanism (CNU) has honored 15 projects in the organization's inaugural Charter Awards. A total of 208 projects were judged on how well they fulfilled the 27 principles in the Charter of the New Urbanism. The awards were given at CNU IX, held in New York City, June 7 to 10.

Winning projects are located in 10 U.S. states and three foreign countries: **Robert Mueller Municipal Airport Reuse Plan** in Austin, Tex., by Roma Design Group of San Francisco; **Flaghouse Courts Hope VI Revitalization** in Baltimore by Torti Gallas and Partners of Silver Spring, Md.; **A Civic Vision for Turnpike Air Rights in Boston** by Goody, Clancy & Associates of Boston; **Eighth & Pearl Mixed Use Building** in Boulder, Colo., by Wolff Lyon Architects of Boulder; **State Street Renovation Project** in Chicago by Skidmore, Owings & Merrill of Chicago; **Managuita Neighborhood Plan** in Managua, Nicaragua, by Delphi Design and Development of Coconut Grove, Fla.; **New Jersey State Plan** by the New Jersey Department of Community Affairs; **Johnson Street Townhomes** in Portland, Ore., by Mithun Partners of Seattle; **King Farm New Town** in Rockville, Md., by Torti Gallas and Partners of Silver Spring, Md.; **Envision Utah** in Salt Lake City by Calthorpe Associates of Berkeley, Calif.; **Fonti di Matilde Resort Development** in San Bartolomeo, Italy, by Studio Bontempi of Gaiano, Puerto Rico; **Britton Courts Housing Development** in San Francisco by Solomon ETC of San Francisco; **Washington Township Town Center Open Space Design Standards** in Washington Township, N.J., by Brown & Keener Urban Design of Philadelphia; **Townhomes on Capitol Hill** in Washington, D.C., by Telesis Corporation of Washington, D.C.; and **Liveable Neighborhoods Statewide Codes** in western Australia by the Ministry of Planning in Perth, Australia.

CNU executive director Shelley Poticha says, "These winners are proof that the New Urbanism movement is succeeding."

The jury included Ray Gindroz, FAIA (jury chair), Jonathan Barnett, FAIA, Robert Campbell, FAIA (RECORD contributing editor), Harvey Gantt, FAIA, Laurie D. Olin, Elizabeth Plater-Zyberk, FAIA, and Anne Vernez Moudon. *JEC*



Stern to scrape Philly sky

Robert A.M. Stern, FAIA, may soon leave his mark on the skyline of Philadelphia. His firm, Robert A.M. Stern Architects, has designed a two-building, 1.7-million-square-foot complex for Liberty Property Trust. The tallest of the two buildings will be 50 stories, or 725 feet, and will be the fourth-tallest building in Center City Philadelphia. Willard Rouse III, chief executive officer of Liberty Property Trust, hired Stern for the complex, which should be complete in 2004.

The complex is planned for a block bounded by John F. Kennedy Blvd., Arch St., 17th, and 18th Streets, next to Suburban Station. The taller tower will have 1.4 million square feet of office space. A 110-foot-high winter garden will serve as entrance to the taller tower. The second tower will be 16 stories tall with 280,000 square feet of space. Olin Partnership has designed an outdoor plaza next to the winter garden. *JEC*

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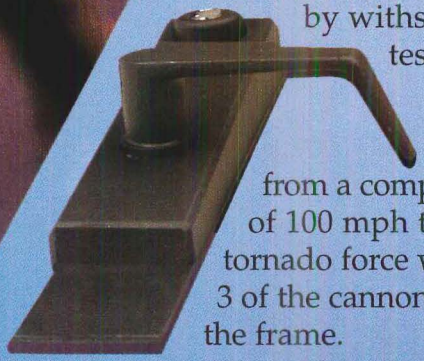

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News Briefs

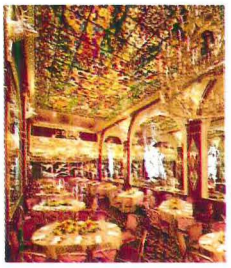
The UCLA Hammer Museum will have a greater presence and graphic identity.

Maltzan, Mau, and Blaisse have a Hammer UCLA unveiled the design in May for a $25 million expansion and reconfiguration of its Hammer Museum by architect Michael Maltzan of Los Angeles, designer Bruce Mau of Toronto, and landscape and interior designer Petra Blaisse of Amsterdam. Plans call for a 288-seat theater, expanded gallery space with four new galleries, a new primary entrance, a restaurant, and a relocated bookstore. Construction is expected to begin in 2002 and be completed in a year. The existing museum building, at the corner of Wilshire and Westwood Boulevards, was designed by Edward Larrabee Barnes.

Mau [see interview, page 65] is developing an identity program for the museum. Maltzan and Mau have collaborated on projects in the past, including the Walt Disney Concert Hall in Los Angeles by Frank O. Gehry and Associates. Maltzan had worked for Gehry at the time the concert hall was designed.

Sarah Tomerlin Lee dies An editor and designer, Sarah Tomerlin Lee died April 15 at age 90. She held various editorial positions at *Vogue* and *Harper's Bazaar* before becoming editor of *House Beautiful* in 1965. She took over her husband's interior design firm after his death in 1971 and became known as a hotel designer. Her firm became a part of Beyer Blinder Belle, where she was head of interior design from 1993 to 1997.

Russian Tea Room honored New York's Russian Tea Room won the 2001 James Beard Foundation Award for Outstanding Restaurant Design on April 30. The award honors the best restaurant design or renovation in North America since 1998. The late Warner LeRoy, owner and CEO of LeRoy Adventures, operated the Russian Tea Room and designed the restaurant's renovation.



Russian Tea Room

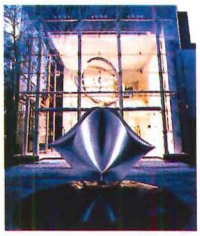
Art Institute launches space exhibition by Garofalo Chicago architect Doug Garofalo [DECEMBER 2000, page 82] has designed both the *Time* exhibition at the Museum of Science and Industry [APRIL 2001, page 42] and the *2001: Building for Space Travel* exhibition at the Art Institute of Chicago (above). On view through October 24, the space travel exhibit presents the work of architects, civil engineers, and industrial and graphic designers for the space program. After Chicago, *2001: Building for Space Travel* flies to Seattle, where it will be at the Museum of Flight, December 15, 2001, through May 15, 2002.

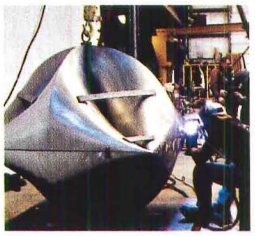
2001: Building for Space Travel

PHOTOGRAPHY: COURTESY MICHAEL MALTZAN ARCHITECTURE

News Briefs

Time stands still The New York Times Capsule, designed by Santiago Calatrava, was permanently installed on April 26 outside the Rose Center for Earth and Space [AUGUST 2000, page 98] at the American Museum of Natural History in New York City. A five-foot-tall sculpture of welded stainless steel, Calatrava's capsule design was selected from among 50 proposals in 1999. Filled with artifacts of the late 20th century, the capsule is sealed until the year 3000.





The time capsule as it was sealed (right).

The academy honors The American Academy of Arts and Letters bestowed on New York architects and partners-in-practice Henry Smith-Miller and Laurie Hawkinson its annual Arnold W. Brunner Memorial Prize, given to an architect "who has made a significant contribution to architecture as an art." Academy Awards in Architecture were given to Vincent James of Minneapolis and SHoP/Sharples Holden Pasquarelli of New York. The architects were honored at a May 16 ceremony.

Perkins & Will win L.A. federal courthouse job Perkins & Will has won a competition for the 1-million-square-foot federal courthouse to be built in downtown Los Angeles by 2007.

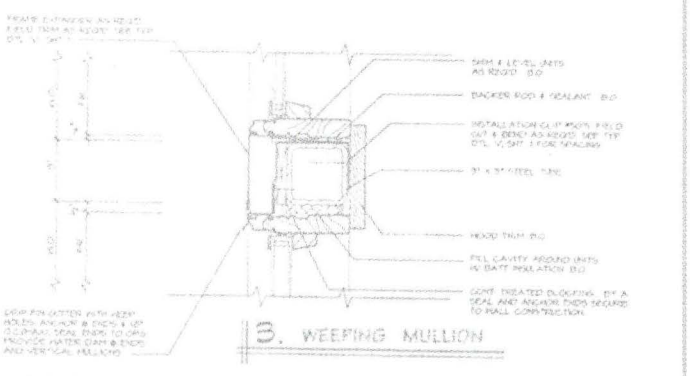
Perkins & Will's winning scheme for the federal courthouse in los Angeles.

Ralph Johnson, FAIA, will be the design architect. The finalists for the $300 million project were Skidmore, Owings & Merrill, Cannon Dworsky, and Rafael Viñoly Architects. The General Services Administration selected Perkins & Will through its Design Excellence Program. Jurors were Thom Mayne, FAIA, William Pedersen, FAIA, Peter Bohlin, FAIA, and Joseph Giovannini.

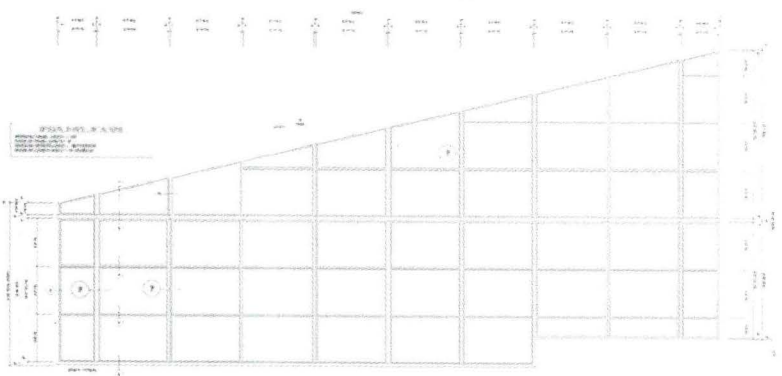
Gehry and the Met on board with Lincoln Center plans New York's Lincoln Center for the Performing Arts is moving forward with its plans for a $1.5 billion renovation and reconstruction [MARCH 2001, page 27]. The design team now includes Frank O. Gehry, FAIA, in addition to New York's Beyer Blinder Belle and Cooper, Robertson & Partners. Landscape architect Laurie Olin is also part of the team. A master plan document is being developed and should be complete in coming months. In May, the design team discussed several options for public space configurations. One option reportedly under consideration is a glass enclosure over the central plaza.

After withdrawing from the project in January, claiming it was slighted in the planning process to that point, the Metropolitan Opera rejoined the coalition of Lincoln Center constituents in May.

WEEPING MULLION



3. WEEPING MULLION



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CIRCLE 29 ON INQUIRY CARD

Dates & Events

New & Upcoming Exhibitions

Albert Kahn: Inspiration for the Mod.ern
Ann Arbor, Mich.
June 2–October 21
Explores how Kahn's industrial architecture inspired the development of international Modernism. Includes works of art and architecture by many of Kahn's contemporaries, such as Diego Rivera and Le Corbusier. At the University of Michigan Museum of Art. Contact 734/764-0395 or see www.umich.edu/~umma.

Equilibrium: The Architecture of Nicolas Grimshaw & Partners
Zurich
June 7–July 21
The firm's work is presented in a series of aluminum flight cases that display mock-ups, fabrics, models, and drawings. Coincides with the publication of *Equilibrium,* the latest monograph on the firm. At the Architektur Forum Zurich. Contact 41 1252 92 95 or ngp@ngrimshaw.ch.

The Idea of Louis Sullivan
Chicago
June 9–September 23
Exhibits the photographs of John Szarkowski, former curator of photography at the Museum of Modern Art and publisher of a book entitled *The Idea of Louis Sullivan.* The exhibition marks the occasion of the republishing of the original 1956 book. At the Art Institute of Chicago. Contact 312/443-3600.

Out of the Ordinary: The Architecture and Design of Venturi, Scott Brown and Associates
Philadelphia
June 10–August 5
Exhibits 250 works from one of the most influential firms of the last half-century. Presents drawings, models, furniture, and reconstructions of elements of their buildings, many of which are exhibited publicly for the first time. At the Philadelphia Museum of Art. Contact 215/684-7860 or see www.philamuseum.org.

Mies in Berlin
New York City
June 21–September 11
Exhibits work from the early career (1905–1938) of architect Ludwig Mies van der Rohe. Though Mies is known mostly for his American Modernist glass skyscrapers, this exhibition will focus on early influences. At the Museum of Modern Art. Contact 212/708-9400 or see www.moma.org. Exhibition complements **Mies in America**

Mies in America
New York City
June 21–September 23
Exhibits work from the late career of the German architect Ludwig Mies van der Rohe, after he arrived in America in 1938. The Seagram Building in New York and the Farnsworth House in Illinois are the show highlights. At the Whitney Museum of Art. Contact 212/570-3600 or see www.whitney.org.

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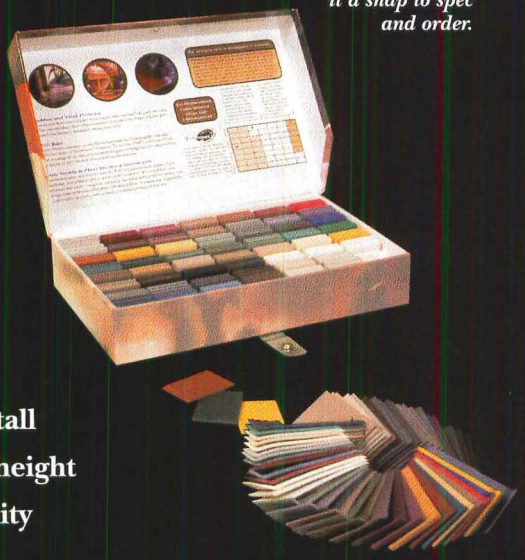

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CIRCLE 31 ON INQUIRY CARD

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Dates & Events

Exhibition complements **Mies in Berlin** (see preceding entry).

Art of the Architect
Atlanta
June 23–September 2
Features creative paintings and drawings of contemporary Italian architects, including the late Aldo Rossi, Massimo Scolari, Arduino Cantafora, and Franco Purini. At the High Museum of Art. Contact 404/733-4437 or see www.artofarchitect.com.

Detonation Deutschland
Vienna
June 28–September 3
A film sequence showing the detonation of German buildings from 1945 to the present, exploring the fate of the act of building. This event will be the first exhibition at Alte Halle, on the occasion of the official opening of the new Vienna Museums Quartier. For more information contact office@azw.at via e-mail, or see www.azw.at.

Glass of the Avant-Garde: From the Vienna Secession to Bauhaus
New York City
August 21–January 6, 2002
An exhibition of the collection of 19th and early 20th century Eastern European glass from the Museo Nacional de Artes Decorativas in Madrid. At the Cooper Hewitt, National Design Museum. Contact 212/849-8400 or see www.si.edu/ndm.

What's Shakin': New Architecture in L.A.
Los Angeles
September 16–January 2, 2002
An exhibition featuring new L.A. architecture currently under construction. Projects include the Disney Concert Hall by Frank Gehry, the Cathedral of Our Lady of Angels by Rafael Moneo, the new Prada store by Rem Koolhaas, and others. At the MOCA galleries at the Pacific Design Center and the Geffen Contemporary. Contact 213/621-2766 or see www.MOCA-LA.org.

Ongoing Exhibitions

Hiro Yamagata: Object, Light, and Laser Installation
New York City
Through July 28
Holographic panels and thousands of spinning, mirrored cubes transform the gallery into a wondrous space refracted with spectra of color. At the Ace Gallery. Contact 212/255-5599 or acegallery@aol.com.

Light Screens: The Leaded Glass of Frank Lloyd Wright
New York City
Through September 2
Exhibits 50 leaded-glass windows of Frank Lloyd Wright. Many of these masterpieces in light and color come from private collections and have never been exhibited publicly. At the American Craft Museum. Contact 212/956-3535 or see www.americancraftmuseum.org.

The Architecture of Fumihiko Maki: Modernity and the Construction of Scenery
London
Through July 22
Exhibits the work of internationally acclaimed Japanese architect Fumihiko Maki. At the Victoria and Albert Museum. Contact 44 207 942 2558 or s.cole@vam.ac.uk.

Frank Gehry, Architect
New York City
Through August 26

WHY THE CUMMINGS CENTER RELIES ON SLOAN'S ROYAL® FLUSHOMETERS

"There was really only one choice for the hundreds of restroom Flushometers when we renovated The Cummings Center," according to Gerry McSweeny, General Manager, it had to be "Sloan Flushometers."

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The Cummings Center houses retail stores, restaurants, bioresearch labs, community facilities, banks, a daycare center, health and entertainment centers and a church as tenants.

McSweeny said, "Quality was the primary consideration for the original shoe factory which featured the first use of steel-reinforced concrete. For Flushometers today, quality is still the key. That's why we chose Sloan's Flushometers with Royal Dual Filtered By-Pass technology. It reflects proven quality innovation and foresight that lasts a lifetime."

Sloan's Dual Filtered By-Pass technology was created to help facilities deal with a variety of water conditions. This patented technology is one of the primary reasons for the reliability and long life of Sloan's Royal line.

The Cummings Center, now a busy high-tech "groundscraper," continues its tradition of quality.

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CIRCLE 33 ON INQUIRY CARD

Dates & Events

Exhibits work from the 40-year career of the architect and his firm, Frank O. Gehry & Associates. This major retrospective includes national and international projects. At the Solomon R. Guggenheim Museum. Contact 212/423-3500 or see www.guggenheim.org.

Federal Design Now! GSA 2000 Design Awards
Washington, D.C.
Through July 8
Exhibits contemporary architecture and works of art that were commissioned by the U.S. federal government and that won GSA 2000 Design Awards. At the National Building Museum. Contact 202/272-2448 or go to www.nbm.org.

Luis Barragán: The Quiet Revolution
London
Through July 8
Exhibits the work of the Mexican Modernist, including houses and gardens. At the Design Museum, South Bank by Tower Bridge. See www.designmuseum.org.

On the Job: Design and the American Office
Washington, D.C.
Through August 19
Explores the role of the office as a microcosm of American social transformations and a yardstick of cultural progress. Investigates issues of the private and public realms within the space of the office. At the National Building Museum. Contact 202/272-2448 or see www.nbm.org.

Events

Family Program:
Egg Drop Design Competition
Washington, D.C.
June 23
Using only paper and a rubber band, participants will create a container to protect an egg when dropped from the museum's second floor. For ages 8 and up. At the National Building Museum. Contact 202/272-2448 x3109 or see www.nbm.org.

From the Ground Up: Two Centuries of Architecture and Development
New York City
July and August– various dates
A series of walking tours around the city which explore major landmarks and neighborhoods like the Brooklyn Bridge, Brooklyn Heights, Grand Central Terminal, the Chrysler Building, and the Seagram Building. Presented by Big Onion Walking Tours in conjunction with the Whitney Museum of American Art and the Museum of the City of New York. Contact 212/534-1672 x257 or see www.mcny.org..

Lectures

Building for the 21st Century
AIA's Top Ten Green Buildings
Washington, D.C.
June 6
Muscoe Martin, will present the AIA's selection of this year's top 10 environmentally sensitive buildings. At the National Building Museum. Contact 202/272-2448 x3109 or kdangoia@nbm.org.

Spotlight On Design Lecture Series
Washington, D.C.
June 21 and 25
Carol Ross Barney, the Chicago-based architect (June 21) and Steven Holl (June 25) will speak about their latest work. At the National Building Museum. Contact 202/272-2448 x3109 or

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CIRCLE 35 ON INQUIRY CARD

Dates & Events

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Conferences & Conventions

The More Things Change
51st International Design Conference
Aspen, Colo.
June 6–9
Examines the world of design from multiple perspectives. Designers, scientists, cartoonists, business professionals, and environmentalists will attend. Contact 970/925-2257 or info@idca.org.

Ninth Congress for the New Urbanism
New York City
June 7–10
Politics, policy, and design concerns from region to neighborhood will be discussed. Speakers include Elizabeth Plater-Zyberk, Andres Duany, Joseph Rose. Contact 800/788-7077 or see www.cnu.org.

Ecospheres: An International Conference and Forum
Lincoln, Nebraska
June 10–13
Explores the connections and relationships between the issues of land, water, culture, technology and the environment. At the Embassy Suites Hotel. Contact 402/472-2175 or see www.unl.edu/ecospheres.

A/E/C Systems 2001 Conference
Chicago
June 18–21
More than 15,000 design and construction professionals will participate in conference sessions and attend a large exhibit to find solutions to complex challenges. At McCormick Place, Lakeside Center. Contact 800/451-1196 or see www.aecsystems.com.

145th Annual CSI Convention and Exhibit
Dallas
June 21–24
Sponsored by the Construction Specifications Institute. At the Dallas Convention Center. For more information, contact 800/689-2900 x4772 or llowe@csinet.org.

Making Cities Livable
San Francisco
Deadline: June 30
Issuing a call for papers and an invitation to exhibit at a conference that will be held October 22–26. The broad range of subjects includes sustainability and urban renewal. Contact 831/626-9080 or see www.livablecities.org.

MESH International Landscape Architecture Conference (EDGE VI)
Melbourne, Australia
July 9–11
MESH is the sixth in a series of student-run conferences. Speakers from all over the world will address landscape infrastructure in the city of the 21st century. At RMIT University. Contact +61 3 9925 3806 or mesh@rmit.edu.au.

National Marketing Conference of the Society for Marketing Professional Services
Orlando, Florida
August 8–11
This annual event draws 750 CEO's, marketers, and business developers from architectural, engineering, planning interior design, construction, real estate and specialty consulting firms. Promises three days of educational sessions and events. Contact 800/292-7677 ext. 14 or melanie@smps.org.

Restoration & Renovation
New Orleans, Louisiana
September 7–8
The only trade show and conference for the rehabilitation of building interiors, exteriors, landscapes, streetscapes and historically inspired construction. Contact 800/982-6247 or see www.restorationandrenovation.com.

International Exhibition of Marbles, Stone and Technology
Verona, Italy
September 27–30
Over 1300 exhibitors from 40 countries display the best of their products. The latest in marble technology is also featured. At the Verona Exhibition Centre. Contact +39 0458 298 111 or see www.marmomacc.com.

Competitions

The Phoenix Awards
Deadline: June 15
Recognizes outstanding brownfield projects from across the United States. The winners will be one of the highlights of the National Brownfields Conference in September. Contact 717/772-2724

Dates & Events

or see www.phoenixawards.org.

MTA Arts for Transit "Sculptural Seating" for Pleasantville Station
Deadline: June 29
The Metropolitan Transportation Authority of New York is currently accepting proposals for the design of sculptural seating for the Pleasantville station. Contact mchen@mtahq.org or fax 212/878-7492.

10th Ermanno Piano Scholarship
Deadline: June 30
To be eligible, candidates must have graduated from an architecture program in 2000 or 2001. The winner will be granted $10,000 to work at the office of Renzo Piano Building Workshop in Genoa, Italy. See www.rpwf.org.

New American Design: Furniture
Deadline: July 1
First annual competition will award $1,000 to the best furniture designs that respond to current issues of the interaction of space and human dynamics. Contact 323/661-4952 or see www.builtinc.com.

Construction Specifications Institute Specifications Competition
Deadlines begin August 3
Awards are available for project manuals, short-form specifications, outline specifications, preliminary project descriptions and product binders. Contact 800/689-2900 or see www.csinet.org.

Can Struction
Entry Deadline: October 15
Teams led by architects and engineers build giant sculptures made entirely of cans of food. Works are judged at the AIA convention each year. After a week-long exhibition, all cans are donated to soup kitchens, shelters, and the elderly. "Build out" event takes place in over 50 cities in America. Contact 212/792.4666 or see www.canstruction.org.

E-mail your submissions for Dates and Events to ingrid_whitehead@mcgraw-hill.com two months prior to the event or competition.

For and about the new generation of architects

archrecord2

FOR THE EMERGING ARCHITECT

This month's archrecord2 celebrates the coming summer by heading out west to the desert, where O'Donnell + Escalante heat up the scene with designs that respond to Modernism without aping it. Meanwhile, back east, the Architectural League of New York has announced the winners of its annual Young Architects competition. And don't forget to visit archrecord2 online, where the four sections, Design, Work, Live, and Talk, receive regular updates and provide more in-depth coverage.

DESIGN

Inventing architecture for the desert

Even for a Palm Springs native like Lance O'Donnell, AIA, setting up an architectural practice in that desert oasis creates certain expectations for a design aesthetic. However, O'Donnell and his partner, Ana Maria Escalante-Lentz, AIA, have absorbed the Modernism of Palm Springs big shots such as Albert Frey without succumbing to it.

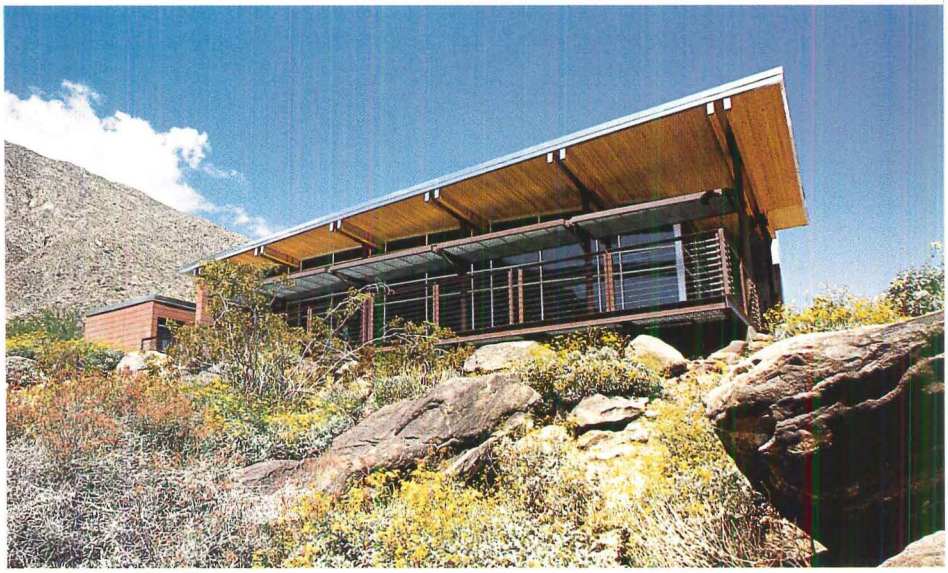
In large part, the pair's freedom in design thinking comes from the close working relationship with their Native American clients. "Native Americans are extremely sensitive to the environment," says Escalante, a native of El Salvador. "They have no architectural heritage to speak of. They've been here for a long time, but in a way, they're newcomers, like I am, with a really fresh potential to explore architecture." O'Donnell and Escalante have designed two major projects for the Native Americans: a visitor center for a canyon and a community center. The programmatic mandate for the latter design was simple: "Don't put us in a box."

The path to such creative freedom was not an easy one, however. The pair actively solicited clients and supported themselves with jobs outside the firm itself. "It has been a long journey," says Escalante. "We were sustained by teaching for a long time. We chased after every single available client in the area. We did projects for relatives and friends, until finally, things began to pan out."

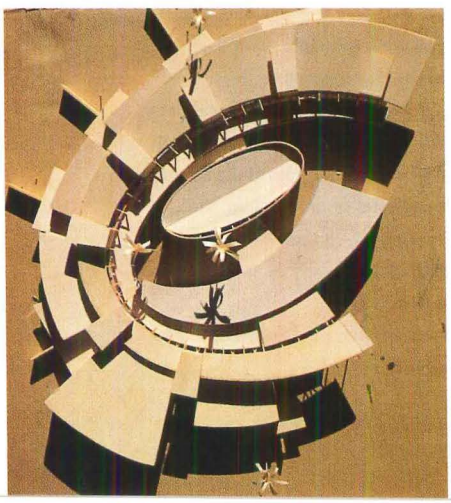
But their passion for design has pulled them through since their first collaborative effort, a survival shelter that the two designed and built with the help of some students. "We were both so motivated and so energized once our ideas came together that nothing could stop us. We learned how to weld and worked at our peril with grinders and sanders and things over our heads and sparks flying," says O'Donnell. "And," adds his partner, "we were putting a lot of people in danger." *Kevin Lerner*

Go to architecturalrecord.com/archrecord2 for more in-depth coverage of O'Donnell + Escalante, including more projects.

Survival Shelter, California, 1995
O'Donnell + Escalante Architects. The firm's first project is portable and can be rebuilt in two hours.



Tahquitz Canyon Interpretive Center, Palm Springs, Calif., 2000
O'Donnell + Escalante Architects. The simple structure tries not to compete with its striking site.



Agua Caliente Band of Cahuilla Indians' Community Center, Palm Springs, Calif., 2000
O'Donnell + Escalante Architects. The tribe commissioned a building that would not put it "in a box."

WORK

In a league of their own

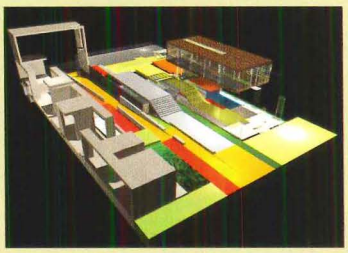
The Architectural League of New York has named six winners in its 20th annual Young Architects Forum competition, themed "City Limits." Open to anyone who graduated from architecture school less than 10 years ago, the competition often recognizes future leaders in the profession. Entrants submit a portfolio of their work for consideration. The winners for 2001 are SERVO, Teddy Cruz of San Diego, and Thaddeus Briner, Petra Kempf, nArchitects, and Eric Worcester of New York City. An exhibition of the winners' work will be on display at the Urban Center in New York through June 27.

nArchitect's Hotel Pro Forma

Born in Guatemala, Cruz is principal of estudio teddy cruz and founded the LA/LA Latin America/Los Angeles Workshop at the Southern California Institute of Architecture. His project *Living Rooms at the Border* includes a church renovation, affordable housing, and a public garden for San Ysidro.

Briner, a project architect with Rogers Marvel Architects in New York City, submitted a portfolio that includes New York competition entries for the Pier 54 Sun Shade and the TKTS booth. His work attempts to "refract the transparency of system."

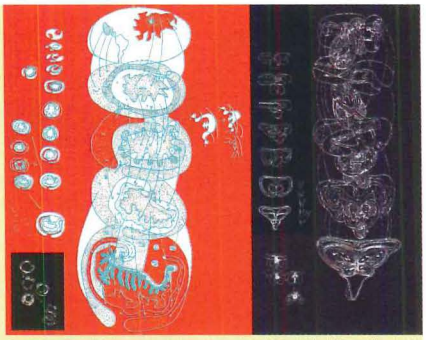
A former urban designer with the Department of City Planning in New York, Kempf teaches urban design at both Pratt Institute and the State University of New York in Buffalo. Her portfolio includes a series of abstract diagrams of urban movement, transportation, and form on translucent vellum.

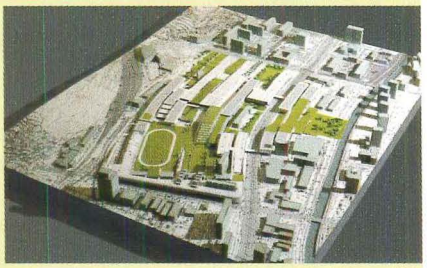


Cruz's Living Rooms at the Border

Eric Bunge and Mimi Hoag are the partners in nArchitects; they won the first round and were finalists in the second round of a competition (with Field OFFICE) for the Hotel Pro Forma in Copenhagen. nArchitects is working on a speculative project, de-Central Park, which will be a hybrid of urban park and transportation/delivery networks.

SERVO was founded by four Columbia University Graduate School of Architecture alum now in four different cities: Chris Perry of New York, David Erdman of Los Angeles, Marcelyn Gow of Zurich, and Ulrika Karlsson of Stockholm. SERVO's work principally deals with "issues of interactivity and collaboration registered at both cultural and organizatinal scales."





Worcester's Budapest sketches (top) and Sarajevo University campus project

Founder of the New York firm Manifold, Eric Worcester has a portfolio that includes a series of sketches and studies from Budapest and a design for the campus of Sarajevo University.

Jurors were Yolande Daniels, Jeremy Edminston, James Slade, Frank Lupo, Wolf Prix, Nanako Umemoto, and Mark Wigley. *John E. Czarnecki, Assoc. AIA*

LIVE

Architects after hours

LIVE is the section of archrecord2 that gives you a glimpse into what architects do when they're not busy being architects. Whether it be furniture design or international travel, you'll find young architects doing, seeing, being, and creating—all in the LIVE section. This month, you can see the recently posted sketchbook of Steven Whitney, AIA, a young architect who got the opportunity to travel to Kyoto, Japan, and sketch its temples and teahouses while studying the Japanese use of space. Flip through his spiral-bound sketchbook to discover his detailed crosshatched sketches and read his commentary on interior space and the importance of the garden in Japanese design.

Go to architecturalrecord.com/archrecord2 for constantly updated, exclusive interactive material and the archives of archrecord2.

TALK

Advice and dissent

This month, in the TALK section of archrecord2, two new forums were introduced, with questions coming from the readers instead of the editors. Are you collapsing under the weight of the ARE? You're not alone anymore with our advice forum for those preparing for the exam. Plus, we've started a general interest and advice forum where you can ask questions of your peers and provide your own peerless answers to others' questions.

Go to architecturalrecord.com/archrecord2 to join the discussion and to see what other young architects are saying.

A master of imagery and collaboration, Bruce Mau discusses his role in design culture

Interview

By John E. Czarnecki, Assoc. AIA

Bruce Mau relishes problems. He may be best known for his graphic design of books and other publications, but don't call Mau a graphic designer. Viewing design in far broader terms, Mau has collaborated with architects, filmmakers, and performance artists, and has designed videos, exhibitions, and graphic identities for buildings and companies. Since 1985 he has had a studio in Toronto, Bruce Mau Design, and has been design director of Zone Books. He was creative director of I.D. *magazine from 1991 to 1993. With Rem Koolhaas, Mau designed* S,M,L,XL *and is currently working on the Seattle Public Library and an urban park in Toronto. With Frank O. Gehry, Mau developed the environmental graphics for the Walt Disney Concert Hall, now under construction in Los Angeles. For the UCLA Hammer Museum [page 42], Mau is creating an identity for a building by architect Michael Maltzan. A book of Mau's own work,* Life Style *[DECEMBER 2000, page 61], was recently published. Mau spoke with* RECORD *about* Life Style, *collaborations, and the New York Times building that could have been.*

ARCHITECTURAL RECORD: *After producing books and publications for other people, what did you have in mind for your own book,* Life Style*?*

BRUCE MAU: I wanted to respond to the general design culture evolving around us. In my studio, we see our work evolving in response to that context, and we realize that in order to produce work in that context, we need to get a handle on what exactly the context is.

Our audience is people who work in the realm of the image. That is a pretty broad spectrum these days because it includes people who work not only in acknowledged realms, like design or architecture or publishing, but also in business.

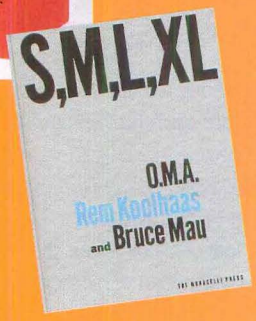
AR: *With the imagery and text, there are multiple layers of information in* Life Style.

BM: Yes, there's a kind of dance that happens between the two. In publishing, obviously, there's a certain kind of precision needed in the text that's quite different from what's required for the image.

AR: *What lessons from the production of* S,M,L,XL, *which was more than 1,400 pages, informed your work in* Life Style, *which was more than 600 pages?*

BM: There were a lot of lessons. One is that as you scale an object up in terms of its sheer volume, it's not a linear progression in terms of its complexity. It actually gets very complex very quickly in a certain way because, at a certain number of pages, a change is not just a change—it's something that has to ripple through everything.

With *Life Style*, it's actually taken to another level. It's really conceived as a kind of multitrack recording, where there are three different tracks of material in a composition conceived from the outside as a shape itself. [The three tracks] in *Life Style* are life theories,



Bruce Mau (top) has designed *Life Style* (above, 2000), which documents his practice, and *S,M,L,XL* (right, 1995), which presents the work of Rem Koolhaas. For Indigo bookstores in Toronto (below), Mau developed a visual identity program.

Mau is part of the team that won a competition in 2000 for the design of Downsview Park, a 322-acre park on a former military base in Toronto. The team includes Koolhaas' Office for Metropolitan Architecture; Petra Blaisse, Inside Outside; and Oleson Worland Architects.

life projects, and life stories, and those are each broken out into text and image.

AR: *In general terms, how is the design of publications evolving?*

BM: Today, it's all about the image and using a kind of cinematic cadence, and introducing a whole different book culture. It's a kind of hybridized product because culture, in a way, is subject to Darwinism too. If a magazine were about to be eliminated as a product, it would be because it wasn't very effective. But, on the contrary, it's a very efficient product.

AR: *You also work with architects. What is interesting in your collaborations with architects is that the role of the graphic designer is really changing. Now you're being brought on at the very beginning of projects. How does that affect your role?*

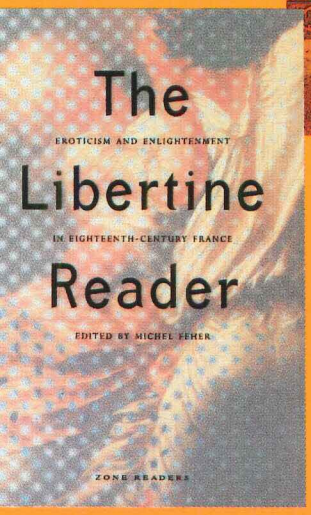
BM: The people we collaborate with are often adventurous in many ways. For instance, when I started working on the Seattle library with Rem, I asked him, "Do you want me to do signage, or do you want me to think about the project?" He said, "I want you to think about the project." [Rem] has systematically worked to break down those boundaries.

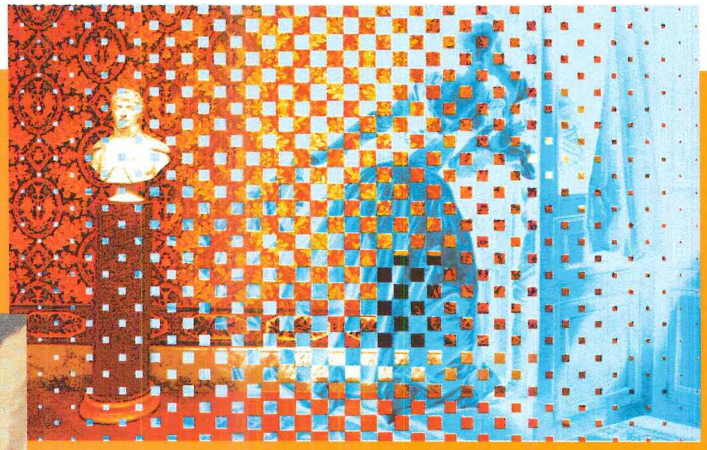
All of the processes of creative production that use the image as a kind of modus operandi are being transformed. They're under pressures in many ways. A lot of the things that are sort of unsatisfactory in the world are those where there hasn't been a synthesis across disciplines. So we need to develop methods that are crossdisciplinary in order to deal with issues like the workplace, and all sorts of things around the way that we work and live. Like the category of graphic designer—I've sort of dropped the word *graphic* from my own title.

"I'VE JUST DECIDED TO BE A DESIGNER, AND TO INVEST IN THE WORD 'DESIGNER' AND DISINVEST IN 'GRAPHIC.'"

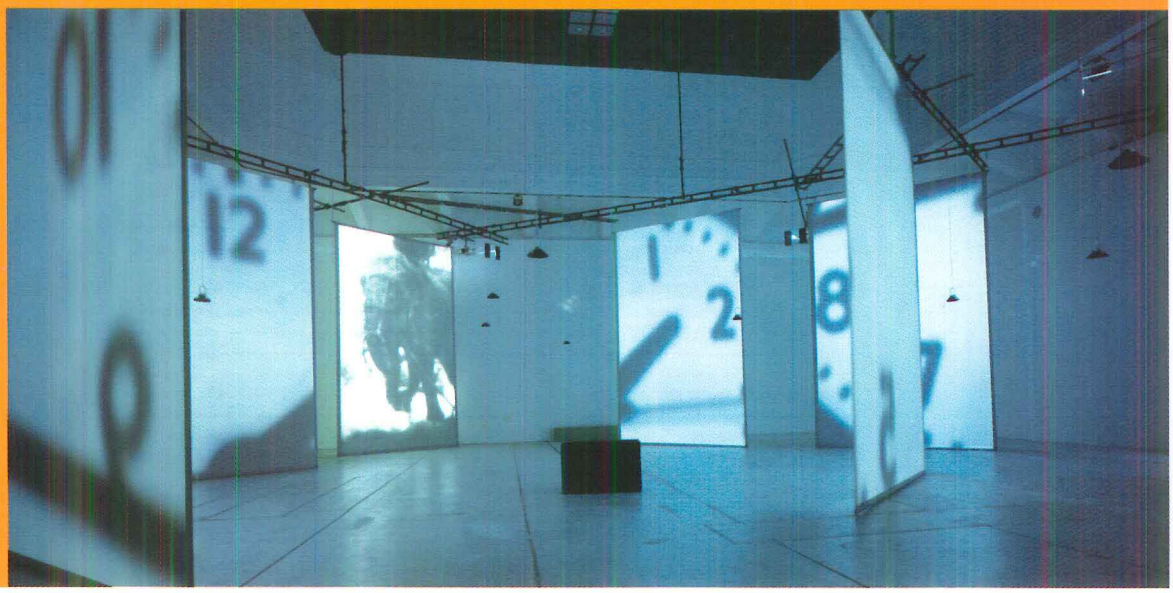
AR: *But that is your background and training.*

BM: Yes, that's really how I started. But it's such a limiting qualifier that I've just decided to be a designer and to invest in the word *designer* and disinvest in *graphic*. The reason that we are what we are is that we use communication design technique to explore ideas. Whether they're spatial, organizational, typographic, formal, or business ideas, we use communication technique to think about those problems and communicate them in a new way.





One of the many publications that Mau designed for Zone Books is *The Libertine Reader* (1997), a collection of erotic letters, fiction, and other texts from 18th-century France (left). In a collaboration with André Lepecki and John Oswald, Mau created a video-based installation, *STRESS* (below), shown in Vienna in 2000.



And that allows us, in a way, to invent things that other people are unable to.

AR: *Does this closer collaboration between architect and designer point to the importance of image?*

BM: The realm of the image is more important than ever, but it's a very complex realm. People still make a distinction between a building and an image, and I think that distinction is less and less supportable.

AR: *You've collaborated with architects like Rem and Frank Gehry on certain projects. Are you extremely selective in who you work with?*

BM: Yes. Because we have such an intimate collaboration, we're pretty selective. We make sure that they have a kind of sympathy for the ambitions of our work, and that, frankly, we have sympathy for the ambitions of theirs.

AR: *When you collaborate with Rem, for example, what exactly is your role? I assume that it may be different on each project, but why does he need another designer with him early on?*

BM: Well, Rem typically has a lot of designers with him on projects, but the methods that we've evolved have to do with rigorous analysis and structure of content—a method that could be applied to almost anything. It's this method that is really critical. The first sort of significant work has to do with conceptualizing the project in the world. Then [with this method] we can produce a park, a book, an institution, a business, or whatever.

AR: *You've suggested that industrial designers are, in some ways, the model of the future and that architects are going to be following the way industrial designers do things. How so?*

BM: Well, I would suggest that it's going to be a kind of hybridization [of designers], and the sooner we can get to the advantages that that offers, the more fun we're going to have. The way it works now is that an engineer often does structure, an architect does skin, a space planner does interiors, and an industrial designer does product. It's a nasty mess. The quality of life that it produces is also a nasty mess, and we all suffer. The problems are where those things rub up against one another.

AR: *There's lots of talk these days about architects and designers collaborating, but they're not always good at it.*

BM: The reason that I got interested in architecture is that I saw it as a field of synthesis—basically a place where you bring into play all these different things. And I think that's Rem's real genius—his ability to pull talent into play on projects and let things evolve.

This year, with New York architect Lindy Roy [News, MAY 2001, page 50], Mau has developed a brand identity program, marketing, and signage for Access Storage Solutions (above), a British storage company. Working with Koolhaas on the Seattle Public Library, which has yet to begin construction, Mau has designed signage and environmental graphics (left).

AR: *You're working with Koolhaas on the design of the Seattle Public Library. It's a rather public project with a lot of input from a very interested constituency.*

BM: Yes, the library has an incredible process. I've never seen anything quite like it. The public interest is phenomenal—literally 2,600 people in a huge auditorium for a design presentation.

AR: *What residual impact does the public process have?*

BM: The process can have a profound effect on the discourse of the city. People can be introduced to a whole other language and level of thinking that can shape many other things in the city that have nothing to do with the library.

"THE CIVIC IS UNDER SIEGE AT THE MOMENT. ANYTHING PUBLIC OUGHT TO BE AGGRESSIVELY PROMOTED."

AR: *On a broader urban scale, you are working with a team that includes Koolhaas on the design of Downsview Park, a 322-acre urban park on a former military base in Toronto [News, JULY 2000, page 28]. What's the significance of this project for you?*

BM: It's a civic project, and the civic is under siege at the moment. Anything public ought to be aggressively promoted. So to take our place in a kind of civic discourse and to begin to engage in these things is really important.

AR: *Can you explain the design process for Downsview?*

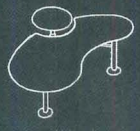
BM: Basically, what we did was map out a series of concepts that we thought would be significant for the work. Those eventually became the kind of formula for the project.

One of the distinctions between this park and any other that I know about is that it's not really a design for a park; it's a formula or an algorithm for producing an environment like this. One of the things that we still have to figure out is how to control it. So we're going to design a process or a method or a recipe—it's quite a different kind of strategy. We designed a vector, basically, and it's a question of how to define the vector.

AR: *You've said that typography and urban planning are one in the same. Can you explain that? How is that informing what you're doing at Downsview?*

BM: Well, they're one in the same in that if you approach it with a method, the problems are more or less the same. Of course, there are different techniques that you have to deploy to be successful. One of

You'll think twice about putting your feet on it. Not to mention your stapler. And your pen...



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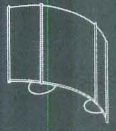

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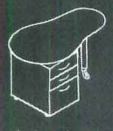

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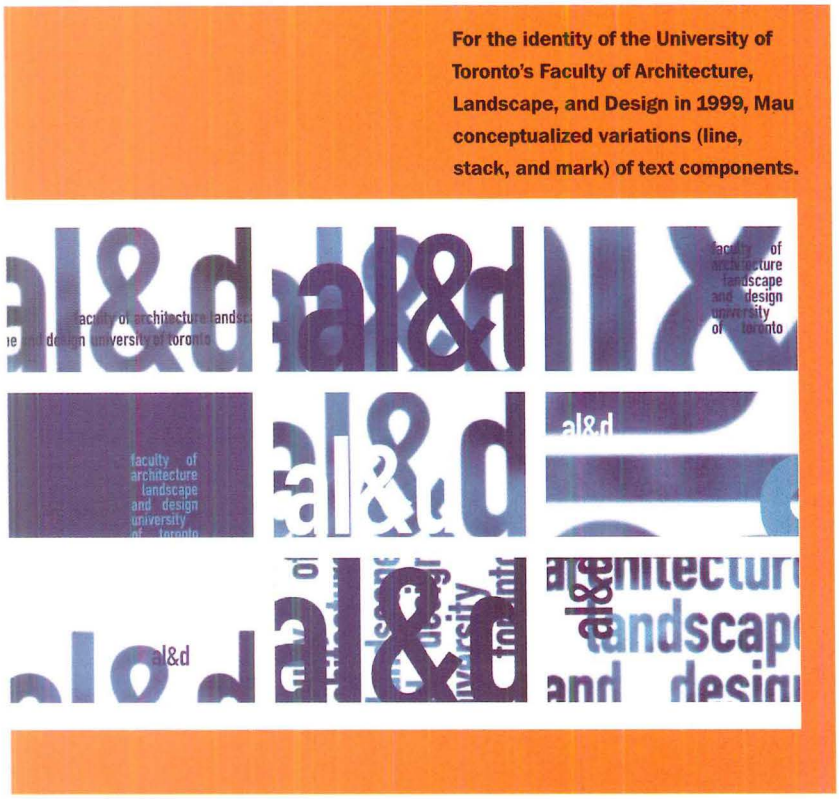


For the identity of the University of Toronto's Faculty of Architecture, Landscape, and Design in 1999, Mau conceptualized variations (line, stack, and mark) of text components.

the arguments about the global image economy is that, as an environment, design is scaleable. So we pour the same kind of design focus into typography as we do into urbanism. In some ways, it's a transposable method. You have a set of different questions or issues or objectives [for typography versus urban design], and you want to achieve certain effects. When you abstract the method, the method is in fact very similar.

Of course, it's different scales of complexity, but in a certain way it's not. You can understand the complexity of the world in letter forms and you can understand the complexity of the world in a park design, too.

AR: *You were going to work with Frank Gehry on the New York Times headquarters, had he won the competition [News, OCTOBER 2000, page 44]. Can you comment on why Gehry dropped out before Renzo Piano won the commission?*

BM: The New York Times wanted the product without the process, which is really a tragedy. They just wanted to buy the product like you could just get it off the shelf, and it's not a shelf-made product. It's a process. I think it was incredibly brave of [Gehry] to say to the *New York Times*, "I can't deliver. I can't guarantee for myself that I'll deliver the quality that I need if you squeeze the process." And I think he did absolutely the right thing. We had a beautiful scheme, which is such a shame.

AR: *You've designed publications and exhibitions, have collaborated with architects on buildings and a park, and have even designed the uniforms for the Canadian Olympic team. Are you open to any design project?*

BM: I'm pretty open, but I need a certain level of complexity to feel challenged. I need problems. ■

www For more of the Mau interview, including his thoughts on branding and globalization, visit **www.architecturalrecord.com**

Low-income housing tax credits increased—for better or worse

Practice Matters

By Charles Linn, AIA

Last December Congress enacted legislation that would increase the per capita value of federal income tax credits given to the Low-Income Housing Tax Credit Program (LIHTC) for the first time since 1986. This is good news for architects and developers—the majority of developer-constructed low-income housing built in the U.S. uses the credits. (Four out of the five projects in RECORD's last multifamily housing Building Types Study [JULY 1997, page 107] used them.)

The value of the tax credits given to each state will rise from $1.25 per state resident to $1.50 this year, and will increase again in 2002 to $1.75. Starting in 2003, the annual increase will be tied to inflation.

How the tax credits work

The program is administered by the Internal Revenue Service under Section 42 of the Internal Revenue Code. Credits are allocated to an agency in each of the 50 states, usually a state housing or finance agency. Each state agency, in turn, divides up the credits: A minimum of 10 percent of them must be reserved for nonprofit developers, and the remaining are granted to for-profit developers to help finance the construction or substantial rehabilitation of existing apartments. Each state has its own criteria for qualifying projects and developers.

To qualify for the 10-year tax credit, the developer must agree that for 15 years a portion of the apartments in the project will be rented to low-income tenants. Either 20 percent of the apartments must be rented to people whose income is 50 percent or less of the area gross median income (AGMI), or 40 percent must be rented to people whose income is 60 percent or less than the AGMI.

The tax credit is calculated by taking the building's depreciable development costs, excluding land (at least $3,000 per unit for renovations, or 10 percent of the building's eligible basis) times the percentage of units that will be designated as low-income units (qualified basis) times the 9 percent tax credit. This 9 percent figure can be subtracted from income tax owed each year over the next 10 years.

Many states offer their own tax credits. New York State, for instance, has an additional $2 million dollar-for-dollar tax credit program, plus four other programs that provide funding through tax-exempt bonds and low-interest loans.

Turning tax credits into gold

But tax credits don't build buildings—developers do, and what most developers need in order to build is cash. Once they receive tax credits, they can sell them to firms specializing in creating tax shelters. Developers can also retain ownership of their projects and keep the tax credits for themselves, but the idea is that developers who sell their credits have additional cash either for construction or for debt reduction on their project, so they can do a better job and still keep the rent low enough to accommodate the required number of low-income tenants.

Companies that buy these kinds of tax credits resell them to institutional investors, who use them to reduce their own federal income taxes. Demand for the tax credits has always outstripped supply, and the availability of additional credits will no doubt be used in the program. For example, New York State's allotment will increase from $22.7 million to $28.4 million this year, and will increase to $33.2 million in 2002. The market price of these credits varies with demand, but recently a dollar's worth of income-tax credit cost about 75 to 80 cents.

The down side

The number of housing units produced annually by the program has diminished over the years, as inflation has taken its toll on the $1.25 per capita tax credit. In addition, the boom in construction activity over the last few years has kept contractors busy, and bid prices on all kinds of construction have been higher, so that each dollar invested into housing construction has bought a bit less. Approximately 800,000 units of low-income rental housing have been created since the LIHTC was initiated in 1986, and over $10 billion in private funds has been invested in them.

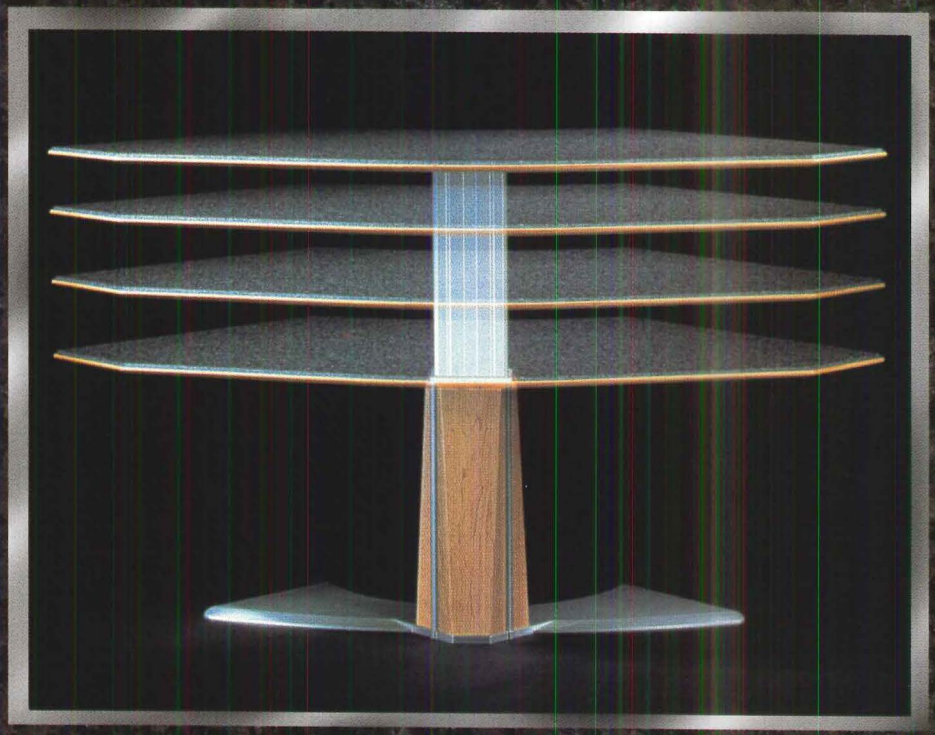
Housing advocates point out that the number of low-income housing units available falls far below the number needed. A 1995 report called "In Search of Shelter: The Growing Shortage of Affordable Rental Housing," by the the National Center on Budget and Policy Priorities, a nonprofit that studies government spending, noted that there were 6.1 million low-cost rental units in the U.S., but 10.5 million renters. Last year's report from the National Low Income Housing Coalition, "Out of Reach 2000," noted that the median fair-market rent for a two-bedroom apartment in the U.S. demands a housing wage of $12.47 per hour, 242 percent of the minimum wage of $5.15 per hour.

Critics also point out that the LIHTC is an extremely awkward way to accomplish what is still in effect a housing subsidy, noting that while the rate of return for investors is good, in the end neither the government nor the tenants have any equity stake in what is built. After 15 years the owner can rent the low-income apartments at the market rate. The LIHTC financing also creates hidden costs: Fees must be paid to the syndicators who put together the tax credit deals; the creation of tax credit partnership agreements generates legal costs; and the syndicator charges annual fees for ongoing services. LIHTC financing also can add months to the development process.

The LIHTC comes off as a bad deal for a good ideal. It is now the only affordable rental housing program that developers can invest in, and it is unlikely that Congress would ever replace it. Both the developers who profit from it and the housing advocates who think more could be accomplished with the money seem to be united behind it. ■

ELEGANCE IN MOTION

GRANITE



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CIRCLE 45 ON INQUIRY CARD

The boldness gap has narrowed, but at what cost?

Critique

By Robert Campbell, FAIA

This month, ARCHITECTURAL RECORD begins a series of Critique essays by two contributing editors, Robert Campbell, FAIA, and Michael Sorkin. This month, Campbell welcomes the boldness in architectural form, while seriously questioning long-term effects. Look for a Critique by Sorkin in our July issue.

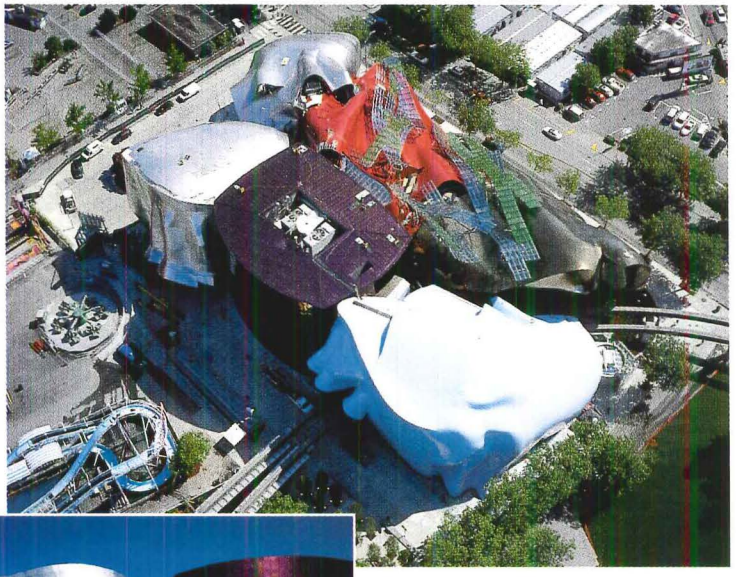
Hey, avant-garde architecture is back. We're thrilled. Right?

Just four years ago, I wrote for this magazine an article called "The Boldness Gap: Why America Is Falling Behind Other Countries." We seemed, at the time, to be the most boring nation, architecturally, in the world. Nobody here was taking risks.

Obviously, my article galvanized an entire nation. Clients began hiring certified media stars, preferably flown in from those "other countries." This year, in my normally conservative home of Boston, at least eight Pritzker Prize winners have been gainfully employed: Norman Foster, Renzo Piano, Frank Gehry, Fumihiko Maki, Rafael Moneo, Rem Koolhaas, Hans Hollein, and Kevin Roche. Other well-known architects with prominent projects in the city are Machado and Silvetti and Steven Holl, as well as retro-gardist Robert Stern.

And behind the media stars, of course, come the shape makers. Leaping off the computer screen comes a building that looks like a tragic collision of boxcars, or perhaps like an abandoned game of Pick-Up Sticks. Or we may prefer the work of the biomorph, the blobmeister, creator of a building that resembles an enormous muffin that failed to rise properly in the oven. The magazines and the critics, including this one, lap it all up. No surprise there: everyone seeks novelty.

Alas, it's the nature of critics to worry. I was worried about tame, and now I'm worried about bold. Exciting new form-making ideas can quickly go stale. Will the blobmeisters last longer than Paul Rudolph's corrugated concrete? The critics and the magazines loved that, too. Will train-wreck architecture (or buildings that have been "earthquaked," as my colleague Blair Kamin in Chicago calls them) remain in vogue as long as cut-and-paste PoMo?



Campbell calls Frank Gehry's Experience Music Project in Seattle a "blobfest."

PHOTOGRAPHY: © LARA SWIMMER/ESTO

Passing parade

I have no problem with the passing parade of architectural fashions. Change for its own sake can be good. It creates a visible timeline. We can walk through the built world, read buildings by their style, and so date them. Style, along with its many other communications, tells us when we are. And there's a legitimate joy in exploring what can be created by a new technology, such as the computer.

So what worries me isn't the form making, even when it seems as childish as a kid with Silly Putty. What worries me is the possibility that other issues are being ignored. There have been previous eras when we applauded celebrity architects. Too often they fell on their faces, and in so doing they diminished the stature of architecture in the public mind. The obvious example is the 1960s, when planners and their architects, with the best of intentions, leveled large portions of our cities and replaced them with Corbusian *villes radieuses,* or with powerful sculptural monuments in the then-cutting-edge poured-in-place concrete. Because such buildings ignored the web of city life so well understood by Jane Jacobs, they left the profession of architecture with a black eye. An architectural generation later, celebrity arose again with Postmodernism. PoMo did at least try to deal with two issues: the need for an architectural language that could be understood by more than the cognoscenti, and the need to pay attention to culture and context. But as is well known, it performed these deeds in a jokey, shallow manner, giving us such monuments as Michael Graves' Portland Building, an AIA Honor Award winner that is a bad place for human beings to work. People

Robert Campbell, FAIA, is the Pulitzer Prize–winning architecture critic of the Boston Globe *and a longtime contributing editor of* RECORD. *He practices architecture as a consultant to cultural institutions and is the author, with Peter Vanderwarker, of* Cityscapes of Boston: An American City through Time.

began to distrust architects. They wonder why we keep giving ourselves prizes for stuff they hate. Will the blobs and train wrecks and fractals and folds and perforated screens and all the other motifs of the moment turn out to be more than passing clichés? Will these buildings work well for their purposes and their surroundings? Will they communicate meanings the public can understand? Will they be durably built? If not, we architects are going to be the losers.

Looking at the whole

We should look at buildings whole. Even when we love them, even when we think they are great, we should retain a clear eye for their flaws. Bilbao is wonderful, but we should admit to ourselves that the interior gallery spaces do not begin to fulfill the promise of the astonishing exterior. Or to go back to an even more sacred icon: Mies' Seagram Building was recently named, by one respected critic, the greatest building of the millennium.

WILL THE BLOBS . . . AND ALL THE OTHER MOTIFS OF THE MOMENT TURN OUT TO BE MORE THAN PASSING CLICHÉS?

The Seagram is a box of conditioned air, a box of leasable volume. It is a very elegantly detailed box. Perhaps it even possesses symbolic significance: Robert Stern suggests that the bronze color is a subtle reminder of the Seagram company's liquid product. But can a building without an interior be great architecture? A building without a program of civic or cultural significance? Is elegant surface all we demand? We should admire what there is to be admired, but we should not fetishize architecture.

Once again, we architects and journalists are falling for exciting ideas just because they're new, without testing them against our beliefs about good environment. International stars flame into being on the basis of two or three modest and sometimes unworkable buildings. I've visited two jobs by Zaha Hadid, for example, and both of them, regarded from any other point of view than that of pure sculpture, were bad architecture. (They're not very interesting sculpture either.) The Jewish Museum in Berlin, by Daniel Libeskind, another widely hyped building, derives most of its ideas from decades-old expressionist cinema, and it's badly detailed. It's a perverse fun-house that may not prove spacious enough to hold the exhibits it was created for. Frank Gehry, of whom I count myself a major fan, created in the Experience Music Project in Seattle a family of blobs—a blobfest—that, like Hadid's work, can be appreciated only as sculptural form. Philippe Starck renovates the lobbies of old New York hotels in such a way as to make each person look like a spotlighted mannequin, while leaving the bedrooms upstairs as the tiny, poorly heated cells they always were.

We can welcome the daring of these works while remaining skeptical of their long-term significance. Certainly, architecture is an art. But it's a different art from sculpture or cinema or haute couture. Architecture is the art of making places. Places exist for human habitation. They include not only architectural interiors, but streets and squares and gardens. Whatever higher virtues they may have, they'd better work. I don't accept that architecture has become another set of images on the timeless and placeless cyberscreen. Nor that its true audience is an international guild of professional appreciators. Novelty is great, but let's give it the honor of our critical attention. ■

Snapshot

PHOTOGRAPHY: © TIM SOAR (TOP); JOHN IAN MACLEAN (BOTTOM RIGHT)

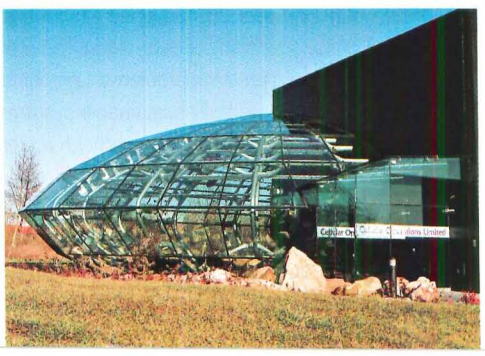
A British call center with space-age attitude

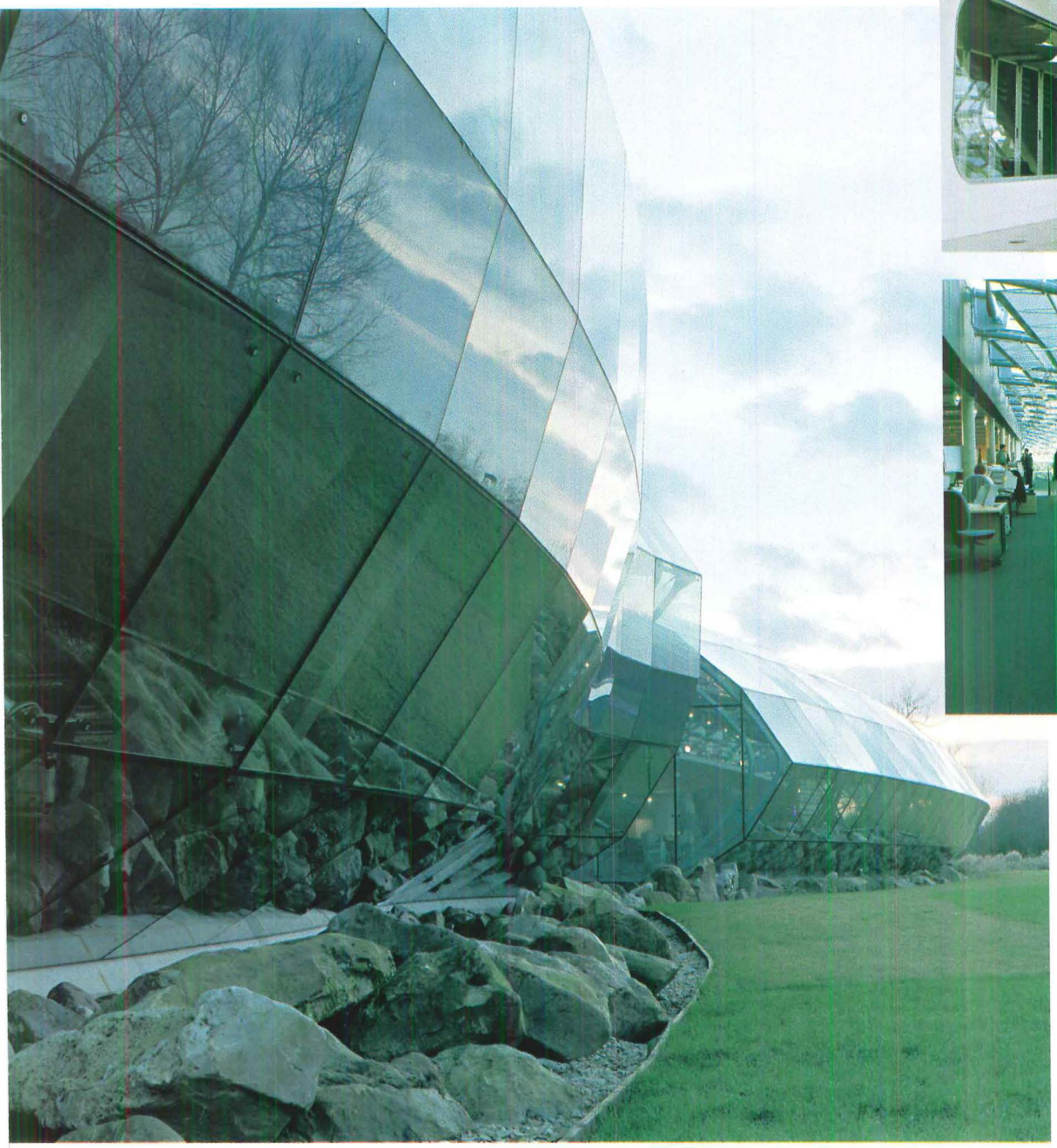
By Adam Mornement

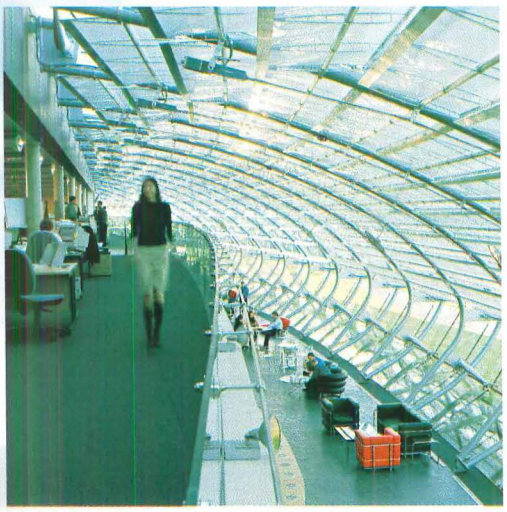
The British call center Cellular Operations is a deliberately playful reinterpretation of a building type with a worldwide reputation for mediocrity. Located near Swindon, a Wiltshire market town with a population of 200,000 approximately 100 miles west of London, it was designed by London-based Richard Hywel Evans Architecture and completed at the beginning of last year.

Marketing guru Ric Lee, chairman of Cellular Operations, wanted a building that employees would drive past and say, "I work there." And the response would be: "You work there? Wow, what's it like inside?" He certainly got what he wanted. "The brief was simple," says Lee. "I wanted an extraordinary building at an ordinary price."

The building is made up of two key components: a stark, Miesian entrance "cube" and a three-story, 340-foot glass atrium, which houses the open-plan work areas. The 48,500 square feet of usable space







Cellular Operations has proven that a modern and comfortable office environment pays for itself in the long run: In the 16 months that the call center company has been based in its new building, staff turnover and absenteeism have been under half Britain's national average.

are supported on slim, steel tubular columns set in a concrete base. But if the external structure is simple, the interior is anything but.

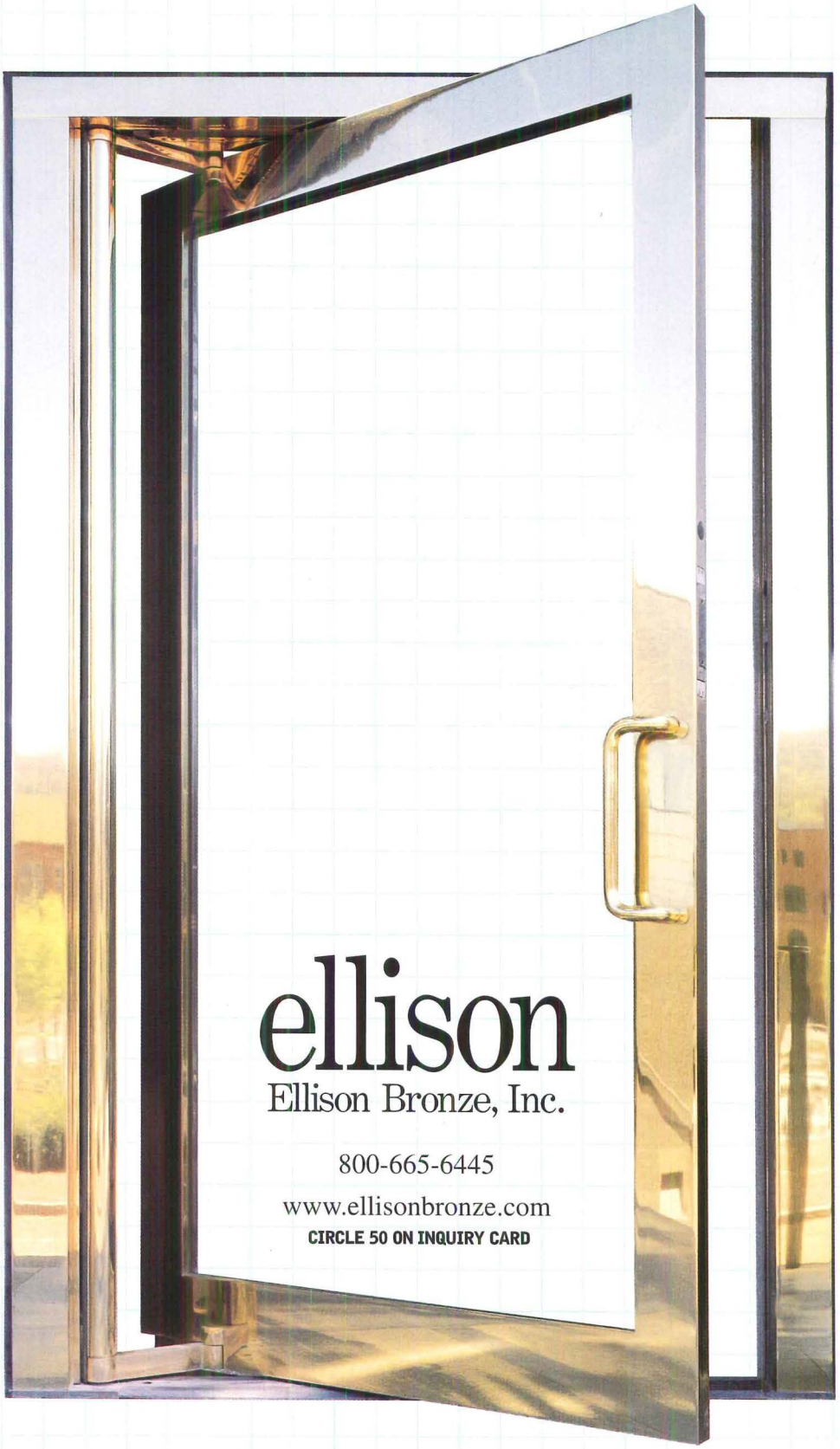
It has been designed as a series of choreographed "event spaces." In the context of Cellular Operations, this manifests itself in a variety of ways: The sliding entrance doors make a Star Trek–like *whoosh* upon arrival and departure, the washrooms are all based on different themes, and the elevator rises and falls in unison with an ornamental fountain.

The design details also accommodate the needs of the staff. Lee and Evans knew that the average age of the workforce would be under 25. "So when we put backlighting, the idea was to re-create the atmosphere of a nightclub, where most of the staff had probably spent the previous evening," Evans jokes.

There have been teething problems. Lee points to the heating and ventilation system as being problematic. The innovative and environmentally sustainable system draws cool air from the surface of the adjoining lake and disperses it through a network of vents running through a pressurized floor void.

But the building works. It is flexible, open-plan, and infused with natural light throughout. Perhaps above all, the Cellular Operations call center is a building that makes people smile. ■

Greater Than The Sum Of Its Parts.



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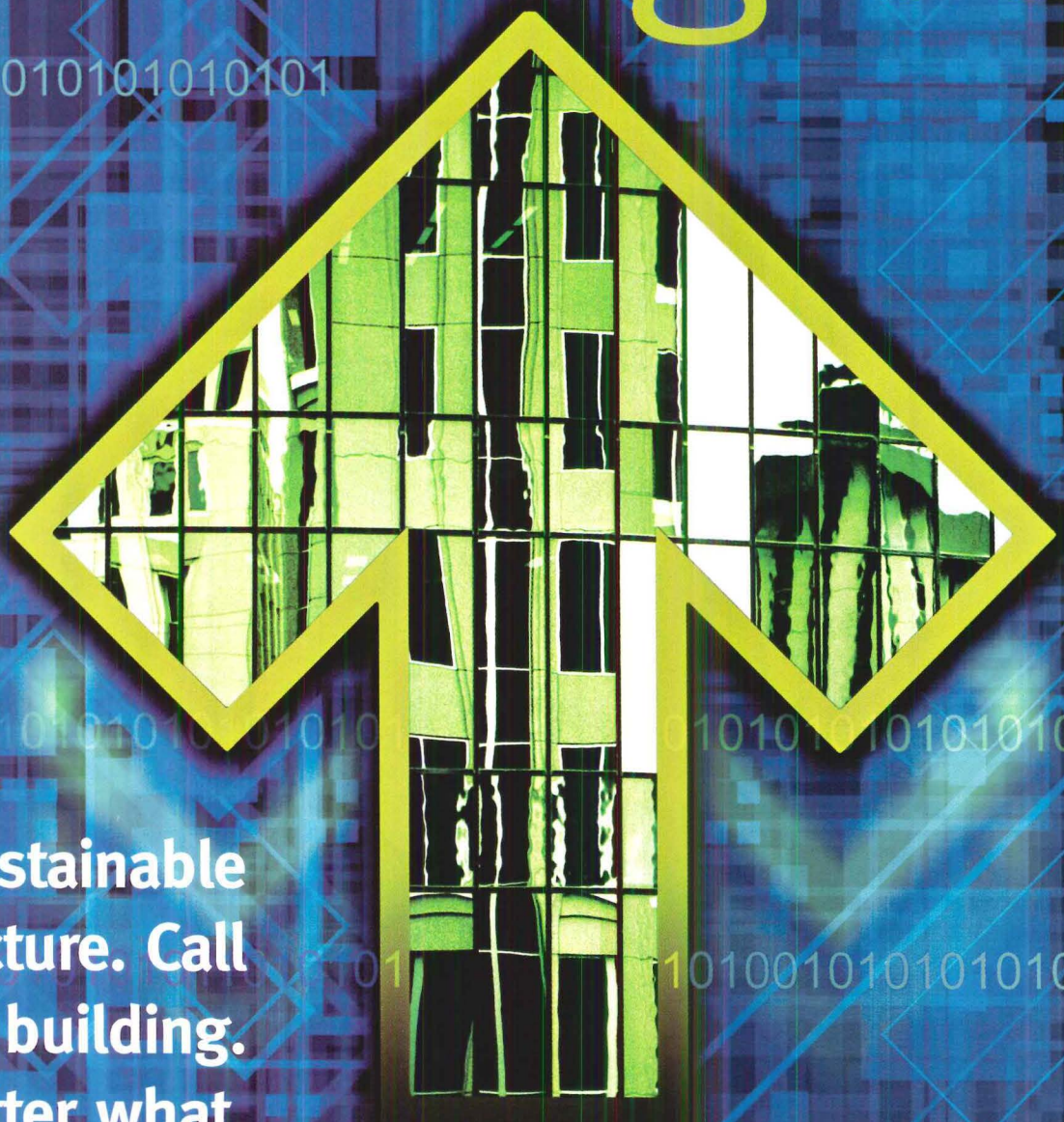
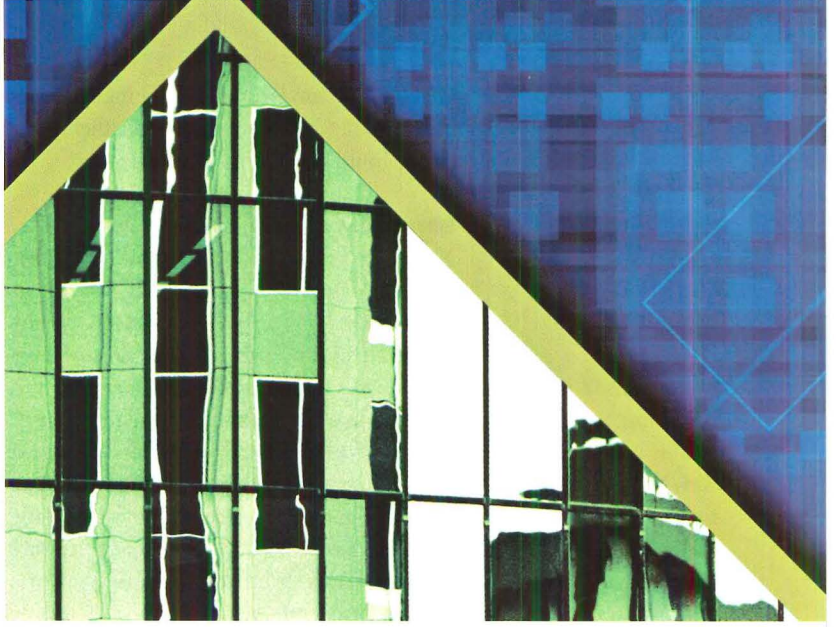
CIRCLE 50 ON INQUIRY CARD

Architecture rediscovers being green



Call it sustainable architecture. Call it green building. No matter what, call it a sea change in design thinking.

Those who design the built environment are being called upon to protect our natural resources. Architects have learned that green design involves going back to basics—and inviting more players to the drawing board.



By Deborah Snoonian, P.E., and Kira L. Gould

If you haven't noticed yet, there's a revolution afoot—one that started nearly 40 years ago and has picked up serious momentum since the early 1990s. Mandates at all levels of government, coupled with concerns about rising energy costs and dwindling natural resources, have given rise to unprecedented interest among U.S. design professionals in protecting and preserving the natural environment. For the first time, developers and owners must ensure their properties aren't gas guzzlers—the sport utility vehicles of the built environment. And they need architects to help them do it.

This is good news all around. Research and anecdotal evidence have shown for years that buildings with abundant natural light and ventilation, high indoor-air quality, and other sustainable design elements create an atmosphere in which occupants are happier, healthier, more productive, and less likely to leave their jobs. Moreover, such buildings are less expensive to maintain. Owners have started to use sustainability as a selling point for their properties, and they can charge higher rents for buildings with these amenities. At the same time, tenants enjoy productivity gains and increased employee retention. Call it sustainable design, green architecture, or green building. But no matter what term you use, the movement is transforming the way buildings are designed, constructed, and operated.

Many architects, faced with navigating these waters for the first time with their clients, are daunted by the prospect of accommodating the complex set of issues demanded by sustainability. Yet in many ways, building sustainably is nothing new under the sun. The main tenets—accommodating the site and climate, preserving resources, and using local materials and expertise—are ancient techniques, neglected since the Industrial Revolution, when it became possible to manufacture massive volumes of construction materials and transport them long distances [see "Revisiting," page 92]. Designing with the environment in mind is as much about unlearning bad habits as it is adopting and updating old ones.

One thing that's changed, though, is that today's sustainability demands a higher level of knowledge and sophistication than it did hundreds of years ago. Modern buildings are a complex, interrelated set of systems, materials, and products, whose components are manufactured and assembled in disparate locations using a wide array of methods. And today's architect has a better understanding of how different building components interact to affect performance. That doesn't mean green buildings need to be complex or high-tech—there are simply more variables to consider. Architects who practice green design are embracing new work practices, multidisciplinary thinking, and integrated design techniques so they can minimize the environmental disruption inherent in any construction project.

Kira L. Gould is a freelance writer living in New York.

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Green shift in government

Who would think that the U.S. military, not known for its extravagant spending on construction, would be a leader in the green building movement? The trend began with a series of executive orders signed in the early 1990s, which aimed to reduce the overall life-cycle cost of government buildings. At that time, military leaders were aiming to attract talent, retain soldiers, and improve morale—and they turned to green building as a partial solution. The Naval Facilities Engineering Command (NAVFAC) initiated its sustainable design program in 1993; five years later, it became the first federal agency to require its facilities to be designed sustainably. This was a significant coup, considering that NAVFAC is responsible for all domestic construction for the navy, air force, and marines, along with a portion of army and overseas construction. In conjunction with the navy's efforts, the U.S. Army Corps of Engineers also began to research ways to go green, even developing its own green rating system for military construction projects.

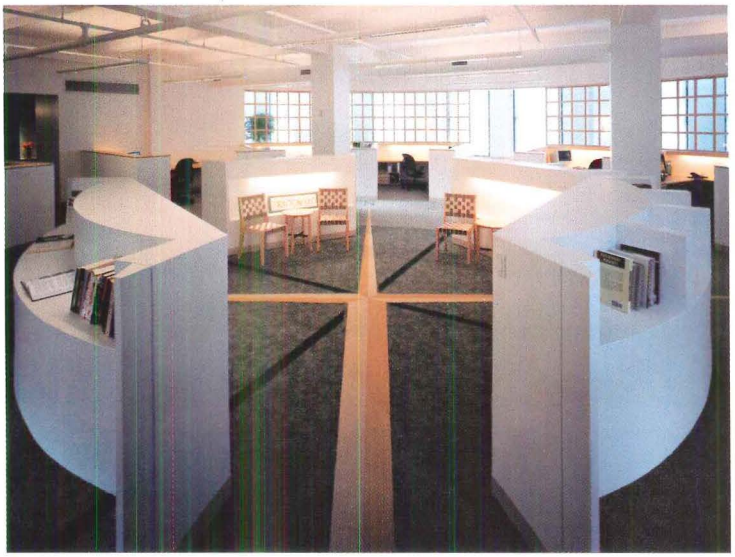
Nevertheless, most private developers continued to resist using green building techniques until the last couple of years, when government agencies on the federal and local level began to adopt the LEED rating system developed by the U.S. Green Building Council (USGBC), a growing trade group of more than 740 stakeholders in the built environment. "For years, developers and owners were taking a wait-and-see attitude about green building," says Ross Spiegel, incoming president of the Construction Specifications Institute (CSI) and a board member of the USGBC. "Now government agencies are tying accomplishment of green building objectives to tax credits and other incentives. Naturally developers and owners are going to want to do it, and architects have to respond." Today's owners

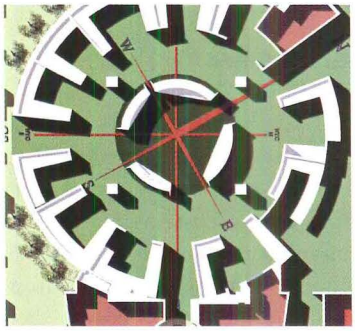
are especially anxious about keeping operating costs down, which has provided further incentive to build green from the ground up.

Shrugging off misperceptions

No matter how energy- and resource-efficient a building is, its staying power is determined by how deeply it appeals to the senses, how well it fits into its community, and how comfortable it is to use. In this light, architects are beginning to realize that sustainability and aesthetics are entirely compatible goals. Randy Croxton, principal of the Croxton Collaborative of New York, believes that these issues are helping to bring architecture back to its rightful course. "Intelligent green design can result in spare, beautiful buildings that will resonate with those who work or live in them. Such buildings will also be more highly valued over time, because they outperform traditional buildings in terms of energy savings as well as intangibles such as worker productivity and morale."

Though conventional wisdom has always held that green buildings had higher capital costs—a real stumbling block for developers—recent examples show that this may be because sustainability goals have been set too low in the past. "We're learning that projects that target higher performance levels with regard to energy savings may actually cost less to build," says Bill Browning of the Rocky Mountain Institute (RMI), a nonprofit advocacy and consulting group based in Snowmass, Colo. Buildings designed to reduce energy use by 50 percent, for instance, may require extra glazing, special lighting, and specific system controls, but these costs are offset because less powerful HVAC and



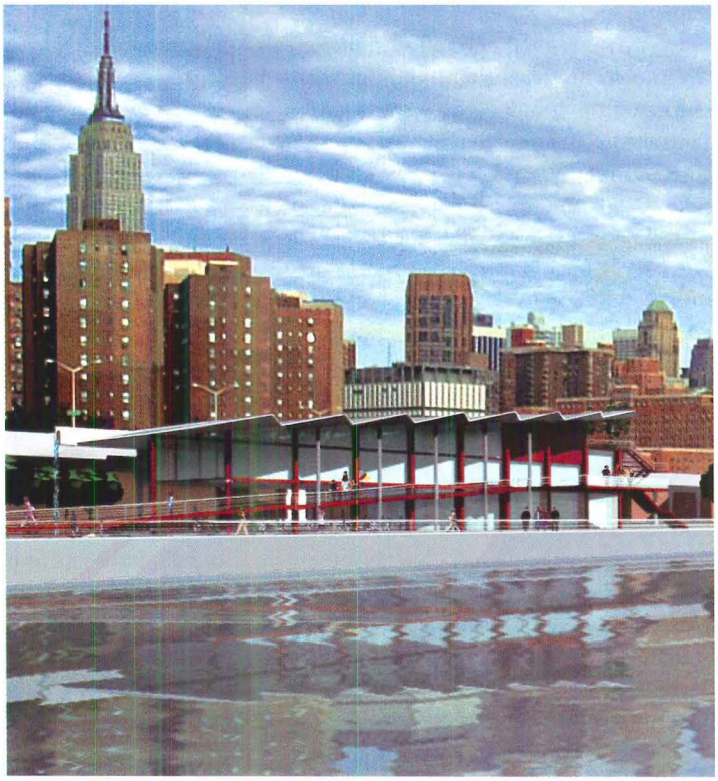


Beldon Headquarters
New York City
Architect: *Croxton Collaborative Architects, P.C.*
An open, circular layout around a central court (above and left), with a compass at its center, evokes images of the earth and creates a campaign-like feel for this environmental advocacy group.

RATING YOUR WAY: The green yardstick

Since the late 1980s, several systems have been proposed to measure the sustainability of buildings; the metric that's taken hold nationally is the Green Building Rating System, developed by the Leadership in Energy and Environmental Design (LEED) program of USGBC. LEED is a system for rating commercial, institutional, and high-rise residential structures. Buildings are awarded points for incorporating criteria in six categories: sustainable sites, water efficiency, energy efficiency, materials and resources, indoor air quality, and innovative design processes. Depending on the number of points received, a building is given platinum, gold, silver, or basic certification. The design team must document the strategies used to meet the criteria and submit them to USGBC for review and approval. USGBC hosts training workshops for LEED and also offers an accreditation exam for designers.

Several municipalities—Portland, Ore.; Seattle, Wash.; and Battery Park City in Manhattan—have adopted LEED and set minimum green standards for new construction. In some cases, developers are offered tax incentives, rebates, and other perks for projects that meet or exceed the minimum. Peter Templeton, LEED program manager, explains that agencies can weight the criteria to address regional or project-specific concerns: "For instance, one county in Illinois will likely adopt LEED with a provision that developers must have a minimum number of credits in energy efficiency to qualify for certification." Future



Stuyvesant Cove Environmental Center
New York City
Architect: *Kiss + Cathcart*
This demonstration and education facility was designed using a loose-fit approach. Its rooftop will incorporate photovoltaics capable of powering the entire building off the grid—a first in New York City.

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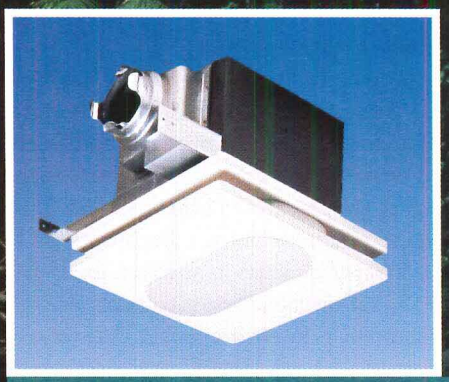

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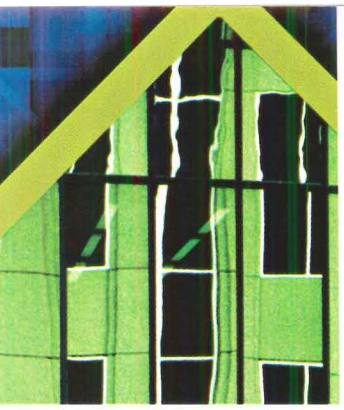


mechanical systems can be specified. "When energy-reduction targets are only 20 to 30 percent, this offset isn't as likely to occur."

Such cost savings require an integrated, whole-building approach in which the design team evaluates building elements with respect to how they affect one another, rather than in isolation. For instance, when Flad & Associates of Madison, Wis., designed a four-story pharmaceutical research laboratory for Pharmacia in Skokie, Ill., the architects considered using a heat-recovery system to lower energy consumption. An initial analysis showed that the system wasn't cost-effective, but the design team identified other energy-saving strategies that reduced the size (and therefore the cost) of pumps, chillers, and piping. In the end, the payback period on the heat-recovery system was reduced to an acceptable level. "The strategies that helped make this happen involved the combined knowledge of several disciplines on the design team," says Steven Schultz, sustainability and energy manager for Pharmacia.

Lending a helping hand

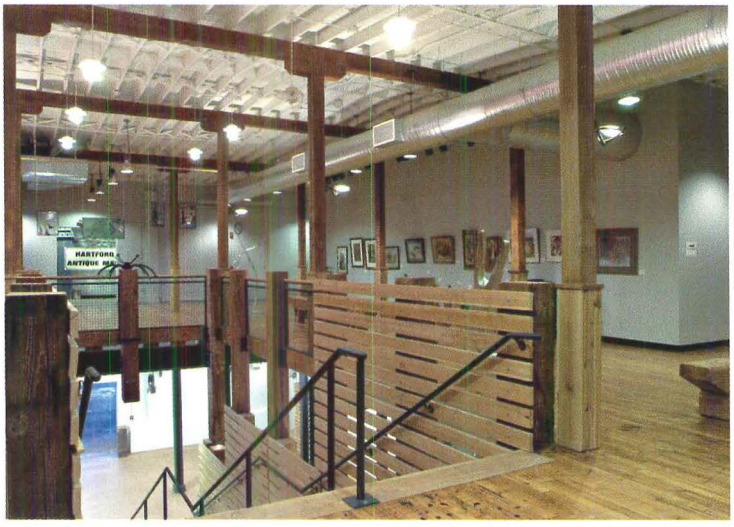
The greening of the design industry has itself become a mini industry: Trade associations, journals, product directories, and Web sites offer case studies, advice on selecting materials and systems, and lessons learned. And firms committed to green design practices are investing in people, technologies, and practices to help them wade through these data and get the job done. Hellmuth Obata + Kassabaum (HOK), for example, is creating an online system to help its architects investigate and select green products. "We also call on chemists, toxicologists, and other scientists with expertise in interpreting the environmental data we get from manufacturers," says William Odell, head of HOK's sustainable design practice.

Green products in particular have been a focus of interest because of the effort involved in sorting through competing claims made by manufacturers eager to provide products that fit the bill. "It's impossible to look over the shoulder of every single supplier to make sure they're giving you

versions of the standard will be available for commercial interiors and residential construction. An operations rating system is also in the works, which would reward owners whose facilities are performing as intended.

The standard is already being acknowledged as a national benchmarking tool. "The adoption of LEED has created a kind of peer pressure that's transforming the market," says Jason F. McLennan, director of Elements, the sustainable design division of BNIM Architects in Kansas City, Mo. Architects unfamiliar with green building use LEED as a guide to incorporating the strategies, which is no doubt making projects greener than they might have been. Nadav Malin of EBN is helping to develop the standard's next version. "Many organizations use LEED to choose sustainability concepts, without going through the additional step of getting certified. Others find that the discipline and documentation needed for certification help to ensure that a project's green goals aren't eroded."

Yet some feel LEED also inherently casts a checklist framework onto the design process. Malin acknowledges that there's work to be done to ensure that the standard continues to emphasize integrated design processes, as well as outcomes. *KLG*



Schauer Arts Foundation
Hartford, Wis.
Architect: *Holabird & Root*
Eight former canning factories were connected and renovated (top) to create a gallery and performing arts center. Salvaged lumber from the factories was used for the staircase and lobby (above).

Residence Hall, Penn State Berks
Reading, Pa.
Architect: *Susan Maxman & Partners*
A stand of trees was preserved when this dormitory was built on a wooded, hilltop site. The building hugs the hill and threads through the forest to minimize excavation and site disturbance.

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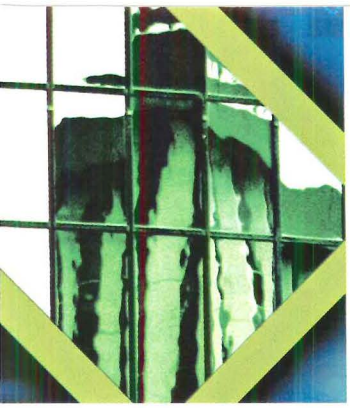


what they say they're giving you," says Spiegel. A unified certification or labeling system for green products may be years away, but efforts to evaluate and catalog them have been under way for some time. *GreenSpec,* developed by Environmental Building News (EBN), is a product catalog and directory of manufacturers and claims, with guideline specification language; the products are investigated and screened by EBN before inclusion. EBN's Green Building Advisor software offers strategies for green design along with successful case studies. Green Seal, an environmental labeling organization, has awarded its Seal of Approval to select building products.

Despite the tools available, selecting green products remains a difficult exercise because it always involves trade-offs. Is it better, for instance, to use locally harvested lumber from a noncertified forest, or lumber from a certified forest in Asia that must be shipped halfway around the globe? Are durable materials preferable because they don't need frequent replacement, or unfavorable because they don't break down easily by natural processes? There are no fully right or wrong answers to these questions. A product's sustainability depends not just on its content and manufacturing method, but also on site-specific environmental concerns, the project type, and the use for which it's intended. In the end, architects must simply make informed choices and find other ways to ameliorate the overall environmental consequences of their projects.

Keep it simple, make it flexible

Architects are learning, or rather relearning, that the buildings resulting from using green design strategies aren't always exotic or complicated. Durable structures that are built to be adaptable for future uses and new technologies—a tenet known as loose-fit or universal design—exhibit the core values of the sustainability movement. And considering that up to 30 percent of landfill waste in the U.S. is composed of construction and demolition debris,

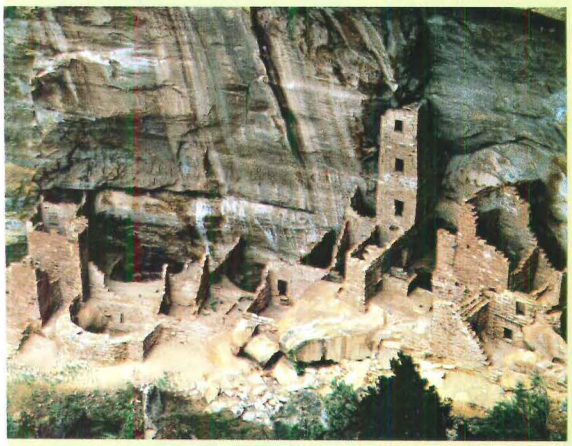
Pharmacia Building Q
Skokie, Ill.
Architect: *Flad & Associates*

A light-filled atrium, an unusual feature for a laboratory building, acts as a central gathering spot for employees.

PHOTOGRAPHY: © MESA VERDE NATIONAL PARK: STEVE HALL/HEDRICH BLESSING

REVISITING THE STORY OF 16TH-CENTURY ENGLISH GLASSMAKERS REMINDS US THAT THE ISSUES THAT MAKE GREEN DESIGN CRUCIAL FOR OUR TIMES ARE NOT NEW.

Green design is not new. Places like Mesa Verde, below, were inherently green. Their builders used local materials and knew how to orient their buildings to take advantage of the sun. Fuel was in short supply, so they used thermal mass to store heat for cold evenings and to keep their dwellings cool during the day.



Centuries later, the Industrial Revolution changed everything. It made new building materials available, allowed them to be transported over great distances, and efficiently delivered fuels such as coal, natural gas, and electricity. For a brief period in the U.S. during the last century, design for climate and conservation of energy were almost non-issues. Architects and engineers felt they could build almost anything they could think of. The downside is that each innovation that brought designers closer to this kind of absolute architectural freedom also seems to have introduced materials and demanded processes that were less green than those that came before.

The tale of the glassmakers

In his 1979 book, *Connections*, English author James Burke describes how most of the glass used in England prior to the mid-1560s was imported from the Continent. Then a glassmaker living in Belgium was given permission to enter the country and set up a wood-fired kiln, on the condition that he would teach his art to the English. By the 1580s lots of people were making glass in England, so many, in fact, that competition (especially with shipbuilders and metal smelters) caused an acute timber shortage. Glassmakers became itinerant. When wood supplies got too far from their kilns, causing the price of wood to go up, they would simply relocate. Timber along the rivers was particularly favored, because water could be used to ship the finished glass to market. Deforestation along the Thames became so severe that Parliament made it illegal to make glass within 22 miles of its banks. Later, wood near certain forests and the coasts was off-limits, and finally, there was no glassmaking allowed within eight miles of any river. The shortage of

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adapting existing structures or reusing their materials are simple ideas that can make significant contributions in environmental stewardship.

For instance, buildings can be designed for conversion to power sources that are off the grid. With an eye toward rising energy costs, Croxton Collaborative has been designing buildings that can easily be retrofitted to use renewable energy sources such as photovoltaics, which will likely become economically viable within the life of the existing mechanical system. Over time, the renewable systems will come online when peak demand conditions occur. "You are doing a disservice to clients if you're not helping them take advantage of energy-efficiency strategies," says Croxton. One such project, scheduled for completion this fall, is a new municipal office building in Chattanooga, designed by Croxton Collaborative in a joint venture with Chattanooga-based Artec. The project involved an aggressive daylighting program that will bring lighting loads far below normal. Croxton says, "The building can be retrofitted by reglazing the east and west facades with photovoltaics, installing roof-integrated photovoltaics, and converting the cooling loads to an on-site source." This retrofit will probably happen in 20 to 25 years, at about the time when the existing mechanical system would require replacement anyway. The architect provided the owner with a manual explaining how the building is designed to make the conversion.

Responsible designers also find ways to keep building materials from being carted away at the end of a project's life. HOK is currently designing flexible workspaces for a pharmaceutical company. "Usually it takes weeks or months to convert a laboratory to a different type of space," says Odell. "But pharmaceutical companies often need less laboratory and more office space once they're done with a research project, so they can apply for patents and FDA approvals. We want them to be able to convert a laboratory to an office space within an afternoon, using modular systems that can be easily dismantled and reassembled, so that no furniture or materials need be discarded."

Green designers take maximum advantage of the opportunities offered by adaptive reuses. Chicago firm Holabird & Root recently transformed eight interconnected canning factories into the Arts and Activities Center for the Schauer Arts Foundation in Hartford, Wis. Building materials from the old factories were repurposed to create staircases, benches, and furniture. New steel trusses for the theater roof were created from the existing structure by constructing them in small pieces, then moving and installing them manually. Auditorium seating was salvaged from a local hospital and a high school.

Approaches lifted from life science have also begun to take root, mostly in siting techniques. "Architects treat buildings and sites like machines, when they should be regarded as organisms—systems that can learn and heal themselves," says William Reed of Regenesis, a consulting firm specializing in sustainability issues. He cites a mixed-use development in the southwestern U.S. where the developer and residents sought to minimize site damage during construction. Research indicated that the site once had a stream running through it, though it had dried up decades ago when development first began in the area. "We asked the developers, do you want to maintain the level of environmental quality that's at the site now, or do you want to give it the potential to return to its natural state?" They decided on the latter. Site work and landscaping restored the area to its

LOOSE-FIT BUILDINGS ARE DESIGNED TO ADAPT TO FUTURE USES AND NEW TECHNOLOGIES.

timber was so severe that there was not enough wood to make both the glass and lumber for the buildings that called for it. When the wood was all gone, they switched to coal to fire their kilns.

The story of the English glassmakers is an archetype for almost everything that can go wrong when the demand for an industrially produced building material begins to put pressure on its manufacturer's ability to find fuel and to transport products where they are needed—the very same issues that over 400 years later are pushing architects to design green buildings. The first problem for the glassmakers was that the process they used to make the glass was not very energy efficient, and caused air pollution. Even though wood is a renewable resource, it was depleted far faster than it could grow back. The clear-cutting likely caused the decline of plant and animal species, caused erosion, and clogged streams with silt. Unless it was made close to market, the glass wasn't practical. Today, we've cut these kinds of costs by using rail and truck transport, but such methods require considerable amounts of petroleum, as well as land for tracks and highways, and also create greenhouse gases.

Glass changed building form irrevocably, introducing light and transparency and taking away the heavy appearance that had always been characteristic of European buildings. The use of large expanses of glass also eliminated thermal mass, bringing about wide swings in heat loss and heat gain. This was a huge departure from the local, climate-based logic that had been the basis of building design for millennia. However, as long as conditioning systems continued to evolve and energy was cheap enough to operate them, this was a moot point. In time, the capabilities of glassmakers and HVAC systems improved so dramatically that one is hard pressed to think of Modern architecture without buildings like the Farnsworth House.

The energy-rich new world

During the 20th century, the mass harvesting of cheap energy and improved techniques for manufacturing allowed for the production of cheaper materials. According to *Engineering News Record*'s weekly cost index, cement costs 20 percent less today than it did in 1913, even though energy still accounted for 30 to 40 percent of the cost of its manufacture in 2000. Today the cost of steel is down by 63 percent since 1913, even though 15 percent of its 2000 cost was for energy.

These were the very materials that made possible the stylistic leap from heavy masonry skins, concrete structural systems, and small operable windows typical of pre–World War II buildings to the sealed, lightweight, aluminum and glass curtain walls, and steel structural systems of the Modern movement. Was all of this because architects decided it was to be so? Not entirely. As with the glassmakers, it was the technical developments that changed everything. Steel, concrete, aluminum, and glass were getting cheaper, central HVAC systems were becoming practical, while the cost of labor was going up. Today, labor is 5,789 percent more costly than in 1913. The recent lightweight steel-and-glass buildings could be put up faster and required less

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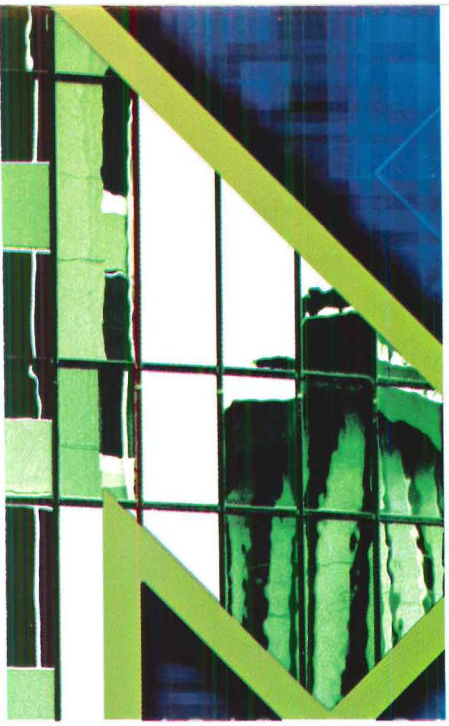


former condition. Within a year, water trickled in, and the streambed hasn't run dry a day since.

Redesigning design

Perhaps the greatest challenge in designing for sustainability is changing long-ingrained design practices and habits. Rafael Pelli of Cesar Pelli & Associates says, "When we talk about green building, we are really talking about redesigning the design process—rethinking everything from the team to the schedule and pace of the design." Enlarging the design team to include multiple disciplines, developing goals for sustainability early in the project, and assessing how each design decision affects the overall performance are especially important for projects that present special challenges. For the Pharmacia project, the design team had to overcome some grim statistics. Schultz says, "Laboratories typically consume 5 to 10 times as much energy as office buildings with the same square footage, in part because of the large volumes of outside air required for fume hood make-up air." Architects at Flad & Associates added engineers, building occupants, and Bill Browning of RMI to their design team. At the outset, the team split into four groups: materials and landscaping, lighting and energy, mechanical systems, and building envelope. Each group met to discuss sustainability strategies. Over 90 ideas were generated during this process, of which 80 were implemented. "Some designers feel that since labs are high-energy consumers, applying green strategies is meaningless. We wanted to prove them all wrong," Schultz added.

The next revolution

Recent examples of green buildings serve to remind architects that sustainability rests on the long-standing basics of smart design. Odell recalls a telling anecdote: Excited about a project he was working on, he told a favorite aunt about a high-rise development in which all the water that fell on the site was collected in a cistern, reused to flush toilets, and treated before being discharged. She eyed him suspiciously when he finished his story, and asked, "What's new about that?"

Today's architects, like those of generations past, are well aware that natural resources aren't infinite. That's not to say there isn't more to learn about designing to protect the environment. "In five years we might all look back and think the things we're doing right now are dumb," Odell adds. As architects begin to apply the concepts and work with other disciplines to accomplish green goals, their efforts will result in uneven outcomes at first. Croxton says, "As sustainability moves from being a marginal idea to a widely accepted one, there will naturally be projects that only partially realize its concepts. We're in that awkward phase right now. In time, issues such as energy deregulation and rising fuel costs will weed out weak examples of green building." Though benefits such as increased productivity and improved morale may be difficult to quantify, they're also difficult to argue against. Happy tenants beget happy owners, which may be all it takes to convince them to take the movement seriously.

LEARNING AN INTEGRATED DESIGN APPROACH MAY BE THE MOST CHALLENGING ASPECT OF GREEN DESIGN.

What's on the road ahead? More research, more buildings, more growing pains, more lessons learned. The goal? In time, sustainable design concepts will simply be incorporated as inherent attributes of standard practice. "Going green" might be the buzz phrase du jour, but ultimately, it will become a survival skill—not just for earth's denizens, but for designers themselves. ■

labor than their counterparts from earlier in the century. The loss of still more thermal mass took a quantum leap, as life-cycle operating cost took a back seat to first cost. Curtain wall and glass buildings of all sizes proliferated in all climates in the U.S. for decades.

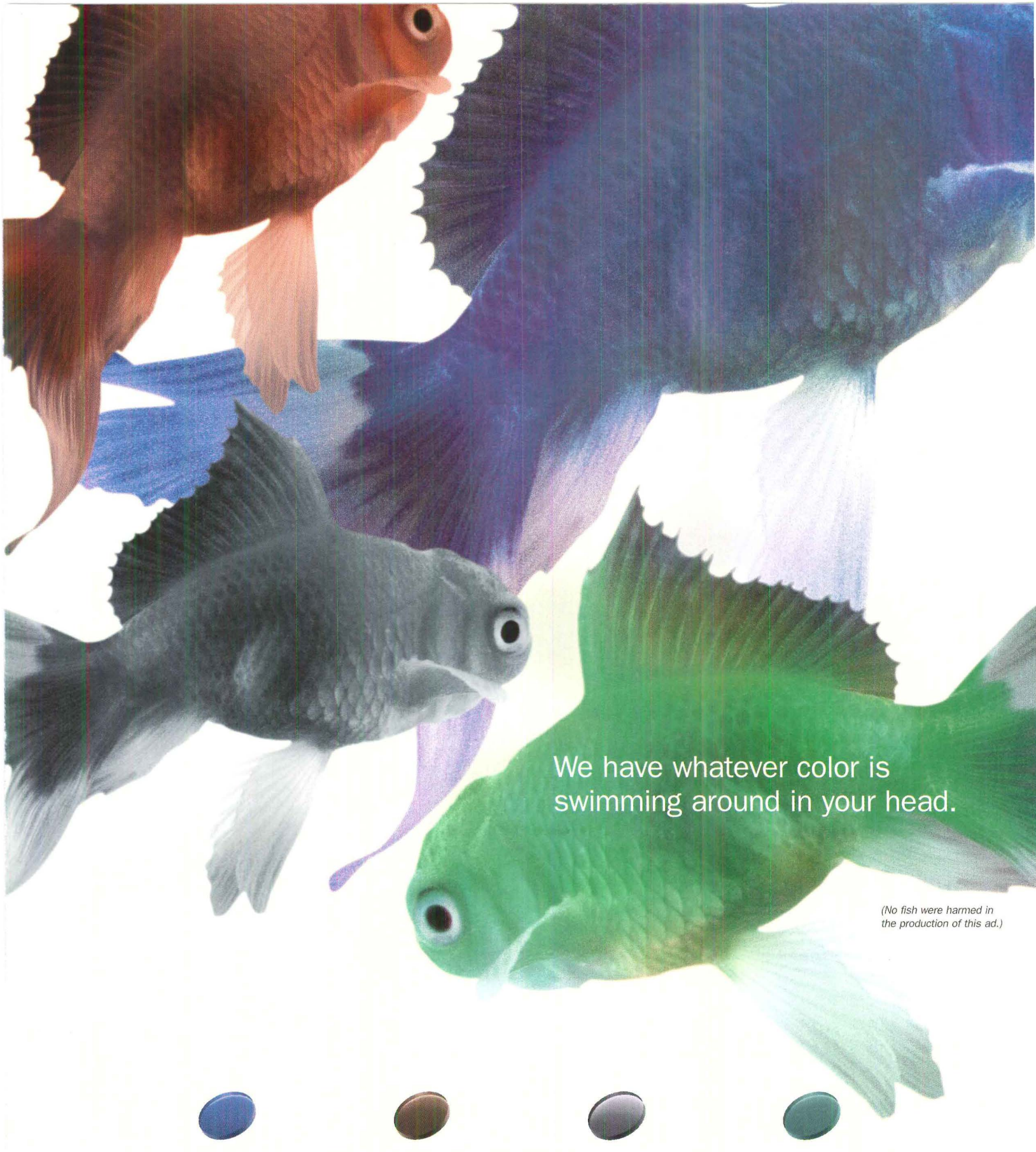
But our ability to build anything in any climate and to use energy freely did not last. With OPEC's oil embargo, we awoke in the 1970s in a country that had used up much of its easily accessible energy resources, just as the English glassmakers had done centuries before.

The Department of Energy's Energy Information Administration produces a publication called *Commercial Buildings Consumption and Expenditures,* which documents energy use in buildings. It incorporates so many variables that it is quite possible to come to incorrect conclusions when attempting to draw generalizations from it. However, when measured in 1994, buildings constructed before 1919 used 8.3 kilowatt hours (kWh) per square foot of building area. This number jumped to 18.8 kWh/sf for buildings constructed in 1990–92. Lighting and air-conditioning loads account for most of the additional electrical load that occurs in buildings built after 1950. In 1994, natural-gas consumption was practically the same in buildings built before 1919 as those built in 1992–93, at around 49 cu/sf. Holding all variables equal—climate, operating hours, type of use, floor space, and number of workers, and modernization of such things as lighting systems—pre–World War II buildings that have thermal mass, the ones built respecting the lessons of Mesa Verde, will almost always be more energy efficient than the light steel and glass buildings of the mid-20th-century.

Going beyond the glassmakers

During the last 30 years, we have begun to relearn many of the same lessons the English glassmakers did 400 years ago. Yet we have the means to make much broader assessments of the consequences of our actions than the glassmakers did. We have powerful design tools and new guidelines to help us do effective, responsible design work. While concrete, steel, aluminum, glass, and thousands of other energy-intensive materials will continue to be manufactured and used, we can now grasp the long- and short-term environmental implications inherent in our design work and decide to act wisely.

Charles Linn, AIA



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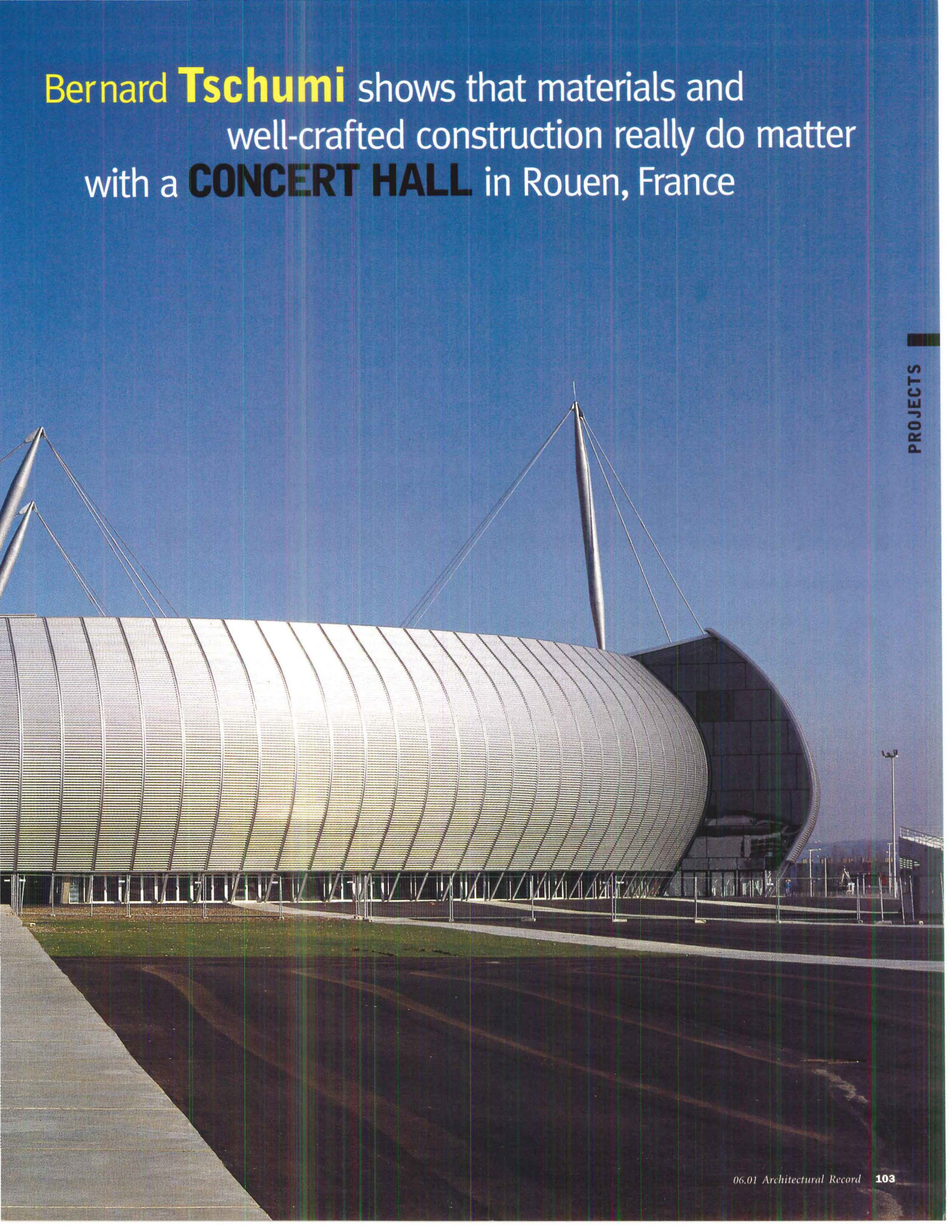
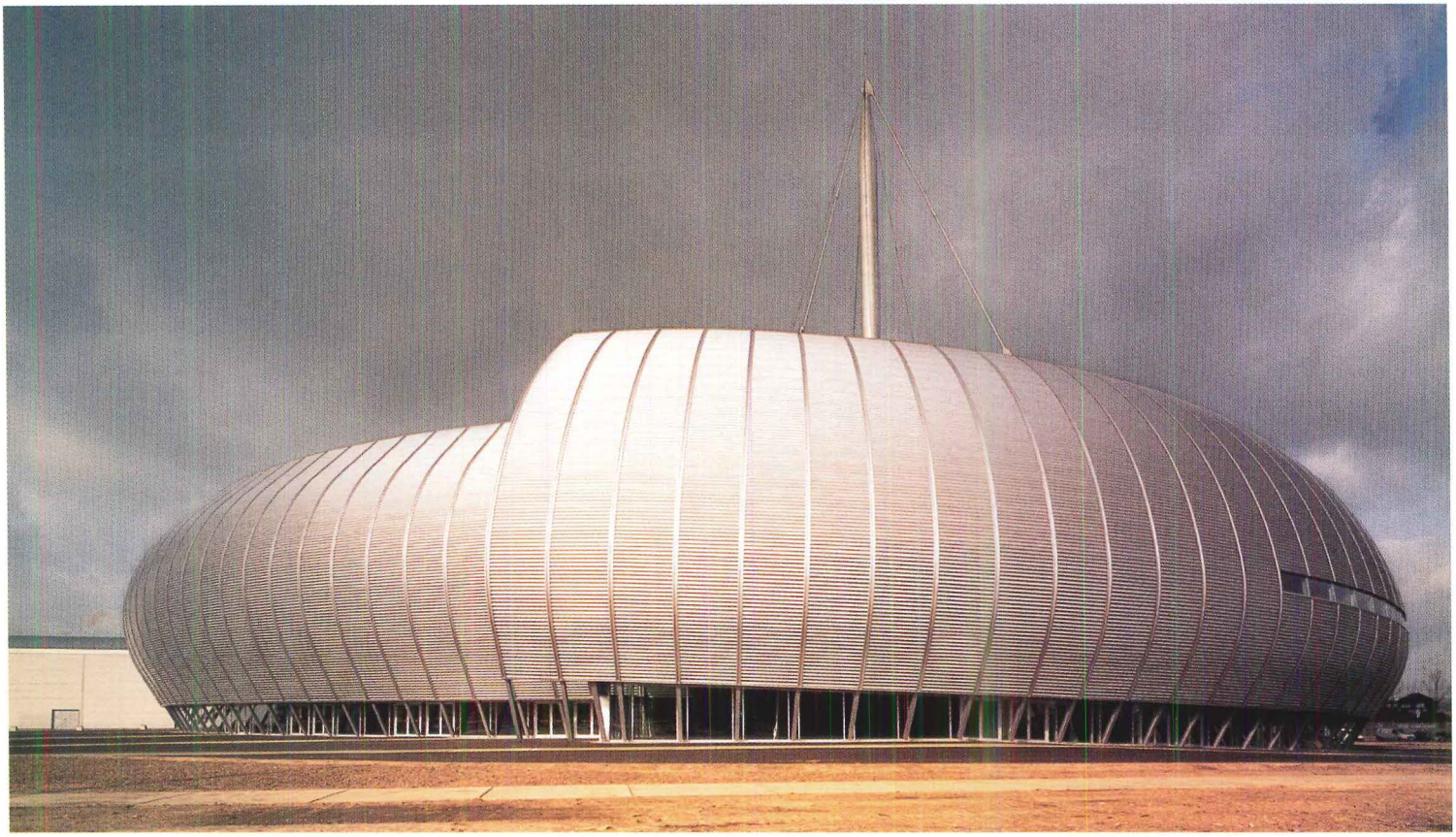
CIRCLE 58 ON INQUIRY CARD

The shimmering, corrugated, steel-clad concert hall and a rectilinear exhibition wing of aluminum and glass partially enclose an outdoor exposition area. The lightweight truss roof of the concert hall is suspended by cables from three masts, while the exhibition hall's roof is an arched truss system.

Bernard **Tschumi** shows that materials and well-crafted construction really do matter with a **CONCERT HALL** in Rouen, France





By Suzanne Stephens

On the road to Rouen you do not expect to see a curved, gleaming object perched among Normandy's pastures like a giant UFO that just landed. Especially if you are en route to visit the famous Gothic cathedral Monet painted so often. All of a sudden, on a rather nondescript 70-acre site at the outskirts of the provincial port of Rouen, northwest of Paris, rises the Zenith Concert Hall and Exhibition Complex. The contrast with its context only serves to dramatize the lustrousness and futuristic quality of this totemic symbol to contemporary culture.

In true European custom, the design for the concert hall resulted from an invited architectural competition sponsored by the regional government. The winner was Bernard Tschumi, the Swiss-born architect who is the dean of Columbia's Graduate School of Architecture, Planning and Historic Preservation, and whose offices in New York and Paris saw the project through design and an intense 13-month construction process. The materials are basic—primarily poured-in-place and precast concrete, plus corrugated steel cladding. And they are straightforwardly, or shall we say, plainly, put together. "There are no self-indulgent details à la Carlo Scarpa," Tschumi says almost defiantly. Yet the quasi-circular hall and its rectilinear exhibition wing are executed with a level of craft and a clarity of form that make them striking. The gestalt is quite different from the interior complexity of Tschumi's suspended steel and glass ramp and window-wall assembly in Lerner Hall at Columbia University [NOVEMBER 1999, page 94], designed in association with Gruzen Samton, or, for that matter, Tschumi's previous enclosure-within-an-enclosure, Le Fresnoy National Studio for Contemporary Arts in Tourcoing, France[JANUARY 1998, page 86].

"THERE ARE NO SELF-INDULGENT DETAILS A LA CARLO SCARPA," TSCHUMI SAYS ALMOST DEFIANTLY.

It may look simple, but it's not. Tschumi based the design of the 7,000-seat concert hall on a concept he had devised for a multiuse urban development at Chartres in 1991, which featured three curved aluminum-wall ellipses with flat roofs suspended from masts. For the Rouen competition in 1988, Tschumi refined the parti so that there are two envelopes, one, the exterior metal skin (intended to be aluminum, but ultimately steel, for heft) that encloses the building proper; the other, the inner concrete shell around the auditorium. The space between the two envelopes is devoted to the lobby, cafe, and a dynamic interweaving of ramps and stairs.

Other twists give the scheme added momentum: For one, the auditorium is designed in an irregular fan shape that can easily be divided and reconfigured for different audience sizes, depending on the event. Second, the exterior curved walls are a broken "torus"; that is, two segments of hyperbolic forms (rather than semicircular arcs) generated from slightly different radii. Tschumi adopted this strategy to solve the problem of drawing crowds into the curved hall: At the point where one segment overlaps the other, he inserted the glassed-in main entrance.

In addition, one of the two arcs is slightly tilted, while the other

Project: *Zenith Concert Hall and Exhibition Complex, Rouen, France*
Architect: *Bernard Tschumi Architects—Bernard Tschumi, principal; Véronique Descharrières, Alex Reid (Paris office); Kevin Collins, Joel Rutten (New York office)*
Owner: *District of Rouen*
Engineers: *Technip-TPS*
Consultants: *CIAL (acoustical)*
General contractor: *Quille*

With the Rouen concert hall, Bernard Tschumi devised a scheme using a torus (a solid ring of circular or elliptical section) that is then broken (opposite). Where the two segments overlap, he inserted a glazed entrance (below).

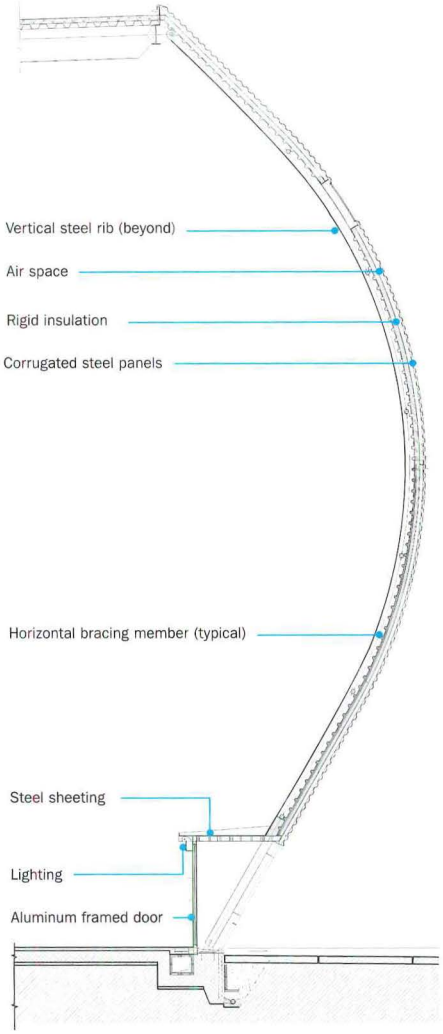
Poured-in-place and precast concrete are used for floors, ramps, and open-riser stairs of the lobby. The outer skin is composed of two layers of metal with insulation between, while HVAC ducts are placed perfunctorily over the glazing around the base. "Everything is utilitarian," says Tschumi.

1. *Auditorium*
2. *Lobby*
3. *Suspended acoustical ceiling*
4. *Catwalk*
5. *Concrete enclosure*
6. *Corrugated steel wall*
7. *Lightweight truss*
8. *Plenum*

TRANSVERSE SECTION

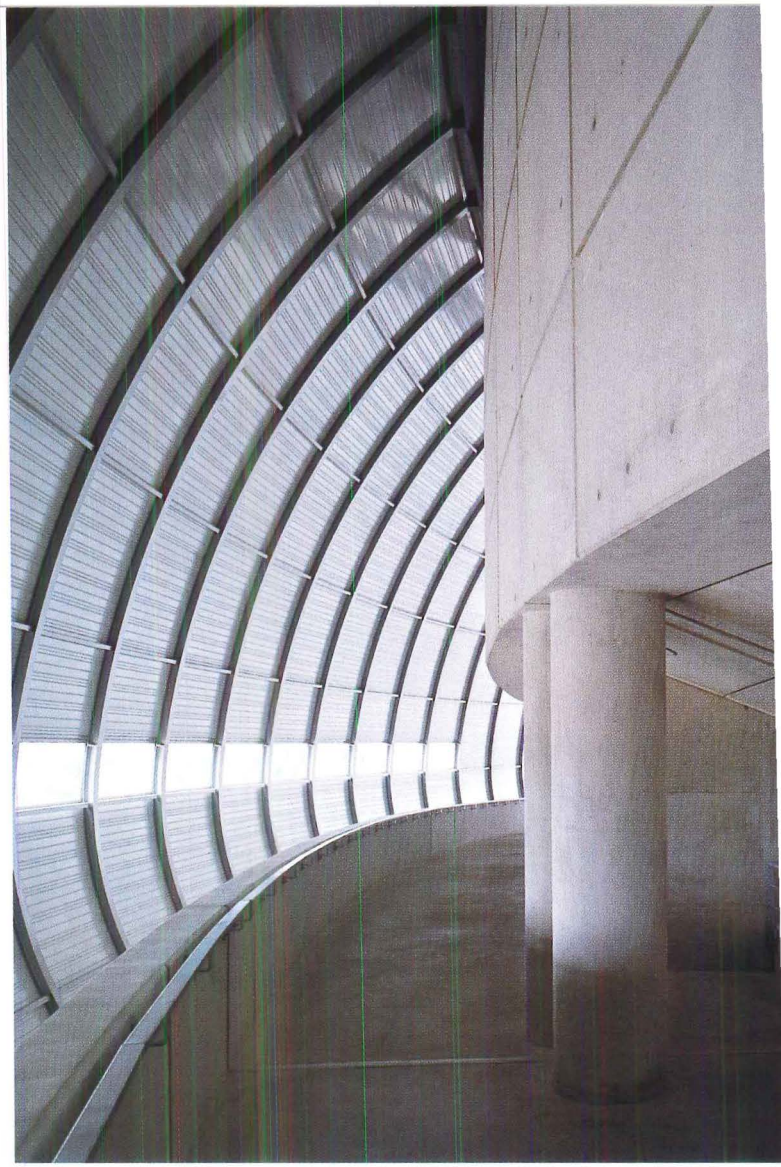
0 30 FT.
9 M.

The concrete structure's Piranesian spaces are dramatized by the uplights on the columns, and by daylight admitted through the band of glazing on the upper part of the outer envelope. Open-riser stairs and linear steel handrails also heighten the sense of porosity and interpenetration of space.



SECTION THROUGH EXTERIOR WALL

The light exterior enclosing wall of corrugated steel is pierced with an upper band of fenestration and braced with curved ribs that continue to the ground (section, left).



is horizontal, to accommodate changes in topography without the need for a plinth. Since the curved form is glazed to a height of nine feet, it seems to hover above the earth, by all appearances resting on the slender steel ribs that extend to the ground. As in the Chartres proposal, three masts jut out of the horizontal roof, in this case 350 feet in diameter. The roof itself is composed of light metal trusses supported by the masts and suspension cables for 200-foot spans.

With its swirling ramps, open-riser stairs, and attenuated columns, the lobby combines the dynamic spaces of Piranesi with the tectonic concrete architecture of Auguste Perret. Indeed, the concrete, poured with the consistency of vanilla pudding, is a suitable homage to François Hennebique's innovations in reinforced concrete in the 1890s.

Adjoining the concert hall is a 700-foot-long Miesian exhibition space occupying most of a 1,000-foot-long bar jutting southward from the curvilinear hall. Defined by a crisp glass-and-aluminum curtain wall, its width, a clear span of 140 feet under a slightly arched truss, can flexibly house trade shows, antique fairs, and similar events.

Although the torus shape, made possible by complex computer calculations, brings to mind "blob" construction being explored by Greg Lynn and others [DECEMBER 1999, page 104, and NOVEMBER 2000, page 78], Tschumi's solution arguably emanates from a tectonic tradition. Building materials and techniques, plus complex geometry, determine the form. "I try not to rely on form over materials," says Tschumi, pointing out that computer-generated designs often ignore the importance of the latter. Not surprisingly, the spirit of earlier Modernist architects, especially Tschumi's favorites, such as Paul Nelson and Oscar Nitzchke (who worked together on a cable-supported, concrete Palace of Discovery project in 1938), as well as the expressionist Frederick Kiesler, seems to float over this realized scheme.

Tschumi's recognized preference for creating unprogrammed spaces where "flows and vectors intersect," and his desire to create "event" architecture, where the movement of people bring life to the void, are also in evidence. Ironically, the shiny skin and sculptural bones almost steal the show from the spaces in between. To be sure, the kinesthetic experience of moving into and through the building is dynamic. But this is also a place where you can just stand still and admire the craft of construction of the object, as well as the space inside. ■

Sources

Structural system: *SMB (metal); QUILLE (concrete)*
Masonry: *QUILLE*
Metal/glass curtain wall: *SMB and Julien*
Built-up roofing: *Spada*
Metal roofing: *Etanchisa*
Steel windows: *Rineau*
Glazing: *Pilkington; St. Gobain*
Fixed seating: *Grofilex (Siège BTA-Modèle Déposé)*
Lighting: *Szen-S3en*
Suspension grid: *Scènetec*

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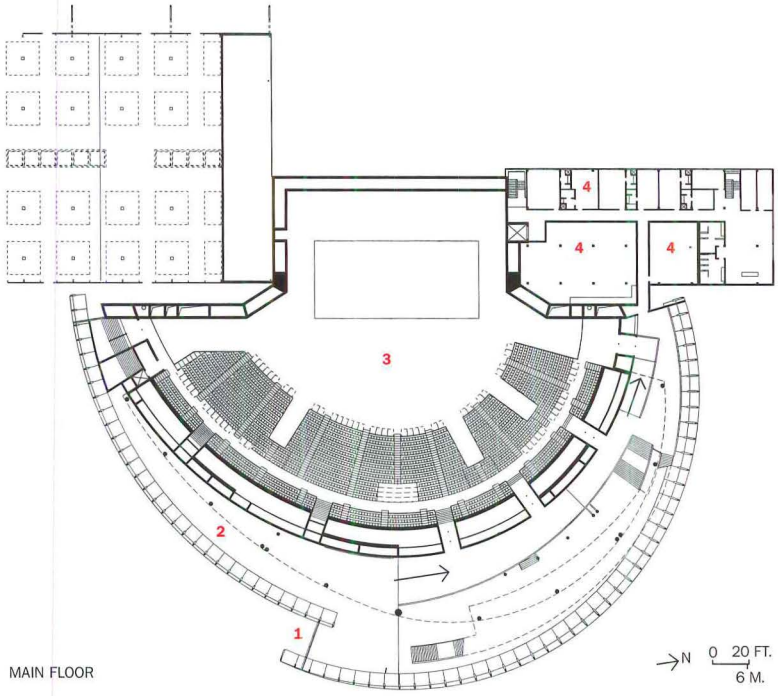
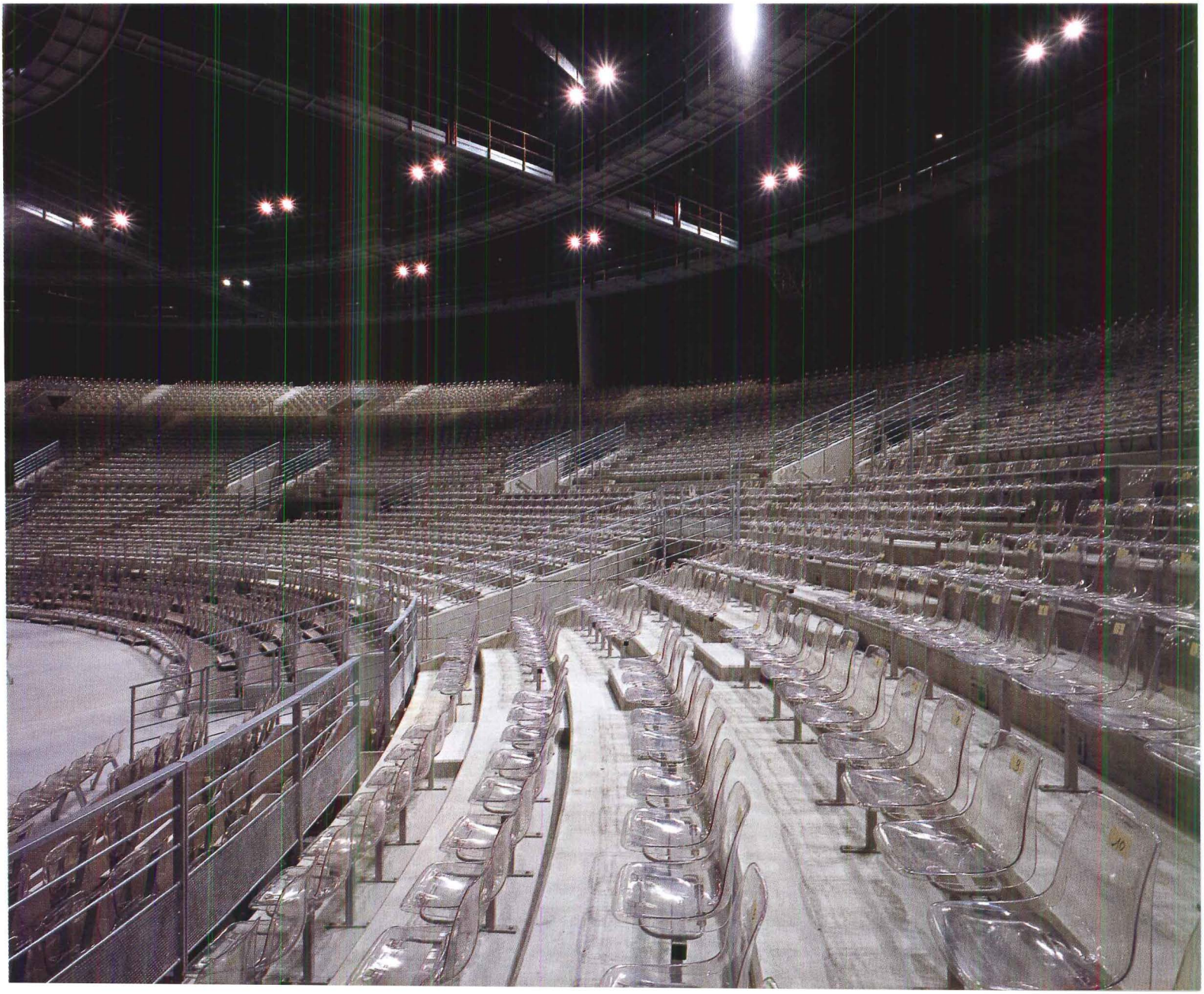
The auditorium is designed so that spaces may be closed off, depending on the various entertainment or political functions taking place. The front section of the transparent, acrylic plastic, folding seating is movable, and a plenum below the floor delivers air through the seating areas.

1. *Entrance*
2. *Lobby*
3. *Auditorium*
4. *Backstage rooms*



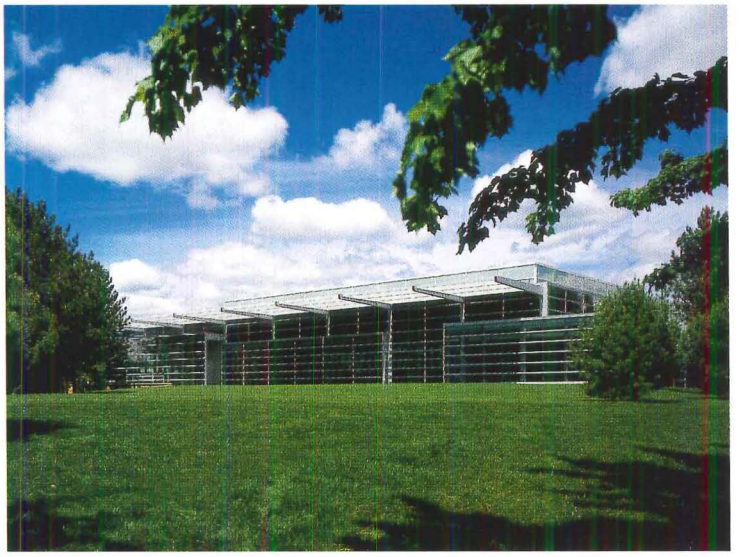
MAIN FLOOR



The east-facing entry facade (this page) combines local stone with glass-and-metal curtain wall. The south elevation (opposite) faces a rolling lawn and Elk Lake.

Krueck & Sexton translates a company's progressive philosophy into modern architecture at the PHILLIPS PLASTICS FACTORY in Wisconsin

By Clifford A. Pearson



When modern architects dream, they often see a machine sitting in a garden. Precise, rational, and repetitive, the machine is the perfect foil to the irregular, ever-changing elements of nature. The contrasting-yet-complementary characters of machine and garden are locked in a powerful embrace that has fascinated architects since Joseph Paxton's Crystal Palace captured flora under glass in 1850 London.

The dream lives on in Krueck & Sexton's design for Phillips Plastics Custom Molding Facility in Phillips, Wis.: an 85,000-square-foot factory on a wooded property near the confluence of Elk River and Elk Lake. The building, which was carefully sited to minimize tree removal, engages its surroundings with great walls of clear glass that bring views of the rural landscape to all employees. As it has done with many of its other facilities, such as its Short Run Factory, designed by James/Snow Architects [FEBRUARY 1992, page 102], Phillips demanded architecture that treats blue-collar and white-collar employees as equals. In the company's nonhierarchical organization, access to daylight, views, and amenities is shared equally.

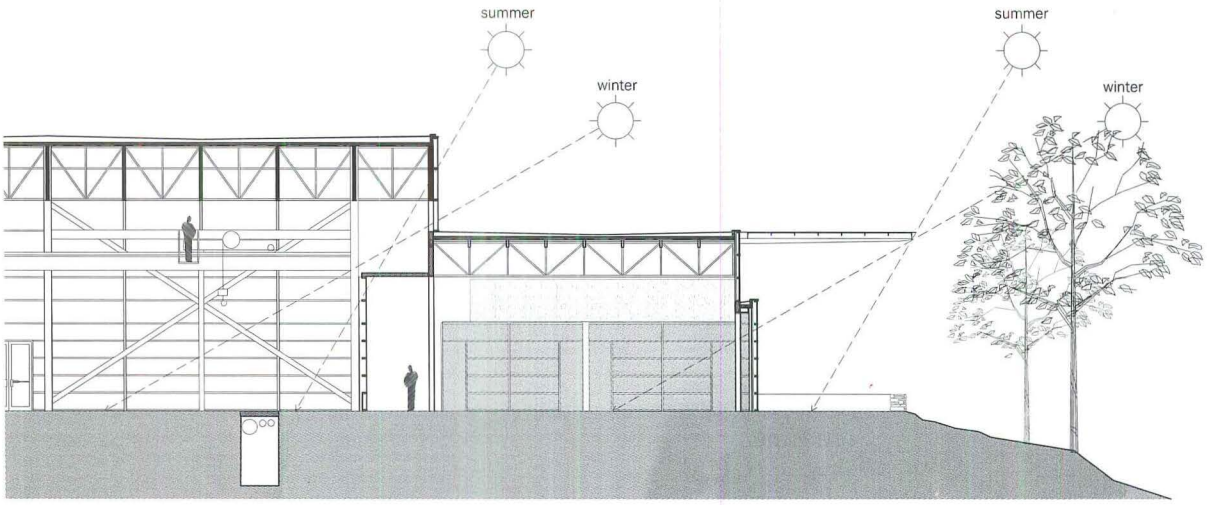
"The foundation of our business is to facilitate people working together," states Robert Cervenka, chairman of the board of Phillips Plastics. "This gives us a competitive advantage," he says, by making employees more productive. Architecture plays a part in this strategy. "If you want people to work together, you need to give them a building that encourages cooperation," explains Cervenka. An open work environment, for example, encourages employees to work as a team. Small factories—no more than 320 employees per plant—help people identify with their workplace. The results have been impressive for Phillips. Over the past 36 years, the company has reaped a return-on-equity of 17.4 percent per year, in part due to very low employee turnover (just 2 to 6 percent each year, compared with 5 to 15 percent for most of its competitors), notes Cervenka.

The great majority of the 220-250 employees at the Custom Molding Facility work on the manufacturing side of the business, producing parts for the automotive, telecommunications, and medical-device industries. As a result, the building's largest component is the 220-foot-long, 130-foot-wide, 35-foot-high manufacturing shed, a glass-clad volume housing twin gantry cranes that facilitate quick reconfiguration of the factory's three production lines.

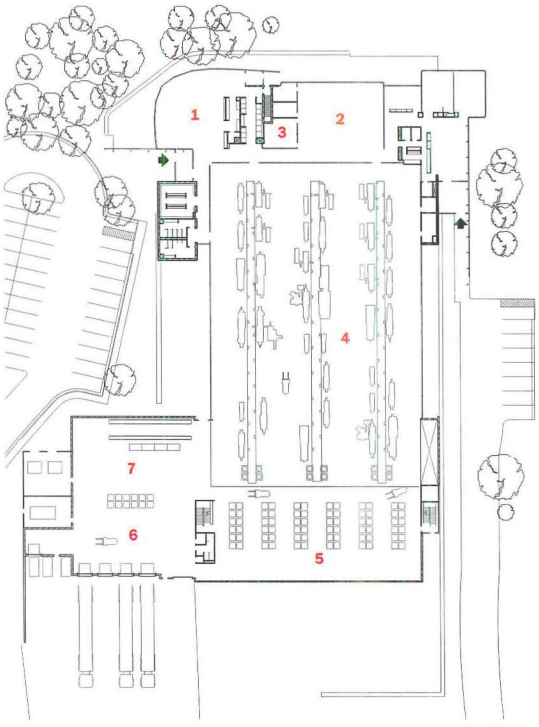
One of the problems with many factories today is that the usually small office portion seems like a pimple on the face of the manufacturing hall, says Mark Sexton, AIA, project principal for the Phillips job. To avoid that problem, the architects combined offices and shared amenities such as a lounge, reception area, and meeting rooms and spread them out along the south side of the building, facing views of the lake and river. And to reduce the apparent bulk of the production hall, they wrapped a storage-and-loading block on its north side and used a variety of exterior materials, including fritted glass, a local stone called Mankato-Kasota, and pre-engineered, insulated-aluminum panels. The result is a building in which blocks of different materials seem to slip past one another—emphasizing a dynamic ensemble, not any one piece. "We wanted to dissolve the usual distinction between manufacturing and offices," says Sexton. A similar kind of seamlessness holds sway inside the building, where only an acoustically rated glass wall separates the factory's production lines from the administrative area's work cubicles. "If it weren't

Project: *Custom Molding Facility, Phillips, Wis.*
Owner: *Phillips Plastics Corporation*
Architect: *Krueck & Sexton Architects—Ron Krueck, FAIA, design principal; Mark Sexton, AIA, project principal; Tim Tracey, Assoc. AIA, project architect; Tom Jacobs, architect*
Associate architect: *Rick Fisher, AIA, Architects Engineers Construction Managers, LLC*
Engineer: *Larson Engineering of Wisconsin*
General contractor: *Oscar J. Boldt Construction—Jerry Feith, architect/project manager; Doug Haas, AIA, architect of record; Pete Kuehl, AIA, architect*

The architects placed shared facilities, such as a meeting room (this page), on the south end of the building to take advantage of views and daylight.



WINTER/SUMMER DAYLIGHTING



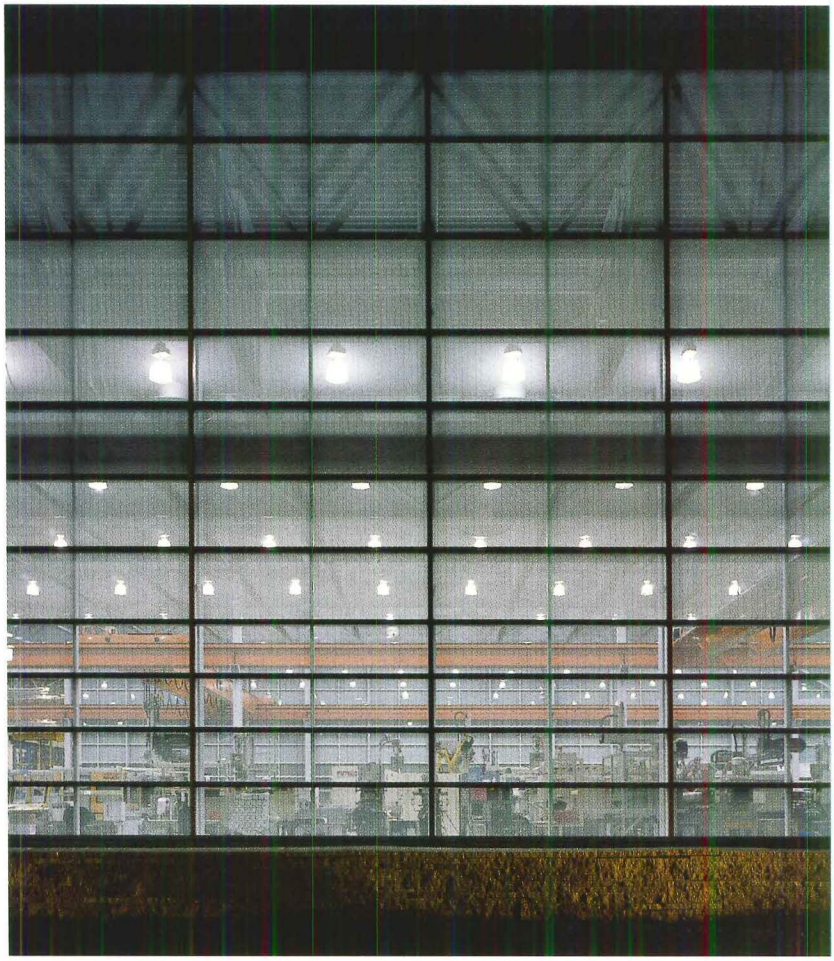
MAIN FLOOR

0 20 FT.
6 M.

1. *Lounge*
2. *Offices*
3. *Conference*
4. *Production*
5. *Storage*
6. *Shipping/receiving*
7. *Maintenance*

Because the factory is in northern latitudes, bringing daylight inside was important. Clerestory windows and curtain wall on the south elevation let the winter sun inside (drawing, above left), while a deeply projecting canopy (below) reduces the impact of summer light on shared spaces, such as the dining lounge (below left).

A sense of openness and equal access is maintained throughout the building—from the entry lobby (left) to the manufacturing hall. Only an acoustically rated glass wall separates the production area from office space (opposite, left). At night the factory glows like a beacon (opposite, right).



for the noise, we wouldn't have anything separating the two parts of our business," says Cervenka.

Steel-frame roof trusses, which are six feet deep, handle the 130-foot-long spans of the factory hall. (The depth was needed, in part, to support the weight of Wisconsin's heavy winter snows.)

Designing for a location where the sun is often a precious commodity, the architects paid particular attention to daylighting. Clerestory windows around much of the building let in winter light, while a deeply projecting, metal-slatted canopy on the south facade shades interiors

WE WANTED TO DISSOLVE THE USUAL DISTINCTION BETWEEN MANUFACTURING AND OFFICES, SAYS SEXTON.

from the sun during summer months. Glass above 12 feet off the ground has an 85 percent white-ceramic frit to reduce glare and heat, while glazing below has a 50 percent frit. (Although the 50 percent frit doesn't help much with the sun, it maintains a uniform look for the glazing.) Workers say they get some glare on computer screens on sunny days, but they feel this is a reasonable trade-off for the glorious views, relates Sexton. Thanks to all the heavy equipment operating on the factory floor, heating this glass box is not a problem, even in winter. In fact, the building takes the heat generated by the plastics presses and circulates it to other parts of the facility.

Instead of the usual design-bid-build process, the client asked the architect to work with the contractor as a design-build venture. Krueck & Sexton had never worked this way and was initially wary. But Cervenka likes design-build because it leverages long-term relationships with suppliers, rather than relying on low bidders. "We've tried bidding out projects in the past and we weren't happy with the results," states Cervenka. "If you focus on quality rather than initial price, you find that long-terms costs are lower." In the end, the architects at Krueck & Sexton were won over as well. "We feared we'd get creamed and our voice wouldn't be heard," recalls Sexton. "But working with Boldt [Construction Company] was great. They were open to new ideas, and the process allowed construction concerns to be dealt with in the design process. Now we're looking for new opportunities to work with Boldt."

Mention factories and most people think of noisy buildings in industrial parks or aging boroughs of big cities. Phillips' custom molding facility is a different kind of place. By connecting the worker on the production line to views and spaces outdoors, the building makes real the idealized image of a machine in a garden. ■

Sources

Stone cladding: *Mankato Kasota Stone, Inc.*
Anodized aluminum curtain wall: *Curtainwall Systems*
Metal panel system: *Benchmark (Design Wall Series 2000)*
Clear low-E insulated glass: *Custom Glass Products*
Ceramic-frit low-E glass: *Goldray*
Cabinetwork: *DeLeers Woodworking*
Bleu gris honed stone floor tile: *Stone Design Inc.*
Carpeting: *Interface*
Office system furniture: *Knoll*

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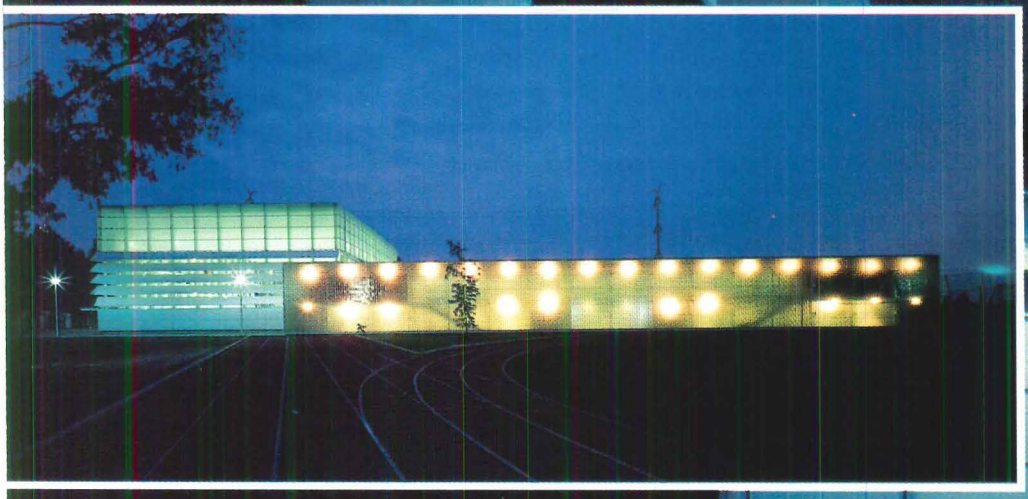
At night, the gym's clerestory is set aglow, and rhythmic lighting animates the glass-block-and-concrete building that houses changing, sauna, and weight rooms (inset). At the pool, low lights in the surrounding stone walls play against the lanternlike gym with its projecting aerobics room (this spread).



At the Educare school in Mexico, TEN **Arquitectos'** **NEW GYMNASIUM** opens and closes its fishlike gills in response to wind, heat, and rain

By Sarah Amelar

"The building's shell was envisioned like the scales of a fish or the feathers of a bird," says architect Enrique Norten of the Educare school gymnasium he designed. "Changing and reacting to weather conditions, the structure is like a live animal—it can really breathe."

The analogy to a living creature appears, at first glance, more abstract than literal. The gym is a pure and rational geometric solid: a simple gridded volume, clad in white enameled-steel panels rising to bands of translucent glazing. But the exterior, especially its opaque zones, is transformed as temperature, humidity, rainfall, and winds shift, prompting the facade's top-hinged, sensor-controlled panels to spring open. Sometimes, a few enameled panels lift barely a crack; other times, nearly every rectangle in the mid-registers swings upward, forming great, gaping parallel louvers.

Though sited in Guadalajara, Mexico, this permeable gymnasium requires no air conditioning, ushering in breezes even through the hottest stretches of summer. And during a typical day, sunlight filtering through the clerestory provides the sole source of illumination.

"This is sustainable architecture," says Norten, "but it's an intentional counterstatement to the 'sustainable' buildings around it." Indeed, the entire sports complex, designed by his firm, Mexico City-based TEN Arquitectos, is clearly a species distinct from its neighbors. Here, quaint reddish adobe structures—built only three years before the new gym—dominate the surrounding 18-acre campus of the kindergarten-to-college Educare school. A walled enclave, the cluster of buildings imitates traditional Mexican villages. In Norten's view, its romanticized imagery outweighs ecological features, offering what he dubs "nostalgic sustainability."

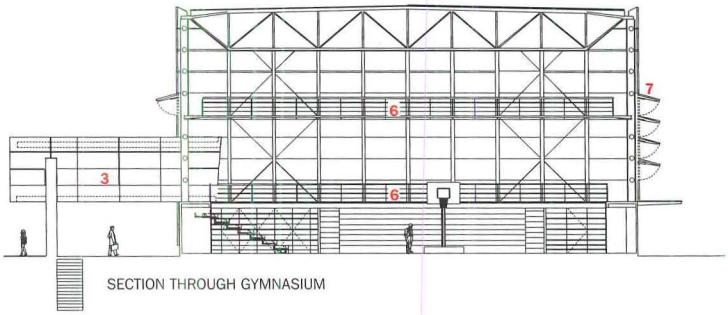
By contrast, his design—the "breathing" 12,000-square-foot gymnasium with an outdoor pool and a separate glassblock-and-concrete building with changing rooms—shuns earthy, homespun references. With a more hard-edged Modernism, typical of TEN's work, the athletic complex draws on the assets of climate and site conditions. Not only does the gym save energy by responding to weather, but its pool is a model of adaptive reuse—the reincarnation of an existing agricultural cistern.

The sports facility took Educare's campus design in a radical new direction—and, at the same time, presaged the greater architectural awakening of its client, Jorge Vergara, now 46. A legendary businessman, Vergara had launched his own meteoric rise from a vendor of fried pork to a nutritional-supplement magnate. (His company, Omnilife, caters to Mexican tastes by marketing vitamin-packed chewing gum, cola, and coffee, rather than less-appetizing pills and powders.) Hoping, he says, to

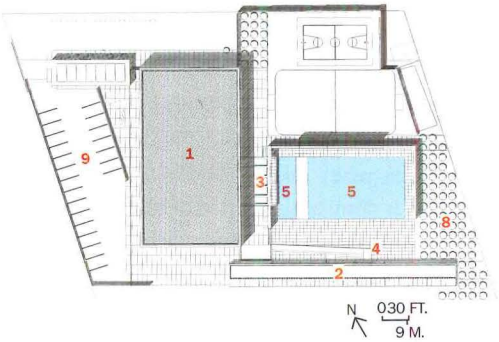
Project: *Sports Facilities, Educare School, Zapopan, Jalisco, Mexico*
Architect: *Ten Arquitectos—Enrique Norten, Hon. FAIA, and Bernardo Gómez-Pimienta, principals; Carlos López, Jorge Arvizu, Rubén Garnica, Hugo Sánchez, project team*
Engineer: *Colinas de Buen*
General contractor: *Corey Integra, Ing. José Ibarra*

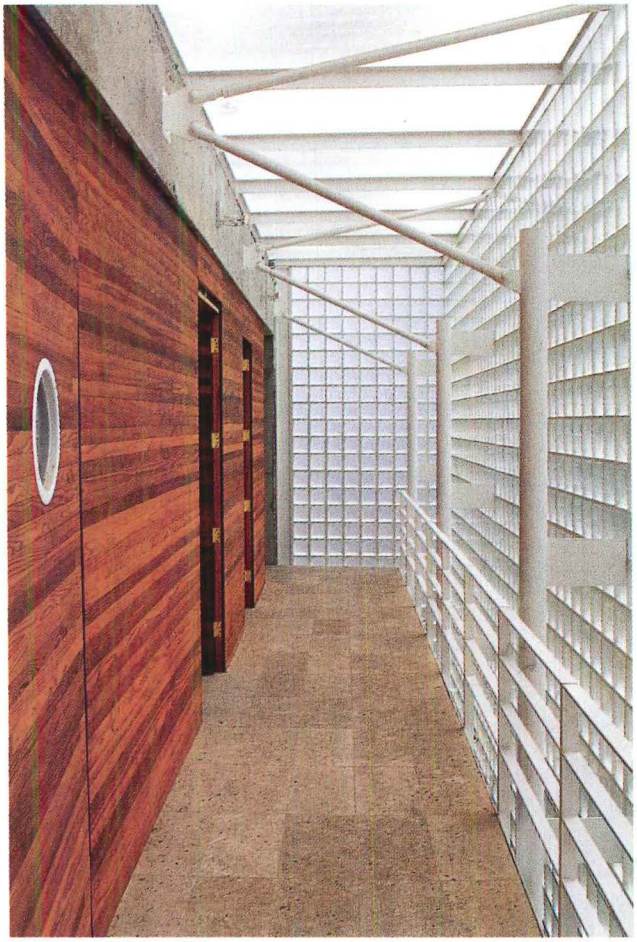
Approached from the south (opposite), the gymnasium and lower glassblock-and-concrete building conceal the courtyard. East of the gym, the court and swimming pool reveal themselves (above). The gym's facades open and close with changing weather (right).

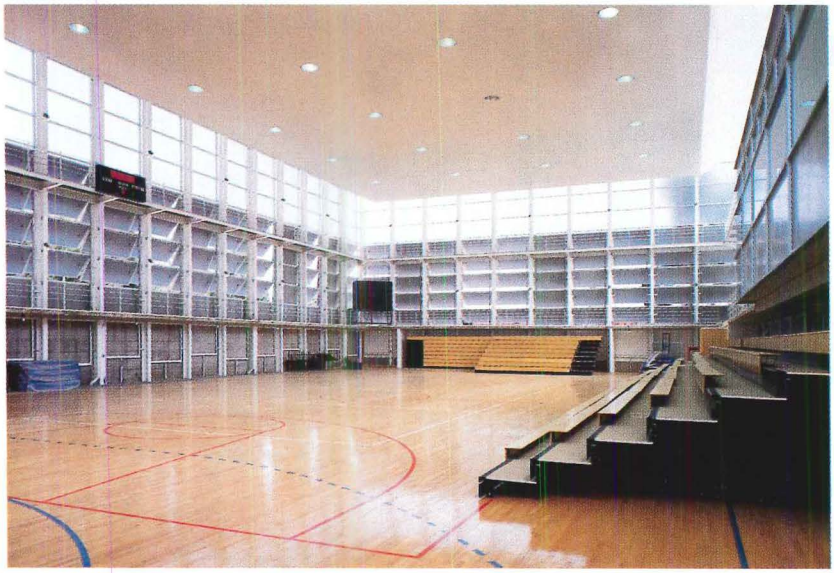
1. *Gymnasium*
2. *Dressing rooms*
3. *Aerobics*
4. *Ramp*
5. *Swimming pool*
6. *Catwalk: maintenance/lighting*
7. *Operable panels*
8. *Lemon grove*
9. *Parking*

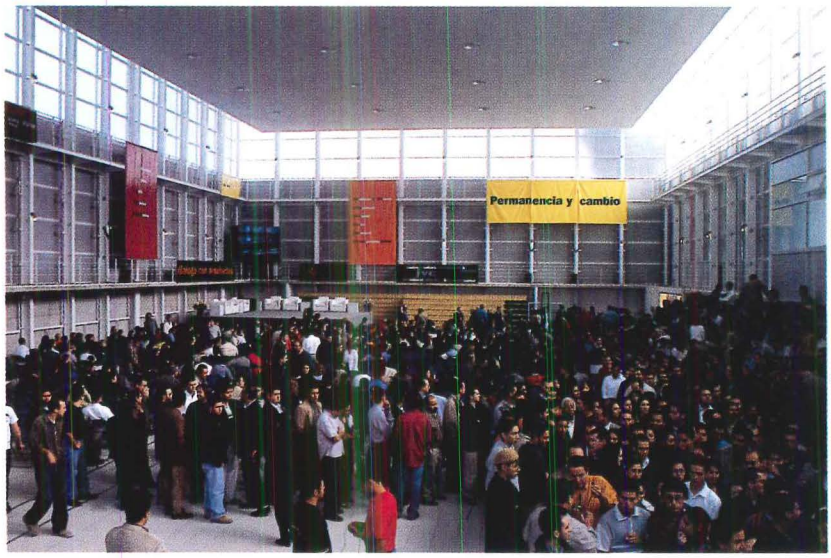


SECTION THROUGH GYMNASIUM









Just as the gym's skin changes, many components of the complex offer programmatic flexibility: Redwood-clad saunas (above) are suitable for a weekend health club, which may open at the facility. The gym (right) can be converted for ceremonies and other events.

spur improvement in Mexico's educational system, he ventured beyond Omnilife and founded Educare in 1996. A state-of-the-art private school, it emphasizes individual talents and growth.

As Vergara was establishing the school, he set out to erect a venue for his distributors' motivational meetings. But the scope of that project expanded—and with it, his enthusiasm for cutting-edge architecture. What began as a convention hall became—with guidance from TEN Arquitectos—Guadalajara's yet-unbuilt JVC Center, a compound with fair grounds, a hotel, entertainment complex, museum, stadium, and more by such star architects as Morphosis, Toyo Ito, Daniel Libeskind, Jean Nouvel, Zaha Hadid, and Coop Himmelblau (see "JVC Center" [JUNE 1999, page 120] and Record News [MARCH 2001, page 27]).

Accordingly, Educare's sports facility favors clean, simple forms, which TEN sited to articulate outdoor space. An 82-foot swimming pool occupies a courtyard defined by freestanding walls and pavers of creamy conchuela stone. On one side of the court stands the gym and, perpendicular to it, a lower horizontal building. These forms seem to slide past one another, never fully enclosing the court, allowing a continuous flow of space. A ramp against a wall of black volcanic rock runs along the court elevation of the lower building, which houses the sauna and weight rooms, along with locker areas. Its opposite face is an uninterrupted 190-foot-long wall of glass block, supported by a separate steel structure: Pulled back within the building, it joins the exterior wall at only a few key places. Straightforward in structure, the gym has steel I-columns supporting its roof, elevations, and interior maintenance catwalks. Its ceiling, hung from a light truss beneath the clerestory, doesn't meet the walls—achieving an ethereal, floating effect. From the exterior, the glassy clerestory allows the top of the gym's blocky form to dematerialize visually.

The complex's palette—silvery steel, blue-green glass, and creamy stone—is luminous though muted (except for the aqua pool, a color not selected by the architects). All the materials come from Mexico, including the conchuela, which has the smooth, pale golden quality of limestone but is laced with small seashell fossils that reduce slippery surfaces.

In season, the fragrance of lemon blossoms will drift over the pool and into the gym, making it an idyllic and luxuriant place to shoot baskets. The building really can breathe on its own (or alternatively, the panels have push-button controls to override the sensors). Of course, such a living creature would not thrive very far from balmy Mexico—a place where outdoor paths can often serve as well as indoor corridors. ■

Sources
Enameled steel: *Alpher*
Steel structure: *Corey*
Showerheads: *Helvex*

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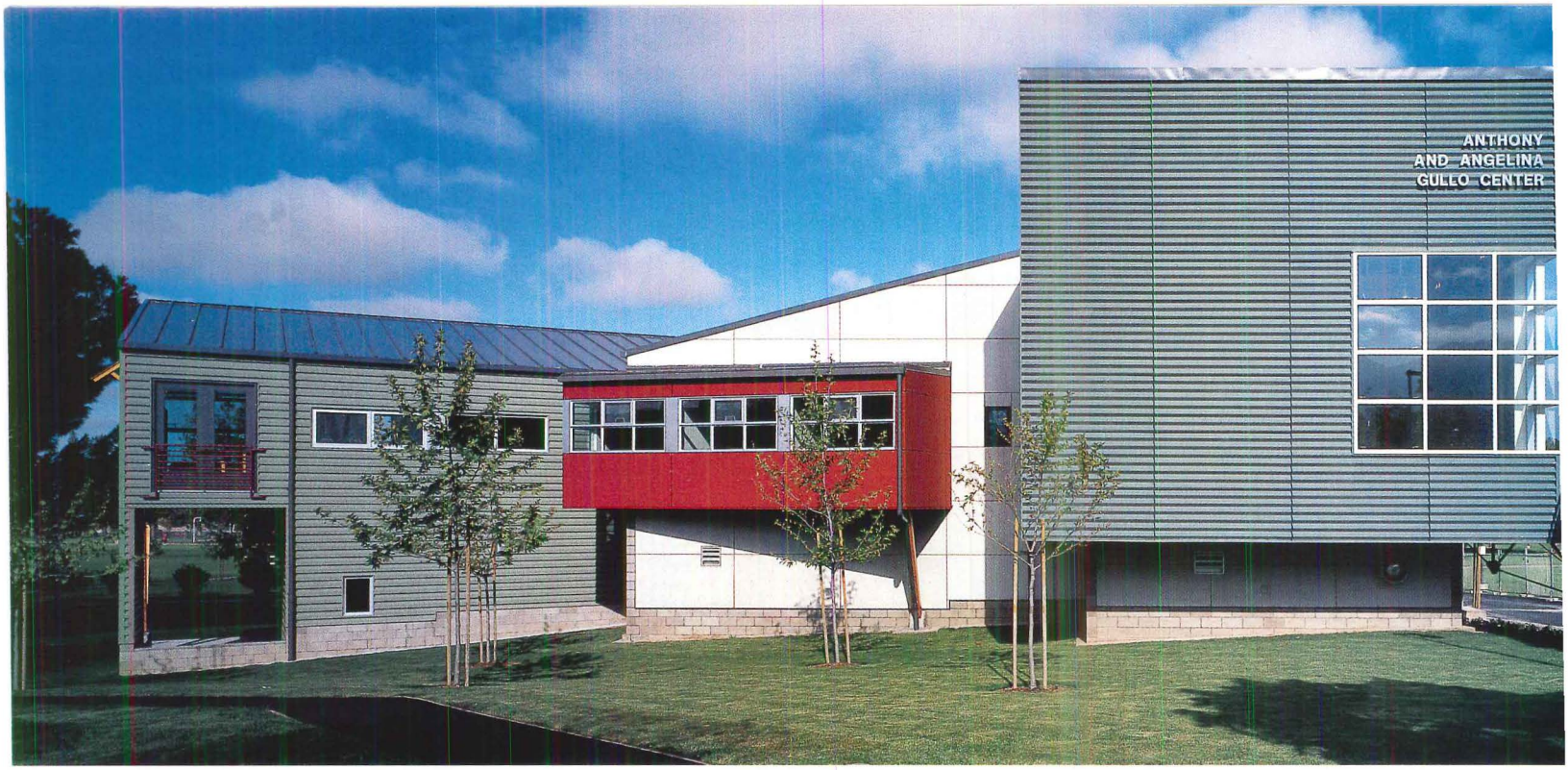
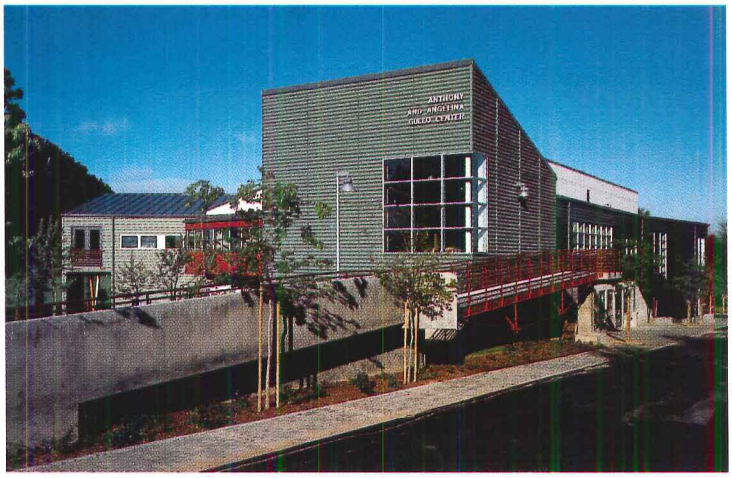
Inside the luminous glassblock-and-concrete building, its supporting steel structure is separate from the exterior wall, meeting it in key places.



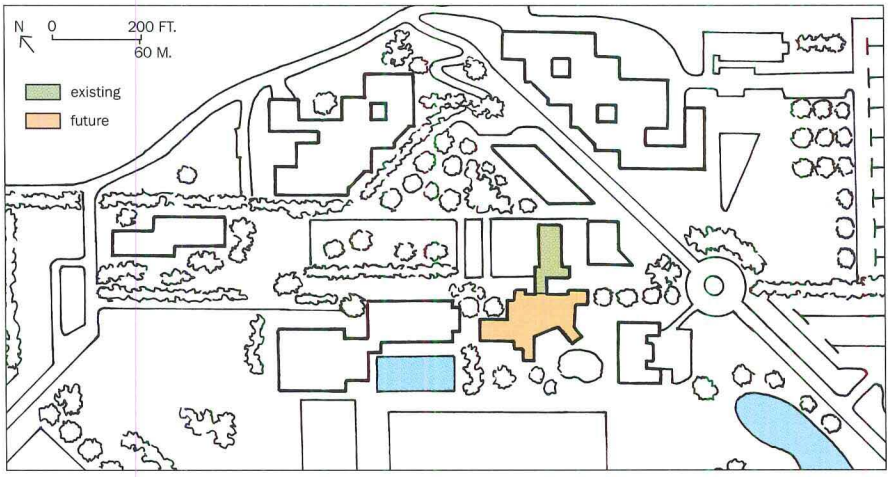
The centrally located student center creates a sense of destination and arrival with its long entrance ramp (opposite), its colorful forms, and its outdoor rooms, such as a dining patio (bottom).

Fernau & Hartman helps heal the architectural wounds of a previous era with a new STUDENT CENTER at Evergreen Valley College



By Clifford A. Pearson

Surrounded by bunkerlike buildings from the early 1970s, the new Gullo Student Center at Evergreen Valley College reaches out in every direction, playing the part of the gregarious new kid intent on enlivening a class of aging slackers. It's a tough act to pull off, considering the campus' relentless march of concrete structures painted dull pink and the ill-defined outdoor spaces that seem to just loiter between buildings. Although it occasionally tries too hard to please, the student center takes an important step in transforming a bland commuter school into a place that engages students, faculty, and visitors.



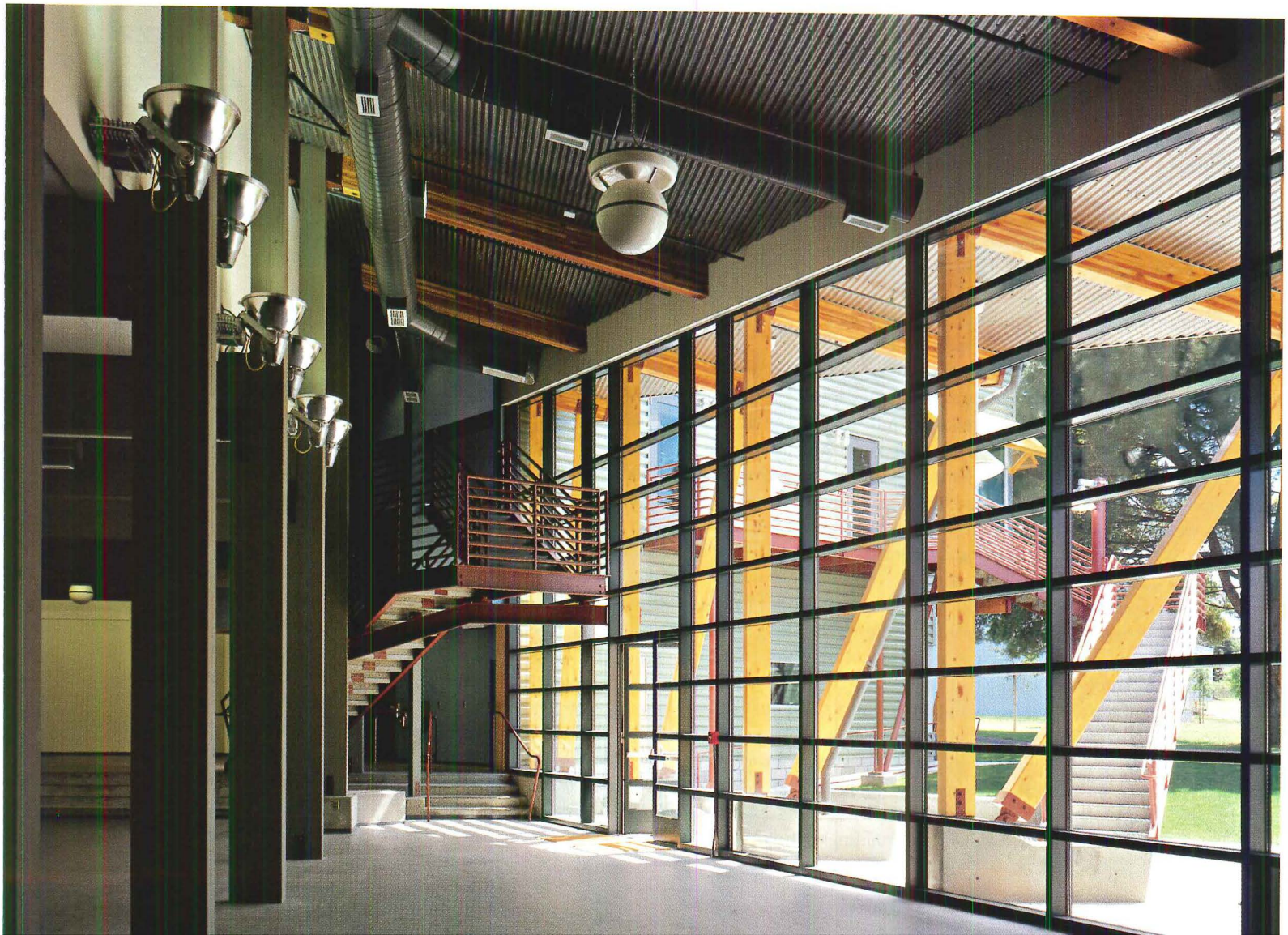
The project began with a new master plan for the community college in 1993, prepared by Fernau & Hartman Architects, the Berkeley-based firm that had earned strong reviews for its student center at the University of California, Santa Cruz, in 1989. The master plan, which was revised by Fernau & Hartman in 1995, envisioned a series of new buildings and set out five guiding principles for future construction. These guiding strategies called for each new building to "express its program and allow the activities within to contribute to the liveliness of the street," to act as stewards of the landscape by revealing the best aspects of the school's site, to contribute at least one distinct outdoor room or space to the campus, to help repair the design mistakes of the past, and to encourage a sense of destination, arrival, and orientation. "We believe that each new building should do more than one thing well and ideally should address to some degree all of the guiding ideas," says Richard Fernau, FAIA, one of the two principals in charge of the project (along with Laura Hartman).

A two-year community college with close to 12,000 students—the majority of whom are Asian or Hispanic—Evergreen had long needed a building that could serve as a physical and social hub for the campus. The new student center does exactly that. "We wanted something different from the rest of the campus, something that would stand out," states Richard Baiardo, the college counselor and a member of the facilities committee that oversaw the project. "We figured this might be the one place we could make an architectural statement," adds Baiardo.

In California, student centers are paid for by student fees, not by general university funds. As a result, these buildings are "the poor stepchildren of the university system," explains Fernau. But when a wealthy benefactor died and left several million dollars to Evergreen, the student center project acquired enough funding to become a significant building on campus. (The building was eventually constructed for $5.9 million and opened this spring.) "There weren't many places for students to gather," says Baiardo. "We wanted something interesting to keep stu-

Project: *Gullo Student Center, Evergreen Valley College, San Jose, Calif.*
Architect: *Fernau & Hartman Architects—Richard Fernau, FAIA, Laura Hartman, partners-in-charge; David Kau, project architect; Tom Powers, Sunshine Chen, Keith Dubinsky, Ariel Dunkel, Sean Gilmore, Thomas Hashberger, Randy Hellstern, Geoff Holton, Henry Kitchell, Alice Lin, Mark Macy, Alexis Masnik, Don Najita, Mary Lynn Radych, Ramon Ramirez, Aaron Thornton, Mathew Tierney, team*
Engineers: *Tipping-Mar + Associates (structural); William Mah (mechanical); O'Mahoney and Myer (electrical); Underwood and Rosenbloom (civil)*
Consultants: *Ron Lutsko Associates (landscape); BEC Associates (energy); Charles Ramm (food services)*
General contractor: *Arntz Builders*

Although just 30,000 square feet, the building feels bigger thanks to a few double-height spaces such as the dining hall (below) and the west lobby (opposite). A 25-foot-tall glass wall in the dining hall and a south-facing patio (left) connect interior spaces to the outdoors and stretch their apparent size.

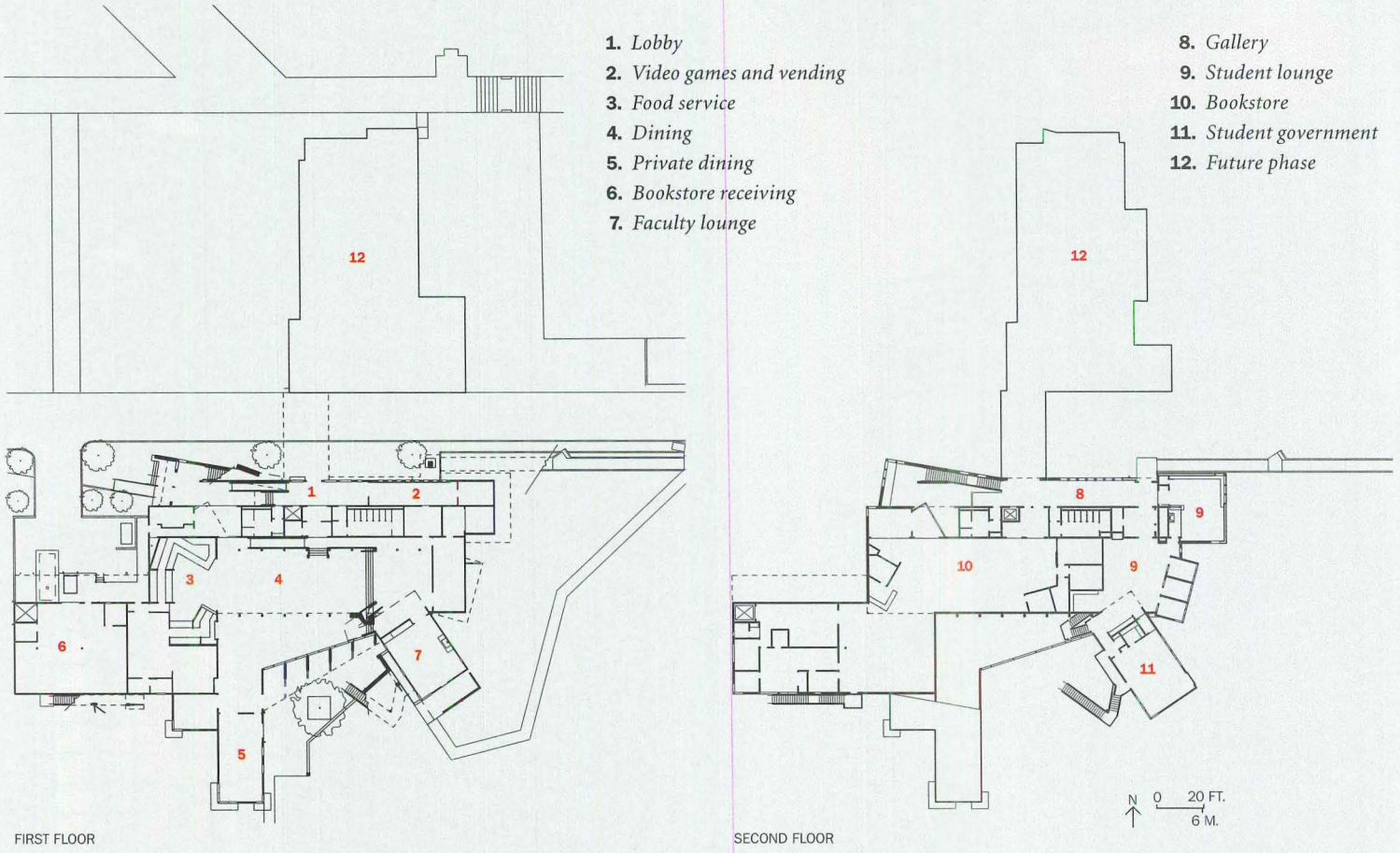


dents on campus. We didn't want to be just a commuter school where people take classes, then leave."

Finding the right spot to build the student center was the architects' first task. They originally selected a site at the northern apex of the campus so the building could serve as a prominent gateway. But they discovered a seismic fault line running through that site and shifted the project to a location closer to the center of the school. Fernau says this turned out to be a good move, allowing the building to have a greater impact as a piece of connective tissue for the campus. It also positions the building to define a key corner of the school's Central Green and to make this outdoor space a more active place. A second phase of the project, which is still on the boards, will be built on the other side of a service road and connected to the first phase by an enclosed bridge. This addition, which will feature a cafe, student offices, and a multipurpose room, will further activate the Central Green and include an outdoor amphitheater on its east side.

One of the challenges of student centers, explains Fernau, is the tendency to pack too many programmatic elements into one building. Every student group and service provider wants to be included in the project, especially at a school such as Evergreen, where extracurricular facilities had long been shortchanged. "We worked with the client to keep the program well defined," says Fernau. "Otherwise it becomes impossible to accommodate everything and give the building a clear identity. At some schools, the student center becomes just a generic container for too many activities."

The major tenants of the building—including the campus bookstore, dining services, and student government—all wanted to be on the main floor and have their own presence. Instead of trying to squeeze all of these components onto one level, Fernau & Hartman designed a building with two main floors and two main entrances. A long entry ramp on the east end of the building serves as an important identifying element while bringing people up to the second floor and the bookstore. At the west end, a two-story space welcomes visitors and leads them to the dining hall. As they shaped the building, the architects organized its various functions into three basic elements: the "worm," which runs along the north edge and serves as the main circulation spine; the "wedge," which is a great sloped-roof hall for dining; and the "wing," which is the phase-two structure on the other side of the service road.



The student center has a lot of perimeter, so it can provide exposure for more of its components, explains Fernau. The roof pops up and windows project out to give visibility to the bookstore, the dining hall, the student government offices, and the student lounge. Such articulation contrasts with Evergreen's original buildings, which hide their functions behind deep arcades and uniform concrete walls.

"We envisioned the student center as a set of background and foreground pieces," says Fernau. To this end, the architects specified beige-colored cement fiberboard to serve as a backdrop for projecting volumes clad in green or burnt-orange metal siding and accented with red metal railings, yellow perforated-metal sunshades, and stained glued-laminated timber. The same palette of materials and colors runs through the building's interiors.

The building is a steel-and-laminated-wood structure with wood shear walls on the perimeter and three steel braced frames inside. (Braced frames have members assembled in triangles.) The roof itself, a seismic collector, brings forces to the braced frames. Rather than hiding such structural gymnastics behind drywall or hung ceilings, the architects exposed them, painted the metal members red, and used them as sculptural elements to animate interior spaces.

The 30,000-square-foot building packs a lot into limited space by using certain rooms for double duty. For example, the second-floor hallway also serves as an art gallery, and the dining hall can host student fashion shows in which models saunter down an open metal stairway. (The school has a well-regarded department of fashion design.) Fernau & Hartman also made the building feel bigger by framing views of nearby athletic fields and the Central Green and by extending spaces such as the dining hall with outdoor rooms.

The architects approached the Gullo Student Center as the intersection of various forms and elements expressed on both the exterior and interior. Indeed, bringing things together is what this building is all about: It creates a place for students and faculty to relax and establishes a sorely needed social hub for a changing institution. While the combination of materials and colors occasionally seems hyperactive, the building brings an outgoing personality to a campus better known for its phlegmatic design. Most important, it is an engaging center of gravity for a school that once seemed as rootless as a crush of commuters. ■

Sources
Curtain wall: *Kawneer*
Metal siding: *Tomen Building Components*
Cement panels: *Eternit*
Built-up roofing: *Johns Manville*
Elastomeric roofing: *Grace*
Metal roofing: *A.E.P. Span*
Skylights: *O'Keefe's*
Metal doors: *Stiles*
Cabinetwork: *Northwestern Design*
Paints and stains: *Dunn-Edwards*
Paneling: *Medite*
Plastic laminates: *Nevamar*
Floor/wall tiles: *Dal-Tile*

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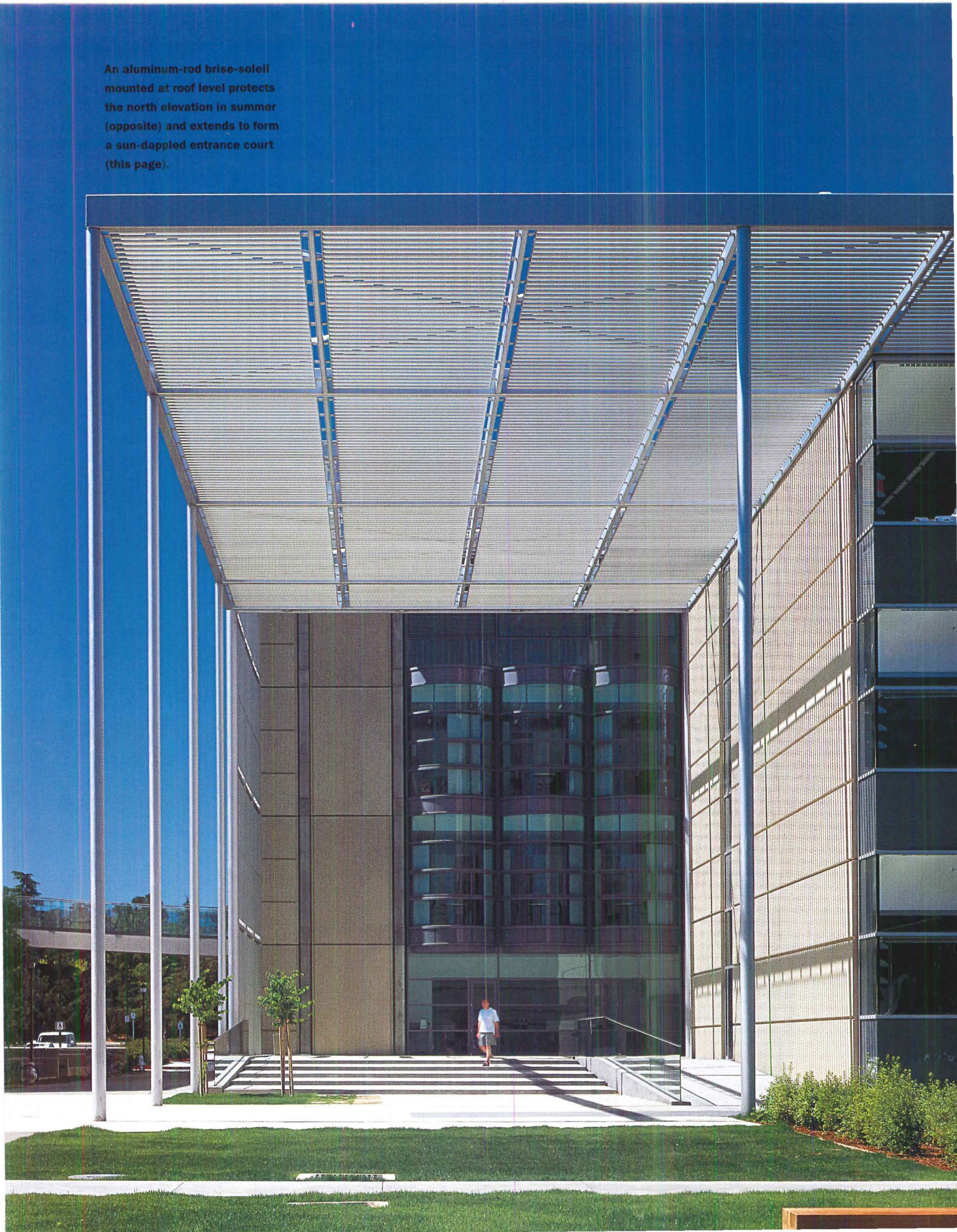
On both the inside and out, the architecture expresses the intersection of forms and materials. On the second floor, a sitting area (right) is tucked off the main spine, and the student government room (below right) projects out to the landscape. Glulam beams work with corrugated metal and painted drywall to create a warm palette of materials (below left).

An aluminum-rod brise-soleil mounted at roof level protects the north elevation in summer (opposite) and extends to form a sun-dappled entrance court (this page).



Solar protection in Norman **Foster's** hands creates an elegant gathering place for scientists at **STANFORD** University's new Center for Clinical Sciences

By Lisa Findley

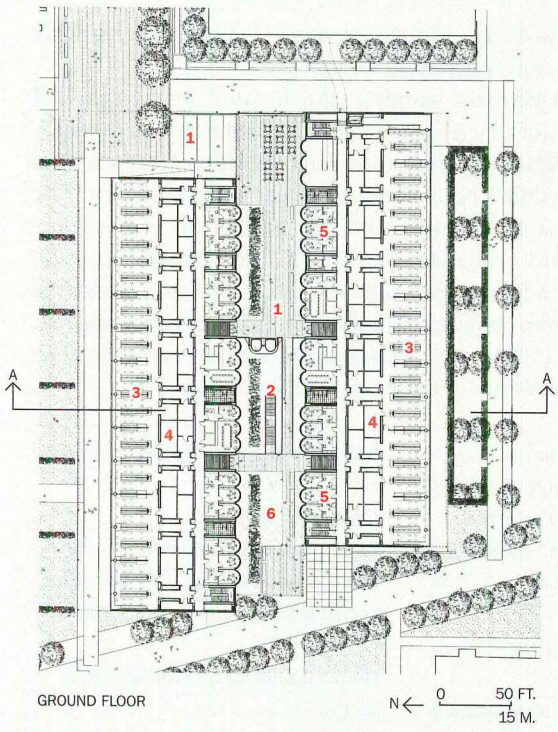
Though it is admirable, the current trend of universities across the country commissioning big-name architects to design their buildings is fraught with difficulty. At institutions like MIT, the University of Cincinnati, and Princeton, internationally known architects are struggling to do significant buildings within highly constrained campus plans, design guidelines often based on strong, sentimental attachments to the original architecture, and marginal budgets. For the recently completed 220,000-square-foot Center for Clinical Sciences Research at Stanford University, in Palo Alto, Calif., Foster and Partners of London, with San Francisco–based Fong & Chan, has successfully negotiated these pitfalls with a design that is simultaneously contextual and challenging. The building is one of several projects that Stanford has commissioned in recent years in an effort to bring high-quality architecture to the school, while extending and clarifying the existing fabric of the campus. Spearheaded by university architect David Neuman, FAIA, Stanford's program has resulted in noteworthy buildings by Antoine Predock Architect, Pei Cobb Freed, Polshek Partnership, Ricardo Legorreta, and Robert A.M. Stern, among others.

For technophile architects like England's Lord Foster, the strong Spanish Colonial architecture that forms the historical core of the campus was one of the demanding aspects of designing a new building at Stanford. Built in 1887–1906 and designed and planned by Shepley, Rutan and Coolidge and Frederick Law Olmsted, the campus has arched colonnades, sloping red tile roofs, courtyards, and sandy-colored walls with punched windows defining a palette that many in the university community consider its true identity. Fortunately for Foster and his building for cancer research, the site was adjacent to the Medical Center, a massive, three-story courtyard complex of 1,240,000 square feet that Edward Durell Stone had executed in 1959. With its patterned concrete block and flat roof, the design was more reminiscent of Frank Lloyd Wright's textile block architecture than it was of the historic core. Now Stone's building, located on the edge of the campus, forms a link between the old architecture and Lord Foster's decidedly Modernist vocabulary of concrete, glass, and steel.

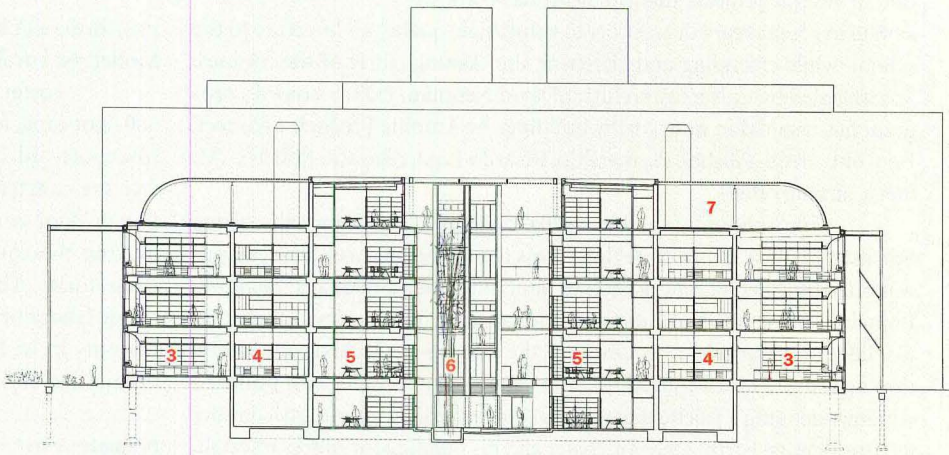
Foster and Partners' winning scheme called for two parallel 300-foot-long, four-story-high bars, slightly offset and separated by a narrow courtyard. In the two buildings, three floors of offices for researchers face the courtyard, while laboratories are placed on the periphery. The fourth floor contains administrative offices and meeting rooms overlooking the courtyard, with large mechanical decks placed above the laboratories. This straightforward solution, which brings to mind the classic laboratory layout designed by Louis Kahn for Jonas Salk at the Salk Institute in La Jolla (1959–1967), is elaborated in response to the solar orientation and relationship of the facility to the campus.

Contributing editor Lisa Findley writes about architecture and design and teaches at the California College of Arts and Crafts.

Project: *Center for Clinical Sciences Research, Stanford University, Calif.*
Architect: *Foster and Partners—Norman Foster, David Nelson, Nigel Dancey, Chris West, Tom Leslie, Steve Best, project team*
Associate architect: *Fong & Chan Architects*
Owner: *Stanford School of Medicine*
Interior designer: *Research Facilities Design*
Engineer: *Arup*
Consultant: *Peter Walker & Partners (landscape), Claude Engle Associates (lighting), Walsh-Norris & Associates (acoustical)*
General contractor: *Rudolph and Sletten*

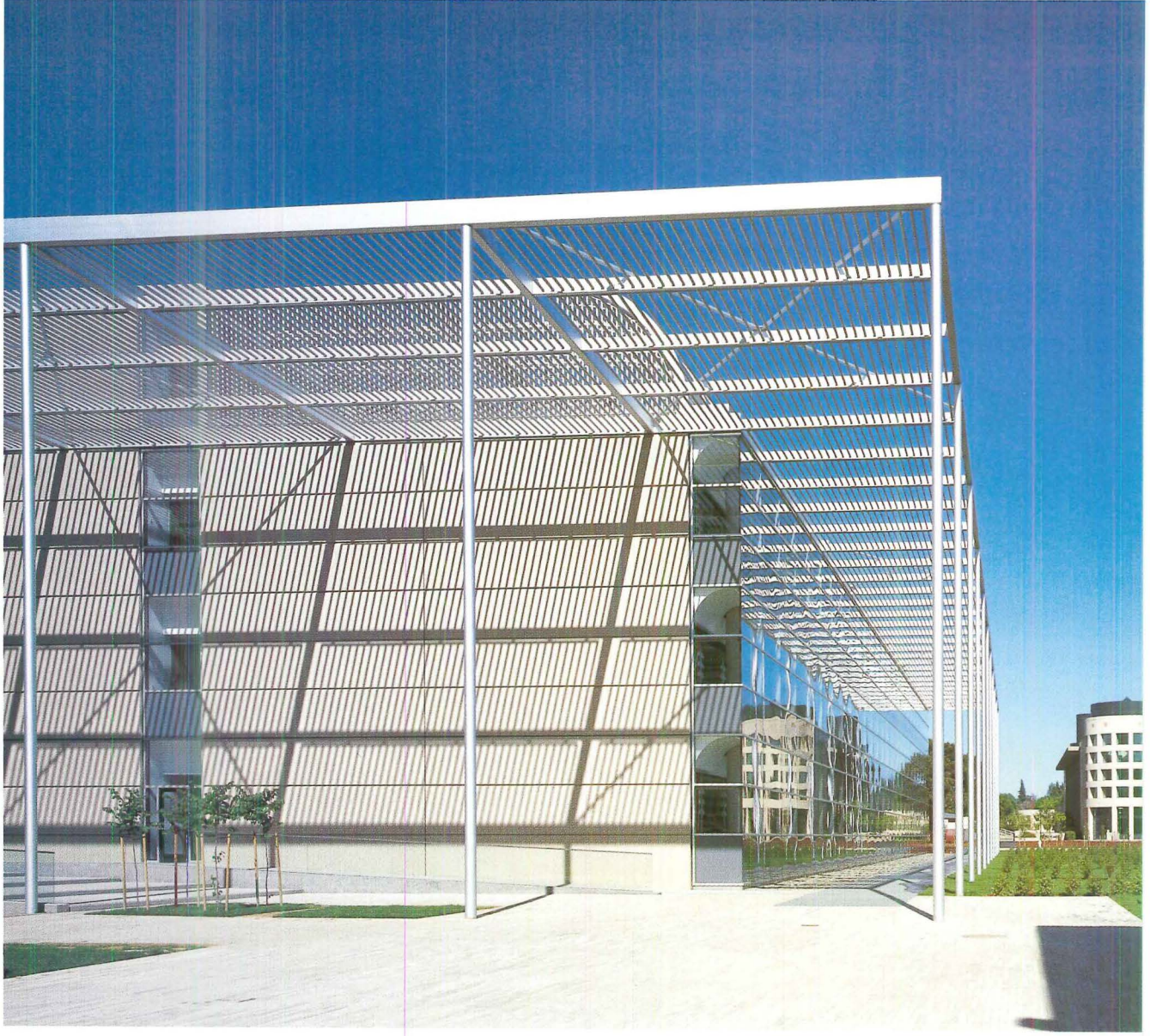


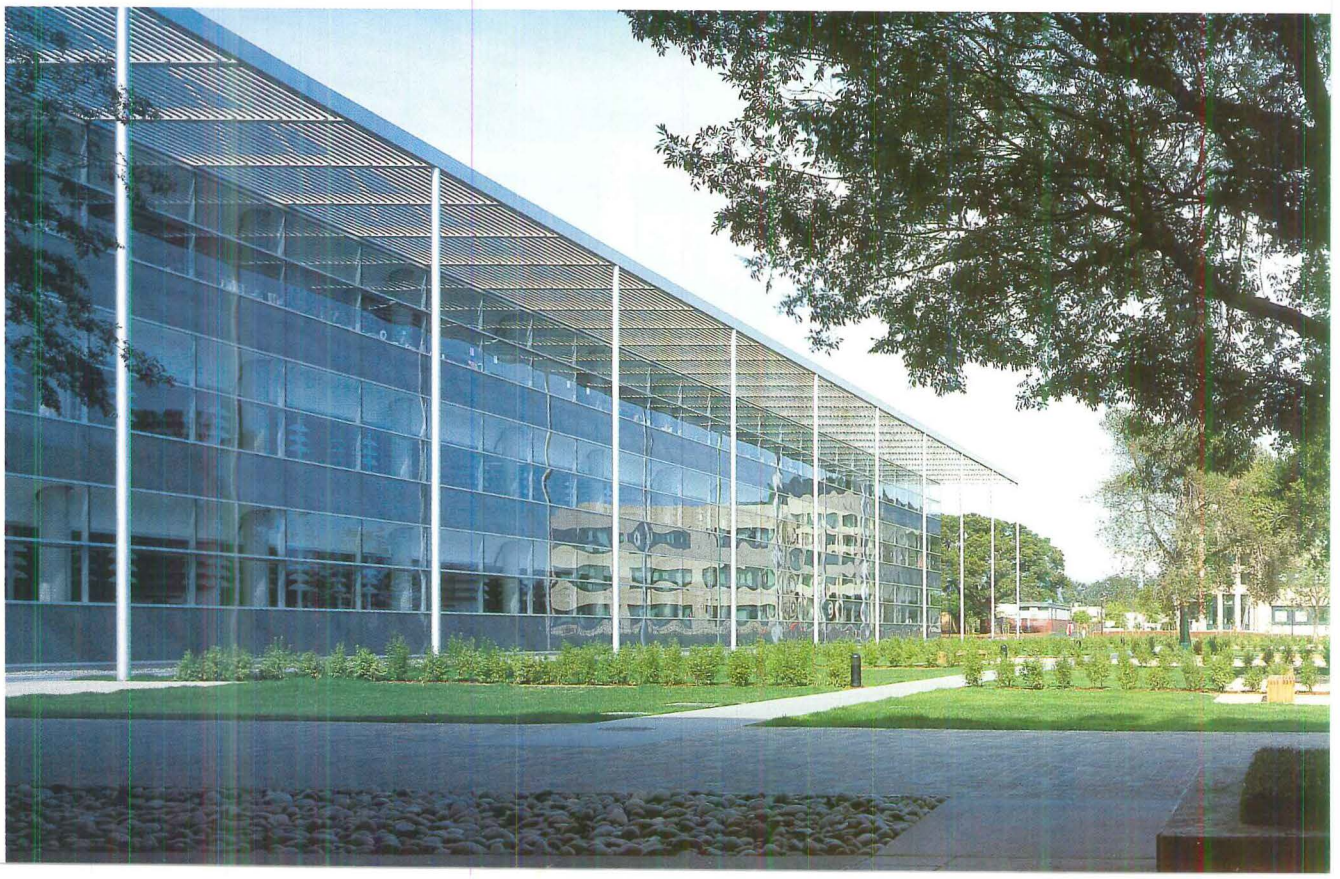
GROUND FLOOR



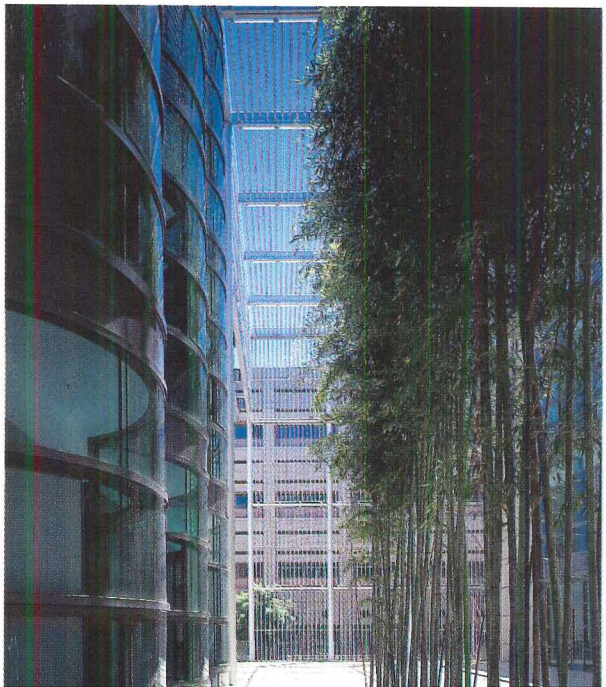
SECTION A-A

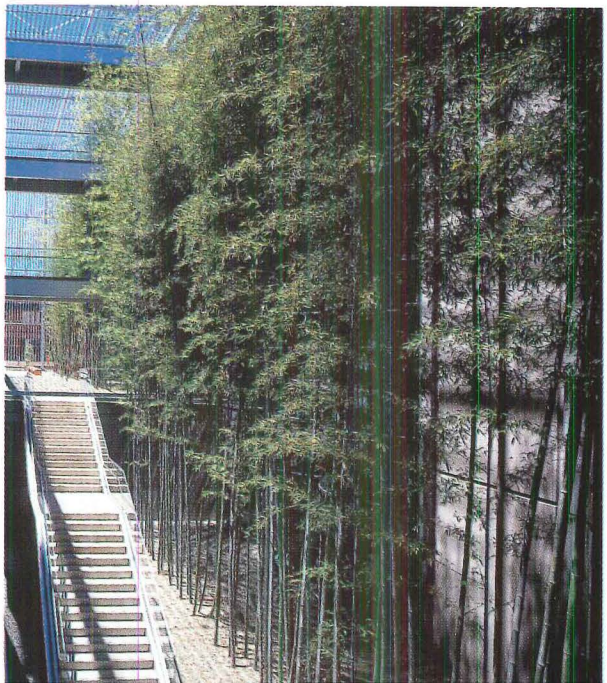
1. *Entrance*
2. *Stair to lower courtyard*
3. *Labs*
4. *Lab support*
5. *Offices*
6. *Courtyard*
7. *Mechanical penthouse*





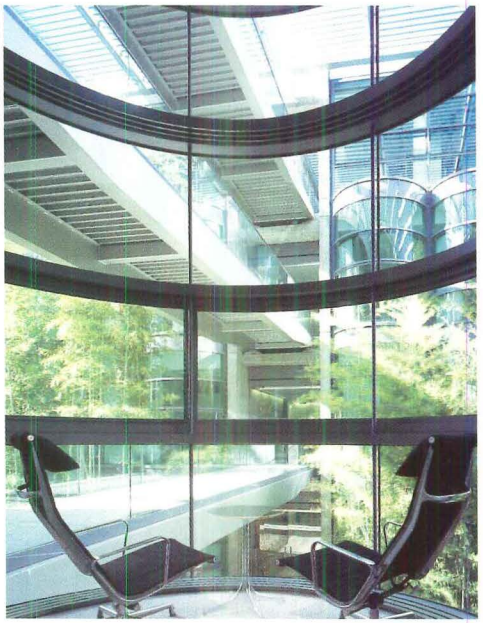
The economy of the two boxlike lab wings—clad in straightforward precast panels and glass-and-metal curtain walls—is disguised by the elegant treatment of the external sun-protection devices. Labs (plan) are protected by the high north-facing trellis (right) and the canted fabric panels that deflect low winter light from the south elevation (opposite).

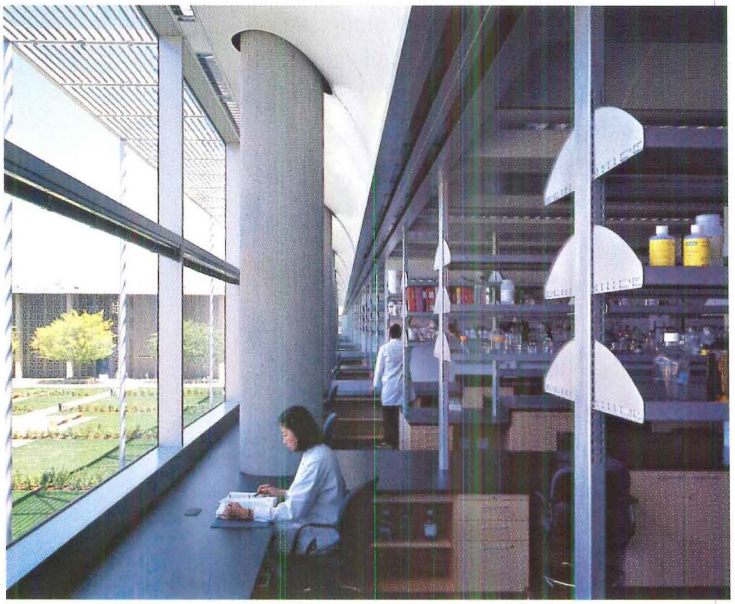




Foster's high aluminum-tube trellis modulates the powerful light and occasional heat, allowing the courtyard that separates the Clinical Research Building's two wings to become an unusually inviting extension of the interior. The elevator core is actually a glazed framework attached to connecting bridges (opposite). Landscape architect Peter Walker's lush stands of bamboo echo the texture of the trellis.

Semicircular extensions of faculty offices open to the courtyard (right and opposite). Sections of the window are operable, minimizing the need for air conditioning. Labs (below) are conventional, with fume hoods and other mechanically intensive activities pushed toward the inner wall. The curved ceiling at the window edge diffuses light dappled by the external protections.





The long, glass curtain walls of the external north and south exposures provide daylight and views for the state-of-the-art laboratories. The south wall, facing a parking lot and vulnerable to intense sun, is shaded by a set of horizontal, lightweight perforated steel sails that will be removed if and when the parking lot is filled with another building.

The north facade faces the campus. Along this edge, a colonnade of thin, three-story-high steel columns, holding up a horizontal, tubular, aluminum lattice, creates a remarkable porch for a garden designed by landscape architect Peter Walker, whose design in turn takes into account the rhythms of the Foster building. The tubular steel lattice continues up and extends over the mechanical deck, enclosing the top and ends of the courtyard and generating striated patterns of light and shadow.

The glazed courtyard walls read as bundled, semicircular vertical shafts: Repeated over four floors, these glass drums give a sense of scale to the otherwise elongated courtyard edges. The rhythm of the bays is further reinforced by the vertical thrust of tall bamboo trees that rise up through the long courtyard space. Inside, the semicircular bays offer each researcher a small conference area jutting into the courtyard, affording privacy and control of air through sliding fabric screens and operable windows .

The courtyard parti, which Kahn made famous for laboratory buildings, was intended to facilitate interaction and exchange between scientists who tend to isolate themselves in their labs. At Kahn's Salk Institute, the courtyard is formal, empty, and austere, urging the eye (and mind) out to the horizon of the Pacific. In stark contrast to this man-made desert, with its infinite horizon, Foster has created a jungle at Stanford, characterized by filtered light, intense texture, and restricted vision.This visual density and activity is appropriate for a university building where, unlike the Salk, students come and go to seminars and anatomy classes, work in labs, and enjoy coffee in the garden.

Foster and his associated architects have created a structure that both fits in with the context and stands out from it. Programmatically, it is a background building, one of the many big laboratory and classroom facilities that define any university science complex. It politely fits into the campus plan by reinforcing walkways, helping to define the edges of open spaces, and continuing a pattern of welcoming courtyards. It responds to the warm, buff-toned palette of the existing buildings, and the tubular aluminum lattice canopy adds a texture at the top that abstracts, perhaps a bit awkwardly, the red roof tiles of the old campus.

Materially, the Center for Clinical Studies is a radical and refreshing departure from much of the campus architecture and also a welcome relief from the constrained architecture of many of the other newer projects. Foster's unabashed love of high-tech materials is only slightly dampened by the concrete end panels. These minimal compromises allow Foster to endow Stanford with a vision of where it might go with its ambitious building program, if it is brave enough to continue to break with the rigid definitions of contextualism. The university's support of this stance represents the visionary leadership one would expect from a top university. ■

Sources

Exposed steelwork: *Bostram & Bergun*
Architectural glass and aluminum: *Wausau Metals*
Concrete: *Precast by Clark Pacific*
Acoustical ceiling: *Ireland Ceilings, Pinnacle Ceiling Systems*
Resilient flooring: *Armstrong Medintech*
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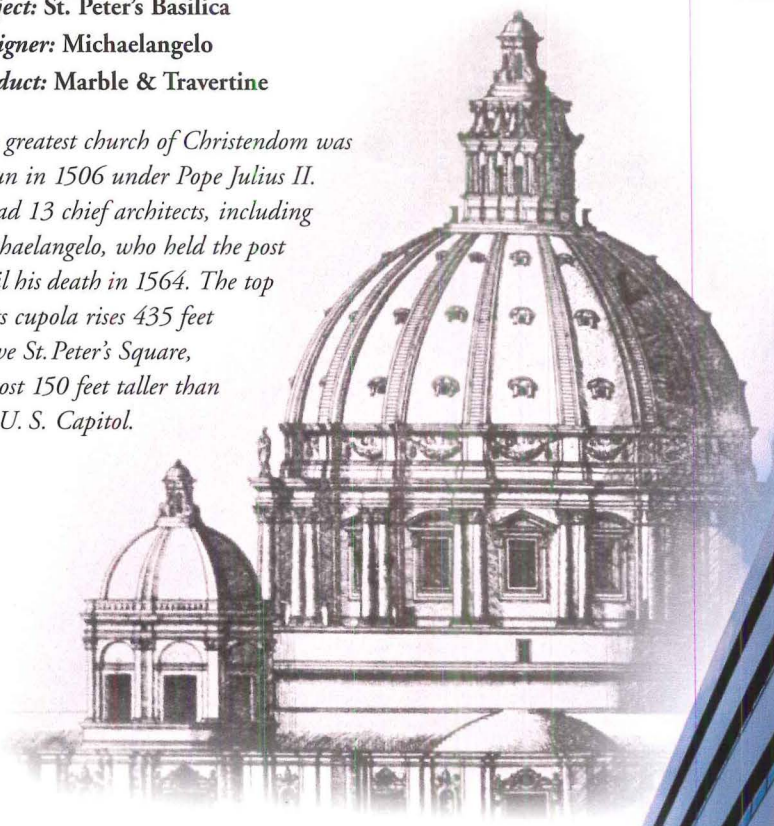

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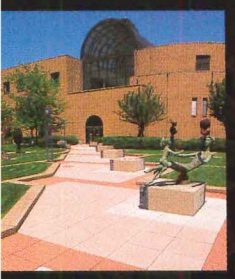

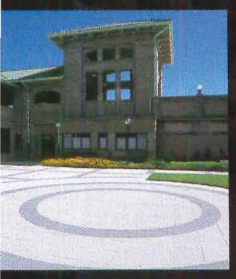

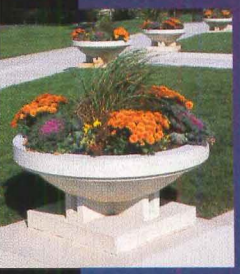

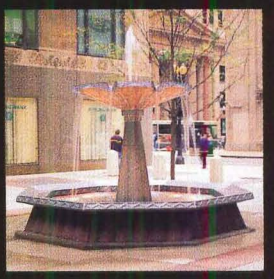

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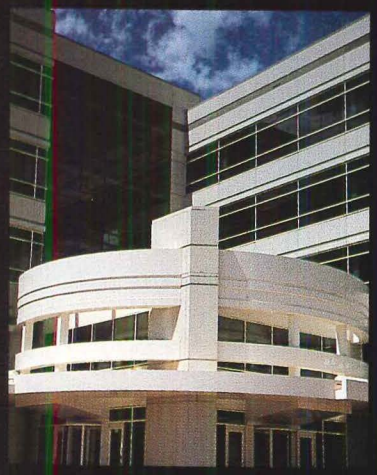
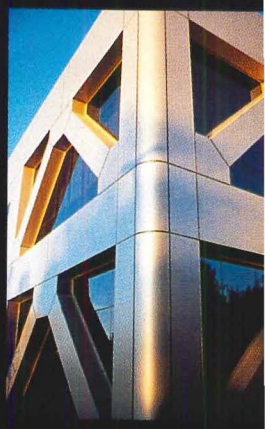


A Panel Discussion



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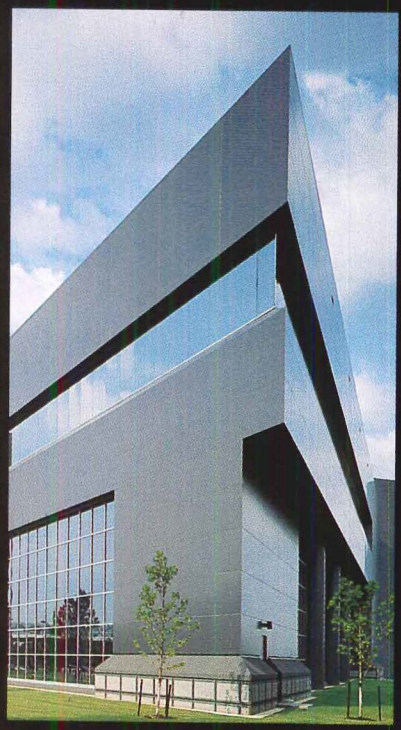

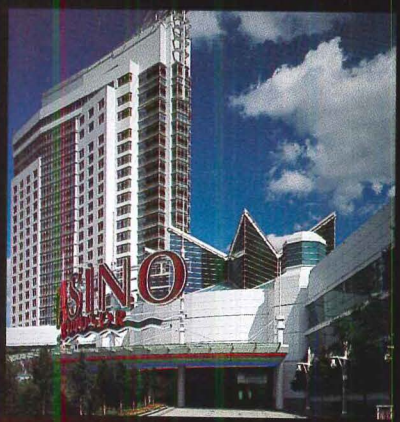

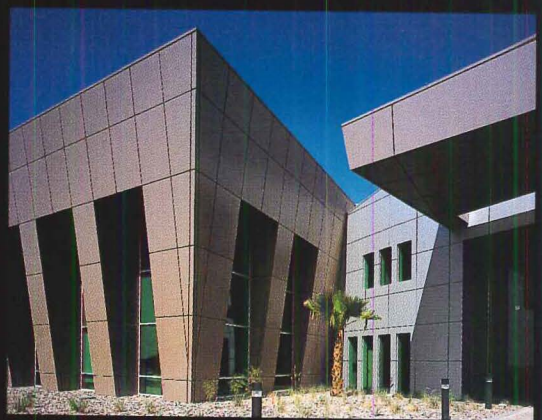

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Where To Now?

THE BURSTING OF THE DOT-COM BUBBLE MAY ACTUALLY HAVE MADE BUSINESS OWNERS MORE AWARE OF DESIGN'S PRODUCTIVE POTENTIAL.

1.

Nottingham, England

DEGW helped Boots the Chemist redesign its corporate culture along with its headquarters.

2.

Chicago

Valerio Dewalt Train choreographed a ballet of calibrated planes and shimmering translucency in the design of its own offices.

3.

New York City

Specht Harpman built a fluid space tuned to the vagaries of a company that bet on growth.

4.

Emeryville, California

Kava Massih preserved an old factory's airy grandeur and gave a growing software company the space it craved.

www

For additional offices and more information on the people and products involved in the following projects, go to Building Types Study at **www.architecturalrecord.com**

By James S. Russell, AIA

With his London-based firm, DEGW, Frank Duffy has for years promoted the value of design as innate to the expression of corporate identity in an era of perpetual change. Has a chillier business climate and a dot-com implosion cooled his ardor? Not at all, as RECORD'S *James S. Russell found in a recent interview.*

ARCHITECTURAL RECORD: *How does business relate to design now?*

FRANK DUFFY: The big discovery we've made in the last two to three years is that the design process itself is an amazing opportunity for a business to reinvent its culture. The expressive component of architecture can be used as a medium of communication—one that makes the intentions of the business powerful and ever-present. It's one thing to say that a company seeks organizational transparency, that it likes to be egalitarian. It's quite another when you use the language of architecture to say it. Then, design becomes absolutely central to the business.

AR: *Can you update a distinction between the North American approach and that in northern Europe that you described in your book,* The New Office *(London: Conran Octopus, 1997)?*

FD: America's capacity to homogenize and do things simply and cheaply at a very large scale is one of the nation's virtues. But when people stop thinking about what buildings are, rubbish gets turned out. There's a photo essay in the *On the Job* exhibition [at the National Building Museum, in Washington, through August, see RECORD, March 2001, page 59] that shows an endless line of bleak, gas-guzzling office buildings along the corridor to Dulles airport. This is what has ended the century that began with Frank Lloyd Wright's Larkin Building. Why aren't people angry about this? Even in the U.K., there is deep in the culture an understanding that buildings are an important part of life and bear a relationship to how people want to be and what they want to do.

AR: *What do you think accounts for the difference in the way architecture is valued here versus in Europe?*

FD: I come from an old country with more stable institutions. But they've been shaken again and again by a series of frights over the last 50 years or so. So there is a real urgency to the idea of reinventing the physical fabric to achieve cultural change. When countries hand state enterprises to the private sector to increase efficiency, for example, that actually shocks the government departments into rethinking their culture. We're doing the space planning and change management for Whitehall, which is being rebuilt by Norman Foster from its Victorian

structure out. We're helping the Department of State use the shock of the move to reinvent itself as one of the most important organs of the State. Other clients, like the BBC, are insecure and frightened enough to want to use the rare and expensive experience of building and rebuilding as part of their reinvention. In America, there's an overconfidence, a sense that nothing can scare us, so we don't have to change anything. But no one can afford to waste human talent, or let the weight of the past impede an organization's promise.

AR: *For all the technical innovation in Europe, I see pretty rigidly laid-out private offices in most "advanced" buildings. Aren't American designers more innovative in the variety and richness of interior layouts?*

FD: There is less creative thought in Europe on that level. The private offices are a legacy of powerful workers councils in Europe, and they're required by law. The regulatory process has stopped people thinking, too. People cannot interact when they are laid out in this formulaic way. The best such projects use internal streets, garden atriums or courts to weave together the idea of shared space with the idea of a comfortable, energy-efficient office environment.

AR: *Why do you think some of the Wall Street darlings—the companies that in a sense have defined America's newly energized business enterprise—use design in such an unadventurous way? I'm thinking of Microsoft, Oracle, Cisco. These are companies that sell innovation but don't innovate when they build facilities.*

FD: I call it the Silicon Valley mystery. The most inventive and entrepreneurial companies build the dumbest buildings with Dilbertville interiors. I think it happened because a particular set of closed, formulaic attitudes got fixed in place. Instead of thinking about and defending the users, the developers, architects, manufacturers of building systems and furniture, the facilities managers and corporate real-estate managers have become just another part of a supply chain. They're cornered and marginalized. There's no communication with users in the process.

AR: *If these companies are so successful, who is to say they need a higher level of design?*

FD: It's very troubling, this presumed correlation between success and ghastly environments. These are barren, lobotomized places. I don't see how companies can succeed over time without a continuous re-creation of corporate culture. And facilities architecture is part of that.

AR: *These companies usually tell us that distinctive design might impede their "exit strategy"—the ability to sell or lease space that's been made surplus by rapid change.*

FD: That's too low level a sense of what generic, flexible space should be. This real-estate logic that you build only one kind of building fails to understand how organizations work. Accencture, a [management consultant] client, has adopted a smarter space strategy for a rapidly evolving organization. It wants to own certain facilities, which will be designed to transmit the culture of the company and protect the brand and knowledge base. Those parts of the organization going through lumpy or fast growth will obtain space on short-term leases. Those operating in an even more fluid environment will use providers who offer fitted-out space for very short-term use. It's much better than obtaining large amounts of Dilbert space in rubbish buildings. It challenges the real-estate industry to look at different kinds of spaces and lease types.

AR: *Is information technology still too disconnected from the kinds of workplace structures it could make possible?*

FD: It is, but it shouldn't be. In BP, a client, there's a place called the hive, which is a theaterlike setting for 20 or 30 people. You assemble in it the geologists, the drillers, and the managers. They can project on a giant screen a virtual model of an oil field in three dimensions. You can turn it upside down, draw sections through it, and have the discussions that are necessary to figure out how to exploit that oil field. In the old days, someone would prepare a financial study, which would be tossed over to the geological people, who would evaluate the feasibility, then toss their conclusions to the engineers. Now the whole discourse takes place in parallel. The assumptions can be debated and new iterations can be prepared for discussion with the model of the real thing right there in the room. Projects like this can only be carried out when facilities people, real-estate departments, and architects are part of the culture and desires of the organization. It can't happen in companies that have hermetically separated real-estate departments as they did in

1

2

3

A far cry from the cubicles-by-the-yard approach still standard in the United States, DEGW's design process probes corporate culture.

the old assembly-line economy.

AR: *The dot-com bubble seemed to inflate and then burst in the wink of an eye. What effect do you think that has had?*

FD: I like recessions. This is number four in my life. I think real invention happens in the more competitive situation that you find in a recession.

AR: *The dot-com phenomenon energized older, diverse downtowns. The high-tech boom that preceded it occurred largely in suburban enclaves. Will the downtown trend survive? What have companies learned from it?*

FD: I think it's a permanent trend and also very important. One of the great paradoxes of the virtual age is that the city becomes more stimulating, entertaining, and interesting. People are realizing, in sort of a folkloric way, that what the city is about is contact in serendipitous ways. It's about increasing discourse. We may live in a virtual world that permits dispersal, but we don't have to be dispersed all the time; we can have it both ways.

AR: *I've wondered if the traditional utility of downtown is reasserting itself at a new, larger scale. Perhaps you can bring intellectual capital of enormous diversity into a room to brainstorm a new product or project at some unimaginably large or complex scale.*

FD: Organizations these days deal with disintermediation [in which, for example, a paper-based business is replaced by a much smaller online version], outsourcing, and a devolution of responsibilities to a variety of subcontractors and consultants. So companies are becoming more permeable to a whole network of outside organizations. They may deny it, but they work as nodes in a network, rather than as separate entities. You are absolutely dependent on more and more interaction with more and more sophisticated suppliers.

You can say, for example, that 1,500 people work for the J. Walter Thompson advertising agency, but those people coordinate a great number of freelance writers, photographers, artists, and art directors. The agency is just a node in a network that is part of a larger matrix of organizations. We're not good at mapping them, but they're still there. When you work this way, you can't think in terms of those 1950s, 500,000-square-foot chunks of one-size-fits-all buildings. What matters is the relationship of the building and other parts of the city and other organizations.

AR: *In the past, we've talked about much greater mobility and fluidity in the workplace—you've compared the workplace to a city street or a club. Do you think this is still a valid model?*

FD: Buildings that emulate the varied interactions occurring along a vital city street are intended to make the organization and its diverse parts literally transparent to each other. The socialness of the street is actually fundamental to the intellectual nature of a rapidly responding organization, whether it's in Covent Garden or Silicon Alley. The density of the interaction is the way that intellectual resources are made to have maximum impact. These are survival strategies for businesses and cities and economies, and so are vital issues for politicians and economists.

AR: *I see companies moving away from that model. Perhaps they are reacting to the well-publicized failure of the highly mobile workplaces of Chiat/Day Advertising in New York and Los Angeles.*

FD: With Chiat/Day, the design gestures were made without parallel sociological and cultural change in the organization itself. You must drive these two things together. You can redevelop via space, then the space becomes the language of the reinvention, which is 10 times more powerful. But you can't do space without the necessary effort to make sure the culture corresponds to what you've designed. To do otherwise is disastrous.

AR: *When you speak of change management and corporate reinvention, aren't you straying far from architects' expertise?*

FD: Change management doesn't mean anything without physical redesign. That's a big lever that could be seized by management consultants. If management consultants understood the value of design, they'd recognize that they have to get the best designers.

AR: *Are we speaking about a different way to be an architect?*

FD: In Foster's or Grimshaw's office, a drawing of a caster at the nexus of a truss is just a first iteration. You do more iterations with the builder. You don't hand the client a design; you work in parallel with everyone concerned throughout the process. You have to work in a different way if workplace design is to become the language of corporate reinvention. ■

As a company's vision of itself becomes clear, the variety of work settings has proliferated for such clients as BBC (1), Capital One (a bank, 2, 3), and Egg, an online banking division (4).

4

Boots the Chemist
Nottingham, England

1 **DEGW HELPED A RETAIL GIANT REDESIGN ITS CORPORATE CULTURE AS IT BUILT AN ADDITION TO A 1968 MODERN MASTERPIECE.**

By Adam Mornement

Architect: *DEGW—Frank Duffy, Tim Allen, Stephen Greenberg, project team*
Consultants: *Mott McDonald (structural engineers); Roger Preston & Partners (MEP)*
Construction manager: *MACE*

Size: *425,000 total, of which 200,000 is new*
Completion date: *1999*

Sources
Curtain wall: *Diamond Project Services (rainscreen tiles); Witte UK*
Raised access floor: *Durabella*
Demountable partitions: *Ergonom*
Carpet: *Gaskell Textiles*
Furnishings: *Office Innovations, Leisuretec, Steelcase*
Solar shading/blinds: *Louvre Blind Company; Levolux*

Program

In 1968, British pharmaceutical-retailing giant Boots the Chemist moved into D90, an elegant glass-walled pavilion on the Beeston side of Nottingham, the company's home in the English Midlands. Architect Skidmore, Owings & Merrill had provided what was, for its time, an advanced workplace: hierarchical, functionally segregated, and centrally controlled. It was listed as a historic landmark in the 1980s.

By the 1990s, however, products were sourced and sold worldwide, decisions had to be made quickly in the face of a more competitive retail environment, and projects could no longer be managed in a strictly top-down manner. Flexibility, teamwork, and communication now defined the language of commerce, and Boots needed a headquarters to reflect the shift of focus.

An incoming managing director, Steve Russell, took an expansive view of what should be done. He saw the design and construction process as an opportunity to reposition the company's culture for 21st-century ways of working. Russell decided to bring the 1,400 staffers scattered in five buildings around Nottingham onto the Beeston site, adding them to the 1,000 already in D90.

The company was already working with DEGW, a London-based design practice with a unique focus on architectural design as a means to advance a corporate strategy and culture. DEGW orchestrated workshops among the company's functional divisions, led by a steering group that added representatives from departments working with all the units, such as human resources and information technology. Separate workshops considered issues related to cross-functional job level and job type. "Steve Russell owned this vision," commented DEGW principal Frank Duffy. "But there's a need for leadership and for mass democratic participation to make such profound changes. That may sound like a contradiction, but it's very important."

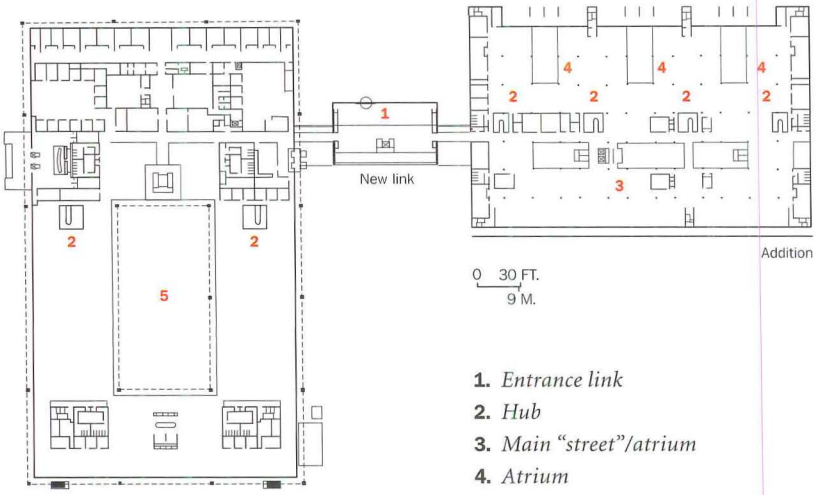
Solution

Out of the workshops came a rich mix of spaces. A double-height central spine runs from a new DEGW-designed structure through a link with a welcoming entrance pavilion and into the 1968 building. It functions as a Main Street, inviting staffers from units that had previously occupied separate premises to

Adam Mornement is a London-based writer. He is a former deputy editor of World Architecture.

www
For additional office projects and more information on the people and products involved in this project, go to Building Types Study at **www.architecturalrecord.com**

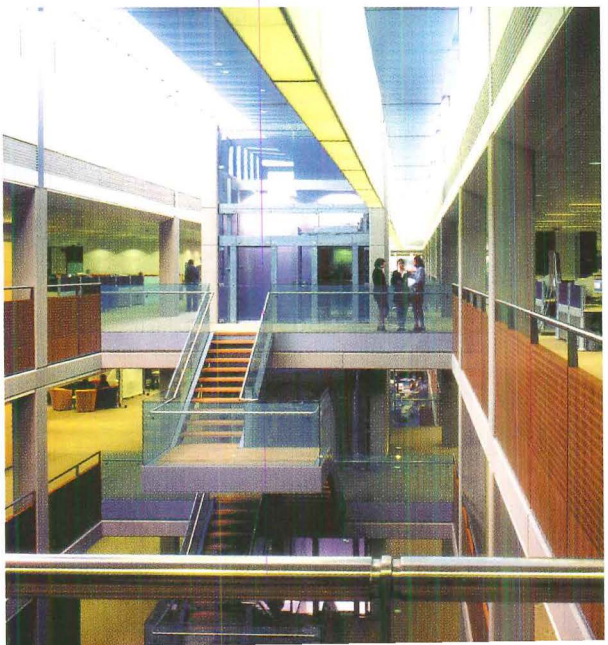
Designed from the inside out, Boots' new wing and glazed entry building (above and opposite) also recognize the landmark quality of the Miesian original by Skidmore, Owings & Merrill.



SECOND FLOOR

1. *Entrance link*
2. *Hub*
3. *Main "street"/atrium*
4. *Atrium*
5. *Courtyard*

The two-level "street" extends from the entrance (below) to a new atrium (bottom right and opposite). In the new wing, three tributary atria were attached on a north-south axis (plan). These subsidiary atria offer daylight and views to a high percentage of staff. Bottom left: An SOM stair in the existing building was opened up.



mingle—intentionally or accidentally—in a pleasingly lighted space lined with a cafe, shops, ATMs, and elevators. Wireless telephones and numerous data connections make it possible to stay in touch throughout the building without being tethered to a single desk.

Smaller, color-coded atria give discrete identity and act as a focus for workgroup "neighborhoods." Though each neighborhood is supplied with desks, large meeting spaces, smaller "break-out" areas, and two offices, the number and arrangement of these elements within each neighborhood are up to the individual group.

The atrium scheme could not be carried into the existing building, but the neighborhood idea was. High partitions have been removed and the private offices were converted into meeting rooms. "It's now like a big shed," says DEGW head designer Stephen Greenberg.

Architecturally, the expression of the new construction is perhaps more discreet than the original.

Commentary

While some elements (the "street," the cafes, the casual meeting places) are not new ideas, the specific combination of strategies came out of Boots' specific requirements and DEGW's unique process. Tim Allen, of DEGW, sorted out the teething problems with Boots during the building's first year of occupancy. (A team process, akin to that deployed in design, made possible a two-year design and construction process.) Allen still attends meetings that address the way the premises works.

With such emphasis on interaction and social spaces, one imagines a hive of activity. In truth, a great many people seem to work mostly within their "neighborhood." The light, comfortable spaces appear to strike a better balance between easy interaction and a sense of "home base" than other ambitious workplace designs. Both Boots and DEGW offer prospective clients tours of the Beeston campus, a testament to the companies' mutual pride in the project. ■

Valerio Dewalt Train
Chicago

2 **VALERIO DEWALT TRAIN CHOREOGRAPHED A BALLET OF CALIBRATED PLANES AND SHIMMERING TRANSLUCENCY IN THE DESIGN OF ITS OWN OFFICES.**

By James S. Russell, AIA

Architect: *Valerio Dewalt Train—Joseph Valerio (partner-in-charge); Jason Hall, Ben Krone, James Botatto (team)*
Consultants: *Don Belford (structural); WMA; (mechanical); Charter Sills (lighting)*
Contractor: *Hill Mechanical*

Size: *7,700 square feet*

Sources
Glass: *Christopher Glass/Aluminum*
Metal wall panels: *Epic Metals*
Luminous ceiling: *Polygal*
Cabinetry: *Laminated Products; William Huber Cabinet Works*
Furnishings: *Teknion, Vitra, ICF, Knoll*
Carpet: *Harbinger*
Resilient flooring: *Forbo*
Lighting: *Duray, Artemide*

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Program

For any architect whose office gets beyond the doors-mounted-on-filing-cabinets stage, much is at stake. An architect's office is a statement about the firm, its aspirations, and the clients it wants to attract. Clients will quickly make judgments as to where you fall on the aesthetic spectrum. Is this a cutting-edge firm, they might ask (as they dodge the lunging desk extension)? Or is it an environment that says, "We're not going to take you anywhere aesthetically that you haven't already been"?

Most satisfying for the designer, one's own office can become an opportunity to explore interests (admit it, obsessions) that would mystify, if not alarm, clients. In new premises for Valerio Dewalt Train's Chicago offices, image making mixes with a near-obsessive concern for inexpensive material wrought beautiful by careful detailing.

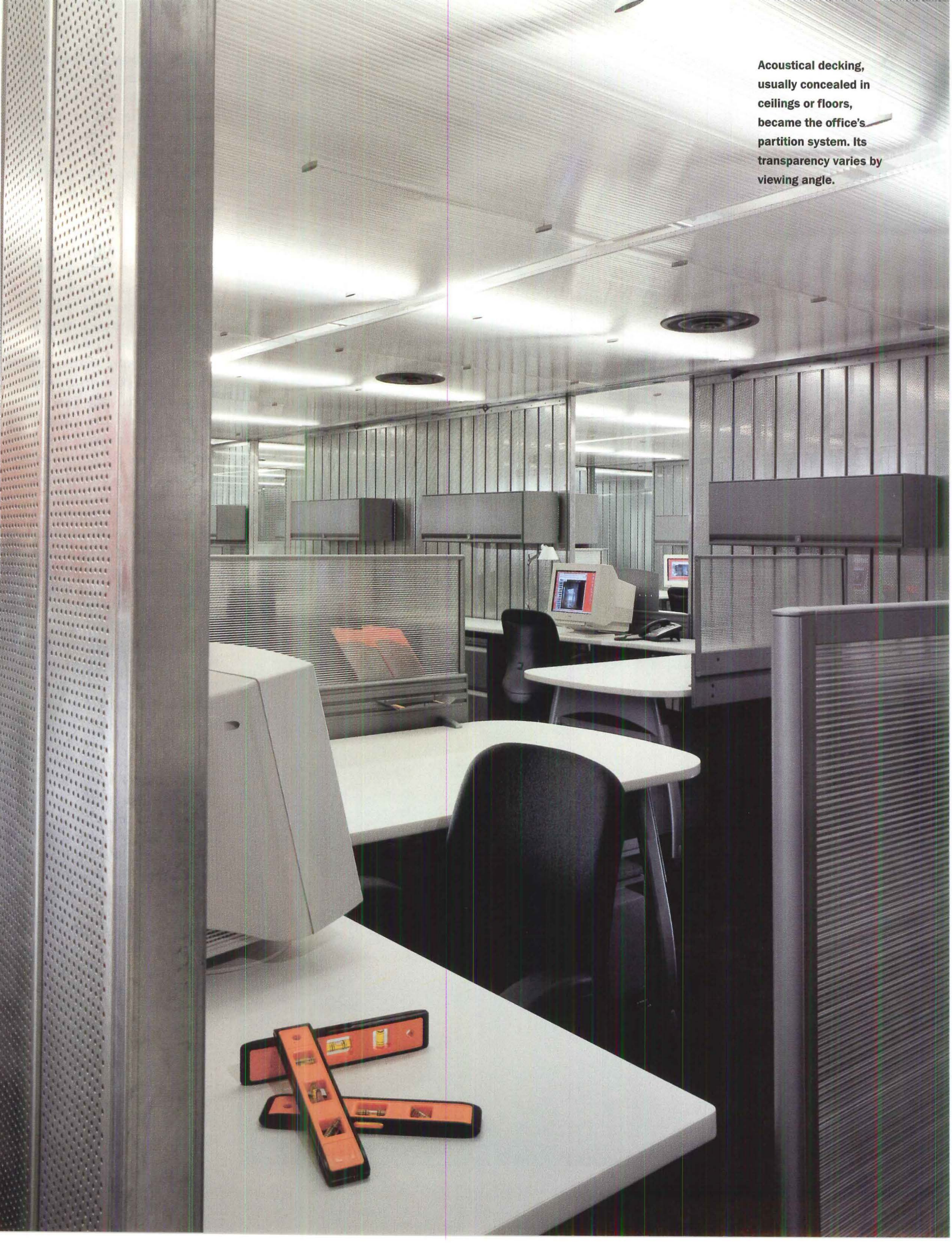
Solution

The image aspect is established dramatically at the entrance, where a flat-screen monitor, deprived of its case, dangles precariously from a rolling, folded-metal panel door. Images of the firm's work flicker across the display's exposed innards. "It's about design and it's about our ability to take something apart and put it back together again," says Joseph Valerio.

After such a daunting introduction, the actual character of the office is quite different. Shimmering perforated-metal panels define a series of vertical planes. A horizontal surface slides overhead, softly diffusing stripes of light through plastic panels.

The piers are laid out perpendicularly to the path the visitor would take through the space. Allowing the office to reveal itself gradually was quite intentional. "Because these planes are partially transparent as you pass through them," explains Valerio, "you become aware of how we live in the space and use it."

This pavilionlike quality is married to a rigorous plan. The piers and ceiling system are organized on a 16-foot module (aligned to the building's structural grid), forming six semi-enclosed bays (opposite, upper left). The bay system demarcates space



Acoustical decking, usually concealed in ceilings or floors, became the office's partition system. Its transparency varies by viewing angle.

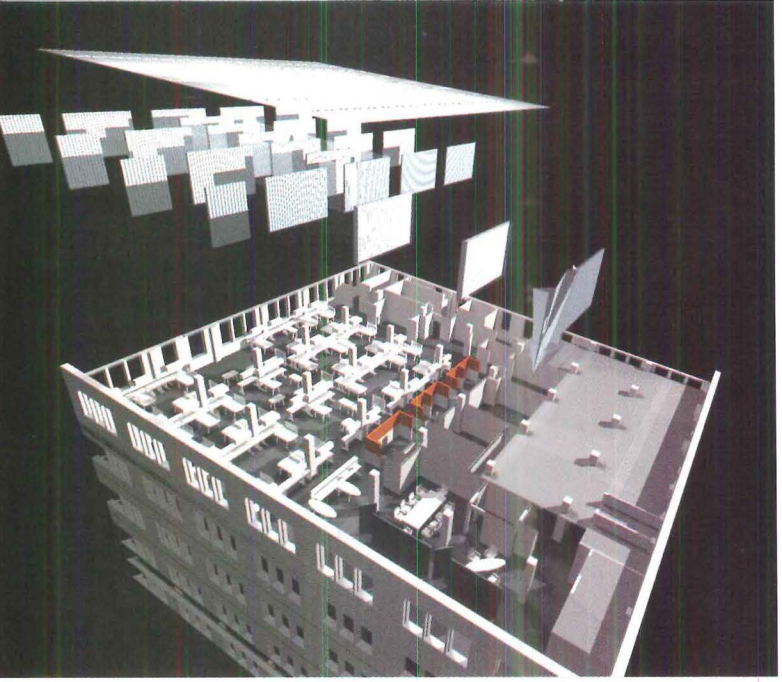
for the firm's typical project teams, which range from two to eight people. At lower densities or for smaller teams, the Teknion benches lining the metal partitions are sufficient. Teams add extra tables as they grow, placing them perpendicular to the partitions.

Materials

It is in the use of materials that the firm's detailing fetish shows itself. Valerio had long experimented with perforated metals as a means to achieve translucency, but he found that the detailing required made an inexpensive material costly. His "Eureka!" moment occurred on a job site when he stood under an acoustical metal floor decking and saw how beautifully its small holes diffused daylight. The conversion to vertical partitions proved inexpensive, and the overlaps in the panel-meeting joints accommodated drops for wiring.

Valerio thinks a great deal about ceilings, too. "Not only do they deserve greater aesthetic attention than they usually get, but they are too complex to construct—they involve too many trades," he says. He simplified a conventional suspended-ceiling system by adapting a standard metal-channel shape (in which lie horizontal wiring runs) to support the translucent-plastic light-diffusing panels. Above the panels, he hung $30 fluorescent tubes. The channels and the lighting are both coordinated to the 16-foot grid spacing. "I wanted the ceiling to be a perceived object," says Valerio. For that reason, he made it lower than would have been necessary just to conceal mechanical ductwork.

Clients today, even architects, often seek more obviously expressive gestures than a gentle play of light or prosaic building necessities that are well organized. "I hope clients recognize that everything is well considered," says Valerio. The response has been gratifying, he reports, even from conservative clients. "They say it's fabulous, but a little too metallic for them." High praise indeed in an era that fixates on spectacle far more than on the handling of panel clips. ■



The luminous plane stops short of the exterior walls (opposite) so that it is perceived as an object floating below the ceiling. Valerio sees the combination of open, semiopen, and closed spaces (private office, below) as reconciling often conflicting needs for seclusion and interaction.

Concrete Media
New York City

3 **SPECHT HARPMAN, A FIRM THAT'S GROWN UP WITH THE INTERNET, BUILT AN ENVIRONMENT TUNED TO THE VAGARIES OF DOT-COM HYPERGROWTH.**

By James S. Russell, AIA

Architect: *Specht Harpman—Scott Specht, Louise Harpman (project designers); Rosemary Smith (project manager)*
Consultant: *Lilker Associates (MEP)*
Contractor: *Manhattan Business Interiors*

Size: *40,000 square feet*
Completion date: *2000*

Sources
Custom steel entrances and doors: *Bliss Nor-Am*
Custom interior steel glazing, special hardware, and surface: *Millennium Steel*
Fiberglass partitions: *Seal Fiberglass*
Wood cabinetry: *NJS*
Cork wallcovering: *Wicander*
Plastic laminate: *Formica*
Raised access floor: *Tri-State*
Hardware: *Schlage, Stanley, Norton, Maglock*

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Program

Committing to the construction of a new facility entails answering tough questions: Is the company growing too fast? If it fails to build, will it lose valued staff or be unable to take advantage of a major business opportunity?

When explosive growth happens, it is almost impossible to answer these questions definitively. If you don't take more space, you have no place to put anyone. But if you build too much, you're married to crushing fixed costs.

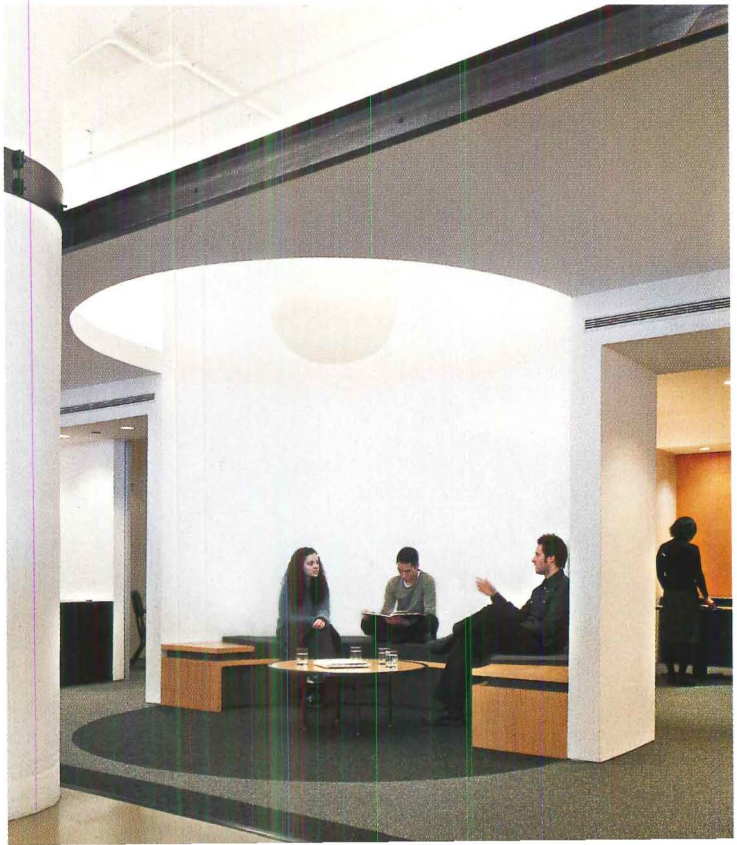
Concrete Media, a Web site developer of Internet-hosting services, bet on growth, moving into 40,000 square feet in the newly fashionable Starrett-Lehigh building, on Manhattan's western edge, in late 2000.

In Specht Harpman, Concrete found a firm that specialized in environments accommodating rapid change, since it has ridden the Internet start-up wave from its infancy way back in 1997.

Given the nature of the business, it is not surprising that the client found its architect on the Web after seeing a couple of small early projects published. They liked what they saw. "They also liked the idea that our firm, too, was a kind of start-up," explains partner Louise Harpman. "They thought we'd understand them."

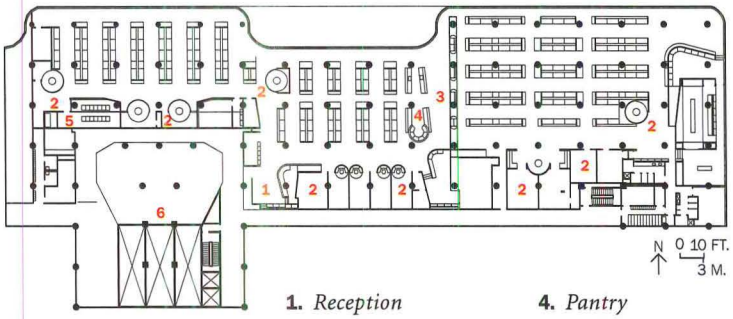
Before venture capitalists started showering nascent Webmeisters with money, Harpman and her partner, Scott Specht, had actually pitched in with screwdrivers and hammers to helped cash-starved early clients construct the spaces they had designed. As a result, they learned to source materials from hardware stores and business-fitting wholesalers. They found it was often cheaper to custom-fabricate desks and partitions from off-the-shelf components than it was to purchase furniture. They found specialty subcontractors who were comfortable making custom-desk supports out of products as prosaic as the wheeled clothing racks that clog Manhattan's gritty Garment District streets.

Concrete needed better space because it had long outgrown its premises. It was forced to jam more people into an office suite that had been built for a previous tenant. There was no time to alter that earlier space or rethink it. When a high-ceilinged, light-bathed space became available in the Starrett-Lehigh building, it looked like everything their old office wasn't and could never be.



PHOTOGRAPHY: © MICHAEL MORAN

A wide aisle offers a Main Street through workstations and meeting spaces to the space's largest conference room (above). Milky fiberglass diffuses daylight into tank-shaped meeting spaces (right); other areas can be used at a moment's notice (left).



1. *Reception*
2. *Meeting*
3. *Operable partition*
4. *Pantry*
5. *Servers*
6. *Loading dock*

Solution

The architects zoned the plan from inside to out. They placed most of the varying-sized meeting rooms on a raised platform, and terraced the rows of workstation benches down in two levels to the window walls opening to breathtaking views of the Hudson River.

Rather than derive an aesthetic from the company's tech-heavy mission, Specht Harpman took inspiration from the building and its surroundings. In the main conference room's partitions, they picked up the thin-membrane configuration of the 1931 streamlined Moderne building's steel sash (even tracking down the original fabricator, which is still in business). They turned the water towers that form Manhattan's rooftop tankscape into meeting rooms. Only these "think tanks" have been fabricated by Long Island boat makers out of fiberglass, tinted milky "surfboard clear." The fiberglass enclosures were inexpensive to make yet brought the outside light into the meeting spaces.

Commentary

Out of a long-neglected industrial space, the architects teased a workplace that has amenities any company might seek: beautiful light and a pleasing openness. Almost any white-collar endeavor could make good use of the combination of small but well-made workstations and varied spaces for meeting and socializing. "Flux is what it's about," says Scott Specht.

More than Specht or Harpman knew. The adaptability of the design will now be put to an unwelcome test. As this issue went to press, Concrete closed its doors, another casualty of the imploding dot-com economy.

Since Concrete failed, it's fair to question whether it should have committed so much of its precious cash to its facility. There is no definitive answer. The company could just as well have foundered because its former space made it so difficult to manage collaborative projects and instill a corporate culture tuned to product quality and customer service. Both qualities have been conspicuously lacking in the much-touted, junk-food-strewn, rec-room look that too often remains the dot-com paradigm. ■

Benchlike, high-density workstations are balanced by a variety of meeting spaces (view from reception, opposite, bottom) and quiet common-use spaces (opposite, top). A custom-designed and -fabricated divider (this page) suspends sliding display boards and accommodates storage and seating.

Evolve Software
Emeryville, California

4

KAVA MASSIH RETAINED AN OLD FACTORY'S AIRY GRANDEUR AS IT GAVE A GROWING SOFTWARE COMPANY GENEROUS SPACE.

By Lisa Findley

Architect: *Kava Massih Architects—Kava Massih, Gerry Tierney, Kyle Prenzlow, Angelo San Diego, Rasha Habiby, Dimitris Aristidon (project team)*
Consultants: *Simons Structural Engineers; Endres Ware Architect Engineer (structural); Horton-Lees (lighting); Gary L. Strang (landscape)*

Size: *46,000 square feet*
Completion date: *2000*

Sources
Acoustical ceiling: *Tectom (panel); USG-Donn (suspension)*
Paneling: *Plyboo*
Plastic laminate: *Tott Turf*
Flooring: *Armstrong (resilient); Dal Tile (ceramic); Karastan (carpet); Plyboo (wood)*
Lighting: *LSI, Zumtobel, Columbia, Focal Point, Lightolier, Targetti*

www
For additional office projects and more information on the people and products involved in this project, go to Building Types Study at **www.architecturalrecord.com**

Program

Until the giddy dot-com growth of the last few years, the town of Emeryville, Calif., was an overlooked industrial outpost wedged between Oakland and Berkeley. As rents surged in San Francisco, the ample and low-cost space abandoned by manufacturers, along with Emeryville's position at the first outbound exit off the Bay Bridge, made it a high-tech magnet.

CEO John Bantleman moved Evolve Software to Emeryville in the spring of 2000 for one reason: "luxury of space." The firm's 200 employees had been crammed into cubicles in standard spec-office space. For this developer of business applications, breathing room meant not only a less-crowded environment, but also an ease of informal interaction that has now become de rigueur in fast-moving high-tech firms.

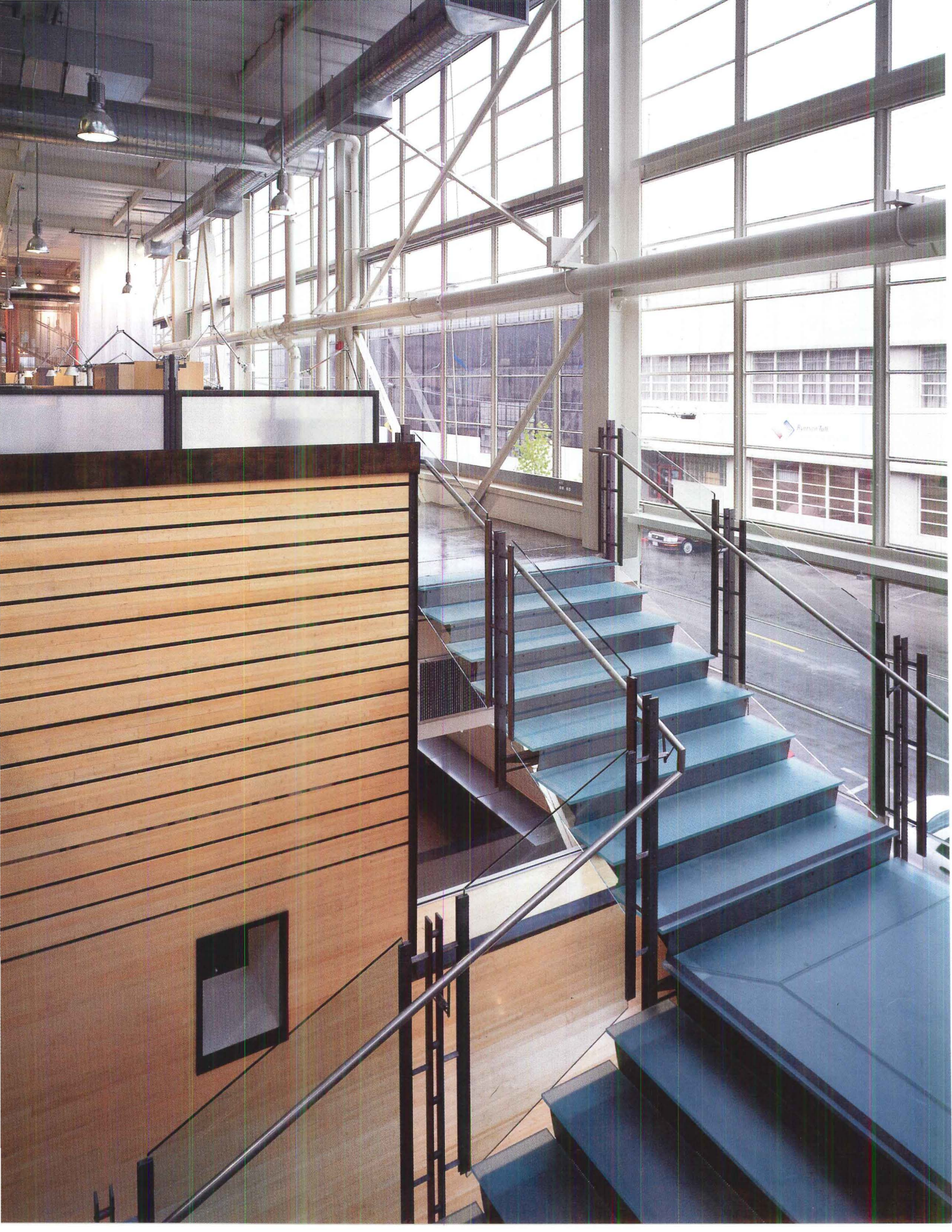
Bantleman chose Emerytech, né the Grove Valve Building. Where once huge fittings were manufactured for the shipbuilding industry, Kava Massih, a five-year-old local firm, had created more than 200,000 square feet of office and retail space for developer Ellis Partners. A high-tech track record and the developer's recommendation was enough for Bantleman, who hired the firm to complete the design.

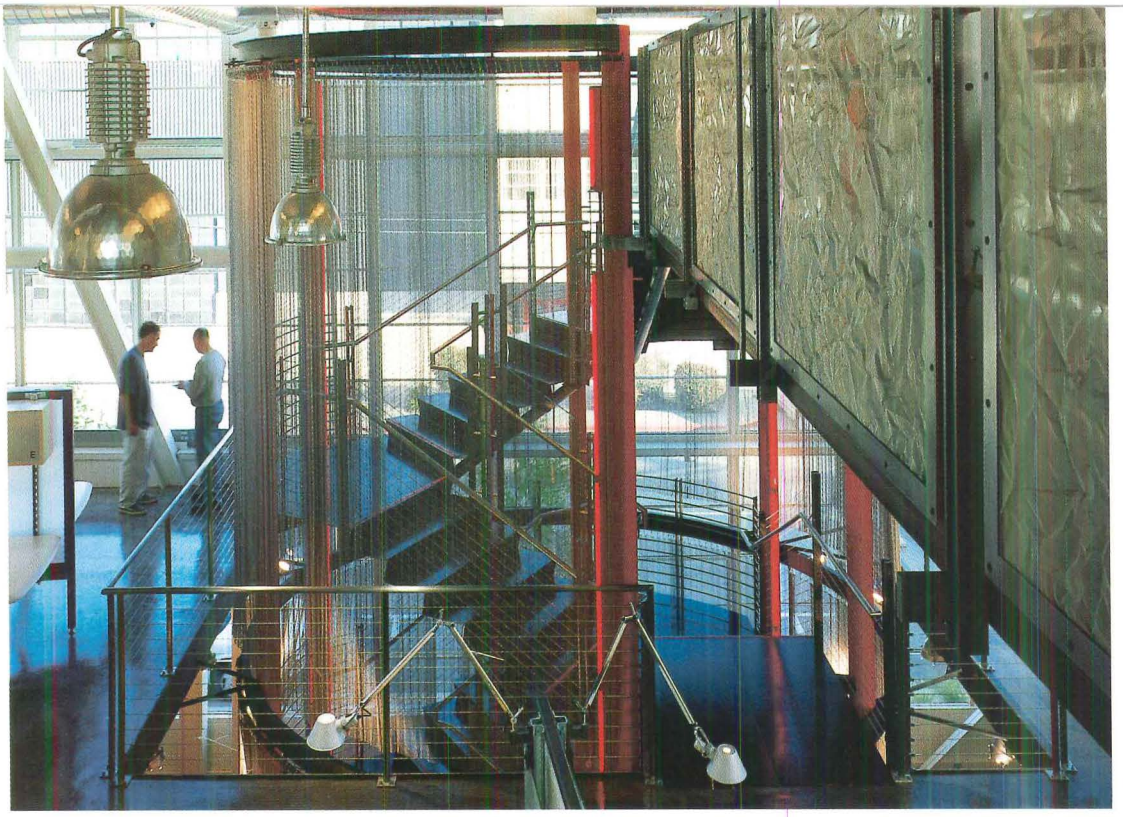
Contributing editor Lisa Findley writes about architecture and design and teaches at the California College of Arts and Crafts.

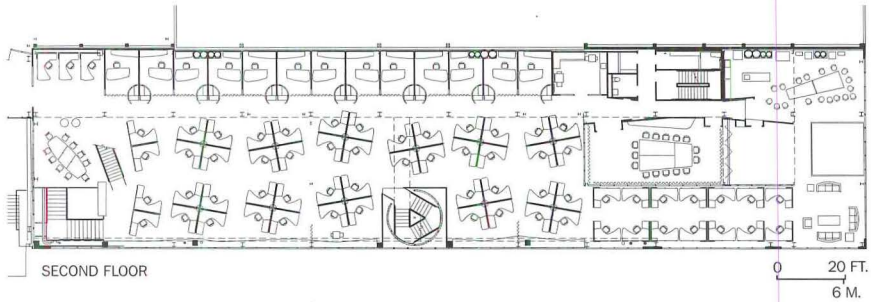
Within an old manufacturing space (left), a glass-treaded stair (opposite) leads to the daylighted main level (above). The stair leads to private offices and meeting rooms on a mezzanine. Desks are custom-made.

Solution

The largest block of Evolve's space, 32,000 square feet, occupies a steel-framed, 300-foot-long former manufacturing bay, wrapped by industrial sash on three sides. Massih's team interpreted Bantleman's desire for spaciousness by inserting only a single full-floor slab in this light-filled rectangle, leaving an 11-foot floor-to-ceiling height on the ground floor. Even this is punctured by generous stair openings. "I wanted to reclaim the light and the immense height of the space wherever I could," says Massih. The second floor opens up







Fine chain-link mesh drapes a stair to the mezzanine (left), where the crumpled metal of the architect-designed rail resembles an Issey Miyake shirt. Bamboo flooring lines the lobby (bottom).

up to a double height, with a mezzanine containing private offices and meeting rooms hung over about a third of the area.

Materials

Massih diffused the generous daylight with light-reflecting and transmitting materials to keep a sense of openness even in enclosed areas. Combinations of clear and translucent glass or plastic enclose the conference areas. The partitions of the custom-made workstations are also translucent.

Massih credits the skill of Dennis Ludeman, a local steel fabricator who often works with architects, for the elegant execution of metal details (for example, see the stair, opposite). Michael Goldin, a furniture maker, created the workstations.

Commentary

Many new work environments struggle to accommodate a leader's vision of a teamwork-oriented workplace with easy interaction and the staff's desire for privacy and relief from perpetual distraction. Evolve is still discovering where this balance lies. Some midlevel managers fought for enclosed—though glass-doored—offices on the mezzanine, and got them. The engineers and software developers on the main level clamored for greater enclosure of their workstations. Bantleman has agreed, and Goldin has just completed the design.

However, the employees have found the light-filled space inspiring and a welcome change from the warren of cubicles in their old offices. The design has significantly aided hiring. "Recruiters love walking job candidates through the space," says Evolve facilities manager Lauren Lee. "It sells itself." ■

New Uses for Army Surplus Buildings

AFTER 150 YEARS OF SERVICE TO THE U.S. ARMY, A WATERFRONT FORT IN NEW YORK CITY IS REINCARNATED FOR THE FIRE DEPARTMENT, PARKS DEPARTMENT, AND LOCAL COMMUNITY.

By Robert Vail Cole, AIA

Adaptive reuse of existing buildings is a growing specialty for architects. More firms are adding refurbishment, restoration, and rehabilitation to their repertoires as important areas of expertise. Swanke Hayden Connell, a New York–based architectural firm, has spent 15 years developing a successful methodology for determining feasibility and design strategies, including the much-lauded refurbishment of the Statue of Liberty (1986).

Abandoned for over 25 years and now in a state of decay, the original 1911 army hospital in Queens is slated for rehabilitation and adaptive reuse as classrooms for the FDNY's new training facility.

According to the National Trust for Historic Preservation, over 1.2 million commercial and institutional buildings constructed 40 or more years ago are still in use in the United States today. A significant portion of these buildings need to be rehabilitated in order to remain viable. With increasing frequency, architects are being asked to evaluate the reuse of large facilities and sites that have outlived their original purposes, such as former school campuses, industrial plants, hospital complexes, and military bases. When the buildings, their infrastructures, and their grounds have been well maintained, new owners are often eager to exploit the economic potential of reusing what exists, rather than razing and rebuilding.

At a multiple-buildings scale, this assessment requires a methodical approach to find the best and most viable redevelopment scenario. To analyze an existing complex, architects must identify the original building types and their existing layouts, evaluate each building's overall physical condition, document the condition and capacity of the site's infrastructure, perform a detailed zoning analysis to identify allowable new uses and opportunities for new construction, and finally, create a conceptual program to place new users in a suitable environment. This information is crucial for the cost estimates, which will establish an overall project budget.

Swanke Hayden Connell Architects (SHCA) in New York used this methodology to evaluate the reuse of the historic, Civil War–era Fort Totten in Bayside, Queens, New York. The site comprises 175 acres with 842,000 square feet of facilities in over 145 existing structures that originally housed U.S. Army operations, administration, storage, housing, and military fortifications. Through the Base Realignment and Closure process (BRAC), the federal government's vehicle to consolidate our nation's defense facilities and dispose of the resulting surplus military property, 120 acres of that property and 735,000 square feet of buildings were identified as redundant to army and other military needs.

Fort Totten is a significant example of a confined and controlled community containing all residential, commercial, and recreational facilities necessary to support a civilian and military population. It was historically planned, designed, built, operated, and inhabited under the auspices of a single agency—the United States Army—for nearly 150 years. The history of Fort Totten extends from its establishment in 1857 as a coastal defense site for the New York City harbor through the middle of the 20th century, when it served as the home of the First Regional

Robert Vail Cole, AIA, is senior associate and director of historic preservation at Swanke Hayden Connell Architects in New York.

CONTINUING EDUCATION

Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/ AIA Continuing Education article. To receive credit, turn to page 218 and follow the instructions.

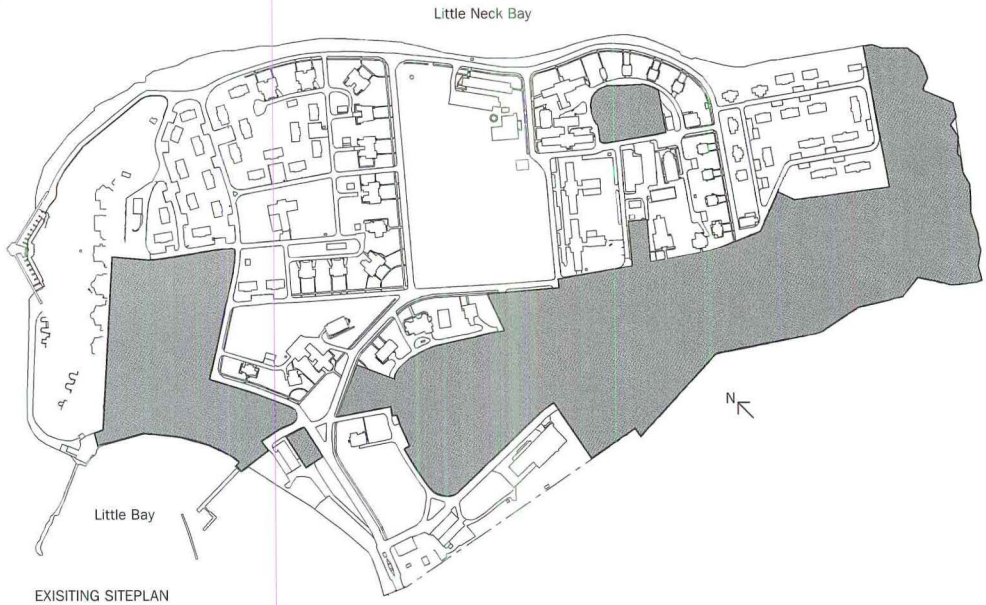
LEARNING OBJECTIVES

After reading this article, you should be able to:

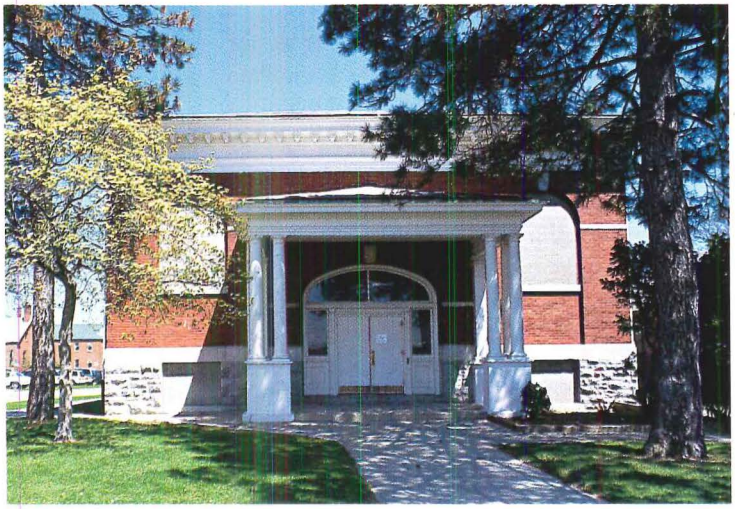
1. *Describe how the Fort Totten site will be reused.*
2. *Explain renovations necessary to reuse this site.*
3. *Explain how cost estimates were determined for the Fort Totten project.*

WWW For this story and more continuing education, as well as links to sources, white papers, and products, go to www.architecturalrecord.com

On the existing site (right), 47 of the 130 buildings will be demolished to make room for public parkland and new construction. This officer's house (below left) is typical of the residences that will be rehabilitated for administrative use, while the gymnasium (below right) is typical of the unique institutional buildings that have been programmed for special uses.



EXISITING SITEPLAN



Army Air Defense Command. The facility conveys the total environment of defense, support, and domestic life that characterized army posts from the mid-19th to the mid-20th centuries.

Because it is one of the rare large development sites remaining within the city limits, the mayor's office joined community leaders to create the Fort Totten Redevelopment Agency (FTRA), charging it with developing a reuse plan and seeking input from various New York City public agencies, private institutions, and developers, as well as the community at large. Three reuse plans were explored: a residential community, a college campus, and the New York City Fire Department (FDNY) training center.

USING A QUESTIONNAIRE, THE TEAM CONDUCTED INTERVIEWS AND COLLECTED INFORMATION TO DEVELOP A DATABASE.

The agency settled on a plan for a multiuse community consisting of a new training facility for the FDNY, 50 acres of new public parkland, designation of specific buildings for not-for-profit use, and a small parks concession. This strategy best addressed neighborhood concerns, provided for public access, fit within the existing site constraints, and had a viable funding source. The other 120 acres of the site, containing 130 structures, were turned over to New York City. Forty-seven of these structures, dating from the 1950s and '60s, have been proposed for demolition to make way for new parkland and potential new construction. The balance of the structures, part of a New York City Historic District, are to be retained, rehabilitated, and reused.

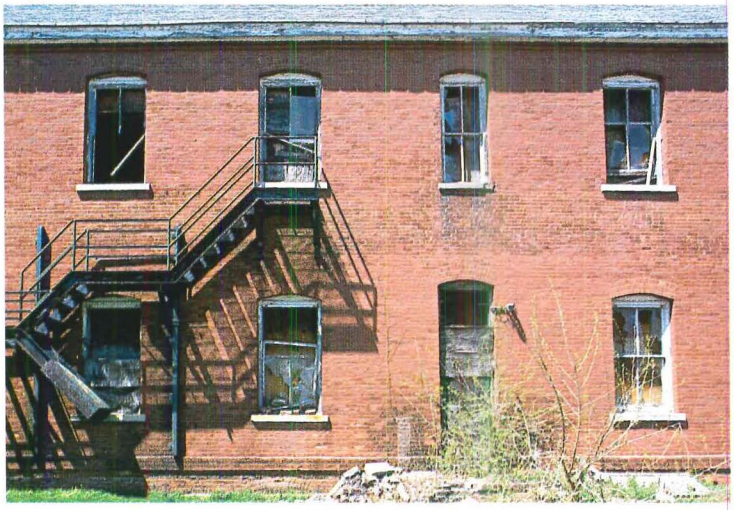
The city retained SHCA and assembled a team of consultants from the New York City Department of Design and Construction to determine the feasibility of adaptively reusing the buildings and the site. At that point, a more detailed, though still conceptual, design analysis could be undertaken.

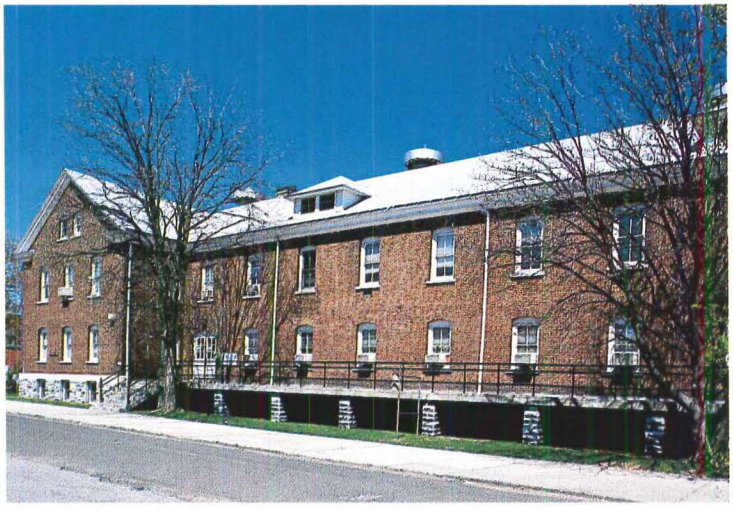
Existing structures

The team inspected and evaluated each of the existing structures on the site, verifying the original drawings in the field and creating as-built documentation. Building on the work of several previous site-evaluation studies prepared for the army by other consultants, the SHCA team developed condition assessments and repair guidelines. Documentation also extended to the mechanical, electrical, plumbing, and structural

PLANNED SITEPLAN

The Officers' Mess Hall (above) will remain open to the public as the Bayside Historical Society. Barracks building 323 (below left) has yet to undergo rehabilitation and conversion to classrooms similar to that of building 330 (below right).





systems; windows, doors, roofing, exterior wood and masonry assemblies; and interior finishes. The team used a cursory, yet methodical, approach for assessing the potential for repair and rehabilitation versus wholesale replacement. The evaluation took into consideration not only the proposed site infrastructure upgrades but also restrictions due to historic preservation requirements of the New York City Landmarks Preservation Commission.

Infrastructure

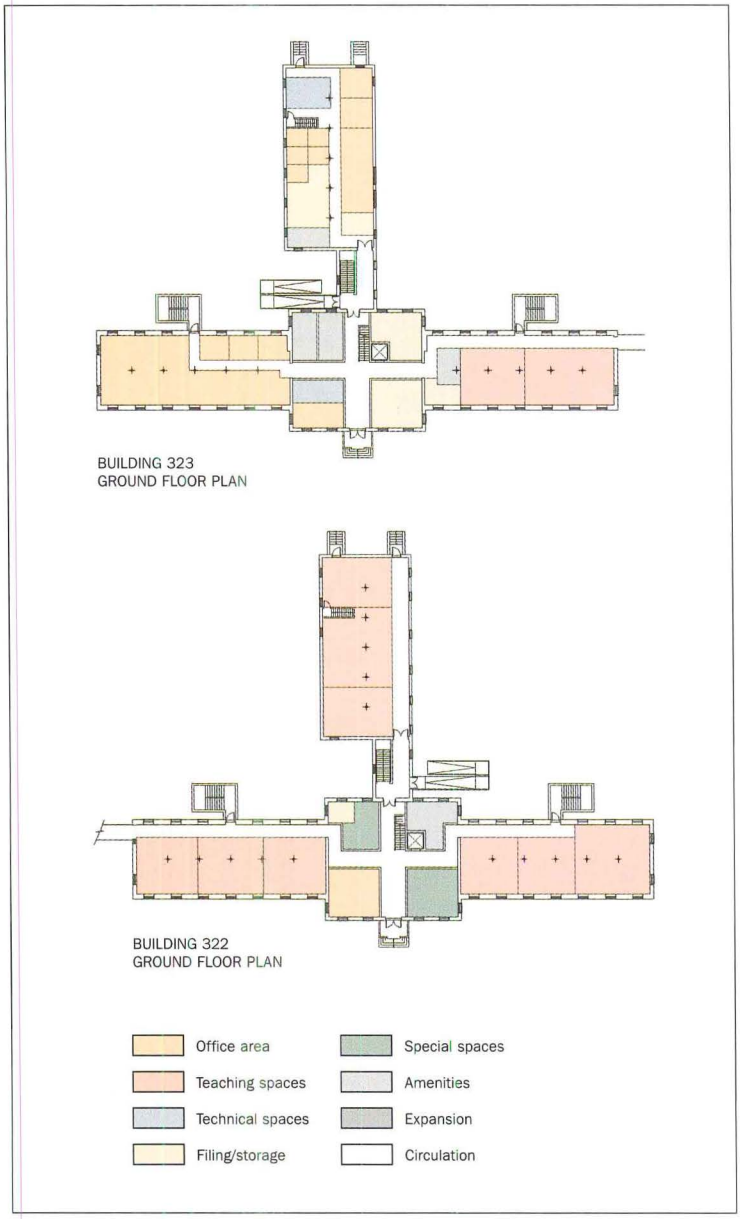
Site surveys and visual inspections throughout the fort revealed the condition and functional aspects of the infrastructure. SHCA also compiled background information from previous studies executed for the army in order to document existing infrastructure conditions on the utility system installations and to compare previous findings with the new data. Discussions with FDNY engineering personnel currently working at Fort Totten yielded additional information.

By examining the requirements established in the programming effort, the architects were able to determine that all the major infrastructure systems will ultimately need to be replaced or rehabilitated to support the capacity requirements of the FDNY Training Academy and the Parks Department facilities. This entails a complete replacement of the domestic water-supply system, reconstruction of storm drainage and sanitary sewer systems, upgrading of the site's electric distribution system, and installation of a communications duct and a natural-gas distribution network. Additional parking and designation of a network of public streets will also be required. SHCA designed a network consisting of two loop roads serving double duty as the location for the new site utility mains.

User programming

The development of a Space Requirements Program for the FDNY and Parks Department marked the beginning of the conceptual design effort. The primary objective of this effort was to establish space requirements for and specific characteristics of the facility. Using a questionnaire tailored to the users' needs, the design team conducted interviews and collected information to develop a database. The resulting program was not site-specific, detailing only the spatial planning needs of the users and their projected future requirements.

The FDNY portion of the program includes teaching areas, specialized training areas, administrative space, and mechanical equip-



Blocking plans were prepared to develop conceptual designs for reuse of each building. The large, open dormitories and ample existing rest rooms and circulation spaces in Barracks 322 and 323 were ideal for reuse as central classrooms for the training facility.

ment space for all of the Fire Department units that might be housed at Fort Totten. The program also responds to the requirements of the Department of Parks and Recreation for recreational areas, comfort stations, maintenance facilities, and administrative space. Eleven not-for-profit buildings were generically programmed since specific user groups had not yet been identified.

The next step was to analyze the overall program for the site with the goal of matching departmental requirements with individual buildings. By providing consolidated, centralized facilities in existing institutional and residential buildings, with rooms sized and configured in accordance with program requirements, the architects could achieve the most efficient reuse. This principle would also give each department an appropriate structure with its own identity and address. Conceptual space blocking was prepared to test the ability of the existing buildings to support new uses.

For example, the two main buildings, Barracks 322 and 323, are scheduled for reuse as the central classroom buildings. Their large, open dormitories are ideal for the required classrooms, and the ample existing rest rooms and circulation spaces will support large assemblies of students. The smaller original supporting rooms are also ideal for reuse as teachers' offices and technical support areas.

The team categorized building types under various renovation scenarios. Coupled with the program assignments and the degree of interior modification that would be required, these scenarios grouped buildings according to the following: exterior architectural conditions,

THE TEAM CATEGORIZED THE VARIETY OF BUILDING TYPES UNDER DIFFERENT RENOVATION SCENARIOS.

interior architectural conditions, structural conditions, required interior alterations, and requirement for rehabilitation or replacement of existing utilities. The various combinations resulted in nine renovation scenarios, ranging from routine interior and exterior maintenance work to significant exterior restoration work and complete interior remodeling. SHCA prepared detailed cost estimates for one example of each of the nine types, then took the average or typical cost per square foot and extrapolated for all buildings within each scenario type. This formed the basis for the overall cost of rehabilitating all buildings on the site. These square footage costs ranged from approximately 7 percent of the cost of new

Tech Brief

A tower in Scotland seems to defy the laws of physics

Rising 462 feet on a river quay, it looks like a radar antenna for guiding extraterrestrial pilots safely to Scotland. In actuality, this graceful reed-thin projection is an observation tower on the south bank of the River Clyde in Glasgow. It's also a marker for the recently completed Glasgow Science Center, designed by Building Design Partnership (BDP). The $118 million complex includes three components: a 350-seat IMAX theater; a titanium-clad, crescent-shaped science center; and the tower. A viewing cabin sits at the 330-foot mark. On a clear day, visitors can see 20 miles in any direction, but the real marvel is that a thin 462-foot tower will be the first one in the world to rotate 360 degrees from the ground up into prevailing winds.

Architect Richard Horden and engineer Peter Heppel originally won the competition, funded by a grant from the UK Millennium Fund, in 1992. In 1994, they joined with Buro Happold to develop a proof of concept study and create a scheme.

First of all, there's the wow factor. The slender tower on a peninsula will be greatly affected by the wind, especially at the top, causing movement of the cabin, which, in turn, could cause viewers to experience motion sickness. By drawing heavily on computational fluid dynamics (CFD) programming, the engineers created a deceptively delicate vertical projection. While it appears to defy the laws of physics, it actually serves as a three-dimensional rendering of the principles of aerodynamics.

Designing the pieces

The tower's main steel shaft has three components: Two airfoil-shaped outriggers and the nose of the stair tower form a triangle in plan and provide the primary structure. They are all linked by diagonal bracing. The outriggers at the sides control air flow and prevent oscillations from vortex shedding (turbulence). They are made of curved steel plate with internal webs. The stair shaft is fabricated from triangular, tubular steel sections clad in painted aluminum to reduce the overall weight. It is fully braced to provide torsional stiffness and strength. The tail section at the rear of the airfoils is not structural but helps balance the tower aerodynamically.

The base consists of a circular, reinforced-concrete bearing ring, 35 feet in diameter, supported by a steel-plate rim. Twenty-four roller bearings mounted on carriages move along the rim. The rollers are mounted on rubber springs, which accommodate errors in the ring and provide dampening. Below the disk, the root structure tapers to a point and is supported by a thrust bearing, which carries the vertical load and a roller bearing, which takes the horizontal loads from the overturning moments. As the diameter of the root structure tapers, the thickness of the steel increases. The bottom 10 feet are solid steel casing. The root structure, the bearings, and the turning systems are contained in a 40-foot-diameter reinforced concrete chamber that extends 65 feet below grade.

Slowly it turns

The tower turns to meet prevailing winds by means of four electric motors driving sprockets, which drive a pinwheel fixed under the bearing ring. The motors are fixed below four of the rollers and move with them, so the relationship with the pinwheel is maintained when the rubber springs allow the ring to deflect. The rotation drive turns the tower from 180 degrees to 45 degrees at a rate of 90 degrees per minute. The wind also helps the rotation, so power requirements are quite small.

Getting to the top

Two Alimak elevators will take visitors to the viewing cabin. Alimak, located in Northamptonshire, England, makes rack-and-pinion lifts used widely in the construction, mining, chemical, power, and offshore industries. The cabin resembles the passenger carriage of a helicopter and is made from glass-reinforced composite and mounted on a steel chassis at the top of the shaft.

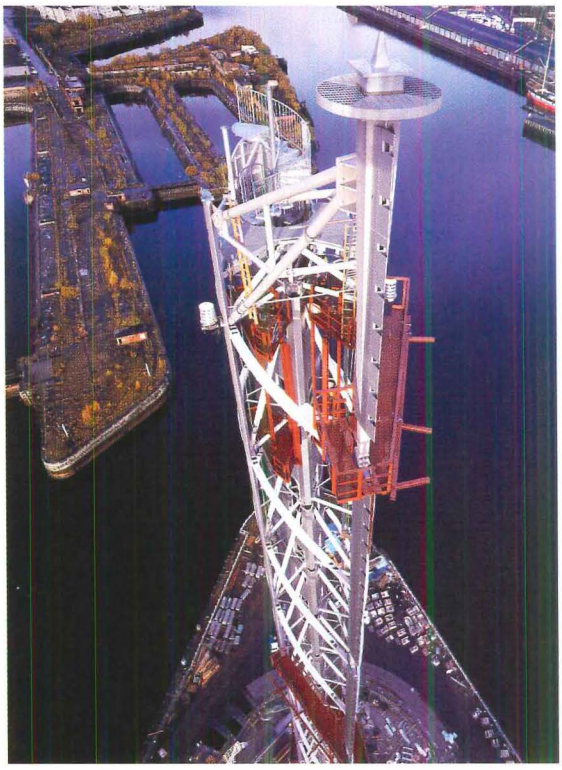
Buffeting of the tower is caused by fluctuations in wind velocity and direction. Wind-tunnel simulations determined that buffeting could cause the tower to deflect unsteadily, causing dynamic accelerations, which would be felt by visitors. The engineers settled on a criterion that accepted a maximum frequency similar to a fair or subway ride. However, studies show that while people accept movement in transportation, movement in buildings is disturbing. Buro Happold advised the client that there will probably be six days a year in which the tower will have to be closed due to high winds.

Two airfoils flank a central tower shaft.

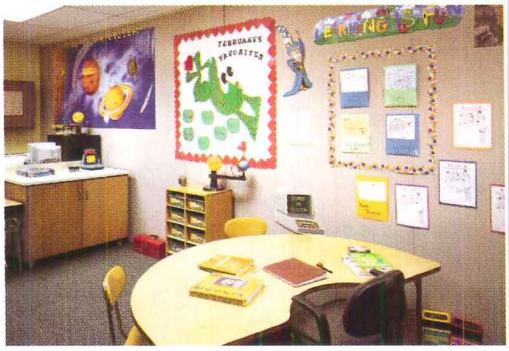
Making it happen

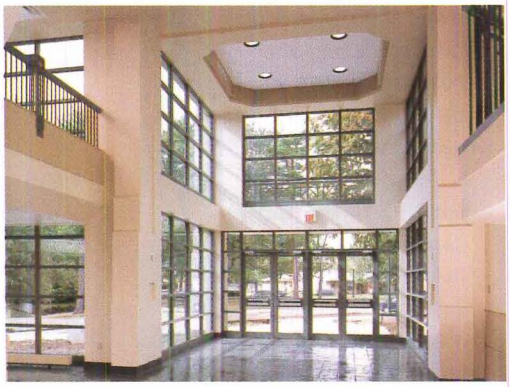
Because the project had so many special conditions, the overall construction management was awarded to Carillion Ltd. Individual packages, including steel work and mechanical systems, were bid separately, with Carillion constructing the foundations and concrete work. The tower opens to the public this month. Images of the entire science center and ongoing activities can be viewed at www.gsc.org.uk.

Sara Hart



The Glasgow Science Center tower rises to 462 feet, with a viewing cabin at the 330-foot mark.





USG presents

A COMPARATIVE GUIDE: UNDERSTANDING AND SPECIFYING ABUSE-RESISTANT WALL SYSTEMS

by: Brian Golden
Director, Marketing
USG Corporation

AIA/ARCHITECTURAL RECORD
CONTINUING EDUCATION Series

Use the learning objectives below to focus your study as you read **A COMPARATIVE GUIDE: UNDERSTANDING AND SPECIFYING ABUSE-RESISTANT WALL SYSTEMS.** To earn one AIA/CES Learning Unit including one hour of health safety credit, answer the questions on page 178 and follow the reporting instructions on page 218. Or, use the Continuing Education self report form located at www.architecturalrecord.com.

LEARNING OBJECTIVES:

- Define abuse resistance in terms of three categories: surface damage, penetration and security.
- Compare the benefits of masonry and AR wall systems.
- Discuss abuse-resistance testing.
- Explain the components that make up abuse-resistant wall systems.

IT USED TO BE THAT WHEN HIGHLY DURABLE WALLS WERE DESIGNED FOR buildings such as schools, community centers or correctional institutions, cement masonry units (CMUs), cast concrete and three-coat gypsum plaster were the only viable options. While those construction methods certainly remain sound choices for some building applications, architects have far more abuse-resistant (AR) alternatives today than ever before.

Abuse resistance has evolved from a product focus (masonry, plaster) to a systems approach encompassing the entire wall construction. Today's AR systems include every construction component, from framing to finishing and decorating materials. They not only ensure that a structure's interior walls will resist damage and remain secure, but accommodate many other design and construction considerations. From reducing installation time to performance flexibility, greater aesthetics, and improved maintenance and life-cycle costs, the right AR system will meet a particular building's needs better than any one product can.

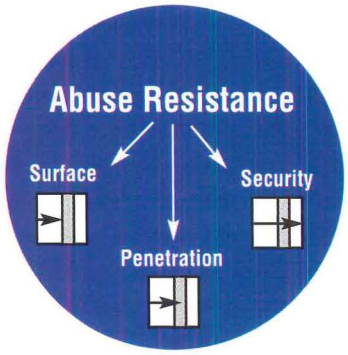
DEFINING ABUSE RESISTANCE

Before specifying a system, it is helpful to know what is meant by "abuse resistance." Although many manufacturers call products "abuse resistant," there is no industrywide definition for this concept or formal test methods by which to measure it. The American Society for Testing and Materials (ASTM) is in the initial stages of reviewing various test methods to measure abuse resistance, but until standards are established, specifiers have only the data from individual manufacturers to rely upon.

Most manufacturers strive to define abuse resistance in the same general way, but modifications to the current ASTM tests during the marketing of products make consistent comparisons difficult. When reviewing manufacturers' AR test data and product information, architects should ask:

- Are companies using current ASTM tests to measure their own products' performance?
- Do their tests represent the real-world conditions I anticipate in my project?

So what does "abuse resistance" mean? At the most fundamental level, abuse resistance can be defined generally as the ability of a wall to resist three primary types of harm:



SURFACE DAMAGE — Abrasion (scratching and gouging) or indentation (denting) of the wall face caused by ordinary contact with people or objects under heavy, but normal, use for a particular building. This damage is mainly aesthetically unattractive. A test that accurately replicates abrasion on AR products is the granual embedment test, where a weighted steel brush is cycled over a product sample until a measurable level of damage is observed. For indentation testing, the Universal Impact Tester replicates typical denting with a rounded punch.

PENETRATION — Impacts that penetrate the wall surface and enter the wall cavity causing damage such as holes or cracks that are unsightly, costly to repair and potentially dangerous. Hard-body impacts result from direct, concentrated contact with a tool or other hard object; soft-body impacts result from bodily contact with a building's human occupants. A Swinging Ram Impact Penetration apparatus is an excellent tool for testing penetration, for it tests both hard- and soft-body impact in a way that replicates real-life conditions.

SECURITY BREACHES — Forced entry or escape that causes significant wall damage or destruction and breaches the safety of a high-security building. The U.S. Department of State has the most stringent forced-entry tests.

Damaged walls can occur in any building, of course, but are commonly found in the following types of facilities:

INSTITUTIONAL	COMMERCIAL	RESIDENTIAL
Education	Hotels	Multifamily
Health Care	Restaurants	High-Rise Public Housing
Life Care	Stores	
Detention	Shopping Malls	
Government	Airports	
Museums	Banks	

Surface damage is typically found, for example, on the walls of offices, hotel lobbies, restaurant dining rooms and medical clinic waiting rooms, among many other locations. It's caused by repeated contact with passersby, luggage, food or mail carts, vacuum cleaners, furniture, etc.

Penetration-type damage is typically found on the walls of hospital corridors or emergency rooms, high school gymnasiums and locker rooms, an apartment building's common hallways or a loading dock, among other heavily used places. It's often caused by impacts from gurneys or other equipment, or strikes from a tool such as a hammer.

Damage from security breaches is usually a concern for buildings where it is important to prevent someone from deliberately and completely breaking through a wall. Examples could include prisons, military installations, embassies, art museums and bank or jewelry-store vaults.

Once architects are clear about the types of buildings typically needing AR systems and the level of damage that usually occurs in various areas of those facilities, they should consider the following issues related to their project:

- **DESIGN REQUIREMENTS.** Would AR systems incorporating framed walls be more desirable to accommodate electrical and plumbing lines, as well as telecommunications and computer cables? Will weight and space limits require lighter, thinner walls? Will the spaces likely be remodeled in the future, requiring the relocation of walls?
- **FIRE AND ACOUSTICS STANDARDS.** AR systems offer fire resistance and sound control to varying degrees, depending on their components. Select the system that best meets specific project concerns.
- **CONSTRUCTION VERSUS LIFE-CYCLE COSTS.** While the tendency to focus on the initial cost of materials is a heavily weighed factor, specifiers should consider all the benefits an abuse-resistant system provides over the long term, including its design flexibility and ease of maintenance. Unexpected factors can come into play here: panel-based systems, for example, are much more easily altered or moved and are much easier to repair than masonry, which can be damaged and is difficult to repair to an aesthetically pleasing appearance.
- **AVAILABLE LABOR.** The lack of certain tradesmen in some regions may preclude the specification and use of plaster-based AR systems, but could leave open the option to use engineered panel systems that drywall installers and finishers could complete.
- **AESTHETICS.** While the surfaces of CMUs and cast concrete may be acceptable in some environments, AR systems that produce a smoother, more monolithic surface may be required or more desirable for certain projects.

COMPARING AR MATERIALS

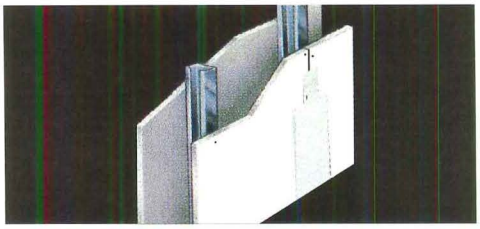
Viewing abuse resistance as a design consideration gives the specifier flexibility in tailoring the application to meet varying client needs. Understanding how various materials perform aids in choosing the right AR system for a particular client.

Masonry has been widely used for years to construct abuse-resistant walls. While it resists all three types of damage, masonry is not immune to abuse and may pose certain construction and maintenance challenges. Compared to various partition-wall systems, masonry also weighs considerably more and occupies more space. All of these factors reinforce the need to view abuse resistance in terms of the structure, the spaces within and their intended use.

Partition-wall AR systems are composed of one or more materials to achieve light-to-extreme levels of abuse resistance. Abuse-resistant drywall, engineered panels (such as gypsum wood fiber panels), veneer plaster, and conventional plaster and lath are the products most commonly specified for abuse resistance. Veneer plasters (the harder the plaster the better), engineered panels without face paper or laminate-faced panels combat abrasion best. Indentations are avoided with systems that incorporate panels with increased core or surface hardness. Penetration resistance is achieved by adding mass (usually through using layers of panels) or by using panels with improved core strengths or a reinforced backing of Lexan® (a polycarbonate material) or mesh.

A weighted swinging ram replicates "real-world" conditions by simulating the direct-concentrated impact of a tool or hard object against a wall system.

ABUSE-RESISTANT SYSTEMS



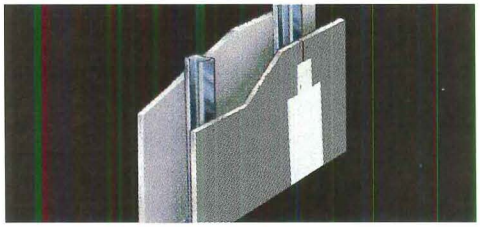
LIGHT-DUTY UPGRADE

Abuse-resistant gypsum panels provide a light-duty upgrade for surface damage and penetration resistance.

System components:

$^5/_8$" Type X paper-faced abuse-resistant gypsum panel, setting-type joint compound, paper tape; minimum $2^1/_2$" 20 ga. metal framing spaced 16" o.c. maximum.

Provides 1-hour fire-resistance rating.



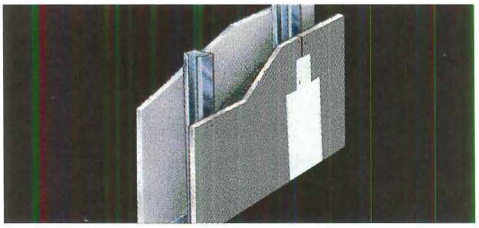
LIGHT- TO MODERATE-DUTY UPGRADE

Engineered gypsum fiber panels provide a light- to moderate-duty upgrade for surface damage and penetration resistance.

System components:

$^5/_8$" Type FRX engineered gypsum fiber panel, setting-type joint compound, paper tape; minimum $2^1/_2$" 20 ga. metal framing spaced 16" o.c. maximum.

Provides 1-hour fire-resistance rating.



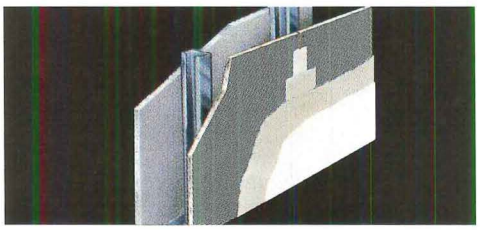
MODERATE- TO HEAVY-DUTY UPGRADE

Engineered gypsum fiber panels with mesh reinforcement provide a moderate- to heavy-duty upgrade for surface damage and penetration resistance.

System components:

$^5/_8$" Type FRX engineered gypsum fiber panel with mesh reinforcement on back, setting-type joint compound, paper tape; minimum $2^1/_2$" 20 ga. metal framing spaced 16" o.c. maximum.

Provides 1-hour fire-resistance rating.



HEAVY-DUTY UPGRADE

High-impact-resistant engineered gypsum fiber panels covered with high-strength veneer plaster basecoat and finish provide a heavy-duty upgrade for surface damage and penetration resistance.

System components:

$^5/_8$" Type FRX engineered gypsum fiber panel, setting-type joint compound, paper tape, high-strength gypsum veneer basecoat plaster (3,000 psi), high-strength non-lime gypsum finish plaster (3,000 psi); minimum $2^1/_2$" 20 ga. metal framing spaced 16" o.c. maximum.

SPECIFYING SYSTEMS

When looking at a structure and the spaces within, defining a building's intended use and prioritizing its AR characteristics will lead naturally into the specification process. Given recent revolutionary changes in the technology of abuse-resistant products and systems, including the latest wood fiber engineered panels, architects have more flexibility than ever before in choosing a system that will perform well for a specific project.

In the case of light-duty applications such as retail public spaces and primary grade classrooms, a variety of $^1/_2$-inch abuse-resistant drywall panels is available. They offer increased resistance to surface abuse and impact for just cents more per square foot over standard $^5/_8$-inch drywall and still require joint treatment finishing only. Engineered wood fiber panels in $^1/_2$-inch and $^5/_8$-inch thicknesses go up much like drywall, require joint-treatment finishing only and offer even more surface and penetration protection for light-duty applications. Finishing certain AR panels with a one-coat veneer plaster also offers an upgraded, smoother surface and slightly more abrasion and penetration protection in this category.

Moderate-duty systems are appropriate for stairwells, common areas of multifamily housing and high school classrooms, for example. They provide moderate resistance to incidental impact and abrasion at a slightly higher cost than light-duty systems. For walls finished with joint treatment only, $^5/_8$-inch wood fiber panels designed for very high impact provide markedly more penetration resistance than comparable options at this level. Other moderate-duty systems include AR panels finished with one- or two-coat veneer plaster, the latter providing significantly more resistance to abrasion.

For heavily used areas such as dormitories, health care facility corridors and loading docks, walls must resist intentional and heavy surface and impact damage. Two-coat veneer plaster systems over very high impact wood fiber panels or two layers of AR drywall panels and an AR veneer plaster face will provide substantial abrasion, indentation and penetration resistance for $1^1/_2$ to two times the cost of standard drywall. Again, assessing the type of heavy-duty use allows specifiers the freedom to tailor an AR assembly to meet the project requirements.

For the most demanding applications — security-related facilities such as jails, currency exchanges and art galleries — AR systems that incorporate specially formed steel sheets and high-strength plasters provide greater penetration and abrasion resistance than 8-inch core-filled CMUs. This type of AR system also supports the weight of wall-mounted sinks and beds, as well as heavy artwork and shelving. Additionally, these systems can weigh nearly one-third of what CMU walls do and take up less than half the space, which are important considerations in buildings with multiple floors or smaller rooms. At the point when these systems' steel sheets are erected, the walls also allow for easier installation of plumbing and electrical lines, much like cavity stud partitions. As a result, they indirectly reduce costs for plumbing and electrical installation.

THE FINISHING TOUCH

The desired level of finish also may help dictate the type of AR system chosen for a project. The corridors of a correctional facility or school, for example, may require only the most basic of finishes. However, the abuse-resistant walls of an office building lobby or retail store may require a more highly polished look.

Paint or various coatings can decorate masonry walls, but will not provide a smoothly finished surface. Plaster-and-lath systems provide a monolithic surface that is then painted.

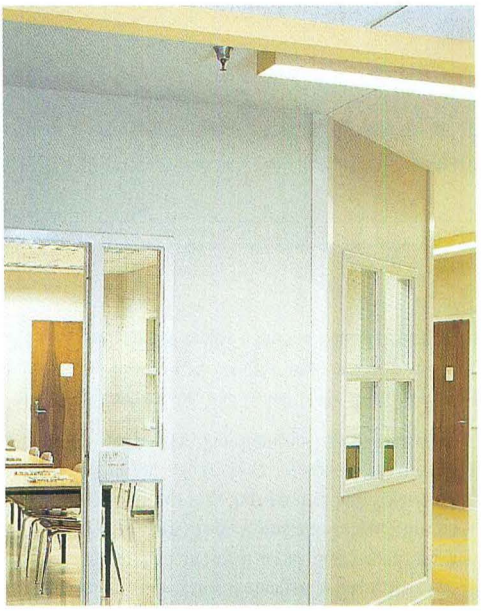
Panelized systems can be finished to a high level with paint, veneer plaster or wallcoverings for a more sophisticated look.

A WORD ABOUT CEILINGS

Architects should not overlook their projects' ceilings when considering abuse resistance. From students impaling pencils in ceiling panels to accidental damage done by maintenance crews, ceilings can be subject to scratches, dents and penetrations just like walls. Drywall is usually the best choice for designing abuse-resistant ceilings. It is typically attached using traditional furring methods or via engineered suspension systems. For smaller areas, gypsum board panels also can be installed directly to metal studs. However, drywall may not provide the access or sound control desired.

For suspended ceiling systems, the most durable panels are cast products, which are formed and cured in a mold. They are harder and resist damage better than standard acoustical panels. And since their color is uniform throughout the panel, rather than simply painted on the surface, nicks are less visible. Cast-manufactured products are available in a variety of patterns.

CASE STUDIES

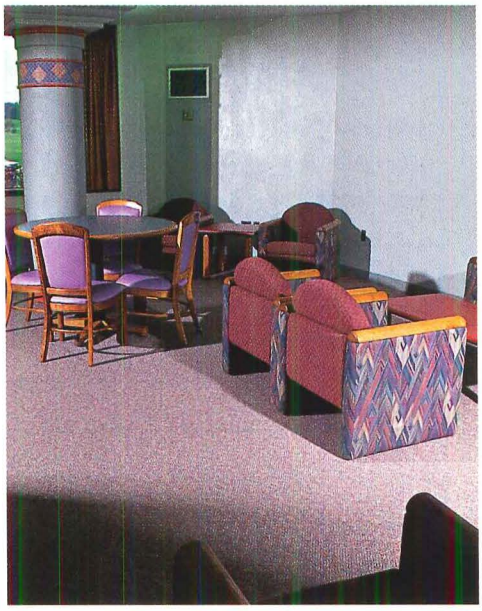


SCHOOL OPTS FOR WOOD FIBER PANELS OVER CMUS

When architect Spencer Armour of Memphis-based Braganza Associates P.C. designed the Sacred Heart Catholic School in Southaven, Miss., he knew the 55,000-square-foot project required abuse-resistant walls, but needed to contain costs and allow for future room configurations as well. So, instead of using concrete block, he opted for FIBEROCK® Brand Abuse-Resistant Panels from USG Corporation. They provided the necessary durability for the gymnasium, corridor and cafeteria walls, and created movable wall partitions with a monolithic appearance. "Most importantly, the square-foot cost of using FIBEROCK was at least half the cost of building with concrete block," said Armour.

SECURITY WALL SYSTEM IS JUDICIOUS CHOICE

Walls that stand up to forced entry and ballistics were crucial for a new criminal courts building in the Broward County Judicial Complex in Fort Lauderdale, Fla., especially for the holding cells and passageways. Project designer Carlos Marciales of Michael A. Shift & Associates, Inc., (Fort Lauderdale) chose the STRUCTOCORE™ Security Wall System from USG Corporation for its security-level durability and more. The system's specially formed steel sheets and high-strength plasters create walls that are nearly 40 percent thinner than concrete block. "We saved a lot of labor time, and the walls weighed significantly less," said Marciales, whose firm pioneered STRUCTOCORE's use in the project's elevator shafts.



PLASTER SYSTEM STANDS UP TO ADOLESCENT ENERGY

The adage "Time will tell" certainly applies to the performance of walls at Hillenbrand Hall, a 300,000-square-foot, $3 million dormitory built six years ago at Purdue University, West Lafayette, Ind. "We built these walls to last," said John Richardson, the dormitory's manager. Instead of using less expensive drywall, the school invested in a three-coat plaster system comprising STRUCTO-BASE® Gypsum Plaster and RED TOP® Keenes Cement from USG Corporation for attractive yet durable walls. Six years later, Richardson comments, "We haven't performed any maintenance but painting on these walls. They'll probably last for decades before needing resurfacing."

MORE SOURCES OF AR INFO

To learn more about abuse resistance and obtain details on specific products and systems, there are several places to which architects and builders can turn. Look for continuing education seminars on the topic sponsored by organizations such as the American Institute of Architects. Manufacturers of AR systems, such as USG Corporation, which has worked extensively over the last 20 years to develop abuse-resistance guidelines, offer seminars, technical brochures and guidelines on the topic. Also visit the Web sites of gypsum product manufacturers and masonry companies, where specifiers often can find special sections devoted to abuse resistance.

ABOUT USG

USG is a Fortune 500 company with subsidiaries that are market leaders in their key product groups: gypsum wallboard, joint compound and related gypsum products; cement board; gypsum fiber panels; ceiling tile and grid; and building products distribution. The company offers a range of abuse-resistant wall systems featuring use of SHEETROCK® Brand Gypsum Panels, FIBEROCK® Brand Abuse-Resistant Panels, veneer plasters and plasters.

For more information about the company's abuse-resistant systems, write USG at P.O. Box 806278, Chicago, IL 60680-4124, call USG's Customer Service Department at 1-800-USG-4YOU or visit the company's Web site at www.usg.com.

LEARNING OBJECTIVES:

- Define abuse resistance in terms of three categories: surface damage, penetration and security.
- Compare the benefits of masonry and AR wall systems.
- Discuss abuse-resistance testing.
- Explain the components that make up abuse-resistant wall systems.

INSTRUCTIONS:

Refer to the learning objectives above. Complete the questions below. Then turn the page upside down and check your answers. Fill out the self report form on page 218 and submit it or use the Continuing Education self report form on *Record's* web site - www.architecturalrecord.com - to receive one AIA/CES Learning Unit including one hour of health safety welfare credit.

QUESTIONS:

1. What is meant by the term "abuse resistance?"

2. What components are used for resisting different amounts of abuse in AR systems?

3. What is the most abuse-resistant type of ceiling material?

4. What are the advantages of AR wall systems over masonry construction walls?

5. What finishes are available for abuse-resistant applications?

ANSWERS:

1. Generally, abuse resistance is defined as the ability of a wall to resist harm from an abrasion that damages the surface of the wall, an impact that penetrates the wall surface and a penetration that causes significant wall damage and breaches the security of the building.

2. For light-duty, AR drywall panels, drywall panels with improved face paper and engineered wood fiber panels are available. For moderate-duty, wood fiber panels designed for high impact or AR panels with veneer plaster or laminate-faced panels are available. For heavy use, these AR wall systems can be used together, such as a two-coat veneer plaster system over high-impact wood fiber panels or two layers of AR drywall panels and an AR veneer plaster face. In security applications, AR systems can incorporate high-strength plaster reinforced by steel sheets or concrete block.

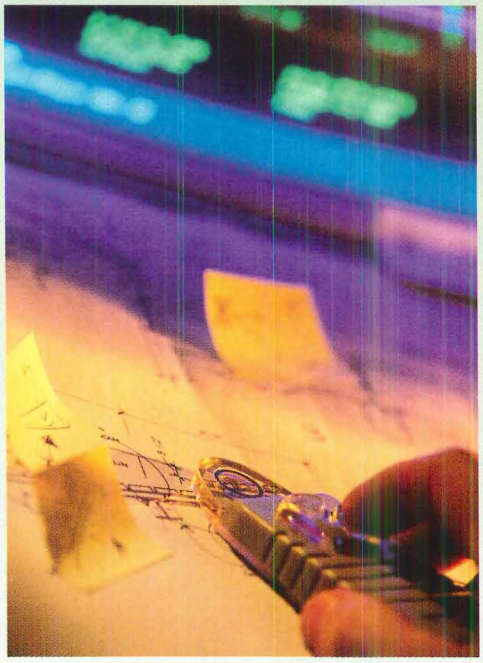
3. Commonly, ceilings are acoustical panels on a suspended grid. These usually have a painted surface and are easily damaged. The panels can be made abuse resistant by using more durable cast products with color throughout the panel so that scratches are less visible. Abuse resistance is highest when ceilings are made of gypsum board panels, which can be attached on furring strips directly to ceiling rafters, or through suspension systems.

4. Traditionally, masonry walls were used for resisting abuse, either surface damage or penetration. Masonry has the added advantages of being fire resistant and the materials are available and inexpensive. However, the development of AR wall systems offers advantages over masonry. Most noticeable is the weight difference; masonry weighs five to eight times more than AR wall systems of drywall, wood fiber or veneer plaster. A second advantage is the construction time. While masonry requires a 60- to 90-day curing time during the construction process, AR wall systems are brought to a job site ready to install with only a joint treatment necessary for finishing. The next critical element is labor. Masonry labor has become specialized, difficult to find in some areas and expensive. Masonry construction also requires water availability and constant temperature levels. The other advantages of AR wall systems are that they require less floor space and they can reduce the cost of plumbing and electrical installation while providing better abuse resistance for abrasion and penetration than concrete masonry units.

5. Abuse-resistant finishes can be left basic, finished with a paint coating or covered with plaster. Plaster applied to the wall surface gives a smooth finish that can be painted or wallpapered to give a more sophisticated appearance.

THE DIGITAL PRACTICE

Tech stocks may be in retreat, but technology is still marching forward.



Three years ago, it seemed like anyone with a Web site, a PowerPoint presentation, and a half-baked idea for an e-business was virtually assured start-up funding. Over the past year we've witnessed the demise of this gold-rush Zeitgeist. Technology stocks took a nosedive, and thousands of New Economy workers have been released into the murky waters of unemployment. The list of companies that have cut back their staffs reads like a Who's Who of the digital age: Motorola, Cisco, Dell, Lucent...

This right-sizing, however unfortunate for its casualties, had long been predicted. From a consumer's standpoint, the good news is that today's leaner, wiser technology companies have more incentive than ever to offer products that are powerful, flexible, and user-friendly.

In this month's digital practice section, we examine software developed because users demanded it, and tools that have been substantially improved based on user feedback. A major CAD company will soon offer a software package that lets you save your hand-drawn sketches electronically—a real boon to architects who prefer pencil and paper to keyboard and mouse (and there are lots of you out there). The Department of Energy has released a next-generation tool for predicting a building's energy consumption, just as owners are increasingly anxious about rising energy costs. Finally, our feature describes how architects, frustrated by the distortions that occur when CAD drawings are sent electronically, can use PDF files—long a staple in publishing houses—to preserve the appearance of their documents.

Don't mistake today's uncertain climate for tentativeness. There are still plenty of people writing software code and developing hardware standards. Unlike the Bush administration on carbon dioxide emissions, digital technology isn't going to reverse course. It's just at a necessary turning point on the road to improvement. *Deborah Snoonian, P.E.*

PHOTOGRAPHY: © STONE/ZIGY KALUZNY

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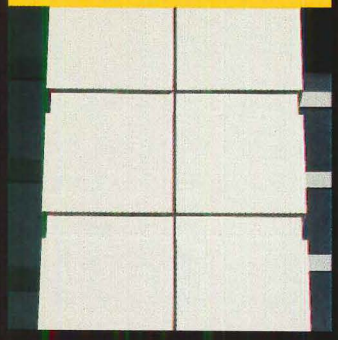

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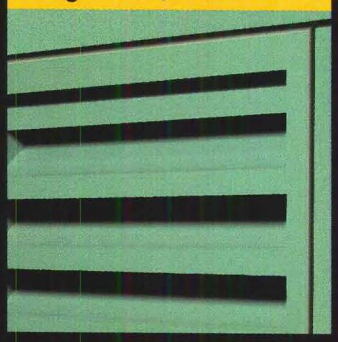
Integrated C/S Louvers



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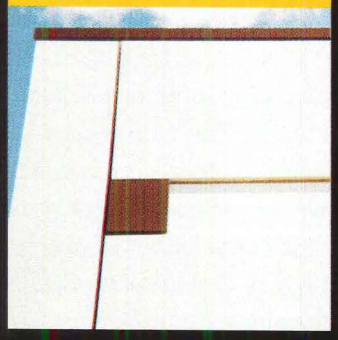

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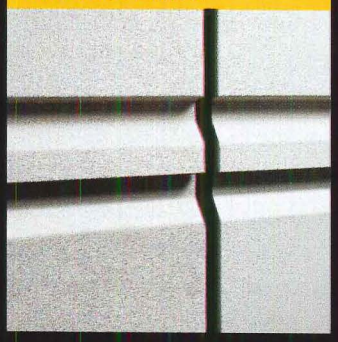

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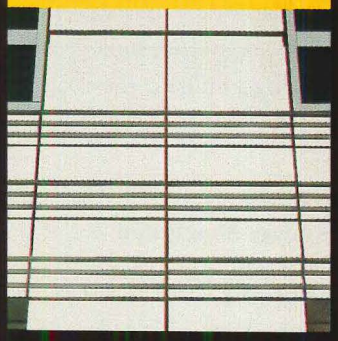

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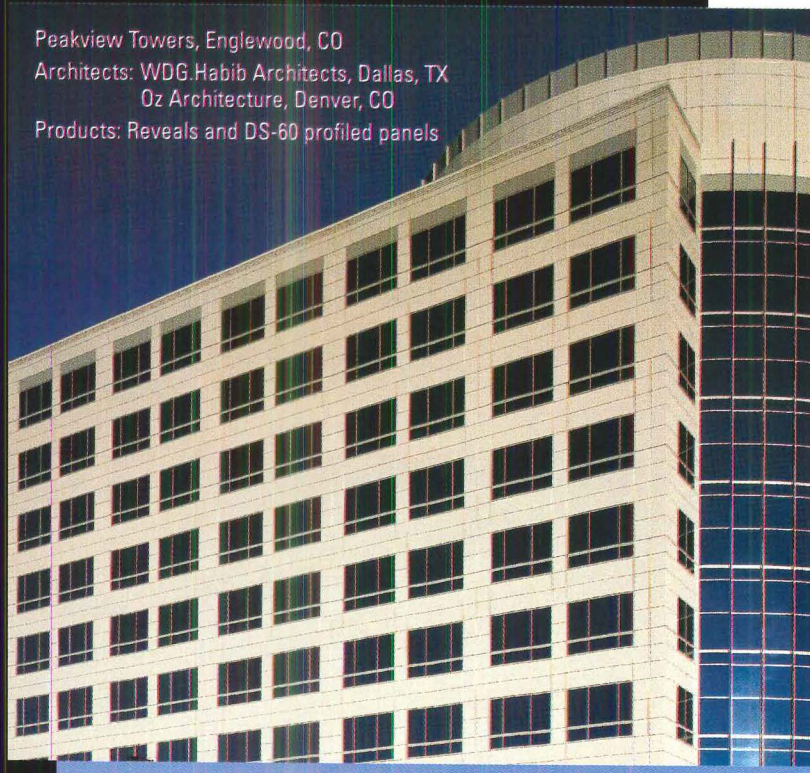

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Digital Briefs

Department of Energy Unveils EnergyPlus • Autodesk's New Design Software Lets Architects Take Back Their Pencils and Trace Paper

New energy simulation software improves features of old tools and offers more flexibility

For over 20 years, design professionals have turned to DOE-2 [see Digital Architect, page 195], the Department of Energy's (DOE) flagship tool, to predict the energy performance of buildings. Those working on military projects relied on BLAST, the Department of Defense's (DOD) comparable program. In April, however, DOE released the first version of EnergyPlus, a new simulation tool that combines the best of DOE-2 and BLAST while offering more flexible and advanced features of its own.

What's new?

EnergyPlus essentially consists of three main parts: an overall simulation manager, which controls the entire simulation; a heat and mass balance engine, which calculates thermal and humidity conditions of the proposed design; and a building systems simulation manager, which oversees the proposed mechanical and electrical systems.

Unlike BLAST and DOE-2, EnergyPlus relies on an integrated simulation process that gives more accurate predictions of room temperature. At user-specified time intervals, heating and cooling load are calculated and submitted to the building systems simulation manager. In turn, the mechanical and electrical systems immediately respond to these loads. If some portion of the heating or cooling load can't be met by the proposed building systems, the temperature of the space adjusts accordingly when thermal conditions are recalculated at the next time interval. This is an improvement over DOE-2 and BLAST, both of which use sequential simulation, in which heating and cooling loads for all time intervals are calculated first, before they're passed on to the building systems. This method provided no opportunity for feedback and adjustment between temperature calculations and the HVAC's response. And, unlike BLAST and DOE-2, which allow only hourly time steps, EnergyPlus permits users to select time increments between load calculations that are most appropriate for the evaluation at hand.

Like BLAST, EnergyPlus calculates loads according to the heat-balance approach, which is more accurate and complex than the room-weighting-factor approach used by DOE-2. The heat-balance approach is a more robust calculation method requiring faster processing times than were available to most people when DOE-2 was originally developed.

EnergyPlus also allows designers to configure HVAC systems by connecting air and water loops that simulate ducts and pipes to appropriate equipment components, such as diffusers, VAV boxes, and radiators. BLAST and DOE-2 users are limited to preconfigured mechanical systems. The new program promises other features as well, ranging from moisture absorption and desorption calculations to window-shade simulations.

Simpler code

Because DOE-2 and BLAST were developed over time by many researchers, they suffer from "spaghetti code," in which threads of data and subroutines for a particular type of energy simulation weave through the program. Only experienced researchers can make modifications to this tangled set of instructions. In contrast, EnergyPlus exhibits an organized and modular structure that can be easily modified, expanded, or linked to other software tools.

One temporary hitch is that EnergyPlus doesn't yet have a truly user-friendly interface. DOE hopes third-party developers will furnish this piece, as they did for DOE-2. Eley Associates of San Francisco (www.eley.com), which created the VisualDOE interface for DOE-2, intends to provide a similar graphical interface for EnergyPlus.

Confidence with prudence

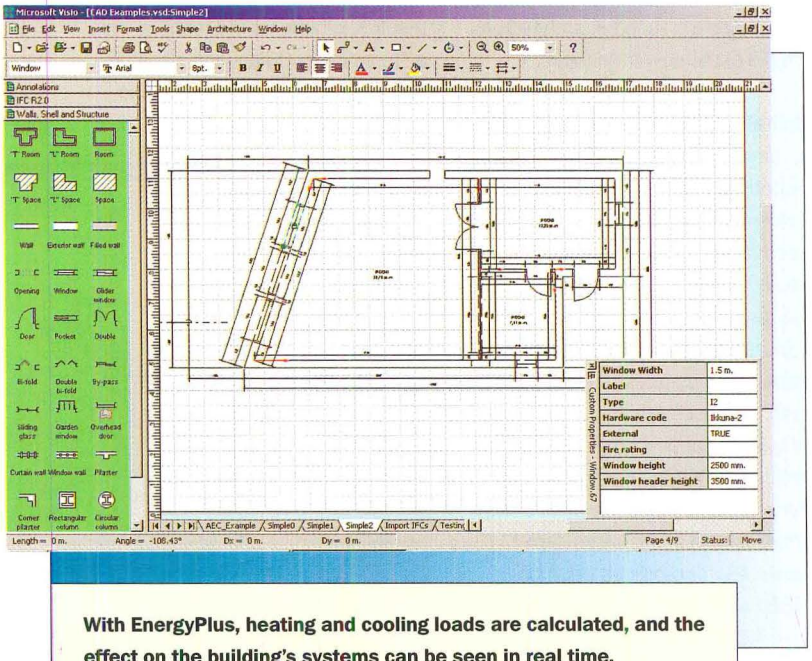
Users of EnergyPlus have expressed the usual mix of enthusiasm and caution that accompanies new software releases. "The algorithms used in EnergyPlus are superior to those of DOE-2," observes Charles Eley, FAIA, P.E. His firm will begin using EnergyPlus in its architectural consulting work; once the staff has gained enough experience with it, they will likely abandon DOE-2.

Adrian Tuluca, principal of Steven Winter Associates in Norwalk, Conn., expressed concern about long-term technical support. "In the past, funding for energy software focused on adding features to make programs more comprehensive. But commercial success lies in maintenance—fixing simple problems." If EnergyPlus is to realize its potential, says Tuluca, the government has to provide ongoing funding for such assistance.

According to architect Drury B. Crawley, AIA, manager of DOE's building energy tools, DOE will continue to support DOE-2 at least until the majority of its users migrate to EnergyPlus. (DOD ended support for BLAST in 1995.)

Version 1.0 of EnergyPlus, which runs on Windows 95, 98, and NT, can be downloaded for free at www.eren.doe.gov/buildings/energy_tools/energyplus. Check this Web site also for dates and locations of upcoming training workshops.

—Nancy B. Solomon, AIA



With EnergyPlus, heating and cooling loads are calculated, and the effect on the building's systems can be seen in real time.

Architectural Studio: Software for architects who don't use software

The future of digital design has arrived. I realize it when I enter the techno-sleek office of an architecture firm in Marina Del Rey, Calif., to watch teams of young designers and firm principals explore the features of Architectural Studio, a new program developed by Autodesk, due for release later this year. Regardless of their computer skills, the architects quickly fill screens with sketches and models—overlays and iterations of design ideas. Technical jargon is limited. Instead, there's lots of peeking over shoulders to see who's drawing what. There is collaboration. There is competition. This is not the buttoned-up, heads-down behavior of a 20th-century CAD drafting room; it is the turned-on, tuned-in architectural studio of the new millennium.

Architects, grab your pencils

In developing Architectural Studio, Autodesk has been working with leading firms nationwide, gathering feedback on the way architects really work. "This product needs to be developed by architects and others who know us and our creative and business processes well," stresses Martin L. Siefering, AIA, principal and chief information officer of Perkins Eastman Architects in New York. That sentiment recurs in firm after firm I observed: two offices each of NBBJ and SOM; Kohn Pedersen Fox; HOK; Perkins Eastman; and consulting engineers Arup.

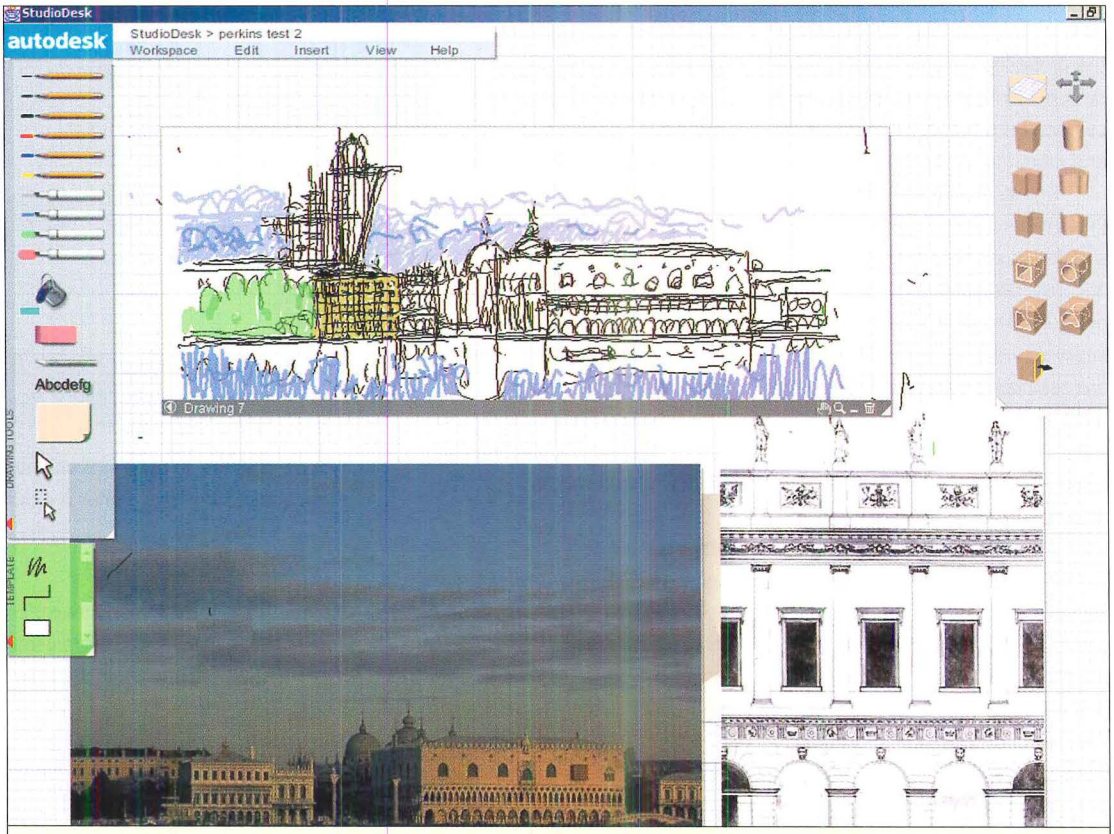
Judging by both hands-on experience and observation, I define Architectural Studio as software for design thinking. Architects think by drawing. In the hand of an architect, a 2B pencil, a thick blue china marker, or a fine camel's hair brush becomes an instrument for exploring and refining form and function, texture and proportion, light and shadow. The medium often is the familiar roll of yellow trace, overlaid on previous sketches, hard-line drawings, site plans, or aerial photos. From the loosest conceptual sketch to the most carefully considered detail, the drawing process is where design happens.

Software aids many architectural tasks—specifications, energy calculations, project management—yet many architects think that CAD, belying its acronym as computer-aided design, has done little to aid the design process. The precision and consistency that make CAD well suited to producing construction documents are at odds with the spontaneity and flexibility that architects need during schematic and design development phases. The result has been what Siefering calls a "technology divide within the profession," between those who use and those who refuse CAD.

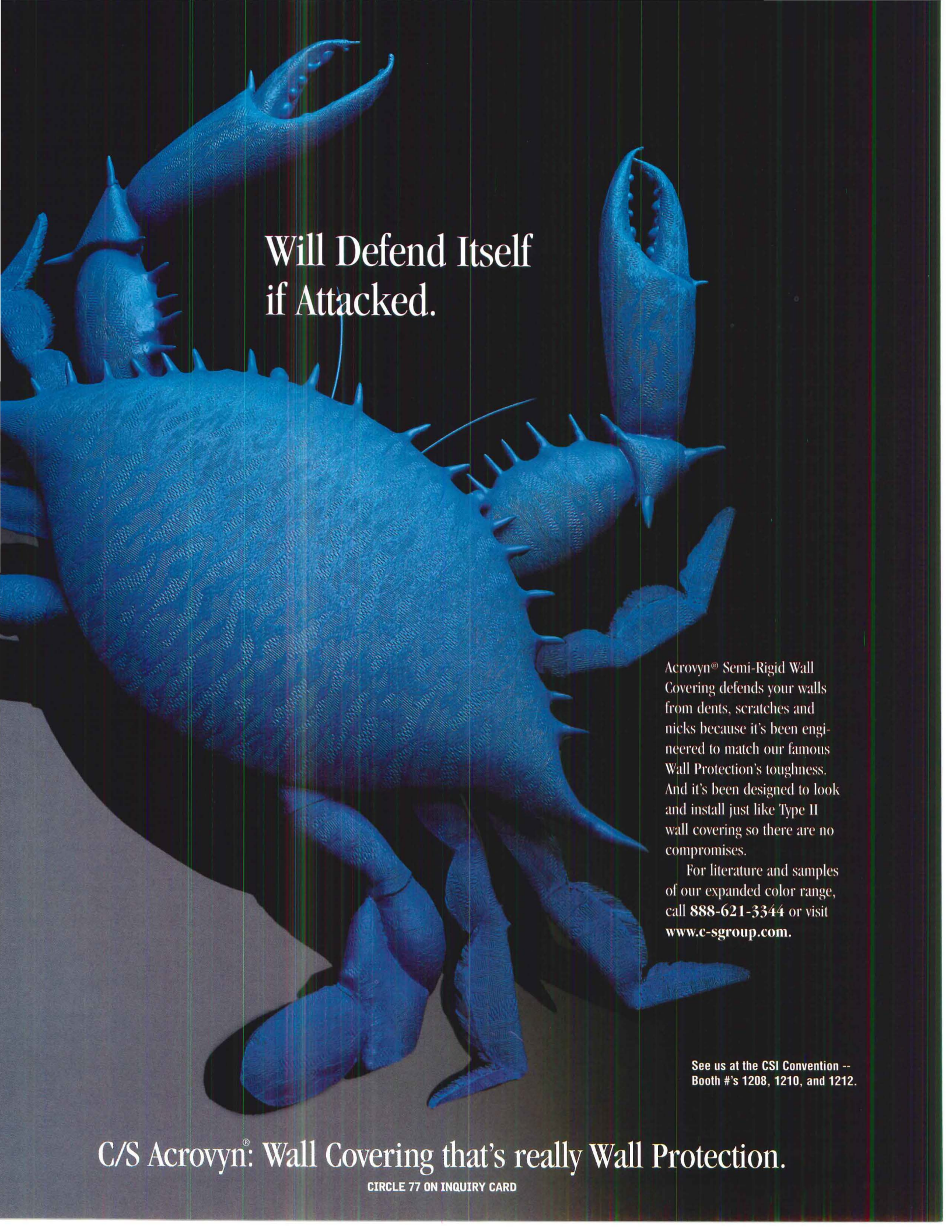
Unleashing design thinking

Many design software vendors, including Autodesk, offer 3D modeling tools as an alternative to the rigors of 2D drafting-oriented CAD. However, even the friendliest 3D modeling tools impose limitations on design thinking. With Architectural Studio, Autodesk hopes to leap over these barriers. The interface is clean and simple, paring away most of the menu and toolbar clutter of the ubiquitous Windows desktop. Instead, arrayed around a graph-paper-covered "board" are the digital equivalents of pencils, markers, erasers, and, yes, even yellow trace. Select any virtual tool and use it to draw freehand, hard-lined (as with triangle and parallel rule), or via template-like squares, circles, and ellipses. There also is a 3D-trace mode, with its own claylike 3D tools, and the 2D and 3D tools can be mixed and matched (inserting 3D objects into 2D drawings or sketching in 2D over 3D models). Architects can work in Architectural Studio at work, at home, or in the field, and they can share their work over local area networks or on the Internet. Designs can be started in Architectural Studio and later handed off for further development and refinement in CAD, as well as the reverse: CAD drawings can be imported into Architectural Studio for the digital equivalent of a "desk crit," but with every design stroke captured in the computer.

As seen in mid-development during April 2001, Architectural Studio holds great promise for extending the usefulness of software into early-phase design exploration and late-phase design communication, areas where effective software has been lacking. However, Autodesk faces a tough challenge: build in enough technical rigor to make the finished product useful, yet continue to shield non-CAD users from intimidating complexity. Siefering emphasizes "focusing on keeping the technology simple, flexible, and in tune with design process." If Autodesk can deliver on that promise, working "in the Studio" will take on a whole new meaning. *Jerry Laiserin, FAIA*



Architectural Studio by Autodesk provides digital equivalents of familiar drawing tools, such as tracing paper, pens, and pencils. Designers with no CAD experience can work directly in 2D or 3D, with sketches, prints, or photos.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Preserve your work in PDFs

Conveying architectural documents electronically can cause problems with graphic appearance. With Portable Document Files (PDFs), you can combine graphics, text, and even sound and video without losing your looks.

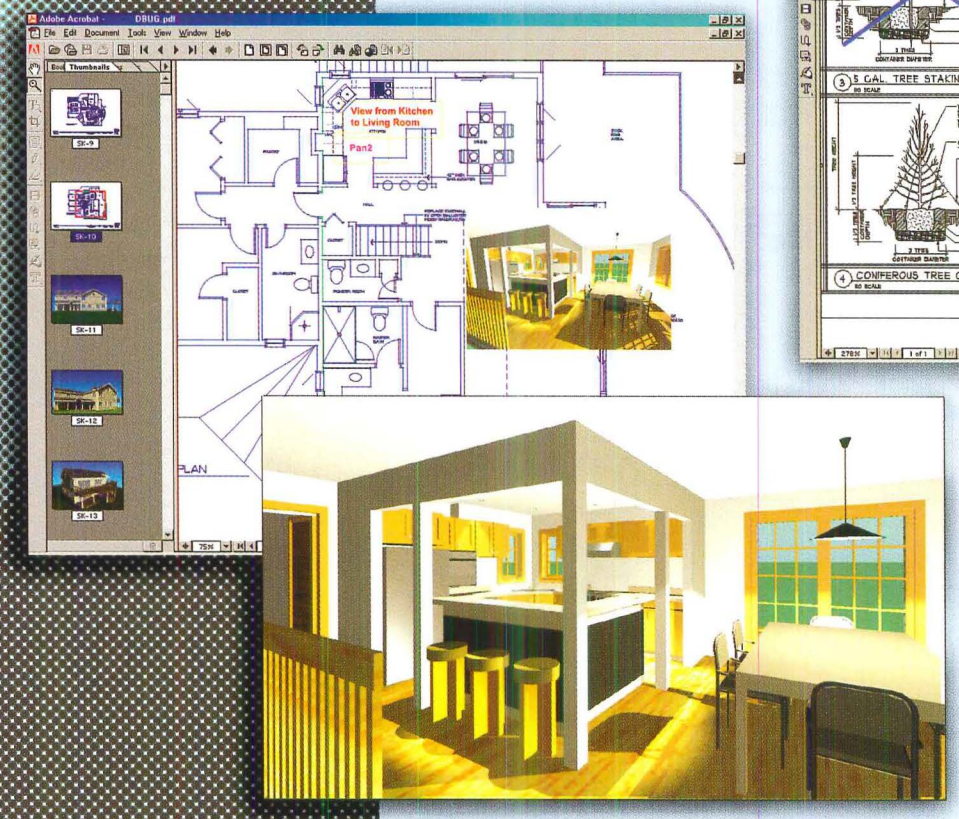
By Evan H. Shu, FAIA

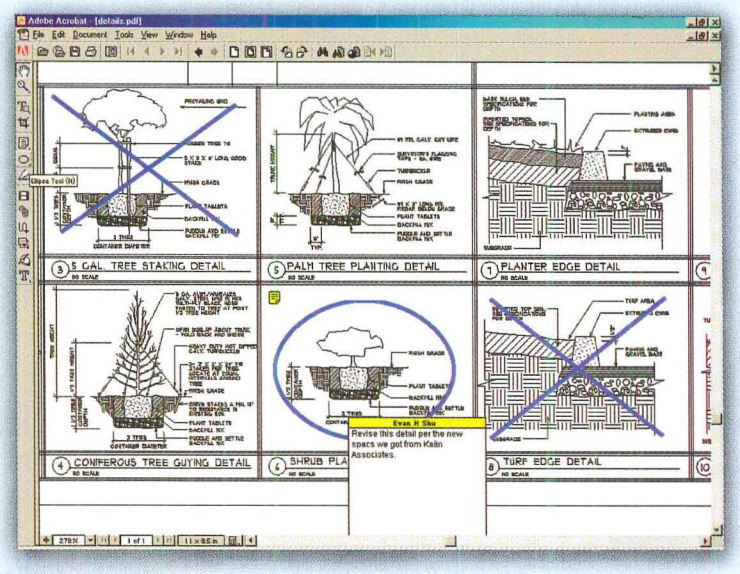
Architects have always valued the appearance of their design documents as a visible sign of style and competence. In recent years, CAD software has improved tremendously, giving architects more control over the appearance of their work. Nowadays, architects face the problem of preserving that appearance when documents are transmitted via e-mail or posted on Web sites. One graphic format, known as portable document file, or PDF, has become a popular and flexible solution for architects and clients alike.

The format problem

At the heart of many graphic problems is the difference between *raster graphics* and *vector graphics*. Raster (or bit-mapped) graphics are composed of individual "dots" of color, similar in appearance to a newspaper photograph viewed up close. By contrast, vector graphics are a set of instructions to the software for drawing objects; they may say, "Start a line at point A and end it at point B." Most software for creating graphics and laying out publishing material is raster-based, and documents created in these types of software are tagged with extensions such as GIF, TIF, JPG, PCX—generic open-file formats used and recognized by many types of software. Vector graphic formats are typically supported by CAD software, because they allow users to manipulate objects within a drawing more easily than other graphic formats. The file formats used in vector-based CAD programs—which have extensions such as DWG, DXF, and DC5—are often proprietary,

Evan H. Shu, FAIA, is a principal architect with Shu Associates in Melrose, Mass. He also edits and publishes Cheap Tricks, *a monthly newsletter for DataCAD users.*





Above: PDF files can be used to mark up CAD drawings and add "sticky note" review comments for digital collaborative work. Left, top, and bottom: Using PDF files, architect Ed Wolfstein, AIA, gives his clients presentations with thumbnail picture indexes and pop-up, panoramic, animated views of rooms.

used and readable solely by the software manufacturer.

When architects convey CAD documents via e-mail or post them to Web sites, they must either convert the drawing objects to a raster-based format or ensure that recipients have the right CAD software on their computers to read the files. Converting vector graphics to raster graphics is simple but can result in graphics that are visually unsatisfactory. Converting raster graphics to vector graphics is both difficult and potentially expensive, and the results aren't guaranteed to look good.

When CAD drawings are converted to raster-based file formats, lines and objects often appear grainy, jagged, or pixellated when "zoomed" on a computer screen so the viewer can make out the details. To address this problem, some architects take small "snapshot" portions of CAD drawings and save them in raster-based formats that can be viewed at full scale on a screen without graphic distortion. In either case, graphic distortions typically increase when images are printed. While CAD software manufacturers have made periodic attempts to develop file viewers that correct this problem, their efforts have either fallen short of expectations or suffered from lack of widespread distribution.

The PDF solution

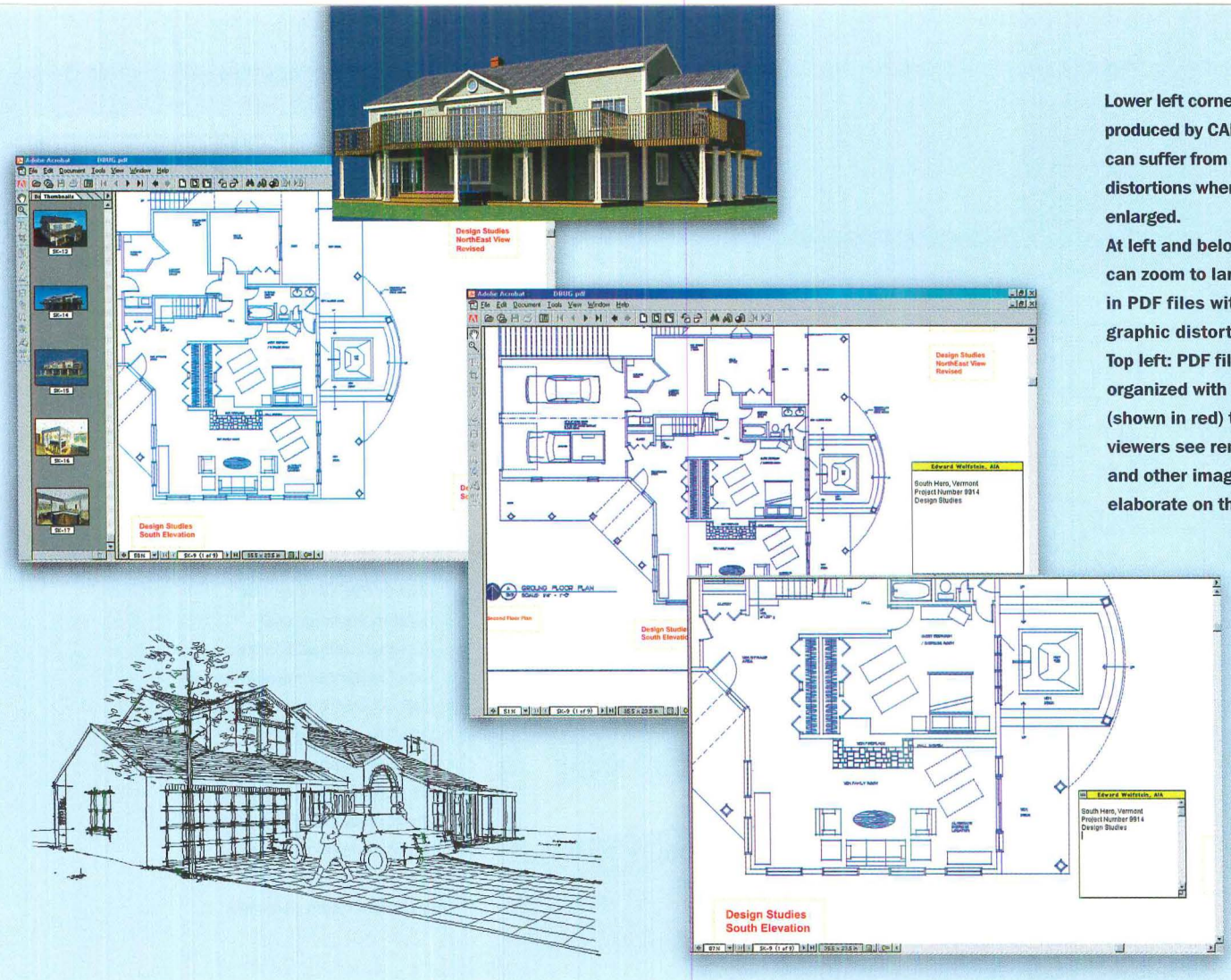
The PDF format offers one solution to these concerns. It's an alternative file format that architects can use to transmit and view documents electronically. PDF files aren't new; the publishing world has used them for years to transfer desktop publishing layouts among different systems or software. Files formatted in PDF are capable of handling multiple media—text, images, audio, and video. Within PDFs, both vector- and raster-based graphics appear intact as they were created in the original documents, even when details are viewed up close. Documents saved in PDF format will appear on a computer screen and in print at the same quality as the original documents.

Another advantage of PDF files is that it's difficult to edit their content if you don't have access to the software programs used to create the elements within them. This makes them more secure than many other file types, such as word processing or spreadsheet files, whose contents could be manipulated as they are passed from hand to hand.

To view PDF files, users must have either a Web browser equipped with a PDF reader, or separate PDF reader software such as Adobe's Acrobat Reader, available at no cost from its Web site (www.adobe.com). Most Web browsers include readers as plug-ins, so users can view PDF files by simply pointing and clicking on them like any other link, and many computers come pre-equipped with separate reader software.

Many software programs, including DataCAD 9, are now offering PDF output as a standard export option. One can also create PDF files using several different tools: for instance, a version of Adobe Acrobat made for this purpose (which is not free of charge), Jaws PDF Creator (www.jawssystems.com), or, for Macintosh users, ePrinter (www.gis.net/~dinmore/).

In response to increasing demand for file sharing and reviewing, the newest release of Acrobat allows multiple reviewers to mark up and comment on PDF files viewed via a local or wide area network or online. The new version also lets users import to or export from PDF files using rich text format (RTF), for ease of repurposing and reformatting their contents. Other new features increase the inter-



Lower left corner: Graphics produced by CAD software can suffer from pixellation distortions when printed or enlarged.
At left and below: Viewers can zoom to larger scales in PDF files without graphic distortions.
Top left: PDF files can be organized with hotlinks (shown in red) that let viewers see renderings and other images that elaborate on the design.

active nature of viewing and marking up PDF documents.

Architects who work with PDF-formatted files have seen the benefits quickly. "My clients are pleased to receive drawings in such clean, sharp detail," says Steven J. Krapek of Archisculpture Architects in San Jose, Calif. Adds Ernest Burden III, an architectural renderer in Ossining, N.Y., "Using PDFs lets you control the appearance of publications that leave your office, which is very important—like it or not, you will be judged by these." Clients have been among the biggest fans because PDF files are so easy to view. Matthew E. Hirsch of Hirsch Architects in Boca Raton, Fla., says, "Many of our clients have requested that we now send them PDFs of all drawings."

Presentation power and storage solution

Some architects use PDF files to create presentations for clients. Ed Wolfstein, AIA, of Wolfstein Architecture, in Burlington, Vt., explains, "I create hotlinks within each page of the PDF file, that, when clicked, will take you to a related document, or another part of the same document. It's like navigating a Web page." For one project, he created plans, 3-D models, and animation files, and e-mailed them as linked PDF files to his computer-savvy client. "He was able to view and comment on the designs right away, and we evolved the design together very quickly," he notes. Presenting information using PDFs also allows flexibility in pulling together multiple media to enrich the information shown in presentations. "As we become increasingly environmentally conscious, planning boards and other committees want a better understanding and visualization of proposed projects. Simple plans and elevations don't cut it anymore. Multimedia presentations are more informative," says Wolfstein.

PDFs can also be used to create archives of drawings and other documentation for completed projects, specification manuals, contract documents, and virtually any other type of documentation. The ability to embed the files with hotlinks makes it simple to create documents that are easily navigable. With Adobe Acrobat software, users can also create "sticky notes" on which review comments or annotated guides to the file's contents can be written. Thumbnail graphic images of each of the pages within a PDF file, as well as index bookmarks that can be searched by the users, also help viewers navigate a PDF document.

The security caution

By default, PDF files don't allow viewers to alter their content or format, but that doesn't mean you should throw caution to the wind when sending them electronically. When creating a PDF file, you can add digital signatures and enable security settings to prevent viewers from changing or even copying its text. Still, if security controls are lax or if a hacker wants to grab the information in the document badly enough, there are ways to circumvent these protective measures. Universal portability of documents for legitimate uses unfortunately also means easier uses for illegitimate purposes.

Still, all in all, PDF represents another major tool in an architect's arsenal. As an aid for preserving the graphic appearance of documents or as a productivity tool to enhance workflow, PDFs can be a boon to architects who want to be sure their intended messages aren't lost in digital media. ■

Digital Architect

Resources for energy design and simulation

By Jerry Laiserin, FAIA

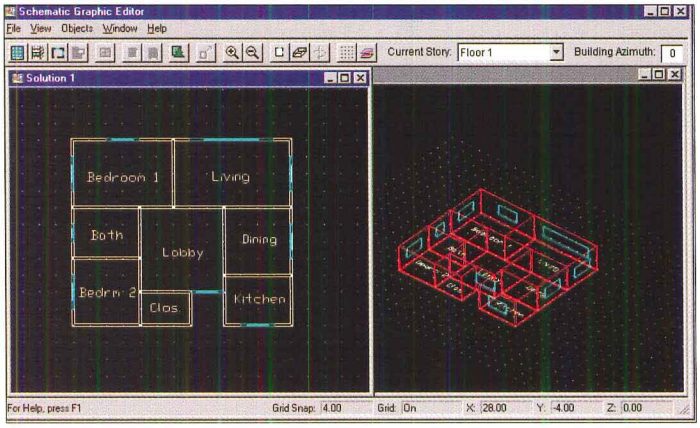
Rolling blackouts. Natural-gas shortages. Soaring prices for electricity, heating oil, and gasoline. Controversy over carbon dioxide and other greenhouse gas emissions. Competing political pressures for energy exploration versus wilderness preservation. Current headlines seem to vindicate the Malthusian doomsday scenarios of *The Limits to Growth*, by Jay Forrester, Donela Meadows, and others, one of the first computerized simulation studies of environmental economics and a precursor of today's sustainable design movement. Because buildings account for a good portion of America's energy consumption, and because energy cost is a significant component of the total life-cycle cost of every building, architects have an obligation to their clients and to society at large to design for energy efficiency and sustainability. Fortunately, there is a wide variety of resources available to help architects make better-informed decisions about the energy performance of their designs.

Design calculations

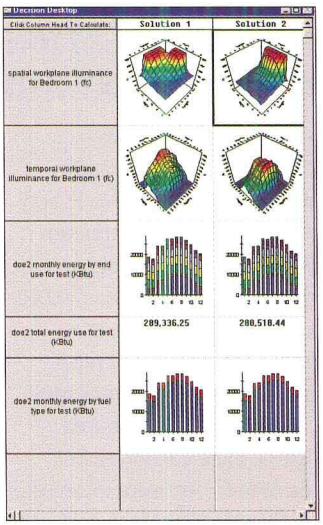
In response to the energy crisis of the 1970s, the federal government undertook multiple initiatives in the late 1970s and early 1980s to improve building energy performance. The Department of Energy (DOE), through its subcontractor, Lawrence Berkeley National Laboratories (LBNL), sponsored the development of a set of building-envelope-based energy use and cost analysis tools that came to be known as DOE-2. Concurrently, the Department of Defense, through the Army Corps of Engineers' Construction Engineering Research Laboratory (CERL), sponsored the development of its own set of whole-building analysis tools for building loads and system thermodynamics, or BLAST. By the mid-1990s, separate approaches for energy savings for civilian and military buildings no longer seemed necessary, and joint development efforts turned toward crafting a unified and enhanced tool for building energy analysis.

One criticism that had been leveled at DOE-2 and other first-generation tools was that a building's design needed to be nearly complete before a robust, full-blown energy analysis could be conducted—and yet the real opportunities to enhance energy savings occur early in the design phase, when critical decisions about site orientation, fenestration, building massing, and wall construction are still fluid. In addition, the tools were not very user-friendly. In response to these issues, joint efforts by DOE, CERL, LBNL, and others led to the development of EnergyPlus, released on April 12 of this year [Digital Briefs, page 187].

EnergyPlus is a first attempt to allow designers to simulate energy usage earlier in the design process, in a more flexible and user-friendly environment. It's not ideal in this regard, but it's a step in the right direction, considering that many of the detailed parameters needed for accurate energy simulation typically are not yet finalized in schematic design—a challenge for any software tool to address. And EnergyPlus does make it easier for novice users to enter data for simulations.



The Building Design Advisor, from Lawrence Berkeley National Laboratories, enables architects to work interactively with schematic designs and energy performance criteria.



Because EnergyPlus combines the best features of DOE-2 and BLAST, along with new features, it remains largely compatible with software that provided user-friendly input and output for DOE-2, which was generally developed by third parties. For example, Visual-DOE, from energy consultants Eley Associates in San Francisco, offers a graphical interface that eases the laborious chore of entering data about a building's climate, location, construction, operation, HVAC systems, and applicable utility rates, as required for a comprehensive energy analysis. Visual-DOE also includes graphic displays of performance parameters, such as hourly energy consumption, that make analytic results easier to understand. Visual-DOE version 3.0 is now part of a larger suite of Green Design Tools, also from Eley Associates, which includes an energy cost calculator and modules for lighting, home energy use, and others.

Another interactive front-end tool that works with DOE-2 and EnergyPlus is the Building Design Advisor (BDA), developed by the Building Technologies Department of

Contributing editor Jerry Laiserin, FAIA, provides strategic consulting services to architects and their technology providers.

WWW For more information on technology for architects, including reviews, vendor lists, and links, go to Digital Architect at **www.architecturalrecord.com**

LBNL. BDA incorporates three functions: the Building Browser for point-and-click selection of building parameters, the Schematic Graphics Editor for input of simplified building models, and the Decision Desktop for comparison of alternative energy performance scenarios. The BDA development team also created the Desktop Radiance daylighting analysis software [Digital Architect, MAY 2001, page 281]. In the future, LBNL plans to integrate Desktop Radiance with BDA's energy performance modules to create a more comprehensive green design package.

Geopraxis, based in Petaluma, Calif., has also created several DOE-2 add-on programs that work with EnergyPlus; some of these are available for free on the Web through California's public utility companies or the California Energy Commission. One such program is EDR-Charrette, available at EnergyDesignResources.com (EDR). It provides parametric what-if scenarios for analyses of retail, commercial, and educational facilities. Another of Geopraxis' free utilities, Quickee 1.0, runs as a Microsoft Excel template to simplify and manage user input to analyses done in DOE-2 or EnergyPlus. In conjunction with CAD vendor Artifice, Inc. (developer of the 3D modeler Design Workshop), Geopraxis also is exploring interactive approaches to linking CAD modeling and energy analysis.

Empirical research versus nuts and bolts

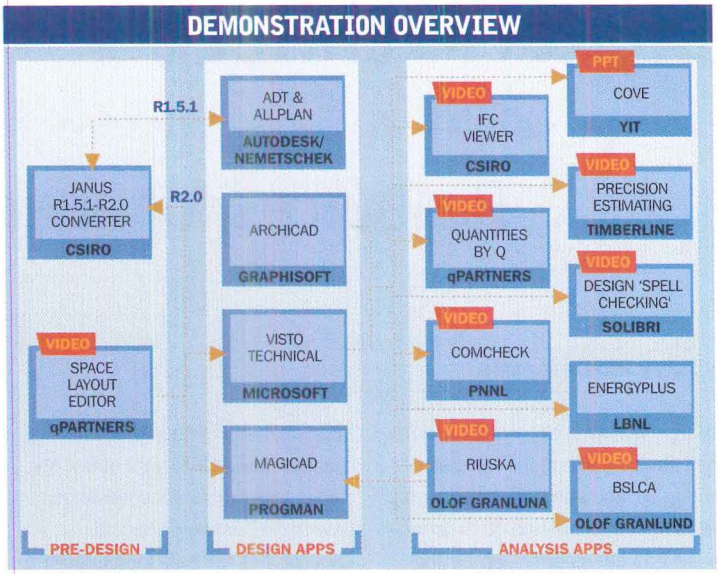
Although DOE-2, EnergyPlus, and various add-on and helper programs evaluate energy performance for specific buildings under design, much empirical research remains to be done on the nature and composition of building skin materials, which have a major impact on the environmental and energy performance. Many of these research efforts use software programs to collect and analyze information. Some of the best empirical research of this sort in the U.S. is being conducted at the Center for Building Performance and Diagnostics (CBPD) at Carnegie Mellon University. Current projects at CBPD that use digital tools include a building investment decision system (BIDS) that performs life-cycle cost comparisons of energy efficiency, waste management, and renewable resources; S2, a Web-enabled, space-based design tool, with dynamic links to different building performance simulation applications; and a self-aware building program (SAB) for so-called smart structures that monitor and document their own performance.

GREEN BUILDING RESOURCES RANGE FROM ENERGY SIMULATION TOOLS TO SOFTWARE THAT AIDS PRODUCT SELECTION.

Getting it together

A full cycle of building energy design can easily expand to three or more independent analyses, using different software and tools. Such incompatibilities and redundancies impose computational overhead on the design process, discouraging designers from bringing all the best tools to bear on each project. Interoperability, or the ability of diverse software programs to operate interchangeably on the same data or model, is targeted at this problem, and some approaches to interoperability hold specific promise for green design.

The International Alliance for Interoperability (IAI) is a global consortium of product manufacturers, software developers, and the AEC user community. Since 1995, IAI has been working on a universal set of building component descriptions, called Industry Foundation Classes (IFCs), which will allow various programs to operate on the same data in the same format. A parallel but independent group of IAI members, operating under the banner of building life-cycle integrated software (BLIS), successfully demonstrated in March 2001 multiple IFC2.0-compliant programs that shared the same 3D CAD building design model for various purposes, including energy code analysis, building performance simulation, and construction cost estimating. Participating BLIS software includes Microsoft Visio, Graphisoft's ArchiCAD, Timberline's Precision Estimating, and EnergyPlus.



Design programs such as Graphisoft's ArchiCAD and Microsoft's Visio feed building model data directly to analytic programs such as EnergyPlus.

Going green

Ultimately, efforts like gbXML will help position energy design in the larger context of green building design, which also takes into account the embodied energy of building materials—that is, the energy consumed in extracting, processing, and transporting them. On the domestic front, decision support software known as Building for Environmental and Economic Sustainability (BEES)—developed jointly in the 1990s by the National Institute of Standards Technology, the Environmental Protection Agency, and the Partnership for Advancing Technology in Housing (PATH)—helps design professionals balance the environmental and economic performance of building products. Another software tool is the Green Building Advisor (GBA), developed by the Center for Renewable Energy and Sustainable Technology (CREST), Design Harmony, and Building-Green. GBA helps designers identify techniques and technologies to reduce the environmental impact of a building project while ensuring healthy and productive indoor spaces.

Another IAI-related activity, the Building Performance Working Group has proposed a version of the Web-standard extensible markup language XML geared to the data needs of green building design. This proposed schema, or descriptive framework, called gbXML, will link 3D CAD building models directly to energy performance criteria. Initially, gbXML will connect to models created in Design Workshop by Artifice. However, because gbXML is compatible with aecXML, a wider AEC language standards effort, the green building schema eventually will work with aecXML-compliant CAD programs.

In perhaps a final irony, it may turn out that energy-consuming computer technology is what helps to keep the lights on for a sustainable future. ■

Show Me

"So Jim, how do you think our meeting with your prospective anchor tenant went?"

"Let me tell you Ned, I've been developing real estate for 30 years. The first tenant is always the hardest and these young lawyers are the toughest I've seen in a while."

"But the meeting went well, didn't it?"

"Well you certainly had all the answers for them—like when they asked about the lobby and you whipped out that 360° panoramic view. Or when they made that comment about the last time they moved. Their architect's documents were so messed up they didn't get their space on time. That extra month cost them a bundle. Then you showed 'em how you guys do it."

"Yeah, our new software is really working for us. Ever since we dumped our old CAD system, we've been much better off. I can't believe it took us so long to make the change."

"Well, it's terrific how you guys are saving me money and helping me fill up my buildings. The way we're going, your firm will be doing our next two towers. Why should I even bother with anyone else? You keep making me look good in front of some pretty pushy tenants."

"Thanks Jim! I'm happy to hear that. Anything else I can do for you now?"

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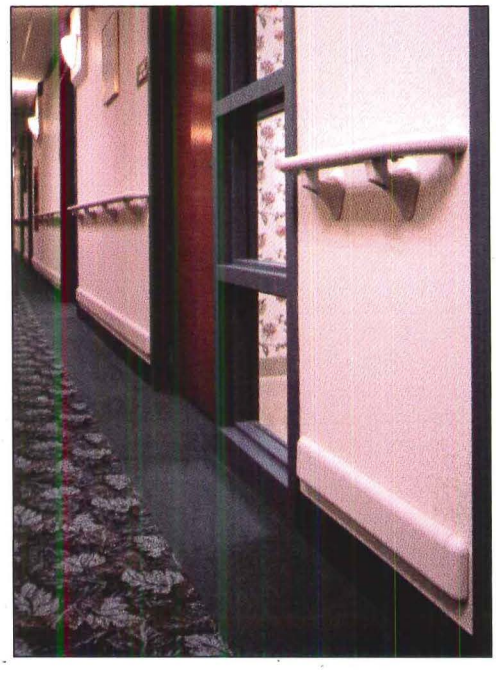

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Digital Product Reviews

Sketching made easy; managing printing costs; schedule on the go; CAD power

By Jerry Laiserin, FAIA

3D doodles

@Last Software—Sketchup

While the pros and cons of computer technology in architectural practice remain open to debate [DECEMBER 2000, page 166], one negative consequence that few question is the disruptive effect of CAD software on the visual thinking process. In nearly 40 years of development, no CAD vendor has perfected the simple technique of drawing a model in 3D by merely sketching the edges—an exercise that countless architects have practiced on countless cocktail napkins.

The CAD veterans who founded @Last Software developed Sketchup as a solution to this problem, and they have succeeded brilliantly. Sketching usable models in Sketchup's 3D interface is so easy that even rank novices can get up to speed almost immediately. This is valuable in firms where designers feel the complexity of conventional CAD interferes with their creativity, especially during the earliest preliminary or schematic phases. With Sketchup, early design thinking is easily captured in a format that can be exported to conventional CAD or to advanced rendering and visualization software. Regular CAD work can be imported into Sketchup for further study and refinement, avoiding the "round-trip problem" of lack of interoperability that plagues other modeling programs.

Sketchup isn't just for beginners. It has built-in tools for light and shadow studies, libraries of textures, and several patent-pending tricks for quickly manipulating surfaces into complex 3D shapes. For designers who resist the hard-edged look of most computer drawings, Sketchup provides a "jitter-line" mode that mimics the appearance of freehand drawing. Overall, Sketchup earns high marks for its innovative fusion of CAD-compatible modeling and cocktail napkin convenience. Highly recommended.

System requirements: Pentium 400 or better; 64MB RAM; Windows 95 and above; 20MB free hard disc space; 3D accelerated graphics card that supports OpenGL at 800x600 resolution or better.

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The paper chase

Sepialine—Argos for Windows

With the 20th anniversary of the IBM PC fast approaching, the promise of a paperless office keeps receding. Every architect with a computer and a printer or plotter understands why. Viewing, reviewing, and checking CAD drawings demands check plots or half-size check prints, because computer monitor displays are too small and blurry for inspecting design work in progress. Attorneys recommend keeping hard copies of records whenever transmitting drawings electronically. Computers make generating paperwork such as memos, reports, minutes, and calendars so much easier that these documents, too, have proliferated.

Every sheet of bond paper or square foot of vellum printed represent costs that need to be captured and attributed to an appropriate project. Whether costs are absorbed into a firm's overhead, a project budget, or reimbursed by clients, capturing those costs accurately can be a tedious chore. Busy staff members dislike having to enter elaborate project codes to print or plot documents, especially when on a deadline.

Argos for Windows offers an elegant solution to these problems. Like Jason's boat in Greek mythology, Argos navigates a course to the "golden fleece" of print/plot cost recovery. Unlike conventional plot-management software, Argos logs printer/plotter output while at the same time scanning all computers on the network for unbilled activity; therefore, users can identify print jobs in advance, or plot first and fill in chargeback data later. Argos links to major financial accounting software used by A/E firms and can assemble cost data across multiple offices. Networked copiers and fax machines can be monitored as well, and Argos has an administrator-controllable threshold for no-charge convenience copies. Argos works on WindowsNT networks with any software that prints or plots to a Windows printer driver. In other words, Argos brings a benefit to any office that uses Windows and paper. Highly recommended.

System requirements: Any WindowsNT network, Windows software, and Windows-compatible printing or plotting device.

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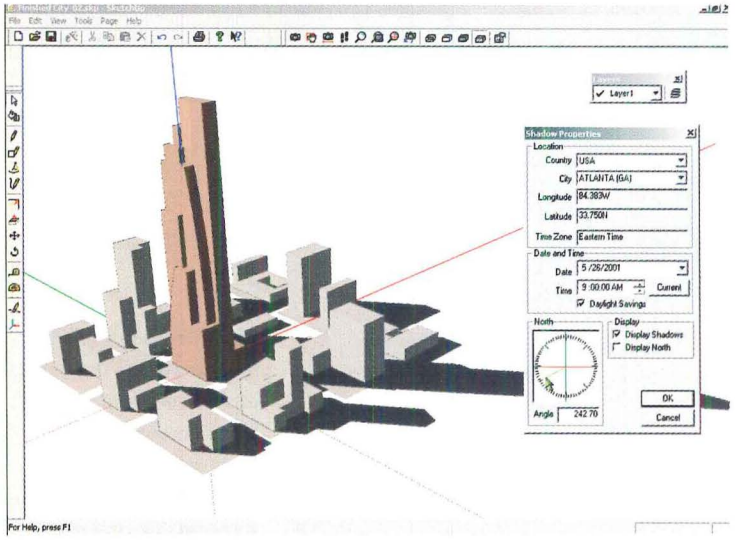
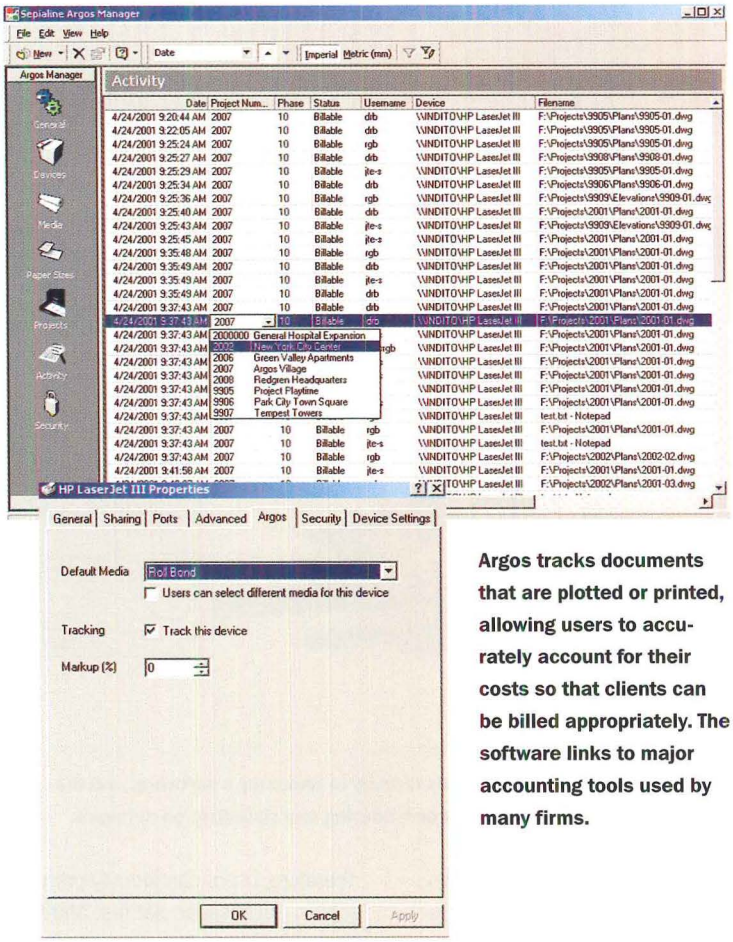


Architects can sketch 3D models directly in Sketchup's software, and the results can be exported to CAD or rendering and visualization software.

Contributing editor Jerry Laiserin, FAIA, provides strategic consulting services to architects.

www For more information on technology for architects, go to Digital Architect at **www.architecturalrecord.com**

Digital Product Reviews



Argos tracks documents that are plotted or printed, allowing users to accurately account for their costs so that clients can be billed appropriately. The software links to major accounting tools used by many firms.

It's about time

AEC Software—FastTrack Schedule 7.0 for Windows, Macintosh, and handheld computers

We last looked at FastTrack Schedule two years ago, in version 6.01 ["Software Reviews," AUGUST 1999, page 43]. Then, as now, the software provided a balance of features carefully tailored to the project-management needs of architects. It has a simple, spreadsheet-like interface: Rows represent tasks, bar-graph style; columns represent duration in time. Drag-and-drop editing eases definition of project milestones and links among tasks. The software works on both the Macintosh and PC platforms and is compatible with management tools such as Microsoft Project or Primavera Project Planner.

New in version 7.0 are convenient features such as Quickstart project templates, "express" clock and calendar functions, and new preset activity fields. The new version also offers more powerful features, such as highlighting a project's critical path and setting of time and other constraints on project tasks and links.

Architects often carry project-management information with them to sites or client meetings so they can update project data while on the go. Schedule 7.0 addresses these needs with a companion version for handheld PCs using the Palm operating system (such as Palm and Handspring Visor) as well as Sony Clié devices. Although the small screen and limited graphics of handheld PCs make creating new schedules a tad tedious, portability is the real bonus with FastTrack Schedule 7.0.

System requirements: Windows—386/DX or better, 4MB RAM, Windows 95 or higher; Macintosh—PowerPC or better, 4MB RAM; System 8.6 or higher; Handheld PC—Palm, Handspring, IBM, or Sony, Palm OS 3.0 or higher, 200K RAM.

AEC Software, Inc.
22611-113 Markey Court
Sterling, VA 20166
800/346-9413
www.aecsoft.com

Object lesson

Graphisoft—ArchiCAD

The current crop of architecture-specific CAD software—products such as Autodesk Architectural Desktop, DataCAD Plus, Revit, and Nemetschek Vectorworks Architect—strives to embody design intelligence rather than just to automate drafting. Design intelligence requires that building elements be represented by software objects—discrete bundles of program code that act as virtual representations of real building elements such as walls, doors, and windows. Typically, such objects exhibit a degree of parametric behavior, following predictable rules and constraints as designers size, modify, and link them with each other. The resulting integration of 2D and 3D representations, called the single building model or the virtual building, also contains attributes, or data links, that connect the parametric software objects to nongraphical information, such as cost, availability, or building-performance criteria.

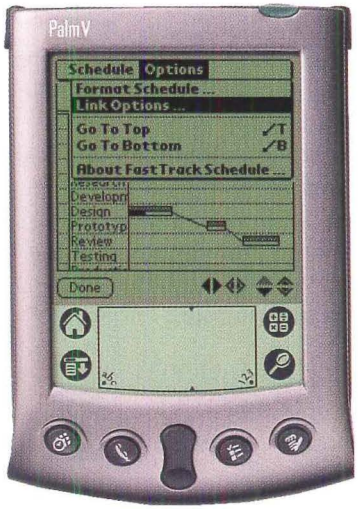
Graphisoft's ArchiCAD has been delivering architecture-specific design intelligence since the mid-1980s. Previous versions pioneered seamless integration of 2D and 3D design and documentation, including the ability to edit in any view and have all edits reflected throughout a model and its associated drawings. ArchiCAD users have long enjoyed the productive benefits of automatically deriving detail drawings from design models and sharing their work with teammates. The latest version of ArchiCAD consolidates its stronghold near the top of the intelligent CAD pecking order, with features such as visualization and animation of construction sequencing; Web-enabled collaboration and annotation in 3D; and drag-and-drop insertion of building objects from electronic libraries or catalogs into design models.

Graphisoft is also a leader in the Building Lifecycle Interoperability Software (BLIS) Project [see "Digital Architect," page 195]. While many CAD vendors support the concept of interoperability, ArchiCAD has actively participated in advanced demonstrations of interoperability among CAD and other architectural software tools.

With such comprehensive features, plus crossplatform support that makes it equally accessible to Macintosh and PC users, ArchiCAD 7.0 should be on every design firm's software shopping list.

System requirements: Windows—PentiumII/300 or better; 128MB RAM; Windows 95 or higher; Macintosh—G3 or better; 64MB RAM; System 9.04 or higher.

Graphisoft U.S., Inc.
224 Mississippi Street
San Francisco, CA 94107
800/344-3468
www.graphisoft.com



FastTrack 7.0 is now available for handheld PCs, so architects can update project data on the go.

New Products

The office furnishings category extends far beyond desks and chairs: workstations, occasional tables, storage systems, and lounge, side, and ergonomic seating work together to furnish the office environment. Most of the products shown on the following pages will be introduced at NeoCon 2001, held this year from June 18–20 in Chicago. *Rita F. Catinella*

Digital printed designs allow office system to express itself

With the DOT program, two Resolve systems never need to look the same.

Herman Miller has launched a program that enables customers of its Resolve office system to choose or personally create digitally printed designs for their system components, including boundary screens, rolling screens, flags, and canopies. The Design on Textile (DOT) program offers customers the choice of either selecting images from an expanding range of designer collections assembled by Herman Miller, or creating their own custom graphics for digital printing on Resolve components. The existing collections feature a range of design ideas and image styles from which to choose, including natural, graphic, abstract, and photographic.

The second choice, dubbed Customers' Own Image (COI), gives designers the freedom to prepare visual treatments, including corporate logos, slogans, pattern designs, and colors. Resolve screens or flags can also be used to identify departments and assist visitors and employees in finding their way through a company's corridors and open spaces. Since the Resolve screens are translucent, the DOT images change their appearance when viewed in varying light and from different perspectives. 800/851-1196. Herman Miller Inc., Zeeland, Mich. CIRCLE 200

Meeting room options

WizardSigns is Steelcase's first line of technology products. These touch-sensitive, flat-screen display signs are Internet and network addressable. RoomWizard (below) takes the frustration out of meeting room management by providing information about meeting spaces, allowing people to book meeting rooms online, and providing at-a-glance information about the room's availability and occupants. Also new from Steelcase is Cachet (above), a seating option that automatically adjusts its balanced-action rocker motion to the person sitting in it. The stacking chair is ideal for mobile workers and for use in meeting rooms, learning environments, cafes, and waiting rooms. 888/STEELCASE. Steelcase Inc., Grand Rapids, Mich. CIRCLE 202

New furnishings collection by designer Michael Vanderbyl features parawood

Bernhardt Design has launched its first collection by Michael Vanderbyl, consisting of four lounge pieces, four side chairs, and two table series. The collection represents another first for the company—the use of an alternative lumber source, parawood, which is native to the Amazon region of South America. This textured and richly hued dense wood possesses the characteristics of maple, but because it is not clear-cut, environmental impact and cost are kept to a minimum. The collection comprises generously sized lounge pieces, as well as smaller-scaled wood side chairs and tables. The Helena chair (far left) and matching ottoman have a strong wood structure, large-scale cushions, and tight upholstery. The tailored look of the upholstered seat cushion and bolster creates clean lines and silhouettes, with a latticelike parawood back. The Madison chair (near left) envelops the user with an exceptionally deep seat for extra comfort. The collection is available in a variety of custom Bernhardt finishes and upholsteries. 828/758-9811. Bernhardt Design, Lenoir, N.C. CIRCLE 201

New Products

▲ Head of the class

Da Capo seminar furniture can be specified for convention centers, auditoriums, conference rooms, or seminars. The line features armrest supports made of injection-molded aluminum that can be added on-site. Writing tables, left or right, can also be added at any time. The patented ganging device encourages the combination of armchairs and side chairs in the same row. Da Capo also provides row and seat numbering systems. 631/589-7337. Kusch+Co., Bohemia, N.Y. **CIRCLE 203**

► A chair for Agent 99

Codesigned by Haworth and Germany's ITO Design Group, X99 features translucent mesh or upholstery in a mid-back task chair, high-back executive chair, guest chair, and seminar seating. Both the task and executive seating have a German-engineered three-point pivot mechanism treating the back/hips/legs region as a single mobile unit; an automatic free-floating forward tilt; a single position backstop; and height and tension adjustment. Silver, black, or chrome finishes are available. 800/344-2600. Haworth, Holland, Mich. **CIRCLE 205**

▼ Gourmet coffee table

The 47-by-23½-inch rectangular glass top on the freestanding Sistema Two occasional table appears to hover above a pair of parallel, arced legs. Curved and perforated sheet metal joins the legs across a broad center section. The tempered glass tabletop, with smoothly polished beveled edges, features a large sandblasted rectangular center section. 800/566-5766. Kron USA, Pompano Beach, Fla. **CIRCLE 207**

► Elbow room

KI's 700 Series Curve System expands to serve as both a filing and storage system. With 1½-inch modularity, the system allows for a variety of storage configurations. Using a 10½-inch drawer, instead of the standard 12-inch drawer, provides for 25 percent more storage. The system offers curved pulls in a range of colors, a radiused frame, both gloss and textured finishes, and the choice of dimples or no dimples. 800/424-2432. KI, Green Bay, Wis. **CIRCLE 204**

▲ Status symbol

The surface and pedestals of Dakota Jackson's modern interpretation of the classic partner's desk are connected by a light metal arch that echoes the shape of a suspension bridge. The desk can accommodate numerous seating options and separate workstations. 718/786-8600. Dakota Jackson Inc., Long Island City, N.Y. **CIRCLE 206**

◄ Kick it up a notch

Turnstone introduces Kick, a new midmarket systems furniture line. The flexible components, including panels, work surfaces, storage, and work tools, are designed to provide solutions for companies ranging from startups to multinationals. The system will be on display at Turnstone's permanent e-tail store/showroom during NeoCon. 616/698-4897. Turnstone Office Furniture, Grand Rapids, Mich. **CIRCLE 208**

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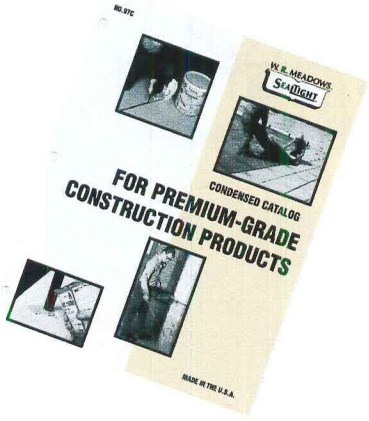

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CIRCLE 83 ON INQUIRY CARD

New Products

▲ U.S. premiere

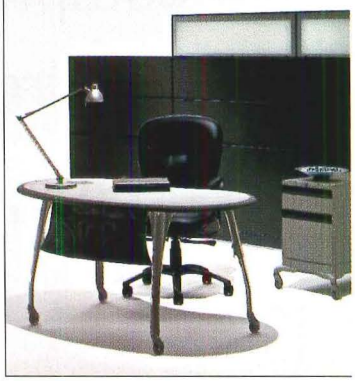
Furnishings from Belgium manufacturer Bulo are available for the first time in the U.S. through D'Apostrophe's 8,000-square-foot showroom in New York. The desk in Bulo's Normal collection, created by French architect Jean Nouvel, features a table-top resting on a drawer unit and a credenza. The three parts are connected by two star-shaped elements of anthracite gray coated steel. The credenza is positioned at a 90-degree angle and has two lateral doors. Storage units and meeting tables in different size and variations complete the range. Normal also offers integrated wire management. 212/334-5045. D'Apostrophe LLC, New York City. **CIRCLE 209**

▲ Nap time, revisited

Vitra believes that sitting, standing, and even sleeping are part of a full day's work, and a chair should adjust itself accordingly. Ypsilon's mechanics allow a smooth transition when sinking back from the upright into the lounging position. It also features a Techno Gel Pad that provides lumbar support and an integrated coat hanger. 212/539-1900. Vitra Inc., New York City. **CIRCLE 210**

▼ No squeaky wheels

The Marbles line of mobile furniture and accessories features roller blade–style wheels, available in clear and flint, which roll more quietly than conventional office casters. Marbles' table-height mechanism locks at nine positions between 27 and 36 inches, including an ADA-required stop at 32½ inches. A "Storage Creeper" converts Allsteel Premium laterals and pedestals into mobile warehouses. 319/262-4800. Allsteel Inc., Muscatine, Iowa. **CIRCLE 211**



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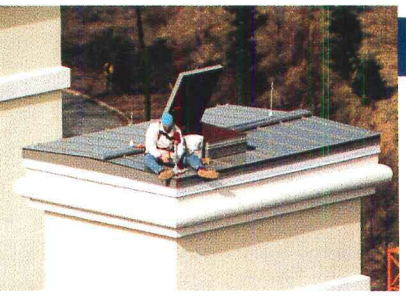

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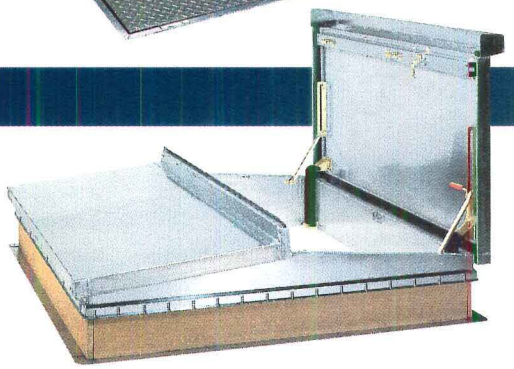

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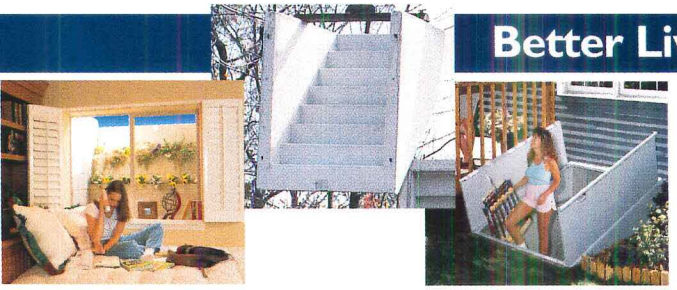

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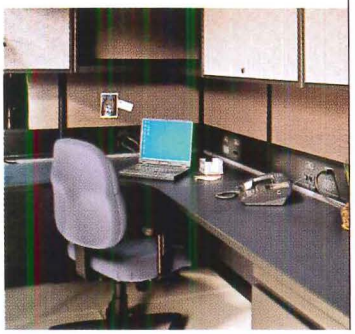
New Products

▼ Double your options

Trendway introduces Choices^2, which functionally and aesthetically integrates with all other Trendway lines and includes a Beltline with power and data accessibility at work-surface height. Choices^2 consists of panel-hung and freestanding products, including filing cabinets, storage units, and tables that together create the foundation for a variety of work environments. 800/748-0234. Trendway Corporation, Holland, Mich. **CIRCLE 212**



▲ Swiss seats

Duca is a Swiss-designed, ergonomic chair available in both executive and conference versions. Duca features a Syncro-Dynamic mechanism that allows continuous adjustment and permanent back contact. Duca is available in top-grain, fully aniline-dyed leather or fabric upholstery. 800/631-1186. Dauphin N.A., Boonton, N.J. **CIRCLE 213**

► Don't mind the wait

The Aryton collection was inspired by the height of the French Empire period, from 1804 to 1864. The lounge seating offers a single-seat upholstered lounge chair, two-seat settee, or three-seat sofa with sweeping arm profiles in a compact floor footprint. 800/456-9672. Geiger Brickel, Atlanta. **CIRCLE 214**

▲ For the computer guys

PowerPlane supports heavy power and data users requiring uncommon ergonomic considerations. PowerPlane offers Shelf Plane with a wire backstop for overhead storage, Technology Plane for computer monitor and equipment, Reference Plane for reference material, and a Keyboard Plane wide enough to accept two keyboards. 800/263-2387. Egan & TeamBoard, Woodbridge, Ontario. **CIRCLE 215**

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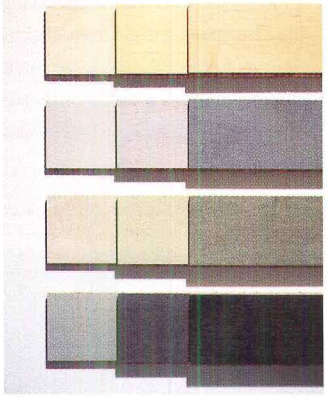
Product Briefs

► Cool stool

Introduced at the Milan Furniture Fair in April, the adjustable-height stool Zanzibar, designed by Raul Barbieri for Rexite, may be the next ubiquitous stool for the home, office, or bar. Thanks to a gas lift mechanism, the height is easily adjusted by pressing any one of the three colored buttons. Zanzibar comes in six colors, has an ergonomic polymer seat to encourage correct posture, and a leg and base in chromium-plated steel. 39/0290390013. Rexite spa, Cusago, Italy. CIRCLE 216

► Walking a colorful plank

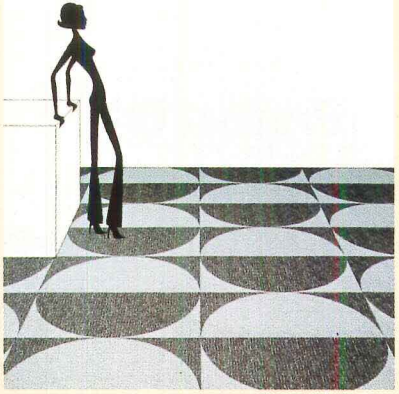


Perlot, Ann Sack's first entrée into hardwood plank, is available in two-, three-, four-, and six-foot lengths. Constructed of a maple wearlayer over a solid lumber core and a solid lumber backer, the planks have undergone a total of 14 separate steps in the finishing process, including an abrasion-resistant finish. Perlot is available in 12 earth-tone shades ranging from grays to yellows, greens, and blues. 310/406-8801. Ann Sacks, Portland, Ore. CIRCLE 218

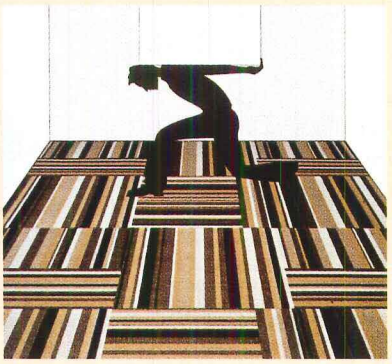
▲ Lordly lavatory

Architect Lord Norman Foster's new collection for Duravit includes sanitary ceramics, bathroom furniture, and accessories. Two circles, side by side, form the basic oval shape that is the foundation of Foster's entire range. His washbasin (above) has generous dimensions, yet retains a narrow rim. It is available in a floor-standing or semi-pedestal version in various widths. Mirrors, medicine cabinets, toilets, bidets, and vanity units complete the line. 888/DURAVIT. Duravit, Duluth, Ga. CIRCLE 219

Product of the Month Oxygen

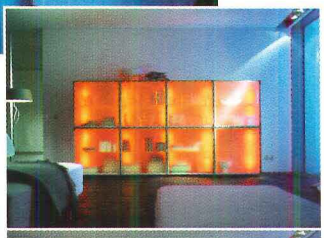


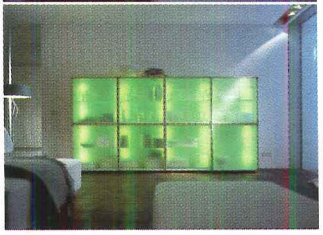
Milliken Carpet, Commercial Markets, and Gensler have teamed up to launch Oxygen, a modern modular carpet collection that the companies believe will be a new graphic concept for the floor. The collection was created for Milliken by Gensler and marks the first time that the worldwide architectural and design firm has put its name on a product. Eight design groups and 15 patterns can be mixed and matched to allow designers to compose their own graphic art on the floor. With names like Float, Catwalk, Kiss, Screen, Shag, Wink, Fizz, and Glam, the patterns suggest images such as bubbles, fizz, striped blocks, and TV screens, and textures such as linen, nubby cotton, and tissue paper. Each carpet is manufactured with precise modulation, which allows multiple patterns to be mixed and matched, checkerboarded, turned in 90- or 180-degree angles, or placed randomly throughout the space. As with all modular carpets from Milliken, Oxygen can be renewed through the company's Earth Square program. 800/241-4826. Milliken Carpet, LaGrange, Ga. CIRCLE 217



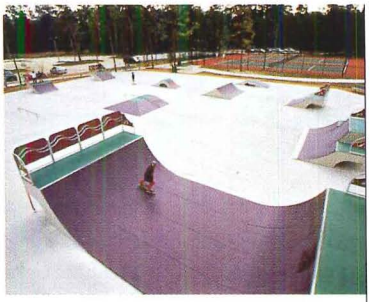
▲ Moody cabinets

The modular cabinet system "eo" consists of cubes with glass walls and doors held in a filigree metal structure. With a remote control, users can mix every conceivable color tone, from sunflower yellow to deep violet; LED strips emitting the primary colors are installed in the back edges of each cube. Four storage variations are available for a CD system, a minibar, dishware, or wine shelves. 49/05242121. Interlübke, Rheda-Wiedenbrück, Germany. CIRCLE 220





Product Briefs

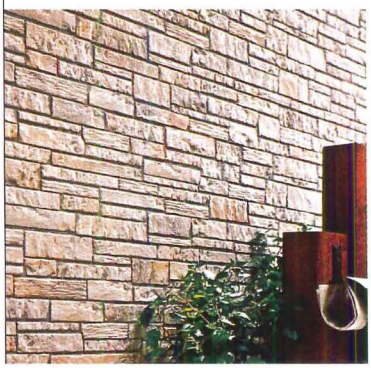


▲ Catch some air

With more than 14 million skateboarders and in-line skaters in the U.S. and only 600 skate parks available for them to share, there is a huge demand for SkateWave, the new customizable and reconfigurable skate park system. Each modular obstacle is constructed of steel with a TekTrak powdercoat finish on the transitions and decks. 866/SK8-WAVE. SkateWave, a Division of Landscape Structures Inc., Delano, Minn. **CIRCLE 221**

▼ Covered inside or out

Nichiha manufactures composite panels for exterior and interior use with a combination of portland cement and fibers. The panels are prefinished in the factory, with a permanent coating which the company claims does not require any maintenance after installation. Panels are 18 by 180 inches and are installed over supplied metal clips. All patterns include matching corner trims. 866/424-4421. Nichiha USA, Atlanta. **CIRCLE 222**



▲ Cutting the grass

The bamboo flooring and panels from TimberGrass are harvested from managed growth areas in China. Since it is a grass, bamboo regrows every six years from the same plant it is cut from. The prefinished flooring has a five-coat finish system, uses environmentally safe adhesives, and is available in natural blond or caramelized colors. TimberGrass carries both residential and commercial warranties. 800/929-6333. TimberGrass LLC, Bainbridge Island, Wash. **CIRCLE 223**

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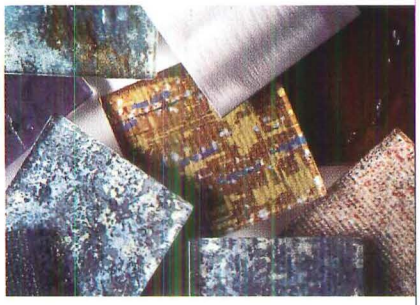
Product Briefs

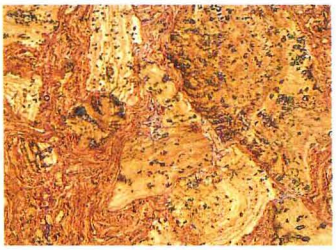
► Textured glass floors



UltraGlas for Mannington is a collection of kiln-formed, heat-tempered, 18-by-18-inch embossed architectural floor tiles for corporate, hospitality, retail, and institutional environments. The three textures include the finely ribbed Lineage, the natural stone look of Forged, and the uneven surface of UltraSlate. Each is available in 16 hand-applied colors and contains up to 30 percent recycled glass. 800/241-2262. Mannington Commercial, Salem, N.J. **CIRCLE 224**

► Volcanic design

Pyrolave manufactures glazed Andesite lava stone, which is quarried from the lava flows of the Nugere crater in central France. This material can be integrated into countertops, floor and wall coverings, swimming pools, tabletops, and more. High-temperature enamel firing at 1,868 degrees Fahrenheit reinforces the natural durability of the stone and gives it an impervious surface. 312/222-1237. French Technology Press Office, Chicago. **CIRCLE 225**



◄ More bark than bite

Produced from the renewable bark of cork trees, Unicork tiles feature 12 color patterns including Lava Blond, Lava Ruby, and Organika Green. Unicork is available in a standard five-millimeter gauge in a 12-by-24-inch tile. 877/843-8184. To Market, Washington, D.C. **CIRCLE 226**

◄ Fancy flushometers

Sloan presents the Guildmark Collection of faucets and flushometers with a selection of high-end finishes. Polished brass, lustre gold, satin, nickel, and chrome finishes are available for hardwired and battery-operated Royal, Royal II, and Continental flushometers, as well as Optima and Optima Plus touchless faucets. 800/745-0800. Sloan Valve Company, Franklin Park, Ill. **CIRCLE 227**

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Product Literature

Custom closet CD

ClosetMaid's new 3-D *Custom Closet Design* program allows the user to create a custom closet in minutes, making it possible for customers to view their new storage space in a detailed, realistic 3-D rendering. 800/874-0008. ClosetMaid, Ocala, Fla. **CIRCLE 228**

Projection screen catalog

The 130-page *Power in Presentation* catalog has been designed with 10 individual sections. Each section contains detailed information on a specific presentation product line, as well as educational information on selecting the correct projection screen for every environment. 800/622-3737. Da-Lite Screen Company Inc., Warsaw, Ind. **CIRCLE 229**

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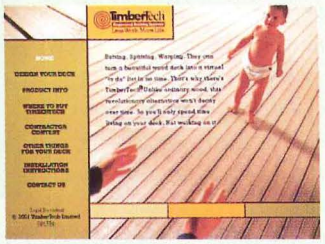


An online exhibit of furniture by six New York designers **www.circline.com/21**

The PVC Alternatives Database featuring over 200 products from companies based in 17 countries
www.greenpeace.org.au/pvc

CAD drawing library with downloadable files to incorporate Milgard windows into project specs **www.milgard.com**

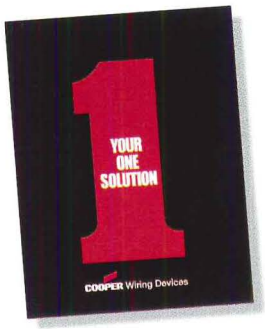
Long Island City, N.Y. **CIRCLE 230**

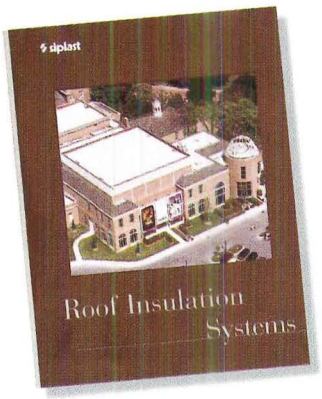
Electrical wiring devices

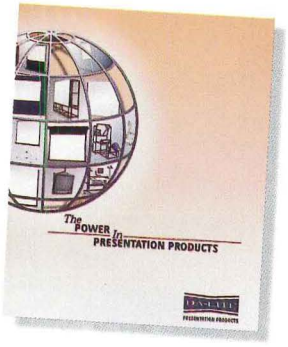
Cooper Lighting's new *Your One Solution* brochure provides electrical wiring contractors, distributors, and specifying professionals with a guide to the company and its electrical wiring devices. Products featured in the brochure include pin and sleeve devices, manual contractors/disconnect switches, and hospital- and specification-grade switches. 718/937-8000. Cooper Wiring Devices, **CIRCLE 231**

Roof system catalog

The Siplast *Roof Insulation Systems* catalog describes in detail Siplast's ZIC, Zonocel, NVS, and Insulcel roof insulation systems. The catalog also offers a comparative analysis of Siplast roof insulation versus ordinary rigid board. The full-color catalog is illustrated with in-progress job photographs and cutaway diagrams. 800/922-8800. Siplast, Irving, Tex. **CIRCLE 231**







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Product Literature

Steel rebar protection

The Concrete Reinforcing Institute offers its most recent *Anti-Corrosion Times* newsletter. The eight-page newsletter has industry news, applications, and developments on fusion-bonded epoxy coating for corrosion protection of steel rebar. As in each issue, the newsletter features projects that use epoxy-coated rebar in concrete construction. 847/517-1200. Concrete Reinforcing Steel Institute, Schaumburg, Ill. **CIRCLE 232**

Marketing primer

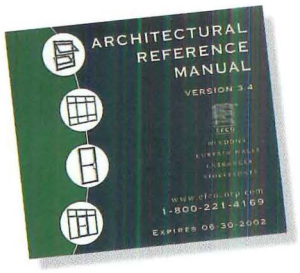
Leviton now offers a handbook that provides electrical contractors with step-by-step instructions on how to use basic marketing practices and principles to plan for increased growth and profitability. The *Marketing Handbook* is designed to give electrical contractors a comprehensive overview of the marketing process. 800/323-8920. Leviton Manufacturing Co. Inc., Little Neck, N.Y. **CIRCLE 233**

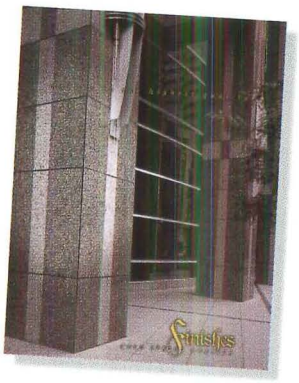
Newest window CD-ROM

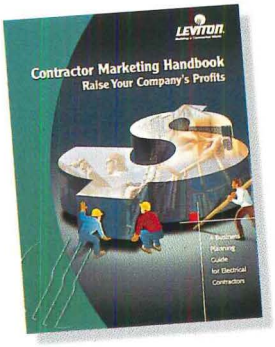
The updated version 3.4 EFCO ARM CD-ROM is now available. It replaces all previous versions and will run on any Web browser using HTML. This CD gives easy access to EFCO's detailed overviews, specifications, and detail drawings, and it makes CAD files easier to download. All information on the disc can be printed on a laser or ink-jet printer. All EFCO ARM CDs are programmed with an automatic expiration date to ensure the user has the most current information. Version 3.4 expires on June 1, 2002. 800/221-4169. EFCO Corporation, Monett, Mo. **CIRCLE 234**

Granite brochure

Cold Spring Granite Company has released a brochure showcasing the variety of standard and proprietary finishes it offers. The brochure pictures each finish in tile and slab form while describing the manufacturing process that is used to create the subtle variations in color, tone, and texture and to enhance functionality. Among the 19 finishes featured, Cold Spring introduces two new ones: the Diamond 100 and Diamond 200. Both are created with high water pressure, which exposes the granite crystals and achieves a constant medium and coarse textured surface. 800/328-5040. Cold Spring Granite Company, Cold Spring, Minn. **CIRCLE 235**







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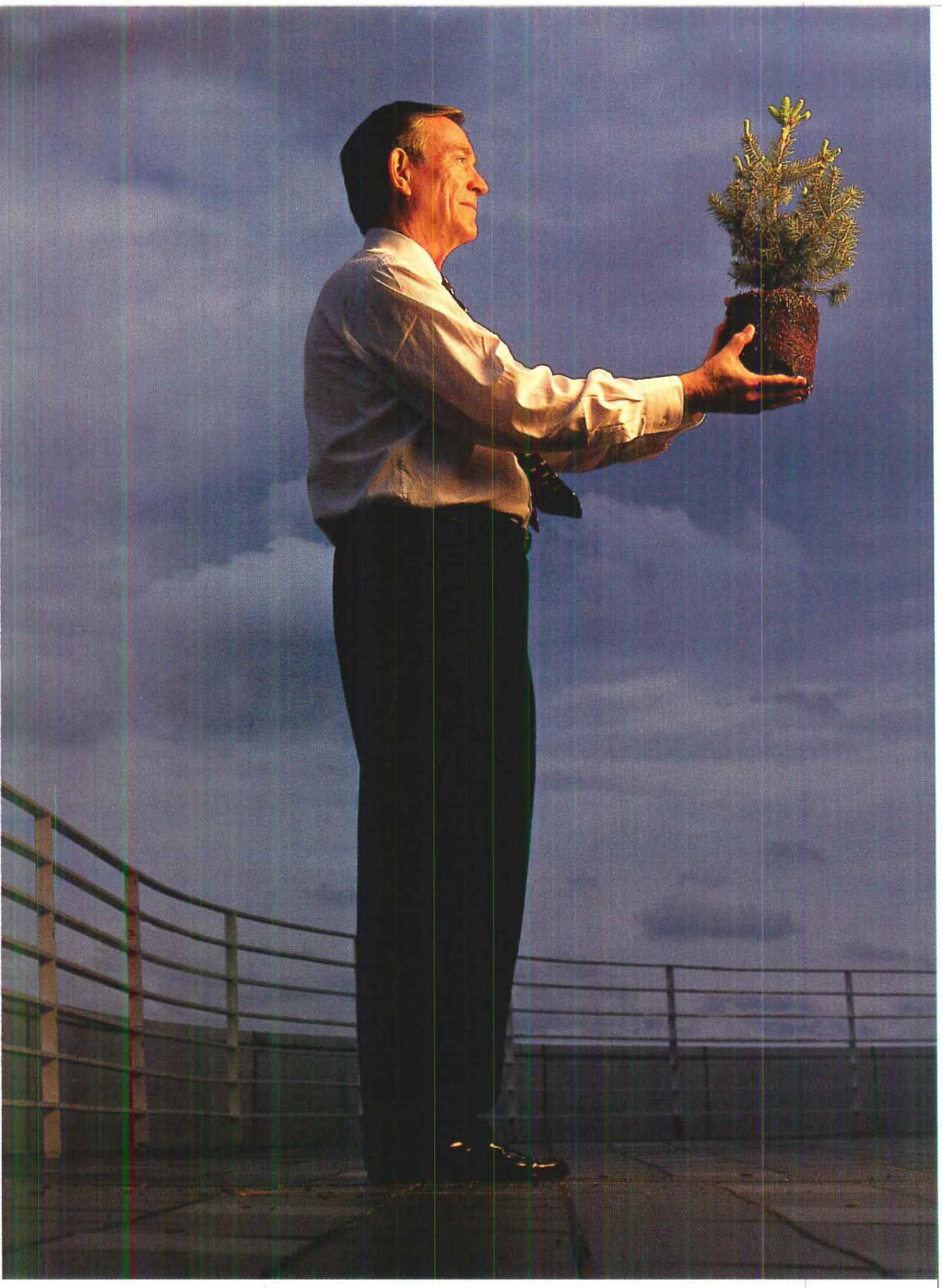

Ray Anderson: Carpet maker with a conscience

Interviewed by Deborah Snoonian, P.E.

Ray Anderson may be the only CEO who begins speeches by asking audience members to hug each other. It creates a bond, he says, among his "fellow astronauts on Spaceship Earth." The founder and president of Interface, the world's largest manufacturer of carpet tiles, is on a mission: make carpet without using petroleum. It's a tall order for an industry that relies on nylon and polyester as its raw materials. Anderson also pioneered another concept: carpet leasing. When clients need carpet replaced, Interface takes it back and recycles it, thereby diverting the waste from landfills. The company also researches ways to make new carpet using less raw material and higher recycled content.

Q: *You've said there's no such thing as a sustainable product.*

That's right. Certainly not in our industry. When you talk about how sustainability should really be defined, it means taking nothing from the earth that's not naturally renewable throughout the whole supply chain. A sustainable product would reflect those attributes, having been produced by processes that reflected those attributes, manufactured in facilities that reflected those attributes, by people who reflect those attributes. And that is a very high standard indeed—taking nothing, doing no harm. So by that definition, there's no such thing as a sustainable product yet. We can only hope to be a little less unsustainable in our product development efforts.

Are government mandates or standards necessary to force the hand of the building industry to become more environmentally responsible?

No. But I do think it's necessary for customers—whether they're architects, interior designers, facility managers, or building owners—to demand environmentally responsible products. Even the hardest-hearted, meanest-spirited manufacturers will respond to their customers.

How are other industries practicing sustainability? Is there anything the design and construction industry can learn from them?

The aluminum industry is operating with something like two-thirds of its raw materials coming from recycled sources. I think that's significant, and it reflects the direct economics of good environmentalism. Refining bauxite to make virgin aluminum is extremely energy-intensive, and recapturing that embodied energy by recycling aluminum reduces the new energy input significantly and makes it very economical.

How will the built environment be different in 50 years?

We need to start designing buildings that use photovoltaics or wind energy or fuel cells or biomass, and we need to use that energy efficiently. Advances in building materials will enable designers and architects to fashion buildings in a more site-specific manner, to be responsive to local environmental conditions. We're seeing the beginning of a strong trend toward more nearly sustainable products. And I think that will eventually extend to all the materials in a building—to the point where we finally have a built environment that makes no net new environmental footprint. I can't overemphasize the power of the marketplace to move business and industry in the direction it ought to go. Economics doesn't show much of a social conscience, but specifiers and users and consumers can. And ethics can enter into the decisions they make, and those decisions will change the world. And the world desperately needs changing. ■

Photograph by Greg Foster

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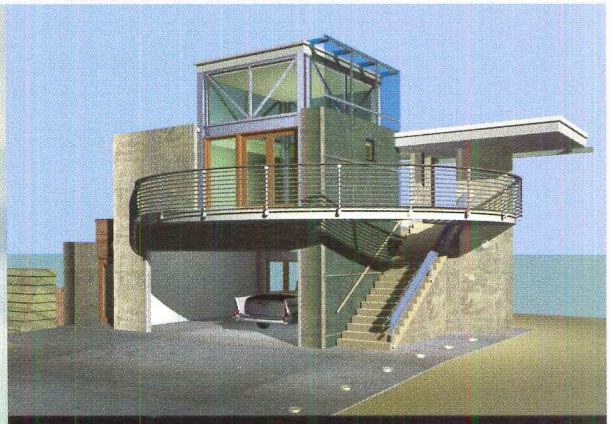

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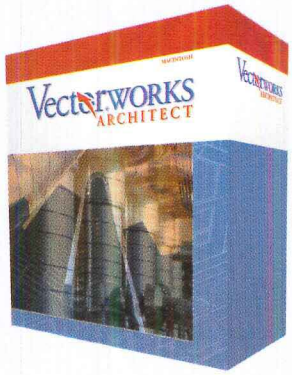

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